



HighLight FL-ARM

High-Power Adjustable Ring Mode (ARM) Fiber Lasers with Beam Management

The HighLight™ FL-ARM series of industrial, multi-kilowatt fiber lasers includes beam management to deliver superior results in a variety of challenging welding tasks.

The ARM technology features two individually controllable, co-axial beams from a single fiber, providing a new level of flexibility for applications such as zero-gap welding of zinc-coated steel, as well as the ability to weld aluminum without filler wire, with minimal spatter, and no hot cracking. The power levels in both central spot and surrounding ring are independently adjustable. This results in high speed and high throughput spatter-free processing and lowers overall production costs by largely eliminating the need for post-processing.

To maximize operational flexibility, HighLight FL-ARM products are equipped with either a Fiber-Fiber-Switch (FFS) or Fiber-Fiber-Coupler (FFC).

FEATURES

- Output power: 2,000 - 10,000 Watts
- Adjustable Ring Mode (ARM)
- Fiber-Fiber-Switch (FFS) or Fiber-Fiber-Coupler (FFC)
- Excellent stability over the entire power range (1% to 100%)
- Inherently back reflection safe
- Industry-leading closed loop power control for high process consistency
- Optimized power profile programming tool for welding processes

BENEFITS

- Reliable and fast welding process with high efficiency
- Superior welding seam quality with minimal heat affected zones
- Maximized freedom for welding geometries
- Highest welded part quality with minimum reject rates
- Minimized operating costs

APPLICATIONS

- High-quality welding of challenging materials like high-strength steel, aluminum, or copper
- Cutting

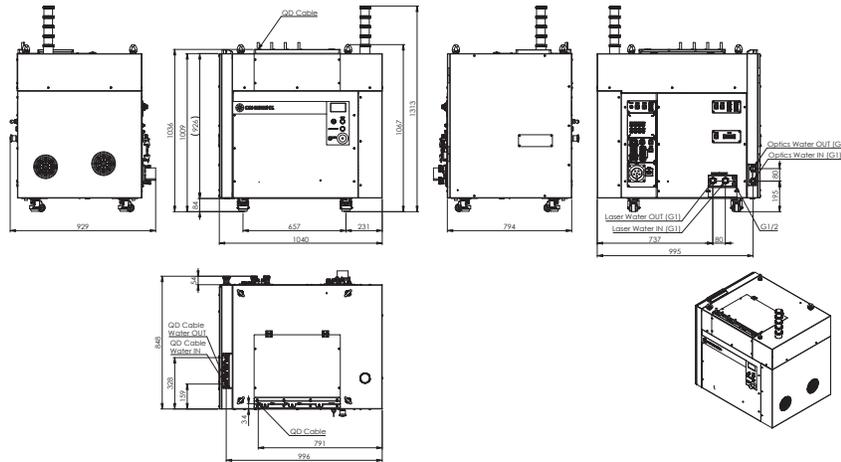


SPECIFICATIONS	HighLight FL2000-ARM	HighLight FL4000-ARM
Nominal Power (W)	2,000	4,000
Power Range (%)	1 - 100	
Laser Beam Quality (BPP) at Collimator (mm x mrad)	For 100/290 μm + FFC/FFS: Center ≤ 4, Ring ≤ 14 For 50/200 μm + FFC: Center ≤ 2.5, Ring ≤ 10	
Power Stability (%)	+/- 1	
Pulse Frequency Range (kHz)	CW - 10	
Wavelength (nm)	1070 ± 10	
ELECTRICAL RATINGS		
Voltage (VAC)	400/440/480 +/- 10%	
Connected Load (kVA)	9.8	13.9
Effective Power at Nominal Power (kW)	9.6	13.7
Max. Current Consumption at 400 V (A)	13.8	19.8
Fuses Type NH (A)	32	
COOLING		
Recommended Cooling Capacity Laser (kW)	4.4	8.9
Recommended Cooling Capacity FFC/FFS and QHB/QD (kW)	FFS2: 1.0 FFC: 1.0	
Flow Rate Laser (l/min)	43	
Flow Rate for FFS/FFC and QBH/QD (l/min)	FFS2: 8.0 FFC: 6.0	
Temperature Laser (°C)	25 ± 1	
Temperature for FFS/FFC and QBH/QD (°C)	For 100/290μm +FFC/FFS: 24 - 40 For 50/200μm +FFC: 24 - 35	
Max. Pressure Laser (MPa)	0.5	
Max. Pressure FFS/FFC and QBH/QD (MPa)	0.4	
Typical Pressure Drop Laser (MPa)	0.25	
FIBER DELIVERY SYSTEM		
Interface	QBH/QD	
Diameter (μm)	Center D 100, Ring OD 290 or Center D 50, Ring OD 200	
Length (m)	20, 30 (other lengths on request)	
DIMENSIONS & WEIGHTS		
Laser Dimension (L x W x H) (mm) (without signal tower)	Midi: 794 x 1040 x 1067	
Laser Weight (kg)	FFC: < 460, FFS: < 520	
ENVIRONMENTAL CONDITIONS		
Ambient Temperature (°C)	5 - 40	
Humidity (°C)	Environmental conditions always below the dew point. Condensation to laser, QBH/QD and optics must be avoided during the operation, storage and transport.	
CUSTOMER INTERFACE		
Digital Signals (V DC)	24	
Power Control (V DC)	0 - 10 V	
Trigger Control (V)	24, rise/fall time < 30 μs	
OPTIONS LASER		
	Field bus (Ethernet/IP, Profinet, Profibus, Devicenet, Ethercat), Scanner control interface, Multi station interface	

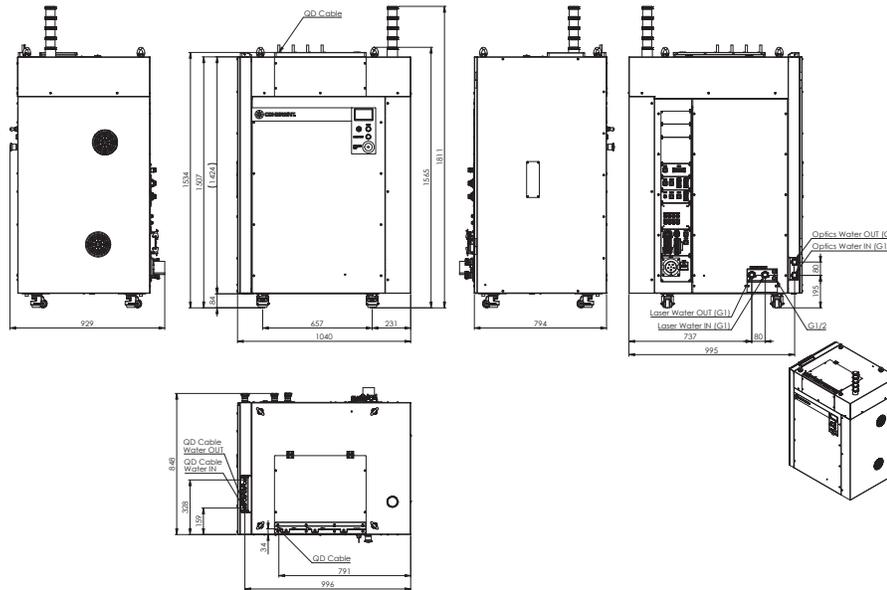
SPECIFICATIONS	HighLight FL6000-ARM	HighLight FL7500-ARM	HighLight FL800-ARM	HighLight FL10000-ARM
Nominal Power (W)	6,000	7,500	8000	10,000
Power Range (%)	1 - 100			
Laser Beam Quality (BPP) at Collimator (mm x mrad)	For 100/290 μm + FFC/FFS: Center ≤ 4, Ring ≤ 14 For 50/200 μm + FFC: Center ≤ 2.5, Ring ≤ 10			
Power Stability (%)	+/- 1			
Pulse Frequency Range (kHz)	CW - 10			
Wavelength (nm)	1070 ± 10			
ELECTRICAL RATINGS				
Voltage (VAC)	400/440/480 +/- 10%			
Connected Load (kVA)	20.8	24.4	27.6	36.2
Effective Power at Nominal Power (kW)	20.6	24.2	27.4	36
Max. Current Consumption at 400 V (A)	29.7	35	39.6	52
Fuses Type NH (A)	63			
COOLING				
Recommended Cooling Capacity Laser (kW)	13.3	16.7	17.8	22.2
Recommended Cooling Capacity FFC/FFS and QHB/QD (kW)	FFS2: 1.0 FFC: 1.0			
Flow Rate Laser (l/min)	65		84	
Flow Rate for FFS/FFC and QBH/QD (l/min)	FFS2: 8.0 FFC: 6.0			
Temperature Laser (°C)	25 ± 1			
Temperature for FFS/FFC and QBH/QD (°C)	For 100/290μm + FFC/FFS: 24 - 40 For 50/200μm +FFC: 24 - 35			
Max. Pressure Laser (MPa)	0.5			
Max. Pressure FFS/FFC and QBH/QD (MPa)	0.4			
Typical Pressure Drop Laser (MPa)	0.25			
FIBER DELIVERY SYSTEM				
Interface	QBH/QD			
Diameter (μm)	Center D 100, Ring OD 290 or Center D 50, Ring OD 200			
Length (m)	20, 30 (other lengths on request)			
DIMENSIONS & WEIGHTS				
Laser Dimension (L x W x H) (mm) (without signal tower)	Maxi: 794 x 1040 x 1565			
Laser Weight (kg)	FFC: < 530, FFS: < 590		FFC: < 560, FFS: < 620	
ENVIRONMENTAL CONDITIONS				
Ambient Temperature (°C)	5 - 40			
Humidity (°C)	Environmental conditions always below the dew point. Condensation to laser, QBH/QD and optics must be avoided during the operation, storage and transport.			
CUSTOMER INTERFACE				
Digital Signals (V DC)	24			
Power Control (V DC)	0 - 10 V			
Trigger Control (V)	24, rise/fall time < 30 μs			
OPTIONS LASER				
	Field bus (Ethernet/IP, Profinet, Profibus, Devicenet, Ethercat), Scanner control interface, Multi station interface			

MECHANICAL SPECIFICATIONS

Midi: HighLight FL2000-ARM - HighLight FL4000-ARM



Maxi: HighLight FL6000-ARM - HighLight FL10000-ARM



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Coherent follows a policy of continuous product improvement. Specifications are subject to change without notice.

Coherent offers a limited warranty for all HighLight Lasers. For full details of this warranty coverage, please refer to the Service section at www.Coherent.com or contact your local Sales or Service Representative.
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DANGER

VISIBLE AND/OR INVISIBLE LASER RADIATION
 AVOID EYE OR SKIN EXPOSURE TO
 DIRECT OR SCATTERED RADIATION

MODEL: HighLight FL Vx FIBER LASER
 MAXIMUM OUTPUT: 10000 WATTS CW
 100 µSEC PULSE ∞
 at wavelength in the range of 950 - 1150 nm
 CLASS IV LASER PRODUCT

ALIGNMENT LASER DIODE INSTALLED
 CLASS IIIa LASER RADIATION ALSO EMITTED
 AVOID DIRECT EYE EXPOSURE
 MAXIMUM OUTPUT: 5mW CW WAVELENGTH: 633-670nm

CAUTION
 INVISIBLE LASER RADIATION CLASS II,
 IIIa, IIIb, IIIr, IIIs, IIIc, IIIe, IIIf, IIIg,
 IIIh, IIIi, IIIj, IIIk, IIIl, IIIm, IIIn, IIIo,
 IIIp, IIIq, IIIr, IIIs, IIIt, IIIu, IIIv,
 IIIw, IIIx, IIIy, IIIz, IIIaa, IIIab,
 IIIac, IIIad, IIIae, IIIaf, IIIag, IIIah,
 IIIai, IIIaj, IIIak, IIIal, IIIam, IIIan,
 IIIao, IIIap, IIIaq, IIIar, IIIas, IIIat,
 IIIau, IIIav, IIIaw, IIIax, IIIay, IIIaz,
 IIIba, IIIbb, IIIbc, IIIbd, IIIbe, IIIbf,
 IIIbg, IIIbh, IIIbi, IIIbj, IIIbk, IIIbl,
 IIIbm, IIIbn, IIIbo, IIIbp, IIIbq, IIIbr,
 IIIbs, IIIbt, IIIbu, IIIbv, IIIbw, IIIbx,
 IIIby, IIIbz, IIIca, IIIcb, IIIcc, IIIcd,
 IIIce, IIIcf, IIIcg, IIIch, IIIci, IIIcj,
 IIIck, IIIcl, IIIcm, IIIcn, IIIco, IIIcp,
 IIIcq, IIIcr, IIIcs, IIIct, IIIcu, IIIcv,
 IIIcw, IIIcx, IIIcy, IIIcz, IIIda, IIIdb,
 IIIdc, IIIdd, IIIde, IIIdf, IIIdg, IIIdh,
 IIIdi, IIIdj, IIIdk, IIIdl, IIIdm, IIIdn,
 IIIdo, IIIdp, IIIdq, IIIdr, IIIds, IIIdt,
 IIIdu, IIIdv, IIIdw, IIIdx, IIIdy, IIIdz,
 IIIea, IIIeb, IIIec, IIIed, IIIee, IIIef,
 IIIeg, IIIeh, IIIei, IIIej, IIIek, IIIel,
 IIIem, IIIen, IIIeo, IIIep, IIIeq, IIIer,
 IIIes, IIIet, IIIeu, IIIev, IIIew, IIIex,
 IIIey, IIIez, IIIfa, IIIfb, IIIfc, IIIfd,
 IIIfe, IIIff, IIIfg, IIIfh, IIIfi, IIIfj,
 IIIfk, IIIfl, IIIfm, IIIfn, IIIfo, IIIfp,
 IIIfq, IIIfr, IIIfs, IIIft, IIIfu, IIIfv,
 IIIfw, IIIfx, IIIfy, IIIfz, IIIga, IIIgb,
 IIIgc, IIIgd, IIIge, IIIgf, IIIgg, IIIgh,
 IIIgi, IIIgj, IIIgk, IIIgl, IIIgm, IIIgn,
 IIIgo, IIIgp, IIIgq, IIIgr, IIIgs, IIIgt,
 IIIgu, IIIgv, IIIgw, IIIgx, IIIgy, IIIgz,
 IIIha, IIIhb, IIIhc, IIIhd, IIIhe, IIIhf,
 IIIhg, IIIhh, IIIhi, IIIhj, IIIhk, IIIhl,
 IIIhm, IIIhn, IIIho, IIIhp, IIIhq, IIIhr,
 IIIhs, IIIht, IIIhu, IIIhv, IIIhw, IIIhx,
 IIIhy, IIIhz, IIIia, IIIib, IIIic, IIIid,
 IIIie, IIIif, IIIig, IIIih, IIIii, IIIij,
 IIIik, IIIil, IIIim, IIIin, IIIio, IIIip,
 IIIiq, IIIir, IIIis, IIIit, IIIiu, IIIiv,
 IIIiw, IIIix, IIIiy, IIIiz, IIIja, IIIjb,
 IIIjc, IIIjd, IIIje, IIIjf, IIIjg, IIIjh,
 IIIji, IIIjj, IIIjk, IIIjl, IIIjm, IIIjn,
 IIIjo, IIIjp, IIIjq, IIIjr, IIIjs, IIIjt,
 IIIju, IIIjv, IIIjw, IIIjx, IIIjy, IIIjz,
 IIIka, IIIkb, IIIkc, IIIkd, IIIke, IIIkf,
 IIIkg, IIIkh, IIIki, IIIkj, IIIkm, IIIkn,
 IIIko, IIIkp, IIIkq, IIIkr, IIIks, IIIkt,
 IIIku, IIIkv, IIIkw, IIIkx, IIIky, IIIkz,
 IIIla, IIIlb, IIIlc, IIIld, IIIle, IIIlf,
 IIIlg, IIIlh, IIIli, IIIlj, IIIlk, IIIll,
 IIIlm, IIIln, IIIlo, IIIlp, IIIlq, IIIlr,
 IIIls, IIIlt, IIIlu, IIIlv, IIIlw, IIIlx,
 IIIly, IIIlz, IIIma, IIImb, IIImc, IIImd,
 IIIme, IIImf, IIImg, IIImh, IIImi, IIImj,
 IIImk, IIIml, IIImm, IIImn, IIImo, IIImp,
 IIImq, IIImr, IIIms, IIImt, IIImu, IIImv,
 IIImw, IIImx, IIImy, IIImz, IIIna, IIInb,
 IIInc, IIInd, IIIne, IIInf, IIIng, IIInh,
 IIIni, IIInj, IIInk, IIInl, IIInm, IIInn,
 IIIno, IIInp, IIInq, IIInr, IIIns, IIInt,
 IIInu, IIInv, IIInw, IIInx, IIIny, IIInz,
 IIIoa, IIIob, IIIoc, IIIod, IIIoe, IIIof,
 IIIog, IIIoh, IIIoi, IIIoj, IIIok, IIIol,
 IIIom, IIIon, IIIoo, IIIop, IIIoq, IIIor,
 IIIos, IIIot, IIIou, IIIov, IIIow, IIIox,
 IIIoy, IIIoz, IIIpa, IIIpb, IIIpc, IIIpd,
 IIIpe, IIIpf, IIIpg, IIIph, IIIpi, IIIpj,
 IIIpk, IIIpl, IIIpm, IIIpn, IIIpo, IIIpp,
 IIIpq, IIIpr, IIIps, IIIpt, IIIpu, IIIpv,
 IIIpw, IIIpx, IIIpy, IIIpz, IIIqa, IIIqb,
 IIIqc, IIIqd, IIIqe, IIIqf, IIIqg, IIIqh,
 IIIqi, IIIqj, IIIqk, IIIql, IIIqm, IIIqn,
 IIIqo, IIIqp, IIIqq, IIIqr, IIIqs, IIIqt,
 IIIqu, IIIqv, IIIqw, IIIqx, IIIqy, IIIqz,
 IIIra, IIIrb, IIIrc, IIIrd, IIIre, IIIrf,
 IIIrg, IIIrh, IIIri, IIIrj, IIIrk, IIIrl,
 IIIrm, IIIrn, IIIro, IIIrp, IIIrq, IIIrr,
 IIIrs, IIIrt, IIIru, IIIrv, IIIrw, IIIrx,
 IIIry, IIIrz, IIIsa, IIIsb, IIIsc, IIIsd,
 IIIse, IIIsf, IIIsg, IIIsh, IIIsi, IIIsj,
 IIIsk, IIIsl, IIIsm, IIIsn, IIIso, IIIsp,
 IIIsq, IIIsr, IIIss, IIIst, IIIsu, IIIsv,
 IIIsw, IIIsx, IIIsy, IIIsz, IIIta, IIItb,
 IIItc, IIItd, IIIte, IIItf, IIItg, IIIth,
 IIIti, IIItj, IIItk, IIItl, IIItm, IIItn,
 IIIto, IIItp, IIItq, IIItr, IIIts, IIItt,
 IIItu, IIItv, IIItw, IIItx, IIIty, IIItz,
 IIIua, IIIub, IIIuc, IIIud, IIIue, IIIuf,
 IIIug, IIIuh, IIIui, IIIuj, IIIuk, IIIul,
 IIIum, IIIun, IIIuo, IIIup, IIIuq, IIIur,
 IIIus, IIIut, IIIuu, IIIuv, IIIuw, IIIux,
 IIIuy, IIIuz, IIIva, IIIvb, IIIvc, IIIvd,
 IIIve, IIIvf, IIIvg, IIIvh, IIIvi, IIIvj,
 IIIvk, IIIvl, IIIvm, IIIvn, IIIvo, IIIvp,
 IIIvq, IIIvr, IIIvs, IIIvt, IIIvu, IIIvv,
 IIIvw, IIIvx, IIIvy, IIIvz, IIIwa, IIIwb,
 IIIwc, IIIwd, IIIwe, IIIwf, IIIwg, IIIwh,
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 IIIwo, IIIwp, IIIwq, IIIwr, IIIws, IIIwt,
 IIIwu, IIIwv, IIIww, IIIwx, IIIwy, IIIwz,
 IIIxa, IIIxb, IIIxc, IIIxd, IIIxe, IIIxf,
 IIIxg, IIIxh, IIIxi, IIIxj, IIIxk, IIIxl,
 IIIxm, IIIxn, IIIxo, IIIxp, IIIxq, IIIxr,
 IIIxs, IIIxt, IIIxu, IIIxv, IIIxw, IIIxx,
 IIIxy, IIIxz, IIIya, IIIyb, IIIyc, IIIyd,
 IIIye, IIIyf, IIIyg, IIIyh, IIIyi, IIIyj,
 IIIyk, IIIyl, IIIym, IIIyn, IIIyo, IIIyp,
 IIIyq, IIIyr, IIIys, IIIyt, IIIyu, IIIyv,
 IIIyw, IIIyx, IIIyy, IIIyz, IIIza, IIIzb,
 IIIzc, IIIzd, IIIze, IIIzf, IIIzg, IIIzh,
 IIIzi, IIIzj, IIIzk, IIIzl, IIIzm, IIIzn,
 IIIzo, IIIzp, IIIzq, IIIzr, IIIzs, IIIzt,
 IIIzu, IIIzv, IIIzw, IIIzx, IIIzy, IIIzz

Coherent industrial lasers are designed in strict accordance with the respective safety regulations. We certify that each laser manufactured by our company complies with FDA Radiation Performance Standards, 21 CFR Subchapter J and with IEC 60825. Warning labels as shown in the figure appear on each Coherent laser to indicate the respective classification.