



Cooling Water Requirements

Series 800 and Series 600 Nd:YAG Lasers

Every Lee Laser Series 800 Nd:YAG laser contains an internal krypton arc lamp that is used to "pump" optical energy into the YAG laser rod which is the source of the laser beam. These powerful krypton arc lamps can consume from 2.2 kW to 8 kW of electrical power, depending on the particular model of laser. Much of this electrical power is emitted from the lamp in the form of unusable heat that must be removed from the laser via its internal water/water heat exchanger cooling system. A source of "city" water is necessary to remove the heat from the laser

The specifications data sheet for each laser lists the "city" water requirements to cool that laser. This is given in water flow rate (liters and gallons per minute) at a maximum temperature of the "city" water (in degrees C and degrees F). If the temperature of the "city" water is colder than the maximum that is listed in the specifications, then less volume of "city" water will be consumed by the laser.

For some installations, "city" water cannot be used to cool the laser:

1. "city" water is not available in the volume that is needed to cool the laser
2. "city" water temperature is too warm
3. municipal restrictions limit consumption of "city" water, or the dumping of the "city" water after it is used by the laser is not permitted.

In these situations, some alternate source of cooling water must be used. Many large manufacturing plants have a central cool water system that is available for this purpose. Otherwise, it may be necessary for the end user to provide a refrigerated chiller system of sufficient capacity to cool the laser.

The attached table summarizes the minimum "city" water requirements for each Series 800 laser, and also lists the cooling capacity of a refrigerated chiller unit or other plant water source that would be needed to replace "city" water.

Series 600 Nd:YAG Lasers use krypton flashlamps that have similar cooling requirements. They are designed for pulsed operation, rather than for continuous operation as are the Series 800 arc lamps.

Laser Model	Krypton Arc Lamp P/N kW		"City" Water Requirements				Recommended Chiller Capacity ³	
			Max. Temp. ¹		Flow Rate ²		kW	BTU/hr
			° C	° F	l/m	gpm		
650M	LFL-650	4.3	20	68	16	4	5	17,000
803	LKA-2020	2.2	20	68	8	2	3	10,000
808	LKA-3020	3.2	20	68	12	3	4	14,000
	LKA-3330	4.3	20	68	16	4	5	17,000
812	LKA-3330	4.3	20	68	16	4	5	17,000
815	LKA-4030	5.1	20	68	20	5	6	20,000
818	LKA-4030	5.1	20	68	20	5	6	20,000
825T	LKA-4030	5.1	20	68	20	5	6	20,000
825M	LKA-2020	2.2	20	68	8	2	3	10,000
850	LKA-3020	3.2	20	68	12	3	4	14,000
	LKA-3330	4.3	20	68	16	4	5	17,000
875	LKA-3330	4.3	20	68	16	4	5	17,000
8100	LKA-4030	5.1	20	68	20	5	6	20,000
8150	LKA-5340	8.0	15	59	30	8	10	34,000
8250	LKA-5340	8.0	15	59	30	8	10	34,000

- Notes:**
- 1 Minimum recommended "city" water temperature 2° C (35° F), non condensing.
 - 2 Volume required at maximum listed "city" water temperature. Less "city" water is consumed at reduced "city" water temperatures. For all lasers, the minimum pressure drop between input "city" water source and drain must be > 2.5 bar (35 psi).
 - 3 See "City" Water Requirements for maximum cooling water temperature and minimum water flow rates.