

metsonpower

TRANSFORMER ACCESSORIES



**MULTI CONTROL
SYSTEM**

Code No: MMCS2013-01

INTRODUCTION

Multi control system (MMCS) is used for oil filled distribution transformer to isolate in the event of slow formation of gases, drop in transformer oil level, excess oil temperature and sudden built-up of pressure. in accordance with EN 50216-3

WORKING PRINCIPLE:

Following are the three sensing devices:

- Reed Switches for Gas and Oil level detection.
- Pressure Sensor Switches for Pressure detection.
- Bimetal Thermometer for Temperature detection.

Operating pressure

The maximum continuous operating pressure is 50 kPa.

Identification of relays

Two types are identified in EN 50216-3 which shall meet the following functions:

Table 1 – Identification of relays

Function	Relay type 1	Relay type 2
Gas and leakage detection	1 contact	1 contact
Overpressure detection	1 contact	1 contact
Over temperature detection		2 contacts (alarm/tripping)
Temperature indicator	Yes	Yes
Visual leakage control	Yes	Yes

NOTE: The two functions gas and leakage detection are usually actuated by one contact in common.

Other types of relay having additional functions to those defined in Table 1 are acceptable by agreement.

Sensitivity of the relay contacts to magnetic fields

The relay is able to withstand a d.c. magnetic field up to 25 mT in any direction and any polarity without inadvertent operation.
NOTE: During operation and in case of faults, the surroundings of the transformers or reactors are subjected to magnetic fields which could produce inadvertent operation of the relays equipped with magnetic contacts (reed type).

Outline and mounting details

See Page 5.

Operational performance

General

Contacts are potential free.

Materials of the protective relay are heat resistant at 115 °C.

This relay shall also permit partial refilling of liquid of transformer.

The level of the liquid shall be visible.

Gas collection

The alarm contact operates for a volume of gas collected up to 170 cm³.

Leakage detection

The contact operates for a liquid leakage when the internal volume of the relay drops by 170 cm³.

Pressure detection

The pressure detecting device operates at a pressure of 50 kPa or according to transformer or reactor manufacturer's requirement.

Temperature detection (for relay type 2)

The relay is equipped with two adjustable contacts for the range from 20°C to 120°C Accuracy for the temperature releasing alarm or tripping is $\pm 1,5$ % of the maximum temperature of the range. This accuracy is fulfilled over the whole range.

Temperature indicator

The temperature indicator is from +20 °C to +120 °C with a resettable maximum pointer.

NOTE : This device should not operate when the transformer is submitted to a short circuit test performed in accordance with EN 60076-5.

Electrical characteristics of switch

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

Rated currents

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

Breaking and making capacity

Table 2 – Breaking capacities (NO and NC contacts)

Voltage	Current	Breaking capacity	
		Power	Time
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 f > 0,5

The minimum contact life shall be 1 000 operations.

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

Operation time

During operation, the contacts operate within 0,5 s maximum.

Mechanical requirements

Terminal box

A terminal box is provided with three terminals for each function and one earth terminal. The thread of the earth terminal is M4. The earth terminal is clearly marked. The terminals are designed to accept cables having a cross sectional area between 1,5 mm² and 2,5 mm². It is possible to fit this cable box with one cable glands Pg 21. The terminal box cover is to class IP 55 in accordance with EN 60529 and equipped with sealable unremovable fastening. Mechanical impact protection is to class IK 07 in accordance with EN 50102.

Testing facilities

Checking of the contact operation for all the functions is possible without the contacts or their operating mechanism being damaged.

Gas sampling

The relay is equipped with an easily accessible sampling petcock. A facility is allowed for the connection of 3,17 mm (1/8") tubing and it is possible to seal it to prevent inadvertent opening.

Presence of gas in the relay

It is possible to visually check the presence of any gas from at least three sides.

Nameplate

The nameplate contains at least the following information:

- serial number,
- number of the standard and year of edition;
- type of relay;
- connection diagram;
- seismic withstand class.

Tests

Reference to EN 60076-1 is made for definitions concerning testing.

In addition to the tests specified in EN 50216-1, the following tests are carried out:

Routine tests

Oil leakage test

The relay is subjected to an oil leakage test by application of 100 kPa of hot oil at 90 °C for a period of 30 min.

Operation test

All the functions defined in clause 6 are checked. Gas detection and leakage detection are checked in the operating position.

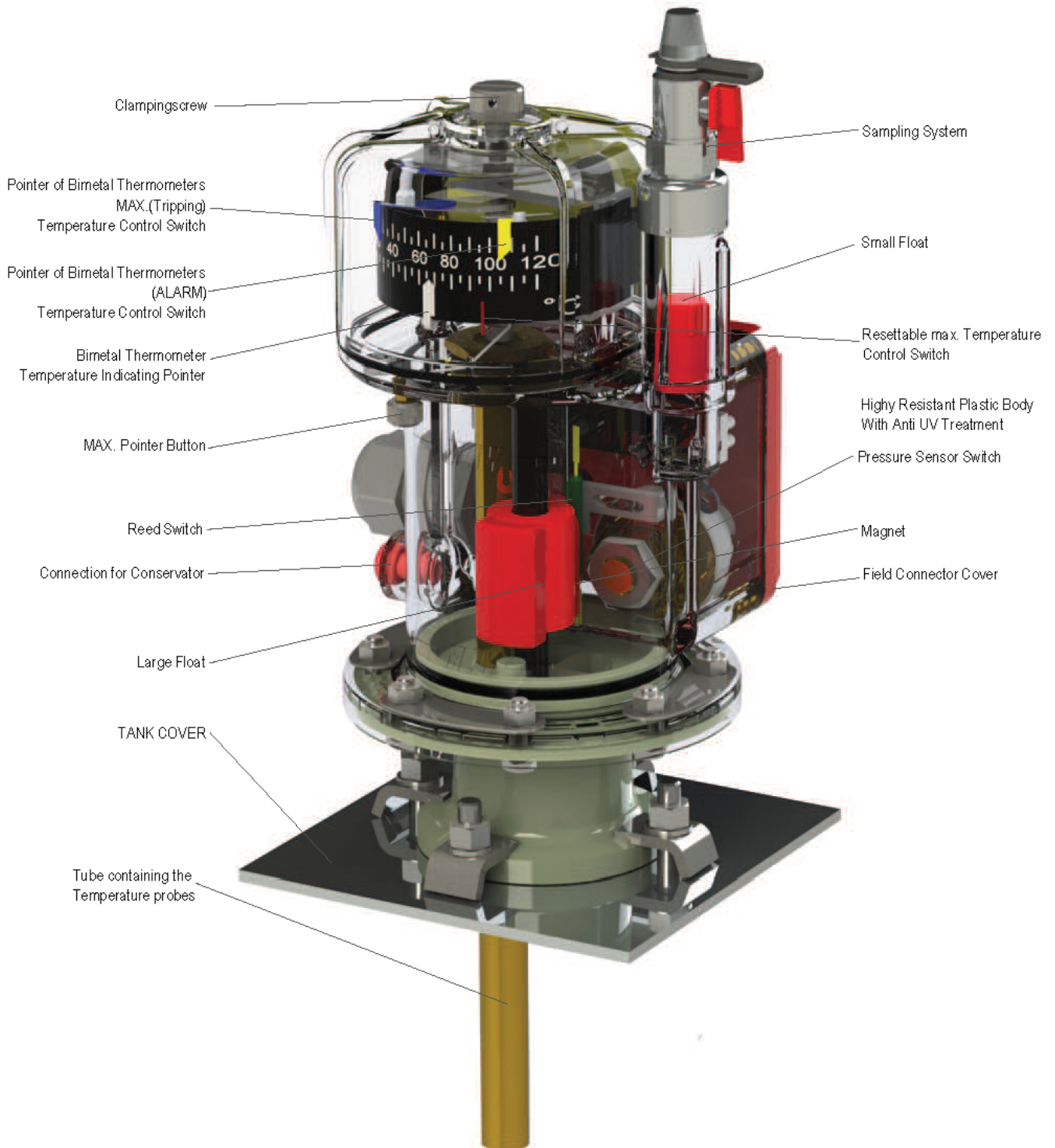
Type tests

-Determination of the volume of gas or liquid sufficient to operate the contact at ambient temperature.

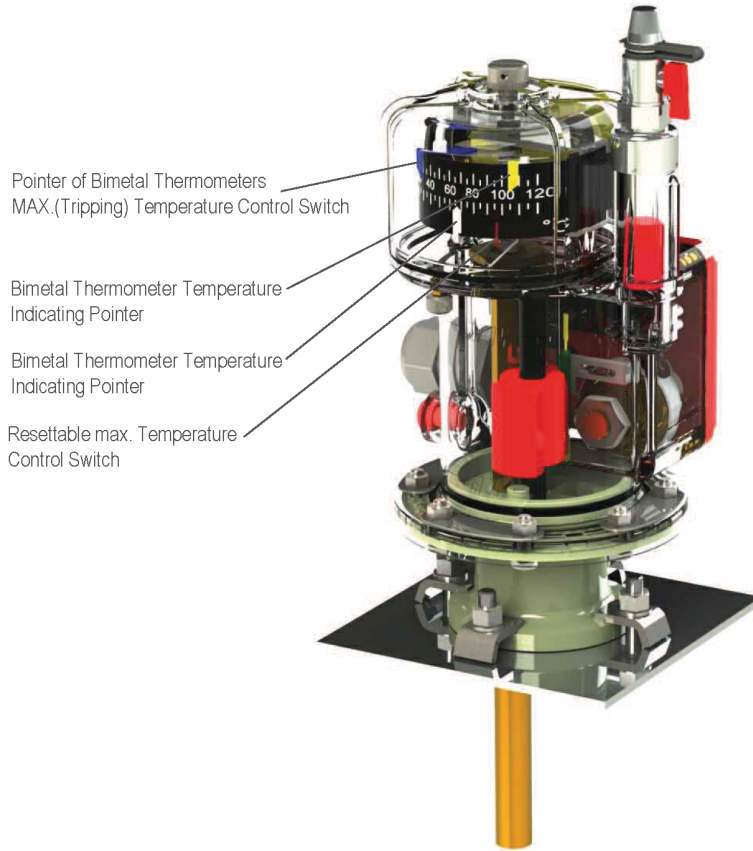
- Pressure test, 250 kPa for 2 min under oil at 115 °C.

NOTE: Sensors, if any, may be removed during the test.

MULTI CONTROL SYSTEM
TYPE - MMCS

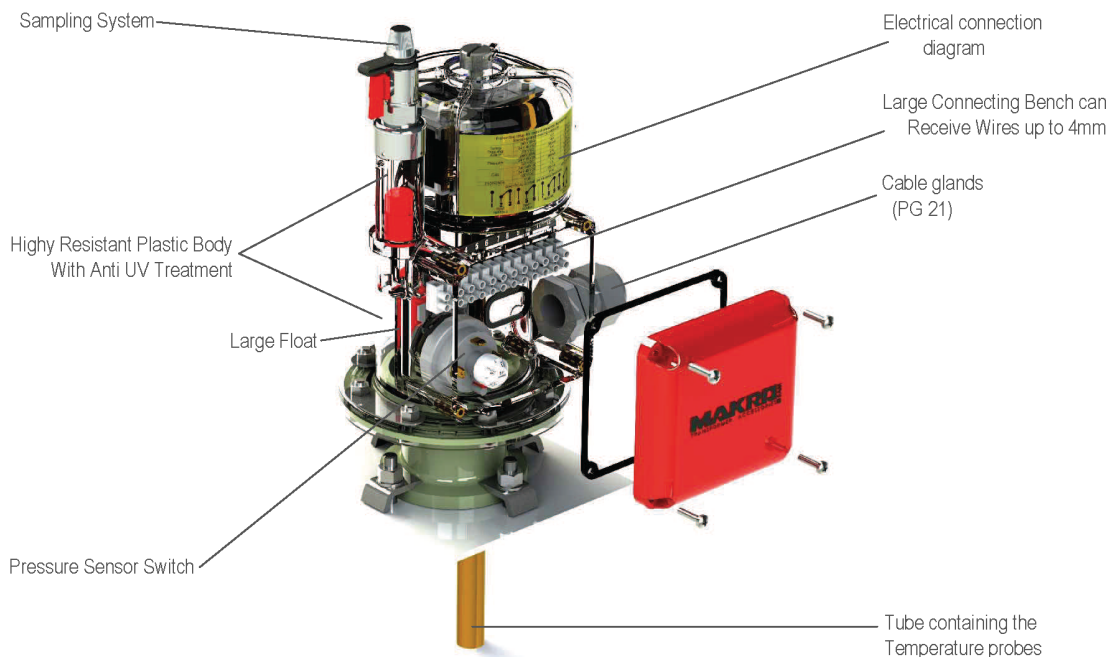


These pointers (max. and min. temperature control pointers) can be adjusted to requested temperatures .



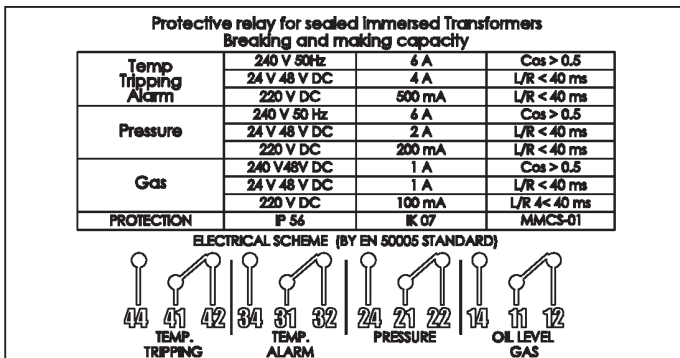
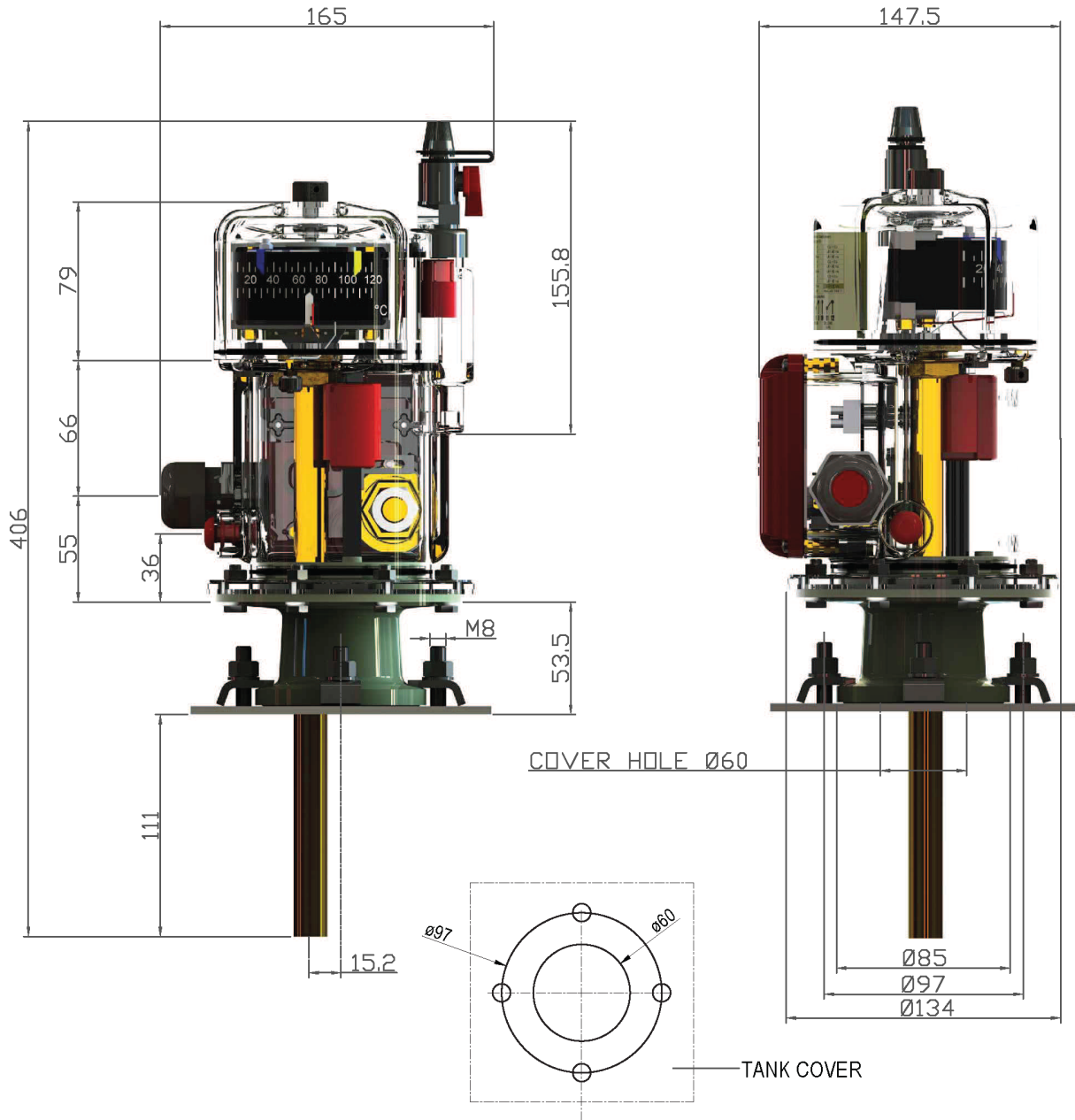
PRESSURE CONTROL

Over pressure is detected through a pressure captor with a changeover contact .

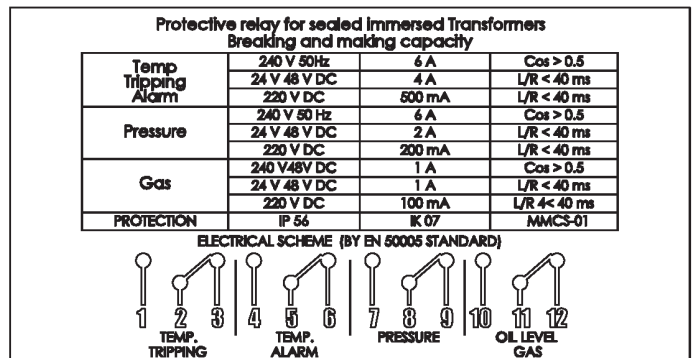


MULTI CONTROL SYSTEM

TYPE - MMCS - 01



TYPE (1) CONNECTION DIAGRAM



TYPE (2) CONNECTION DIAGRAM