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Current transformer for a gas insulated switchgear

Stromwandler für eine gasisierte Schaltanlage

Transformateur de courant pour une installation de commutation à isolation gazeuse

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Description

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

[0001] The present invention relates to a gas insulated switching device transforming an electric power in a power system, particularly to installation of a current transformer.

DISCUSSION OF BACKGROUND

[0002] A gas insulated switching device, used in a field of generating and transforming an electric power in a power system, is constructed by a switching device, a conductor, a current transformer, a surging arrester, and so on, which are accommodated in a metallic pressure container, filled with an arc-extinguishing gas such as a sulfur hexafluoride (hereinbelow referred to as SF$_6$ gas) having excellent insulating capability and excellent arc-extinguishing capability. The switching device, the conductor, the current transformer, the surging arrester, and so on are mutually connected, whereby the gas insulated switching device has been small-sized. A similar installation is described in US-A-5,939,876. However, further improvement in economy is required by reducing a space occupied by the gas insulated switching device by virtue of miniaturization and improvement in reliability of component obtained as a result of a recent technological development.

[0003] Figure 7 is a cross-sectional view illustrating a conventional current transformer. In Figure 7, numerical references 1, 4 designate a pressure container, in which a conductor 2 is accommodated in a center thereof and which is SF$_6$ gas filled. Numerical reference 3 designates an insulating spacer for supporting the conductor 2 and separating the gas in the pressure container 1 from the gas in the other pressure container 4, connected to the pressure container 1. Numerical reference 6 designates a current transformer holder attached to flanges of the pressure containers 1 and 4 via the insulating spacer 3, the current transformer holder includes a cylindrical portion having grooves like a ring and an attaching flange corresponding to the flanges of the pressure containers 1 and 4. Numerical reference 7 designates a plurality of Rogowskii coils, positioned in the groove like the ring in the current transformer holder 6 via a spacer 8 in an axial direction of the pressure container 1. Numerical reference 9 designates a fixing plate for fixing the Rogowskii coils 7 inside the groove. A current transforming portion is constructed by the current transformer holder 6, the Rogowskii coils 7, the spacer 8, and the fixing plate 9 for detecting a current applied to the conductor 2. The Rogowskii coils 7 is formed by uniformly winding a coil around a high molecular member, being flexible and having a circular cross sectional view or the like by many turns, wherein the Rogowskii coils work as a current sensor, from which a current signal is obtainable in proportion to a current value flowing inside the Rogowskii coils 7.

[0004] However, since the Rogowskii coils 7 forming the current transformer are flexible, hollow portions of the Rogowskii coils are deformed by a pressure applied to surfaces of the Rogowskii coils when attaching these to the current transformer holder 6, whereby the accuracy of detecting a current is deteriorated.

[0005] Further, since the Rogowskii coils 7 are attached to the current transformer holder 6 having protrusions in the axial directions of the pressure container 1, for example, in case that a breaker container containing a breaker and so on are connected, the protrusion of the current transformer holder 6 insufficiently protrudes inside the breaker container, whereby the length of the pressure container 1 should be increased, and a miniaturization of an entirety of the switching device is difficult.

[0006] Further, although it is necessary to sufficiently keep an insulating distance between the Rogowskii coils and the conductor 2, the current transformer holder 6 also protrudes in a radial direction of the pressure container 1, whereby the diameter of the pressure container is increased, miniaturization of the entire switching device is difficult.

SUMMARY OF THE INVENTION

[0007] It is an object of the present invention to solve the above-mentioned problems inherent in the conventional technique and to provide a gas insulated switching device, in which a highly accurate current transformer is equipped for miniaturizing the gas insulated switching device.

[0008] According to a first aspect of the present invention, there is provided a gas insulated switching device comprising: a series of mutually connected pressure containers within the center of which a conductor is positioned and within which an insulating and arc-extinguishing gas fills a space around the conductor; and a current transformer fabricated by Rogowskii coils for detecting a current passing through the conductor and being accommodated in a groove formed within the body of an annular adaptor attached to the pressure containers; characterised in that the annular adaptor is metallic and located between flanges of the pressure containers, and the current transformer is attached to the pressure containers via the annular metallic adaptor and uses the metallic adaptor to obtain an earth potential, the groove being open to the space purge with the insulating and arc-extinguishing gas.

[0009] Preferably, the Rogowskii coils of the current transformer are formed by uniformly winding a coil with a plurality of turns around an inflexible insulating member.

[0010] Preferably also, the metallic adaptor is attached to one of the pressure containers via an insulat-
ing spacer that separates the gas in the series of containers, and the metallic adaptor defines a rounded portion in an inner peripheral surface on a side in contact with the insulating spacer to relax an electric field in a triple junction, formed by the insulating and arc-extinguishing gas filled in the pressure containers, the insulating spacer, and the metallic adaptor.

Preferably also, a flange of one of the pressure containers is the metallic adaptor.

Preferably also, a current detector for measuring the current detected by the current transformer is located on an outer periphery of the metallic adaptor.

Preferably also, a breaker is located inside a breaker container, which is closely joined to the series of pressure containers; a second current transformer is fabricated by Rogowskii coils for detecting the current passing through a second conductor connected to the breaker by attaching a second annular metallic adaptor located in an outer periphery of the conductor to a breaker container, and the second current transformer is accommodated in a groove formed within the body of the second metallic adaptor and uses the second metallic adaptor to obtain an earth potential.

Preferably also, a plurality of Rogowskii coils of the same dimensions is concentrically arranged in the metallic adaptor in an axial direction with respect to the pressure containers.

Preferably also, a plurality of the Rogowskii coils of the same dimensions in an axial direction with respect to a cross section of the coils and of different dimensions in a radial direction with respect to the coils are concentrically arranged in a radial direction with respect to the pressure containers.

Preferably also, the Rogowskii coils are monolithically molded by a flexible resin inside the metallic adaptor.

A more complete appreciation of the invention and many of the attendant advantages thereof will be readily obtained as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings, wherein:

Figure 1a is a cross-sectional view of a current transformer of a gas insulated switching device according to Embodiment 1 of the present invention; Figure 1b is an enlarged view of the current transformer. In Figures 1a and 1b, numerical references 1 and 4 designate pressure containers filled with a SF₆ gas, wherein a conductor 2 is accommodated in a center of the pressure containers. Numerical reference 3 designates an insulating spacer for supporting the conductor 2 and separating the gas in the pressure container 1 and the other pressure container 4 connected thereto. Numerical reference 5 designates an annular metallic adaptor attached to flanges of the pressure containers 1 and 4 via the insulating spacer 3. Numerical reference 7 designates a plurality of Rogowskii coils arranged in a groove formed in the metallic adaptor 5. Numerical reference 10 designates a current detector measuring a current detected by the current transformer including the Rogowskii coils. Numerical reference 11 designates a lead wire for connecting the Rogowskii coils 7 with the current detector 10. Numerical reference 12 designates a resin having flexibility, by which the metallic adaptor 5 and the Rogowskii coils 7 are monolithically molded. The current transformer is fabricated by the metallic adaptor 5, the Rogowskii coils 7, the current detector 10, and the lead wire 11 for detecting a current passing...
through the conductor 2.

Differences between Embodiment 1 and the conventional technique are as follows. First, a current transformer holder in the conventional technique is changed to the metallic adaptor 5. The metallic adaptor 5 according to Embodiment 1 has the groove inside a body of the metallic adaptor 5. The Rogowskii coils 7 are accommodated in the groove, wherein a plurality of the Rogowskii coils 7 having same diameters are arranged side by side in an axial direction of the pressure container 1 around same axis centers, wherein two Rogowskii coils are exemplified in Figures 1a and 1b.

The metallic adaptor 5 is attached to the flanges of the pressure containers 1 and 4 in a similar manner to that in the conventional technique. The current detector 10 is attached to an outer periphery of the metallic adaptor 5, which is connected to the Rogowskii coils 7 through a lead wire 11. Further, a rounded portion is formed in an inner diameter of the metallic adaptor 5 on a side in contact with the insulating spacer 3. The rounded portion is to relax an electric field in a triple junction among the insulating and arc-extinguishing gas filled in the pressure containers 1 and 4, the insulating spacer 3, and the metallic adaptor 5.

Second, although in a conventional technique the coil having many turns is uniformly wound around an insulating member having flexibility, an inflexible insulating member is used for the Rogowskii coils 7 in Embodiment 1. A suitable material for the insulating member of the Rogowskii coils 7 is an epoxy laminating resin with a glass fabric base, a phenol laminating resin with a paper base, FRP and so on.

On the other hand, the Rogowskii coils are monolithically molded by the resin 12 having flexibility inside the groove of the metallic adaptor 5. By monolithically molding the Rogowskii coils, it is possible to obtain the current transformer, which can be easily operated and simply installed, at a low cost. A method of monolithically molding the Rogowskii coils 7 is injection of a silicon system resin, an epoxy system resin, a butyl system resin, and so on respectively having excellent anti-arc gas property. Further, it is possible to apply a conventional method of producing the Rogowskii coils such that a resin is impregnated after winding an insulating tape.

As described, according to Embodiment 1, since the Rogowskii coils 7 are arranged in the groove of the metallic adaptor 5 without protruding portions, it is possible to prevent sizes in the axial and radial directions of the pressure container 1 from increasing, and an entire size of the switching device can be miniaturized.

Further, since the Rogowskii coils 7 is obtained by winding the coil around the insulating member without flexibility, it is possible to suppress deformation of hollow portions of the Rogowskii coils 7, and the current can be detected with high accuracy.

Figure 2 is a cross-sectional view illustrating a current transformer of a gas insulated switching device according to Embodiment 2 of the present invention. A difference from Embodiment 1 is that a flange of a pressure container 1 overlaps a groove accommodating the Rogowskii coil because the pressure container 1 and a pressure container 4 have same diameters. Therefore, a cut-out 15 is formed in the flange of the pressure container 1 so as not to clog an opening portion of the groove. Accordingly, it is possible to obtain an effect of matching the diameter of the pressure container 1 with the diameter of the pressure container 4 and making the diameters of the pressure containers 1 and 4 small.

Figure 3 is a cross-sectional view illustrating a current transformer of a gas insulated switching device according to Embodiment 3 of the present invention. In Embodiment 3, an opening portion of a groove in a metallic adaptor 5 is formed to face a side of an insulating spacer 3. Therefore, as in Embodiment 2, it is unnecessary to form a cut-out in a flange of a pressure container, and processing of the flange of the pressure container 1 is simplified, whereby an effect of producing at a low cost is obtainable.

Figure 4 is a cross-sectional view illustrating a current transformer of a gas insulated switching device according to Embodiment 4 of the present invention. In embodiment 4, flanges of a pressure container 1 and a metallic adaptor 5 are identical. Therefore, it is unnecessary to use the metallic adaptor 5, a dimension of the pressure container 1 in its axial direction is reduced, and a body of the switching device is miniaturized.

Figure 5 is a cross-sectional view illustrating a current transformer of a gas insulated switching device according to Embodiment 5 of the present invention. In Embodiment 5, two Rogowskii coils 7 having same dimensions in an axial direction of a pressure container 1 and different dimensions in radial directions are concentrically arranged in a groove of a metallic adaptor 5. Therefore, the width of the metallic adaptor 5 in the axial direction is shortened to make a dimension of an entirety of the gas insulated switching device in its axial direction short, whereby the device is miniaturized.

Further, in Embodiment 5, a case that the Rogowskii coils having the same dimensions in the axial direction of the pressure container 1 and different dimensions in the radial direction are concentrically arranged in the groove of the metallic adaptor 5, such a
structure can be respectively applied to the above-mentioned embodiments.

EMBODIMENT 6

[0031] In Embodiment 6, a case that a structure of locating a current transformer in a connecting portion of pressure containers in the above-mentioned embodiments to an inside of a breaker container. Figure 6a is a cross-sectional view illustrating a breaker container of a gas insulated switching device according to Embodiment 6 of the present invention. Figure 6b is an enlarged view illustrating a current transformer located inside the breaker container. In Figures 6a and 6b, numerical reference 13 designates the breaker container; numerical reference 14 designates the breaker; and numerical reference 15 designates an inner conductor connected to the breaker 14.

[0032] As illustrated in Figure 6a and 6b, an annular metallic adaptor having a groove is arranged in an outer periphery of the internal conductor 15 around an axis center thereof. In the groove of the metallic adaptor 5, two Rogowskii coils 7 having same diameters are arranged side by side in an axial direction of the metallic adaptor. Although a structure around the metallic adaptor 5 inside the breaker container is similar to that illustrated in Figure 1, structures respectively described in the above-mentioned embodiments can be applied to Embodiment 6.

[0033] Further, in all of the above-mentioned embodiments, two Rogowskii coils 7 are used. However, the present invention is not limited to the use of two coils 7, and three or more Rogowskii coils 7 may be used. Further, in Figures 1a through 5, an inner diameter of the metallic adaptor 5 may be the same as an inner diameter of the pressure container 1 or less. Further, the gas insulated switching device may be a three-phase-bus and single-phase breaker type, a type that all three phases are simultaneously switched, and an isolated phase type. The breaker illustrated in Figure 6 is a vertically arranged type. However, the breaker may be a horizontally arranged type.

[0034] Also, in all of the embodiments, the coils 7 forming the current transformer uses the metallic adaptor 5 to obtain an earth potential.

[0035] The first advantage of the gas insulated switching device according to the present invention is that the dimensions of the pressure containers in the axial and radial directions are not increased, and an entire size of the switching device is miniaturized.

[0036] The second advantage of the gas insulated switching device according to the present invention is that the hollow portion of the Rogowskii coils can be prevented from deforming, and a current can be detected with high accuracy.

[0037] The third advantage of the gas insulated switching device according to the present invention is that an electric field around the triple junction can be relaxed.

[0038] The fourth advantage of the gas insulated switching device according to the present invention is that an influence of a surge noise is suppressed, and it is possible to measure with high accuracy and high reliability.

[0039] The fifth advantage of the gas insulated switching device according to the present invention is that the dimension of the pressure containers in the axial direction can be shortened, the dimension of the entire gas insulated switching device can be shortened, and therefore the gas insulated switching device is miniaturized.

[0040] The sixth advantage of the gas insulated switching device according to the present invention is that the structure of attaching the Rogowskii coils to the metallic adaptor is simplified, and the Rogowskii coils can be produced at a low cost.

[0041] Obviously, numerous modifications and variations of the present invention are possible in light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described herein.

Claims

1. A gas insulated switching device comprising:

- a series of mutually connected pressure containers (1, 4) within the center of which a conductor (2) is positioned and within which an insulating and arc-extinguishing gas fills a space around the conductor; and

- a current transformer fabricated by Rogowskii coils (7) for detecting a current passing through the conductor (2) and being accommodated in a groove formed within the body of an annular adaptor attached to the pressure containers (1, 4);

characterised in that

- the annular adaptor (5) is metallic and located between flanges of the pressure containers (1, 4), and the current transformer is attached to the pressure containers (1, 4) via the annular metallic adaptor (5) and uses the metallic adaptor (5) to obtain an earth potential, the groove being open to the space purged with the insulating and arc-extinguishing gas.

2. The gas insulated switching device according to Claim 1, characterised in that the Rogowskii coils (7) of the current transformer are formed by uniformly winding a coil with a plurality of turns around an inflexible insulating member.
3. The gas insulated switching device according to Claim 1 or Claim 2, characterised in that the metallic adaptor (5) is attached to one of the pressure containers (1, 4) via an insulating spacer (3) that separates the gas in the series of containers (1, 4), and in that the metallic adaptor defines a rounded portion in an inner peripheral surface on a side in contact with the insulating spacer (3) to relax an electric field in a triple junction, formed by the insulating and arc-extinguishing gas filled in the pressure containers (1, 4), the insulating spacer (3), and the metallic adaptor (5).

4. The gas insulated switching device according to Claim 1 or 2, characterised in that a flange of one of the pressure containers (1,4) is the metallic adaptor (5).

5. The gas insulated switching device according to Claim 1 or 2, characterised in that a current detector (10) for measuring the current detected by the current transformer is located on an outer periphery of the metallic adaptor (5).

6. The gas insulated switching device according to Claim 1 or 2, characterised in that a breaker (14) is located inside a breaker container (13), which is closely joined to the series of pressure containers (1,4); in that a second current transformer is fabricated by Rogowski coils (7) for detecting the current passing through a second conductor (15) connected to the breaker (14) by attaching a second annular metallic adaptor (5) located in an outer periphery of the conductor (15) to a breaker container (13); and in that the second current transformer is accommodated in a groove formed within the body of the second metallic adaptor (5) and uses the second metallic adaptor (5) to obtain an earth potential.

7. The gas insulated switching device according to Claim 1 or 2, characterised in that a plurality of Rogowski coils (7) of the same dimensions is concentrically arranged in the metallic adaptor (5) in an axial direction with respect to the pressure containers (1,4).

8. The gas insulated switching device according Claim 1 or 2, characterised in that a plurality of the Rogowski coils (7) of the same dimensions in an axial direction with respect to a cross section of the coils and of different dimensions in a radial direction with respect to the coils is concentrically arranged in a radial direction with respect to the pressure containers (1, 4).

9. The gas insulated switching device according to Claim 1 or 2, characterised in that the Rogowski coils (7) are monolithically molded by a flexible resin (12) inside the metallic adaptor (5).

10. The gas insulated switching device according to claims 1 or 2, characterised in that an opening of the groove of the metallic adapter (5) faces to a side of the insulating spacer (3).

Patentansprüche

1. Gasgekapselte Schaltvorrichtung, umfassend:

   - eine Reihe miteinander verbundener Druckbehälter (1, 4), in deren Mitte ein Leiter (2) positioniert ist, und in denen ein isolierendes und lichtbogenlöschendes Gas einen Raum um den Leiter füllt; und

   - einen Stromwandler, der aus Rogowski-Spulen (7) hergestellt ist, um einen durch den Leiter (2) fließenden Strom zu erfassen, und der in einer Auskehrung untergebracht ist, die im Körper eines an den Druckbehältern (1, 4) befestigten ringförmigen Anpassungsstücks ausgebildet ist;

   dadurch gekennzeichnet, dass

   - das ringförmige Anpassungsstück (5) aus Metall besteht und zwischen Flanschen der Druckbehälter (1, 4) angeordnet ist, und der Stromwandler über das ringförmige Metallanpassungsstück (5) an den Druckbehältern (1, 4) befestigt ist und das Metallanpassungsstück (5) dazu verwendet, ein Massenpotential zu erhalten, wobei die Auskehrung zu dem Raum hin offen ist, der mit dem isolierenden und lichtbogenlöschenden Gas durchspült ist.

2. Gasgekapselte Schaltvorrichtung nach Anspruch 1, dadurch gekennzeichnet, dass die Rogowski-Spulen (7) des Stromwandlers dadurch ausgebildet sind, dass eine Spule mit einer Vielzahl von Windungen um ein nicht flexibles Isolierteil gewickelt ist.

3. Gasgekapselte Schaltvorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, dass das Metallanpassungsstück (5) über einen isolierenden Abstandhalter (3), der das Gas in der Reihe von Druckbehältern (1, 4) trennt, an einem der Druckbehälter (1, 4) befestigt ist, und dass das Metallanpassungsstück einen abgerundeten Abschnitt an einer inneren Umfangsfläche auf einer Seite bildet, die mit dem isolierenden Abstandhalter (3) in Berührung ist, um ein elektrisches Feld in einer Dreifachverbindung zu entspannen, gebildet durch das in die Druckbehälter (1,4) gefüllte, isolier-
rende und lichtbogenlöschende Gas, den isolierenden Abstandshalter (3) und das Metallanpassungsstück (5).

4. Gasgekapselte Schaltvorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, dass es sich bei einem Flansch eines der Druckbehälter (1, 4) um das Metallanpassungsstück (5) handelt.

5. Gasgekapselte Schaltvorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, dass ein Stromsensor (10) zum Messen des vom Stromwandler erfassten Stroms sich an einem Außenumfang des Metallanpassungsstücks (5) befindet.

6. Gasgekapselte Schaltvorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, dass ein Unterbecher (14) innerhalb eines Unterbrecherbehälters (13) befindet, der mit engem Abstand an die Reihe der Druckbehälter (1, 4) angeschlossen ist; dass ein zweiter Stromwandler aus Rogowski-Spulen (7) hergestellt ist, um den Strom zu erfassen, der durch einen zweiten Leiter (15) fließt, der dadurch an den Unterbecher (14) angeschlossen ist, dass ein an einem Außenumfang des Leiter (15) befindliches, zweites ringförmiges Anpassungsstück (5) am Unterbrechergehäuse (13) befestigt ist; und dass der zweite Stromwandler in einer in den Körper des zweiten Metallanpassungsstücks (5) ausgebildeten Auskehlung untergebracht ist und das zweite Metallanpassungsstück (5) dazu verwendet, ein Massepotential zu erhalten.

7. Gasgekapselte Schaltvorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, dass eine Vielzahl von Rogowski-Spulen (7) mit denselben Abmessungen im Hinblick auf die Druckbehälter (1, 4) in einer axialen Richtung im Metallanpassungsstück (5) konzentrisch angeordnet sind.

8. Gasgekapselte Schaltvorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, dass eine Vielzahl von Rogowski-Spulen (7) mit denselben Abmessungen im Hinblick auf einen Querschnitt der Spulen in einer radialen Richtung konzentrisch in einer radialen Richtung im Hinblick auf die Druckbehälter (1, 4) angeordnet sind.

9. Gasgekapselte Schaltvorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, dass die Rogowski-Spulen (7) innerhalb des Metallanpassungsstücks (5) in einem Block aus einem flexiblen Harz (12) geformt werden.

10. Gasgekapselte Schaltvorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, dass eine Öffnung der Auskehlung des Metallanpassungsstücks (5) einer Seite des isolierenden Abstandshalters (3) zugewandt ist.

Revendications

1. Installation de commutation à isolation gazeuse comprenant:

   - une série de réservoirs de pression (1,4) au centre desquels est positionné un conducteur (2) et à l'intérieur desquels un gaz isolant et extincteur d'arc remplit un espace autour du conducteur ; et
   - un transformateur de courant fabriqué au moyen de boucles de Rogowski (7) pour détecter un courant passant à travers le conducteur (2) et qui est logé dans une rainure formée à l'intérieur du corps d'un adaptateur annulaire fixé aux réservoirs de pression (1,4) ;

caractérisée en ce que

l'adaptateur annulaire (5) est métallique et monté entre les brides des réservoirs de pression (1,4) et le transformateur de courant est fixé aux réservoirs de pression (1,4) au moyen de l'adaptateur annulaire métallique (5) et se sert de l'adaptateur métallique (5) pour obtenir un potentiel de mise à la masse, la rainure étant ouverte vers l'espace purgé avec le gaz isolant et extincteur d'arc.

2. Installation de commutation à isolation gazeuse selon la revendication 1, caractérisée en ce que les boucles de Rogowski (7) du transformateur de courant sont formées en enroulant uniformément une bobine avec une pluralité de tours autour d'un élément isolant inflexible.

3. Installation de commutation à isolation gazeuse selon la revendication 1 ou 2, caractérisée en ce que l'adaptateur métallique (5) est fixé à l'un des réservoirs de pression (1,4) au moyen d'une entretoise isolante (3) qui sépare le gaz dans la série de réservoirs (1, 4) et en ce que l'adaptateur métallique (5) définit une partie arrondie dans une surface périphérique intérieure sur un côté en contact avec l'entretoise isolante (3) pour relâcher un champ électrique dans une jonction triple, formée par le gaz isolant et extincteur d'arc remplissant les réservoirs de pression (1,4), l'entretoise isolante (3) et l'adaptateur métallique (5).

4. Installation de commutation à isolation gazeuse selon la revendication 1 ou 2, caractérisée en ce
qu'une bride de l'un des réservoirs de pression (1,4) est l'adaptateur métallique (5).

5. Installation de commutation à isolation gazeuse selon la revendication 1 ou 2, caractérisée en ce qu'un détecteur de courant (10) pour mesurer le courant détecté par le transformateur de courant est placé sur une périphérie extérieure de l'adaptateur métallique (5).

6. Installation de commutation à isolation gazeuse selon la revendication 1 ou 2, caractérisée en ce qu'un détecteur de courant (10) pour mesurer le courant détecté par le transformateur de courant est placé sur une périphérie extérieure de l'adaptateur métallique (5).

7. Installation de commutation à isolation gazeuse selon la revendication 1 ou 2, caractérisée en ce qu'une pluralité de boucles de Rogowski (7) ayant les mêmes dimensions est disposée concentrique-ment dans l'adaptateur métallique (5) dans une direction axiale par rapport aux réservoirs de pression (1,4).

8. Installation de commutation à isolation gazeuse selon la revendication 1 ou 2, caractérisée en ce qu'une pluralité de boucles de Rogowski (7) ayant les mêmes dimensions dans une direction axiale par rapport à une section transversale des boucles et ayant des dimensions différentes dans une direction radiale par rapport aux boucles est disposée concentrique-ment dans une direction radiale par rapport aux réservoirs de pression (1,4).

9. Installation de commutation à isolation gazeuse selon la revendication 1 ou 2, caractérisée en ce que les boucles de Rogowski (7) sont moulées de manière monolithique par une résine flexible (12) à l'intérieur de l'adaptateur métallique (5).

10. Installation de commutation à isolation gazeuse selon la revendication 1 ou 2, caractérisée en ce qu'une ouverture de l'adaptateur métallique (5) fait face à un côté de l'entretoise isolante (3).