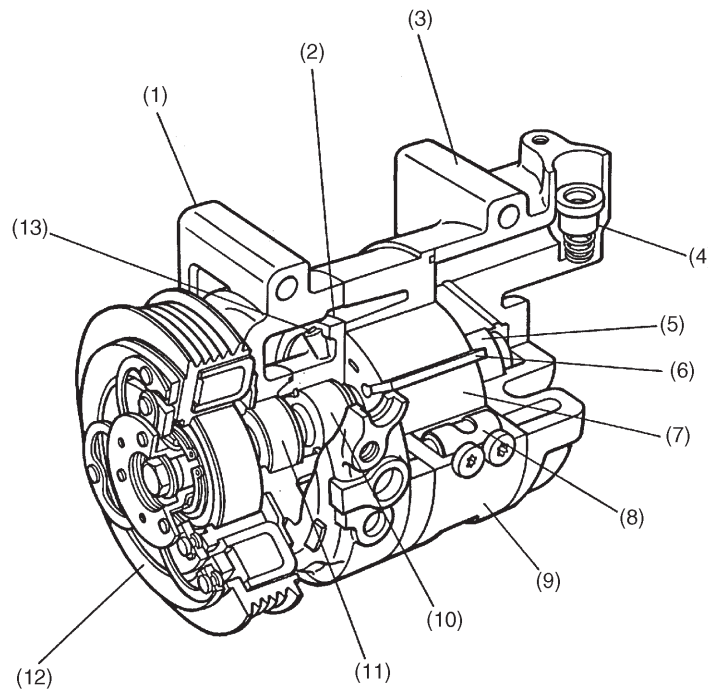


## 2. Compressor

### A: GENERAL

The vane rotary type compressor has five vanes fitted in the rotor mounted on the shaft. The centrifugal force produced by rotation of the rotor in the elliptical cylinder causes the vanes to move out and change the volumes in the areas surrounded by the rotor and cylinder. Suction, compression and discharge take place 10 times per rotation. A roll type valve is used on the discharge side only. Shaft seals are provided for the shaft and front head to maintain air tightness in the compressor. A trigger valve is provided in the side block to apply a back pressure to the vanes. The compressor is charged with the specified quantity of compressor oil which is forced to all the parts for lubrication by the discharge pressure of the refrigerant.



S4H0307A

- |                  |                    |                    |
|------------------|--------------------|--------------------|
| (1) Front head   | (6) Vane           | (11) Shaft seal    |
| (2) Side block   | (7) Rotor          | (12) Magnet clutch |
| (3) Rear head    | (8) Roll valve     | (13) Trigger valve |
| (4) Check valve  | (9) Cylinder       |                    |
| (5) Rear bearing | (10) Front bearing |                    |

## 4-7 [M2B0]

### 2. Compressor

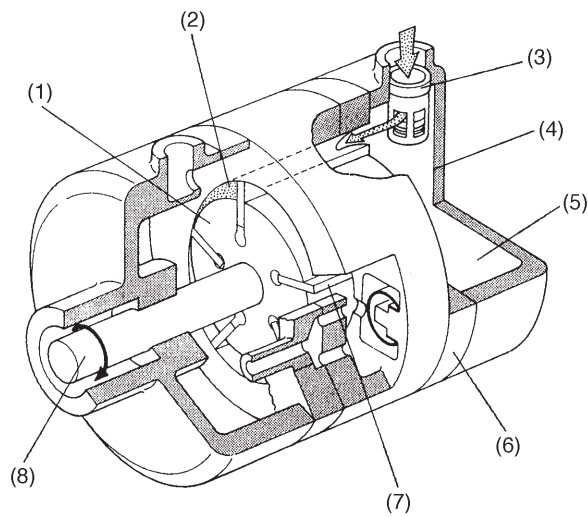
## MECHANISM AND FUNCTION

### B: FUNCTION

Rotation of the shaft changes the volumes in the areas surrounded by the rotor, vanes, cylinder and side block, thereby accomplishing the functions of suction, compression and discharge.

#### 1) Suction:

The low-pressure gaseous refrigerant forced out from the evaporator by rotation of the compressor passes from the suction side of the rear head through the check valve and enters the low pressure chamber in the rear head. The gaseous refrigerant is drawn into the cylinder by rotation of the vanes from the two suction ports provided in the side block. Air tightness in the cylinder chamber is maintained by the compressor oil.

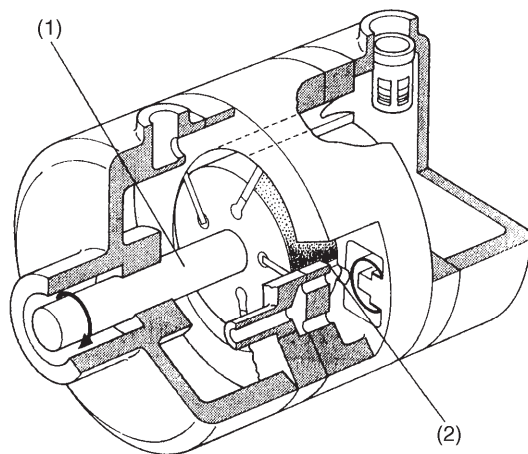


B4H0745A

- |                 |                          |                 |
|-----------------|--------------------------|-----------------|
| (1) Rotor       | (4) Rear head            | (7) Vane        |
| (2) Refrigerant | (5) Low-pressure chamber | (8) Drive shaft |
| (3) Check valve | (6) Rear side block      |                 |

#### 2) Compression:

Further rotation after suction makes the cylinder chamber smaller, thus the compression starts.

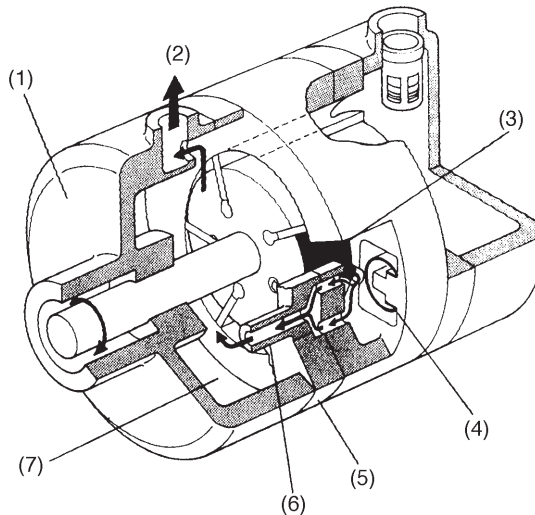


B4H0746A

- |                 |                 |
|-----------------|-----------------|
| (1) Drive shaft | (2) Refrigerant |
|-----------------|-----------------|

**MECHANISM AND FUNCTION****[M2C0] 4-7**  
2. Compressor**3) Discharge:**

When the refrigerant pressure in the cylinder chamber exceeds the high pressure value, the roll valve opens to discharge the refrigerant through the pipe portion jointly provided in the front side block into the high pressure chamber in the front head. The gaseous refrigerant in the high pressure chamber is led through a baffle to separate the compressor oil contained in the gaseous refrigerant before it is forced to the high pressure piping.

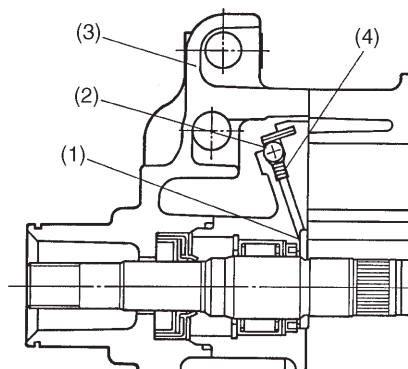


B4H0747A

- |                                 |                      |                           |
|---------------------------------|----------------------|---------------------------|
| (1) Front head                  | (4) Roll valve       | (7) High-pressure chamber |
| (2) Refrigerant (Discharging)   | (5) Front side block |                           |
| (3) Refrigerant (High-pressure) | (6) Pipe             |                           |

**C: TRIGGER VALVE**

This mechanism is designed to maintain proper vane back pressure to allow the vanes to move out with ease when the compressor starts. The trigger valve is provided in the side block, and a ditch called the K-ditch is provided in the side block rotor surface. The trigger valve has a ball combined with a spring. When vane chattering readily occurs like when the compressor starts or when the difference between the high and low pressures is small, spring action causes the valve to open to provide additional back pressure to the vanes, thereby assuring smooth operation.



S4H0308A

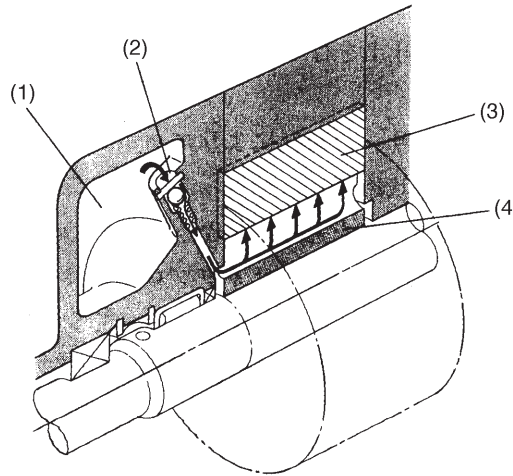
- |                |                |
|----------------|----------------|
| (1) K-ditch    | (3) Front head |
| (2) Check ball | (4) Spring     |

## 4-7 [M2C0] 2. Compressor

### MECHANISM AND FUNCTION

1) When compressor starts or when load is low:

When the compressor starts or when the load is low (the high pressure value is low), the trigger valve is opened by spring action to apply the pressure of the high pressure chamber to the back plane of vane to prevent vane chattering.



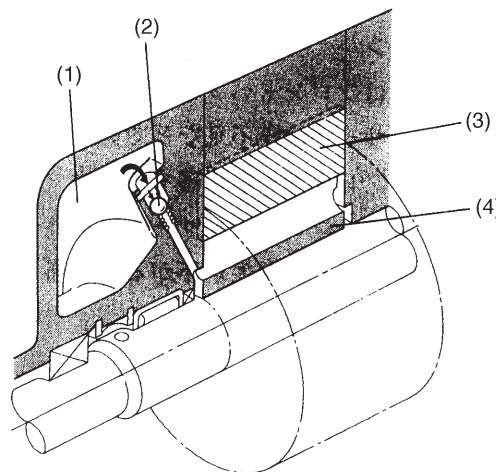
B4H0749A

- (1) High-pressure chamber
- (2) Trigger valve (Open)

- (3) Valve
- (4) Rotor

2) When compressor is in regular operation:

When the pressure in the high pressure chamber of the compressor increases, the pressure difference closes the trigger valve against spring action. The oil port pressure of the side block is applied to the back plane of vane to maintain proper back pressure.



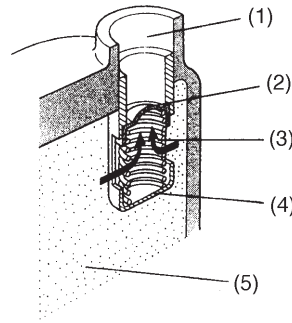
B4H0750A

- (1) High-pressure chamber
- (2) Trigger valve (Shut)

- (3) Valve
- (4) Rotor

**D: CHECK VALVE**

A plate and spring are provided on the suction side of the rear head. When there is a large difference between the high and low pressures immediately after the compressor has stopped, reverse rotation of the compressor could cause counter flow to the evaporator, as no suction valve is provided. For this reason, a check valve is provided to prevent counter flow. Immediately after the compressor has stopped, the high pressure refrigerant forces the check valve up to close the suction side piping passage and prevent counter flow from the high to low pressure side.



B4H0751A

(1) Refrigerant suction port  
(2) Plate

(3) Spring  
(4) Check valve

(5) Refrigerant

## 4-7 [M2E0] 2. Compressor

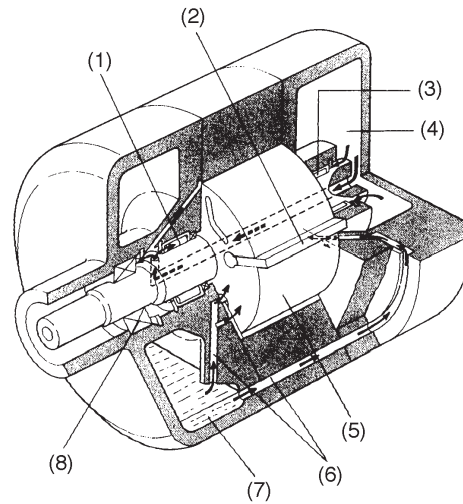
### MECHANISM AND FUNCTION

#### E: LUBRICATION

The oil in all the parts is forced up from the bottom of the front side block along the oil passages by the pressure on the high pressure side to lubricate the rotor front end. The oil passed through the oil port at the bottom of the cylinder lubricates the rear end of the rotor. The oil that has lubricated each of the ends of the rotor is returned to the low pressure side by the internal pressure of the compressor.

The oil contained in the gaseous refrigerant returned from the evaporator passes through the low pressure chamber and lubricates the rear bearing. Furthermore, the oil passes through the guide hole provided in the drive shaft and lubricates the front bearing and shaft seal before returning to the suction portion of the cylinder.

Since the pressure in the suction portion of the cylinder is slightly lower than that in the low pressure side, the oil that has lubricated all the parts is returned to the suction chamber.



B4H0752A

- (1) Front bearing
- (2) Vane
- (3) Rear bearing

- (4) Low-pressure chamber
- (5) Rotor
- (6) Oil port

- (7) High-pressure chamber
- (8) Shaft seal