



Treotech



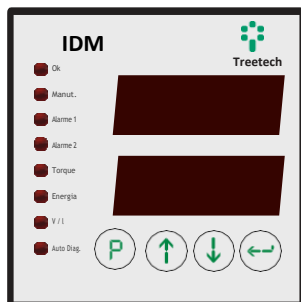
IDM

OLTC TORQUE MONITOR

**PRODUCT
CATALOG**

treotech.com.br

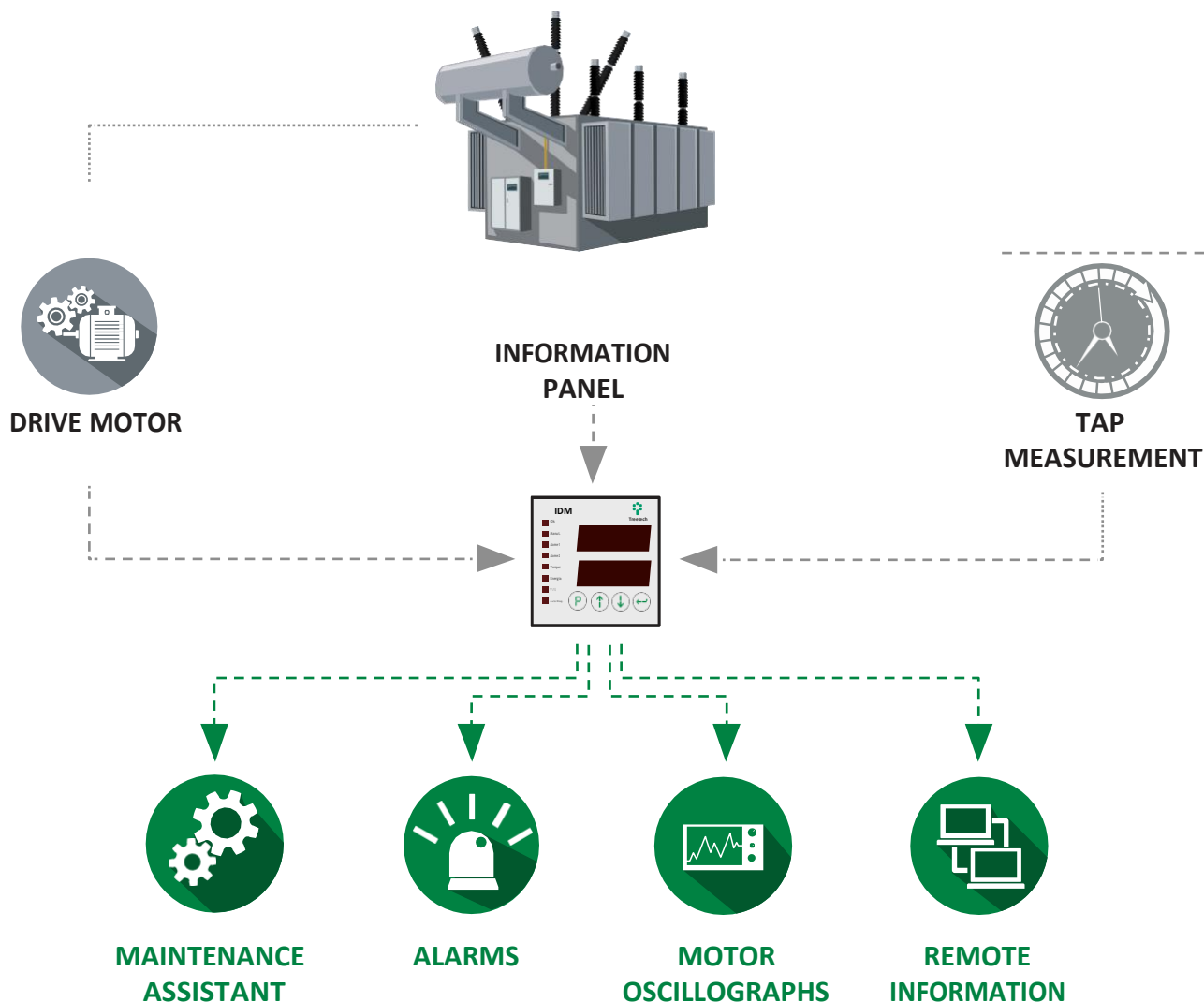
HOW IS YOUR OLTC OPERATING?



The on-load tap-changer (OLTC) is statistically one of the main sources of transformer failures. The OLTC Torque Monitor - IDM performs an online diagnostic of the OLTC's operation state, using measurements, oscillographs, and algorithms which monitor the mechanism.

IDM monitors the mechanical performance while directly assisting the OLTC maintenance control and planning.

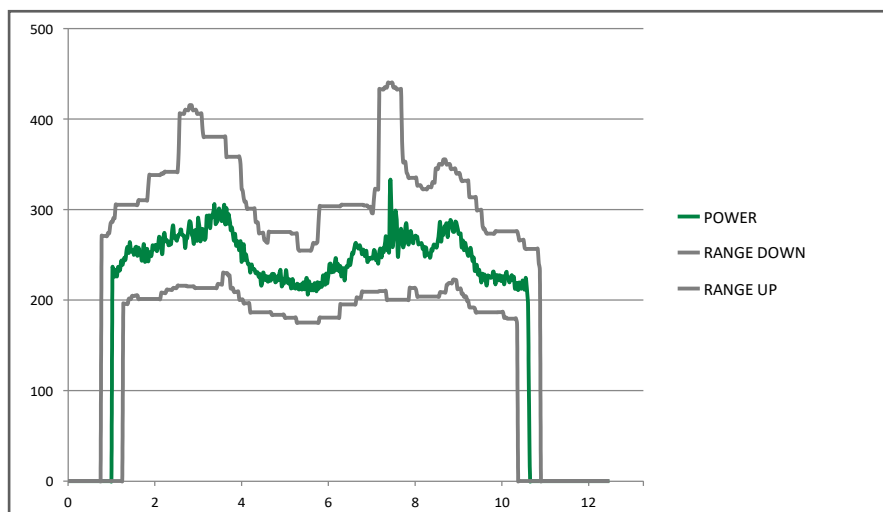
SYSTEM TOPOLOGY





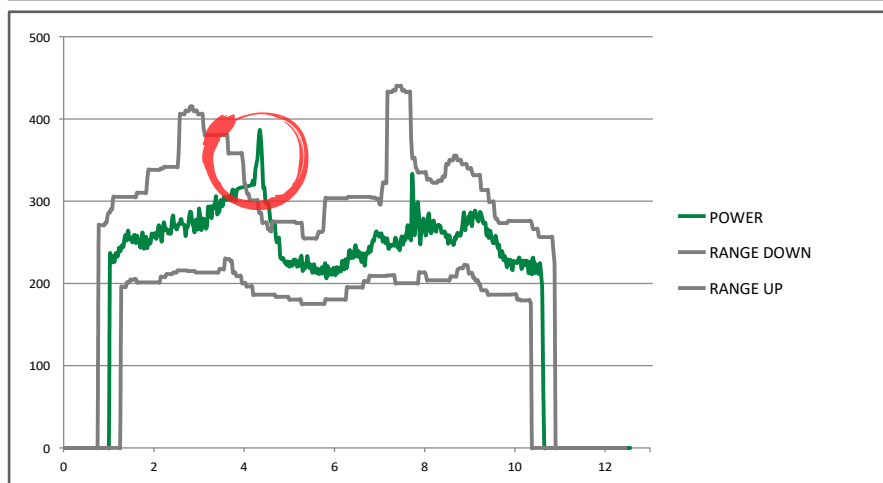
MOTOR OSCILLOGRAPHS

- Current oscillographs, power factor and voltage in the motor during the operations.
- The mototr power signatrure is recorded during operation.

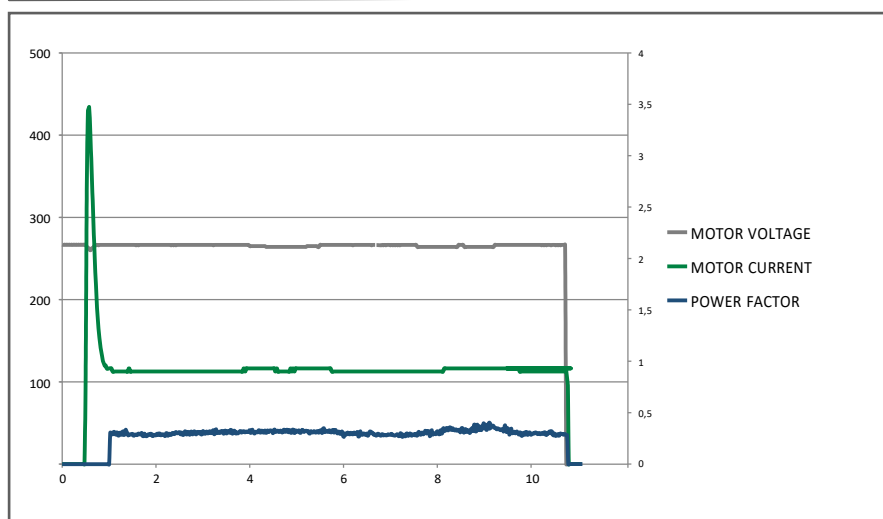


POWER CURVE DURING TAP CHANGER OPERATION:

- In this example, a switching pulse with values within the alarm range acquired by tthe learning reference.



- In this example, a shifting with values exceeding the alarm range.



CURRENT, VOLTAGE AND POWER FACTOR CURVE:

- In this example, voltage, current and power factor during OLTC operation.
- Alarms are generated from adjustable settings on the IED.



DRIVE MOTOR AND CONTROL CIRCUIT

- Motor start-up current at the beginning of the operation;
- Under and overvoltage of the motor supply;
- Min. and max. voltages;
- Local voltage, current and power factor indication on the display.



MAINTENANCE ASSISTANT

- Maintenance remaining time indication due to working time and number of operations;
- Indication of OLTC contact wear, total and after last maintenance.



TAP MEASUREMENT

- TAP position with operation number count and working time.



MECHANISM OR AMBIENT TEMPERATURE

- Measurement of the driving mechanism or ambient temperature;
- Operation of the heating system mechanism .



COMMUNICATIONS

- RS-485 serial communication port with open communication protocols Modbus® RTU (default) or DNP3 RTU (optional).



ALARMS AND SELF-DIAGNOSES

- Issuance of alarms in case of abnormalities and maintenance warnings;
- Self-diagnose for internal failure detection.



ADVANTAGES

- Exceeds the EMC (Electro-Magnetic Compatibility) supportability standards;
- Does not have mechanical parts for parametrization of calibration;
- Reduced size;
- High brightness, readable under any lighting and temperature condition;
- Universal supply 38 to 265 Vac/Vdc, 50/60 Hz.

OPTIONAL FUNCTIONS

The product can be supplied with one or more of the optional functions below:

MMEM - Mass Memory

Non-volatile memory for store measurements, alarm events and others, with over 10-month storage capacity. Free software for downloading information¹.

DNP3 - DNP3 RTU Protocol

DNP3 RTU slave communication protocol level 1, with timestamp support and 1 ms precision. Accept level 3 when applicable.

HTCV - Anti-condensation system monitoring and control power

Anti-condensation system operation monitoring through measurement of the heater current and panel temperature.

Also enables the OLTC control voltage monitoring through the input voltage.

TAPP - OLTC Position Measurement (Potentiometer transmitter)²

Enables line current and OLTC position measurement by a potentiometric transmitter, with cable resistance compensation and error detection.

TAPI - OLTC Position Measurement (mA)²

Enables OLTC position measurement through a current input.

OLMT - OLTC Maintenance Assistant

Expert functions for OLTC maintenance, including:

- >> Number of operations and OLTC service time;
- >> Prediction of the remaining time for maintenance by number of operations, service time.

¹ Download only available via Modbus® RTU protocol.

² The availability of this item depends on the model purchased.

TECHNICAL SPECIFICATIONS

HARDWARE	RANGE/DESCRIPTION
Power supply	38...265 Vac/Vdc, 50/60 Hz
Max. consumption	< 8 W
Operating temperature	-40...+85 °C
Protection class	IP20
Connections	0,3...2,5 mm ² , 22...12 AWG
Installation	Panel installed
MEASUREMENT INPUTS	RANGE/DESCRIPTION
Currents	4 from 0...10 Arms / 14 A peak, with clip-on CT ¹ or shunt ¹ resistor
Voltages	3 of 0...265 Vac, with auxiliary PT ¹ / 0...300 Vdc
Temperatures	1 Pt100 ¹ sensor, range from -55...200 °C
Dry contacts	1 potential-free
Tap positions	Potentiometer transmitter or current loop (0...5, 0...10, 0...20 or 4...20 mA)
MAXIMUM ERRORS	RANGE/DESCRIPTION
Currents	0.5 % of the reading + CT error
	0.5 % of the reading + Shunt error
Voltages	0.5 % of the reading + PT error
	0.5 % of the reading + Shunt error
Temperatures	0.5 % of the scale end + sensor error
OUTPUTS	RANGE/DESCRIPTION
Relay outputs	3 Reversible + 2 NO
Maximum switching power	220 VA(ac) / 70 W(dc)
Maximum switching voltage	250 Vac/Vdc
Maximum conduction current	5 A
NETWORK INTERFACES	DESCRIPTION
Serial communication ports	1 TIA-485-A (RS-485)
Communication protocols	Modbus [®] RTU, DNP3 RTU (optional)
STORAGE	DESCRIPTION
Standard version	Oscillographs of 10 engine operation ²
Version with MMEM optional	Oscillographs of 90 OLTC operations, alarm log, events and measurements ²

¹ Accessory sold separately.² Download only available via Modbus[®] RTU protocol.

TYPE TESTS (SENSOR 1 SMART PLATFORM)

Immunity to surges (IEC 60255-22-5 and IEC 61000-4-5)

Immunity to electric transitories (IEC 60255-22-1, IEC 61000-4-12 e IEEE C37-90-1)

Voltage pulse (IEC 60255-5)

Applied voltage (IEC 60255-5)

Immunity to irradiated electro-magnetic fields (IEC 60255-22-3 e IEC 61000-4-3)

Immunity to conducted electro-magnetic disturbances (IEC 60255-22-6 and IEC 61000-4-6)

Immunity to industrial frequency magnetic fields (IEC 61000-4-8)

Electrostatic discharges (IEC 60255-22-2, IEC 61000-4-2 e IEEE C37-90-3)

Immunity to fast electric transitories (IEC 60255-2-4, IEC 61000-4-4 e IEEE C37-90-1)

Power supply failure (IEC 60255-22-11 e IEC 61000-4-11)

Cold weather supportability (IEC 60068-2-1)

Dry hot weather supportability (IEC 60068-2-2)

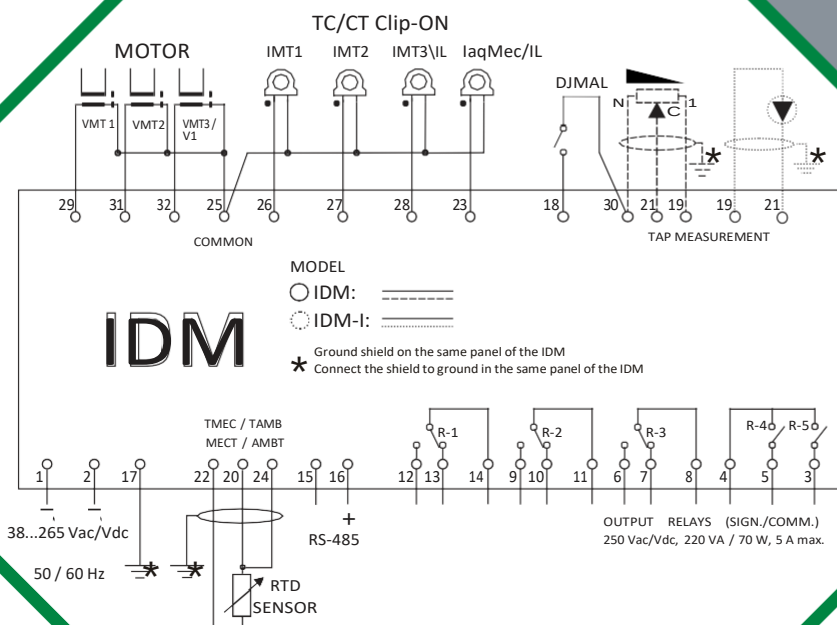
Wet hot weather supportability (IEC 60068-2-78)

Thermal cycle (IEC 60068-2-14)

Vibration response (IEC 60255-21-1)

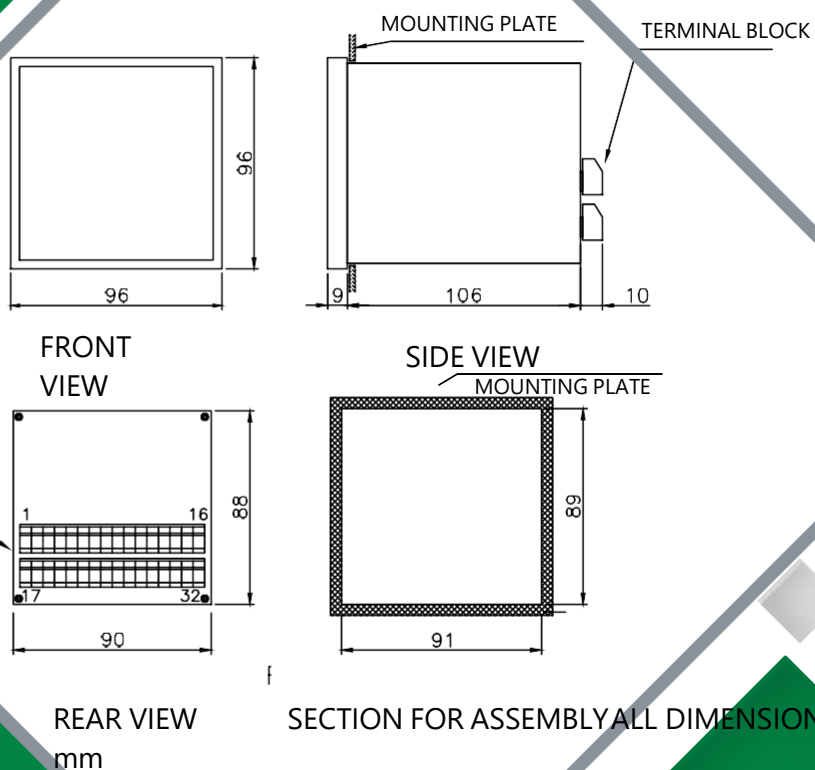
Vibration durability (IEC 60255-21-1)

Electrical safety (EN 61010-1)



WIRING DIAGRAM

PRODUCT DIMENSIONS



SECTION FOR ASSEMBLY ALL DIMENSIONS IN



SPECIFICATION FOR ORDERS

On the product purchase order, it is necessary to specify:

- Product name;
- Model;
- Optionals;
- Accessories.



Model: Choose one of the options below:
IDM: 1 input for tap position measurement.
IDM-I: 1 current loop input for tap position measurement.

Optionals:

IDM	IDM-I	
		MMEM
		DNP3
		HTCV
		TAAP
		TAPI
		OLMT

LEGEND:

Available

Not Available

REQUIRED ACCESSORIES



SPLIT CORE-TYPE EXTERNAL CTs
Split core CTs are essential to properly read the motor and heating system current.

AUXILIARY PT

Used for insulating the voltage circuit to be measured, in addition to reducing the voltage when it exceeds the IED measurement limit.



SHUNT RESISTOR
Used for DC current measurement in motors.

RECOMMENDED ACCESSORIES

**QUICK INSTALLATION PANEL - PIR**

The IEDs should always be installed protected from weather. It can be supplied in a weather-proof panel, easy to install.

Assists the heating system monitoring, in panel (internal) and ambient (external) temperature. Allows to measure other temperatures, such as the mechanism's, as an example.

Pt100**WEATHER SHELTER**

If ambient temperature measurement is desired in outdoor locations, a weather shelter should be used to protect the Pt100 sensor, minimizing errors such as the ones the sun, rain, wind and others would cause over the measurement.



For more information: see Accessory Catalog!

01

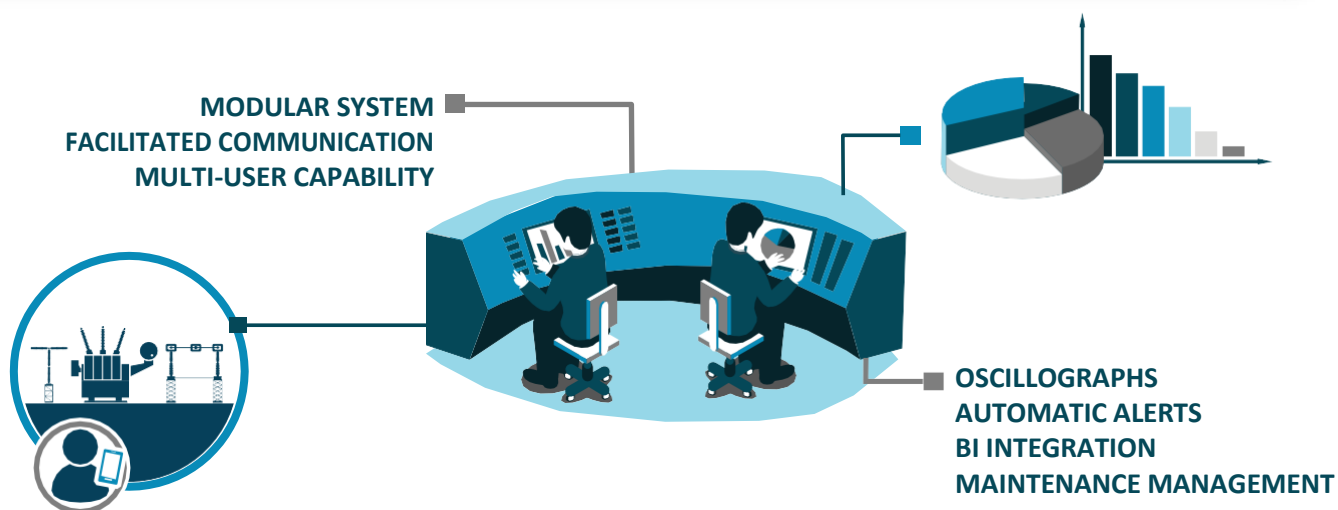
NEED A HAND FROM AN EXPERT? LET TREETECH INSTALL!

With a team of highly skilled and experienced designers, technicians and engineers, Treetech can be responsible for the design, installation, commissioning and training of all monitoring solutions offered. See the conditions and make the implementation of new technologies easier.

02

ENTER THE SUBSTATION 4.0 ERA WITH SIGMA ECM®

The **Sigma ECM®** (Equipment Condition Monitoring) software integrates the company's entire electric range on a single platform and allows online monitoring of every power substation asset operation.



03

ELECTRIC ASSET MANAGEMENT IS THE SECRET! TREETECH TAKES CARE OF IT FOR YOU

The **SAM®** expert team, with over 40 years of industry experience, provides services and consulting on all processes from asset design to the end of service life, with interfaces in the engineering areas of maintenance, operation, planning and enterprises.



Treetech

Rua José Alvim, 112, Centro
CEP 12940-750 - Atibaia/SP
+55 11 2410-1190

www.treetech.com.br