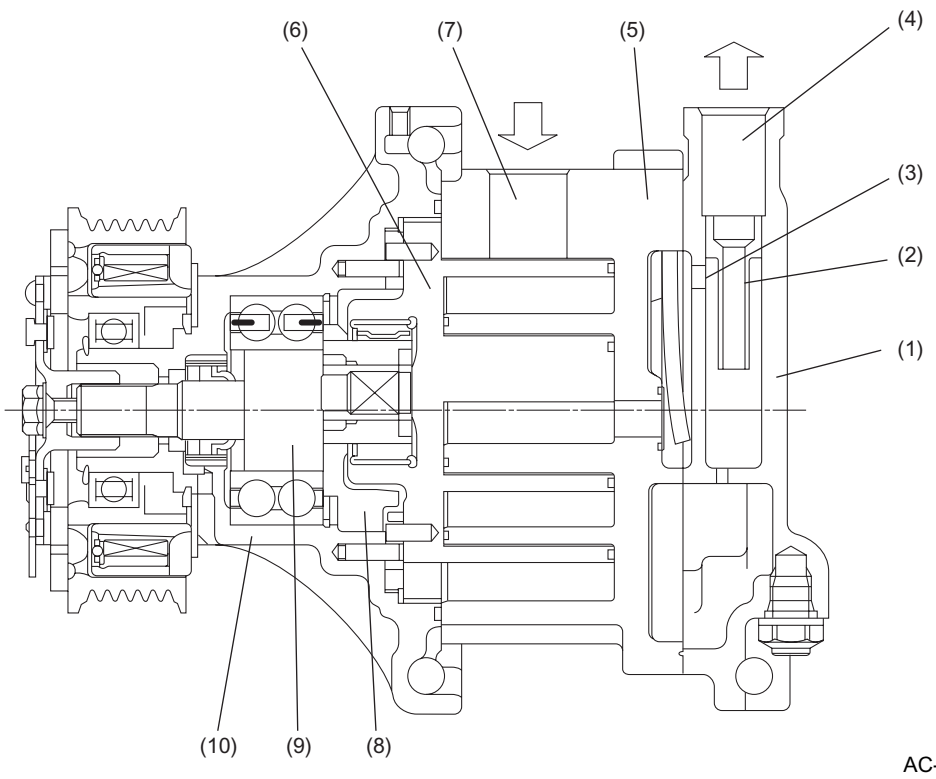
2. Cooling System

A: COMPRESSOR

As two scrolls (one movable and other fixed) are engaged, a crescent chamber is formed between multiple contact points. The movable scroll cannot rotate on its own axis but orbits instead, so the operating chamber moves inwards while its capacity is reduced. Intake, compression and discharge take place simultaneously at multiple operation chambers, and compressed refrigerant is sent from the discharge hole at the center to the oil separator and then separated in to refrigerant gas and oil before it is output from the discharge port.



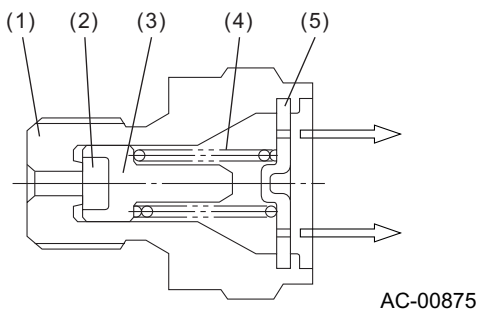
AC-00874

(1) Rear housing
(2) Oil separator
(3) Discharge hole
(4) Discharge port
(5) Shell: fixed scroll
(6) Rotor: movable scroll
(7) Suction port
(8) Balancer
(9) Shaft
(10) Front housing

1. PRESSURE RELIEF VALVE

This valve opens if the pressure of the high-pressure refrigerant gas rises to a dangerously high level to release part of refrigerant into the atmosphere, thus protecting the compressor. The valve is designed to limit the amount of released gas to the necessary minimum.

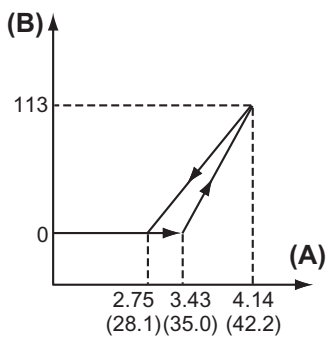
- Valve opening pressure: above 3.43 MPa (35.0 kgf/cm^2)
- Valve closing pressure: above 2.75 MPa (28.1 kgf/cm^2)
- Valve wide open pressure: below 4.14 MPa (42.2 kgf/cm^2)



AC-00875

(1) Housing
(2) Valve
(3) Holder
(4) Spring
(5) Plate

Operating characteristics



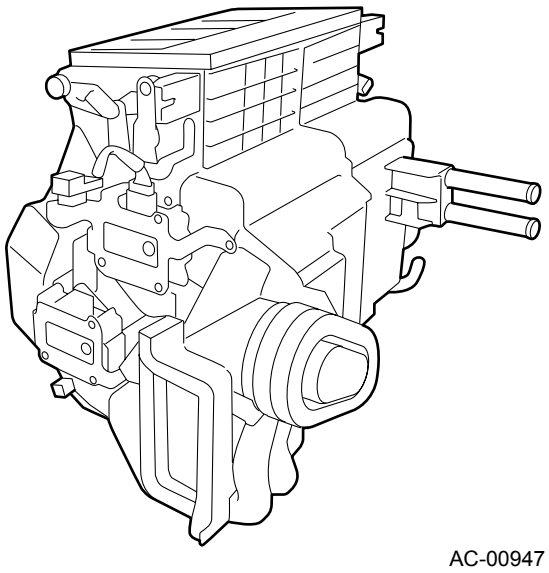
AC-00876

(A) Pressure MPa (kgf/cm^2)
(B) Leakage ℓ/min

B: COOLING UNIT

The heater unit and cooling unit are integrated into a single heater and cooling unit.

The cooling section components of this unit include an evaporator, expansion valve, and case.



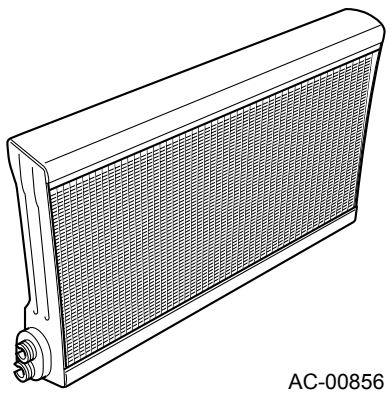
AC-00947

1. EVAPORATOR

The evaporator is a laminated type.

When a low-pressure, low-temperature refrigerant is sprayed by the expansion valve into the evaporator, it evaporates and cools the evaporator surfaces.

The cabin air is drawn by the blower and cooled down as it flows over the evaporator. The cooled air then flows passing through the heater unit and delivered into the cabin through vent outlets.



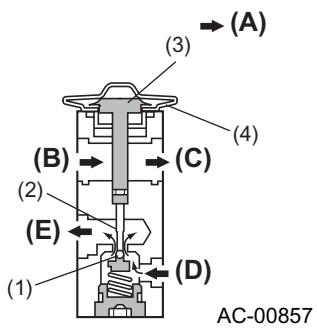
AC-00856

2. EXPANSION VALVE

The expansion valve regulates the flow of refrigerant such that heat exchange takes place optimally.

The expansion valve performs two functions; it sprays the high-pressure refrigerant from the condenser using a throttle valve, and it regulates the amount of the spray by changing opening of the throttle valve.

The expansion valve consists of such main components as a heat sensing cylinder, diaphragm, ball valve, spring, and adjusting screw.



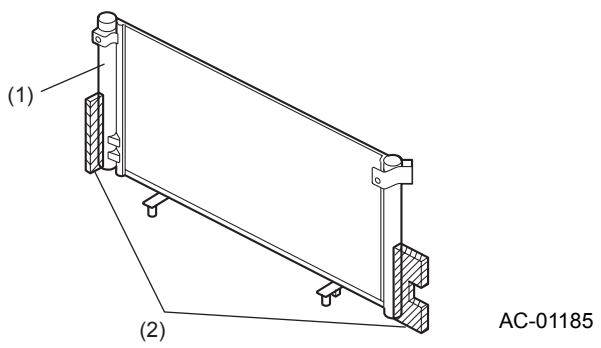
(1) Ball valve
(2) Shaft
(3) Heat sensing cylinder
(4) Diaphragm

(A) Refrigerant flow
(B) From evaporator (low-pressure side)
(C) To compressor
(D) To liquid tank
(E) To evaporator (high-pressure side)

The heat (temperature) sensing cylinder is held in contact with the evaporator outlet pipe so that a pressure corresponding to the sensed temperature may be applied to the chamber above the diaphragm. There is a pressure equalizing hole which communicates with the chamber below the diaphragm to transmit changes in the refrigerant pressure to the chamber. The ball valve is linked with the diaphragm and moves according to changes in the balance between the force applied to the diaphragm and the tension of the spring.

C: CONDENSER

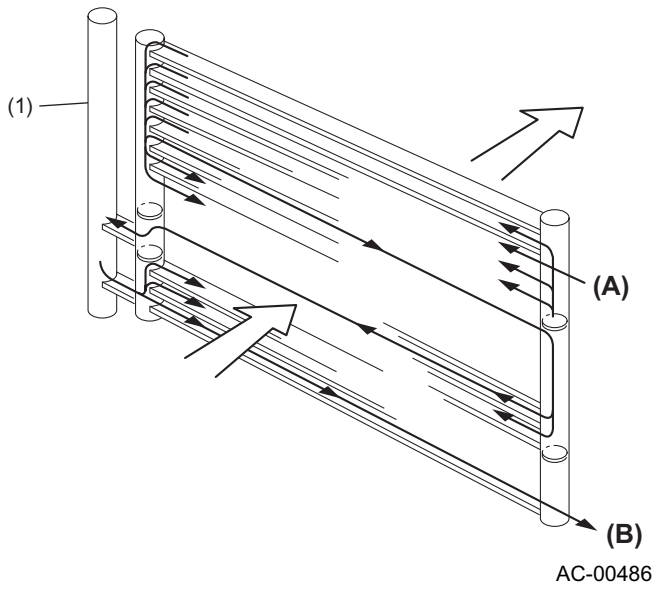
The condenser is a newly developed subcooling condenser that integrates a multi-flow type condenser and a modulator (gas-liquid separator) into a single unit. The condenser has a high heat-exchange efficiency.



(1) Liquid tank
(2) Urethane

1. SUBCOOLING CONDENSER

The new subcooling condenser has a subcooling section where part of the refrigerant that remains in gas form is cooled and reduced into liquid form. This enables almost 100% of the refrigerant to be re-liquefied.



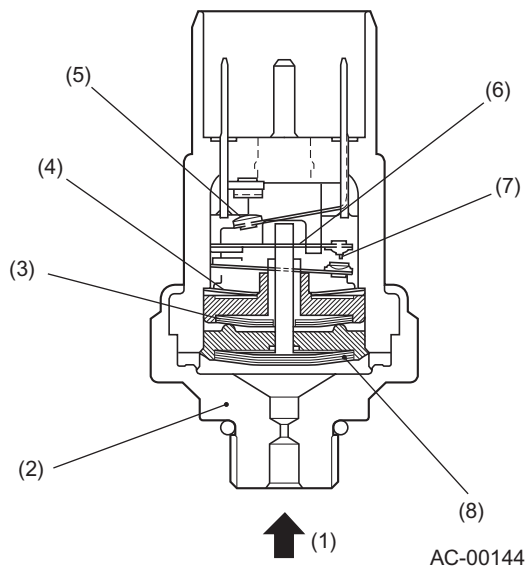
(1) Liquid tank
(A) Suction
(B) Discharge

D: PRESSURE SWITCH

The pressure switch is a high-pressure side component of the refrigeration cycle (cooling cycle). It consists of a diaphragm that receives refrigerant gas pressure, a snap plate, a rod, contacts that open both when the gas pressure is too low and when it is too high, and a switch that operates at mid-pressure.

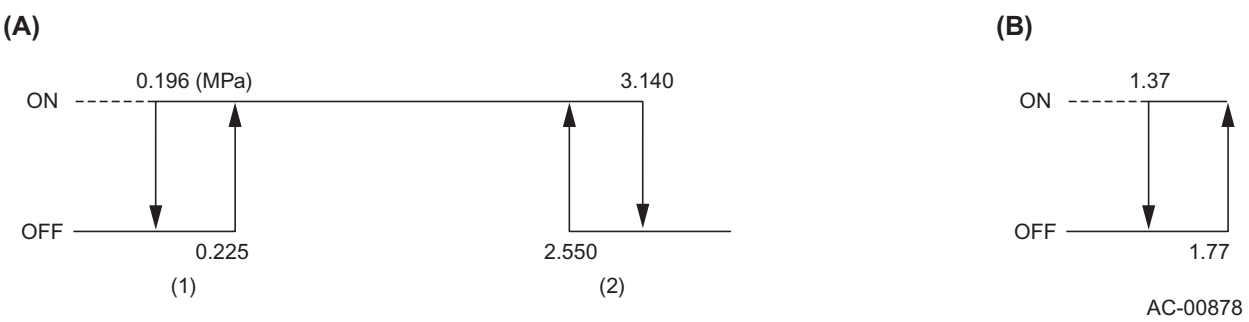
The pressure switch plays the following roles:

- Prevents “no-gas” operation due to leakage (when gas pressure is too low)
- Protects the system against abnormally high refrigerant pressure (when gas pressure is too high)
- Detects compressor load (mid pressure contact: electric cooling fan output control)



(1) Pressure
(2) Housing
(3) Diaphragm (high pressure)
(4) Diaphragm (low pressure)
(5) Mid-pressure switch
(6) Lever (high-pressure)
(7) High and low pressure switch
(8) Diaphragm (mid pressure)

ON-OFF pressures



(A) High and low pressure switch
(1) Low pressure
(B) Mid-pressure switch
(2) High pressure

1. SPECIFICATIONS

High/low pressure switch (compressor ON/OFF control)

Low pressure switch	ON→OFF	0.196 MPa (2.00 kgf/cm^2)
	OFF→ON	0.255 MPa (2.60 kgf/cm^2)
High pressure switch	ON→OFF	3.140 MPa (32.0 kgf/cm^2)
	OFF→ON	2.550 MPa (26.0 kgf/cm^2)

Mid pressure switch (electric cooling fan output control)

Compressor at low load	ON→OFF	1.37 MPa (13.9 kgf/cm^2)
Compressor at high load	OFF→ON	1.77 MPa (18.0 kgf/cm^2)