

## **A/C Refrigerant Pressure Switch/Sensor Operation**

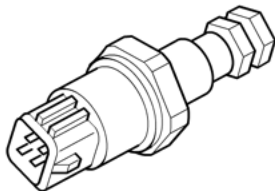
SYSTEM OVERVIEWS



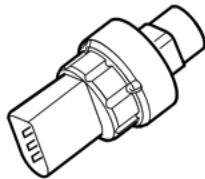


The purpose of this module is to compare two methods used to sense system pressure:

- **F129 A/C Pressure Switch** and
- **G65 High Pressure Sensor**

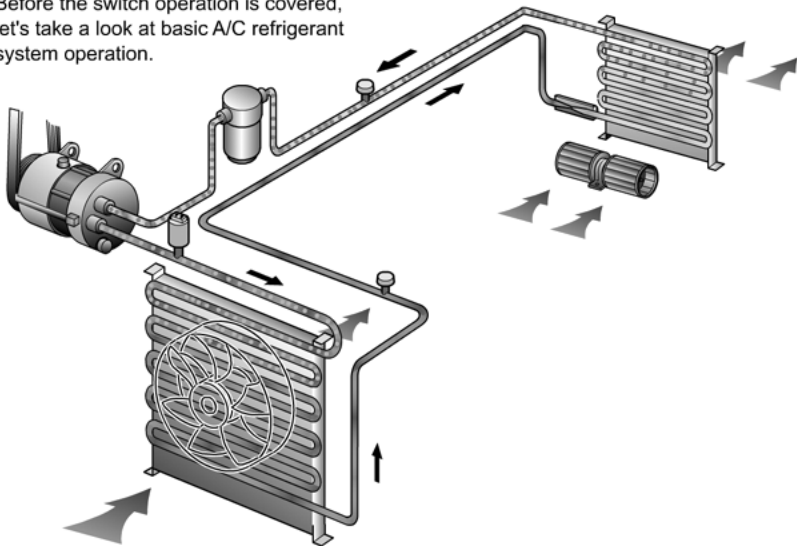


**F129 A/C Pressure Switch**

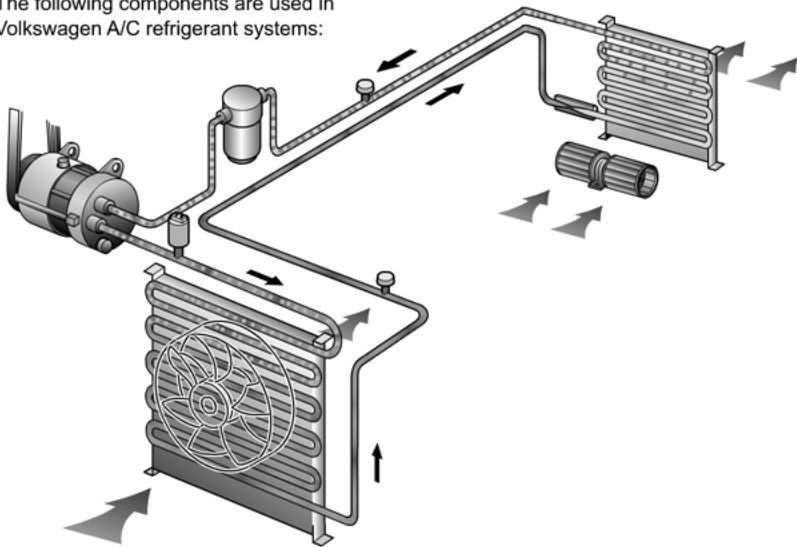


**G65 High Pressure Sensor**

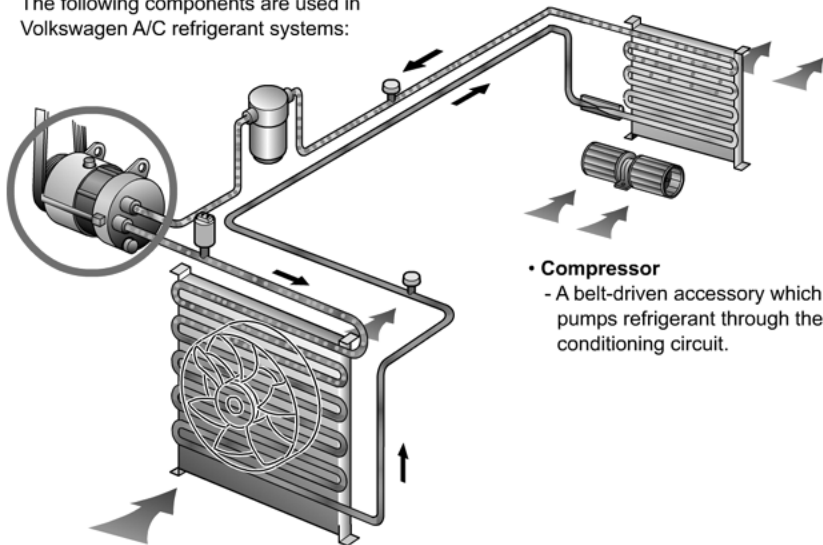
Before the switch operation is covered, let's take a look at basic A/C refrigerant system operation.



The following components are used in Volkswagen A/C refrigerant systems:



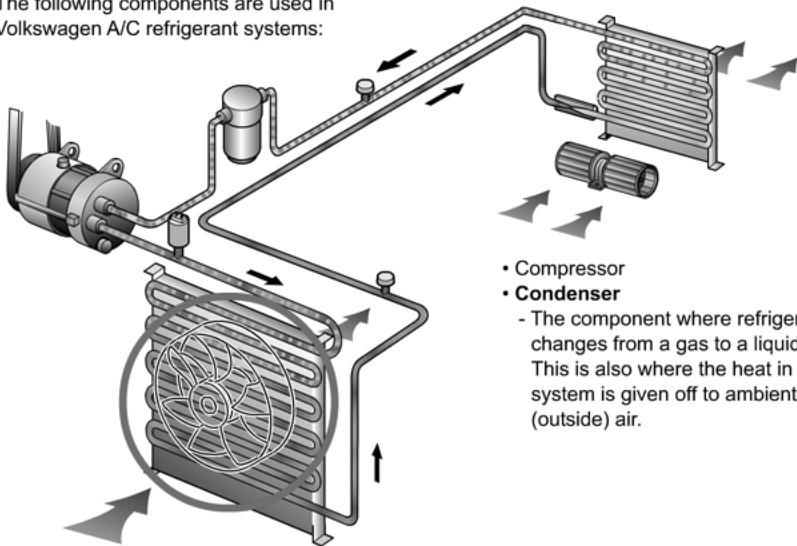
The following components are used in Volkswagen A/C refrigerant systems:



- **Compressor**

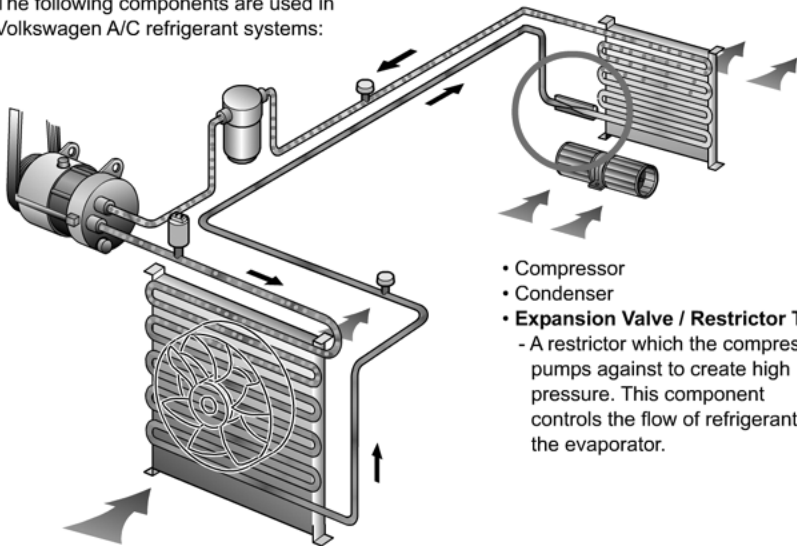
- A belt-driven accessory which pumps refrigerant through the air conditioning circuit.

The following components are used in Volkswagen A/C refrigerant systems:



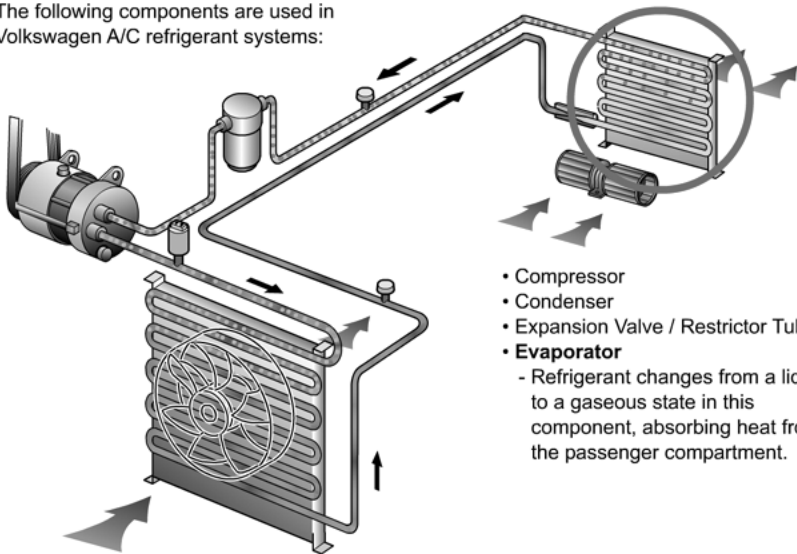
- Compressor
- **Condenser**
  - The component where refrigerant changes from a gas to a liquid. This is also where the heat in the system is given off to ambient (outside) air.

The following components are used in Volkswagen A/C refrigerant systems:



- Compressor
- Condenser
- **Expansion Valve / Restrictor Tube**
  - A restrictor which the compressor pumps against to create high pressure. This component controls the flow of refrigerant to the evaporator.

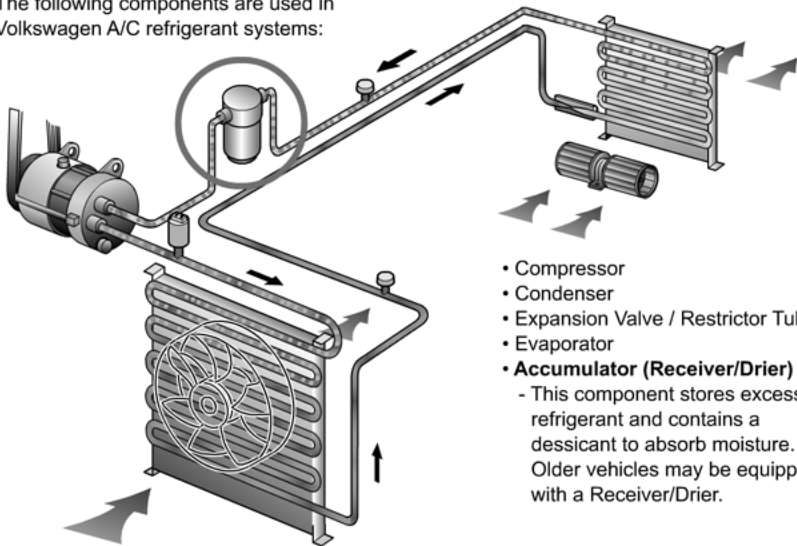
The following components are used in Volkswagen A/C refrigerant systems:



- Compressor
- Condenser
- Expansion Valve / Restrictor Tube
- **Evaporator**
  - Refrigerant changes from a liquid to a gaseous state in this component, absorbing heat from the passenger compartment.

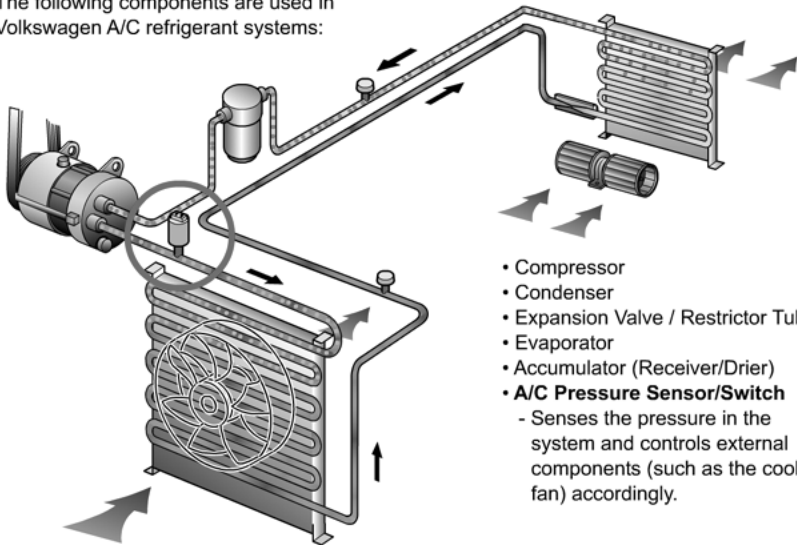


The following components are used in Volkswagen A/C refrigerant systems:



- Compressor
- Condenser
- Expansion Valve / Restrictor Tube
- Evaporator
- **Accumulator (Receiver/Drier)**
  - This component stores excess refrigerant and contains a dessicant to absorb moisture. Older vehicles may be equipped with a Receiver/Drier.

The following components are used in Volkswagen A/C refrigerant systems:

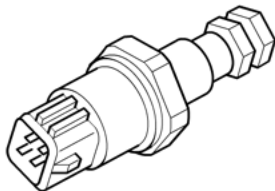


- Compressor
- Condenser
- Expansion Valve / Restrictor Tube
- Evaporator
- Accumulator (Receiver/Drier)
- **A/C Pressure Sensor/Switch**
  - Senses the pressure in the system and controls external components (such as the cooling fan) accordingly.

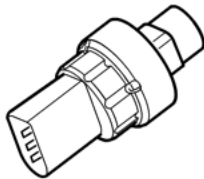
Two alternative methods used to sense refrigerant pressure in the A/C system are:

- **F129 A/C Pressure Switch** and
- **G65 High Pressure Sensor**

Vehicles are fitted with either **F129** or **G65**, depending on the design of the A/C system.

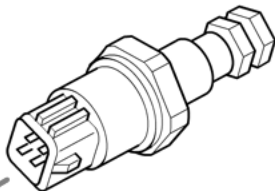
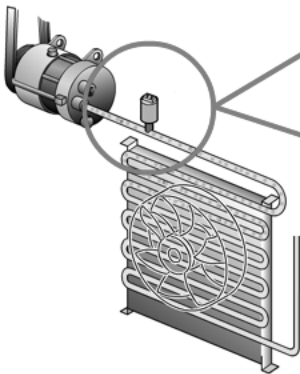


**F129 A/C Pressure Switch**

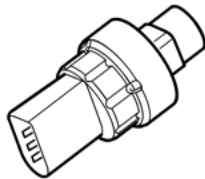


**G65 High Pressure Sensor**

**F129** and **G65**, depending on application, are both located in the same area of the Air Conditioning system; between the compressor and the condenser. Both are pressure sensors, but each operates differently.



**F129 A/C Pressure Switch**

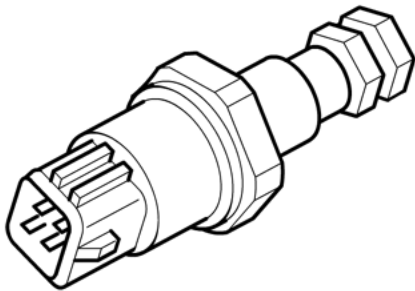


**G65 High Pressure Sensor**

## F129 Operation

**F129** uses two pressure-operated switches to control:

- Two high-pressure functions, and
- One low-pressure function

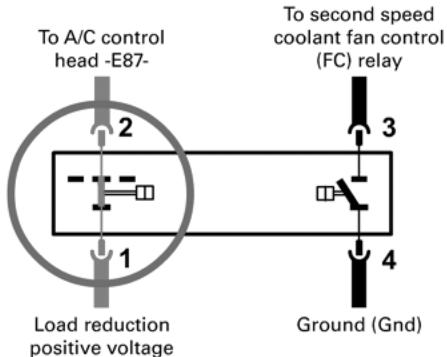
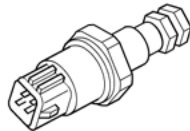


## F129 Operation

In the lower graphic, pins 1 and 2 receive signals from a three-position pressure switch.

This switch is normally closed, but will open whenever pressure either drops too low (under 1.6 bar) or rises too high (over 28 bar).

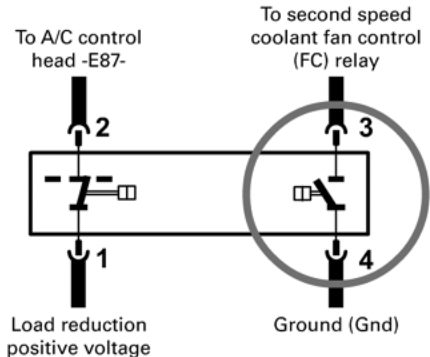
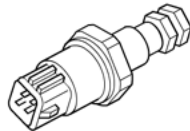
Pins 1 and 2 send signals to either **A/C Cut-off Control Module J314** in manual control systems, or **A/C Control Head E87** in Climatronic systems.



## F129 Operation

In the lower graphic, pins 3 and 4 are normally open, and complete a Ground circuit for the **Second Speed Coolant Control Relay J101**.

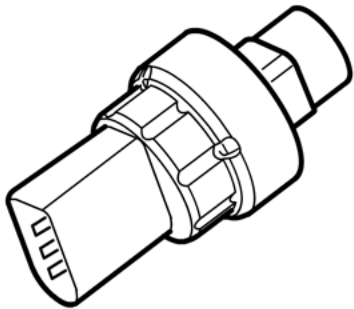
When pressure rises above 16 bar, the switch closes, causing the relay to run the second coolant fan.



## G65 Operation

**G65** is being phased in on Volkswagen vehicles to replace **F129**.

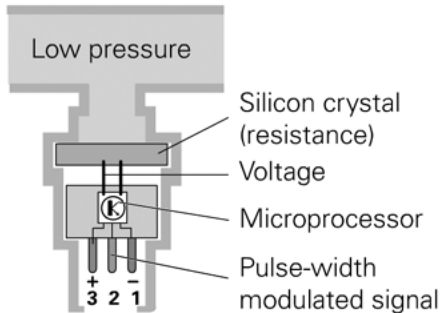
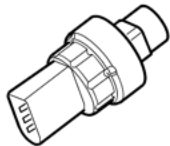
It is mounted in the same location and performs the same function as **F129** but does so in a different way.





## G65 Operation

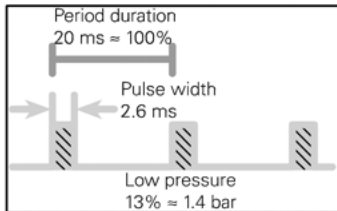
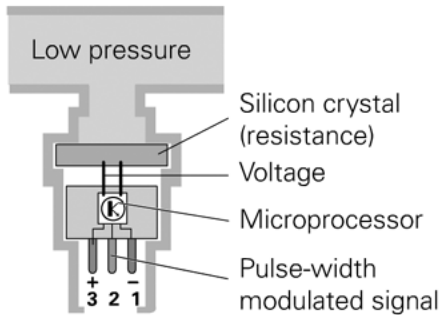
Instead of using a pressure-operated switch, **G65** uses a silicon crystal to sense pressure.



## G65 Operation

Voltage is applied to this silicon crystal. As the crystal deforms under pressure, the applied voltage changes.

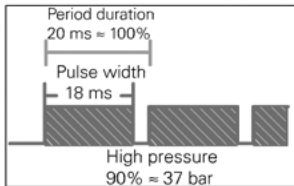
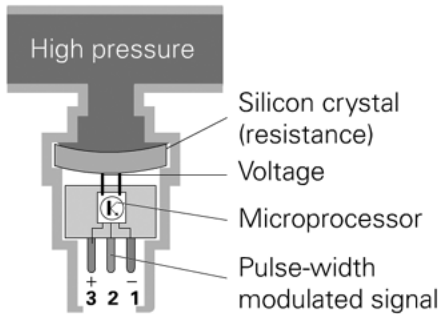
An internal microprocessor converts this reference voltage into a pulse-width modulation signal.



## G65 Operation

The pulse-width modulated signal varies in proportion to system pressure.

- Low duty cycle is a result of low pressure.
- High duty cycle is a result of high pressure.






## System Testing

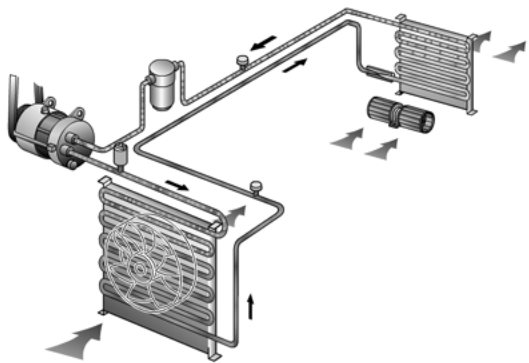
### Manual A/C Systems:

Use **Guided Fault Finding** tests, where available, to diagnose the function of either **F129** or **G65**.

### Climatronic A/C Systems:

Use **Guided Fault Finding** tests, where available, to diagnose the function of either **F129** or **G65**. View the function of **F129** or **G65** using **Read Measuring Value Blocks** in **Vehicle Self-Diagnosis**. In addition, vehicles with Climatronic are equipped with **On-Board Diagnostic (OBD)** capabilities. If Short or Open circuits occur in these components, **Diagnostic Trouble Codes (DTCs)** will be stored in memory.





- Module complete**
- Click to Replay Overview*
- Click for Printable Version*