

DC SERIES

High-Power CO₂ Slab Laser

Coherent DC Series high-power CO₂ lasers offer an unmatched combination of economy and reliability for a variety of materials processing tasks, including cutting, welding, and surface treatment. Plus, their far infrared output wavelength makes them compatible with a wide range of materials, including metals, wood, plastics, textiles, paper and carbon fiber reinforced polymers (CFRPs).

These lasers employ a slab discharge design, which is unique and enables output characteristics superior to that of lasers based on flow construction. The sealed, slab discharge configuration avoids optics contamination, and eliminates the complexity, cost, and reliability issues of turbines for gas recirculation. All this means the DC Slab series offers low operating costs, market-leading reliability, along with long lifetimes of components and the laser itself.



FEATURES

- Output power: 1000 to 8000 Watts
- Wavelength 10.6 μm
- Gaussian beam profile with $M^2 < 1.05$
- Excellent laser power and beam point stability
- Minimal gas consumption due to diffusion cooling
- Low service requirements
- Compact version available: laser head and control cabinet combined in one unit

MARKETS AND APPLICATIONS

- Automotive:
 - Cutting of airbags, plastics, and interior
 - Scoring of dashboards
- Packaging:
 - Cutting of die boards
 - Direct laser cutting of corrugated boards
- Semicon:
 - Wafer annealing
- Precision manufacturing:
 - Surface treatments of glass and solar cells
 - Welding
 - Cutting of metal, wood, plastics, CFRP

Specifications	DC 010	DC 015	DC 020	DC 025
Nominal Power (W)	1000	1500	2000	2500
Power Range (%)	10 to 100			
Laser Beam Quality <i>ISO 11146, deviation $\pm 5\%$</i>	K (M ²) = 0.95 (1.05)			
Power Stability (%) <i>Cooling water $\Delta T \leq \pm 1K$</i>	± 2			
Pointing Stability (mrad) <i>ISO 11145</i>	≤ 0.15			
Pulse Frequency Range	CW, 2 to 5000 Hz			
Beam Diameter (mm) ¹	18 \pm 3		20 \pm 3	
Polarization	linear, 45° to horizontal level			
Wavelength (μ m)	10.6			
Excitation	RF			
Electrical Ratings				
Voltage	3 x 400 V $\pm 10\%$, 3 x 440 V $\pm 10\%$ or 3 x 480 V $\pm 10\%$; 50/60 Hz; 3 Phases; PE			
Connected Load (kVA)	16	22	35	41
Effective Power at Nominal Power (kW)	15	21	34	39
Max. Current Consumption at 400 V (A)	<25	<35	<51	<59
Fuses Type NH (A)	50		80	
Cooling				
Recommended Cooling Capacity (kW)	≥ 15	≥ 21	≥ 34	≥ 39
Flow Rate Laser Head (l/h)	≥ 3000	≥ 4000	≥ 4000	≥ 5000
Flow Rate Laser Cabinet (l/h)	≥ 500			
Flow Rate Laser Compact (l/h)	≥ 3500	≥ 4500	≥ 4500	≥ 5500
Temperature Θ (°C) ²	20 or 27 (above dew point)			
Temperature Tolerance Range (°C)	± 1			
Supply Pressure (hPa)	≤ 6000 (6 bar)			
Back Pressure (hPa)	≤ 1500 (1.5 bar)			
Laser Gas				
Type	Premix-Laser Gas			
Consumption (NI/h)	<0.06			
Change Interval (h)	168			

Notes:

1. Measured in a distance <10 m; please contact Coherent for detailed data of the beam propagation.
2. $\frac{\Delta \theta}{\Delta t} \leq 3^\circ/\text{min}$; t > 1.5 min.

Dimensions and Weights	DC 010	DC 015	DC 020	DC 025
Standard Laser Head (L x W x H) (mm)	1685 x 800 x 850			
Weight (kg) (approximate)	520		565	
Control Cabinet (W x D x H) (mm)	1200 x 680 x 2062			
Weight (kg) (approximate)	575		670	
Compact Laser (L x W x H) (mm)	1880 x 873 x 1863			
Weight (kg) (approximate)	1310		1380	
Environmental Conditions				
Ambient Temperature (°C)	5 to 40			
Humidity	Dew point below the cooling water temperature			
Custom Interface				
	Commands from external controller / control panel, status signals to external controller, external pulse interface, external analog and digital power control, Ethernet Interface			

Specifications	DC 030	DC 035	DC 040
Nominal Power (W)	3000	3500	4000
Power Range (%)	10 to 100		
Laser Beam Quality <i>ISO 11146, deviation $\pm 5\%$</i>	K (M ²) = 0.95 (1.05)		
Power Stability (%) <i>Cooling water $\Delta T \leq \pm 1K$</i>	± 2		
Pointing Stability (mrad) <i>ISO 11145</i>	≤ 0.15		
Pulse Frequency Range	CW, 2 to 5000 Hz		
Beam Diameter (mm) ¹	25 \pm 3		
Polarization	linear, 45° to horizontal level		
Wavelength (μm)	10.6		
Excitation	RF		
Electrical Ratings			
Voltage	3 x 400 V $\pm 10\%$, 3 x 440 V $\pm 10\%$ or 3 x 480 V $\pm 10\%$; 50/60 Hz; 3 Phases; PE		
Connected Load (kVA)	48	56	60
Effective Power at Nominal Power (kW)	46	52	57
Max. Current Consumption at 400 V (A)	<70	<81	<87
Fuses Type NH (A)	100		125
Cooling			
Recommended Cooling Capacity (kW)	≥ 46	≥ 52	≥ 57
Flow Rate Laser Head (l/h)	≥ 5000		
Flow Rate Laser Cabinet (l/h)	≥ 500		
Flow Rate Laser Compact (l/h)	≥ 5500		
Temperature Θ (°C) ²	20 or 27 (above dew point)		
Temperature Tolerance Range (°C)	± 1		
Supply Pressure (hPa)	≤ 6000 (6 bar)		
Back Pressure (hPa)	≤ 1500 (1.5 bar)		
Laser Gas			
Type	Premix-Laser Gas		
Consumption (NI/h)	<0.08		<0.09
Change Interval (h)	168		

Notes:

1. Measured in a distance <10 m; please contact Coherent for detailed data of the beam propagation.
2. $\frac{\Delta\theta}{\Delta t} \leq 3^\circ/\text{min}$; $t > 1.5 \text{ min}$.

Dimensions and Weights		DC 030	DC 035	DC 040
Standard Laser Head (L x W x H) (mm)		2085 x 850 x 850		
Weight (kg) (approximate)		675	685	
Control Cabinet (W x D x H) (mm)		1200 x 680 x 2062		
Weight (kg) (approximate)		670	750	
Compact Laser (L x W x H) (mm)		2280 x 968 x 1863		
Weight (kg) (approximate)		1610	1670	
Environmental Conditions				
Ambient Temperature (°C)		5 to 40		
Humidity		Dew point below the cooling water temperature		
Custom Interface				
		Commands from external controller / control panel, status signals to external controller, external pulse interface, external analog and digital power control, Ethernet Interface		

Specifications	DC 050	DC 060	DC 080
Nominal Power (W)	5000	6000	8000
Power Range (%)	20 to 100		15 to 100
Laser Beam Quality <i>ISO 11146, deviation $\pm 5\%$</i>	K (M ²) = 0.95 (1.05)		
Power Stability (%) <i>Cooling water $\Delta T \leq \pm 1K$</i>	± 2		
Pointing Stability (mrad) <i>ISO 11145</i>	≤ 0.15		
Pulse Frequency Range	CW, 2 to 100 Hz		
Beam Diameter (mm) ¹	25 \pm 3		
Polarization	linear, 45° to horizontal level		
Wavelength (μm)	10.6		
Excitation	RF		
Electrical Ratings			
Voltage	3 x 400 V $\pm 10\%$, 3 x 440 V $\pm 10\%$ or 3 x 480 V $\pm 10\%$; 50/60 Hz; 3 Phases; PE		
Connected Load (kVA)	76	90	123
Effective Power at Nominal Power (kW)	71	85	120
Max. Current Consumption at 400 V (A)	<110	<130	<154
Fuses Type NH (A)	160		200
Cooling			
Recommended Cooling Capacity (kW)	≥ 71	≥ 85	≥ 120
Flow Rate Laser Head (l/h)	≥ 6000	≥ 7500	≥ 9000
Flow Rate Laser Cabinet (l/h)	≥ 800	≥ 800	≥ 1000
Flow Rate Laser Compact (l/h)	≥ 6800	≥ 8300	$\geq 10,000$
Temperature Θ (°C) ²	20 or 27 (above dew point)		
Temperature Tolerance Range (°C)	± 1		
Supply Pressure (hPa)	≤ 6000 (6 bar)		
Back Pressure (hPa)	≤ 1500 (1.5 bar)		
Laser Gas			
Type	Premix-Laser Gas		
Consumption (Nl/h)	<0.15	<0.17	
Change Interval (h)	168		

Notes:

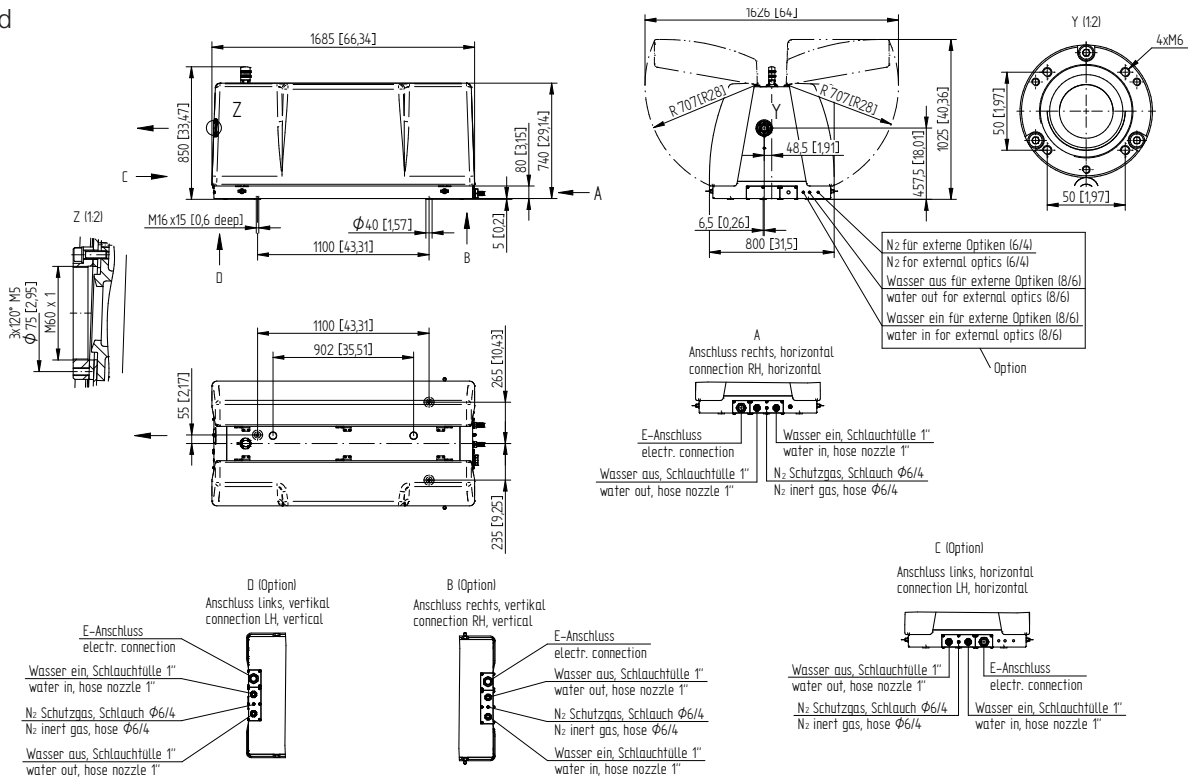
1. Measured in a distance <10 m; please contact Coherent for detailed data of the beam propagation.
2. $\frac{\Delta\theta}{\Delta t} \leq 3^\circ/\text{min}$; $t > 1.5 \text{ min}$.

Dimensions and Weights	DC 050	DC 060	DC 080
Standard Laser Head (L x W x H) (mm)	2350 x 950 x 950	2600 x 950 x 950	
Weight (kg) (approximate)	1000	1100	
Control Cabinet (W x D x H) (mm)	1200 x 680 x 2062		1500 x 805 x 2062
Weight (kg) (approximate)	800		1160
Compact Laser (L x W x H) (mm)	2520 x 1023 x 1963	2770 x 1023 x 1963	
Weight (kg) (approximate)	2250	2300	2500
Environmental Conditions			
Ambient Temperature (°C)	5 to 40		
Humidity	Dew point below the cooling water temperature		
Custom Interface			
	Commands from external controller / control panel, status signals to external controller, external pulse interface, external analog and digital power control, Ethernet Interface		

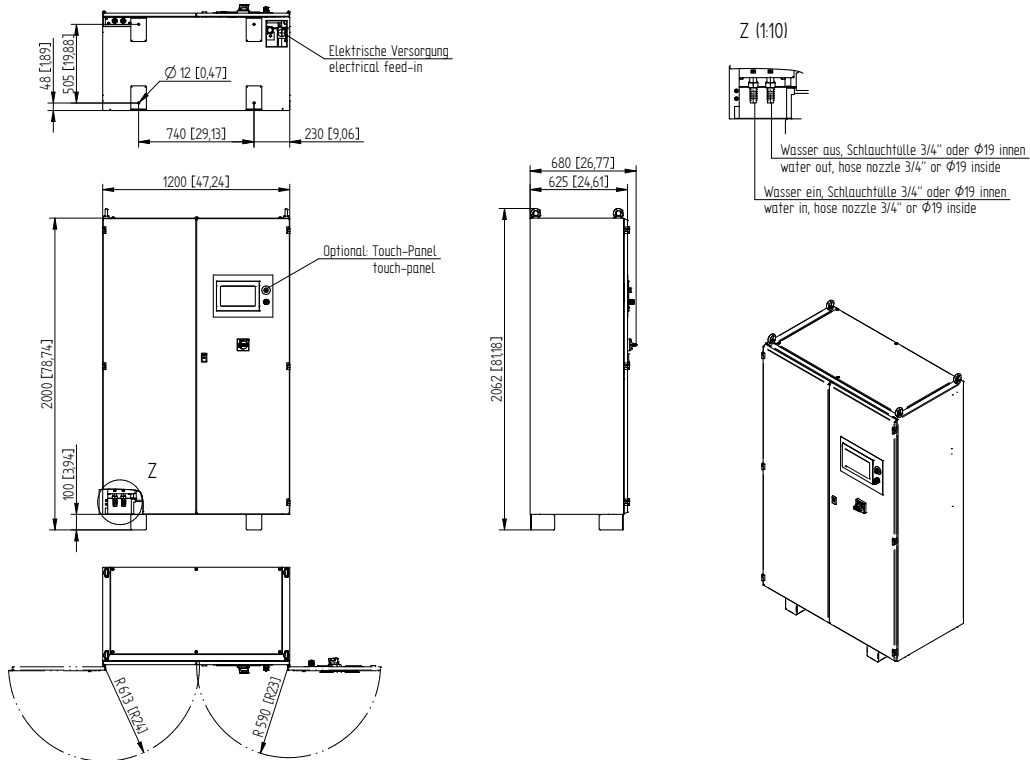
Mechanical Specifications

DC 010 - DC 025 Standard

Laser Head

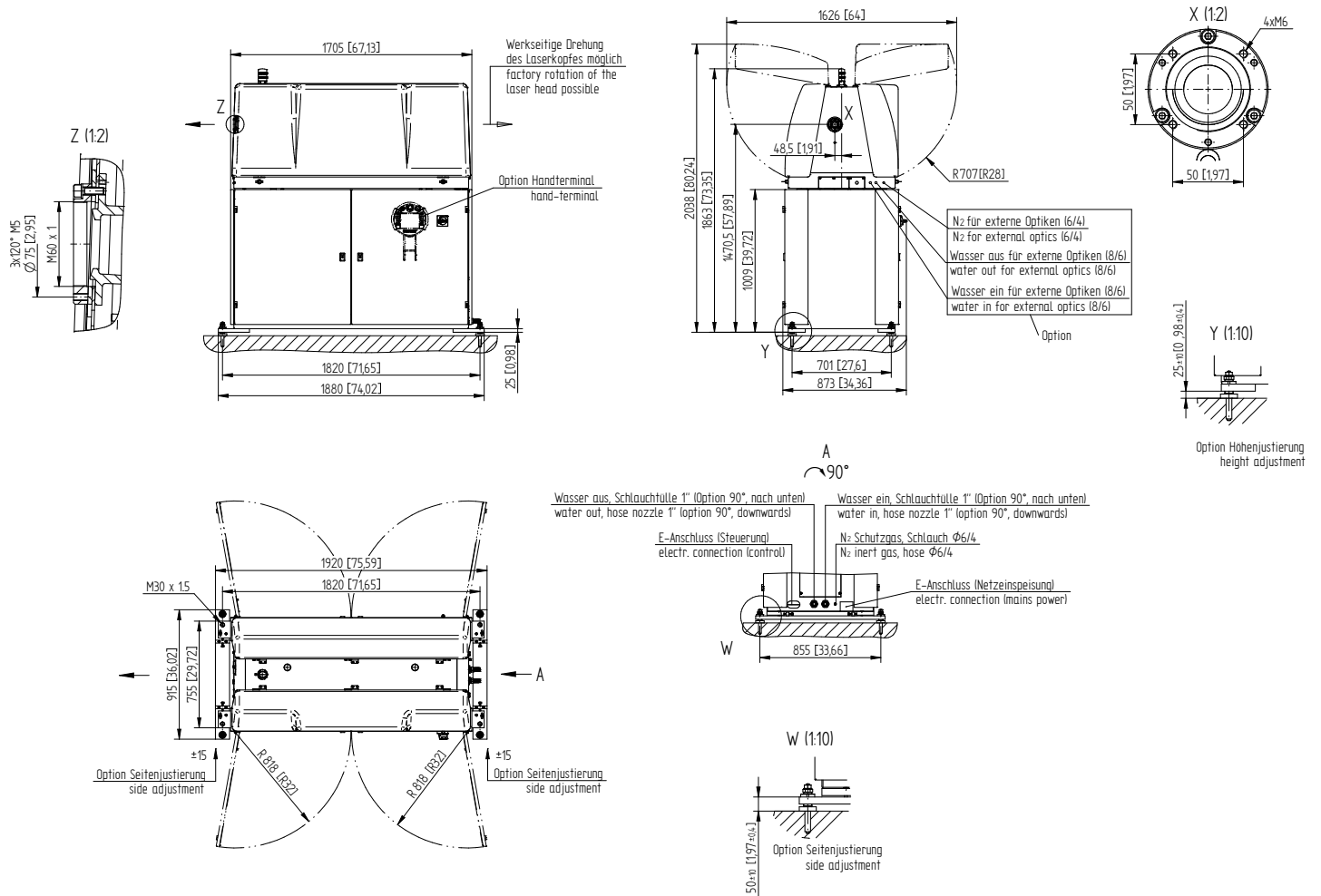


Cabinet



Mechanical Specifications

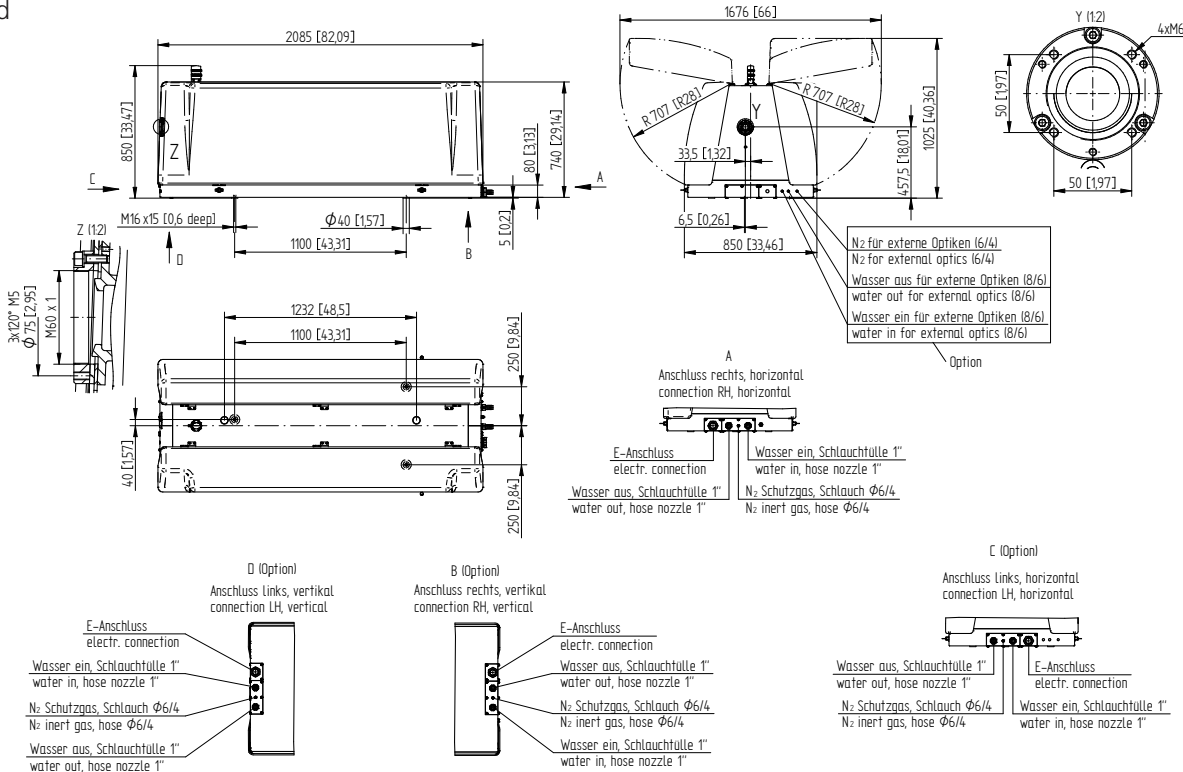
DC 010 - DC 025 Compact



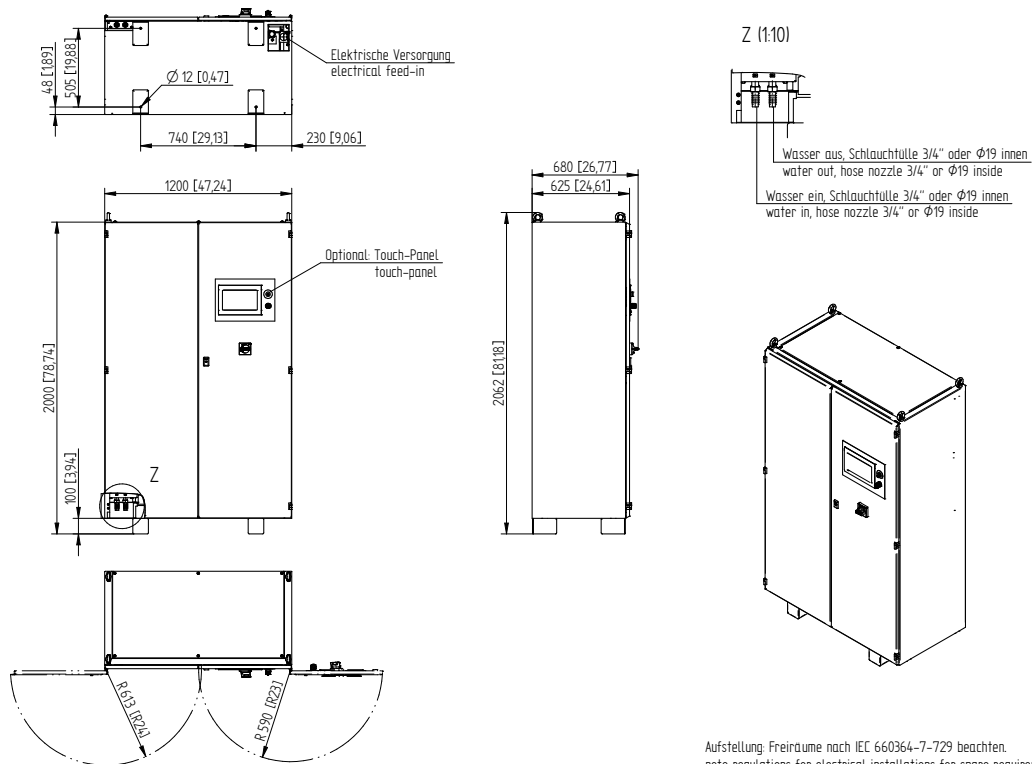
Mechanical Specifications

DC 030 - DC 040 Standard

Laser Head



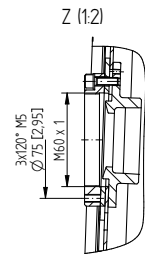
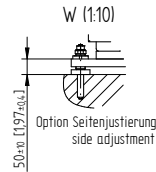
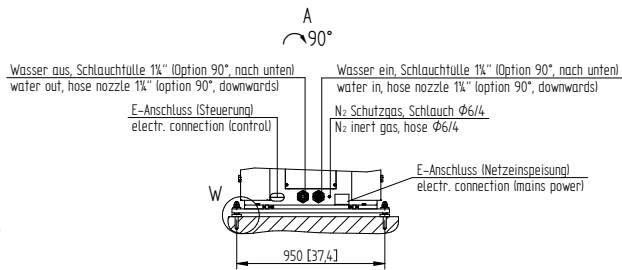
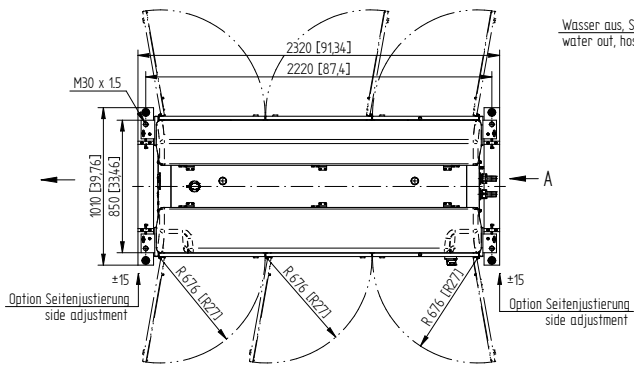
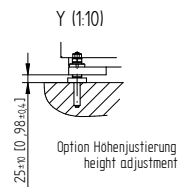
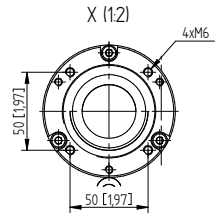
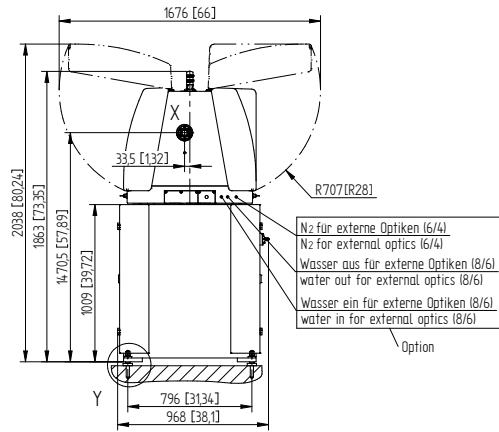
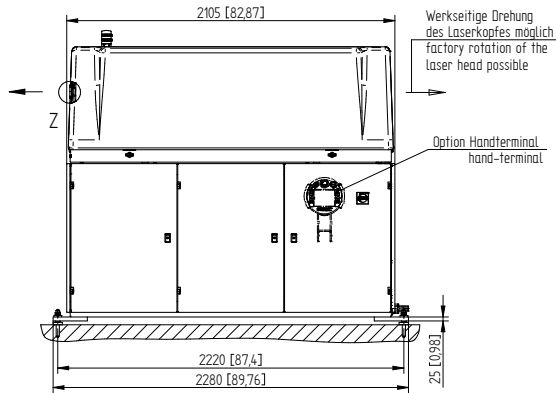
Cabinet



Aufstellung Freiräume nach IEC 660364-7-729 beachten.
note regulations for electrical installations for spare requirement

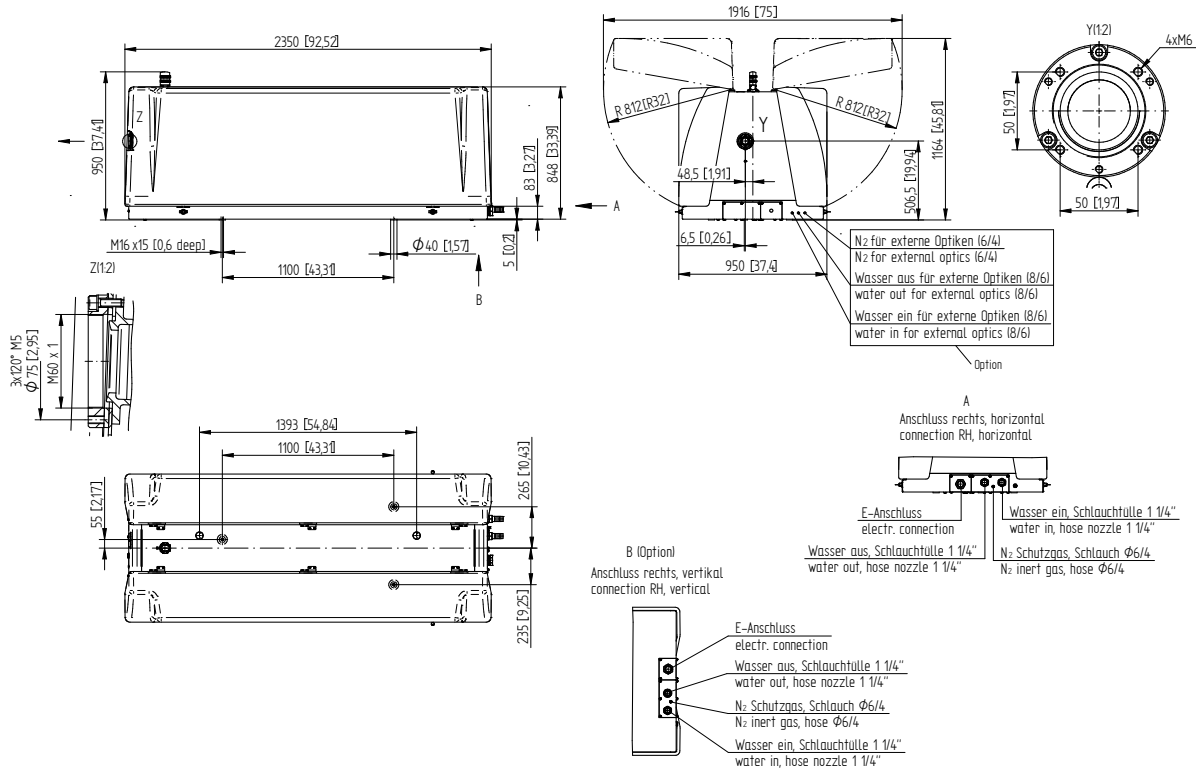
Mechanical Specifications

DC 030 - DC 040 Compact

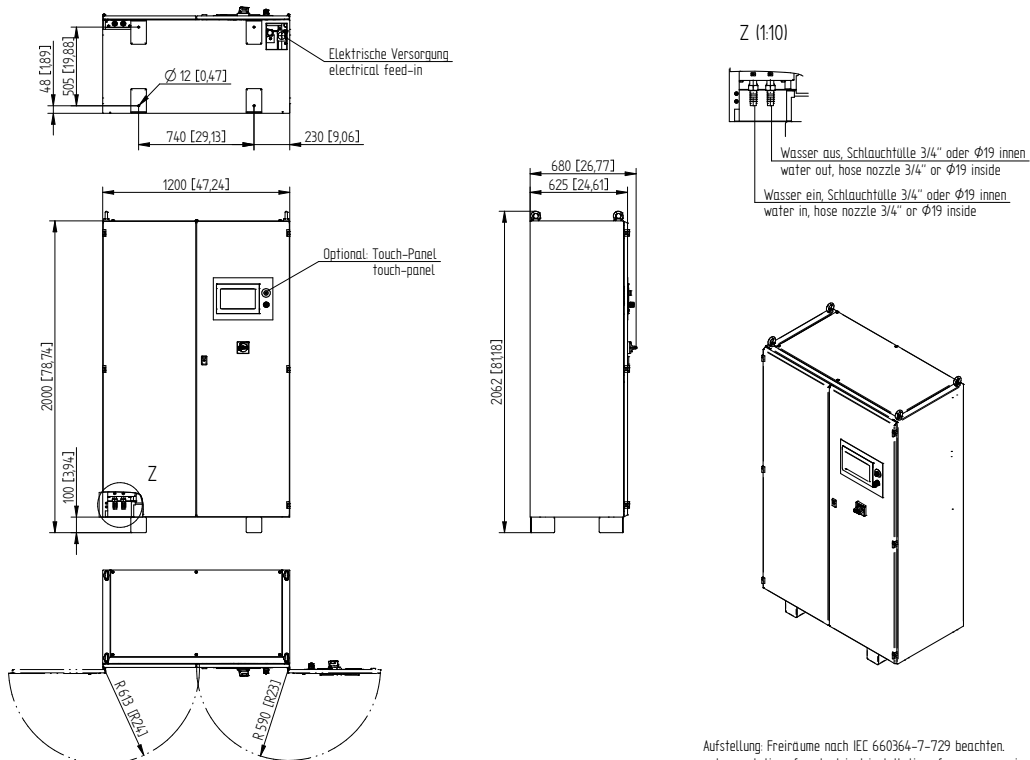


Mechanical Specifications

DC 050 Standard
Laser Head

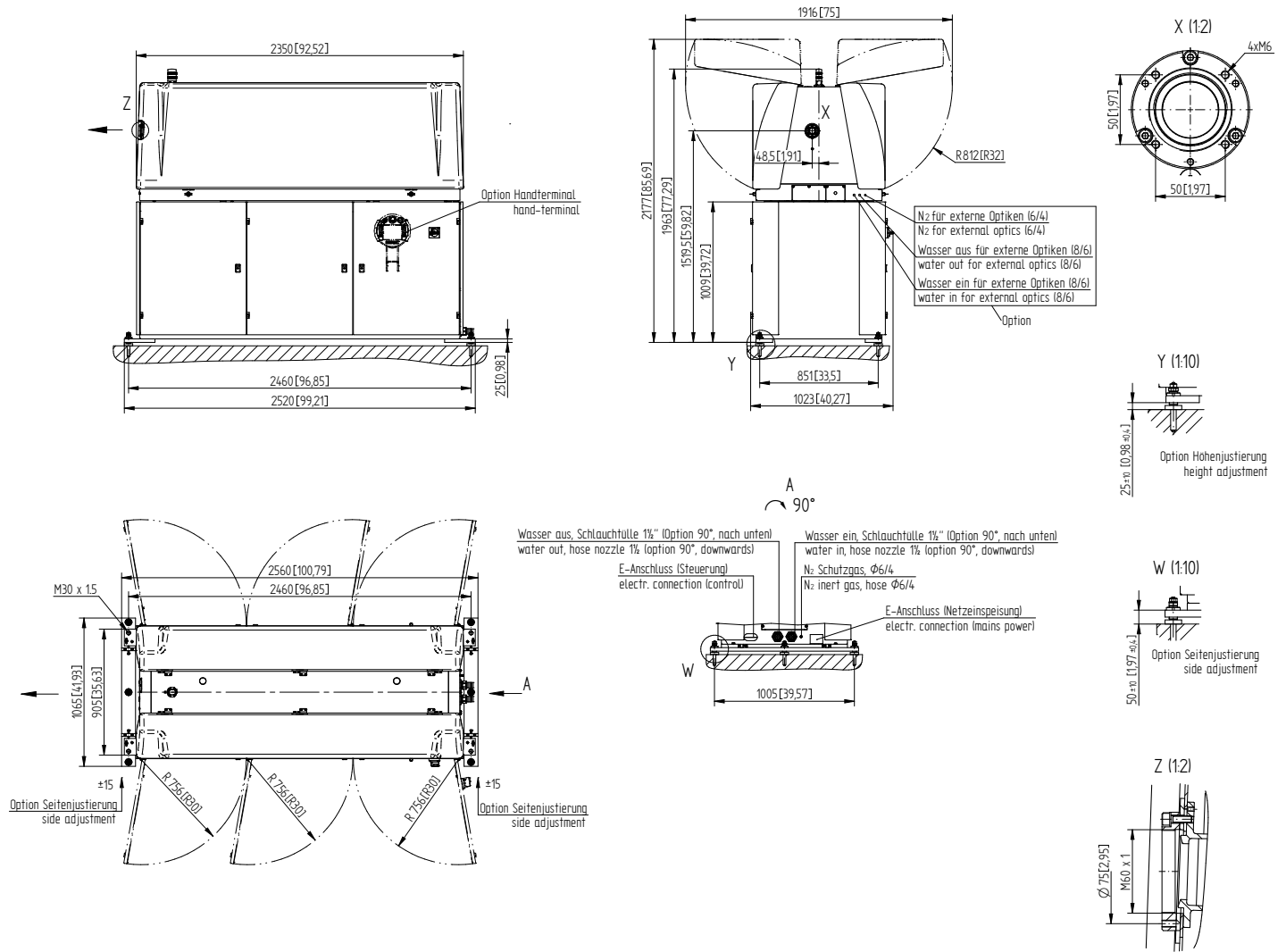


Cabinet (also for DC 060 Standard)



Mechanical Specifications

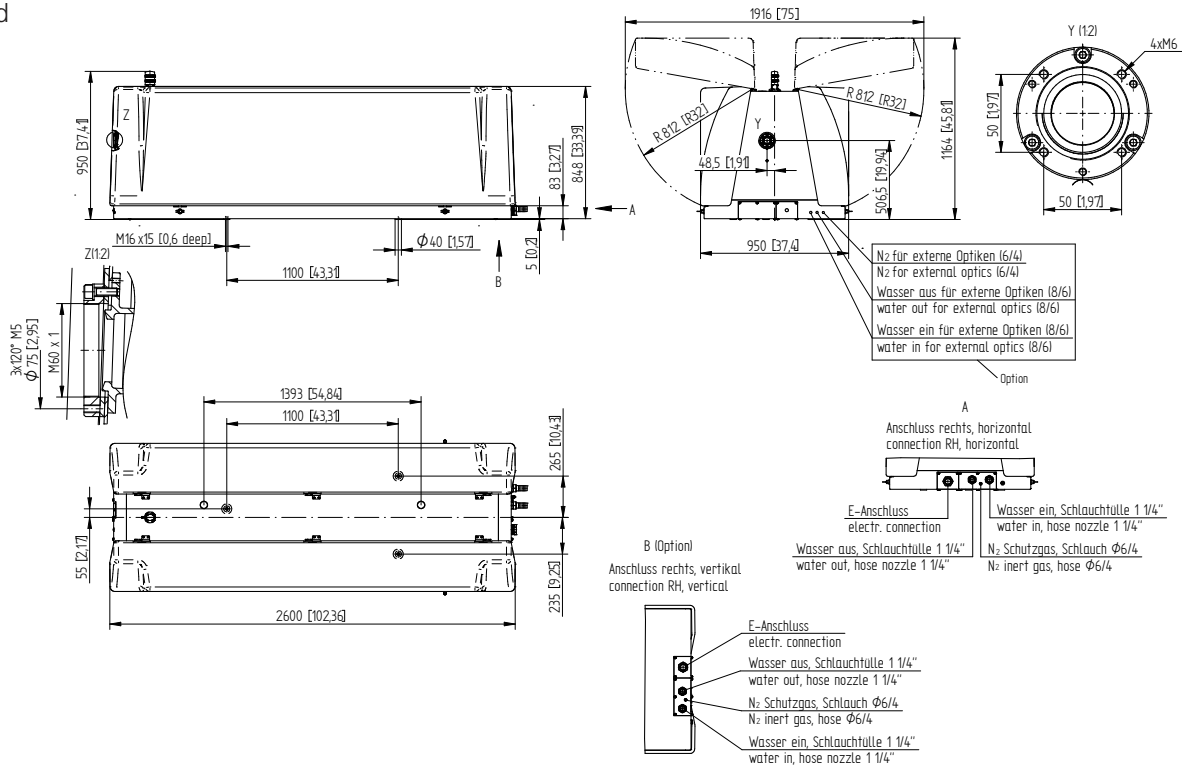
DC 050 Compact



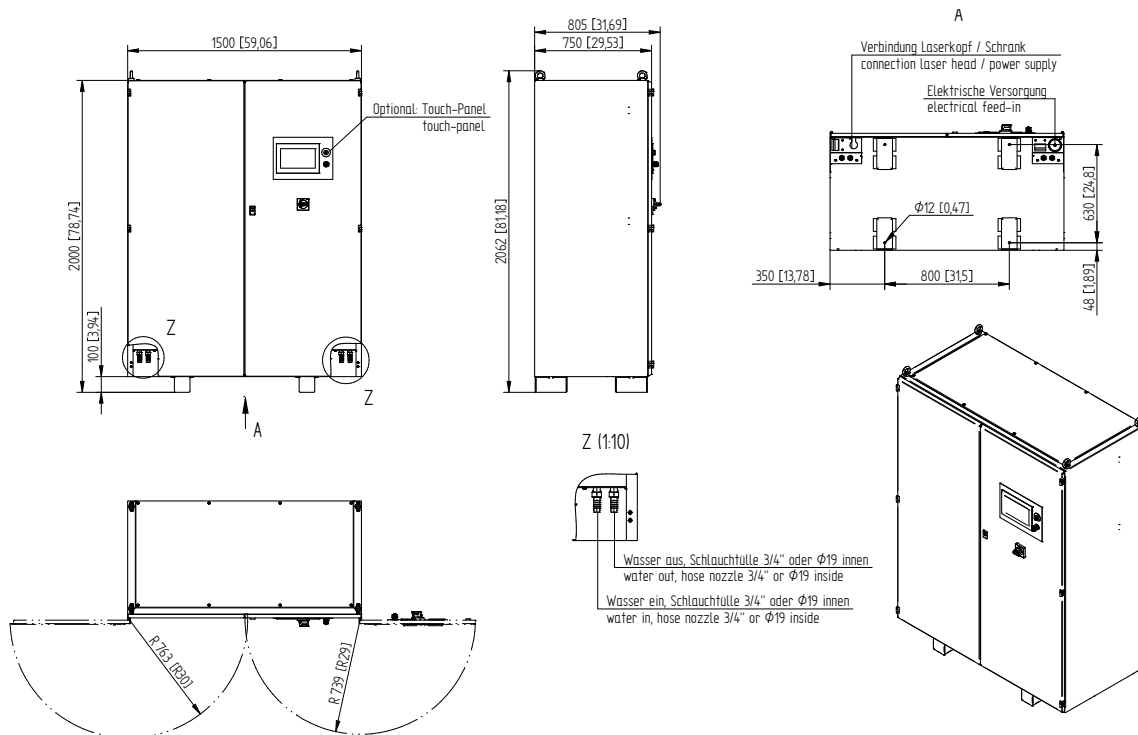
Mechanical Specifications

DC 060 - DC 080 Standard

Laser Head

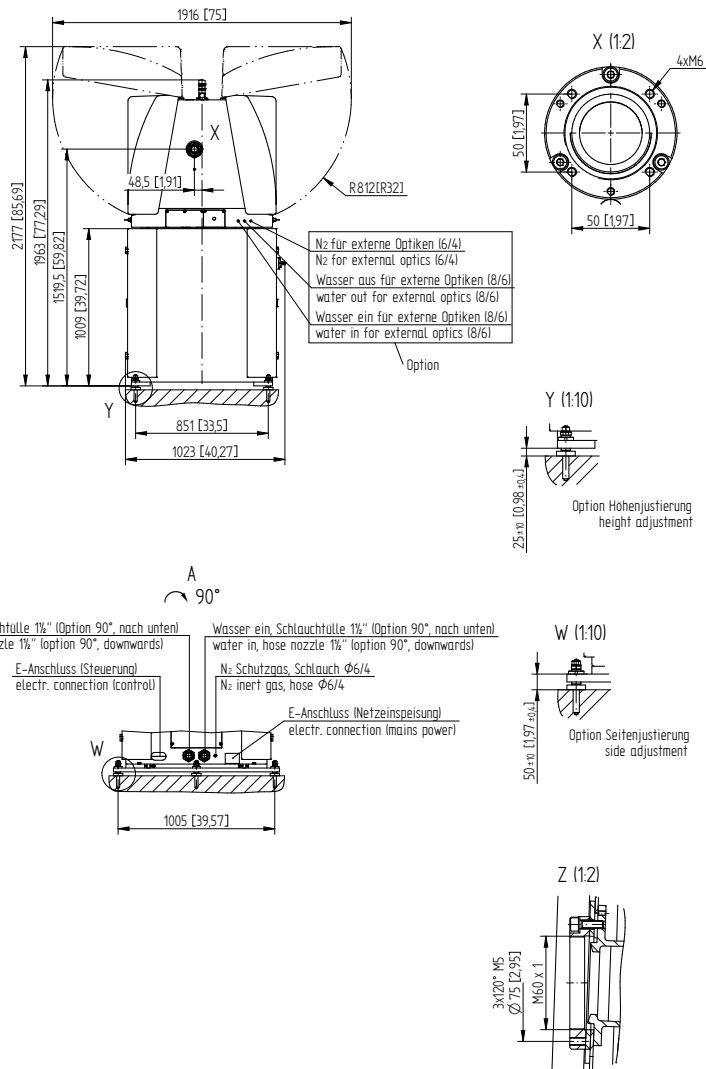
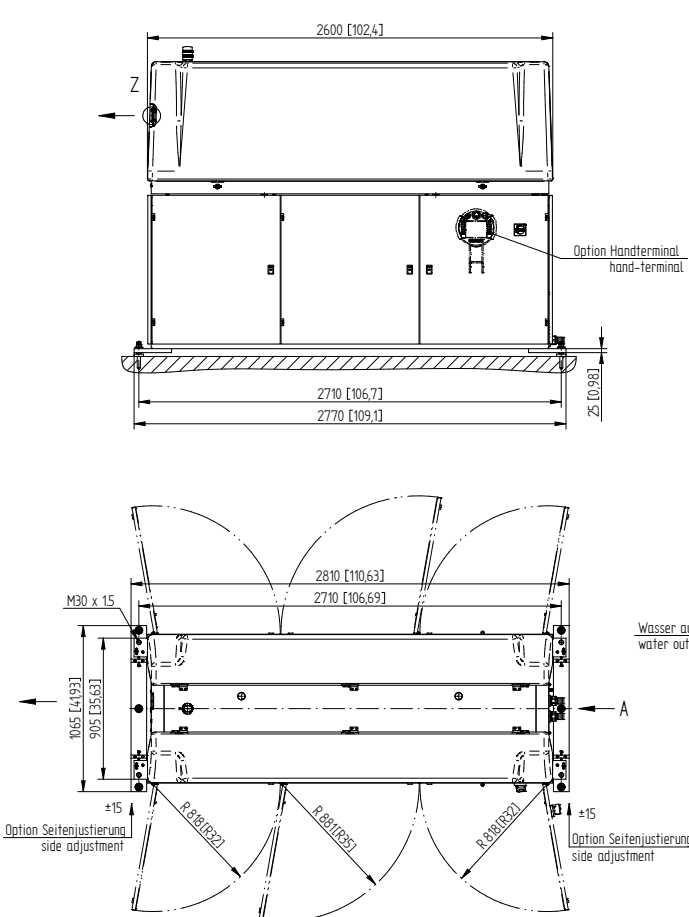


Cabinet (for DC 080 Standard)



Mechanical Specifications

DC 060 - DC 080 Compact



	DANGER		
LASER 4			
VISIBLE AND INVISIBLE LASER RADIATION. AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION.			
WAVELENGTH: 10600nm MAX. OUTPUT POWER: 8500W MAX. PEAK POWER: 17000W MIN. PULSE LENGTH: 100µs			
<small>ALSO INSTALLED: ALIGNMENT LASER CLASS 2 DO NOT STARE INTO RED BEAM MAXIMUM OUTPUT 100mW WAVELENGTH: 635nm</small>			
IEC60825-1:2014			

DANGER
VISIBLE AND INVISIBLE LASER RADIATION
CLASS 4, WHEN OPEN
AVOID EYE OR SKIN EXPOSURE TO
DIRECT OR SCATTERED RADIATION

LASER RADIATION
DO NOT STARE INTO BEAM
LASER CLASS 2
IEC 60825-1:2014
P_{10mW} An 833nm