LOBO pump block intallation manual.

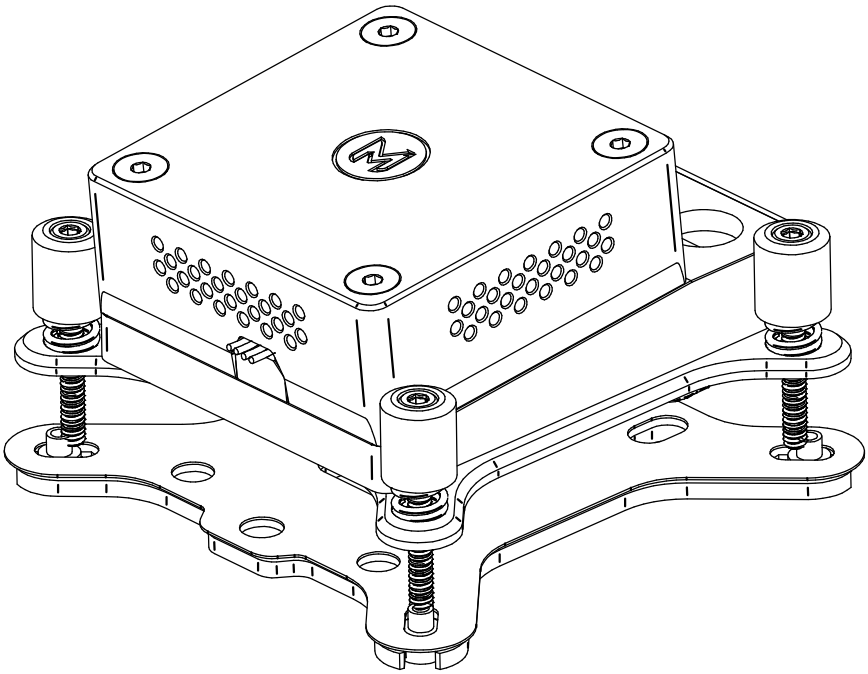
Thank you for purchasing Modultra products. We strive for quality and perfection in everything we do. All of our product line is designed and made in the U.S.A.

Please read instructions carefully before installation. If you do not fully understand these instructions do not attempt installation! Improper installation can lead to motherboard and or CPU damage!

The Modultra LOBO short for "low boy" is a low profile CNC machined solid brass and copper CPU thermal solution.

Never before has a CPU thermal solution been engineered to with so many features in such a tiny package. At only 45mm tall it is the shortest CPU pump block available on the market. We have included multiple industry first features that set this unit apart from the competition.

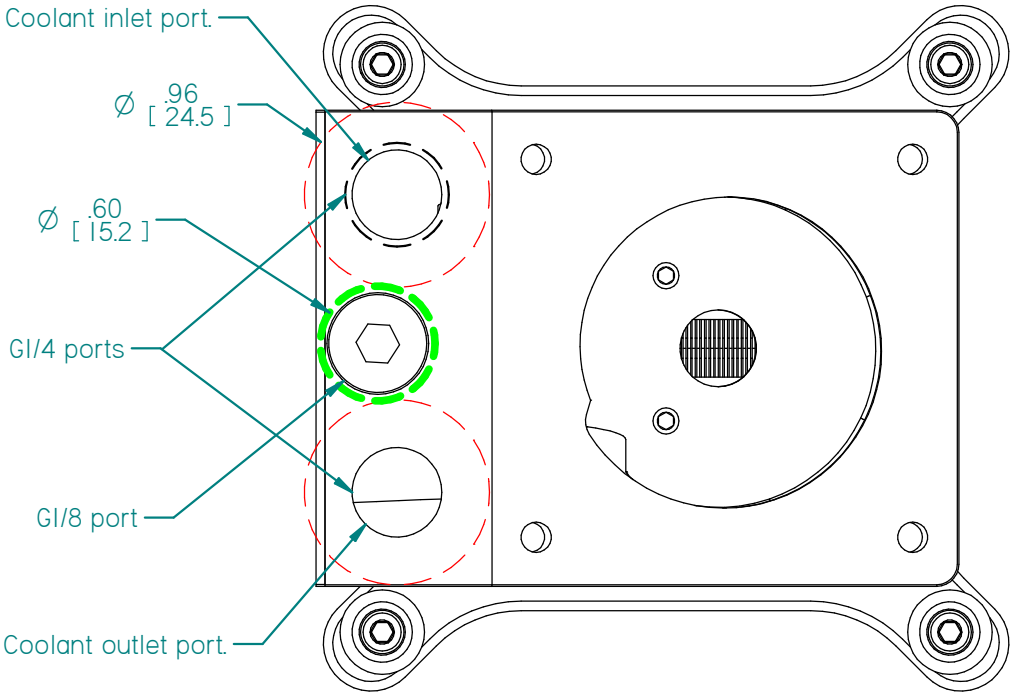
The LOBO is a total package not only for your CPU but your pump as well. The LOBO in conjunction with any Modultra DDC heatsink gives you D5 pump reliability with DDC performance all in a compact DDC package. In addition the LOBO uses optimized flow paths for superior fluid dynamic performance. Deep volute technology (DVT) for pumping power. Center span cold plate support for mounting rigidity and cold plate adjustability. And lastly, Cerakote for corrosion resistance.

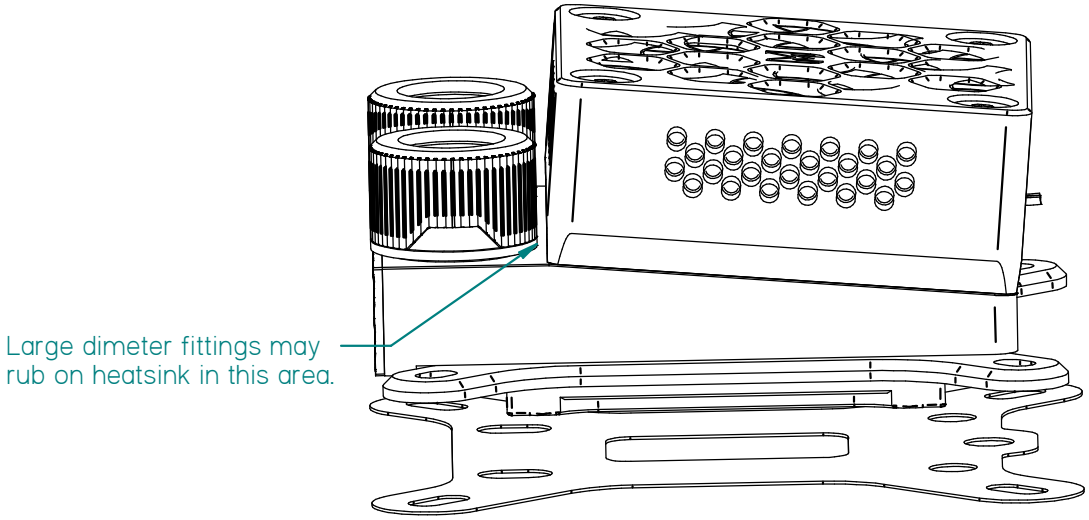


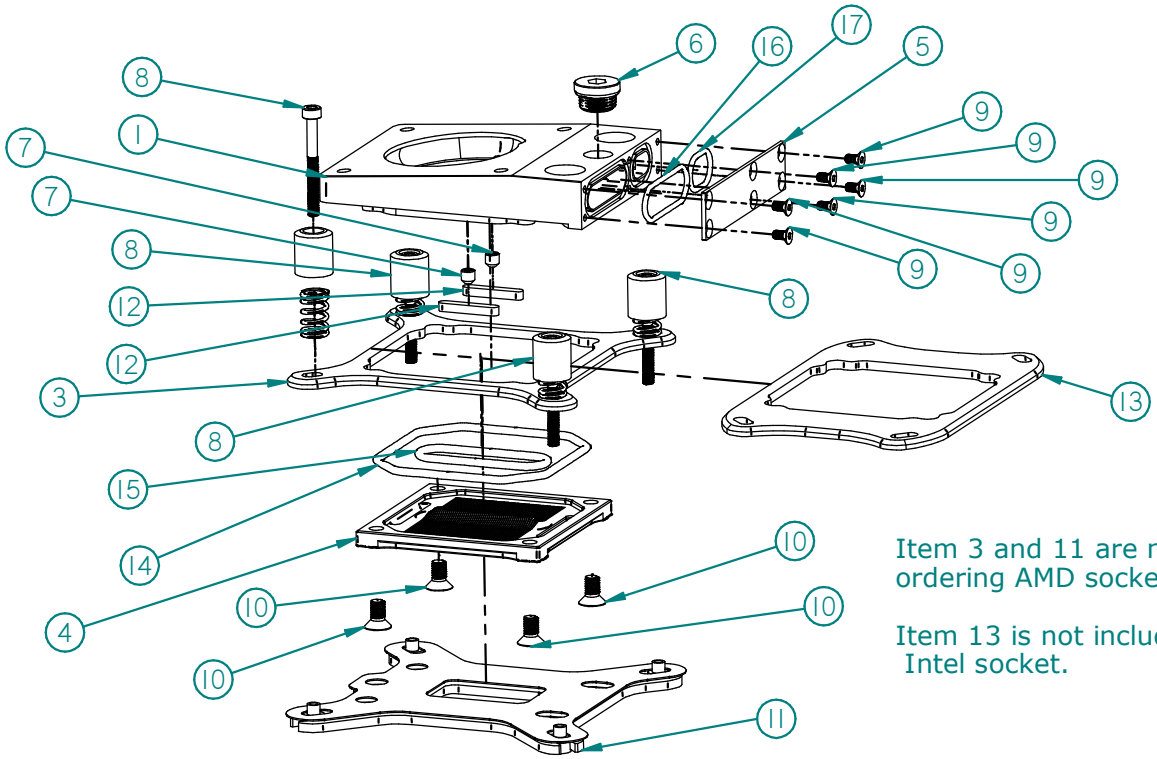
Quick note on fittings sizes.

Due to the compact nature of the LOBO pump block, fittings used for cooling loop should not exceede .96 inch [23.5mm] in diameter, otherwise fitting may rub on pump hosing or heatsink. Pump housing may be shifted slightly away from fitting if more space is needed. Fill port fitting should not exceede .600 inch [15.2mm] in diameter.

If pump it shifted too much toward fittings, pump impeller may rub or hit on the volute water cut. If noise or rattling is heard during pump operation shift pump away from fittings slightly.







Item 3 and 11 are not included if ordering AMD socket.

Item 13 is not included if ordering Intel socket.

Pump housing parts list

Item	Part #	Description	Quantity
1	MDTR-E-010	Pump housing C360 Brass	1
3	MDTR-B-021	Intel LGA 115x, 1200 socket top retention	1
4	MDTR-E-009	Cold plate C110 Copper	1
5	MDTR-B-004	Port access cover	1
6	g 1-8 plug	G 1/8 plug nickel brass	1
7	SSHC-SUS-MS4-4_203	M4 Set screw 92015A110	2
8	Mount spring pack	See item list below	4
9	M2.5 X 5MM PFH SS	M2.5mm x 5mm PFH SS screw,	6
10	M4X8MM Flat head Socket	M4 X 8mm flat head screw 18-8ss	4
11	LGA 115x-1700 back plate	See pg 4	1
12	MDTR-A-003	Cold plate adjusters	2
13	MDTR-B-022	AM4 socket retention top brkt.	1
14	Cold plate perimeter	2mm x 57mm EPDM Oring, E2.00X057	1
15	Cold plate inner Oring	2mm x 28mm EPDM Oring, E2.00X028	1
16	Pump inlet port Oring	1.5 x 23.5mm EPDM oring	1
17	Pump outlet port Oring	1.5mm x 12mm EPDM Oring E1.50X012	1
18*	MDTR-A-002	Spring cover / Tension limiter washer	1

Spring pack parts list 4x

Item	File Name (no extension)	Revision number	Quantity
20	pc045-328-6250-mw-0515-cg-	Compression spring	1
21	MDTR-A-002	Spring cover / Tension limiter washer	1
22	M3 X 30mm SHCS	M3X30mm Socket head screw 91292A022	1
23*	632 x1.25 SHCS 18-8 ss	6-32 x 1 1/4 SHCS 18-8ss 92196A166	1

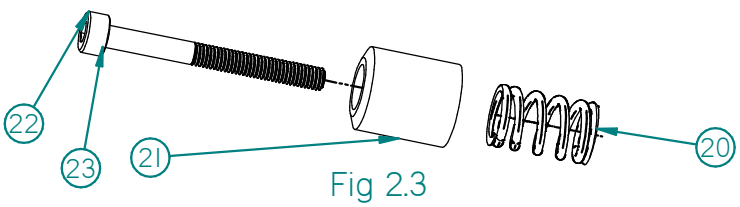
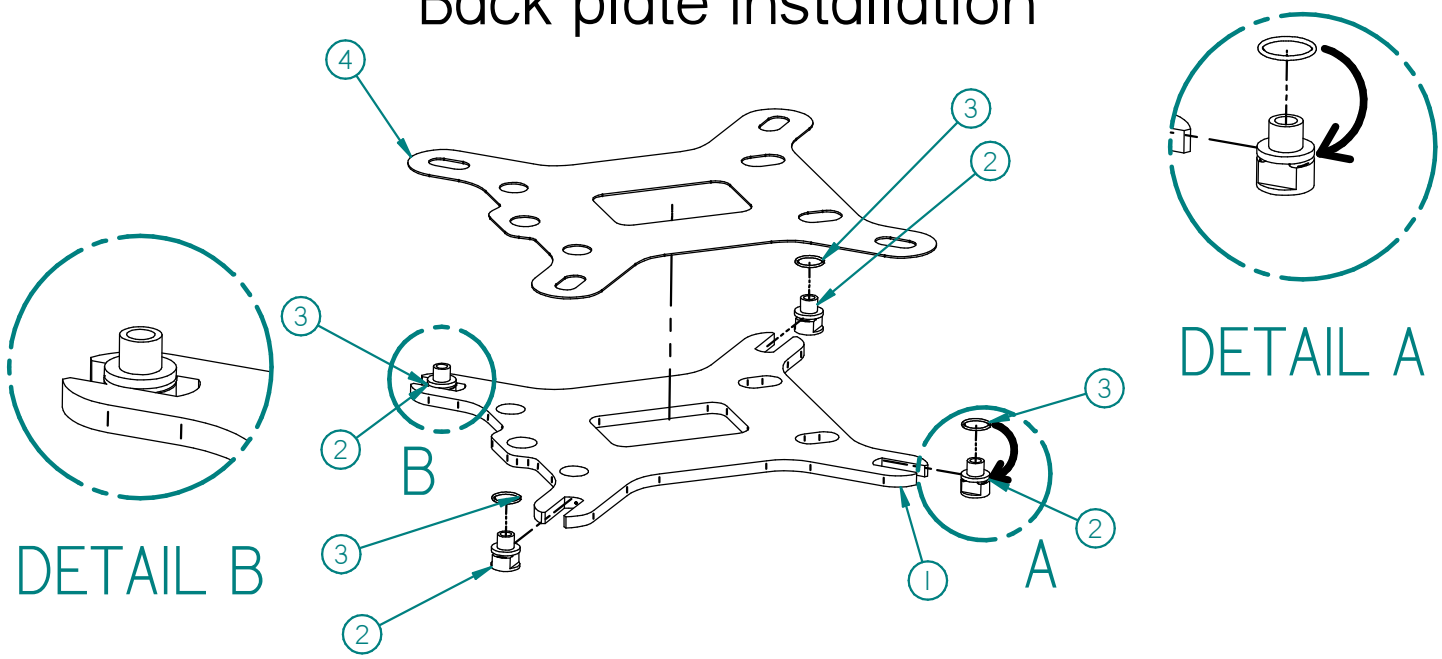


Fig 2.3

Intel socket comes with 4x item 22

AMD socket comes with 4x item 23

Back plate installation



Intel back plate parts list

Item	Part #	Description	Quantity
1	MDTR-A-015	LGA 115X-1700 back plate	1
2	MDTR-A-016	Adjustable standoff-M3	4
3	.5x5mm metric oring	.5 mm x 5 mm oring	4
4	MDTR-A-032	LGA 115X-1700 Insulator	1

The Modultra adjustable rear plate for Intel sockets LGA 115x-1700 is designed to be extremely rigid and easily adjustable between socket types. It uses 4 steel standoffs to retain the thermal solution to the back plate. The provided small orings are designed to keep the threaded standoffs in place while installing thermal solution. The orings are not entirely necessary, if one is accidentally lost, install is still possible. However difficulty of thermal solution installation will be increased.

Assembly of rear plate:

Step 1. Place 1x oring on to each of the M3 standoffs in small groove as show in detail A.

Step 2. Gently slide 4x standoff and oring assemblies into slots on rear plate. as shown in detail B. Take care not to snag and rip oring on edges of rear plate. If necessary add a small amount of soapy water to oring to ease installation.

Step 3. With motherboard CPU side down, place back plate on rear side of motherboard. Slide adjustable standoffs so that all 4 fit through the motherboard heatsink mounting holes. Next remove back plate and place insulator sheet between motherboard and back plate. Now flip motherboard over so that the CPU side is up, while holding back plate in. Sit Motherboard on top of a folded bath towel or other substrate that will hold back plate in. The provided foam block from the product packaging will also work for this step. Next move on to pg 5 "LOBO installation".

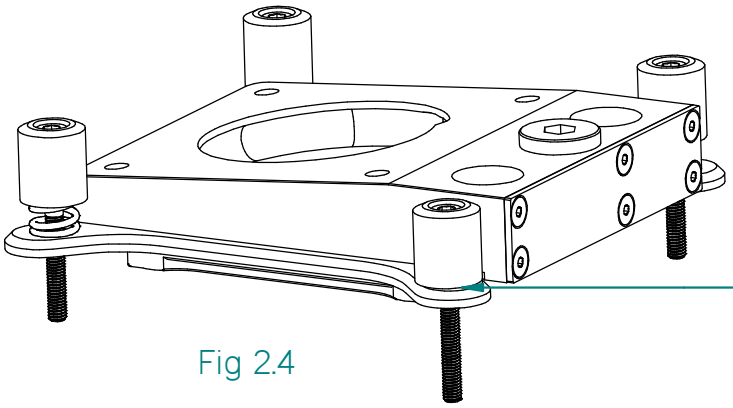


Fig 2.4

Tighten mounting screws evenly until spring cover lightly touches top mount plate. Tighten in steps of 3-4 turns moving between each screw.

Pump block installation

Installation of the LOBO pump block is similar to any other CPU block, however please take note of the following items.

The LOBO is designed to fit in 2 orientations on AMD sockets and up to 4 orientations on Intel sockets. However depending on mother board, not all orientations will be possibles due to component interferences. Before adding thermal paste it is good practice to test the desired orientation to see if fitment is feasible. If fitment is feasible add thermal paste to the CPU and begin installation.

Step 1. Assemble Spring packs as shown in figure 2.3 pg 3.

Step 2. Insert spring pack screws into top mounting plate as shown in Fig 2.4 above. and carefully lower LOBO block onto CPU.

Step 3. Hold LOBO down frimly and push mounting screw downward with an allen wrench while turning. After screw has engaged the threaded standoff in the bottom mounting plate, rotate scew one additonal turn and move onto the next mounting screw. After all 4 screws are started into the retention bracket standoffs, thread in screws the remaining distance. However do not fully tighten any one screw completely. It is importnat that each screw is only tightened 3-4 turns before moving on to the next screw. repeat this process until all 4 spring housing lightly contact the mounting plate. Turning resistance will increase significantly when spring housing bottoms out. Do not tighten further, as damage to the CPU, motherboard or LOBO may result. Tightening in this method prevents uneven loading during installation.

Pump heatsink installation

Item	File Name (no extension)	Revision number	Quantit
1	Laing DDC 3.1 pwm pump	Laing DDC or clone	1
2	MDTR-A-006	DDC thermal pad 2mm	1
3	Laing DDC oring		1
4	MDTR-A-012	DDC heatsink	1
5	M4 X 30mm PFH	M4 x 30mm flat head	4

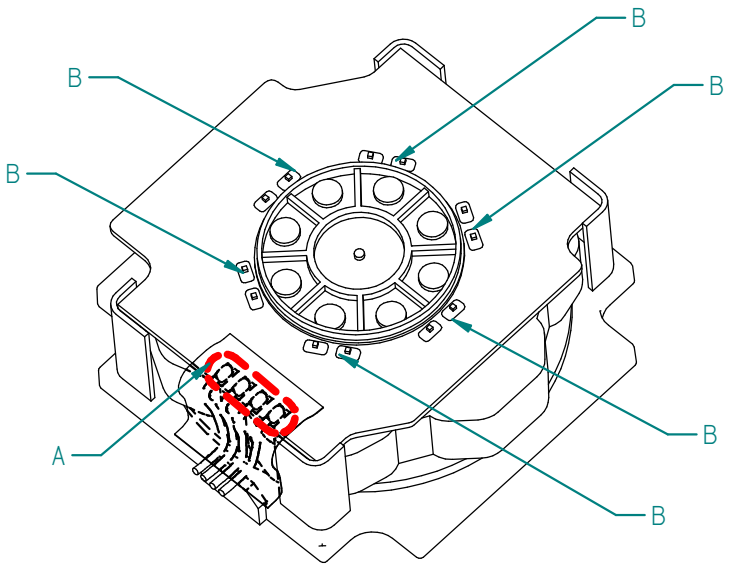
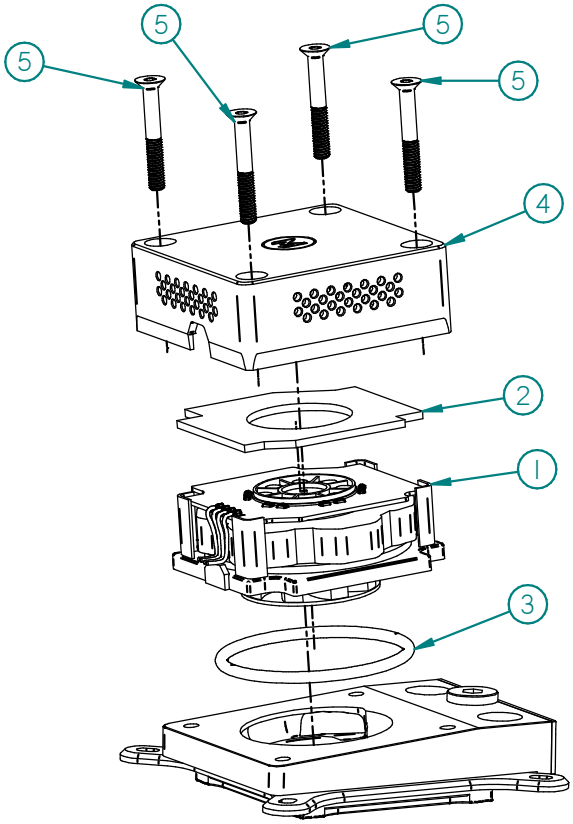


Fig 2.5



The Modultra LOBO and heatsink are designed to be used with any Laing DDC or Laing DDC clone pump.

Pump heatsink installation

Step 1 Remove stock Laing ddc pump housing.

Step 2. Inspect pump circuit board area. Any solder leads or wiring protrusion over .078 in or 2mm must be trimmed before installing pump heatsink. Areas where solder leads should be inspected and or trimmed are marked with A and B in Fig 2.5. A small set of side cutters can be used to snip away any long solder protrusions. A small file can likewise be used to file down solder protrusions. In order to gauge heights, use supplied 2mm thick thermal pad for reference. If any solder joint is taller than the supplied thermal pad then trimming will be required.

Failure to trim tall solder joints can cause a ground short to heasink housing, Ground shorts can damage motherboard and or fan controller.

Step 3. Use 1 piece of supplied kapton tape to cover solder joints and pump wiring as shown in Fig 2.6 Detail C. Tape should be applied so that it covers pump wire solder pads and extends down pump wiring toward wire capture boss. If installed correctly, tape will extend slightly outside of heatsink when it is installed. Tape is provided as an additional layer of safety to prevent ground shorts between pump wiring and pump housing. 2 pieces of kapton are provided, one is extra.

Step 4. Apply provided thermal pad on top of pump circuit board. Thermal pad should go over kapton tape applied in previous step. Thermal pad should be oriented so that its perimeter matches the pump circuit board perimeter as shown in Fig2.6.

Step 5 Install heatsink onto pump, taking note that pump wiring will exit through relief cutout on heatsink.

Step 6. Place pump/heatsink assembly onto LOBO block. Do not forget to include pump Oring. Pump/heatsink assembly can mount in any one of 4 directions on LOBO. This can be used to orient pump wiring in preferred direction. After orientation is determined, use provided M4x 30mm flat head screws to attach pump/heatsink to LOBO. If heatsink is installed correctly there should be no gap between the heatsink base and LOBO block. Contact between heasink base and LOBO is essential for heat conduction into loop coolant.

Step 7. If user has a multimeter avalialbe it is good practice to test for ground shorts between pump wiring and heatsink. After installation remove one heatsink mounting screw. Next unplug pump connector. Use mulitmeter to check continuity between all pump wires and inside of removed screw hole. It may be nesscary to scratch paint off on wall inside screw hole to get proper contact.

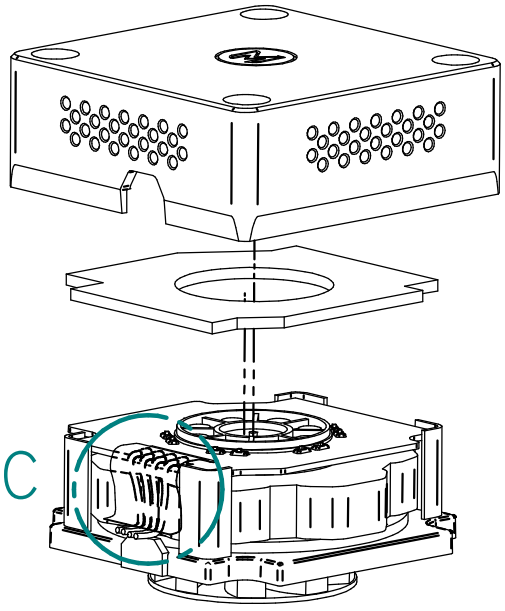
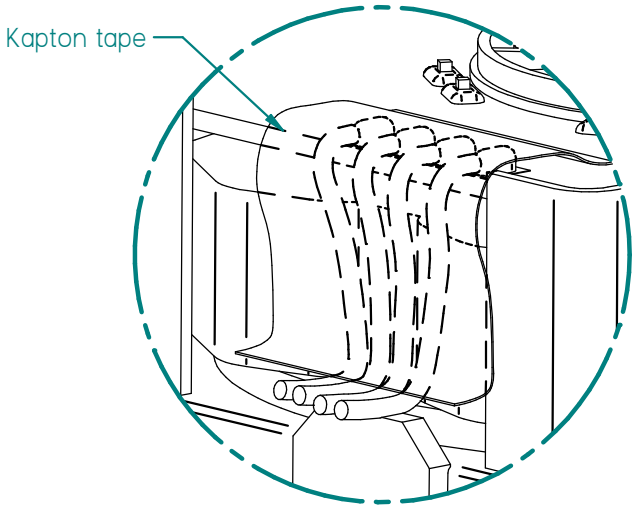
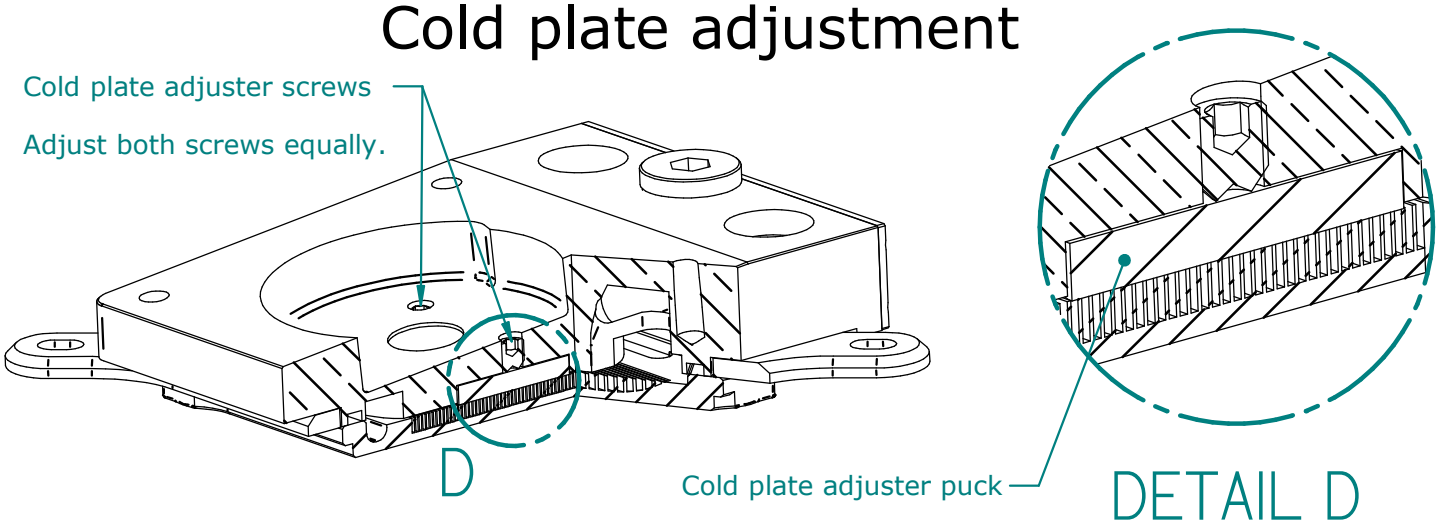


Fig 2.6



DETAIL C

Cold plate adjustment



The Modultra LOBO comes with an industry first, fully adjustable cold plate, within range.

For anybody who doesn't want to deal with cold plate adjustment, you don't have to. The cold plate is set from the factory at a .002 in (.05mm) flatness spec before they ship. All you need to do is install the pump block and move on as normal. Please skip this section.

How the adjustable feature works is there are 2 set screws that push an acetal puck that contacts the cold plate mid span. The primary function of these adjusters is to acheive zero tolerance between the center of the cold plate and the pump block. This is important in that if there is even a little bit of free space between the cold plate and pump housing, the cold plate can deform in a concave manner during hardware tightening. This is not desirable, as it decreases heat transfer because the center of the cold plate deforms away from the CPU die.

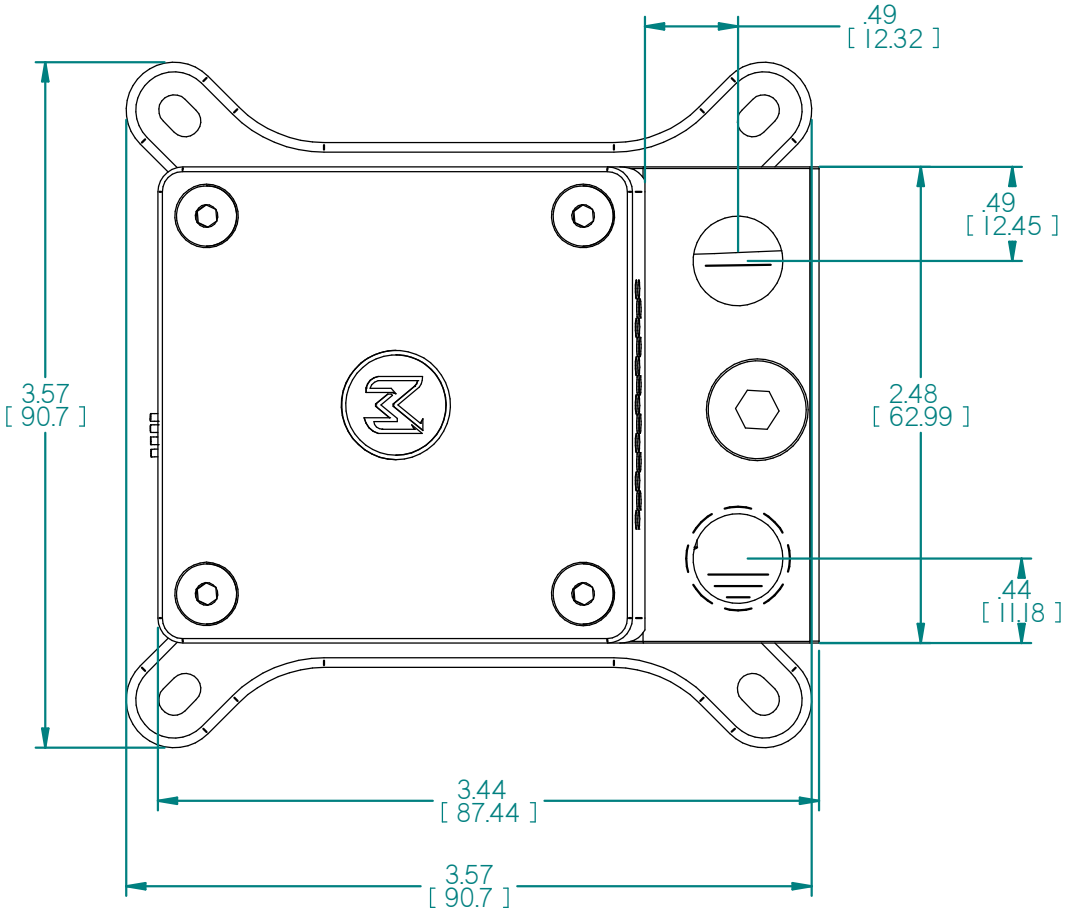
Secondly the adjuster can actually bow the cold plate outward into a convex shape. This can be advantageous if you have a processor that has a concavity on its IHS or has been bent due to socket retention force. From the factory, our cold plates are flat to within .002 in (.050 mm) from corner to corner, when attached to the LOBO pump block. With the adjusters it is possible to add around a maximum of .007 inch (.177mm) of convex bow before the cold plate is permanently deformed, this is about ½ revolution of the set screws. It is possible to further deform the cold plate up to .014 inch, (.35mm) but permanent deformation in the cold plate will occur. At this point you would need to lap your cold plate if you need dead flat again.

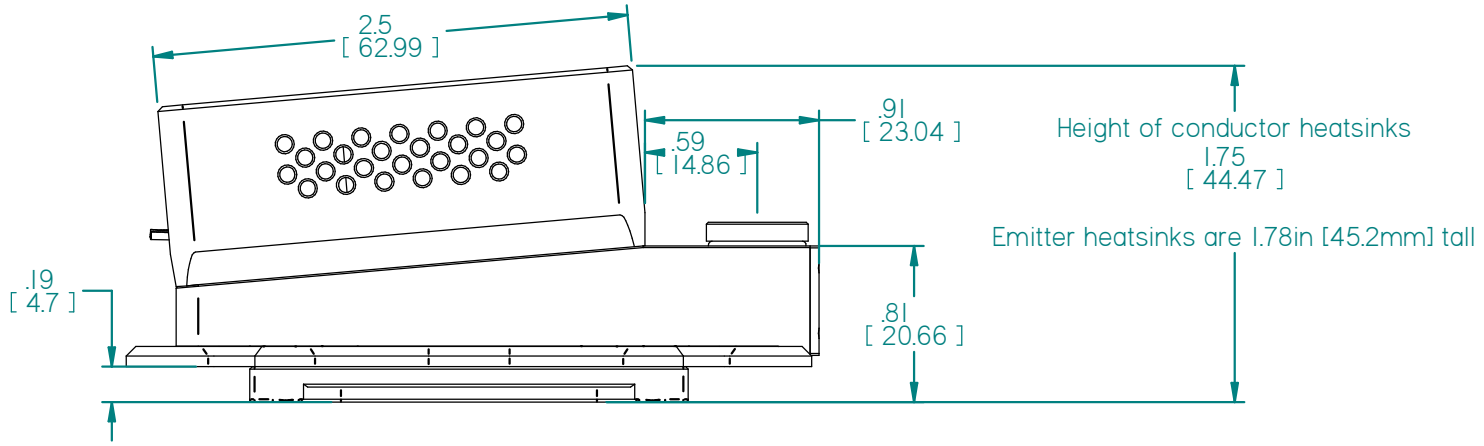
How to reset the cold plate adjusters to zero.

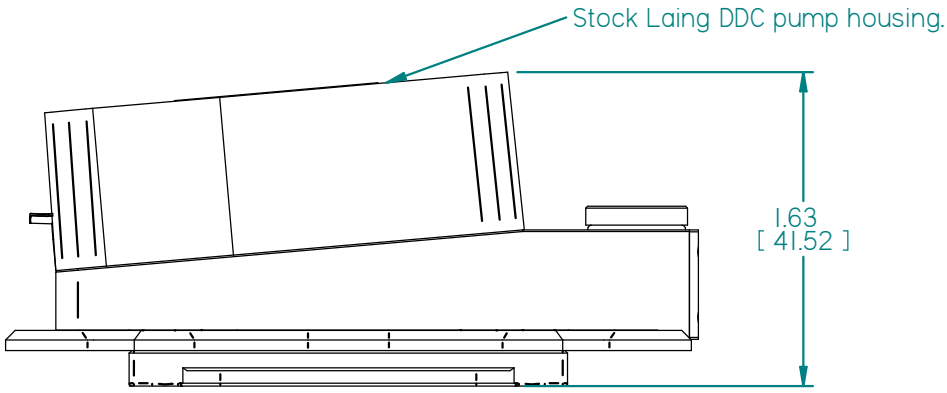
The only time you would need to perform this procedure is if you purchase a new cold plate, or are resetting the cold plate after performing adjustment.

Using a 2mm allen wrench, the cold plate adjustment screws can be turned counter clockwise until they stop on the block itself. Do not try to remove cold plate adjuster screws from the pump side of the pump housing. Damage to the housing will result! If screws need to be removed, they should be turned clockwise until they thread out of the cold plate side of the pump housing.

After reinstalling the cold plate and cold plate adjuster pucks, turn cold plate adjuster screws until they very lightly touch the cold plate. The resistance will increase when you contact the cold plate. Turn an additional 1/16 turn, this should set the cold plate to be approximately flat.


.49
[12.32]
.49
[12.45]
3.57
[90.7]
2.48
[62.99]
.44
[11.18]
3.44
[87.44]
3.57
[90.7]


2.5
[62.99]
.91
[23.04]
.59
[14.86]
Height of conductor heatsinks
1.75
[44.47]
Emitter heatsinks are 1.78in [45.2mm] tall
.19
[4.7]
.81
[20.66]


Stock Laing DDC pump housing.
1.63
[41.52]