

On-Load Tap Changer Type G

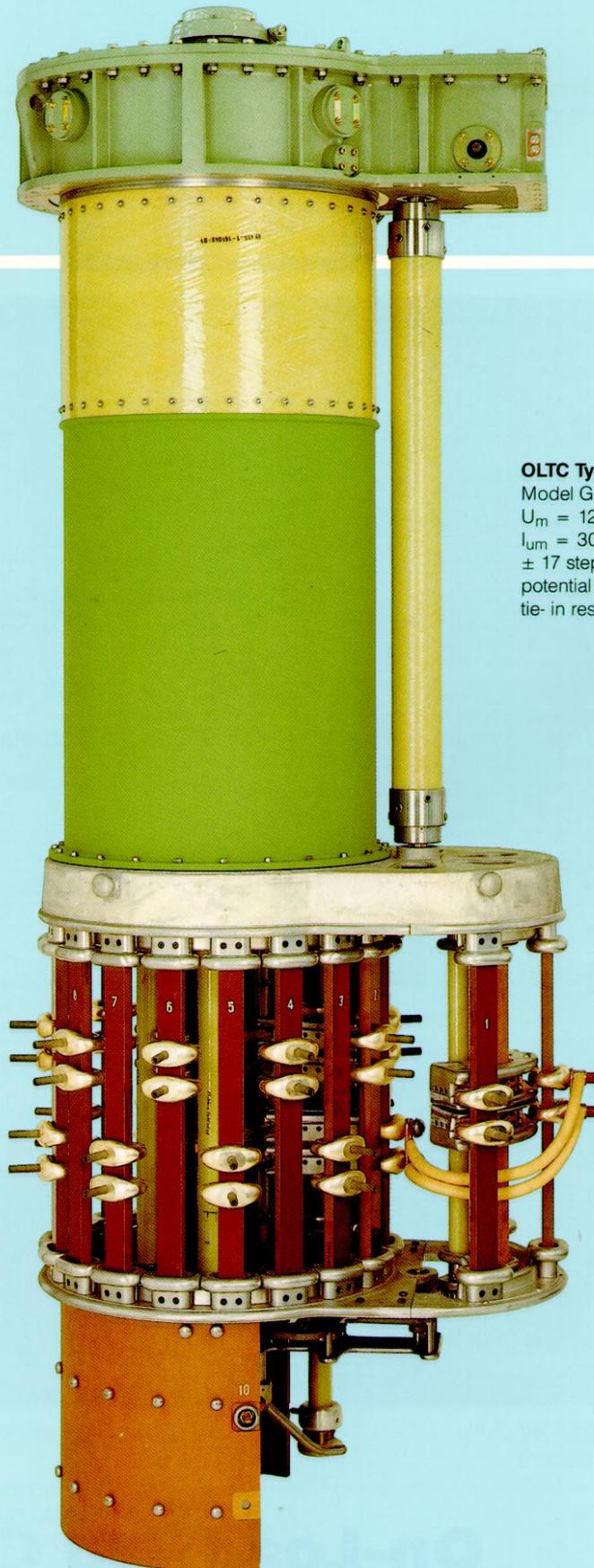
On-Load Tap Changer Type G

The on-load tap changer type G is used to vary the ratio of an oil-immersed transformer under load. In general, it is designed to suit power transformers with high ratings for network and industrial service.

The on-load tap changer type G offers a great number of advantages for both manufacturer and user.

Versatility

- star-point design for 1600 A and 2000 A for use in 3-phase star-connected windings.
- single-pole design at 1600 A, 2000 A, 3000 A and 4500 A.
- insulation to ground up to $U_m = 245$ kV and 2 tap selector sizes which can be selected independently of each other.
- available with ± 9 , ± 11 , ± 13 , or ± 15 (± 17) steps.
- additional devices for potential tie-in of the tap winding during change-over selector operation (potential switch with or without integrated tie-in resistors).
- additional screening for the diverter switch oil compartment, free of partial discharge, offering minimum distance to the tank.



OLTC Type G
Model G I 3022,
 $U_m = 123$ kV,
 $I_{um} = 3000$ A,
 ± 17 steps,
potential switch and
tie-in resistors



Heavy-duty on-load tap changer

- diverter switch designed as a high-speed transition resistor type with arc extinction at the first current zero.
- rapid tap change operation of the diverter switch, low thermal stress on the transition resistors.
- automatically controlled motion sequence of arcing contacts which are made of tungsten-copper material, separate shunt contacts.
- robustly designed selector, effective contact cooling, silverplated connection terminals, high short-circuit withstandability.
- simple selector mechanics with precise action, all movable parts run on backlashfree roller bearings.

Cost-saving — easy installation and reduced maintenance

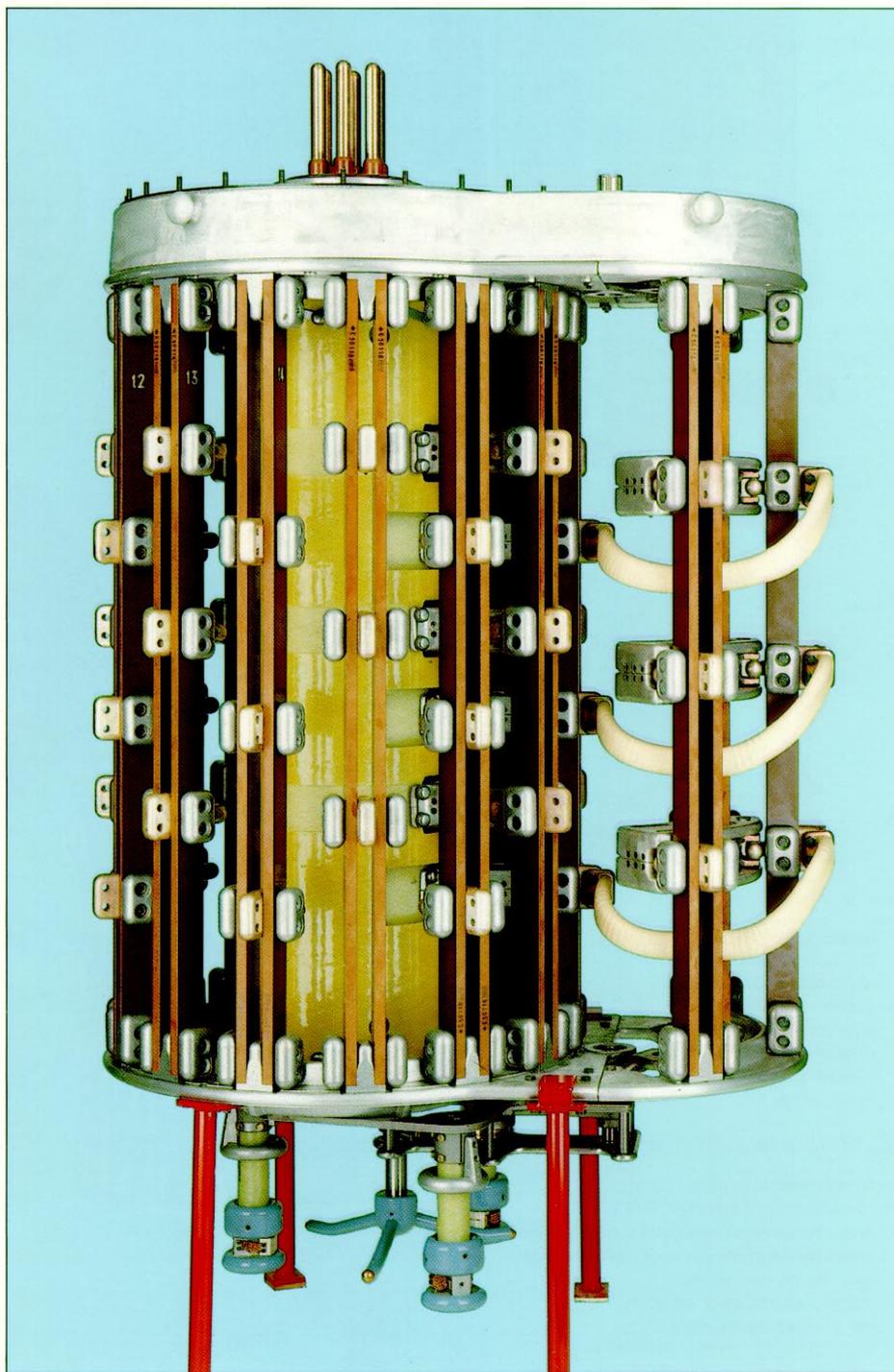
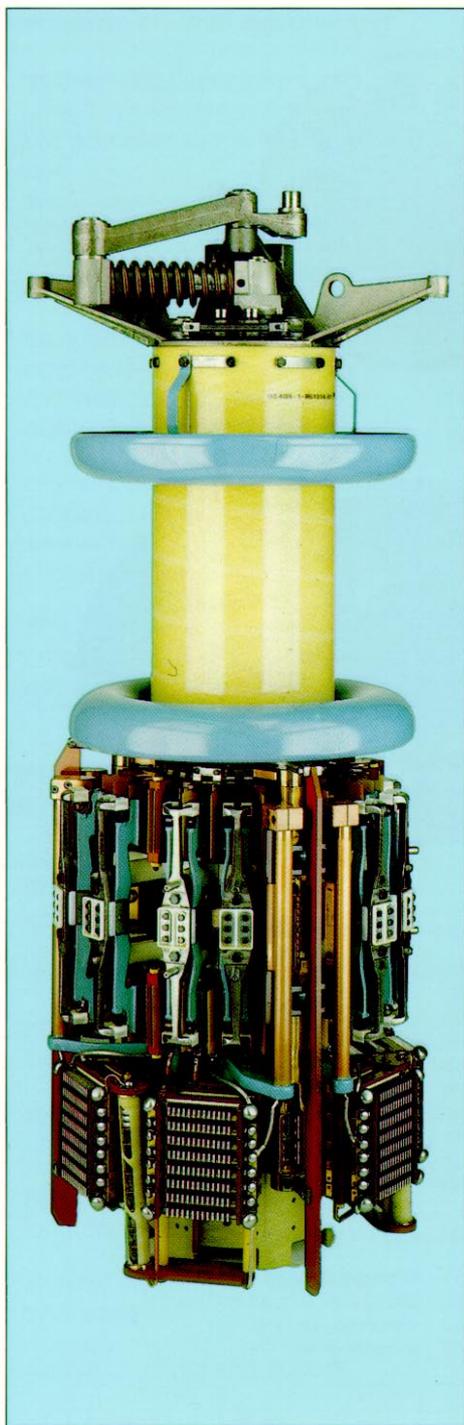
- oil-immersed installation of the entire tap changer in the transformer main tank.
- simple to connect.
- no diverter switch unit/tap selector leads connecting to outside.
- straightforward coupling to motor drive unit.
- little maintenance required due to long contact life.
- diverter switch quick and easy to disassemble.
- simple to adjust and control.
- oil suction pipe built-in.

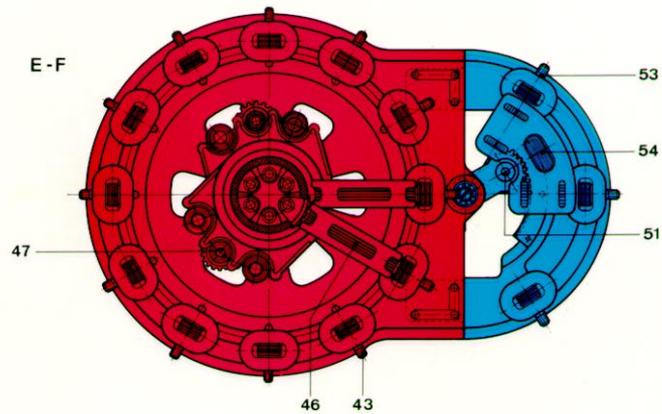
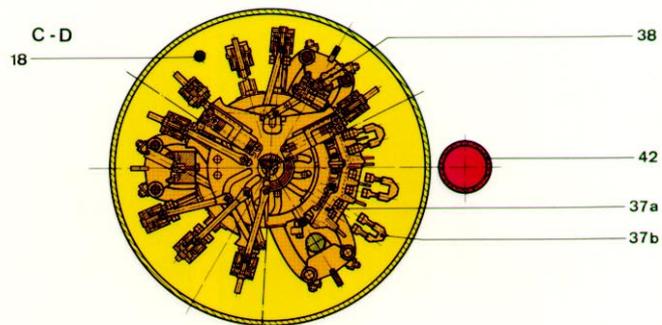
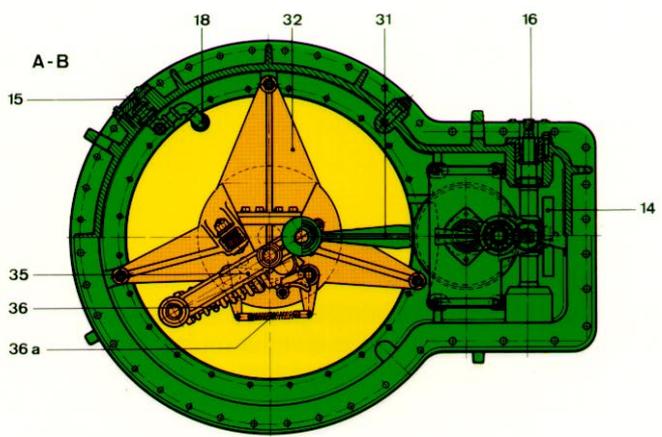
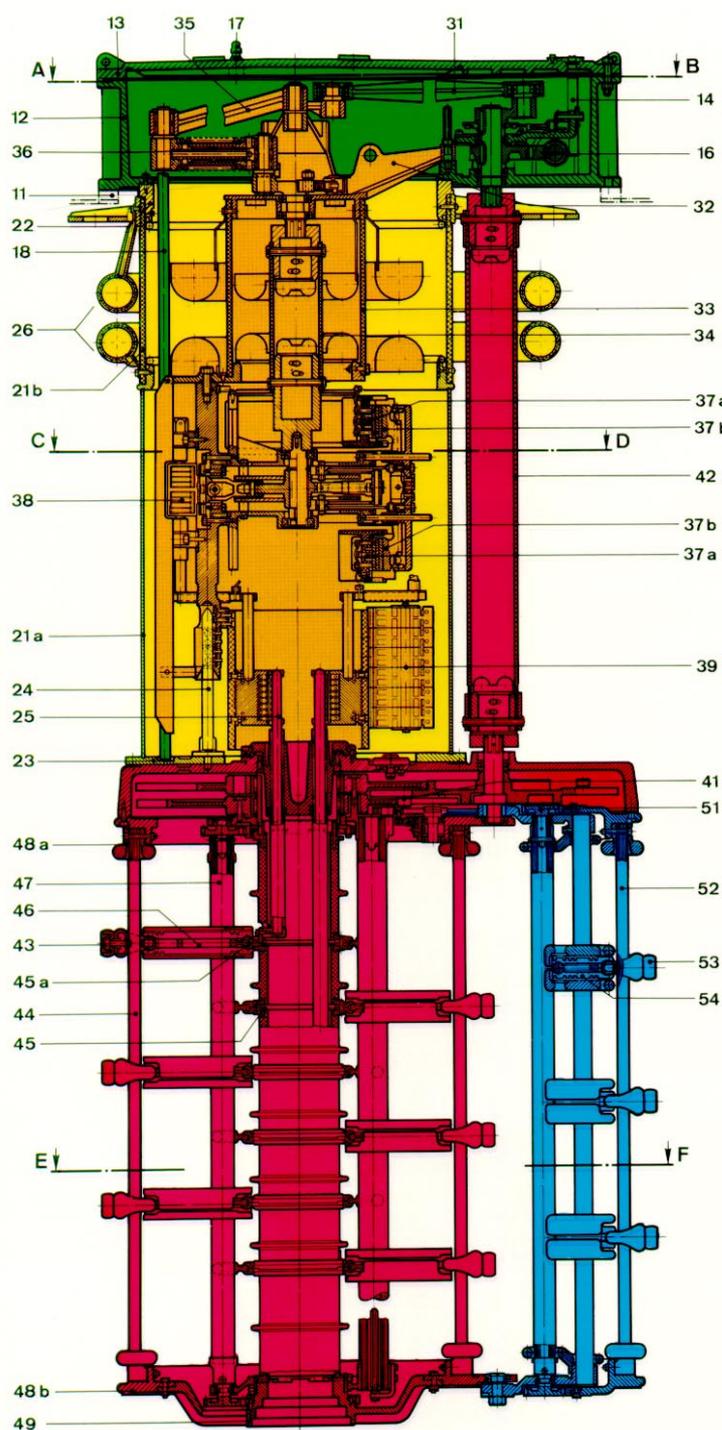
OLTC Type G
Model G III 2002 Y,
 $U_m = 245 \text{ kV}$,
 $I_{um} = 2000 \text{ A}$,
 ± 13 steps,
potential switch

Diverter Switch Tap Selector Unit

This unit comprises the spring-operated energy accumulator, the diverter switch itself and the transition resistors. For inspection, the unit can be withdrawn from the oil compartment through the head.

The tap selector comprises the gearing, the column with take-off rings, the insulation bar cage with connecting terminals, the contact bridges with the corresponding drive tubes and segments, and the upper and lower cage rings. The tap selector may also include a changeover selector for doubling the number of steps. The gear casing of the tap selector is also the pressure-tight junction with the diverter switch oil compartment.





Group 10 — Tap changer head

- 11 mounting flange
- 12 tap changer head casing
- 13 tap changer cover
- 14 position indication
- 15 pipe connection for suction pipe
- 16 drive shaft
- 17 bleeder screw
- 18 suction pipe

Group 20 — Diverter switch oil compartment

- 21 a oil compartment cylinder (steel)
- 21 b oil compartment cylinder (GFRP)
- 22 upper flange with gasket and supporting flange for installation into bell-type tank (special design)
- 23 lower flange with gasket
- 24 guiding pin and plug contact for tap changer neutral terminal
- 25 plug contact for selector connecting lead
- 26 grading ring (for $U_m \geq 170$ kV only)

Group 30 — Diverter switch unit

- 31 coupler
- 32 supporting stay
- 33 supporting cylinder
- 34 drive shaft
- 35 winding crank
- 36 energy accumulator with pawl 36 a
- 37 a stationary contact system
- 37 b movable contact system
- 38 shunt contact
- 39 transition resistor

Group 40 — Fine tap selector

- 41 tap selector gear
- 42 drive shaft
- 43 connection terminal
- 44 laminated paper terminal bar
- 45 tap selector column with take-off ring 45 a
- 46 tap selector contact bridge
- 47 tap selector drive tube
- 48 a upper cage ring
- 48 b lower cage ring
- 49 bottom

Group 50 — Changeover selector

- 51 changeover selector drive
- 52 changeover selector terminal bar
- 53 connecting terminal
- 54 movable contact

Technical Data

The technical data of the tap changer type G have been verified in type tests according to IEC International Standard 214 (1989). Moreover, it complies with all relevant national standards. Detailed information and comprehensive data for the selection of a type G tap changer for particular applications can be inferred from our manual TD 48.

| Tap changer model | G III 1602 Y | G III 2002 Y ¹ | G I 1612 | G I 2012 | G I 3022 | G I 4502 ² |
|---|--|---------------------------|-------------------|-------------------|---|-----------------------|
| Number of poles and application | 3 (neutral) | 3 (neutral) | 1 | 1 | 1 | 1 |
| Max. rated through-current (A) | 1600 | 2000 | 1600 | 2000 | 3000 | 4500 |
| Short-circuit strength (kA) | | | | | | |
| thermic (3 sec.) | 24 | 24 | 24 | 24 | 30 | |
| dynamic (peak) | 60 | 60 | 60 | 60 | 75 | |
| Max. rated step voltage (V) | 5000 | 5000 | 5000 | 5000 | 5000 | |
| Rated switching capacity (kVA) | 5000 | 5000 | 5000 ³ | 5000 ³ | 6500 ³ | |
| Rated frequency (Hz) | 50 . . . 60 | | | | | |
| Operating positions | without changeover selector: max. 16 (special design: 18) with changeover selector: max. 31 (special design: 35) | | | | | |
| Insulation to ground | | | | | | |
| Highest voltage for equipment U _m (kV) | 72,5 | 123 | 170 | 245 | (Insulation to ground for U _m > 245 kV on request) | |
| Rated lightning impulse withstand voltage (kV, 1.2 50) | 350 | 550 | 750 | 950 | | |
| Rated power-frequency withstand voltage (kV, 50 Hz, 1 min.) | 140 | 230 | 325 | 395 | | |
| Tap selector | optional tap selector size (D, E) available according to the requirements by voltage stress on the tap winding; the tap selector size may be chosen independently of the voltage class. | | | | | |
| Diverter switch oil compartment | pressure-proof up to 0.3 bar pressure difference (test pressure 0.6 bar) | | | | | |
| Oil suction pipe | standard equipment | | | | | |
| Oil displacement | approx. 1000 . . . 1190 litres | | | | | |
| Oil filling quantity | approx. 750 . . . 880 litres | | | | | |
| Weight | approx. 1380 . . . 1950 kg | | | | | |
| Drying procedure | vacuum-drying up to max. 110 ° C vapor-phase drying up to max. 125 ° C | | | | | |
| Motor drive | motor drive unit MA 7, protective housing in outdoor design, motor data: 3 AC 230/400 V, 50 Hz, 0,75 . . . 1,5 kW, step-by-step operation with local and remote control, mechanical and electrical position limitation, facility for remote position indication (pointer instrument, lamp panel, digital display), hand crank operation for emergency and adjustment purposes. | | | | | |
| Notes: | ¹ higher max. rated through-current on request ² on request only ³ up to 8000 kVA as special design | | | | | |

Manufacture and Sales

Maschinenfabrik Reinhausen GmbH
 P.O.P. 120360
 D-93025 Regensburg
 Phone + 49-941-4090-0
 Fax + 49-941-4090-111
 Telex 65881

VK 13/95 en — 0695/2000
 Printed in Germany