



BOOST COOLER™



Water/Alcohol Injection Systems

Intercooling | Octanebooster | More





QUALITY through technical know-how from the motorsports



Bodo Schürmann
Managing Director

Over the years, Snow Performance has become the world's leading manufacturer in Water-Methanol Injection Systems. Each system has been designed and tested by engineers to ensure reliability and robustness.

Snow Performance pumps are designed with exclusive features to ensure reliability and strength.

No other offers such a lot of specific systems for the different requirements of the particular engines. No other system has been tested, with verifiable excellent results, in the specialized press.

The Boost Cooler System is used in most diverse engines around the world. Among others, also in the professionally motorsports such NHRA Dragster Racing, SCAA, DRM, NTPA Traktor Pulling and so on.

Many successes in motorsports were achieved by using the Boost Cooler Injection Systems.

Among others, two 1/4miles Diesel Dragster world-records, different top-speed world-records for street-legal cars in 2005, 2006, 2008, 2009 and 2013 on VW, BMW, Porsche and Ford.

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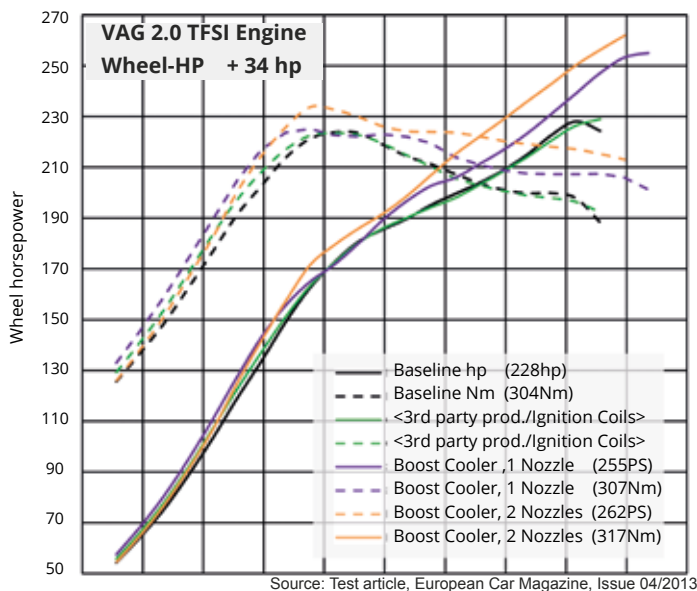


Functionality & Background Knowledge

Waterinjection is not new. During WW2, water injection was extensively used on both Allied and Axis aircraft. In the 1980s, Ferrari and Renault adopted water injection on their F1 turbo engines. Up until a few years ago (when it was banned), most World Rally Championship cars used water injection systems.

MORE POWER

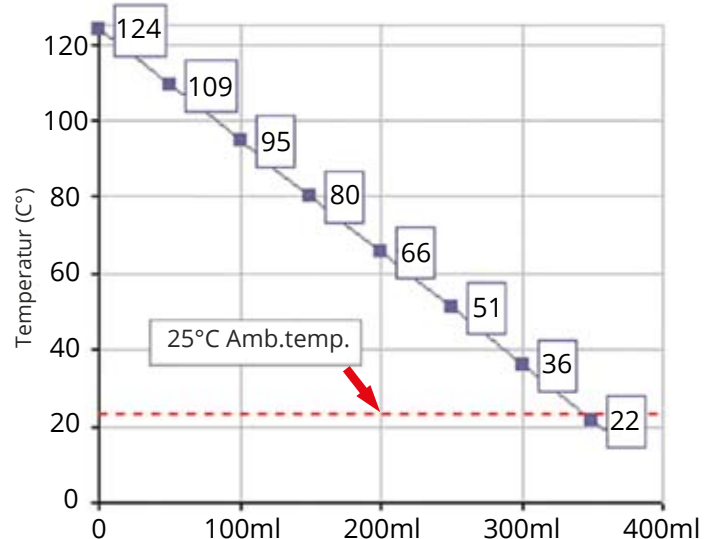
By using the Boost Cooler, you can expect up to approx. 10-20% more power on charged gasolines engines, 15-25% on Turbodiesels and up to 5-15% on naturally aspirated gasoline engines. - Even on pre-tuned cars



OPTIMAL COOLING

The Boost Cooler injection works in three ways: Firstly, when water is injected into the intake system prior to the cylinder head, the small droplets absorb heat from the intake air.

Diagram - Intercooling with Waterinjection



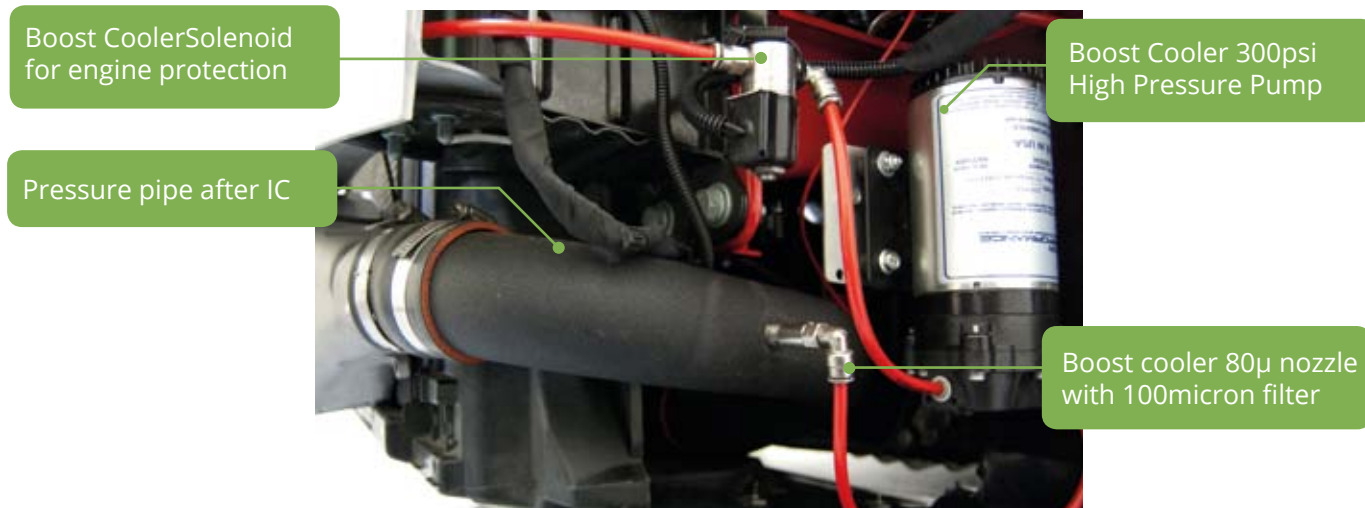
When we apply heat energy to it, its molecules begin to expand: a great deal of heat is absorbed during this process owing to water's specific heat capacity - approximately 4.2kJ/(kg.K). Next, the small droplets of water start to evaporate. And so the intake air charge is cooled still further (up to 60°C and more).

THERMAL RELIEF

Finally, when the remaining water droplets and water vapour reach the combustion chamber, steam is produced. When the water changes from the liquid to gas state, large amount of heat energy is consumed in sustaining the process. The latent heat of evaporation is 2256kJ/kg, approx. six times more than gasoline.

This chemical process acts as an anti-detonant and also keeps the interior of the engine very clean, so preventing the build-up of carbon "hot spots". So water is the perfect liquid for regulating excess heat under certain engine-operating conditions and you'll cool down your EGT, the valves, pistons and turbocharger!

Easy Installation - Large Impact



STEAM EXPANSION

Converting water to steam is a product of the heat generated from the fuel ignition. This lowers the temperature and modifies the characteristics of the expanding gasses in the cylinder during the power stroke. The ignition flame front will travel slower with the Boost Cooler and as such timing can be advance for even more power gains. The slower moving flame front causes the power stroke to be accomplished with a lower peak pressure, because energy is being absorbed from the heat generated by fuel ignition to convert the water in to steam.

Though the power stroke duration is longer, there is more energy because of steam expansion, creating considerably more torque. Which will be an advantage when accelerating.

UNIVERSALLY USABLE

Usable for nearly all engine types!

The Boost Cooler can be used in more than just turbo / compressor engines. Even in naturally aspirated engines, which operate at the thermal threshold, the Boost Cooler increases the power output especially at higher ambient temperatures or increased compaction.

Race Gas Performance

Methanol (alternately Ethanol) with a high octane value added into it both reduces the knocking tendency and improves the cleaning effect within the combustion chamber. It is also used as antifreeze and prevents limescale deposits.

The injection of a water/methanol mixture together with 95-octane gasoline is similar in effect to high-priced 116-octane racing fuel.

REAR WHEEL HORSEPOWER			
	91	91 +SNOW Stage-2	117
3500 RPM	95.4	96.4	98.9
4000 RPM	147.7	146.6	154.2
4500 RPM	221.9	219.4	248.1
5000 RPM	257.2	342.2	353.1
5500 RPM	284.1	407.5	409.3
6000 RPM	297.5	376.7	402.2
6500 RPM	299.8	396.8	409.1
7000 RPM	309.6	377.9	398.6

Comparison Chart:

Left column with 91 oktane gas, middle 91 octane gasoline with Boost Cooler, right column VP Racing Q16 race gas. (Nissan SR20DET 2.0litre turbo engine. Source: DSport Tech Magazine)

Product Benefits



**Guinness-World Record
In 1600m from 0 to 455,7km/h
w/ Boost Cooler Stage 2-System!**

Ford GT "Badd GT" 5,4l V8 Bi-Turbo von Performance Power Racing, 1724PS mit Boost Cooler
Offizieller Guinness-Rekord "Schnellste Stra enauto der der Welt"

BOOST COOLER™

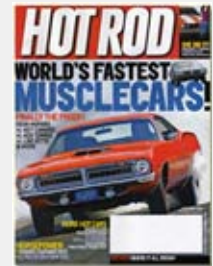
PRESS REVIEWS

- **Systems for all turbo- and supercharged engines available.**
- **Allows more boost and/or timing.** - More power and torque up to approx. 10-20%, even on pre-tuned engines.
- **More power while reducing the thermal stress at the same time.** Perfect for prior chiptuned engines, LPG-Autogas, NOS-Injection, bigger turbo, supercharger conversions and so on.
- **Cooler intake air.** Reduces the intake charge temperature up to 60°C, resulting in a denser, more powerful air/fuel charge.
- **No loss of boost** as with an ordinary intercooler
- **Reduces the specific fuel consumption** due leaner mixture
- **No wear issues:** only carbon free, clean intake, combustion chamber and valves.
- **Individual consultation service and assembly possible**
- **Easy installation** without any bodywork



5.0 Mustang Magazine

"..big hp and torque increases with only a modest cash outlay. We saw a 104Nm increase in torque and 68hp more power!"



Hot Rod Magazine

"...the car picked up more than 50whp and the air/fuel ratio stayed well within the safe 12.00-12.25 range"



Turbo Magazine

"The Boost Cooler costs less than typical intercooler setup. For that small investment, we were able to increase our EVO's power output by nearly 10%!"



Grass. Motorsports

"...we were able to improve the performance of WRX STi by another 35 hp. The Boost Cooler definitely works. - We were impressed!"

► Boost Cooler Stage 1



- The gasoline Stage 1 Boost Cooler™ kit is available for forced induction applications that are either fuel injected or carbureted. Supplied completely.
- Operation is very simple: the system starts injecting when the boost switch reaches the user-adjustable point and it injects a fixed amount of fluid through the nozzle until the switch opens again.

BOOST COOLER STAGE 1 - OUR LOW BUDGET-KIT -

Features / Scope Of Delivery

EPDM-High Pressure Pump	300 PSI
Number of nozzles (as needed)*	2
Variable Injection	✗
Adjustable Pressure Switch	✓
3l Reservoir (**)	✓
Comprehensive installation manual incl. misc. test reports	✓

Footnote: (*) customised for your car as per reported performance data, including integrated 100 micron-fine filter. (**) Since March, 2014 all Boost Cooler tanks are delivered in black.



WE PRODUCE PRESSURE!

The Snow Performance high-pressure pumping systems are exclusively made according to our specifications and are 100% methanol resistant thanks to double gaskets in EPDM.



OPTIMUM NEBULIZATION

The Boost Cooler is unsurpassed in its atomization due to superior nozzle design - The nozzle first spins the fluid supersonically before forcing it through a venturi shaped orifice - no one else comes close!

The key to water injection is how fine the fluid droplets are upon injection. The smaller the droplets, the more total surface area per volume injected which results in more heat reduction = more power. Because of this fact, more cooling can be done with less fluid. More of the intake charge can be filled with cold O2 - not water.

Order Number	Product Description
SP10102	Boost Cooler Stage 1
SP30120U	9.5l Trunk Mounting Kit -Upgrade, instead 3l Tank-

▶ Boost Cooler Stage 2

Snow Performance Stage 2 systems offer an optimum solution for almost any engine. From 3 to 12 cylinders, carburetor, fuel injection, turbo or compressor.



A ready-to-install complete system for the engine compartment. You can select between 9.5 l, 26.5 l or our new modular 19 l reservoir mounting sets to be installed in the boot.

The freely adjustable control unit of the Boost Cooler Stage 2 systems flexibly varies the injection quantity to the boost pressure with a response time of 1.5 msec.

With the variable injection of the Stage 2 Boost Cooler, an optimised injection quantity for the individual engine load conditions is implemented.

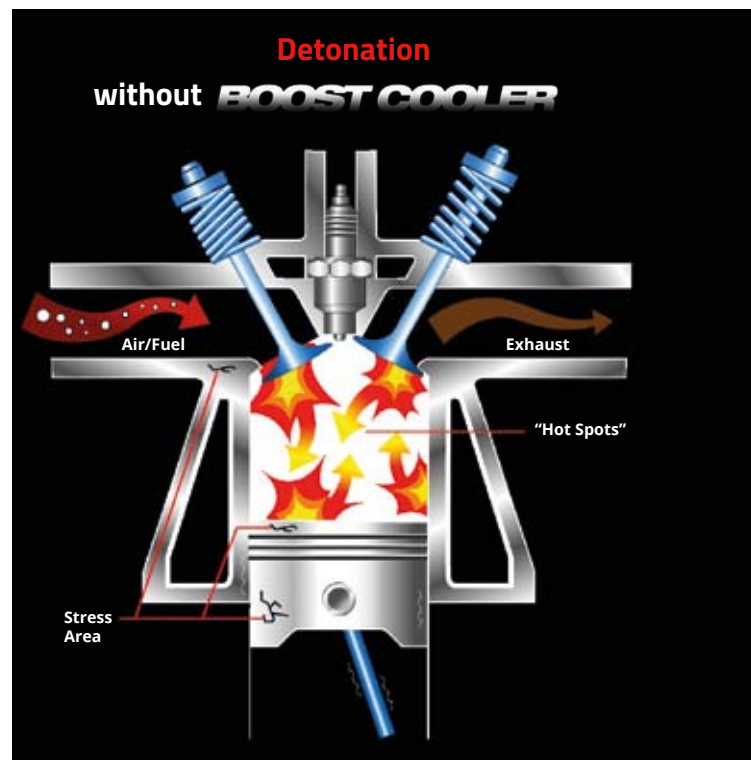
The Boost Cooler control unit can be easily placed in the engine compartment. It is thermally protected against splash water and fitted with an electronic fuse.

BOOST COOLER STAGE 2 WITH VARIABLE INJECTION

Features / Scope Of Delivery

EPDM-High Pressure Pump	300 PSI
Number of nozzles (as needed)*	2
Variable Injection	✓
3l Reservoir (**)	✓
Fluid Level Switch with LED (red)	✓
Comprehensive installation manual incl. misc. test reports	✓

Footnote: (*) customised for your car as per reported performance data, including integrated 100 micron-fine filter. (**) Since March, 2014 all Boost Cooler tanks are delivered in black.



BOOST COOLER TURBO-/SUPERCHARGED

Stage 2 Low Boost:
Art.No.: SP10220

Stage 2 High Boost:
Art.No.: SP10225

▶ Stage 2-Low / High Boost

Easy setup

The VC-20 control unit integrated in the Boost Cooler Stage 2-low boost resp. VC-100uc unit in the High Boost system flexibly varies the injection quantity to the boost pressure.



The settings on control unit can be made within a few seconds without any prior knowledge.

The only thing you need to determine is at what boost pressure the injection is to begin and what the maximum boost pressure is. - The variable injection of the Boost Cooler is performed within these two preset boost pressure points.



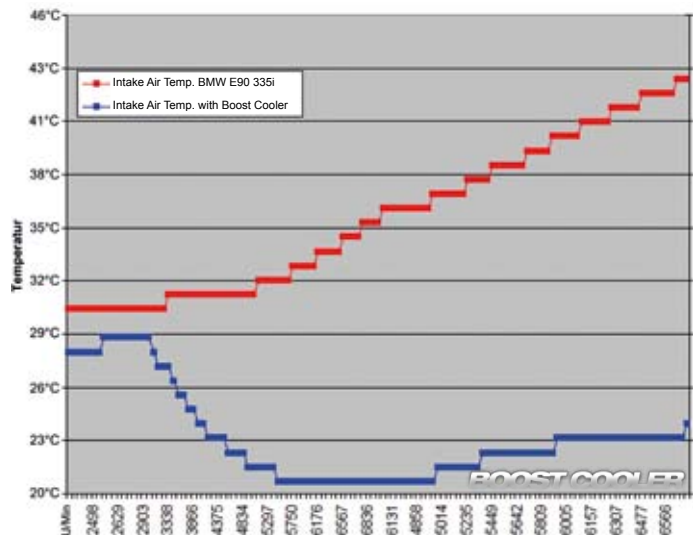
BMW E90 335i with Boost Cooler S2



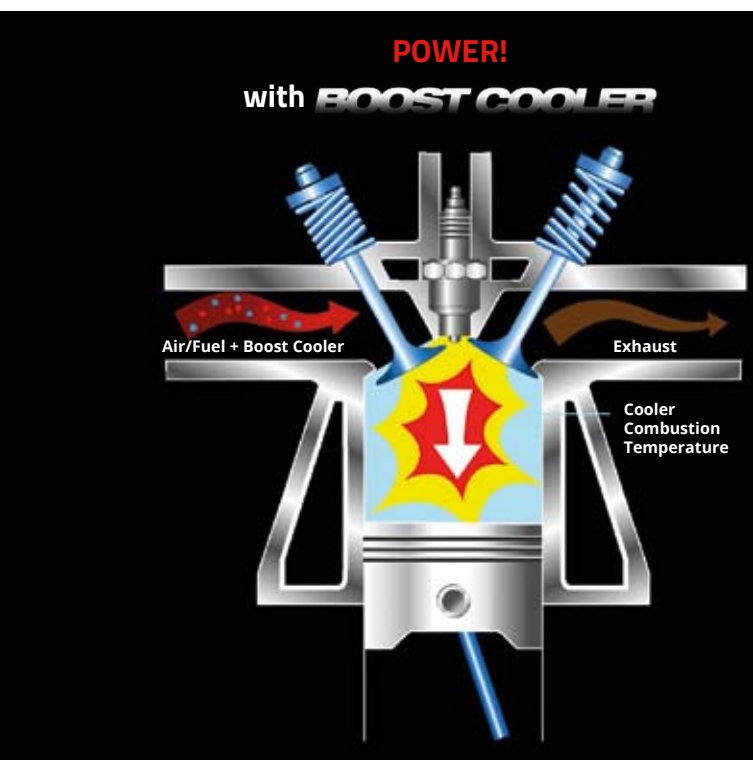
Stage 2 - Low Boost or High Boost System?

The holding pressure of your turbocharger should be at least 1.5 bar. If the boost pressure of the Low Boost version is within the threshold range, we recommend opting for the Low Boost system. The Stage 2 Power-MAX (p.12) handles all boost pressures up to 3.5bar.

Example Diagram: Boost Cooler-Intercooling



BOOST COOLER TURBO-/SUPERCHARGED



Order Number	Product Description
SP10220	Boost Cooler Stage 2 - Low Boost: <1.5bar -
SP10225	Boost Cooler Stage 2 - High Boost: >1.5bar -
SP30120U	9.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30121U	26.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30125U	19l Modular Mounting Kit -Upgrade instead 3l Tank-

Stage 2-MAF (T/FSI)

Art.No.: SP10227

Designed for VW/AUDI 2.0 T FSI engines

The Boost Cooler Stage 2 MAF system is simply connected to the air mass meter of your TFSI.



In contrast to the previously used VAG air mass sensor (MAF), the output signal is based on frequency, rather than voltage.

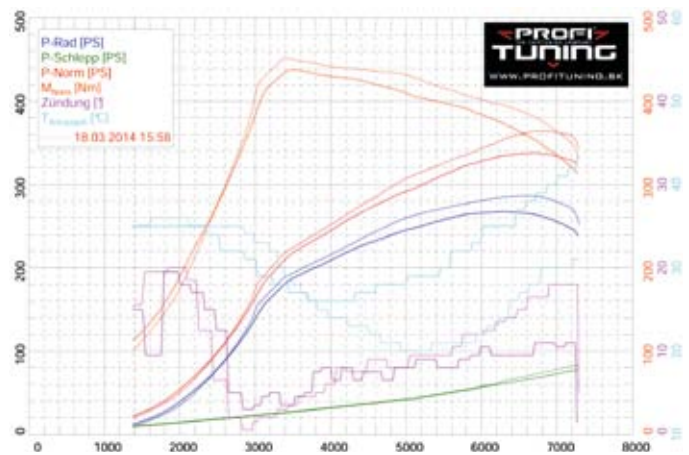


Audi A3 2.0TFSI with Boost Cooler controller within the engine compartment

Ideal for TFSI engines such as:

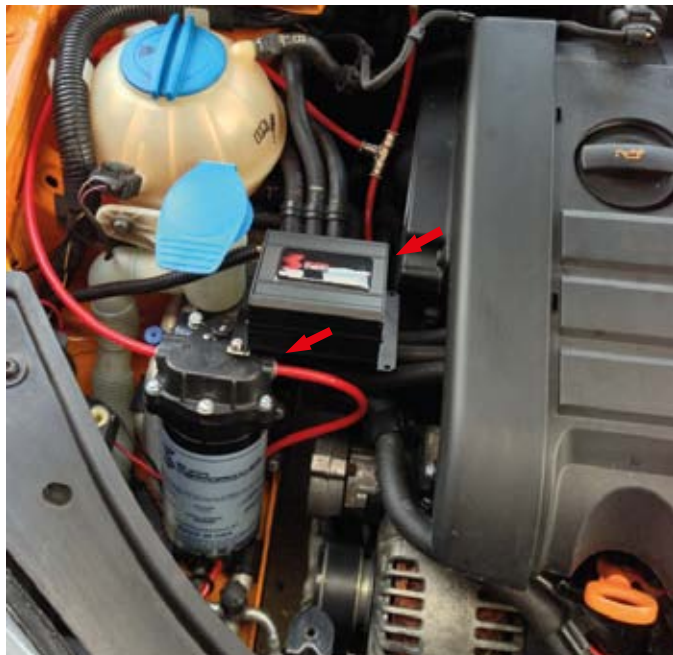
- Audi A3 / S3, A4, A5, A6, TT, TTS
- Seat Leon, Exeo 2.0T FSI
- Skoda Octavia, Superb
- VW Eos, Golf, Jetta, Passat, Tiguan, Touran, Scirocco and so on.

Test bench comparison: Audi S3 2.0 TFSI



Explanation: Audi S3 2.0 TFSI (series 195kW) MAHA-bench testing. Without Boost Cooler 337,5hp, with Boost Cooler 364,2hp

Order Number	Product Description
SP10227	Boost Cooler Stage 2 - VC-MAFU -
SP30120U	9.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30121U	26.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30125U	19l Modular Mounting Kit -Upgrade instead 3l Tank-



VW Golf 5 GTI with Boost Cooler Stage 2

The Boost Cooler can absolutely be flexibly installed in your car. When installed in the trunk, an additional pressure line and a solenoid are necessary for safety reasons.



Mounting Example: Audi TTS - 3l Boost Cooler reservoir with pump in the trunk

▶ Stage 2-VC MAF (1.8T)

Art.No.: SP10226

Our recommendation for all engines with K03/K04 turbocharger or compressor (Eaton etc).

The injection volume is optimised through the 0-5 volt air mass sensor signal to ensure the best results.



The Stage 2-VC MAF system is simply connected to the air mass sensor in your car and uses the MAF-signal from the sensor.

The signal must range within 0-5 volt only.

If high-speed turbo chargers (e.g. KKK K03/K04) or supercharged engines are used, the injection rate via the 0-5 volt MAF signal is more precise than the control through the boost pressure.

The signal cable of the boost cooler controller is simply connected to the signal cable of the air mass sensor / MAF.

Also suited for supercharged engines like:

- Mercedes Benz CLK, SLK
- Lotus Elise SC, KomoTec 250S
- Engines with Roots Supercharger (Eaton, B&M, ...)



Supercharged BMW M5 with Boost Cooler Stage 2 and installed solenoid (left)



VW Golf GTI 1.8T with Boost Cooler S2 (old design)

Ideal for all engines with K03/K04 turbocharger and 0-5 volt LMM/MAF signal voltage:

- VAG 1.8 Turbo (z.b. A3, TT, Golf, Leon)
- Audi S4 B5, RS4, S6, RS6
- Opel Z20LET/LEL/LER/LEH engines (e.g. Astra G, Zafira, Speedster)



Supercharged Jaguar XJR V8 with Boost Cooler Stage 2-MAF and Dual Nozzle



Mini Cooper S JCW with Boost Cooler Stage 2

Order Number	Product Description
SP10226	Boost Cooler Stage 2 - VC-MAFU -
SP30120U	9.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30121U	26.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30125U	19l Modular Mounting Kit -Upgrade instead 3l Tank-



Boost Cooler S2E POWER-MAX™ Art.No.: SP10250

The latest development from Snow Performance!

Complete kit with freely programmable 52mm OLED-gauge and optionally Dual Stage Technology.



The all new Snow Performance Stage 2 Boost Cooler water-methanol injection system comes fully revamped for all boosted (turbo- and supercharged) vehicles and uses a progressive 52mm-gauge style controller that proportionally injects more or less according to boost pressure.

Start and full points are adjustable for engagement and delivery curve to match what the engine requires. Proportionally injecting according to boost pressure gives an accurate delivery of water-methanol and allows cooling and performance improvements over a wide range for improved drivability.

Dual Stage Technology (DST)

The Stage 2 has the ability to progressively command 2 Hyper-Sonic™ Nozzles independently of one another. This sophisticated dual stage injection management yields the highest increases in HP and cooling along all stages of the engine allowing you to greatly increase the boost & timing of your vehicle safely.



(* For positive displacement superchargers (Eaton, Twin Screw) and small fast spooling turbos see (e.g. K03/K04 turbochargers) use the Boost Cooler Stage 2 MAF or our Stage 3 kits for best performance.



Opel Corsa Group N DRM with Boost Cooler System by Performance GmbH

TURBO-/SUPERCHARGED

Features:

- Complete with our industry leading 300 PSI UHO pump and Hypersonic Nozzles™
- Boost referenced injection control
For use with all centrifugal superchargers (ProCharger, Vortech) and large turbos (*)
- Dual Stage Technology
2 nozzle control independently of one another (Optional, Upgrade Art.No.: SP10350 required)
- 52mm gauge style progressive water-methanol controller
- Dual tone 7 color OLED screen

Stage 2 POWER-MAX™ Europe Edition

Die Europe-Edition (display & programming in BAR) is exclusively available only by Snow Performance Europe and its European authorized dealers.



**BOOST COOLER STAGE 2E POWER MAX
52MM GAUGE DISPLAY**

Displays :

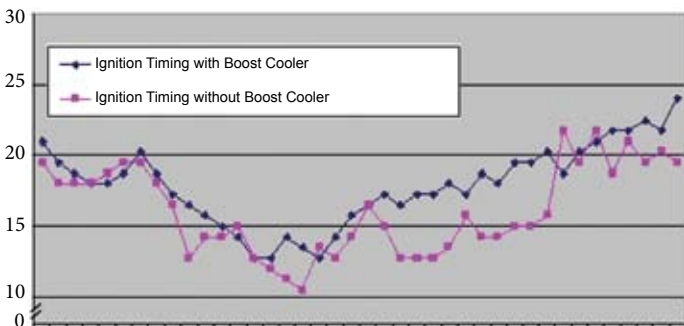
- Boost pressure (S2E / EURO-Edition in BAR)
- Boost Cooler percentage of injection
- Low level of the fluid reservoir
- Secondary nozzle activation (Dual Stage Technology, optionally as upgrade)
- 2 specific fault modes (Clogged line, broken line)



NASCAR engine (<1200 hp) with Boost Cooler



Mounting Example: 3l tank (separate brake cooling) and 9.5l trunk mounting kit with pump



Explanation: Car Porsche 996 Turbo, test run in 3rd gear. Without Boost Cooler, you can see very clearly an interruption of ignition by the Motronic. If a Boost Cooler system is used, there is almost no interruption of ignition, similar to racing fuel. The early and knock-free, stable ignition timing results in an increase in performance and a smooth power curve.

Order Number	Product Description
SP10250	Boost Cooler Stage 2E - POWER-MAX -
SP10350	Dual Stage Tech. Upgrade (2-Nozzle-Control)
SP30120U	9.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30121U	26.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30125U	19l Modular Mounting Kit -Upgrade instead 3l Tank-



► Boost Cooler Stage 3 EFI/DI DST

Award-winning system - our top model for your car!

The 2D controller varies the injection quantity through the boost pressure and fuel injection quantity.



The most efficient system on the market

The Boost Cooler Stage 3 systems are unbeatable in terms of precision and setting options! The Stage 3 creates a 2D injection map based off boost and fuel injection quantity to deliver the most accurate and tunable water-meth delivery on the market.

Boost Cooler Stage 3 - tailored for your needs

The Stage 3 EFI DST system has been designed for any EFI (electronic fuel injected) and forced induction (turbo- and supercharged) engine. The Stage 3 EFI creates a 2D injection map based of boost and fuel injector pulse width.

The Stage 3 DI DST has been designed for any Direct Injected engine (like VAG T/FSI) and creates a 2D injection map based off boost and fuel pressure sensor voltage.

Complete Kit

A ready-to-install complete system for the engine compartment. You can select between 9.5 l, 26.5 l or our new modular 19 l reservoir mounting sets to be installed in the trunk.

BOOST COOLER STAGE 3 VARIABLE 2D-INJECTION

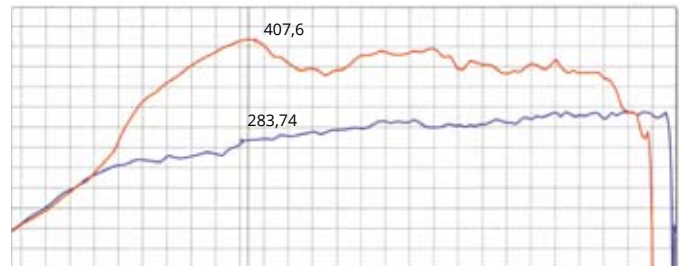
Features / Scope Of Delivery

EPDM-High Pressure Pump	300 PSI
Dual Stage Technology (DST)	✓
No. of Nozzles (Primary + Power)	2
Variable Injection, 2D Mapping	✓
3l Reservoir (**)	✓
Fluid Level Switch with LED (red)	✓
Terminated weather tight OEM harnessed wiring connections	✓

Footnote: (*) customised for your car as per reported performance data, including integrated 100 micron-fine filter. (**) Since 2014, all Boost Cooler reservoirs are delivered in black.

Dual Stage Technology (DST)

The Stage 2 has the ability to progressively command 2 Hyper-Sonic™ Nozzles independently of one another. This sophisticated dual stage injection management yields the highest increases in HP and cooling along all stages of the engine allowing you to greatly increase the boost & timing of your vehicle safely. The DST-Upgrade is already included in the Stage 3 systems.



"The blue power curve without Boost Cooler, the red power curve with Boost Cooler". We managed to increase the LD significantly after the Boost Cooler installation.
- The result was a massive boost of power".

Source: DSPORT Performance + Tech Magazine.
Test vehicle: Nissan S15 SR20DET.

The boost pressure with the Boost Cooler has been increased from 1.1 bar to 1.65 bar due its cooling effect and octane boosting.



The cockpit display indicates the current boost pressure (PSI or BAR), fuel injection valve timing (Stage 3 EFI), resp. fuel pressure sensor output (Stage 3 DI) and the current Boost Cooler injection volume.

Easy Installation

The Boost Cooler Stage 3 EFI / DI DST systems are the most precise systems on the market, absolutely flexible settings, easy installation.



You can easily make the required settings using 2 push buttons on the control unit.

Only the electric timing of the engine fuel injector (Stage 3 EFI) or fuel pressure sensor (Stage 3 DI) and boost pressure must be connected. Then set a few key data on the control unit and this will automatically create a 2D map for the injection control. This results in precise amounts of water-methanol exactly when your vehicle needs it.

Boost Cooler Stage 3 DI DST - Ideal for any Direct Injected Engines like :

- Audi T/FSI: A1, A2, A3 / S3, A4, A5, A6, A8, TT, TTS
- Ford EcuBoost (e.g. Focus ST, RS, Lincoln MKC)
- BMW Turbo: 3 E90 335i, 3 F80, 4 F82, 5 F10
- Peugeot / Citroën THP Engines
- Seat TFSI: Leon, Exeo; Skoda Fabia, Octavia.
- VW TFSI/TSI: Eos, Golf 5+, Jetta 3+, Passat, Polo 6R, Tiguan 5N, Scirocco 137/138, T5 and so on.



Mounting example: Stage 3 Controller between centre console and passenger seat (BMW E90)

Boost Cooler Stage 3 EFI - Ideal for any traditional manifold injection engines (electronic fuel inj.):

- AUDI Turbo (e.g. Audi A3 8L/8P, A4 B5/B6/B7, A6 C5, TT 8J/8N)
- Opel Astra H (z.T. auch J), Insignia, Vectra C, Zafira
- Porsche 911 Turbo (964, 993, 996), 924/944 Turbo
- VW Turbo (Bora 1J, Golf 4, Jetta 3, Passat 3B)

Order Number	Product Description
SP10315	Boost Cooler Stage 3 EFI - Electronic Fuel Injected -
SP10317	Boost Cooler Stage 3 DI - Direct Injected Engines -
SP30120U	9.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30121U	26.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30125U	19l Modular Mounting Kit -Upgrade instead 3l Tank-

Product Benefits



Porsche 9ff 9f-V400, 800hp, 388km/h with Boost Cooler Waterinjection

BOOST COOLER NATURALLY ASPIRATED (GASOLINE)

- **Customised systems** available for nearly every gasoline engine.
- **Power increase possible of up to 10-15%.** Earlier ignition timing without knocking combustion.
- **More power and torque** with simultaneous reduction of thermal load in already modified engines, such as chip tuning, NOS, or LPG autogas.
- **Effective cooling of the intake air,** compensation of power losses at higher outdoor temperatures
- **Reduction of specific fuel consumption**
- In conjunction with methanol, it can be fuelled with lower octane gasoline wherever necessary.
- **Deposit free combustion chamber** and air intake, without formation of carbon.
- **Individual consulting** and configuration are possible.



BOOST COOLER™

PRESS REVIEWS



Nissan Sport Magazine

"...we were able to gain 10% more power on the Nissan without any knocking problems. An excellent result!"

Drag Racer Magazine

"a perfect add-on for NOS-powered engines. Your nitrous setup become much more efficient, while ultimately, producing much more power!"



▶ Boost Cooler Stage 2 MAF N/A

Art.No.: SP10224



The Stage 2-VC MAF controller is simply connected to the air mass metre of your vehicle to detect a corresponding load signal of the engine. Similarly, the operation through a throttle valve potentiometer, electronic accelerator pedal position, etc. is also possible. The signal voltage must range within 0-5 volts only.

The scope of supply is identical to that of Stage 2 MAF (page 11). If necessary, the control unit can be switched to the boost pressure dependent water injection.

Naturally aspirated engines must be fitted with a solenoid valve (item no. SP30104, page 30). It is already included in the scope of delivery when ordering a trunk

Order Number	Product Description
SP10224	Boost Cooler Stage 2 N/A
SP30120U	9.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30125U	19l Modular Mounting Kit -Upgrade instead 3l Tank-

▶ Boost Cooler Stage 3 EFI DST

Art.No.: SP10316



The Stage 3 LCD EFI system is conveniently adjustable and the installation is very easy. The electrical timing of a fuel injector on your engine must be reduced (no direct injection). The fuel and Boost Cooler injection volume is shown on the display.

The delivery and functionality scope is identical to that of the Stage 3 EFI DST (page 14/15). If necessary, the control unit can also handle the boost pressure.

Naturally aspirated engines must be fitted with a solenoid valve (item no. SP30104, page 30). It is already included in the scope of delivery when ordering a trunk mounting kit.

Order Number	Product Description
SP10316	Boost Cooler Stage 3 EFI
SP30120U	9.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30125U	19l Modular Mounting Kit -Upgrade instead 3l Tank-

Product Benefits



Diesel Pro Stock World Record
 Quarter mile: 7.46sec @ 299.3km/h
 with Boost Cooler Diesel System!

2002 Chevrolet S-10, Borg Warner 8374 Bi-Turbo, ca. 1800PS mit Boost Cooler

BOOST COOLER™

PRESS REVIEWS

- **Systems for virtually any turbo diesel** (TDI/TDCi/TDS/etc.) of approx. 80 - 2,000 hp.
- **More power and torque** possible of up to 10-25%
- **Reduction of the thermal loading** in already modified turbo diesel, such as chip tuning.
- **Reduction of exhaust gas temperature (EGT)** of up to 120° C - ideal for tuned engines or trucks.
- **No charging pressure loss** as in conventional intercooler, highly efficient! Additional cooling of the charge air of up to 60° C possible.
- **Reduction of specific fuel consumption** by up to 10-15%
- **Reduction of nitrogen oxide formation & carbon emission** with full load acceptance, ideal add-on to DPF.
- **Deposit free combustion chamber** and air intake, without formation of carbon.
- **Individual consulting** and configuration are possible.



Diesel Power

"... As we expected, we saw an increase in power and torque without any restrictions of everyday use."



Automagazin24

"... The chip tuned Audi A6 2.5TDI accelerated from 80-140 km/h with the Boost Cooler Stage 2 TD in a whole 2.8 sec faster (...) a worthwhile investment!"



Trucks Magazin

"...even prior tuned, the Ford Turbodiesel produced a 50,4 horsepower gain! More gains would have been achieved with an installation on a stock truck"



Diesel World

"... With the Boost Cooler Stage 3 MPG-MAX in a VW 2.0 TDI engine, we gained a power increase of 35-40 hp, while reducing the specific fuel consumption."

▶ Boost Cooler Stage 1 TD



WE PRODUCE PRESSURE!

The Snow Performance high-pressure pumping systems are exclusively made according to our specifications and are 100% methanol resistant thanks to double gaskets in EPDM.



OPTIMUM NEBULIZATION

The Boost Cooler is unsurpassed in its atomization due to superior nozzle design - The nozzle first spins the fluid supersonically before forcing it through a venturi shaped orifice - no one else comes close!

The key to water injection is how fine the fluid droplets are upon injection. The smaller the droplets, the more total surface area per volume injected which results in more heat reduction = more power. Because of this fact, more cooling can be done with less fluid. More of the intake charge can be filled with cold O2 - not water.

- The Stage 1 Boost Cooler™ Diesel kit is available for any forced induction Turbodiesel engine. Supplied completely.
- Operation is very simple: the system starts injecting when the boost switch reaches the user-adjustable point and it injects a fixed amount of fluid through the nozzle until the switch opens again.

BOOST COOLER STAGE 1 TD - OUR LOW BUDGET-KIT -

Features / Scope Of Delivery

EPDM-High Pressure Pump	300 PSI
Number of nozzles (as needed)*	2
Variable Injection	✗
Adjustable Pressure Switch	✓
3l Reservoir (**)	✓
Comprehensive installation manual incl. misc. test reports	✓

Footnote: (*) customised for your car as per reported performance data, including integrated 100 micron-fine filter. (**) Since 2014, all Boost Cooler reservoirs are delivered in black.

Order Number	Product Description
SP10103	Boost Cooler Stage 1 TD
SP30120U	9.5l Trunk Mounting Kit -Upgrade instead 3l Tank-

► Boost Cooler Stage 2 Turbodiesel

Snow Performance Stage 2 systems offer an optimum solution for almost any turbodiesel engine. From the 3 cylinder Smart CDI up to 12 cylinder truck, CHP or marine engine.



A ready-to-install complete system for the engine compartment. You can select between 9.5 l, the modular 19 l or 26.5 l mounting sets to be installed in the boot.

The freely adjustable control unit of the Boost Cooler Stage 2 systems flexibly varies the injection quantity to the load pressure with a response time of 1.5 msec.

With the variable injection of the Stage 2 Boost Cooler, an optimised injection quantity for the individual engine load conditions is implemented. Basically, the use of the electronic accelerator pedal position signal is also possible.

The Boost Cooler control unit can be easily placed in the engine compartment. It is thermally protected against splash water and fitted with an electronic fuse.

Due to the higher consumption of liquid in powerful turbodiesel cars, we recommend at least 9.5 l, the modular 19 l or 26.5 l trunk mounting kit as needed.

BOOST COOLER STAGE 2 TD WITH VARIABLE INJECTION

Features / Scope Of Delivery

EPDM-High Pressure Pump	300 PSI
Number of nozzles (as needed)*	2
Variable Injection (via boost)	✓
3l Reservoir (**)	✓
Fluid Level Switch with LED (red)	✓
Comprehensive installation manual incl. misc. test reports	✓

Footnote: (*) customised for your car as per reported performance data, including integrated 100 micron-fine filter. (**) Since 2014, all Boost Cooler tanks are delivered in black.



Explanation: The water or water/alcohol mixture is sprayed into the combustion chamber. In the evaporation process of the previously injected liquid, diesel fuel is "breakage" and a very fine diesel mist is generated. This results in a power increase because the diesel burns more completely, rather than discharged partially burning or unburned as exhaust gas. When changing the aggregate states of water in steam, its volume increases greatly. The steam expansion also increases the engine torque.

Stage 2 TD Low Boost:
Art.No.: SP10221

Stage 2 TD High Boost:
Art.No.: SP10228

▶ Stage 2 TD Low / High Boost

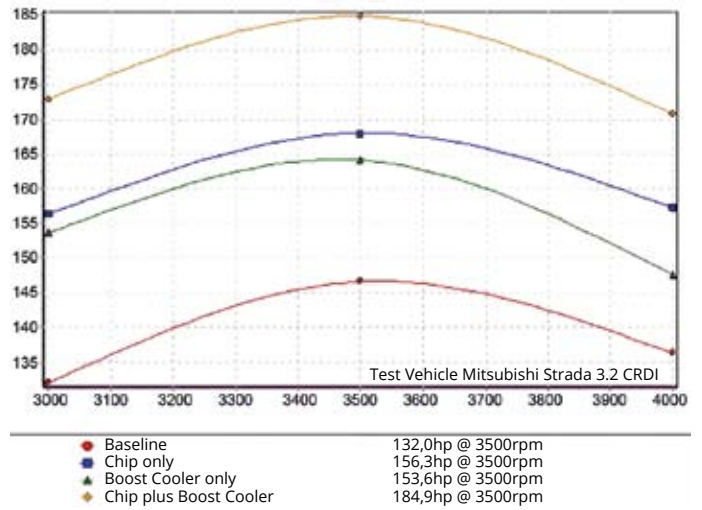
Boost referenced variable injection

The control unit integrated in the Boost Cooler Stage 2-low boost system flexibly varies the injection quantity to the boost pressure.



Audi A3 TDI with Boost Cooler Stage 2 TD Low Boost

Test bench comparison: Baseline - Boost Cooler - Chip



Stage 2 - Low Boost or High Boost System?

The holding pressure of your turbocharger should be at least 1.5 bar. If the boost pressure of the Low Boost version is within the threshold range, we recommend opting for the Low Boost system. The Stage 2 TD Power-MAX (p.22) handles all boost pressures up to 3.5bar.

Easy Setup

The settings on the Stage 2 TD Low-Boost (VC-20) and the High-Boost (VC-100uC)-control unit can be made within a few seconds without any prior knowledge.

The only thing you need to determine is at what boost pressure the injection is to begin and what the maximum boost pressure is. - The variable injection of the Boost Cooler is performed within these two preset boost pressure points.



Mounting example: BMW E92 - 3l Tank incl. pump in the trunk (not visible below the reservoir).



VW Golf 1.9 TDI Bio-Diesel Rallye car with Boost Cooler Stage 2 TD-Waterinjection. Pikes Peak International Hill Climb-Record holder in its class.

Order Number	Product Description
SP10221	Boost Cooler Stage 2 TD - Low Boost: <1.5bar -
SP10228	Boost Cooler Stage 2 TD - High Boost: >1.5bar -
SP30120U	9.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30121U	26.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30125U	19l Modular Mounting Kit -Upgrade instead 3l Tank-

▶ Boost Cooler S2E TD POWER-MAX™

Art.No.: SP10251

The latest development from Snow Performance!

Complete kit with freely programmable 52mm OLED-gauge and optionally Dual Stage Technology.



The all new Snow Performance Stage 2TD Boost Cooler water-methanol injection system comes fully revamped for all Turbodiesel vehicles and uses a progressive 52mm-

gauge style controller that proportionally injects more or less according to boost pressure.

Features:

- Complete with our industry leading 300 PSI UHO pump and Hypersonic Nozzles™
- Boost referenced injection control
For use with all Turbodiesel-engines
- Dual Stage Technology
2 nozzle control independently of one another
(Optional, Upgrade Art.No.: SP10350 required)
- 52mm gauge style progressive water-methanol controller
- Dual tone 7 color OLED screen

Easy Setup - Great Performance

Start and full points are adjustable for engagement and delivery curve to match what the engine requires. Proportionally injecting according to boost pressure gives an accurate delivery of water-alcohol and allows cooling and performance improvements over a wide range for improved drivability.

Dual Stage Technology (DST)

The Stage 2 has the ability to progressively command 2 Hyper-Sonic™ Nozzles independently of one another. This sophisticated dual stage injection management yields the highest increases in HP and cooling along all stages of the engine. The net effect is smooth power in all engine load states with no combustion quench resulting in a true turn-on-and-forget system



**BOOST COOLER STAGE 2E TD POWER MAX
52MM COCKPIT-DISPLAY**

Displays :

- Boost pressure (S2E / EURO-Edition in BAR)
- Boost Cooler percentage of injection
- Low level of the fluid reservoir
- Secondary nozzle activation
(Dual Stage Technology, optionally as upgrade)
- 2 specific fault modes
(Clogged line, broken line)



Stage 2 TD POWER-MAX™ Europe Edition

Die Europe-Edition (display & programming in BAR) is exclusively available only by Snow Performance Europe and its European authorized dealers.

Order Number	Product Description
SP10251	Boost Cooler Stage 2E TD - POWER-MAX™ -
SP10350	Dual Stage Tech. Upgrade (2-Nozzle-Control)
SP30120U	9.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30121U	26.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30125U	19l Modular Mounting Kit -Upgrade instead 3l Tank-



Boost Cooler Stage 3 TD LCD

Art.No.: SP10320

Award-winning system - our top model for your turbo diesel!

The 2D-Controller will vary the injection volume of the boost pressure and the exhaust gas temperature.

The Boost Cooler Stage 3 TD kit is extremely precise, flexible and easily adjustable.



If the exhaust gas temperature increases despite a constant boost pressure, as is the case with trailer operation, then the injection volume adjusts automatically to reduce the exhaust gas temperature of the engine.

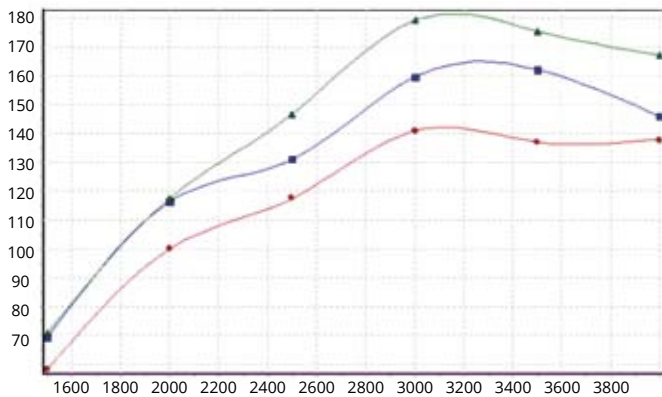


You can easily make the required settings using 2 push buttons on the Stage 3 TD control unit.



For an optimum injection volume calculation, the Stage 3 TD evaluates the boost pressure and exhaust gas temperature. The EGT probe is included in the delivery package of your Stage 3 TD system.

Test bench comparison using the example Ford Focus 2.0 TDCi



- Baseline 140,9hp @ 3000rpm
- Chip only 159,6hp @ 3000rpm
- ▲ Chip plus Boost Cooler 179,2hp @ 3000rpm



The cockpit display indicates the boost pressure (PSI or BAR), the exhaust gas temperature (can be switched to °C / °F) and the current Boost Cooler injection volume (in %). There are also several display modes.



Stage 3 TD-Controller discreetly in the instrument panel compartment (BMW E82 123d)

Order Number	Product Description
SP10320	Boost Cooler Stage 3 TD - >0.6 bar boost pressure -
SP30120U	9.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30121U	26.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30125U	19l Modular Mounting Kit -Upgrade instead 3l Tank-



▶ Boost Cooler Stage 3 TD MPG-MAX

The further development of our successful Stage 3 Diesel System is the only system on the market, which positively impacts the fuel consumption and emissions in all load ranges.



Stage 3 MPG-MAX with 26.5l Trunk Mounting Kit

The up-to-date digital 2D control unit was designed to reduce the specific fuel consumption in almost all load ranges.

The MPG-MAX control unit variably controls a small boost cooler nozzle through the entire power curve. This increases the combustion efficiency which in turn results in more power, without the increased fuel consumption.

The fuel economy is improved due to the better combustion efficiency. Normally, the fuel economy ranges within 5-15 %, depending on the vehicle, driving style and operation (e.g. tractor unit).

Dual Stage Technology (DST)

The Stage 3 TD MPG-MAX system has a 2nd output to control another, larger nozzle with a separate mapping ("Power Mode"). The activation point of the second nozzle can be adjusted individually to achieve the best performance results.

The net effect is smooth power in all engine load states with no combustion quench resulting in a true turn-on-and-forget system.



TURBODIESEL



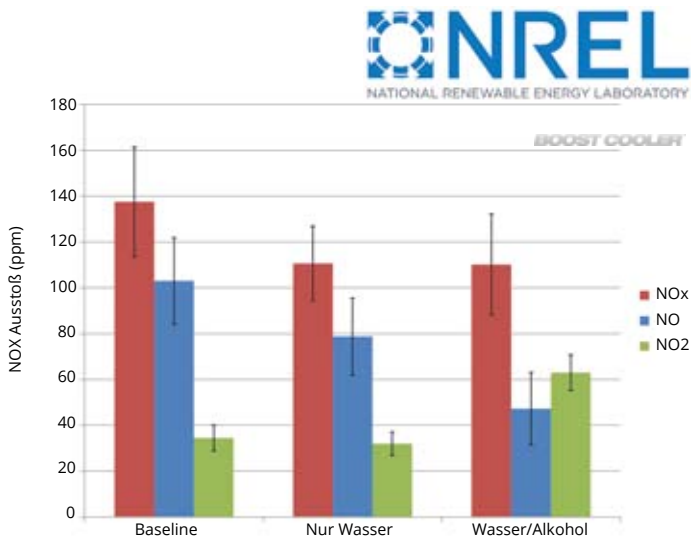
Art.No.: SP10321

Boost Cooler Stage 3 MPG-MAX - tested by the U.S. government and confirmed to be effective!

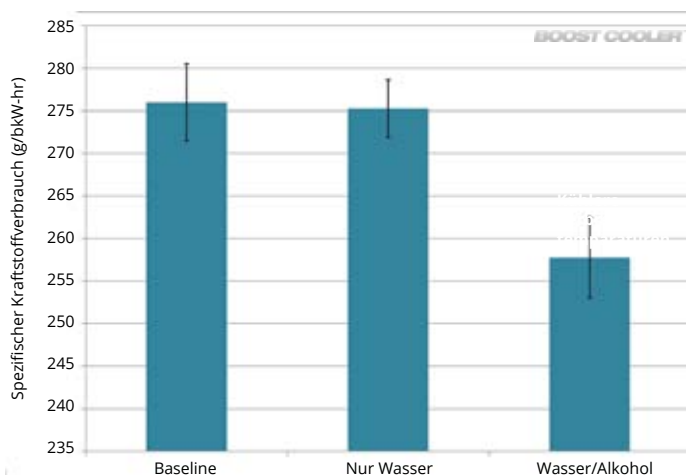


In cooperation with the U.S. Department of Energy, the Boost Cooler Stage 3 MPG-MAX was tested for fuel economy and emissions.

We tested the Boost Cooler in the renowned National Renewable Energy Laboratory; the test engine was a 2012 winner at Cummins ISL345 as a turbo diesel engine with particulate filter (DPF).



he NREL test result clearly shows that with an activated Boost Cooler system, the NOx emissions are significantly reduced. The DPF regeneration cycles become longer as a positive side effect due to lower emissions.



The diagram shows the specific fuel consumption in a direct comparison. While with pure water injection only a small fuel economy was observed, the effect of a water / alcohol mixture (50% methanol in the test) is way more clear.



As in Stage 3 TD, the required settings can be easily made using 2 push buttons on the control unit. The MPG-MAX cockpit display indicates the boost pressure (PSI or BAR), the exhaust gas temperature (can be switched to °C / °F) and the current Boost Cooler injection volume (in %)



VW Jetta 2.0 TDI with Boost Cooler Stage 3 MPG-MAX. Without Boost Cooler 5.73 l/100km, with enabled Boost Cooler, average fuel consumption dropped to 4.52 l/100km. The performance increase was 35 hp. Read the review in Diesel World magazine Vol.6/No.5.

The Boost Cooler Stage 3 MPG-MAX is a complete turnkey solution, including all necessary components and sensors. A 3-litre tank is included in the Basic System delivery package. - Due to the higher fluid consumption, we recommend at least the 9.5 l trunk mounting kit as an upgrade to the MPG-MAX system. For longer range or heavy-duty vehicles, marine, etc., we recommend the modular 19 l or the 26.5 l upgrade.

Order Number	Product Description
SP10321	Boost Cooler Stage 3 TD MPG-MAX
SP30120U	9.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30121U	26.5l Trunk Mounting Kit -Upgrade instead 3l Tank-
SP30125U	19l Modular Mounting Kit -Upgrade instead 3l Tank-

System monitoring and protection system

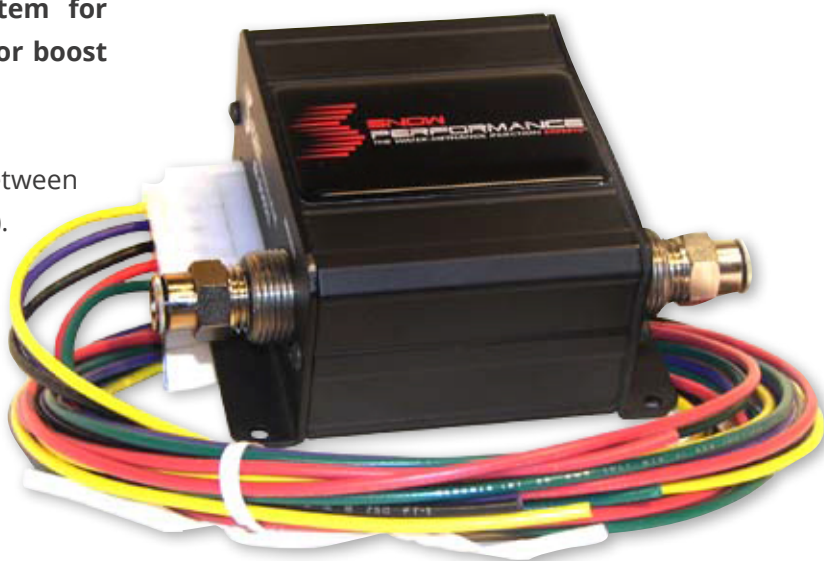
Snow Performance Safe Injection™ system for system monitoring and optional ignition or boost pressure reduction!

The Safe Injection™ controller is installed between the pump outlet and the atomizer nozzle(s). When the flow rate drops below a preset value, the controller sends a 12 volt control signal.

Moreover, the Safe Injection activation is indicated by a warning LED in the vehicle interior

The monitoring of the flow rate involves all possibilities of disabled injection:

- Empty liquid container
- Blocked line or nozzle
- Defect in the pump or controller etc.
- Flaked pressure line ("overflow detection")



The 12-volt control signal of the SafeInjection™ can be used for the following applications:

- Triggering an ignition control unit / ECU to reduce the ignition (e.g. of MSD, J&S Safeguard) or to switch to a different mapping (e.g. HKS F-CON V Pro)
- As a trigger signal for lowering the boost pressure with a retrofitted Boost Controller ("electronic boost controller")
- To trigger a solenoid valve, which reduces the boost pressure on a turbocharged vehicle with wastegate (see art.no. SP20102)

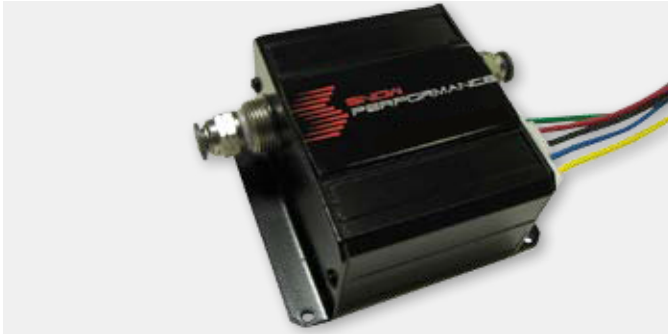
The possibilities are almost limitless! For example, you can make a very aggressive engine tuning on the Boost Cooler and ensure the optimum safety of your engine.



Einbaubeispiel: SafeInjection- und Stage 2 Controller im Motorraum (Mazda 3 MPS)

SafelInjection™ V2 Controller

Art.No.: SP20101



Boost pressure / ignition reduction system for the Boost Cooler water / methanol injection!

Including warning LED and flashing materials.

- Possibility of a safe and simultaneously extreme tuning
- Automatic reduction of the boost pressure or the ignition, when the Boost Cooler injection volume is insufficient
- Variable alarm activation point
- Optional solenoid valves for opening a waste gate or bypass valve to reduce the boost pressure
- Fast response time enables real-time flow rate display (see item no. SP20106)



Mounting Example
Seat Leon Cupra 1.8T

Mounting Example
Mazda 3 (SI-Solenoid)

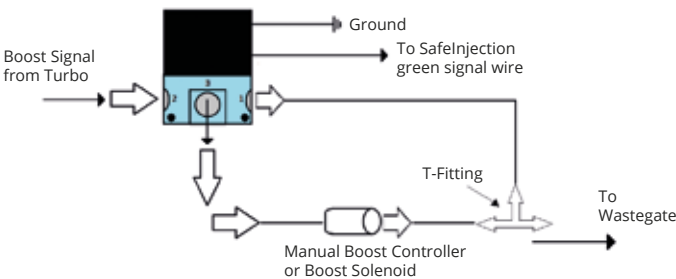
Order Number	Product Description
SP20101	SafelInjection Controller

SafelInjection Solenoid



Art.No.: SP20102

Solenoid such that boost is reduced in a wastegated turbo set-up incl. fittings and pressure tubing.



Order Number	Product Description
SP20102	SafelInjection Solenoid

SafelInjection Gauge



Art.No.: SP20106

Our new 52mm gauge indicates actual flow rate for easy tuning and peace of mind.

- Displays the flow rate in ml/min. in real time.
- Display easily switched from Blue-to Red face and backlight to match existing dash gauges.
- Displays both digital and analog gauge sweep.
- Makes tuning with water-methanol injection easy by knowing actual injection.

Order Number	Product Description
SP20106	Safeinjection Gauge

▶ 9.5l Trunk Mounting Kit

Art.No.: SP30120



With this complete kit, you get everything you need for a professional installation in the trunk of the vehicle!

Ready-to-install kit consisting of:

- 9.5l Reservoir (black) with 1/4" Connection, inkl. Aluminium-Befestigungen (Art.No.: SP30122)
- Solenoid Upgrade (Art.No.: SP30104)
- 6m 1/4" FEP-Pressure Line (Art.No.: SP30209)
- 3m Corrugated Tube (Art.No.: SP30210)
- Fluid Level Switch incl. LED (Art.No.: SP30101)



Mounting Example
Audi A6
Spare Wheel Recess



Mounting Example
Nissan 370Z
Driver's side trunk compartment

Order Number	Product Description
SP30120	9.5l Trunk Mounting Kit
SP30122	9.5l Reservoir separately

▶ 26.5l Trunk Mounting Kit

Art.No.: SP30121



Complete kit with a large 26.5 l tank - ideal for long distance, rally and heavy-duty vehicles.

Ready-to-install kit consisting of:

- 26.5 l tank (black) with a 1/4" connection, including aluminium fasteners (Art.No.: SP30124)
- Solenoid Upgrade (Art.No.: SP30104)
- 6m 1/4" FEP-Pressure Line (#SP30209)
- 3m Corrugated Tube (#SP30210)



Mounting Example
VW Golf 4
Car Trunk



Mounting Example
Suzuki Jimny (n-tv Motor)
Load Floor

Compact dimensions of: 38 x 43 x 23cm (l/h/w) allow installation in almost any car trunk!

Order Number	Product Description
SP30121	26.5l Trunk Mounting Kit
SP30124	26.5l Reservoir separately

▶ 19l Modular Trunk Mounting Kit

Art.No.: SP30125



Our new 19l Modular Fuel Cell leaves nothing to be desired! A truly plug & play race ready fuel cell assembly at a special rate :

- 19l reservoir (black) with 3/8" NPT outlet, including 2 Aluminum fuel cell straps
- 3/8" NPT Outlet Fitting for use with our 1/4" Bost Cooler tubing
- Required hardware to assemble Pump/Solenoid to Fuel Cell and also to mount the fuel cell inside trunk.
- Solenoid Upgrade (Art.No.: SP30104)
- 6m 1/4" FEP-Pressure Tube (Art.No.: SP30209)
- 3m Corrugated Tube (Art.No.: SP30210)

Features:

- Modular 19 litre-Reservoir Fuel Cell Style with large filling opening for easy fill up.
- Compact dimensions (32 x 32 x 32cm (l/h/w)) and simplifying installation : modular pump and solenoid mount.
- Integrated sump will maintain fluid to the outlet at high speed turns

Order Number	Product Description
SP30125	19l Modular Mounting Kit
-n/a-	19l reservoir separately



Solenoid Upgrade



Art.No.: SP30105

Ultimate security for your engine!

The solenoid valve is controlled by the pump in parallel with the controller and opens up the line to the injector only when the injection is enabled.

The shut off solenoid is used when mounting the injection nozzle lower than the reservoir or the reservoir is rear-mounted to prevent gravity flowing.

Order Number	Product Description
SP30105	Solenoid Upgrade

Tank + Fluid Level Switch



Art.No.: SP30102

3 l reservoir with level indicator in the kit

3 l tank with separate level indicator and LED (red) for installation in the vehicle interior. With the "reserve light", you can be sure to never operate your Boost Cooler system without sufficient liquid. Including connection (steel) for 1/4" line pressure.

Approximate dimensions of the tank: 22 x 22 x 10 cm

Order Number	Product Description
SP30102	3l Tank + Fluid Level Switch

Quick Connector, 1/4"



Art.No.: SP30201

Quick coupling / tank connection, stainless steel and EPDM sealings. With a holder for the 1/4" Boost Cooler pressure line.

Ideal for laying the pressure line through the vehicle, as well as tank connection in any container used (see Figure).

Order Number	Product Description
SP30201	1/4" Quick Connector

LED-Fluid Level Switch



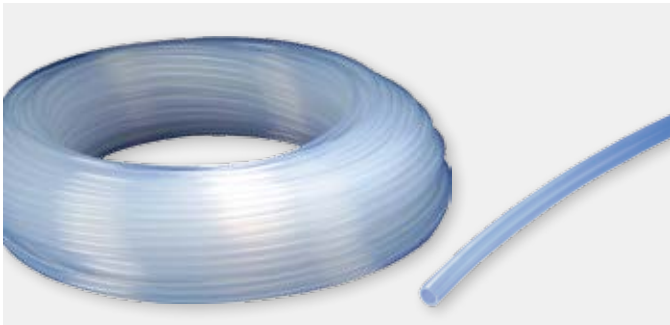
Art.No.: SP30101

Our low level indicator - Keeps track of low fluid level for. The indicator switch upgrade includes a red LED and an EZ installation grommet for use with any Boost Cooler reservoir.

It can be also added to any plastic reservoir including factory windshield washer fluid tanks.

Order Number	Product Description
SP30101	Fluid Level Switch

▶ Pressure Line (FEP)



Art.No.: SP30209

High-quality 1/4" O.D. FEP pressure line, pressure resistant up to 62 bar. Excellent UV and weathering resistance, flame retardant and 100% methanol-resistant.

Temperature resistant from -200° C to 200° C.

Perfect bending property & 100% methanol-resistant.

Our recommendation: The price is per metre.

Order Number	Product Description
SP30209	FEP-Pressure Line, prm

▶ Pressure Line (Nylon)



Art.No.: SP30208 / SP30212

High-quality 1/4" O.D. Nylon pressure line, pressure resistant to 35 bar.

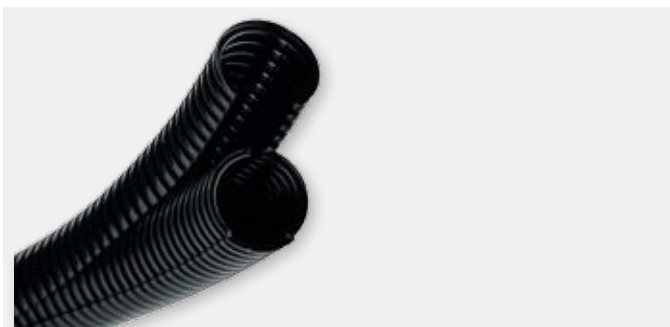
Excellent UV and weathering resistance.

Temperature resistant from -40° C up to 100° C.

100% methanol-resistant and flame retardant. The price is per metre.

Order Number	Product Description
SP30208	Pressure Line, red, prm
SP30212	Pressure Line, black, prm

▶ Corrugated Tube



Art.No.: SP30210

Protection for your Boost Cooler pressure line (or harness) and neutral appearance of the engine compartment.

The corrugated hose is universally applicable and has very good bending properties. Material : PAG.

Outside diameter 10.00 mm, halogen free, UV-stable

Order Number	Product Description
SP30210	Corrugated tube, prm



Freightliner Cascadia Racetruck, 1950 PS with Boost Cooler.

▶ Hypersonic™ Nozzles

Art.No.: SP3030x



Boost Cooler atomising nozzles with different flow rates for the Boost Cooler system.

The Boost Cooler is unsurpassed in its atomization due to superior nozzle design - The nozzle first spins the fluid supersonically before forcing it through a venturi shaped orifice.

To use our nozzles, you need our Boost Cooler nozzle holder (art.no. SP30202)

The nominal flow data relate to 60 psi pump pressure.



BOOST COOLER™

Order Number	Product Description
SP30301	Nozzle, 60ml/min
SP30302	Nozzle, 100ml/min
SP30303	Nozzle, 175ml/min
SP30304	Nozzle, 225ml/min
SP30305	Nozzle, 375ml/min
SP30306	Nozzle, 625ml/min

▶ Dual Nozzle Upgrade

Art.No.: SP30103



The DNU allows an additional nozzle to be mounted in any of our Boost Cooler kits. It includes a Tee junction piece with our quick-connect fittings, a nozzle holder and a section of hose.

We recommend:

- Bi-Turbo engines (e.g. Audi S4/RS4, Porsche)
- Engines with 2 separate throttle valves (e.g. V8)
- Powerful engines (> 500 hp), where one nozzle alone is not sufficient.
- 2-nozzle installation for combined charge air and combustion chamber cooling (one Boost Cooler nozzle directly downstream of IC-output, another one right in front of the throttle valve resp. intake manifold).

Order Number	Product Description
SP30103	Dual Nozzle Upgrade



Mounting Example Porsche 997 Turbo with Dual Nozzle

Direct Port Upgrades (4/6/8 Cylinder)

Art.No.: SP3031x



4-Cylinder Direct Port Upgrade, Art.No.: SP30314



6-Cylinder Direct Port Upgrade, Art.No.: SP30316



8-Cylinder Direct Port Upgrade, Art.No.: SP30318

For those running high HP applications that depend on water-methanol for tuning, Snow Performance now offers direct port injection upgrades to directly mount a water-meth nozzle into each cylinder.

Direct port is the clear solution when your high-output engine is equipped with a big turbo.

Perfect your octane delivery and put racing gasoline expense behind you. Mist distribution is guaranteed so that no cylinder is overloaded or underserved. Tuning is simplified and fluid consumption is optimized.

The Boost Cooler-Direct Port Upgrade contains:

- Snow Performance Distribution Block(s)
- Solenoid Upgrade
- 1/4" Push Lock Fittings
- Nozzle Holder/Check Valve Combo
- 1/4" T-Connector (8-Cylinder Upgrade only)

Does not include nozzles and must be purchased separately.

Order Number	Product Description
SP30314	DPU - 4-Cylinder
SP30316	DPU - 6-Cylinder
SP30318	DPU - 8-Cylinder



RCV-Nozzle Holder, Steel



Art.No.: SP30202

Nozzle holder for the Boost Cooler nozzles with EPDM seals and integrated check valve. The nozzle is screwed into the holder and connected to our 1/4" pressure line.

Order Number	Product Description
SP30202	Nozzle holder, steel

T-Connector, Steel



Art.No.: SP30216

T-connector, steel with EPDM seals. With appropriate 1/4" connections for the Boost Cooler pressure line.

Order Number	Product Description
SP30216	T-connector, steel



Racewerks BMW 135i, 439hp with Boost Cooler Stage 2

Boost Source Adapter



Art.No.: SP30213

Boost source adapter, 1/8" NPT27 thread. The adapter is screwed into the pressure tube and is universally applicable (for Boost Cooler controller, boost gauge, ..)

Order Number	Product Description
SP30213	Boost Source Adapter

1/8" Drill Tap



Art.No.: SP30211

Suitable taps for installing the Boost Cooler atomiser nozzles as also the boost source adapter and EGT-probe (Stage 3 Diesel). Thread: 1/8" NPT 27

Order Number	Product Description
SP30211	1/8" Drill Tap

Nozzle Mounting Adapter

Art.No.: SP30112



Mounting Example with silicone hose

Need a way to mount your injector nozzle into your silicone/rubber intake tube? Do you want to install the nozzle into a thin-walled aluminium intake without welding?

Snow Performance now offers this high quality Nozzle Mounting Adapter which will meet your requirements and satisfy your expectations.

Made from stainless steel, the adapter is methanol resistant and highly durable. Installation is easy: simply drill a hole using a spade bit, insert the inner adapter piece, and thread on the outer adapter nut.

Recommend for :

- Silicone and rubber intake tubes
- Thin-walled aluminium intakes

Order Number	Product Description
SP30112	Nozzle Mounting Adapter

Nozzle Mounting Bung

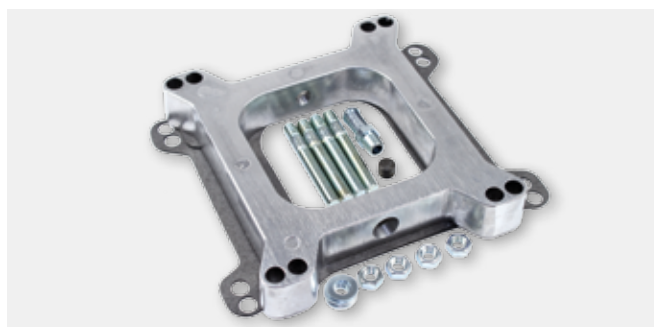


Art.No.: SP30109 / SP30110

Weldable threaded bungs make installing your injector nozzle easier when using thin-walled intake tubing. 1/8" NPT threads for Snow Performance Boost Cooler nozzle. Can also be used with nitrous nozzles etc. Simply drill a hole in your intake tube and weld in the bung. Your nozzle then has a strong threaded connection that can be used with confidence.

Order Number	Product Description
SP30109	Mounting Bung, Steel
SP30110	Mounting Bung, Alu

4150-Carb Spacer Plate



Art.No.: SP30106

2,5cm thick adapter plate allows a very clean and easy installation of our injector nozzles (one or two) on carbureted applications using square-bore Holley, Edelbrock, or Carter 4 barrel carburetors (4150 Style).

Note: Mounting injector nozzle below throttle plate requires a Solenoid Upgrade (Item No. SP30104).

Order Number	Product Description
SP30106	Carb Spacer Plate

FAQ - FREQUENTLY ASKED QUESTIONS

Why turbo / naturally aspirated engine achieves more power with the Boost Cooler?

The main problem of any internal combustion engine is the thermal load. In nearly all engines, the power is restricted by the temperature in the combustion chamber. If a certain temperature is exceeded, uncontrolled combustion ("knocking") occurs.

Uncontrolled combustions results in a massive loss of power and engine damage.



In a turbo engine, this problem is compounded even further. The intake of the turbo engine heats up strongly in the turbine (through compression and heat transfer of the exhaust gases) and the thermal limit is quickly reached. In conventional turbo engines, one tries to get this problem solved with the help of intercoolers.

The performance of a turbocharged engine is therefore directly dependent on the efficiency of the intercooler, as well as the cooling rate of the intake and charge air.

The efficiency of intercoolers, however, is constrained by the ambient temperature and the maximum size of tight physical limits. An increase in boost pressure no longer produces more power and the damage to the engine is virtually inevitable.

This issue can be solved using the Boost Cooler waterinjection concept. You can ensure additional cooling of the heated intake air through the injection of a water / alcohol mixture.

The great advantage of the Boost Cooler is that the cooling is virtually unlimited in physical terms. That is, if the intake air is too hot, simply increase the injection volume to achieve the required cooling degree. This unique advantage can help fully exploit the capacity of turbo engines and the engine power is not restricted by the thermal limits.

Does the Boost Cooler cause any damage to my engine?

No. At a relative humidity of 50% and ambient temperature of 25° C, a turbocharged engine consumes (2.0 l displacement, 1 bar boost pressure) approx. 160 ml of water per minute.

For example, if a gasoline engine is used, the combusted air / fuel mixture consists of approximately 50% of water vapour and carbon dioxide. With the injection of 250 ml/min of water per minute at full load, the Boost Cooler accounts for less than 1.6% of the exhaust gases.

Horror scenarios ("water hammer", rusting motors, etc.) that some of you might have read on the Internet tuning forums are only based on a lack of understanding of the technical writer or improper systems.



Study of Porsche Engineering (excerpt):

"The technology of water injection into the intake manifold provides significant potential. This technology can use a stoichiometric air-fuel ratio in the entire operating area and an optimal ignition timing to increase the efficiency of the engine.

In addition to a further reduction in fuel consumption, this effect also reduces the compression work so that the engine displacement can be further reduced.

Source: Porsche Engineering Magazine, Issue 01/2013

Where can I mount my reservoir and pump?

The pump needs to be within about 60cm (hose length) of the reservoir, and as low or lower than the base of the reservoir. It is a "pusher" pump, not a "puller" pump.

In the engine bay, the reservoir and pump can be placed almost anywhere, as long as they are not very close to exhaust heat, or in the path of debris from the road. Be sure that the pump is mounted at the same level or below the reservoir and that the reservoir is not located higher than the nozzle. If the reservoir must be located higher than the nozzle, a solenoid upgrade is required to prevent gravity feed. Trunk mounting is also fine, but the pump needs to be close to the reservoir and gravity fed. Lengths of 6-7m of tubing to the nozzle are fine.

FAQ - FREQUENTLY ASKED QUESTIONS

Which mixing ratio and what kind of water are used?

Use distilled or demineralised water only. Distilled water is available in any hardware store or gas station.

Of course you can also use clean tap water when nothing else is available at the moment.

Use methanol or bio-ethanol, or isopropanol. A 50/50 ratio is recommended. This has been demonstrated to be the best for charge/air cooling, excellent detonation control, and safety.

Do NOT use E85 or any other fluid with gasoline mixed in. It will destroy the fluid delivery part of your Boost Cooler and instantly void the warranty.

How much range will a tank of Water/Methanol provide?

This depends on a number of variables. HP, injection system, settings, driving style, etc.

For most gasoline engines in the 200-250hp range, the standard 3l tank will last around a tank of gasoline when driving on the road.

Diesels use more fluid than a gasoline application, and are in heavier load states more often. Due to the higher consumption of liquid in turbodiesels and/or powerful gasoline cars, we recommend at least our 9.5 l or 26.5 l trunk mounting kit as needed.

Where can I mount the nozzle?

The best placement of the nozzles is in the area around the inlet to the intake manifold or virtually anywhere on the pipe leading from the intercooler to the intake manifold. The nozzles can be placed at any position on the tube, so long as they are pointing at a 90 degree angle to the direction of airflow. The nozzles can be placed in a series or right next to each other. There is enough heat and velocity and flow through the pipe under boost to absorb the water/methanol regardless of the nozzle positions relative to each other.

Placement before the intercooler or turbo(s) is not recommended. Cooling is not improved. Never mount an injector nozzle before a turbocharger compressor. Studies performed by SAAB, concluded that pre-turbo injection will over time cause cavitation on the turbo wheel leading edges.

Do I need to activate the Boost Cooler in some way?

The Boost Cooler will activate automatically. Depending on the system, it activates after receiving a pre-set boost pressure or engine load signal, and then starts injecting in a load-dependent manner.

Do I need an intercooler with the Boost Cooler?

Up to approximately 2bar of boost, water/methanol injection (using 50% methanol) will provide all the density increase/detonation control needed in most applications.

Of course, intercooling and water/methanol injection would provide even greater benefits, especially beyond 2bar of boost.

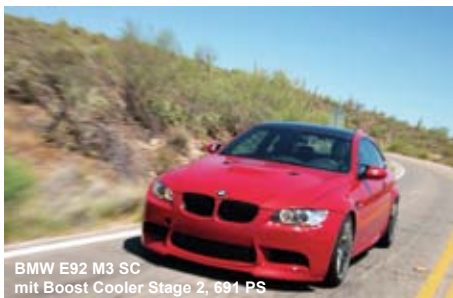
Most air-to-air intercoolers are only 50-65% efficient. For example, with 0.75 bar of boost and the resulting 50°C air charge temperature increase, an intercooler reduces the air charge temperature only 25 degrees. Also, an intercooler will reduce boost 0.1-0.25bar on average.



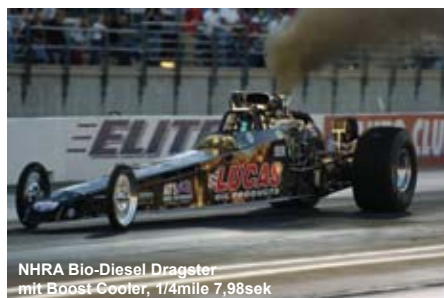
Snow Performance
Lotus Elise 111R Supercharged
293 hp with Boost Cooler System



Seat Leon Cupra 2.0 TFSI with Boost Cooler Stage 2, ca. 550hp



BMW E92 M3 SC mit Boost Cooler Stage 2, 691 PS



NHRA Bio-Diesel Dragster mit Boost Cooler, 1/4mile 7,98sek



Kawasaki ZZR1100 Turbo mit Boost Cooler Stage 2, Kele Design



Hyundai Genesis PM580 4,1l V6 Turbo, 750hp Pikes Peak International Hill Climb race car (10:09min)



ARE YOU CHEMICALLY INTERCOOLED?



Opel Speedster 2.0 Turbo, Boost Cooler Stage 2



Lancia Delta Integrale, Boost Cooler Stage 2, 300PS.



Kia Sorento 2.5 CRDI, Boost Cooler Stage 2, 230PS



Mitsubishi EVO VIII Race Car
610hp with Boost Cooler Stage 2



Lisa Klassen
@ Pikes Peak



Suzuki Samurai TD
with Boost Cooler Stage 2 TD



9ff GT9R
1120hp, Boost Cooler S2



Dodge Megacab
with Boost Cooler Stage 3 MPG-MAX

Are you chemically intercooled?



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Drivers
- Smudo (Fanta 4)
- Tim Schrick
- Tom von Löwis

Four Motors Bioconcept-Car
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