



## CRYOREFRIGERATOR K 170020 A

### FEATURES

- + High cooling capacity 20 W
- + Temperature 170 K
- + Cool-down time 20 minutes
- + Cold head vibration-free
- + Almost noiseless
- + Compact design
- + Maintenance-free

### APPLICATIONS

- + Laser crystal cooling
- + High power laser amplifier
- + CEP stabilized laser system
- + Ti:Sapphire multi-millijoule multi-kHz amplifier system
- + Quantum Cascade Laser
- + Cryopumping

### COLD HEAD UNIT-FEATURES

- + Compact chamber design
- + Vibration-free
- + Orientation-independent operation
- + CFF-40- or KF-50-flange
- + Diamagnetic metal head
- + Extremely high heat conductivity

### System Description

The K170020A is a compact high power recirculating cooling system for cryogenic high cooling capacity applications. Especially designed to work in compact chambers for high power laser systems, the closed-loop cooling system ensures maintenance-free operation. The K170020A consists of a compressor unit, a flexible coolant delivery line and a special cold head with a vacuum flange that directly connects a heat source such as a laser crystal assembly to a chamber in high power lasers. The cold head guarantees an absolutely ultra-compact vibration-free cold source inside chambers.

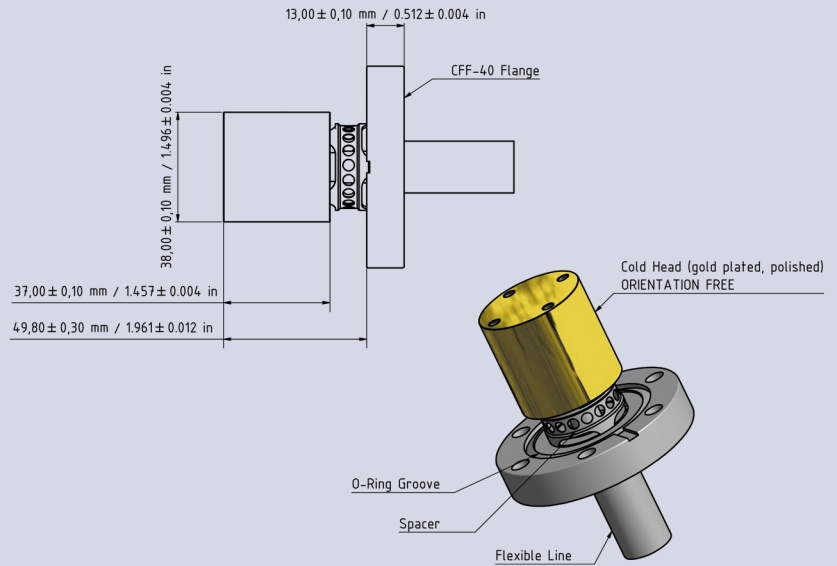
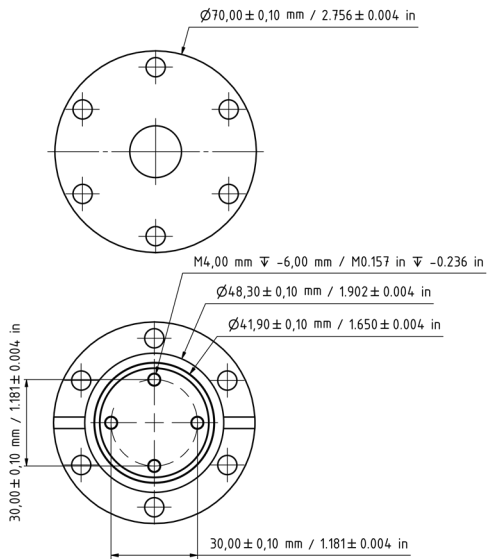
### Compressor Unit

The compact portable air-cooled K170020A can be installed virtually anywhere and cooled down to its operating temperature just within 20 minutes. With the size of 0,46m (L) x 0,33m (W) x 0,35m (H) the compressor unit is suitable for small labs. Due to the cryogenic temperatures, new and advanced materials for solid state laser applications can be used. Moreover the K170020A is the best choice to ameliorate the beam quality of the laser system and to enable higher beam power. The repetition rate of the system can be increased and problems with the thermal lense can be solved.

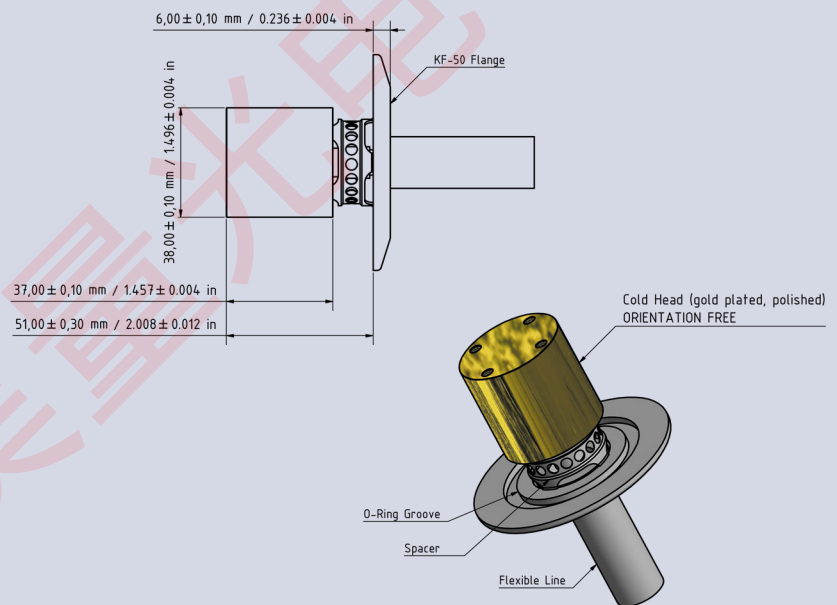
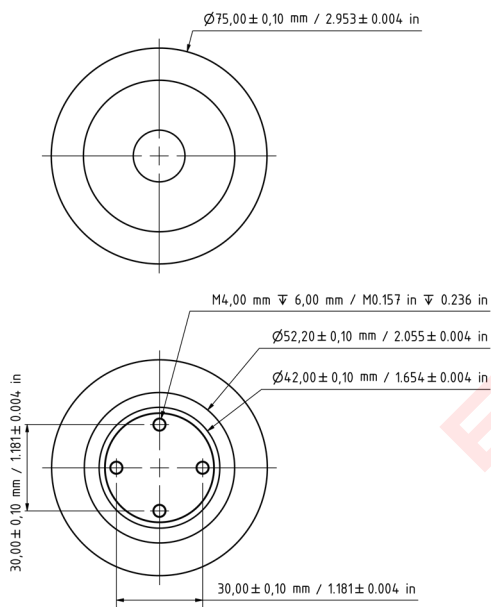
### Cold Head Unit

Our standard cold head-units are available with CFF-40 flanges or KF-50 flanges. Both cold head-units can easily be attached to the chamber. Special vacuum chambers are no longer needed. Moreover, the unique design makes it possible to reduce size and costs of the chambers. This fact provides better vacuum conditions which can be attained faster. All cold heads are gold plated and polished for highest quality demands concerning heat conductivity, optical reflectivity and oxidation protection. The CFF-40 cold head is made for ultra high vacuum conditions. The leakage rate of this vacuum flange is lower than  $10^{-11}$  mbar l /s.

## STANDARD CFF-40 COLD HEAD



## STANDARD KF-50 COLD HEAD



## TECHNICAL DATA - PRELIMINARY

### Compressor Unit (air cooled)

Maximum cooling capacity: 20 W @ 170 K <sup>(A)</sup>  
 Temperature range: 160 K - 170 K  
 Cool down time: 20 minutes  
 Weight: 19 kg (41,9 lbs)  
 Maximum sound level: 54 dB(A) @ 1 m  
 Size: 0,46 m (18.1 in) (L) x 0,33 m (13.0 in) (W) x 0,35 m (13.8 in) (H)  
 Power requirement: AC 220 V-240 V 50 Hz single phase, typ. 540 W  
 or AC 208 V-230 V 60 Hz single phase, typ. 540 W  
 Cool lines: Standard 2,5 m (98.4 in)  
 Minimum bend radius: 0,3 m (11.8 in)

<sup>(A)</sup> 18 °C ambient air temperature

### Cold Head CFF-40 Unit

Weight: 0,645 kg (1.42 lbs)  
 Surface: Gold plated, highly polished  
 Size: See cold head - unit line drawing  
 Designed for vacuum applications up to  $10^{-12}$  mbar ( $7.5 \times 10^{-13}$  torr)

### Cold Head KF-50 Unit

Weight: 0,450 kg (0.99 lbs)  
 Surface: Gold plated, highly polished  
 Size: See cold head - unit line drawing  
 Designed for vacuum applications up to  $10^{-7}$  mbar ( $7.5 \times 10^{-8}$  torr)