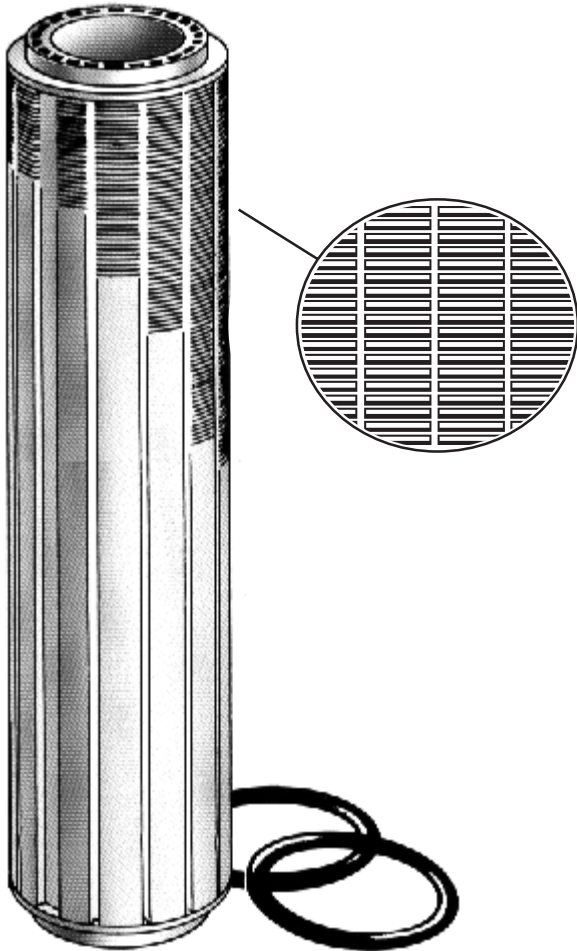


LAMINAR FLOW OIL TO WATER HEAT EXCHANGERS





- ◆ *High heat transfer- three times higher than conventional exchangers.*
- ◆ *Low pressure drop- advanced flow pattern allows full heat dissipation while sacrificing a minimum of pressure.*
- ◆ *No solder joints- o'rings seal the two piece modular design instead of stacks of pipes and plates.*

Laminova Heat Exchangers

The Laminova heat exchanger consists primarily of two pieces of extruded aluminum profiles, the core and the shell. The inner surface of the core is optimized for efficient water flow rates, low pressure drop and minimum risk of fouling. The outer surface of the core is optimized for maximum liquid (oil) to surface contact, laminar flow, low pressure drop and high heat transfer. The assembly of both sections is sealed with o-rings, ensuring that the unit is resistant to vibration and pressure pulsation.

Laminova Theory

The Laminova concept can be best described as an almost infinite number of interconnected laminar cooling fins. Each fin is 3mm in height by only 0.2mm thick. The oil flow gap between the fins is 0.3mm. By this arrangement the oil flow is continuously interrupted and restarted after an optimized flow length. Normally such restrictive finning would cause a huge pressure drop, but by introducing channels in the finning, the oil is kept laminar (as opposed to turbulent as in other cooler designs) and pressure drop remains low.

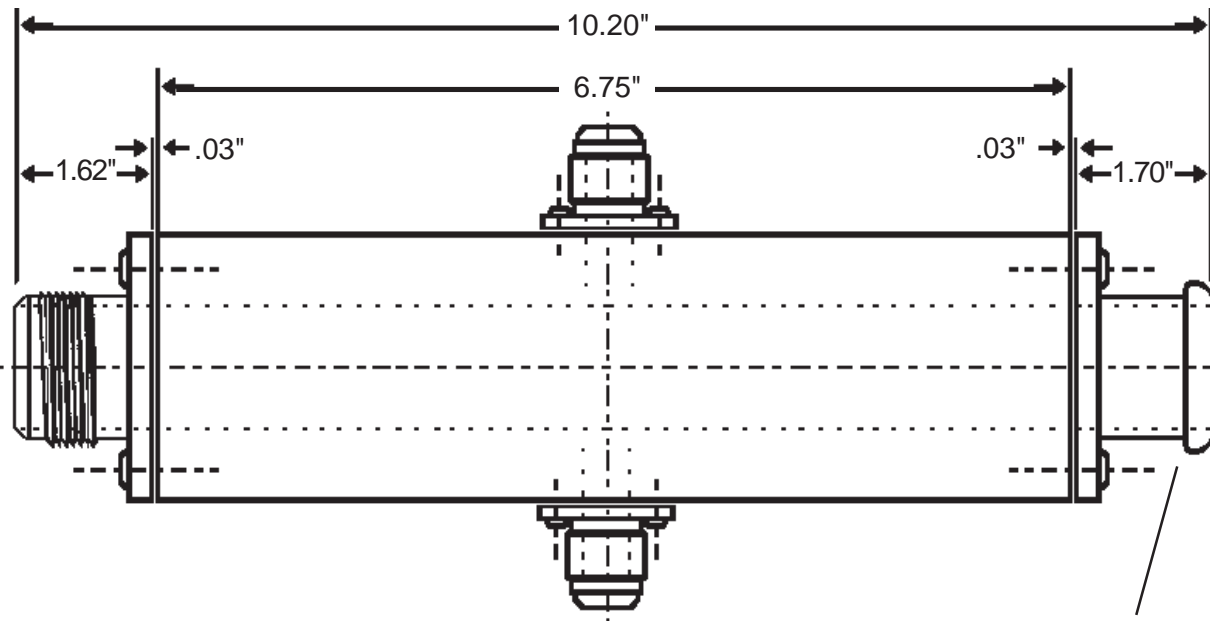
Laminova Application

Ideally, all engine water (coolant) should pass through the unit. If this is not possible a partial flow may be obtained by teeing off and running in parallel with the water radiator/heater core. In this case we can supply a partial restrictor or plug to divert more water through the annular water ducts in the core. This will restrict the overall flow of water in the main cooling system and is more likely to be beneficial in partial flow installations. We suggest experimenting with restrictors only when more cooling is required. Oil flow to the unit may be obtained by using a take off plate between the engine block and filter or plumbing in with the remote filter or drysump circuit. BAT stocks a large selection of MOCAL oil plumbing components for ease of installation. In application Laminova coolers offer real advantages in ease of installation where space is limited, also the cooler does not consume precious under hood air flow and their robust construction protects from oil leakage and possible fire in crash situations. The modular construction allows for easy disassembly for cleaning or service.

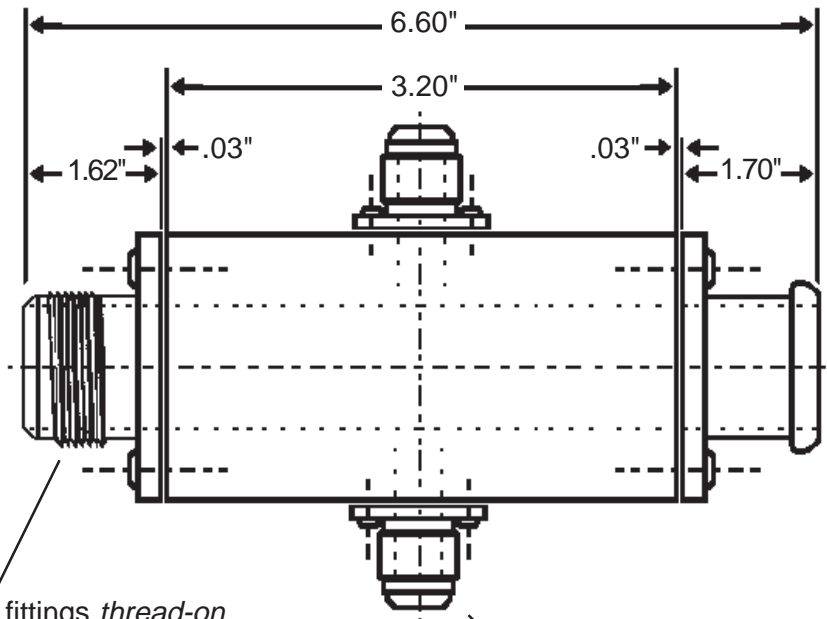
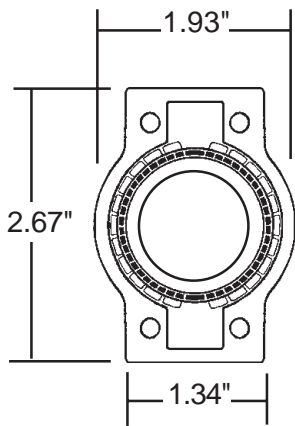
Recommended Sizing

It is difficult to come up with meaningful "real world" performance figures as these are dependent on oil and water flow and size and efficiency of the water radiator as variables. In application we have found that a Laminova 90mm (small) core will perform similar to a typical 10 to 13 row air to air 235 matrix cooler, a 180mm (medium) to a 16 to 19 row and 330mm (large) to a 25 to 30 row.

MOCAL



waterside fittings push-on
(5/8", 3/4" 1.10", 1.25", 1.50" 1.75")



waterside fittings *thread-on*
(-16AN, -20AN, -24AN / JIC)

oilside flange fittings *thread-on*
(-8AN, -10AN, -12AN, -16AN / JIC)

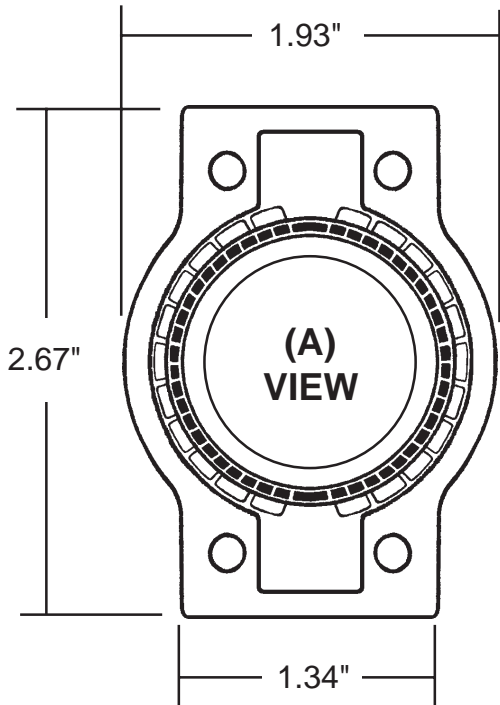
C43 Series Heat Exchangers

A43-180 Cooler (top)

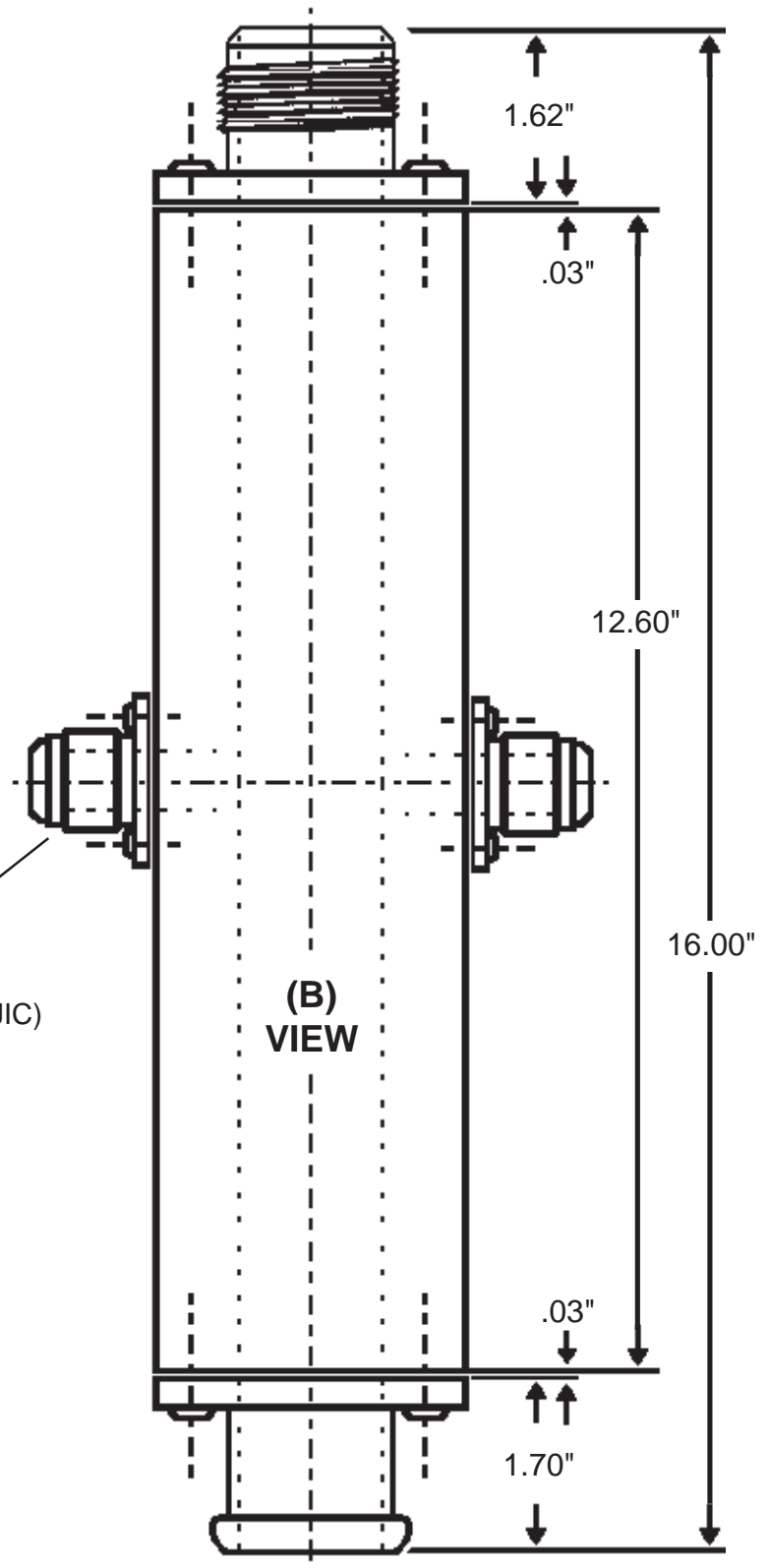
A43-90 Cooler (bottom)

MOCAL

thread-on waterside fittings
(-16AN, -20AN, -24AN / JIC)



thread-on oilside fittings
(-8AN, -10AN, -12AN, -16AN / JIC)



push-on waterside fittings
(5/8", 3/4" 1.10", 1.25", 1.50" 1.75")

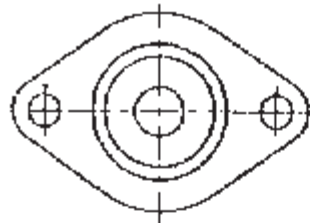
C43 Series Heat Exchangers

Cooler Cutaway (A View) *same all sizes*

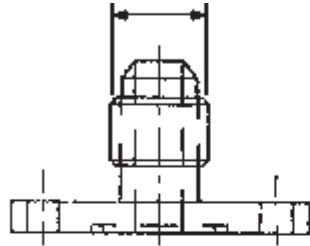
A43-330 Cooler (B View)

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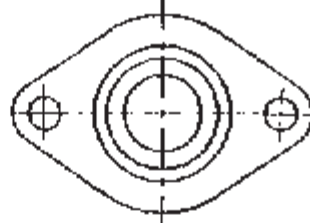
MOCAL



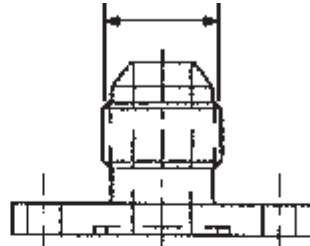
UNF 9/16"-18



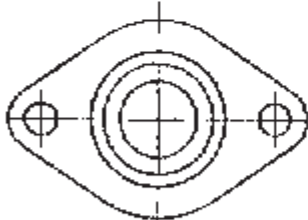
JIC 6 (-6AN)



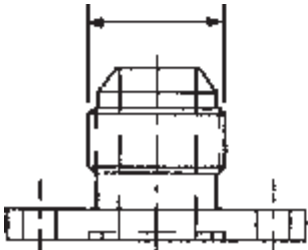
UNF 3/4"-16



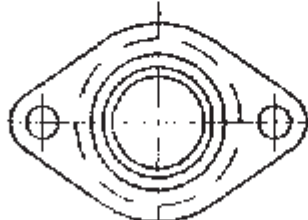
JIC 8 (-8AN)



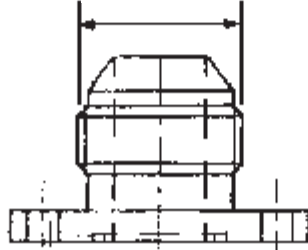
UNF 7/8"-14



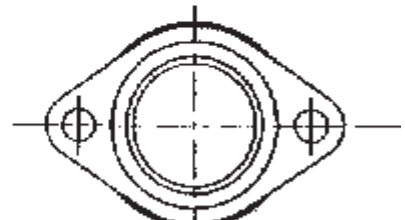
JIC 10 (-10AN)



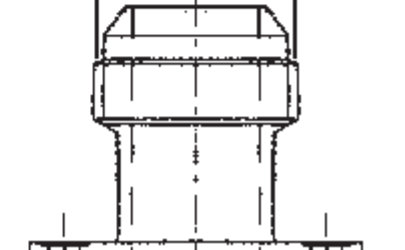
UNF 1 1/16"-12



JIC 12 (-12AN)



UNF 1 5/16"-12



JIC 16 (-16AN)

Additional sizes: 1/2" push-on hose, -4AN/JIC, 3/4" BSP

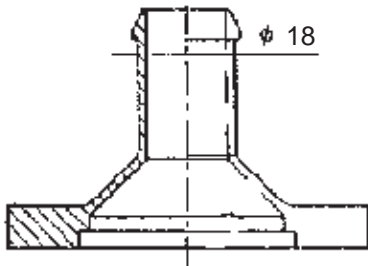
C43 Series Oil Side Fittings

(top row) -6AN, -8AN

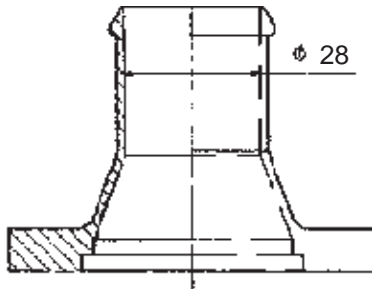
(bottom row) -10AN, -12AN, -16AN

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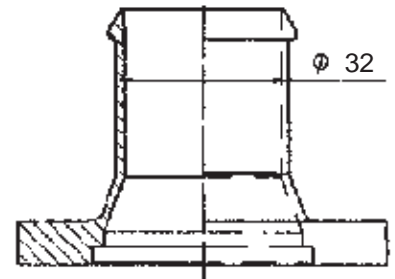
MOCAL



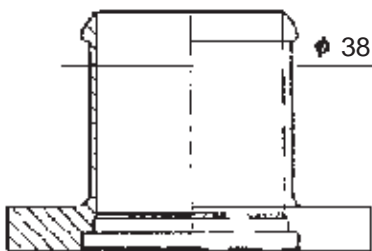
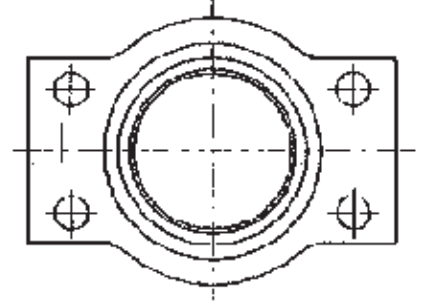
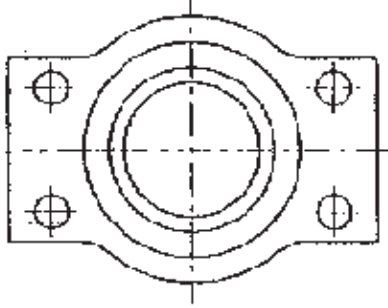
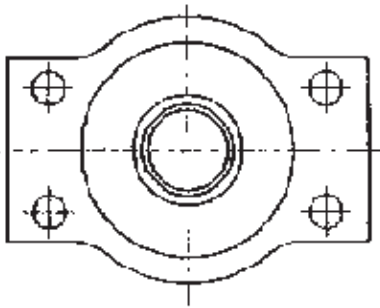
18mm (.70") push-on



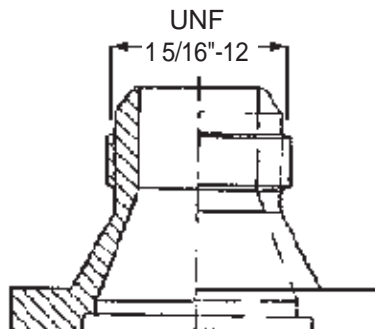
28mm (1.10") push-on



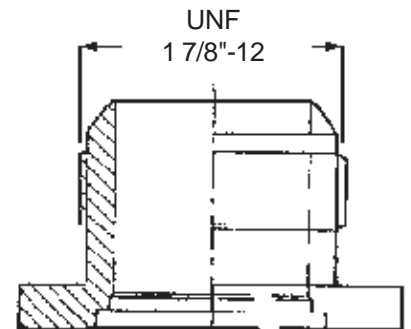
32mm (1.25") push-on



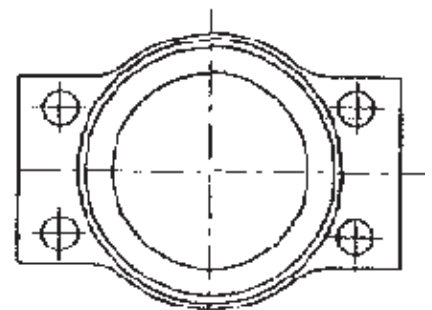
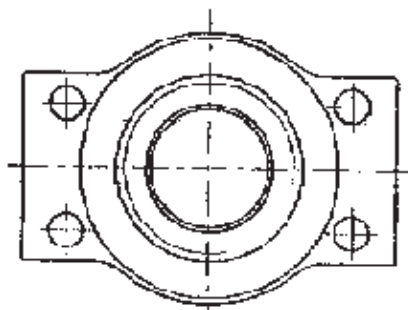
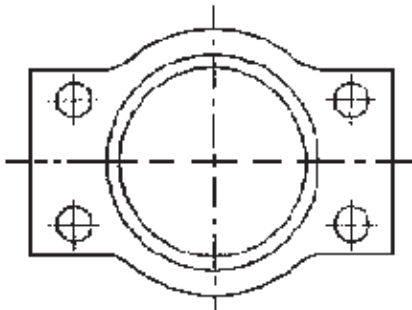
38mm (1.5") push-on



JIC 16 (-16AN) thread-on



JIC 24 (-24AN) thread-on



Additional sizes: (push-on hose) 16mm, 24mm, 35mm, 42mm, 45mm, (male thread) -20AN/JIC, 3/4" BSP, (female thread) 3/4" NPT.

C43 Series Water Side Fittings

(top row) 18mm, 28mm, 32mm

(bottom row) 38mm, -16AN, -24AN

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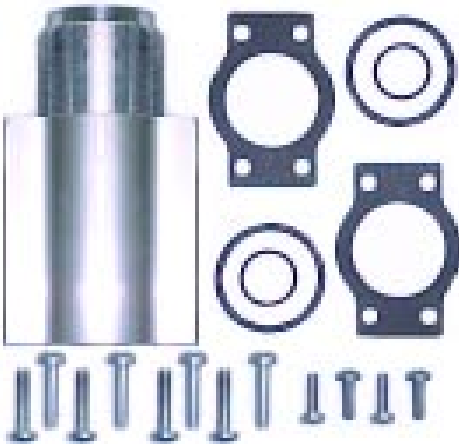
A43P cooler with push-on water end



A43 Series Coolers - 90mm, 180mm & 330mm core sizes.



A43A cooler with thread-on water end



A43K (Build Kit) includes: core, housing, seals, gaskets & hardware.

Laminova C43-90 Series Heat Exchanger

A43-90P cooler with push-on water connections **\$235.00**

(1) assembled 90mm core heat exchanger unit configured with your choice of (2) oil -6, -8, -10, -12 and (2) push-on water 16, 18, 24, 28, 32, 38, 45mm fittings

A43-90A cooler with thread-on water connections **\$255.00**

(1) assembled 90mm core heat exchanger unit configured with your choice of (2) oil -6, -8, -10, -12 and (2) thread-on water -16, -20, -24AN fittings.

A43-90K core, housing, seals, gaskets & hardware **\$155.00**

main components - less water and oil connections - allows for custom build if optional specification fluid connections are required. See additional listing of oil and water fittings.

Laminova C43-180 Series Heat Exchanger

A43-180P cooler with push-on water connections **\$265.00**

(1) assembled 180mm core heat exchanger unit configured with your choice of (2) oil -6, -8, -10, -12 and (2) push-on water 16, 18, 24, 28, 32, 38, 45mm fittings

A43-180A cooler with thread-on water connections **\$285.00**

(1) assembled 180mm core heat exchanger unit configured with your choice of (2) oil -6, -8, -10, -12 and (2) thread-on water -16, -20, -24AN fittings.

A43-180K core, housing, seals, gaskets & hardware **\$189.00**

main component - less water and oil connections - allows for custom build if optional specification fluid connections are required. See additional listing of oil and water fittings.

Laminova C43-330 Series Heat Exchanger

A43-330P cooler with push-on water connections **\$325.00**

(1) assembled 330mm core heat exchanger unit configured with your choice of (2) oil -6, -8, -10, -12 and (2) push-on water 16, 18, 24, 28, 32, 38, 45mm fittings

A43-330A cooler with thread-on water connections **\$345.00**

(1) assembled 330mm core heat exchanger unit configured with your choice of (2) oil -6, -8, -10, -12 and (2) thread-on water -16, -20, -24AN fittings.

A43-330K core, housing, seals, gaskets & hardware **\$239.00**

main components - less water and oil connections - allows for custom build if optional specification fluid connections are required. See additional listing of oil and water fittings.



A43 water side fittings



A43 oil side fittings



A43 water restrictors



A43 gasket, seal & hardware kit

Laminova Water Side Fittings (each)

| | | |
|-------------------|--|----------------|
| LWC-M16 | 16mm (.630") O.D. push-on hose | \$28.00 |
| LWC-M18 | 18mm (.70") O.D. push-on hose | \$28.00 |
| LWC-M24 | 24mm (.945") O.D. push-on hose | \$28.00 |
| LWC-M28 | 28mm (1.10") O.D. push-on hose | \$28.00 |
| LWC-M32 | 32mm (1.25") O.D. push-on hose | \$28.00 |
| LWC-M32/90 | 32mm (1.25") O.D. push-on hose 90 degree | \$28.00 |
| LWC-M35 | 35mm (1.38") O.D. push-on hose | \$36.00 |
| LWC-M38 | 38mm (1.50") O.D. push-on hose | \$28.00 |
| LWC-M42/90 | 42mm (1.65") O.D. push-on hose 90 degree | \$28.00 |
| LWC-M45 | 45mm (1.77") O.D. push-on hose | \$30.00 |
| LWC-N75 | (3/4" NPT female) for NPT union | \$32.00 |
| LWC-A16 | (-16AN/JIC) thread-on | \$38.00 |
| LWC-A20 | (-20AN/JIC) thread-on | \$38.00 |
| LWC-A24 | (-24AN/JIC) thread-on | \$38.00 |

Laminova Oil Side Fittings (each)

| | | |
|----------------|---|----------------|
| LOC-4 | (-4AN fitting for thread-on hose ends) | \$33.30 |
| LOC-6 | (-6AN fitting for thread-on hose ends) | \$19.00 |
| LOC-8 | (-8AN fitting for thread-on hose ends) | \$18.00 |
| LOC-10 | (-10AN fitting for thread-on hose ends) | \$18.00 |
| LOC-12 | (-12AN fitting for thread-on hose ends) | \$18.00 |
| LOC-16 | (-16AN fitting for thread-on hose ends) | \$33.30 |
| LOC-B12 | (3/4" BSP" for thread-on hose ends) | \$32.00 |
| LOC-P5 | (1/2" fitting for push-on hose) | \$19.00 |

Water Restrictor & Plug (each)

| | | |
|----------------|------------------------|---------------|
| TB00007 | (full restrictor/plug) | \$9.05 |
| TB00027 | (partial restrictor) | \$4.40 |

Restrictors can be used to adjust overall cooler efficiency by regulating water flow to the core. Factors such as; water flow & temperature, oil flow & temperature, oil viscosity & volume, engine rpm, water radiator size & efficiency will also determine overall cooler performance.

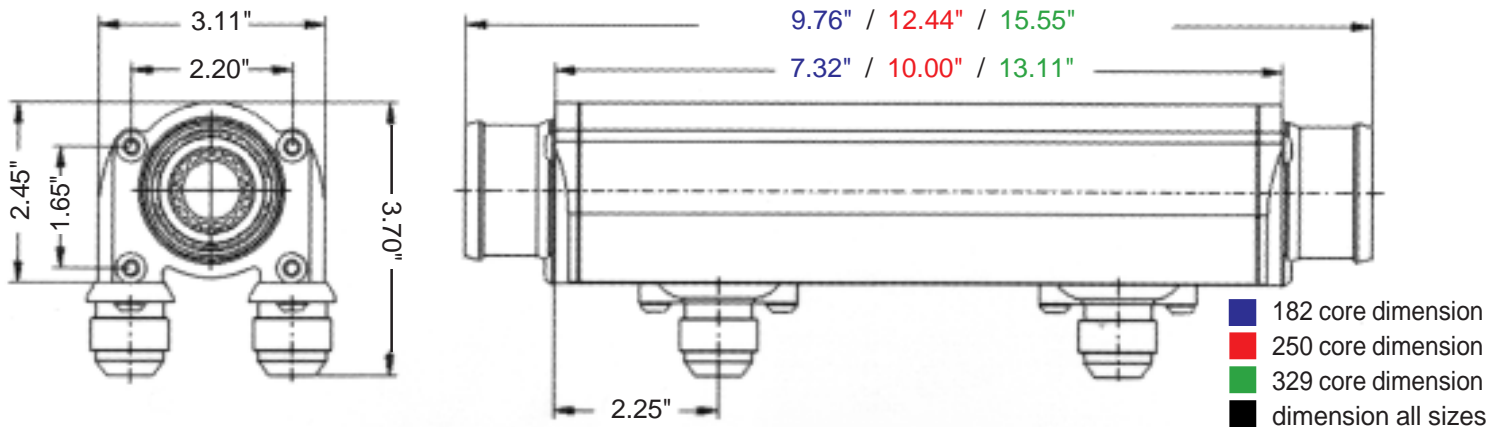
Gaskets, O-rings & Hardware (each)

| | | |
|-----------------|---|----------------|
| LS-M5 | (oil side retaining screw) 4x | .85 |
| LS-M6 | (water side retaining screw) 8x | .90 |
| L0-M18 | (18mm O-ring for oil side fittings) 2x | \$1.35 |
| L0-M36 | (36mm O-ring for water side fittings) 2x | \$1.50 |
| LWG-43 | (gasket between housing & water side ends) 2x | \$2.45 |
| UA00005* | (kit with all gaskets, o-rings & screws) | \$15.50 |

*enough components to build one A43 cooler

E54 Series Coolers

These compact, high performance, single and dual core design oil coolers are the choice for maximum heat transfer in motorsports and industrial vehicle service. Construction is similar to the popular C43 type coolers modular design which allows flexible configuration. Heat transfer of a E54 single core cooler is 25% greater than a similar length C43 cooler. The dual E54 cores offer roughly 40% greater cooling over single core version and almost double the performance of similar length C43 cooler. E54 series coolers can be "stacked" for multiple cooling tasks: Engine and transmission cooler sections joined together as one unit.



EDC54 Series Advantages:

- Superior cooling with low pressure drop
- Extremely Robust design & construction
- Modular design can be configured to application
- Provides cooling at all speeds
- Compact unit can be mounted anywhere for better aerodynamics
- No oil thermostat required

EDC54 Fluid Connection Sizes:

Water connection: 1.00" (24mm), 1.10" (28mm), 1.25" (32mm), 1.37" (35mm), 1.50" (38mm), 1.75" (45mm) and 2.00" (50mm)

Oil connection: (-AN/JIC): -8AN, -10AN, -12AN, -16AN

E54 Pricing:

single core

| | |
|-----------------|-----------------|
| EC54-182 | \$560.00 |
| EC54-250 | \$635.00 |
| EC54-329 | \$705.00 |

dual core

| | |
|------------------|-----------------|
| ECD54-182 | \$759.00 |
| ECD54-250 | \$815.00 |
| ECD54-329 | \$885.00 |

price includes (1) assembled unit with choice of water and oil connections. Coolers are built to order and require 7-10 day delivery.