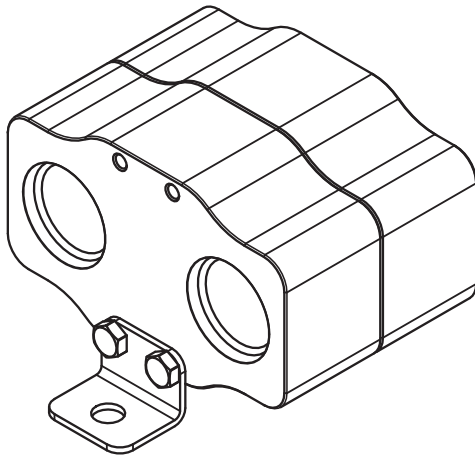




**HIGH-FLOW IN-LINE ENGINE AND  
TRANSMISSION OIL COOLER THER-  
MOSTAT, -10AN**

**PART NO. FSM-XXX**

MADE IN USA



Important: Read these instructions in their  
entirety prior to installation.

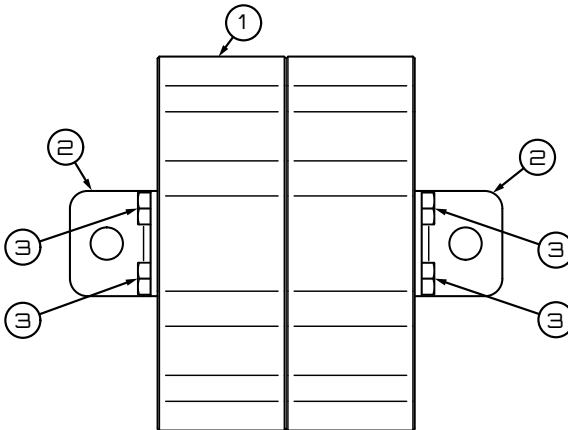
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## PRODUCT INFORMATION & APPLICATIONS

- The Flow-Series-Motorsport (FSM) thermostat installs in-line and regulates fluid temperature for applications such as engine oil, transmission fluid, gear fluid, and engine coolant.
- Accelerates warm up to improve vehicle efficiency and reduce engine wear.
- Fluid flow will never be blocked, even if the thermostat fails.
- Heat exchangers should meet or slightly exceed the system heat load so that fluid leaving FSM (returning to source) more closely matches the Stabilization Temperature shown in the table on page five.
  - The Stabilization Temperature is higher when using undersized heat exchangers.
  - The Stabilization Temperature is lower when using oversized heat exchangers.
  - The Stabilization Temperature can fluctuate when using extremely oversized heat exchangers.

**⚠ FSM is not recommended for use with highly corrosive fluids.**

## PARTS LIST & HARDWARE



**Figure 1 - FSM Parts List**

Item	Qty	Part Number	Description
1	1	FSM-XXX	Thermostat (Choose Temperature)
2	2	ENV-1000	Mounting Bracket
3	4	HSC-1016	Mounting Bracket Screw

## ADAPTER FITTING OPTIONS

- SAE -10 ORB to SAE 37° male flare, shown in Figure 2:
  - SAE -10 ORB to -6 male flare part number is OM-10-06
  - SAE -10 ORB to -8 male flare part number is OM-10-08
  - SAE -10 ORB to -10 male flare part number is OM-10-10
  - SAE -10 ORB to -12 male flare part number is OM-10-12

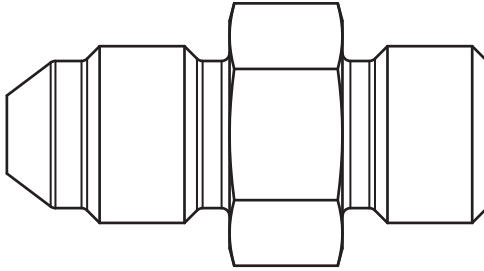


Figure 2 - OM-10-XX Fitting Style

- SAE -10 ORB to hose barb, shown in Figure 3:
  - SAE -10 ORB to  $\frac{5}{16}$ " hose barb part number is OM-10-06.
  - SAE -10 ORB to  $\frac{3}{8}$ " hose barb part number is OM-10-08.
  - SAE -10 ORB to  $\frac{1}{2}$ " hose barb part number is OM-10-10.

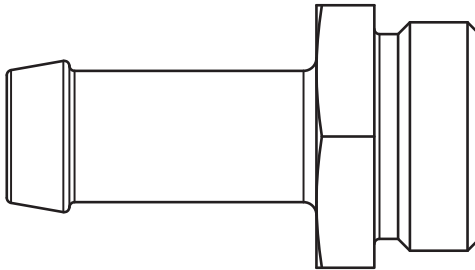


Figure 3 - OB-10-YY Fitting Style

# IMPORTANT DIMENSIONS

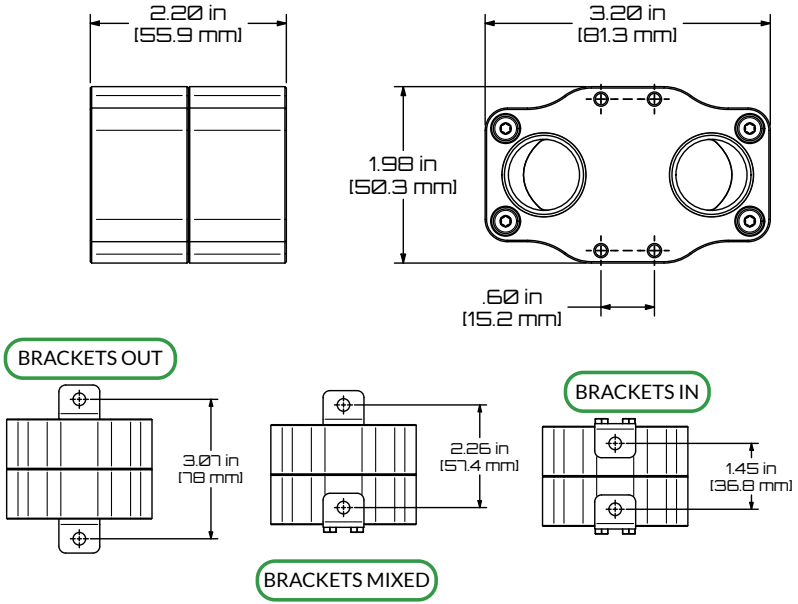


Figure 4 - FSM Dimensions

# TECHNICAL SPECIFICATIONS

Max. Operating Temp.	302°F (150°C)
Min. Operating Temp.	-22°F (-30°C)
Max. Operating Pressure	300 psi (20.68 bar)
Max. Flow Rate	SAE 30W Oil @ 212°F (100°C): 20 GPM (76 LPM) Water: 40 GPM (151 LPM)
Weight	12.7 oz (360 g)
Ports	-10 SAE Straight Thread O-ring Ports 7/8" -14 UN - 2A
Housing Material	CNC-Machined 6061-T6 Billet Aluminum
Housing Finish	MIL-A-8625, Type II Anodize, Black
Valve Material	CNC-Machined 6061-T6 Billet Aluminum
Thermal Actuator	Brass Body, Steel Ram, Paraffin Wax
Valve Spring	304 Stainless Steel, Passivated per ASTM A967
Seals	Viton (FKM) Elastomer
Estimated Service Life	> 10,000 Heat Cycles

# TEMPERATURE SPECIFICATION TABLE

Part Number	Activation Temperature	Stabilization Temperature
FSM-145	140°F +/- 2°F (60°C +/- 1°C)	145°F +/- 2°F (63°C +/- 1°C)
FSM-165	160°F +/- 2°F (71°C +/- 1°C)	165°F +/- 2°F (74°C +/- 1°C)
FSM-185	180°F +/- 2°F (82°C +/- 1°C)	185°F +/- 2°F (85°C +/- 1°C)
FSM-205	200°F +/- 2°F (93°C +/- 1°C)	205°F +/- 2°F (96°C +/- 1°C)
FSM-215	212°F +/- 2°F (100°C +/- 1°C)	215°F +/- 2°F (102°C +/- 1°C)

## OPERATION & FLOW DIAGRAM

The FSM thermostat operation during warm-up and full-flow modes is explained below. Figure 5 illustrates the operation.

- During warm-up, most fluid flowing into the FSM thermostat bypasses the heat exchanger and returns to the source.
  - Approximately 90-95% of fluid returns to source during warm-up because the total hydraulic resistance for a heat exchanger, lines, and fittings is higher than the FSM thermostat.
  - Minor flow through the heat exchanger slowly warms the fluid in the core to reduce thermal shock after activation.
- Once the activation temperature is reached, the internal valve slowly closes the internal bypass passage, diverting more hot fluid into the heat exchanger.
  - The slow movement of the valve reduces fluid hammer effects between bypass and full flow modes to protect sensitive systems.
- In full flow mode, the valve completely closes the internal bypass, forcing all fluid to the heat exchanger for maximum cooling.
  - All fluid is being sent through the heat exchanger.
  - This mode stays active while the FSM and the heat exchanger balance the system to the Stabilization Temperature..

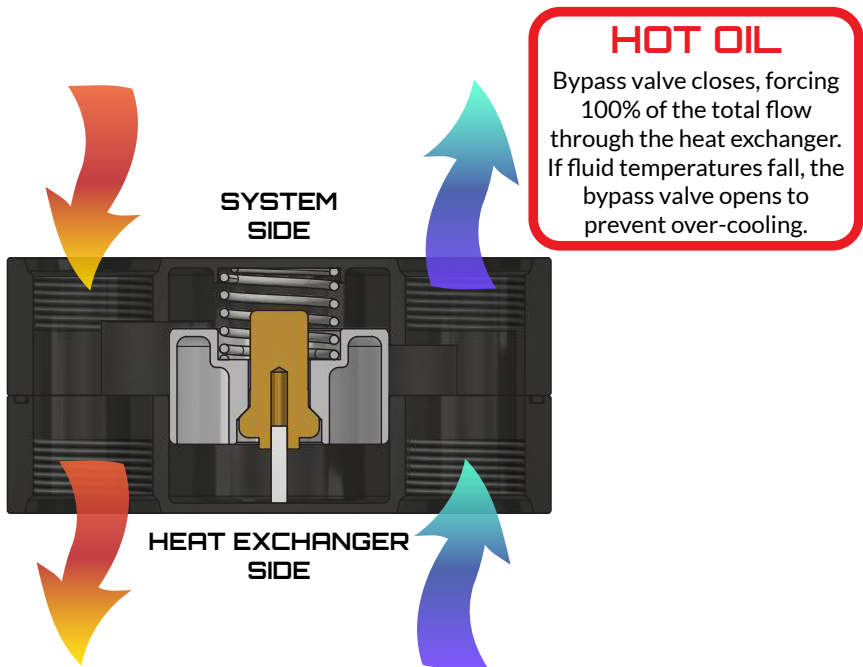
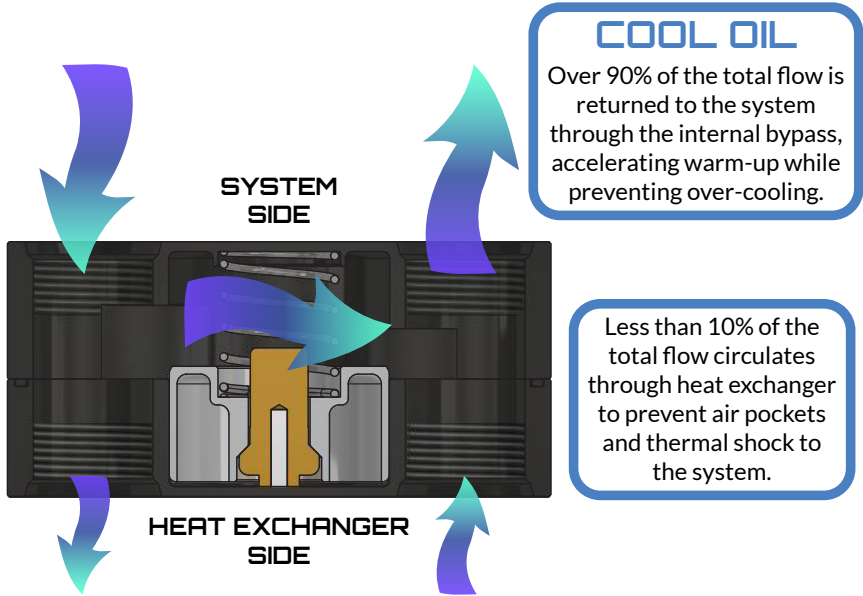








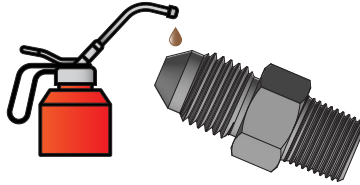



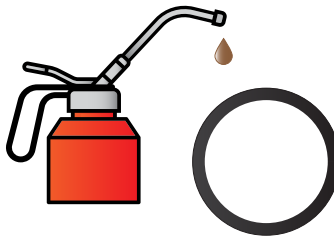
Figure 5 - FSM Flow Diagram


## BEFORE YOU BEGIN

-  **WARNING: NEVER PLUG THE FLUID PORTS.**
-  **WARNING: Running the engine with plugs in the ports will block fluid flow and result in catastrophic damage.**
-  **WARNING: This product should only be installed by a qualified mechanic. Improper installation could result in severe engine damage.**
-  **WARNING: Never secure hoses to moving components.**
-  Use zip-ties and P-clamps to ensure no hoses pinch / rub on the exhaust, engine, suspension components and chassis.
-  Ensure heat exchangers are isolated from vibration.
-  Pre-fill heat exchangers to prevent a dry startup.
-  Lubricate all 37° flares on the adapter fittings before final tightening.




-  Lubricate O-rings on adapter fittings prior to installation to prevent damage and ensure a leak-free seal.




-  Use aluminum tools to avoid damaging fittings.

## INSTALLATION INSTRUCTIONS

1. Thoroughly plan a line configuration based on the tips explained in the section *Before you Begin*.
2. Plan where the FSM thermostat will be mounted, then create the holes for the mounting brackets.

3. Plan where the heat exchanger will be mounted, then create the holes for the mounting brackets. Brackets with vibration isolation rubber mounts are recommended.
  4. Install all four adapter fittings into the FSM thermostat ports.
  5. Torque the adapter fittings installed into the FSM thermostat between 30 to 35 lb-ft (41 to 48 N-m).
  6. Configure and assemble the hydraulic lines for the system.
  7. Pre-fill and install a new oil filter.
  8. Connect and tighten the system lines according to your line size below:
    - a. -6 Lines = 13 to 16 lb-ft (18 to 22 N-m)
    - b. -8 Lines = 23 to 29 lb-ft (31 to 40 N-m)
    - c. -10 Lines = 30 to 35 lb-ft (41 to 48 N-m)
    - d. -12 Lines = 34 to 45 lb-ft (46 to 62 N-m)
    - e. Worm Screw Hose Clamps = 25 in-lb (or tight to feel)
  9. Secure the heat exchanger to the vehicle.
  10. Refill all fluids in the system to their specified levels.
  11. Prime the system to fill the system, lines, and heat exchanger with fluid before starting:
    - a. Perform the priming procedures outlined in the factory service manual for the system, accounting for the added components installed with FSM.
-  It may be necessary to use a fluid preluber to perform the priming procedures.
12. Clean up and prepare for testing the vehicle.
  13. Start the vehicle and inspect for leaks and proper system functionality.
  14. Turn-off the vehicle and inspect the fluid level of the system.
  15. Add fluid if necessary.
  16. Inspect the hydraulic lines and fittings for leaks after the first drive.
  17. Inspect the mounting hardware for loosening after the first drive.

 Installation is complete! Thank you for purchasing an Improved Racing product!