TransformerCare Unit
TCU Series

REDFOX

Description

The TransformerCare Unit TCU is a service unit designed to extend the operating life of oil-filled transformers and reactors.

The continuous degassing, dewatering and filtration of the insulating oil ensures that the oxygen content, water content and particle contamination in the transformer is kept low and the breakdown voltage of the insulating oil is increased. As a result, the service life of the insulation is also increased. Typically the remaining service life of the transformer can be extended by a factor of three.

The throughput of approx. 15 m³/week prevents the formation of damaging turbulence in the transformer. The TCU is used throughout the life of the transformer, while the transformer is connected and in operation.

The volume of fault gases removed using the TCU corresponds to the gas formation rate in the transformer, which can be interpreted in accordance with DIN EN 60599* or DGA (Dissolved Gas Analysis). In addition, humidity and total gas content in the insulating oil can be monitored online, and an alarm can be triggered in good time in the event of significant changes.

Advantages

- Preserves the insulating property of the transformer oil
- Increased operating reliability
- Fault gas analysis is possible, similar to DGA
- Extends the remaining service life of the transformer by slowing down the process of cellulose ageing.

* DIN EN 60599 - Mineral-oil impregnated electrical equipment in service - Guide to the interpretation of dissolved and free gas analysis.

Technical specifications

General data	
Suitable for transformer sizes	5 to 1100 MVA
Flow rate (50 Hz)	15 m³ / week for 24 hour operation
Degassing capacity	≈ 155 litres / 24 h for 10% gas content ≈ 14 litres / 24 h for 2% gas content
Dewatering capacity (adjusted to prevent excessive drying out of the cellulose insulation)	Temperature of medium 50 °C, 10 ppm water content ≈ 12 ml / 24 h for 10% gas content ≈ 1.12 ml / 24 h for 2% gas content Lower limit of water content ≈ 10 ppm.
Permitted pressure at suction port (IN)	0.1 to 0.5 bar
Operating pressure (OUT)	0 to 6 bar (max. 25 bar internal pump pressure)
Seal material	NBR (FPM)
Filtration rating	3 µm
Operating viscosity	5 to 300 mm²/s
Fluid temperature range	-35 to +90 °C
Ambient temperature range	-35 to +50 °C
Storage temperature range	-20 to +40 °C
Connection inlet/connection outlet	ISO8434-1-18L (M26x1.5 male thread)
Mounting position	≈ 1 metre above the floor
Type of mounting	Mounting via 4 bore holes on the back of the unit
Ambient temperature	-35 to +50 °C
Weight (empty)	≈ 60 kg
Relative humidity	Maximum 95%, non-condensing
Noise level max.	< 70 dBA, at distance of 1 m, 90° from the wall
Electrical specifications	
Supply voltage	(See model code)
Power consumption	≈ 550 watts
Protection class to DIN 40050	IP 55

Model code

TCU - 1 - I - 1 - M - 3 - 3 - Z - Z - AD - 00 / –

Basic type
TCU = TransformerCare Unit

Size
1 ≈ 15 m³/week

Operating medium
I = Insulating oil, NBR seals, tested with insulating oil based on mineral oil (Residues of the test oil remain in the unit after testing)

Mechanical design
1 = stationary unit

Voltage / Frequency / Power supply

A	=	400 V, 50 Hz, 3 Ph	I	=	500 V, 50 Hz, 3 Ph
B	=	415 V, 50 Hz, 3 Ph	K	=	480 V, 60 Hz, 3 Ph
C	=	200 V, 50 Hz, 3 Ph	L	=	220 V, 50 Hz, 3 Ph
D	=	200 V, 50 Hz, 3 Ph	M	=	230 V, 50 Hz, 1 Ph
E	=	220 V, 60 Hz, 3 Ph	N	=	575 V, 60 Hz, 3 Ph
F	=	230 V, 60 Hz, 3 Ph	O	=	460 V, 60 Hz, 3 Ph
G	=	380 V, 60 Hz, 3 Ph	X	=	Other voltage
H	=	440 V, 60 Hz, 3 Ph			

Filter size
3 = Type 3

Filtration rating
3 = 3 µm

Cooler
Z = without cooler

Additional equipment
GS = GasSampling Unit*
Z = without GasSampling Unit

Measuring equipment
Z = without
AD = AquaSensor AS 3000, sensor with integrated display

Modification number
000 = the latest version is always supplied

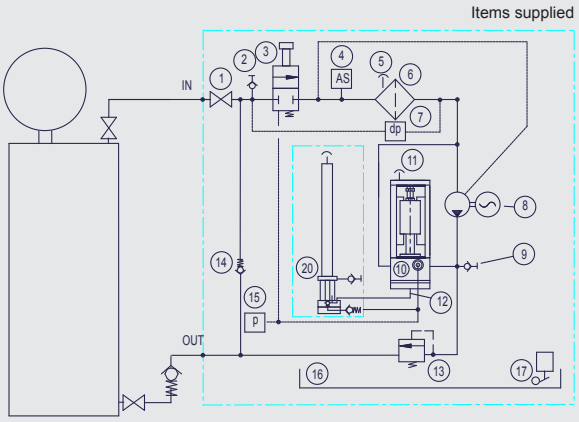
Supplementary details
V = FPM seals

* For first installation only recommended for transformers with a service life of up to max. 10 years

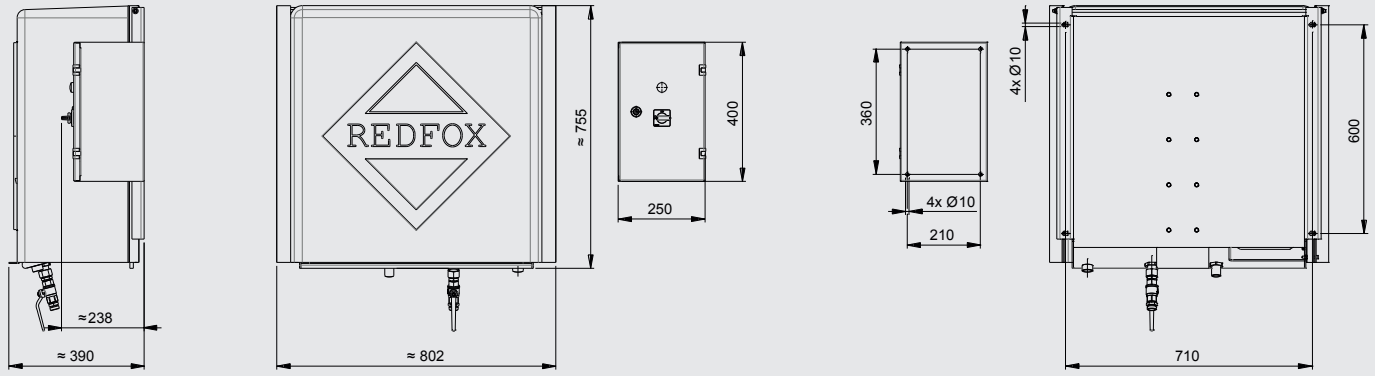
Hydraulic circuit

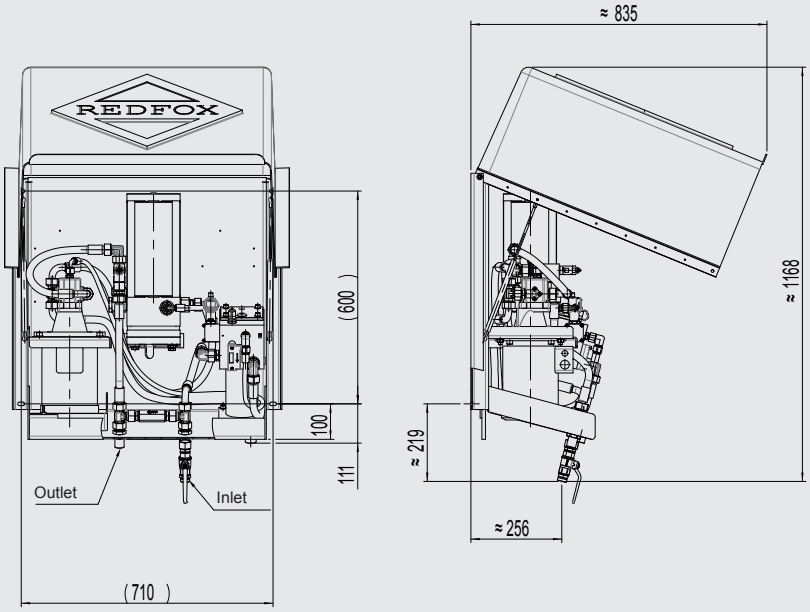
Items supplied

1. Manual shut-off valve
2. Oil sampling point
3. Automatic shut-off valve
4. AquaSensor with integrated display (option)
5. Air bleed valve for fluid filter
6. Fluid filter
7. Filter clogging indicator (differential pressure)
8. Motor-pump unit
9. Oil sampling point
10. Dewatering and degassing unit RFX
11. Air bleed screw for RFX
12. Gas sampling point
13. Pressure relief valve
14. Check valve
15. Electronic pressure switch with integrated display (vacuum measurement)
16. Drip tray
17. Safety switch for drip tray
20. GasSampling Unit GSU (optional)



Dimensions (in mm)





Items supplied

– TCU
– Control cabinet, electrically connected to TCU (roughly 0.5 m)
– Protective cover (weather protection)
– Operating and maintenance manual

Accessories

At the gas sampling point (see hydraulic diagram, no. 12) a small amount of insulation oil is ejected, which is required for lubrication and sealing of the internal vacuum pump (up to ~ 6 litres/year).

TCU with additional equipment GasSampling Unit GS:

- The oil is automatically returned to the TCU.

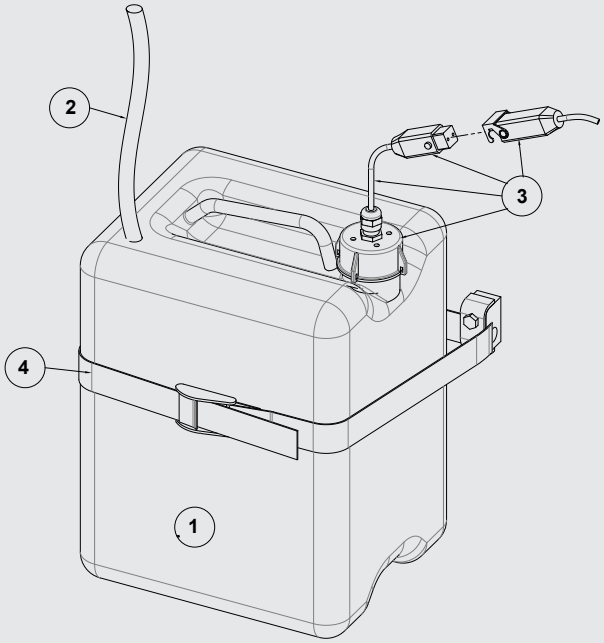
TCU without additional equipment GasSampling Unit GS:

- If regular checks of the TCU are performed, the oil can be collected from the drip tray (16). The drip tray fills up until the safety switch (17) deactivates the TCU (~ 2 litres).
- If regular checks of the TCU are not performed, we recommend installing the collecting canister, available as an accessory, underneath the TCU.

Designation	Part number
Collecting canister with float switch	3534977

Items supplied, collecting cannister

① Collecting canister (capacity ~ 25 litres)
② Connection hose of gas sampling point connection to the collecting canister
③ Float switch
④ Strap to secure or fasten the collecting canister.



Note

The information in this brochure relates to the operating conditions and applications described.

For applications and/or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

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