

The DENSO logo is displayed in white, italicized, sans-serif capital letters on a red rectangular background.

DENSO Thermal Products

OE quality for air conditioning and engine cooling

DENSO is the world's number one manufacturer of original thermal systems equipment and a name that major car makers rely on globally. With a market share of 30% in the OE segment and a 40% share of the total market for original equipment A/C Compressors, we're proud to be renowned for our efficient, reliable air conditioning and engine cooling systems. In Europe alone, DENSO's thermal technologies are installed and included in 25% of all new vehicles as original equipment, speaking volumes for our reputation.

Our expertise means DENSO's replacement ranges offer unique advantages to aftermarket customers with an increasing premium quality selection of parts guaranteeing long-lasting and efficient performance.

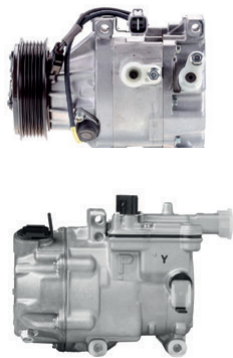
CHOOSE DENSO. Free your thinking.

A/C components

Compressors

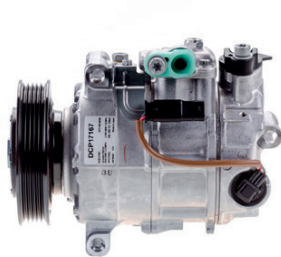
Air conditioning operation relies on taking heat out of the passenger compartment by absorbing it into a refrigerant. This is then transported away to be released outside.

The A/C compressor is the key element that transports this heat from the passenger compartment (evaporator) to the outside air (condenser).



Rotary type

Includes vane-type A/C compressors and scroll types, as well as Electric Driven compressors which are used in hybrid and electric vehicles.



Piston type

Dual operating swash plate (fixed displacement) and single swash plate types (variable displacement) are available within our A/C compressor range.

Extensive testing ensures reliable performance.



Compressor oils

All DENSO A/C compressors are originally pre-filled with a uniquely formulated compressor oil. This oil is developed by DENSO to ensure long-lasting high performance of the compressor.

DENSO ND-oil is the preferred compressor oil for car makers and A/C specialists, also available in the independent aftermarket. It's the best choice of oil for any DENSO compressor.

Available oil types:

- ND-oil 8 for mechanical compressors using R134a
- ND-oil 11 for electrical compressors using R134a & R1234yf
- ND-oil 12 for mechanical compressors using R134a & R1234yf

Superior refrigerant miscibility and lubricity properties

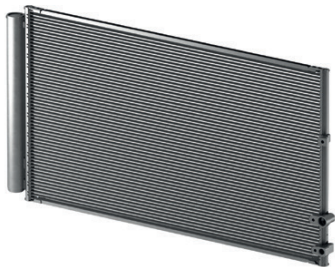
A/C components



Cabin air filters

To give the best possible driving experience, a comfortable cabin is just as important as an efficient, high-performing engine. Filtration systems work hard to optimise the cabin environment, preventing dust, pollutants or pollens from entering the cabin and taking the driver's attention away from the road. DENSO's cabin air filters have been developed to OE quality standards, with advanced technologies, easy fit design and long-life efficiency.

Includes particle and combination filters with high coverage of the European car parc.



Condensers

In the A/C system, the release of heat to the outside air is done by the condenser, located in the front of the vehicle. By releasing the heat to the cooler outside air, the gaseous refrigerant changes state to a liquid refrigerant. Able to withstand high internal pressures, the condenser passes the liquid refrigerant on to the receiver drier, or the modulator in the case of a super cool condenser.

Optimised heat dissipation and refrigerant condensation.



Evaporators

The evaporator absorbs the heat from the outside, warm air, while the condenser dissipates this heat to the outside air. To cool down the (outside) warm air before it moves into the car's cabin, the air is 'pushed' through the cold evaporator fins. Inside the evaporator flows low pressure, low temperature liquid refrigerant (mist), which changes state to gaseous refrigerant by absorbing this heat from the warm outside air.

Each part is specially coated to prevent bacteria growth.

A/C components



Expansion valves

A thermostatic expansion valve controls the evaporation process inside the evaporator. It reduces the high pressure, high temperature liquid refrigerant into a low pressure, low temperature mist refrigerant. The expansion valve also adjusts the refrigerant quantity to the evaporator, to maintain optimal cooling performance, depending on the cooling load.

Precision built for a consistent air conditioning components.

The expansion valve setting exactly matches the OE specifications.



Pressure switches

Pressure switches (or pressure sensors) are a safety device, which protect the refrigerant cycle components from refrigerant pressure that is too high or too low. DENSO A/C components are rigorously tested and manufactured to ensure they can withstand these changes in pressures and temperatures.

DENSO pressure switches and sensors are engineered to OE quality standards to ensure they can protect air conditioning components effectively.

Receiver driers and Accumulators

To ensure an A/C system cools air efficiently, the right amount of refrigerant needs to be put under the right conditions, before it is delivered to the evaporator. The receiver drier plays a key part in this by storing the liquid refrigerant safely until the evaporator needs it.



Receiver drier

The receiver drier separates gas from liquid to ensure only liquid refrigerant is supplied to the evaporator. (A/C system with expansion valve).



Accumulator

The accumulator separates liquid from gas to ensure only gaseous refrigerant is supplied to the compressor. (A/C system with orifice).

100% OE quality, extensively tested. Highly reliable with a long life expectancy.

A/C components

Resistors and actuators

To make sure the right amount of cold and hot air enters the vehicle cabin, the HVAC system needs to run efficiently. High quality actuators, resistors and controllers achieve this by controlling the flow of air into the vehicle cabin.

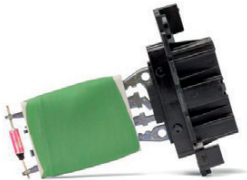
Actuator

Actuators control the airflow within the HVAC system itself and help regulate the mixture of hot and cold air by sending it to the required outlet position within the passenger cabin.

Resistor or PWM controller

Resistors control the power of the airflow via the cabin blower fan speed (manual A/C). This means the driver can easily adjust the speed of the blower fan according to their needs. The PWM controller is used with Climate Control Systems.

It is important to select high quality components to keep the in cabin climate comfortable and temperate.



Engine cooling



Radiators

To keep the engine running efficiently, it needs to be at an optimum temperature. The cooling radiator plays a key part in the engine cooling system. DENSO has worked with engine cooling experts to ensure our components can run effectively even in the most challenging environmental conditions.

Pioneering design and technology delivers an ultra efficient performance.



Cabin blower fans

After (fresh) air has been cooled or heated, it needs to be delivered into the car cabin on demand. Cabin blower fans are the component that performs this function. The flow of air into the cabin is controlled either manually by the driver or passenger(s), or automatically when the vehicle is equipped with climate control.

The highest quality components and housing ensure performance without unwanted vibration.



Cooling fans

To avoid overheating of the engine when it is stationary or when the engine gets extremely hot, the cooling fans keep the engine within a safe temperature range by forcing air through the radiator. DENSO's cooling fans can have solenoids fitted with sensors to ensure they only operate when needed in either low or high speed rotation, supporting reliable and efficient operation.

All our cooling fan components are developed to match the specifications of particular cars or engine types to guarantee a first time fit.



Thermostats

They have a key function in keeping the correct temperature in the engine and control the engine's temperature adjusting the coolant flow towards the radiator. It keeps the engine's temperature within normal operation values, regardless of the outside temperature.

DENSO Thermostats are manufactured to strict OE specifications and fit to a wide range of applications.

Engine cooling



Heater cores

Heater cores are part of the cooling system of the vehicle's engine. The warm engine coolant flows through the heater core and exchanges heat with the air in the vehicle to warm up the interior in cool conditions. The interior air is pushed through the heater core by the blower motor. After the air is warmed up it is distributed to the different air outlets, like feet, face or defrost outlets. DENSO heater cores are designed alongside experts to ensure optimum HVAC performance, journey after journey.

A guaranteed perfect fit.

Intercoolers

Turbochargers and superchargers compress air to increase its density before it is pushed into the engine cylinders. This process significantly increases the engine's power output. Intercoolers ensure enough oxygen gets to the cylinders for maximum combustion efficiency. By lowering the temperature of the charge air, the thermal load of the engine will also reduce, resulting in enhanced engine life.



Air to air intercoolers

With air to air intercoolers, the charge air is cooled by the airflow when driving. Air to air intercoolers are usually located in the front of the vehicle for maximum cooling performance, or on top of the engine with an additional air intake in the bonnet.



Air to water intercoolers

Air to water intercoolers are usually integrated in the intake manifold. The charge air is cooled by a heat exchanger inside the intake manifold, which is connected to the low temperature cooling circuit of the vehicle's smart cooling system. The advantage is a shorter routing of the intake air, resulting in a better response and less turbo drag.

Each of our components are put through rigorous testing to ensure they can withstand the high pressures and temperatures of turbocharged engine operation.

The DENSO Thermal range is constantly expanding and offers Aftermarket customers the most advanced technologies.

Our innovative solutions ensure improved performance and simultaneously reduce environmental impact.

LEAGUE OF **TRUE** MECHANICS

e-Learning:

Improve your knowledge and get technical know-how and tips via the DENSO technical portal.

Register on www.denso-technic.com to access our online courses, including:

Air Conditioning:

- A/C principles
- A/C components
- A/C compressors
- Most common compressor failures 1
- Most common compressor failures 2
- Oil contaminations

Engine Cooling:

- Engine cooling system

