W1, W2 / cooling water for laser diodes and laser heads

W1 termotek chiller - laser room water distribution

3/4 " tube
25 liter / min
T= 18°C
p_in= 4.5 bar

W2 termotek chiller - laser diode rack water distribution

silicon tube

LD: transfer heat via water running through cold plates to water-water chiller (two poin
Xtal: front end no TEC only cooling water of secondary loop, transfers heat to water-w

temperature range Xtal loop	
temperature stability Xtal loop	0.1C TBC
temperature range LD loop	
temperature stability LD loop	0.5C TBC
heat load - Xtal	10kW
heat load - LD	10kW

AdLIGO Laser Calculations	
total electrical heat load (W)	2194.489796
total thermal load (W)	4370.552601

Pump Diode Calculations	
maximum optical output power P_{max} (W)	45
maximum operation current A_{max} (A)	65
maximum operating voltage V_{max} (V)	2
maximum TEC cooling power (W)	346
maximum TEC current (A)	11.3
maximum TEC voltage (V)	49.2
TEC electrical power input (W)	136.5797688
TEC generated heat (W)	51.57976879
heat generated per diode, Q_{diode} (W)	136.5797688

MOPA Calculations	
number of diodes per amplifier	4
amplifier heat load Q_{amp} (W)	546.3190751

Power Supply Calculations	
maximum output voltage (V)	
maximum output current (A)	
maximum output power (W)	600
power factor	0.98
heat load per power supply (W)	12.24489796
number of supplies per MOPA	2
power supply heat load (W)	24.48979592

ıt control) (connects to LIGO facility water)
vater chiller (analog valve control) (connects to LIGO facility water)

maximum input power P_{input} (W)	130
maximum heat generated H_{diode} (W)	85
maximum TEC input power (W)	555.96
coefficient of performance COP	0.622346931
maximum TEC heat (W)	209.96

maximum input power (W)	612.244898

Personnel Calculations	
number of working personnel	4
moderate work heat load (W)	160
total personnel heat load Q_{people} (W)	640