SLOVENSKI STANDARD
SIST EN 50216-5:2002

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Power transformer and reactor fittings - Part 5: Liquid level, pressure devices and flow indicators

Power transformer and reactor fittings -- Part 5: Liquid level, pressure and flow indicators, pressure relief devices and dehydrating breathers

Zubehör für Transformatoren und Drosselspulen -- Teil 5: Flüssigkeitsstandanzeiger, Druckanzeigeeinrichtungen und Durchflussmesser, Druckentlastungsventile und Luftentfeuchter

Accessoires pour transformateurs de puissance et bobines d'inductance -- Partie 5: Indicateurs de niveau de liquide isolant, manomètres et indicateurs de circulation de liquide isolant, soupapes de sûreté et assécheurs d'air

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EUROPEAN STANDARD **EN 50216-5**

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English version

Power transformer and reactor fittings
Part 5: Liquid level, pressure devices and flow indicators

Accessoires pour transformateurs de puissance et bobines d'inductance
Partie 5: Indicateurs de niveau de liquide isolant, manomètres et indicateurs de circulation de liquide isolant

Zubehör für Transformatoren und Drosselspulen
Teil 5: Flüssigkeitsstandanzeiger, Druckanzeigeeinrichtungen und Durchflussmesser

This European Standard was approved by CENELEC on 2001-09-25. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC
European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 14, Power transformers.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50216-5 on 2001-09-25.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2002-10-01
- latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2004-10-01

EN 50216-5 is to be read in conjunction with EN 50216-1.

Contents

1 Scope

EN 50216-5 specifies the liquid level, pressure and flow indicators for power transformer and reactor fittings.

Except where otherwise specified or implied herein, liquid level, pressure and flow indicators shall comply with the requirements of EN 50216-1.

2 Normative references

Addition to EN 50216-1:

EN 60947-5-1 + A12	1997 1999	Low-voltage switchgear and controlgear - Part 5-1: Control circuits devices and switching elements - Electromechanical control circuit devices (IEC 60947-5-1:1997)

3 Direct reading dial type liquid level indicators

3.1 General

Where the conservator for transformer tanks or other separated expansion chambers are required to be provided with a liquid level indicator of the direct reading dial type, it shall comply with the following:

- In case of electric alarm contacts, a terminal box shall be provided with one earth terminal.

- The terminals shall allow for connection of cables having a cross section area of 1,5 mm^2 to 4 mm^2.

- The thread for the cable glands should be either Pg 16 or M20 x 1,5 to be agreed between supplier and purchaser.

- The liquid level indicator shall be fitted with a solid float operating on the displacement principle (hollow floats are not permitted). There shall be no direct mechanical contact between the float mechanism and the dial indicator.

- The liquid level indicator shall withstand seismic and operational vibrations and environmental conditions in accordance with EN 50216-1.

- Unless otherwise agreed, the liquid level at 20 °C and the minimum and the maximum level shall be indelibly and clearly marked.

- The movement of the pointer form the minimum to the maximum level shall be clockwise when facing the dial.

- The mounting arrangement of the indicator shall be such that it can be dismantled and removed from the outside of the conservator. It shall be possible to remove the dial, maintain or replace switches, without emptying the conservator.

- The marking of the dial plate shall be indelible.

3.2 Electrical characteristics of switch

This device is based on EN 60947-5-1.

3.2.1 General

The purchaser shall specify whether the switch shall have normally open, normally closed or change over contacts. Unless otherwise specified, the supplier shall provide switches with change over contacts.

The switch shall be able to operate at between maximum 5 % and minimum 95 % of the pointer deflection range.

3.2.2 Currents

The rated current shall be 2 A r.m.s. and the short time current 10 A r.m.s. for 30 ms.

Other values may be agreed between purchaser and supplier.

3.2.3 Breaking and making capacity

Table 1 - Breaking capacity

Voltage	Current	Breaking capacity	
24 V d.c. to 127 V d.c.	2 A	250 W	L/R < 40 ms
230 V a.c.	2 A	400 VA	Cos φ > 0,5

Other values may be agreed between purchaser and supplier.

The minimum contact life shall be 1 000 operations.

The switch shall be able to make on a current of 10 mA for any value of voltage defined in Table 1 even after one year of non-operation.

3.3 Tests

3.3.1 Routine tests

3.3.1.1 Leakage test

The devices shall be subjected to an oil leakage test using one of the three following methods, at the choice of the supplier:

- application of a gas pressure of $2{,}5 \times 10^5$ Pa for 2 min at ambient temperature;
- application of a pressure of 1×10^5 Pa for 30 min to the relay filled with oil at a liquid temperature of 90 °C;
- application of a pressure of $1{,}4 \times 10^5$ Pa for 6 h to the relay filled with oil at ambient temperature.

The relay shall not leak.

3.3.1.2 Applied voltage test

The test shall be carried out in accordance with Table 1 of EN 50216-1.

3.3.1.3 Functional test

A functional test shall be carried out to prove the mechanical and electrical operation of the indicator and associated switches.

3.3.2 Type test

The devices shall be subjected to a vacuum test of an absolute pressure of 2,5 kPa for 24 h. This test shall be followed by the test as detailed in 3.3.1.1 above.

4 Liquid pressure gauges - Differential pressure gauges

4.1 General

Liquid pressure and differential pressure gauges shall be of the dial type. Liquid pressure gauges shall incorporate a screwed connection threaded G3/8 and differential pressure gauges shall incorporate two pipework unions threaded G3/8, for connection to the liquid and water circuits as appropriate. Diameters G3/4 and G1/2 may be also be used if required.

Liquid pressure gauges shall be scaled $(0 - 2{,}5) \times 10^5$ Pa. For some water pressures, $2{,}5 \times 10^5$ Pa may be increased accordingly.

Differential pressure gauges shall be scaled $(2 - 0 - 2) \times 10^5$ Pa. The nominal setting for the electrical switches shall be when the liquid pressure in the cooler outlet does not exceed the water inlet pressure by at least 20 000 Pa. Any deviation from these parameters shall be subject to agreement between purchaser and supplier.

The marking of the dial plate shall be indelible. The maker's name or trade mark, grades and type shall be given.

In the case of liquid pressure gauges, the error in pressure indication, for either increasing or decreasing pressure, shall not exceed 1 % of the maximum scale value at any point between 10 % to 90 % for the maximum scale value.

Other values can be acceptable by agreement between purchaser and supplier.

Unless otherwise specified, all gauges shall be mounted and calibrated in the upright (vertically mounted) position.

4.2 Electrical characteristics of switch

This device is based on EN 60947-5-1.

4.2.1 General

The purchaser shall specify whether the switch shall have normally open, normally closed or change over contacts. Unless otherwise specified, the supplier shall provide switches with change over contacts.

The switches shall be able to operate at between maximum 5 % and minimum 95 % of the pointer deflection range.

4.2.2 Rated current

The rated current shall be 2 A r.m.s. and the short time current 10 A r.m.s. for 30 ms.

Other values may be agreed between purchaser and supplier.

4.2.3 Breaking and making capacity

Table 2 - Breaking capacity

Voltage	Current	Breaking capacity	
48 V d.c. to 127 V d.c.	2 A	250 W	L/R < 40 ms
230 V a.c.	2 A	400 VA	Cos φ > 0,5

Other values may be agreed between purchaser and supplier.

The minimum contact life shall be 1 000 operations.

The switch shall be able to make on a current down to 10 mA for any value of voltage defined in Table 2 even after one year of non-operation.

4.3 Tests

4.3.1 Routine tests

4.3.1.1 Pressure test

The gauges, ready for operation, filled with liquid, shall be subjected to an over pressure 1,1 times higher than the maximum scaled level for 6 h at ambient temperature.

4.3.1.2 Applied voltage test

The test shall be carried out in accordance with Table 1 of EN 50216-1.

4.3.1.3 Functional test

A functional test shall be carried out to prove the mechanical and electrical operation of the indicator and associated switches.

4.3.2 Type test

The devices shall be subjected to a vacuum test of an absolute pressure of 2,5 kPa for 24 h. This test shall be followed by the test as detailed in 4.3.1.1 above.

5 Liquid flow indicators

5.1 General

A terminal box shall be provided with one earth terminal.

The terminals shall allow for connection of cables having a cross section area of 1,5 mm² to 4 mm².

The thread for the cable glands should be either Pg 16 or M20 x 1,5 to be agreed between supplier and purchaser.

The design of the indicators and the components contained therein and the mounting and pipework connecting arrangements shall be such that they will not sustain damage during service or maloperate due to vibration under service conditions according to 3.1 of EN 50216-1.

There shall be no direct contact between the liquid in the body of the equipment and the dial indicator scales of the oil flow indicators.