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(54) Titre : UTILISATION D'UN ELEMENT INDICATEUR D'UN CONVERTISSEUR, PROCEDE POUR FAIRE FONCTIONNER UN CONVERTISSEUR ET CONVERTISSEUR

(54) Title: USE OF A DISPLAY MEANS OF A CONVERTER, METHOD FOR OPERATING A CONVERTER, AND CONVERTER

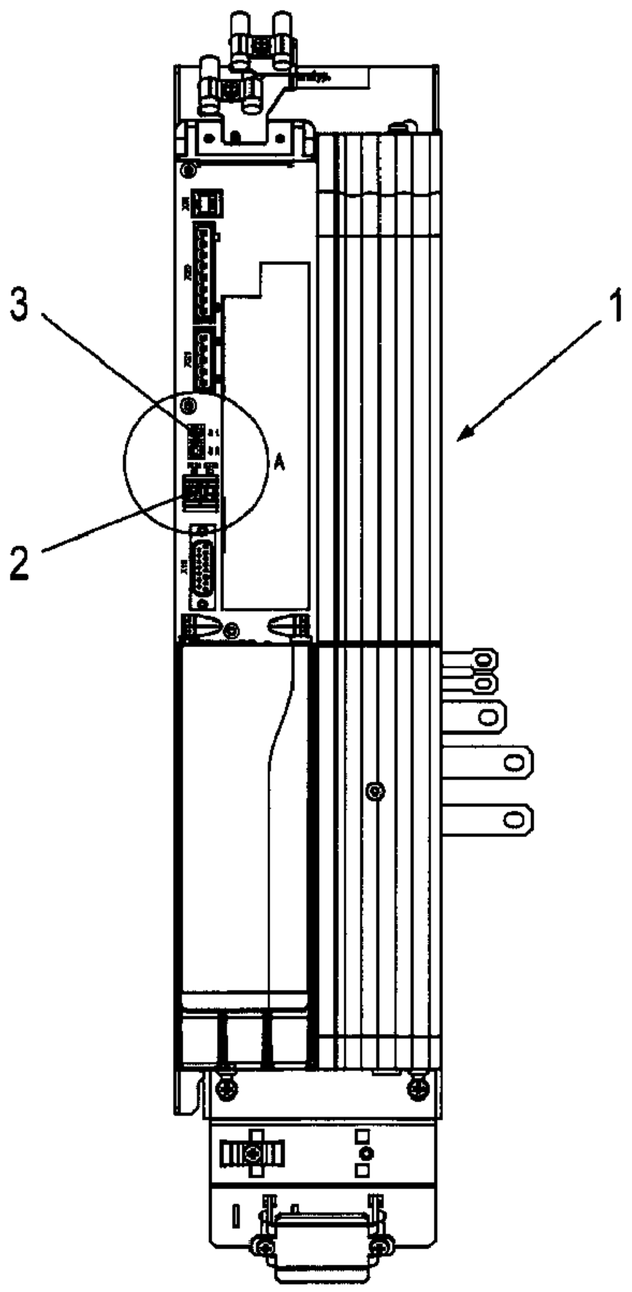


Fig. 1

(57) Abrégé/Abstract:
Disclosed are a display element of a converter, a method for operating a converter, and a converter. The converter includes an address encoding switch, in particular on the housing thereof; when the address encoding switch is actuated, a value

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(57) **Abrégé(suite)/Abstract(continued):**
corresponding to the specific switched position of the address encoding switch is displayed by the display element after a given time period, otherwise operation-related information on the converter is displayed.

Abstract

Use of a display means of a converter, method for operating a converter, and converter,
the converter having an address code switch, in particular on its housing, and in an actuation of the address code switch and during a subsequent, predefined period of time, a respective value corresponding to the respective switch position of the address code switch is displayed by the display means, and operating information of the converter is displayed in all other cases.

CA Application
National Entry of PCT/EP2015/001410
Blakes Ref. 67754/00021

Use of a Display Means of a Converter, Method for Operating a Converter, and Converter

Description:

The present invention relates to a use of a display means of a converter, a method for operating a converter, and a converter.

It is generally known that a converter includes display means for displaying an operating status.

Therefore, the present invention is based on the objective of avoiding faults in the operation of industrial systems.

According to the present invention, in the use of a display means of a converter, the objective is achieved according to the features indicated in Claim 1; in the method for operating a converter, it is achieved according to the features indicated in Claim 8 or 9; and in the converter, it is achieved according to the features indicated in Claim 10.

Important features of the present invention in the use of a display means of a converter are that the converter has an address code switch, in particular on its housing,

and that when the address code switch is actuated and following a subsequent, predefined period of time, a respective value corresponding to a respective switch position of the address code switch is displayed by the display means,

and that operating information of the converter is displayed in all other cases.

This has the advantage that when setting the address, a display means used for other purposes, in particular a 7-segment display, may be utilized for displaying the address, thus making it possible to reduce faults. In particular, not only may the direct labeling of the address code switch at a small type size be used, but also the much larger display of the display means. The type size of the display means is preferably twice as large as

the labeling of the address code switch on the housing of the address code switch. This ensures reliable readability, and thus reduces the fault rate.

In one advantageous development, the time period has a value between 1 second and 100 seconds. This is advantageous insofar as after the actuation of the address code switch, the address value input with the aid of the address code switch is displayed for the period of time, so that the operator receives optical feedback of his input. The operator is therefore able to check his input within an adequate period of time.

In one advantageous development, the operating information includes a status, especially an operating status, e.g., the type of control method of the converter, enable information or a fault status, in particular. This is advantageous in that operating information is displayed when no address is input. Only when an address is input will the input address be visualized for a period of time.

In one advantageous development, the address code switch has a rotary switch, in particular a rotary switch having discrete rotary positions and/or address code rotary switches, or a DIP switch,

the address code switch having a finite number of switch positions, in particular. This has the advantage that a digital display, in particular such as a 7-segment display, is advantageous since the finite number can then be displayed in an uncomplicated manner. The display is particularly simple if each rotary switch of the address code switch has only 16 or fewer switch positions. The switch position of the respective rotary switch is thus representable by a 7-segment display in each case, in particular hexadecimally.

In one advantageous development, a hexadecimal number is allocated to each switch position of the address code switch, and the switch position is correspondingly labeled on the address code switch. This has the advantage that the operator can view the labeling on the one hand and the display means on the other. The fault rate is therefore able to be reduced further. In addition, an item of information regarding the address allocated to the converter during the initial startup operation is also displayed during a

normal operation due to the fact that it can be read out on the address code switch itself.

In one advantageous development, the address code switch has labeled surface sections, and a respective labeled surface section is assigned to each switch position of the address code switch. This has the advantage of allowing a simple readout, which also remains in a power outage.

In one advantageous development, the information displayed by the display means in an actuation of the address code switch and during a subsequent predefined period of time corresponds to the labeling assigned to the corresponding switch position, in particular the allocated labeled surface section. This is advantageous insofar as a redundant display of information is provided and as a result, the fault rate is reduced.

Important features of the method for operating a converter are that the converter has an address code switch, in particular on its housing, and a display means,

wherein

- the actuation of the address code switch is detected, and a respective value corresponding to the respective current switch position of the address code switch is displayed by the display means temporally after the detection instant for a subsequent, predefinable period of time,

and operating information of the converter is displayed in all other cases.

This has the advantage that on account of the redundant display, the type size of the display means being greater than the type size of the labeling of the address code switch.

Important features of the alternative method for operating a converter are that the converter has an address code switch, in particular on its housing, and a display means,

wherein

- the actuation of the address code switch is detected,
- following each detected actuation, a value corresponding to the respective switch position of the address code switch is displayed by the display means for a subsequent, predefined period of time,

and different operating information of the converter is displayed in all other cases, that is to say, values or information not related to the switch position, in particular.

This is advantageous inasmuch as no further display means are required, since the existing display means may be used for displaying the address information for the duration of the time period.

Important features of the converter are that the converter has an address code switch, in particular on its housing, and a display means,

wherein

- the converter includes a means for detecting an actuation of the address code switch,
- a means for the time delay after a respective detected actuation, in particular for a subsequent predefined period of time,
- the means for the delay time generating an enable signal, which
  - in an enablement, controls an actuating means actuating the display means in such a way that it actuates the display means so that a respective value corresponding to the respective switch position of the address code switch is displayed by the display means;
  - and in the absence of an enablement, the enable signal controls the actuating means in such a way that it controls the display means so that other operating information of the converter is displayed, that is to say, values or information not related to the switch position, in particular.

This is advantageous in that the actuation is detectable with the aid of a sensor, i.e. a means for detecting the actuation of the address code switch. The sensor preferably detects an electric variable that depends on the switch position, such as a current or voltage.

Additional advantages result from the dependent claims. The present invention is not restricted to the feature combination of the claims. Further useful combination possibilities of claims and/or individual claim features and/or features of the description and/or the figures result for one skilled in the art, in particular from the objective and/or task that arises from a comparison with the related art.

The present invention will now be described in greater detail with the aid of figures:

Figure 1 shows a field device according to the present invention in a frontal view.

Figure 2 shows an enlarged cut-away section.

Field device 1 is developed as a bus device of a data bus. For this purpose, an address, i.e. a device address, is assigned to field device 1 during the start-up operation.

This allows a higher-level control, preferably a master, to transmit data to field device 1. The address is added to each transmitted data packet, so that field device 1 receives the data and other field devices that are also possibly connected to the data bus as bus devices disregard the data packet. The data packet, for example, includes command data and/or other data.

The inputting of the address on field device 1 is accomplished with the aid of address code switches, which are here developed as address code rotary switches 3. This means that the address is codable by turning, i.e. adjusting the rotary position. In the exemplary embodiment, 16 rotary positions are possible. However, since two such address code switches 3 are used, addresses between 0 and 255 are able to be set.

Although address code switch 3 is labeled so that each rotary position is assigned a corresponding value, the labeling is implemented at a type size whose numbers or letters are smaller than the diameter of the rotatable part of address code switch 3.

Field device 1 also has a display means 3. In the exemplary embodiment, it is realized by two 7-segment displays.

During an operation, display means 3 is used for the display of operating information, such as the status of the converter. The operating type or a fault status of the converter, for instance, is shown.

During the start-up operation, especially when setting the address, no operating information of the converter is displayed, but instead, the switch position of the address code switches is shown.

The switch position of the first address code switch 3 is digitally displayed in the first one of the two 7-segment displays. In the same way, the switch position of second address code switch 3 is displayed with the aid of the second one of the two 7-segment displays.

Following a certain period of time, the 7-segment displays are once again used for the display of the operating information.

In one preferred development, the actuation, or in other words, the modification of the position of address code switch 3, is detected. As soon as the actuation has been detected, the 7-segment display will then be used to display the address information, i.e. the position of the address code switch. Once the actuation has been concluded, the display of the address information will continue to be maintained for a predefined period of time, whereupon a switch to the display of the operating information takes place.

Therefore, during the setting of the address information and during a subsequent, predefined period of time, display means 3 is used for the display of the input address information and then for the display of the operating information.

Even in the case of an address change that takes place after the startup operation, i.e. an actuation of address code switch 3, the display means will once again be used to display the address information assigned to the switch position for the time period of the actuation and a subsequent period of time.

Preferably, a hexadecimal number is able to be displayed by each one of the 7-segment displays, thereby utilizing the 7-segment display in an optimal manner. 256 different addresses are thus able to be displayed by the two hexadecimal numbers.

In one further exemplary embodiment according to the present invention, address code switches other than address code rotary switches 3 are employed. DIP switches may preferably be used for this purpose. These too have labeling on each switch. When the respective DIP switch is actuated, the information that corresponds to the respective switch position will be displayed.

List of Reference Numerals

1 field device, in particular converter

2 Display means, in particular 7-segment display

3 Address code rotary switch

Patent Claims

1. Use of a display means of a converter,

   the converter having an address code switch, in particular on its housing,

   wherein

   in an actuation of the address code switch and during a subsequent predefined period of time, a value corresponding to the respective switch position of the address code switch is displayed by the display means,

   and operating information of the converter is displayed in all other cases.

2. The use as recited in at least one of the preceding claims,
   wherein
   the period of time has a value between 1 second and 100 seconds.

3. The use as recited in at least one of the preceding claims,
   wherein
   the operating information includes a status, in particular an operating status, in particular the type of the control method of the converter, enable information or a fault status, for example.

4. The use as recited in at least one of the preceding claims,
   wherein
   the address code switch is a rotary switch, in particular a rotary switch having discrete rotary positions and/or address code rotary switches, or a DIP switch,

   the address code switch in particular having a finite number of switch positions.

5. The use as recited in at least one of the preceding claims,
   wherein
   each switch position of the address code switch is assigned a hexadecimal

number, and the switch position is labeled accordingly on the address code switch.

6. The use as recited in at least one of the preceding claims,
wherein
the address code switch has labeled surface sections, and each switch position of the address code switch is assigned a respective labeled surface section.

7. The use as recited in at least one of the preceding claims,
wherein
the information displayed by the display means in an actuation of the address code switch and during a subsequent, predefined period of time corresponds to the labeling assigned to the respective switch position, in particular the allocated labeled surface section.

8. A method for operating a converter,
the converter having an address code switch, in particular on its housing, and a display means,

wherein

- the actuation of the address code switch is detected, and a respective value corresponding to the respective current switch position of the address code switch is displayed by the display means temporally following the detection instant,

and operating information of the converter is displayed in all other cases.

9. The method for operating a converter,
the converter having an address code switch, in particular on its housing, and a display means,

wherein

- the actuation of the address code switch is detected,
- after a respective detected actuation, a respective value corresponding to the respective switch position of the address code switch is displayed by the display means for a subsequent, predefined period of time,

and other operating information of the converter is displayed in all other cases, that is to say, values or information not related to the switch position, in particular.

10. A converter, in particular for executing a method as recited in one of the preceding claims,

the converter having an address code switch, in particular on its housing, and a display means,

wherein

- the converter has a means for detecting an actuation of the address code switch,
- a means for the time delay following a respective detected actuation, in particular for a subsequent, predefined period of time,
- the means for the time delay generating an enable signal, which

  - in an enablement, controls an actuating means actuating the display means in such a way that it actuates the display means so that a respective value corresponding to the respective switch position of the address code switch is displayed by the display device,

  - and in a non-enablement, it controls the actuating means in such a way that it actuates the display means so that other operating information of the converter is displayed, that is to say, values or information not related to the switch position, in particular.

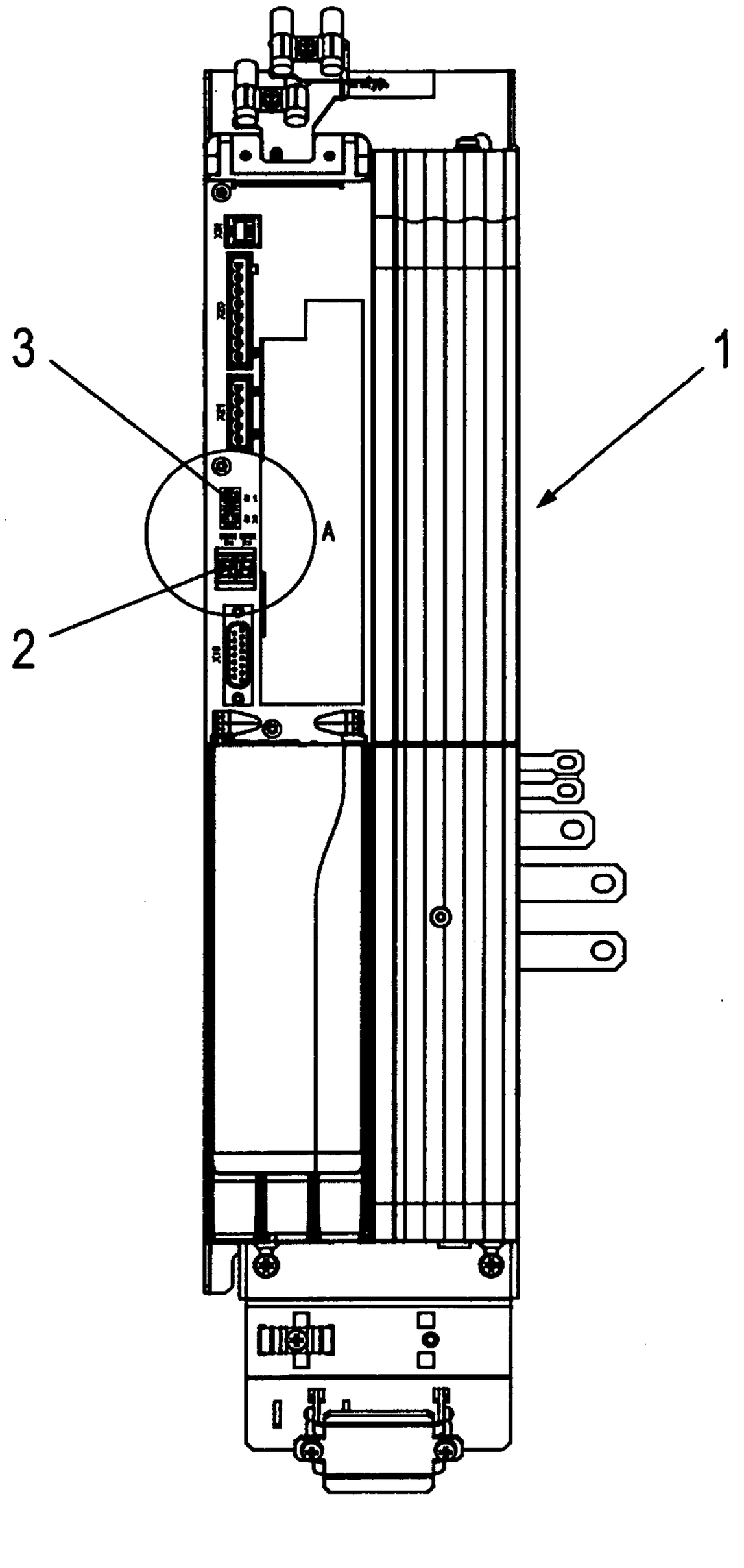


Fig. 1

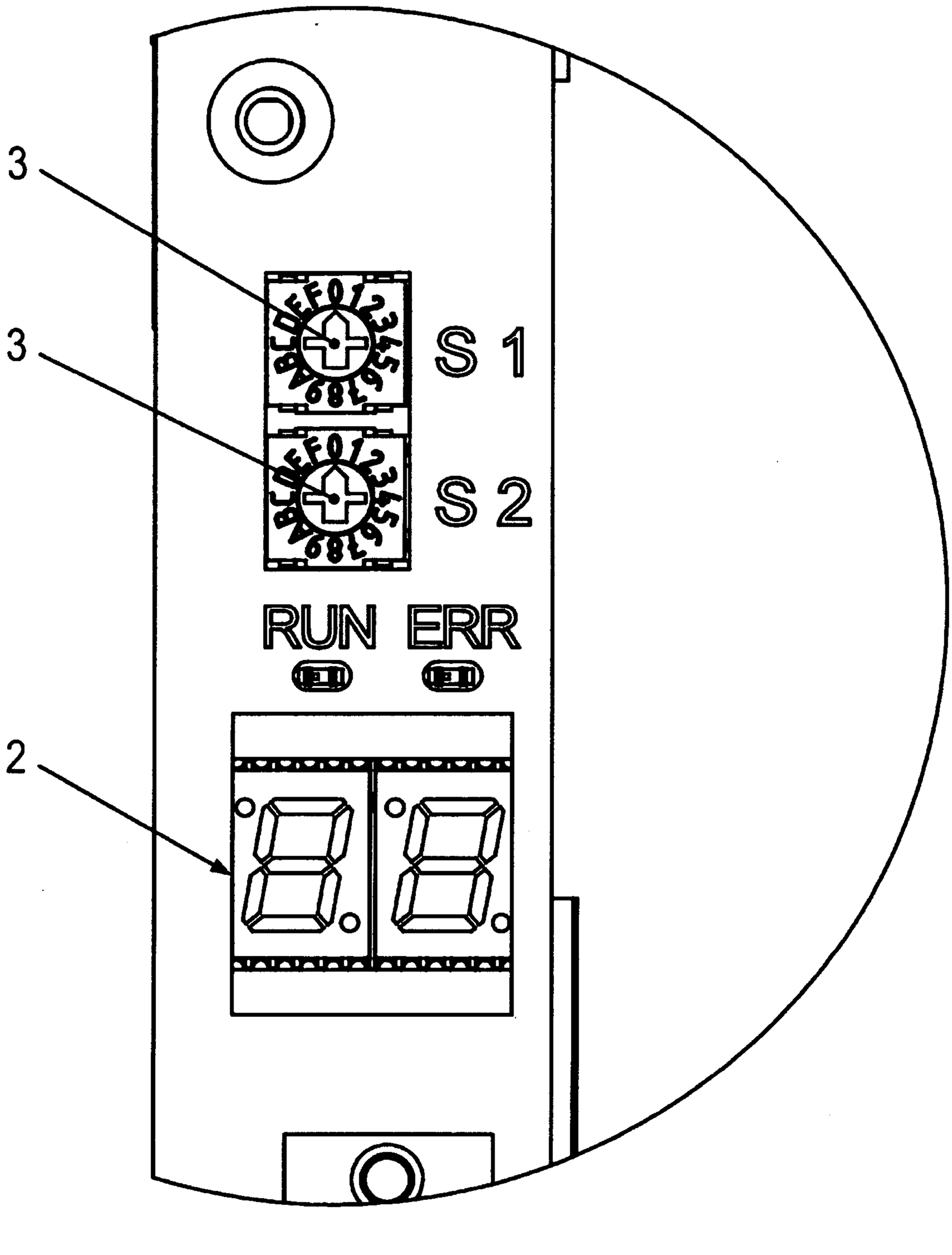


Fig. 2

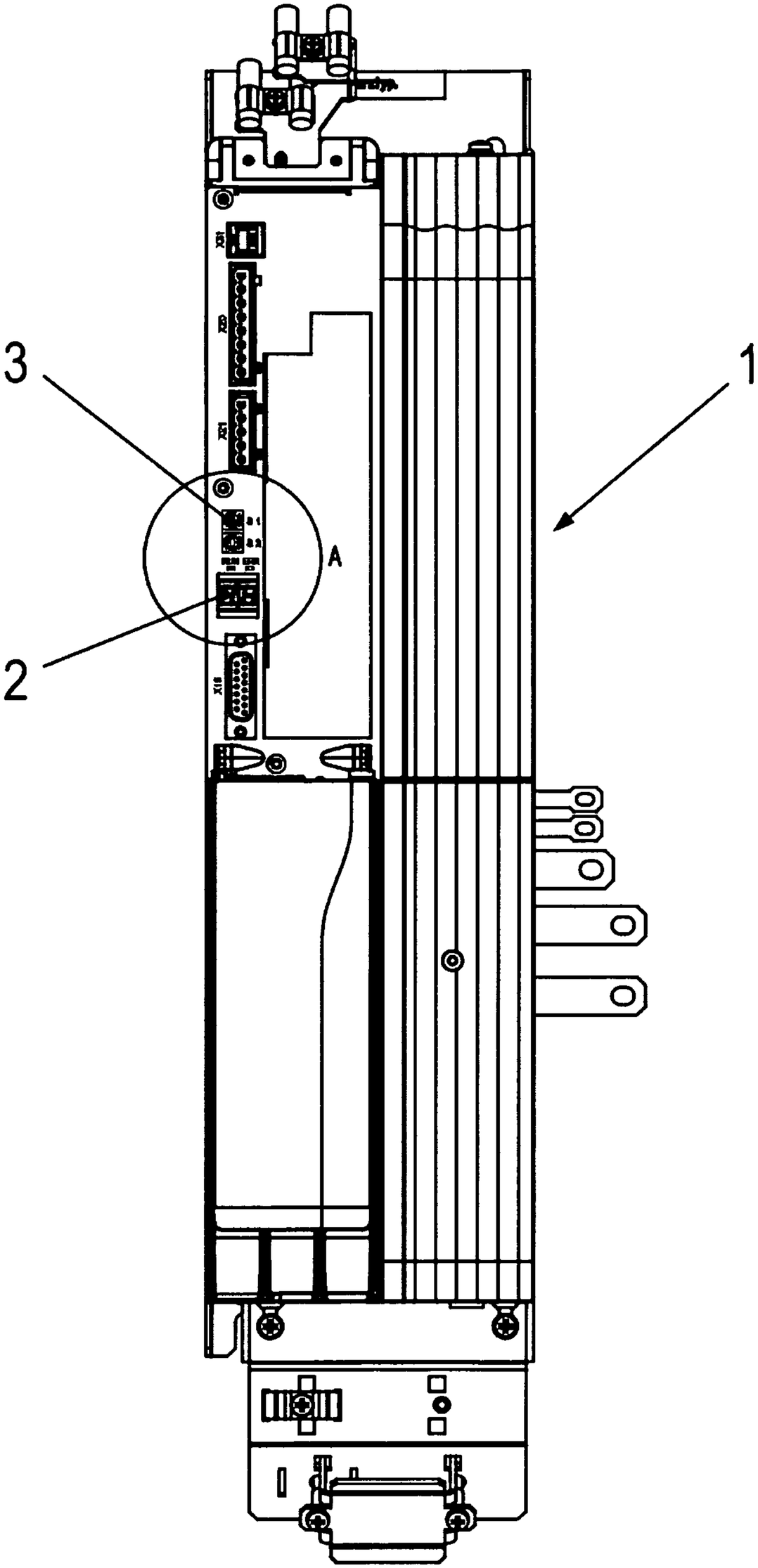


Fig. 1