

OIL LEVEL INDICATORS IFG Series



The inclined face gauge for oil-immersed power transformers



1.0 Features

The magnetic oil level indicators type IFG has been specially studied for use on power transformer to give an analogical indication of the oil level inside the conservator by a graduated dial with arrow plus one or more electric signal (max 4 signals) when the oil inside the conservator reaches the max or min level.

2.0 Construction features

○ Materials and components

The body of the gauge is made in one piece of solid compact aluminium alloy casting oiltightned proof. The dial face is inclined of 20° from the connecting flange towards the ground, offering a better view at human height of the oil level indication system.

The indicating system is located inside the body and is composed by a yellow arrow, a graduated scale with ten division, one or more contacts activated by cams and a permanent magnet.

The monitoring system is partially located inside the fixing flange and is composed by a permanent magnet, a bevel gear rigidly connected to a float arm which follows the movement of the surface of the oil.

The two systems are connected by a magnetic joint obtained using the magnetic flux of the permanent magnets

The electric signal coming from contacts are carried out through a waterproof terminal box (IP55) fitted with a PG16 cable gland and a ground screw

○ Oil-tightness and resistance to pressure

The magnetic oil level indicators IFG are suitable to work with oil up to a max temperature of 115°C; lowest ambient temperature -25°C and are mechanically resistant to vacuum (10 torr)

○ Resistance to dynamical stress

The magnetic oil level indicators IFG can operate without undue operation in following conditions:

Sinus vibrations with frequency ≤ 120 Hz and amplitude ≤ 250 μm ;

Dynamical conditions causing following accelerations:

- Max 3g in all directions, sinus vibration, amplitude ≤ 20 mm;
- Shock condition with max 10 g in all directions.

○ Surface protection

Body, frame, terminal box and cover are painted internally and externally with one primer coat of epoxy paint and externally with a finishing coat of polyurethane paint colour RAL 7030. The primer coat on the internal surfaces is compatible with transformer mineral oil up to temperatures of 120°C. Total thickness of two coats is 80 microns; special painting cycle can be provided for transformers located in very polluted areas

3.0 Manufacturing program

Magnetic oil level indicator series IFG is manufactured in 2 different execution

- Type IFG FK2 axial type suitable for use in conservator with rubber bag
- Type IFG BQ2 radial type suitable for use on OLTC compartment

All execution are equipped with 1,2 or more electric contacts, microswitch type that are activated when the oil (and consequently the arrow of the instrument) reaches presetted positions.

Indicating arrow moves over a 180° angle, float arm moves over an angle of 60°/140° respectively for type FK2, BQ2; for type BQ2 is also available a special execution with float arm rotation angle of 90°.

White indicating dial having 10 divisions with black marking.

4.0 Operation, installation and maintenance

○ Operation

Should an increase of oil inside the conservator (due to heating) or a decrease of oil (due to an oil loss) the float arm detects this variation and gives an optical signal (analogic type) through the arrow and when the oil reaches the presetted value for alarm and/or trip a microswitch is activated and an electric signal is provided inside the terminal box.

○ Installation

Use one magnetic oil level indicator for the conservator of the main tank and one for OLTC conservator (if present); the oil level indicator can be fixed to the conservator using 8 (or 6) nuts M10 complete with washer and spring washer that have to be mounted on studs M10x30mm

○ Maintenance

Magnetic oil level gauges IFG don't need specific maintenance; we suggest to check regularly contacts during the normal maintenance of the transformer

5.0 Electric contacts

The contacts are microswitches changeover type and are mechanically operated by a cam.

Following main characteristic of microswitches

Lever	Stainless steel
Body and pushbutton	Thermosetting composition
Contact material	Silver
Mechanical endurance of contact	1x10 ⁷ cycles
Temperature range	-40°C - +125°C
Standard interruption power AC	AC 250V-5A
Standard interruption power DC	see diagram at end of brochure
Insulation to earth at 20°C	2.000V
Protection degree of terminal box	IP 55

6.0 Wiring diagrams

Available wiring diagram are:

- wiring diagram type C1 : gives a signal when oil reaches low level inside conservator
- wiring diagram type C2 : gives a signal when oil reaches low and max level inside conservator
- wiring diagram type D1 : gives an alarm signal when oil reaches low level and trip signal for very low level inside conservator
- wiring diagram type D2 : gives a double signal when oil reaches low level inside conservator

All contacts are operated 3/5 degrees before the arrow reach the minimum or the maximum level of oil
 See sketch

7.0 Compatibility of installation

The installation compatibility of the magnetic oil level indicator depend mainly on the material used for the flange gasket; therefore the executions differ because of the material used for this gasket.

o Standard execution N – nitrile rubber gasket

Admitted operating conditions are:

Environmental conditions:

Ambient temperature -25°C to +50°C
 Relative humidity 95% to 20°C - 80% to 40°C - 50% to 50°C

Insulating liquid: transformer mineral or silicon oil

Temperature - 25°C to + 115°C

o Execution C – cork gasket

Admitted operating conditions are:

Environmental conditions:

Ambient temperature -20°C to +50°C
 Relative humidity 95% to 20°C - 80% to 40°C - 50% to 50°C

Insulating liquid: transformer mineral or silicon oil

Temperature - 20°C to + 110°C

o Special executions

For other environmental and/or operating conditions to be examined individually.

8.0 Ordering Instructions

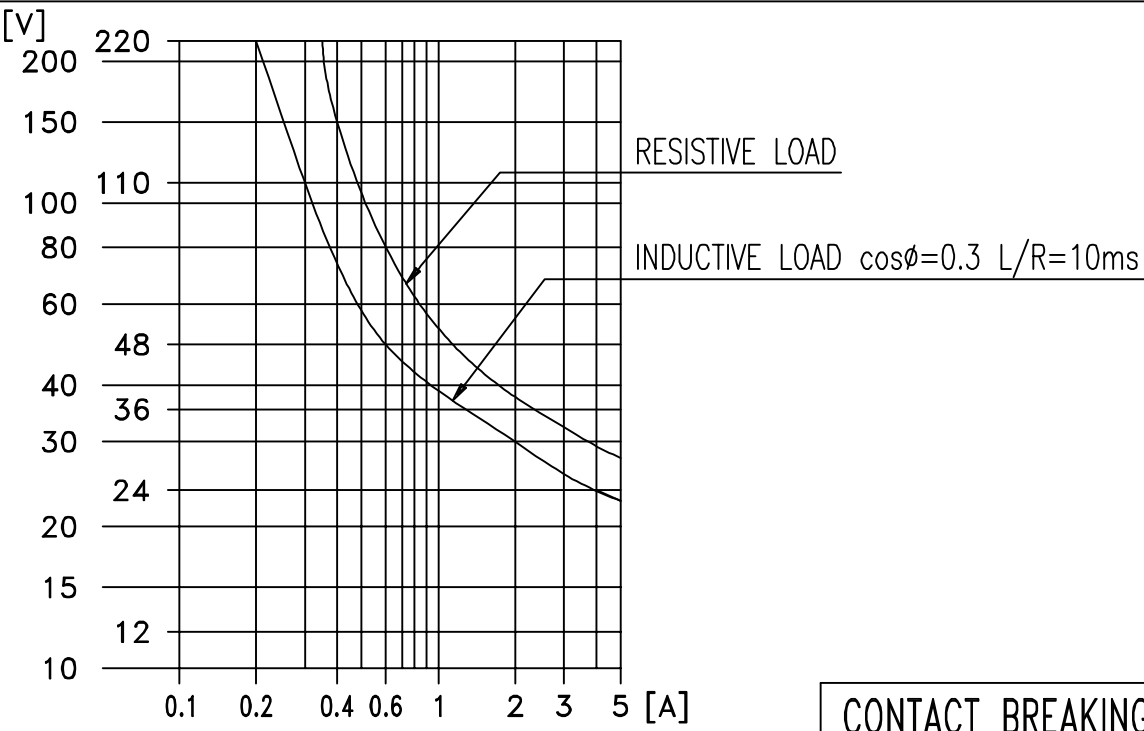
When ordering must be defined following data:

- Type of magnetic oil level indicator : IFG FK2 or BQ2
- Type of gasket required : N; C or special
- Wiring diagram: C1; C2; D1; D2
- For type FK2 also float arm length or a mounting sketch showing min, max and filling levels of oil, (see form at the end of brochure)

FILE = 3835 .DWG

REV. 03 DTD 22/03/16

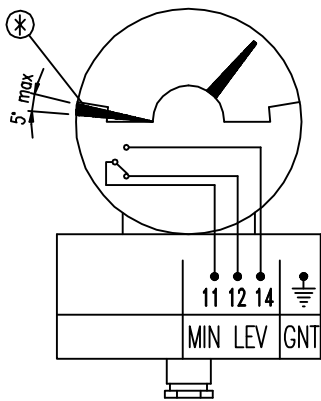
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CONTACT BREAKING CAPACITY DC

WIRING DIAGRAM

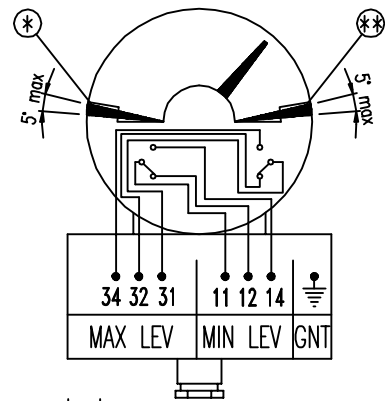
WIRING DIAGRAM C1



Only min contact

*) Min contact operates in this area

WIRING DIAGRAM C2

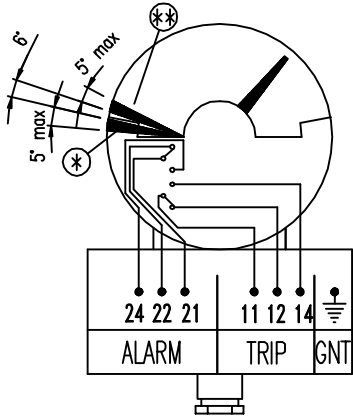


Min & max contact

*) Min contact operates in this area

***) Max contact operates in this area

WIRING DIAGRAM D1

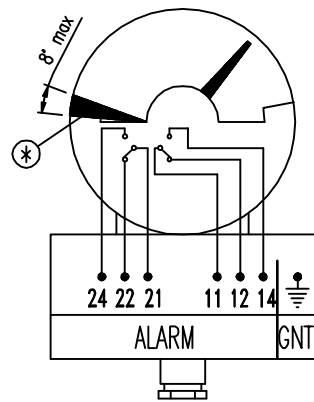


Alarm contact low level - Trip contact very low level

*) Trip contact operates in this area

***) Alarm contact operates in this area

WIRING DIAGRAM D2



Double contact at min level

*) Both contacts operate in this area



Titolo

Magnetic oil level indicator IFG

Data 12/03/13

Scala ==

Dis.

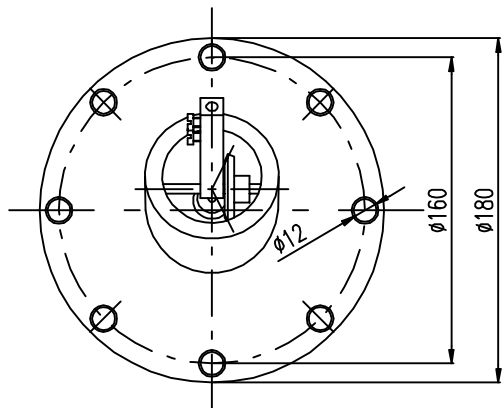
Visto

Dis. Nr

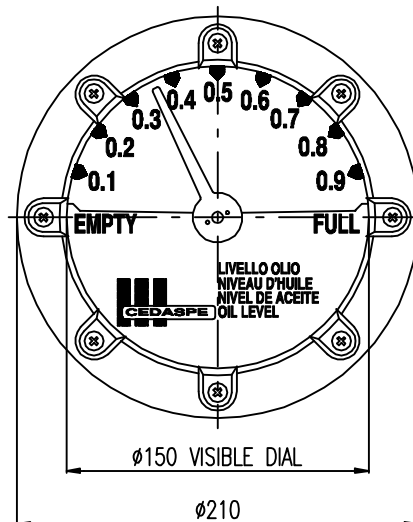
3835

1 2 3

VIEW OF CONNECTING FLANGE



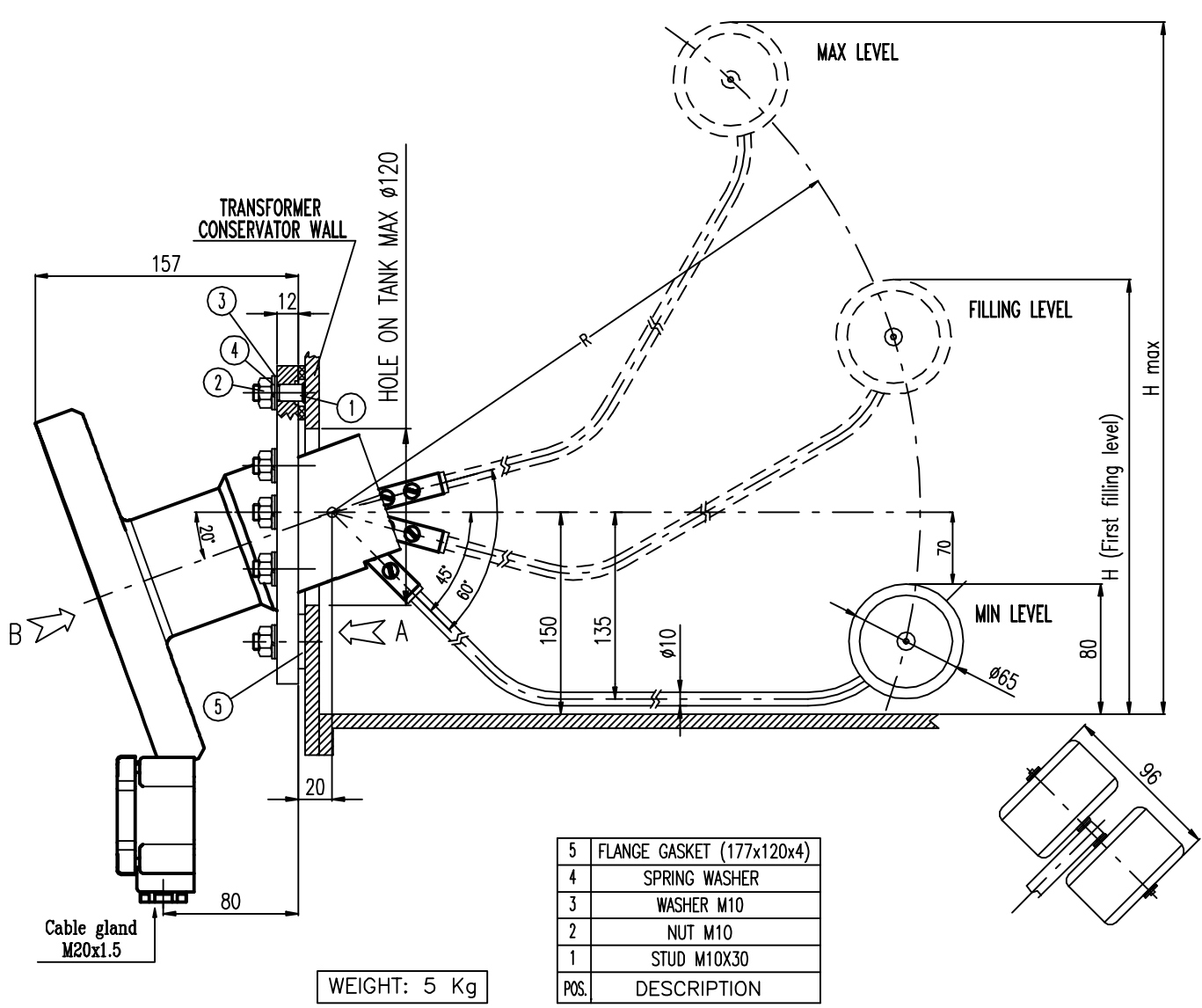
VIEW OF FRONT FACE



FILE = 3836 .DWG LMT [(0,0) (196,296)] A4 (210x297)

REV. 01 DTD 31/03/2016

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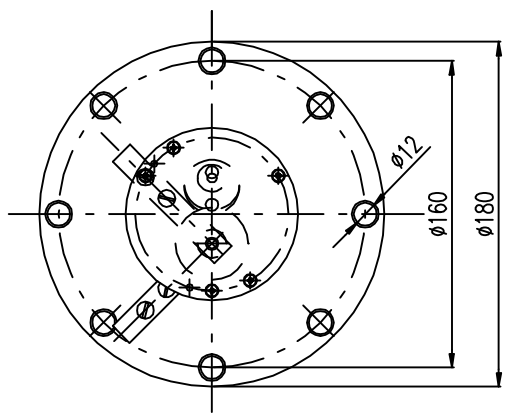
POS.	DESCRIPTION
5	FLANGE GASKET (177x120x4)
4	SPRING WASHER
3	WASHER M10
2	NUT M10
1	STUD M10X30

WEIGHT: 5 Kg

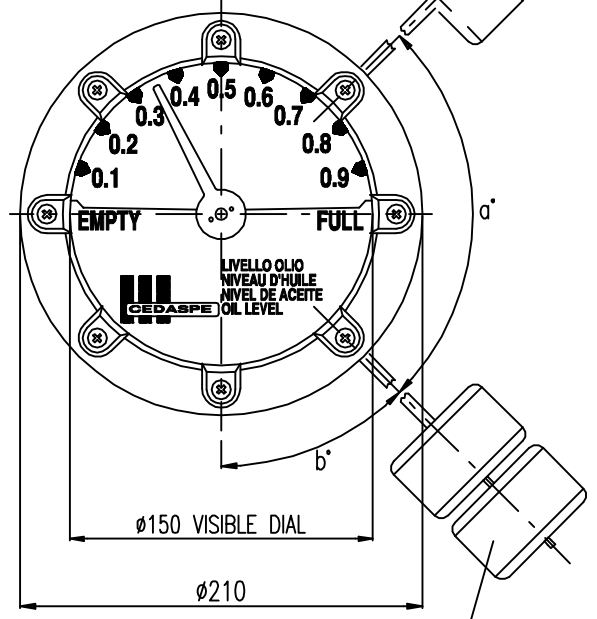
NOTE : STARTING FROM 01/01/08 EXECUTION FLANGE "6H" IS NO LONGER AVAILAIBLE

	Titolo MAGNETIC OIL LEVEL INDICATOR IFG MODEL FK2 FOR HERMETIC RUBBER BAG CONSERVATOR	Data 12/03/13 Scala == Dis. Visto	Dis. Nr 3836
			1

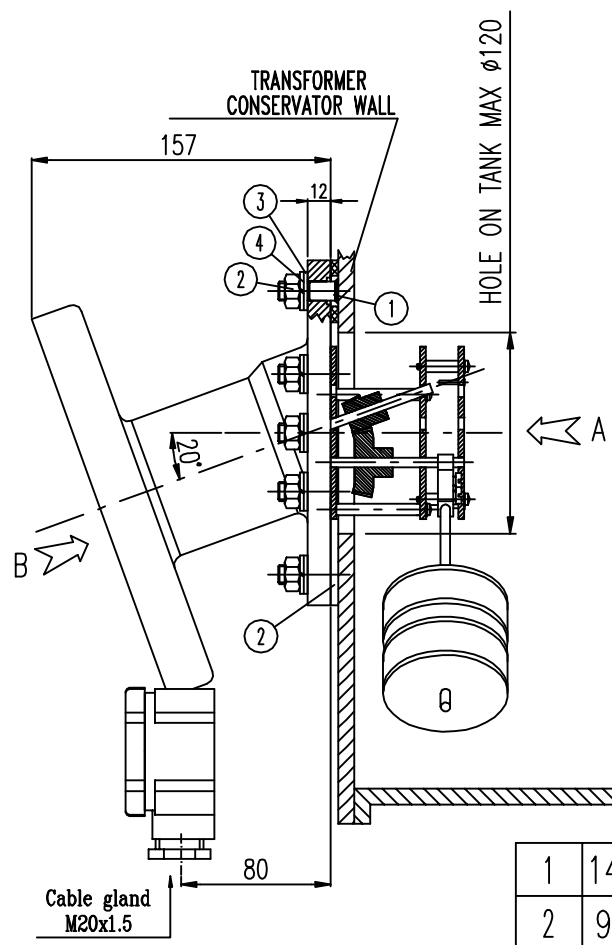
VIEW OF CONNECTING FLANGE



VIEW OF FRONT FACE



ATTENTION:
FLOAT ARM IS ON
RIGHT HAND SIDE



WEIGHT: 5 Kg

POS.	DESCRIPTION
5	FLANGE GASKET (177x120x4)
4	SPRING WASHER
3	WASHER M10
2	NUT M10
1	STUD M10X30

1	140°	20°	STANDARD
2	90°	45°	SPECIAL
POS.	a°	b°	EXECUTION



Titolo **MAGNETIC OIL LEVEL INDICATOR IFG MODEL BQ2 RADIAL TYPE FOR OLTC CONSERVATOR**

Data 12/03/13
Scala ==
Dis.
Visto

Dis. Nr
3837