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ELECTRIC COMPRESSOR

Abstract

An electric compressor includes: a housing; a compression mechanism accommodated in the housing and configured to compress a fluid; a motor accommodated in the housing and configured to drive the compression mechanism; an inverter accommodated in the housing and configured to drive the motor; and a hermetic terminal disposed in the housing, and electrically connecting the motor and the inverter. The hermetic terminal includes: a conductive member made of a conductive material; a support plate having a plate-like shape and made of metal; and an insulator. The support plate supports the conductive member. The insulator provides electrical insulation between the conductive member and the support plate. The electric compressor includes a reinforcing plate having a plate-like shape. The support plate and the reinforcing plate for enhancing rigidity of the support plate are fastened together to the housing by a fastening member.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority to Japanese Patent Application No. 2024-019341 filed on Feb. 13, 2024, the entire disclosure of which is incorporated herein by reference.

[0002] The present disclosure relates to an electric compressor.

BACKGROUND ART

[0003] The electric compressor includes a compression mechanism, a motor, an inverter, and a housing. The compression mechanism compresses a fluid. The motor drives the compression mechanism. The inverter drives the motor. The housing accommodates the compression mechanism, the motor, and the inverter. The electric compressor further includes a hermetic terminal. The hermetic terminal is disposed in the housing and electrically connects the motor and the inverter. For example, as in Japanese Patent Application Publication No. 2005-155369, the hermetic terminal includes a conductive member, a support plate, and an insulator. The conductive member is made of a conductive material. The support plate has a plate-like shape and supports the conductive member. The insulator provides electrical insulation between the conductive member and the support plate.

[0004] Such an electric compressor may use a natural refrigerant, such as carbon dioxide or propane gas. It is necessary to enhance the rigidity of the support plate depending on the type of refrigerant. One option to enhance the rigidity of the support plate is to increase the thickness of the support plate. However, it is difficult to provide, for example, a sintered glass insulator between such a support plate having an increased thickness and the conductive member during manufacturing. Therefore, it is desired to enhance the rigidity of the support plate without increasing the thickness of the support plate.

[0005] The present disclosure, which has been made in light of the above-described problem, is directed to providing an electric compressor that includes a support plate with enhanced rigidity without increasing the thickness of the support plate.

SUMMARY

[0006] In accordance with an aspect of the present disclosure, there is provided an electric compressor that includes: a housing; a compression mechanism accommodated in the housing and configured to compress a fluid; a motor accommodated in the housing and configured to drive the compression mechanism; an inverter accommodated in the housing and configured to drive the motor; and a hermetic terminal disposed in the housing, and electrically connecting the motor and the inverter. The hermetic terminal includes: a conductive member made of a conductive material; a support plate having a plate-like shape and made of metal; and an insulator. The support plate supports the conductive member. The insulator provides electrical insulation between the conductive member and the support plate. The electric compressor includes a reinforcing plate having a plate-like shape. The support plate and the reinforcing plate for enhancing rigidity of the support plate are fastened together to the housing by a fastening member.

[0007] Other aspects and advantages of the disclosure will become apparent from the following description, taken in conjunction with the accompanying drawings, illustrating by way of example the principles of the disclosure.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The disclosure, together with objects and advantages thereof, may best be understood by reference to the following description of the embodiments together with the accompanying drawings in which:

[0009] FIG. **1** is a sectional view of an electric compressor according to an embodiment of the present disclosure;

[0010] FIG. **2** is a fragmentary enlarged sectional view of the electric compressor according to the embodiment;

[0011] FIG. **3** is an exploded perspective view of a hermetic terminal; and

[0012] FIG. **4** is a fragmentary enlarged sectional view of the electric compressor according to the embodiment.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0013] The following will describe an embodiment of an electric compressor with reference to accompanying FIGS. **1** to **4**. The electric compressor of the embodiment is applied, for example, to a vehicle air conditioner.

[0014] FIG. **1** illustrates an electric compressor **10** that includes a housing **11**. The housing **11** includes a discharge housing **12**, and a motor housing **13**. The discharge housing **12** and the motor housing **13** have a cylindrical shape. The motor housing **13** is connected to the discharge housing **12**. Each of the discharge housing **12** and the motor housing **13** is made of a metallic material. For example, each of the discharge housing **12** and the motor housing **13** is made of aluminum. The motor housing **13** includes an end wall **13***a* having a plate-like shape and a peripheral wall **13***b* having a cylindrical shape. The peripheral wall **13***b* extends from an outer peripheral portion of the end wall **13***a*.

[0015] The electric compressor **10** includes a rotary shaft **14**. The rotary shaft **14** is accommodated in the motor housing **13**. That is, the rotary shaft **14** is accommodated in the housing **11**. The rotary shaft **14** is rotatably supported by the motor housing **13**.

[0016] The electric compressor **10** includes a compression mechanism **15** and a motor **16**. The compression mechanism **15** and the motor **16** are accommodated in the motor housing **13**. That is, the housing **11** accommodates the compression mechanism **15** and the motor **16**. The compression mechanism **15** and the motor **16** are arranged in an axial direction of the rotary shaft **14**. The motor **16** is disposed between the compression mechanism **15** and the end wall **13***a* of the motor housing **13**. In the motor housing **13**, a space between the compression mechanism **15** and the end wall **13***a* of the motor housing **13** serves as a motor chamber S**1** for accommodating the motor **16**. That is, the housing **11** has the motor chamber S**1**.

[0017] The compression mechanism **15** is driven by the rotation of the rotary shaft **14**. The compression mechanism **15** is configured to compress refrigerant as a fluid. The compression mechanism **15** is, for example, a scroll compression mechanism that includes a fixed scroll (not illustrated) fixed to the motor housing **13** and a movable scroll (not illustrated) facing the fixed scroll. The refrigerant compressed by the compression mechanism **15** is, for example, a natural refrigerant, such as carbon dioxide or propane gas.

[0018] The motor **16** includes a stator **17** having a cylindrical shape and a rotor **18** having a cylindrical shape. The rotor **18** is disposed inside the stator **17**. The rotor **18** is rotatable together with the rotary shaft **14**. The rotor **18** includes a rotor core **18***a* and a plurality of permanent magnets **18***b*. The rotor core **18***a* is fixed to the rotary shaft **14**. The permanent magnets **18***b* are disposed in the rotor core **18***a*. The stator **17** surrounds the rotor **18**. The stator **17** includes a stator core **17***a* having a cylindrical shape and a motor coil **19**. The motor coil **19** is wound around the stator core **17***a*. As power is supplied to the motor coil **19**, the rotor **18** rotates, and the rotary shaft

14 rotates together with the rotor **18**. The compression mechanism **15** is driven by the rotation of the rotary shaft **14**. Accordingly, the motor **16** drives the compression mechanism **15**.

[0019] The housing **11** has a suction port **13***h*. The suction port **13***h* is formed in a portion of the peripheral wall **13***b* adjacent to the end wall **13***a*. The refrigerant is drawn into the motor chamber S**1** through the suction port **13***h*. The suction port **13***h* is connected to a first end of an external refrigerant circuit **20**. The housing **11** has a discharge port **12***h*. The discharge port **12***h* is formed in the discharge housing **12**. The discharge port **12***h* is connected to a second end of the external refrigerant circuit **20**.

[0020] The refrigerant is drawn into the motor chamber S**1** from the first end of the external refrigerant circuit **20** through the suction port **13***h*, and compressed by the compression mechanism **15**. The refrigerant compressed by the compression mechanism **15** flows out to the second end of the external refrigerant circuit **20** through the discharge port **12***h*. The refrigerant passes through a heat exchanger and an expansion valve of the external refrigerant circuit **20**, and returns to the motor chamber S**1** through the suction port **13***h*. The electric compressor **10** and the external refrigerant circuit **20** cooperate to form a vehicle air conditioner **21**.

[0021] The electric compressor **10** includes an inverter cover **22**. The inverter cover **22** is a part of the housing **11**. That is, the housing **11** includes the inverter cover **22**. The inverter cover **22** has a cylindrical shape. The inverter cover **22** is connected to the end wall **13***a* of the motor housing **13**. The end wall **13***a* of the motor housing **13** and the inverter cover **22** cooperate to define an inverter chamber **23**. That is, the housing **11** has the inverter chamber **23**. The end wall **13***a* of the motor housing **13** serves as a partition wall of the present disclosure that separates the motor chamber S**1** from the inverter chamber **23**.

[0022] The electric compressor **10** includes an inverter **24**. The inverter **24** is accommodated in the inverter chamber **23**. The inverter **24** drives the motor **16**. The compression mechanism **15**, the motor **16**, and the inverter **24** are arranged in this order in the axial direction of the rotary shaft **14**. The housing **11** accommodates the compression mechanism **15**, the motor **16**, and the inverter **24**.

[0023] The electric compressor **10** includes a plurality of motor wires **25**. The motor wires **25** extend from the motor coil **19** of the motor **16**. Specifically, three motor wires **25** extend from a portion of the motor coil **19** adjacent to the end wall **13***a* of the motor housing **13**. The motor coil **19** includes a U-phase motor coil, a V-phase motor coil, and a W-phase motor coil, and the three motor wires **25** extend from the U-phase motor coil, the V-phase motor coil, and the W-phase motor coil, respectively. The windings of the motor coil **19** are covered with an insulating coating, and the windings partly extend from the motor coil **19** and serve as the motor wires **25**.

[0024] As illustrated in FIG. **2**, the end wall **13***a* of the motor housing **13** has a first insertion hole **26**. The first insertion hole **26** penetrates the end wall **13***a* of the motor housing **13** in a thickness direction of the end wall **13***a*. The first insertion hole **26** is located outward of the center portion of the end wall **13***a* of the motor housing **13** in a radial direction of the rotary shaft **14**. A first end of the first insertion hole **26** is opened on a surface of the end wall **13***a* that faces the motor chamber S**1**. A second end of the first insertion hole **26** is opened on a surface of the end wall **13***a* that faces the inverter chamber **23**.

[0025] As illustrated in FIGS. **2** and **3**, the electric compressor **10** includes a hermetic terminal **30**. The hermetic terminal **30** is disposed on the end wall **13***a* of the motor housing **13**. That is, the hermetic terminal **30** is disposed in the housing **11**. The hermetic terminal **30** seals the motor chamber S**1** and the inverter chamber **23**, and electrically connects the motor **16** and the inverter **24**.

[0026] The hermetic terminal **30** includes a plurality of conductive members **31** (in this embodiment, three conductive members **31**), a support plate **40**, and a plurality of insulators **50** (in this embodiment, three insulators **50**). Each of the conductive member **31** is made of a conductive material. The conductive members **31** of the hermetic terminal **30** respectively correspond to the U-phase motor coil, the V-phase motor coil, and the W-phase motor coil of the motor coil **19**. Each of

the conductive members **31** is a cylindrical metal pin that extends linearly. The conductive member **31** is inserted through the first insertion hole **26**. The conductive members **31** extend parallel to each other. The first end of each conductive member **31** extends into the inverter chamber **23** through the first insertion hole **26**. The first end of the conductive member **31** is electrically connected to the inverter **24**. The second end of each conductive member **31** extends into the motor chamber S**1** through the first insertion hole **26**.

[0027] The second end of the conductive member **31** is electrically connected to a corresponding one of the motor wires **25** via a connecting terminal **28** in a cluster block **27**. The power is supplied from the inverter **24** to the motor **16** via the conductive member **31**, the connecting terminal **28**, and the motor wire **25**. Accordingly, the motor **16** is driven.

[0028] The support plate **40** has a plate-like shape. The support plate **40** is made of metal. For example, the support plate **40** is made of steel. The support plate **40** has an elongated rectangular plate shape in a planar view. The support plate **40** has a plate end wall **41**, a plate cylindrical wall **42**, and a plate flange wall **43**.

[0029] The plate end wall **41** has an elongated plate shape. The plate cylindrical wall **42** extends cylindrically from an outer peripheral portion of the plate end wall **41**. The plate cylindrical wall **42** has an elongated rectangular cylindrical shape.

[0030] The plate flange wall **43** has an annular shape, and extends outwardly from an end of the plate cylindrical wall **42**, which is the end distant from the plate end wall **41**. The plate flange wall **43** has an elongated rectangular annular shape. The plate end wall **41** and the plate cylindrical wall **42** define a recess **44**. That is, the support plate **40** has the recess **44**.

[0031] The plate end wall **41** has three plate through holes **45**. Each of the plate through holes **45** penetrates the plate end wall **41** in a thickness direction of the plate end wall **41**. The plate through holes **45** are arranged in a longitudinal direction of the support plate **40**. The conductive member **31** is inserted through a corresponding one of the plate through holes **45**.

[0032] The three insulators **50** of the hermetic terminal **30** correspond to the conductive members **31**, respectively. Each of the insulators **50** is disposed inside a corresponding one of the plate through holes **45**. The insulator **50** is a glass member with electrical insulation properties. The insulator **50** is a sintered glass insulator. The insulator **50** is disposed between the conductive member **31** and the plate end wall **41**. The insulator **50** provides electrical insulation between the conductive member **31** and the plate end wall **41**. That is, the insulator **50** provides electrical insulation between the conductive member **31** and the support plate **40**. The support plate **40** supports the conductive member **31** with the support plate **40** electrically insulated from the conductive member **31** by the insulator **50**.

[0033] Specifically, in the manufacturing process of the hermetic terminal **30**, firstly, the conductive member **31** and the support plate **40** are aligned with each other and heated. Then, glass is poured between the insulator **50** and the conductive member **31**, and cooled to solidify. Through this manufacturing process, the glass sintered insulator **50** is disposed between the conductive member **31** and the plate end wall **41**.

[0034] As illustrated in FIG. **3**, the support plate **40** has a plurality of first holes **46** (in this embodiment, four first holes **46**). The first holes **46** each have a circular hole shape. The first holes **46** are formed through the plate flange wall **43**. The first holes **46** penetrate the plate flange wall **43** in a thickness direction of the plate flange wall **43**. The first holes **46** are located at four corners of the plate flange wall **43**, respectively. Also, the first holes **46** are arranged around the opening of the recess **44** of the plate flange wall **43**.

[0035] As illustrated in FIG. **2**, the support plate **40** is disposed in the inverter chamber **23** and fixed to the end wall **13***a* of the motor housing **13**. The recess **44** is inserted into the first insertion hole **26**, and supports the conductive member **31**. The support plate **40** is fixed to the end wall **13***a* of the motor housing **13** and closes the first insertion hole **26**. The plate flange wall **43** faces a part of the end wall **13***a* of the motor housing **13** around the first insertion hole **26**. The plate flange wall

43 of the support plate **40** has opposite surfaces, and one surface of the opposite surfaces faces the end wall **13***a* of the motor housing **13** and serves as a contact surface **47** of the support plate **40** that is in contact with the housing **11**. In such a way, the support plate **40** is disposed in the inverter chamber **23**.

[0036] An insulating member **60** is disposed in the recess **44**. The insulating member **60** is made of a rubber material. The insulating member **60** has a base portion **61** having a plate-like shape and three cylindrical portions **62**. The base portion **61** is disposed in the recess **44**, and is in close contact with the plate end wall **41**. An outer peripheral part of the base portion **61** extends along the plate cylindrical wall **42**. The base portion **61** has opposite surfaces, and one surface of the opposite surfaces faces the plate end wall **41**. The cylindrical portions **62** extend cylindrically from the other surface of the opposite surfaces of the base portion **61**.

[0037] The conductive member **31** is inserted through a corresponding one of the cylindrical portions **62** and the base portion **61**. That is, the conductive member **31** penetrates the insulating member **60**. The cylindrical portion **62** protrudes from a surface of the plate flange wall **43**, which is not a surface connected to the plate cylindrical wall **42**. That is, the end of the cylindrical portion **62** extending from the base portion **61** protrudes from the recess **44**. The insulating member **60** provides electrical insulation between the conductive member **31** and the support plate **40**.

[0038] The hermetic terminal **30** includes three hermetic insulating members **70**. Each of the hermetic insulating members **70** is made of a rubber material. The hermetic insulating member **70** has a cylindrical shape. Each of the conductive members **31** is inserted through a corresponding one of the hermetic insulating members **70**. The hermetic insulating member **70** covers a part of the conductive member **31**, which protrudes from the plate end wall **41** and is located inside the first insertion hole **26**. The hermetic insulating member **70** provides electrical insulation between the conductive member **31** and the end wall **13***a* of the motor housing **13**.

[0039] The hermetic terminal **30** includes a sealing member **71**. The sealing member **71** has an annular shape. The sealing member **71** is an O-ring made of a rubber material. The sealing member **71** is disposed between an outer surface of the plate cylindrical wall **42** and an inner peripheral surface of the first insertion hole **26**. The sealing member **71** seals a gap between the outer surface of the plate cylindrical wall **42** and the inner peripheral surface of the first insertion hole **26**. That is, the sealing member **71** seals the gap between the support plate **40** and the inner peripheral surface of the first insertion hole **26**. The sealing member **71** is arranged to overlap with the support plate **40** and a reinforcing plate **80** in an axial direction of the sealing member **71**.

[0040] As illustrated in FIGS. **2** and **3**, the reinforcing plate **80** and the support plate **40** are fastened together to the end wall **13***a* of the motor housing **13** by a plurality of bolts **81**, which each serve as the fastening member of the present disclosure. That is, the support plate **40** and the reinforcing plate **80** are fastened together to the housing **11** by the bolts **81**. The reinforcing plate **80** is made of metal. For example, the reinforcing plate **80** is made of steel. The reinforcing plate **80** has an elongated rectangular plate shape in a planar view. The reinforcing plate **80** enhances the rigidity of the support plate **40**.

[0041] The plate flange wall **43** is disposed between the reinforcing plate **80** and the end wall **13***a* of the motor housing **13**. That is, the support plate **40** is disposed between the reinforcing plate **80** and the housing **11**. A thickness direction of the reinforcing plate **80** and the thickness direction of the plate flange wall **43** of the support plate **40** are aligned with each other. In such a way, the reinforcing plate **80** is disposed in the inverter chamber **23**.

[0042] The reinforcing plate **80** has a second insertion hole **82**. The conductive members **31** are inserted through the second insertion hole **82**. The second insertion hole **82** extends along the opening of the recess **44**. The second insertion hole **82** is smaller than the opening of the recess **44**. The second insertion hole **82** and the opening of the recess **44** have similar shapes. The second insertion hole **82** of the reinforcing plate **80** is connected to the recess **44** of the support plate **40**. A portion of the reinforcing plate **80** around the second insertion hole **82** partly covers the opening of

the recess **44**. That is, the reinforcing plate **80** covers the opening of the recess **44**.
[0043] The end of each cylindrical portion **62** extending from the base portion **61** of the insulating member **60** protrudes from the recess **44** and is positioned inside the second insertion hole **82**. That is, an end of the cylindrical portion **62** is surrounded by the second insertion hole **82**. That is, the insulating member **60** is surrounded by the second insertion hole **82**.
[0044] As illustrated in FIG. **3**, the reinforcing plate **80** has a plurality of second holes **83** (in this embodiment, four second holes **83**). The second holes **83** each have a circular hole shape. The second holes **83** penetrate the reinforcing plate **80** in the thickness direction of the reinforcing plate **80**. The second holes **83** are located at four corners of the reinforcing plate **80**, respectively. Also, the second holes **83** are located around the second insertion hole **82** of the reinforcing plate **80**. Each of the second holes **83** of the reinforcing plate **80** is connected to a corresponding one of the first holes **46**.
[0045] As illustrated in FIG. **4**, a diameter of the second hole **83** is smaller than a diameter of the first hole **46**. A part of the reinforcing plate **80** around the second hole **83** partly covers the first hole **46**. Each of the bolts **81** is inserted through the second hole **83** and the first hole **46**. The bolt **81** is screwed into a female screw hole **13***c* of the end wall **13***a* of the motor housing **13** through the second hole **83** and the first hole **46** to fix the support plate **40** and the reinforcing plate **80** to the end wall **13***a* of the motor housing **13**.
[0046] As illustrated in FIGS. **2** and **3**, the reinforcing plate **80** has a pair of cutouts **84**. The reinforcing plate **80** has opposite ends that define the reinforcing plate **80** in a longitudinal direction of the reinforcing plate **80**, and the cutouts **84** are respectively formed at edges of the opposite ends of the reinforcing plate **80**. The cutouts **84** penetrate the reinforcing plate **80** in the thickness direction of the reinforcing plate **80**.
[0047] The plate flange wall **43** of the support plate **40** has the opposite surfaces, and the one surface of the opposite surfaces faces the end wall **13***a* of the motor housing **13** and serves as the contact surface **47**. The plate flange wall **43** has, on the other surface of the opposite surfaces, a plurality of information members **85** indicating predetermined information. That is, the support plate **40** has the opposite surfaces, and one surface of the opposite surfaces serves as the contact surface **47**. The support plate **40** has, on the other surface of the opposite surfaces, the plurality of information members **85** indicating predetermined information. The information members **85** are disposed on the other surface respectively on opposite sides in a longitudinal direction of the plate end wall **41**. The information members **85** are exposed through the cutouts **84**, respectively. In other words, each of the cutouts **84** serves as the exposure portion of the present disclosure through which the information member **85** is exposed. That is, the reinforcing plate **80** has the exposure portion of the present disclosure through which the information member **85** is exposed. The information member **85** may indicate information, such as a manufacturing location and manufacturing date of the hermetic terminal **30**, or information on the electric compressor **10**. The information member **85** is, for example, a QR code (registered trademark) or a barcode. The information member **85** may be a sticker indicating predetermined information. FIGS. **2** and **3** schematically illustrate the information member **85**.

Operation

[0048] The following will describe the operation of the electric compressor **10** according to the present embodiment.
[0049] In the electric compressor **10**, the pressure of the refrigerant drawn into the motor chamber S**1** acts on the support plate **40** through the first insertion hole **26**. The support plate **40** and the reinforcing plate **80** for enhancing the rigidity of the support plate **40** are fastened together to the end wall **13***a* of the motor housing **13** by the bolts **81**. This configuration enhances the rigidity of the support plate **40**. This configuration therefore enables the support plate **40** to withstand the pressure of the refrigerant.
[0050] When the end wall **13***a* of the motor housing **13** is cooled by the refrigerant drawn into the

motor chamber S**1**, water may condense on the support plate **40** located between the end wall **13***a* of the motor housing **13** and the reinforcing plate **80**. The water may flow along the recess **44**, however, the reinforcing plate **80**, which covers the opening of the recess **44** as illustrated in FIG. **2**, blocks the water.

[0051] Furthermore, the reinforcing plate **80** blocks the water flowing through the first hole **46** since the diameter of the second hole **83** is smaller than that of the first hole **46** as illustrated in FIG. **4**. This configuration prevents the water from entering the inverter chamber **23**.

[0052] The aforementioned embodiment may achieve the following advantageous effects.

[0053] (1) The support plate **40** and the reinforcing plate **80** for enhancing the rigidity of the support plate **40** are fastened together to the housing **11** by the bolts **81**. This configuration allows the support plate **40** to have enhanced rigidity without increasing the thickness of the support plate **40**.

[0054] (2) The support plate **40** is disposed between the reinforcing plate **80** and the housing **11**. This configuration facilitates the alignment of the reinforcing plate **80** with the support plate **40**, thereby facilitating the assembly of the reinforcing plate **80**. This also facilitates visual check of the reinforcing plate **80** to confirm that the reinforcing plate **80** has been mounted. In particular, this facilitates visual check for detecting incorrect assembly of the reinforcing plate **80** if the support plate **40** is selected from multiple types of support plates depending on the type of refrigerant.

[0055] (3) The reinforcing plate **80** covers the opening of the recess **44**, thereby blocking the water flowing along the recess **44**. This increases the reliability of the electric compressor **10**.

[0056] (4) The insulating member **60** is surrounded by the second insertion hole **82**. The presence of the insulating member **60** facilitates ensuring electrical insulation between the reinforcing plate **80** and the conductive member **31**. This configuration further increases the reliability of the electric compressor **10**.

[0057] (5) The diameter of the second hole **83** is smaller than that of the first hole **46**. This configuration allows the reinforcing plate **80** to block the water flowing through the first hole **46**. This increases the reliability of the electric compressor **10**.

[0058] (6) Although the support plate **40** and the reinforcing plate **80** are disposed in the inverter chamber **23**, the electric compressor **10** allows the support plate **40** to have enhanced rigidity without increasing the thickness of the support plate **40**.

[0059] (7) The reinforcing plate **80** has the cutouts **84**. The presence of each of the cutouts **84** allows the exposure of the information member **85**, which is disposed on the surface of the support plate **40** opposite to the contact surface **47** that is in contact with the housing **11**.

[0060] (8) For example, if the thickness of the plate flange wall **43** is increased to enhance the rigidity of the support plate **40** instead of providing the reinforcing plate **80**, the plate flange wall **43** becomes thicker than the rest of the support plate **40**. This structure may cause distortion of the support plate **40** when the support plate **40** is heated and cooled in order to dispose the insulator **50** between the conductive member **31** and the plate end wall **41**. According to the present embodiment, the rigidity of the support plate **40** is enhanced without increasing the thickness of the support plate **40**. This prevents the distortion of the support plate **40** that may occur when the support plate **40** is heated and cooled. This therefore facilitates the manufacturing of the hermetic terminal **30** including the insulator **50**, e.g., a sintered glass insulator, between the conductive member **31** and the support plate **40**.

[0061] (9) The reinforcing plate **80** covers the opening of the recess **44**, thereby blocking the water flowing along the recess **44**. The reinforcing plate **80** also blocks the water flowing through the first hole **46** since the diameter of the second hole **83** is smaller than that of the first hole **46**. This prevents the condensation of the water on the support plate **40**, thereby preventing the water from entering the inverter chamber **23**. This therefore prevents the water from causing the occurrence of failures in the inverter **24**.

[0062] (10) The sealing member **71** is arranged to overlap with the support plate **40** and the

reinforcing plate **80** in the axial direction of the sealing member **71**. This configuration ensures the sealing performance of the sealing member **71**, if the sealing member **71** is an O-ring.

[0063] The aforementioned embodiment may be modified as below. The embodiment and the following modifications may be combined with each other within technically consistent range.

[0064] In the embodiment, the reinforcing plate **80** may be disposed between the plate flange wall **43** of the support plate **40** and the housing **11**. That is, the support plate **40** does not necessarily have to be disposed between the reinforcing plate **80** and the housing **11**.

[0065] In the embodiment, the reinforcing plate **80** does not necessarily have to cover the opening of the recess **44**.

[0066] In the embodiment, the end of each cylindrical portion **62** extending from the base portion **61** of the insulating member **60** may protrude from the second insertion hole **82**. That is, the insulating member **60** may protrude from the second insertion hole **82**.

[0067] In the embodiment, the end of each cylindrical portion **62** extending from the base portion **61** of the insulating member **60** protrudes from the recess **44**, but does not necessarily have to be positioned inside the second insertion hole **82**. That is, the insulating member **60** does not necessarily have to be surrounded by the second insertion hole **82**.

[0068] In the embodiment, the diameter of the second hole **83** may be equal to or greater than the diameter of the first hole **46**.

[0069] In the embodiment, the support plate **40** and the reinforcing plate **80** may be disposed in the motor chamber S**1**.

[0070] In the embodiment, the reinforcing plate **80** may have a through hole, for example, which serves as the exposure portion of the present disclosure through which the information member **85** is exposed. That is, the exposure portion of the present disclosure through which the information member **85** is exposed is not limited to the cutout **84**.

[0071] In the embodiment, the support plate **40** does not necessarily have to have the information member **85** on the surface opposite to the contact surface **47** that is in contact with the housing **11**.

[0072] In the embodiment, for example, a press-fit pin may be used as the fastening member of the present disclosure, instead of the bolt **81**.

[0073] In the embodiment, the electric compressor **10** may include: a bottomed-cylindrical covering body formed separately from the motor housing **13** and attached to the end wall **13***a* of the motor housing **13**; and a lid member for closing an opening of the covering body, and the inverter chamber **23** may be defined by the covering body and the lid member. This configuration allows the end wall **13***a* of the motor housing **13** and a bottom wall of the covering body cooperate to serve as the partition wall of the present disclosure that separates the motor chamber S**1** from the inverter chamber **23**. The first insertion hole **26** may penetrate the end wall **13***a* of the motor housing **13** and the bottom wall of the covering body.

[0074] In the electric compressor **10** of the embodiment, for example, the inverter **24** may be disposed outward of the housing **11** in the radial direction of the rotary shaft **14**. That is, the compression mechanism **15**, the motor **16**, and the inverter **24** do not necessarily have to be arranged in this order in the axial direction of the rotary shaft **14**.

[0075] In the embodiment, the compression mechanism **15** is not limited to a scroll compression mechanism. The compression mechanism **15** may be a compression mechanism, such as a piston compression mechanism, a vane compression mechanism, or a rotary compression mechanism.

[0076] In the embodiment, the electric compressor **10** is included in the vehicle air conditioner **21**, but the electric compressor **10** may be mounted to a fuel cell vehicle and be configured to compress air as a fluid, which is supplied to a fuel cell, with the compression mechanism **15**.

[0077] The following will describe technical ideas derived from the above-described embodiments and modifications.

Appendix 1

[0078] An electric compressor comprising:

[0079] a housing;
[0080] a compression mechanism accommodated in the housing and configured to compress a fluid;
[0081] a motor accommodated in the housing and configured to drive the compression mechanism;
[0082] an inverter accommodated in the housing and configured to drive the motor; and
[0083] a hermetic terminal disposed in the housing, and electrically connecting the motor and the inverter,
[0084] the hermetic terminal including: [0085] a conductive member made of a conductive material; [0086] a support plate having a plate-like shape and made of metal, the support plate supporting the conductive member; and [0087] an insulator that provides electrical insulation between the conductive member and the support plate, wherein
[0088] the electric compressor includes a reinforcing plate having a plate-like shape, and
[0089] the support plate and the reinforcing plate for enhancing rigidity of the support plate are fastened together to the housing by a fastening member.

Appendix 2

[0090] The electric compressor according to appendix 1, wherein [0091] the support plate is disposed between the reinforcing plate and the housing.

Appendix 3

[0092] The electric compressor according to appendix 1 or 2, wherein
[0093] the housing includes a partition wall that separates a motor chamber for accommodating the motor from an inverter chamber for accommodating the inverter,
[0094] the partition wall has a first insertion hole through which the conductive member is inserted,
[0095] the support plate has a recess that is inserted into the first insertion hole and supports the conductive member,
[0096] the reinforcing plate has a second insertion hole through which the conductive member is inserted, and
[0097] the reinforcing plate covers an opening of the recess.

Appendix 4

[0098] The electric compressor according to appendix 3, wherein
[0099] the conductive member penetrates an insulating member disposed in the recess,
[0100] the insulating member provides electrical insulation between the conductive member and the support plate, and
[0101] the insulating member is surrounded by the second insertion hole.

Appendix 5

[0102] The electric compressor according to any one of appendices 1 to 4, wherein
[0103] the support plate has a first hole through which the fastening member is inserted,
[0104] the reinforcing plate has a second hole through which the fastening member is inserted, and
[0105] a diameter of the second hole is smaller than a diameter of the first hole.

Appendix 6

[0106] The electric compressor according to appendix 3, wherein
[0107] the support plate and the reinforcing plate are disposed in the inverter chamber.

Appendix 7

[0108] The electric compressor according to any one of appendices 1 to 6, wherein
[0109] the support plate has opposite surfaces, and one surface of the opposite surfaces serves as a contact surface in contact with the housing,
[0110] the support plate has, on the other surface of the opposite surfaces, an information member indicating predetermined information, and
[0111] the reinforcing plate has an exposure portion through which the information member is exposed.

Claims

1. An electric compressor comprising: a housing; a compression mechanism accommodated in the housing and configured to compress a fluid; a motor accommodated in the housing and configured to drive the compression mechanism; an inverter accommodated in the housing and configured to drive the motor; and a hermetic terminal disposed in the housing, and electrically connecting the motor and the inverter, the hermetic terminal including: a conductive member made of a conductive material; a support plate having a plate-like shape and made of metal, the support plate supporting the conductive member; and an insulator that provides electrical insulation between the conductive member and the support plate, wherein the electric compressor includes a reinforcing plate having a plate-like shape, and the support plate and the reinforcing plate for enhancing rigidity of the support plate are fastened together to the housing by a fastening member.

2. The electric compressor according to claim 1, wherein the support plate is disposed between the reinforcing plate and the housing.

3. The electric compressor according to claim 1, wherein the housing includes a partition wall that separates a motor chamber for accommodating the motor from an inverter chamber for accommodating the inverter, the partition wall has a first insertion hole through which the conductive member is inserted, the support plate has a recess that is inserted into the first insertion hole and supports the conductive member, the reinforcing plate has a second insertion hole through which the conductive member is inserted, and the reinforcing plate covers an opening of the recess.

4. The electric compressor according to claim 3, wherein the conductive member penetrates an insulating member disposed in the recess, the insulating member provides electrical insulation between the conductive member and the support plate, and the insulating member is surrounded by the second insertion hole.

5. The electric compressor according to claim 1, wherein the support plate has a first hole through which the fastening member is inserted, the reinforcing plate has a second hole through which the fastening member is inserted, and a diameter of the second hole is smaller than a diameter of the first hole.

6. The electric compressor according to claim 3, wherein the support plate and the reinforcing plate are disposed in the inverter chamber.

7. The electric compressor according to claim 1, wherein the support plate has opposite surfaces, and one surface of the opposite surfaces serves as a contact surface in contact with the housing, the support plate has, on the other surface of the opposite surfaces, an information member indicating predetermined information, and the reinforcing plate has an exposure portion through which the information member is exposed.