

CATALOGUE





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Overhead fault indicators

Feeder Monitors

Intelligent Disconnector

KOMORSAN Monitoring System

OLTC Position Monitors

OLTC Controllers

Transformer Tap Sensors

What solution is right for you?

Which fault indicator do you need?

Overhead fault indicators

Feeder Monitors

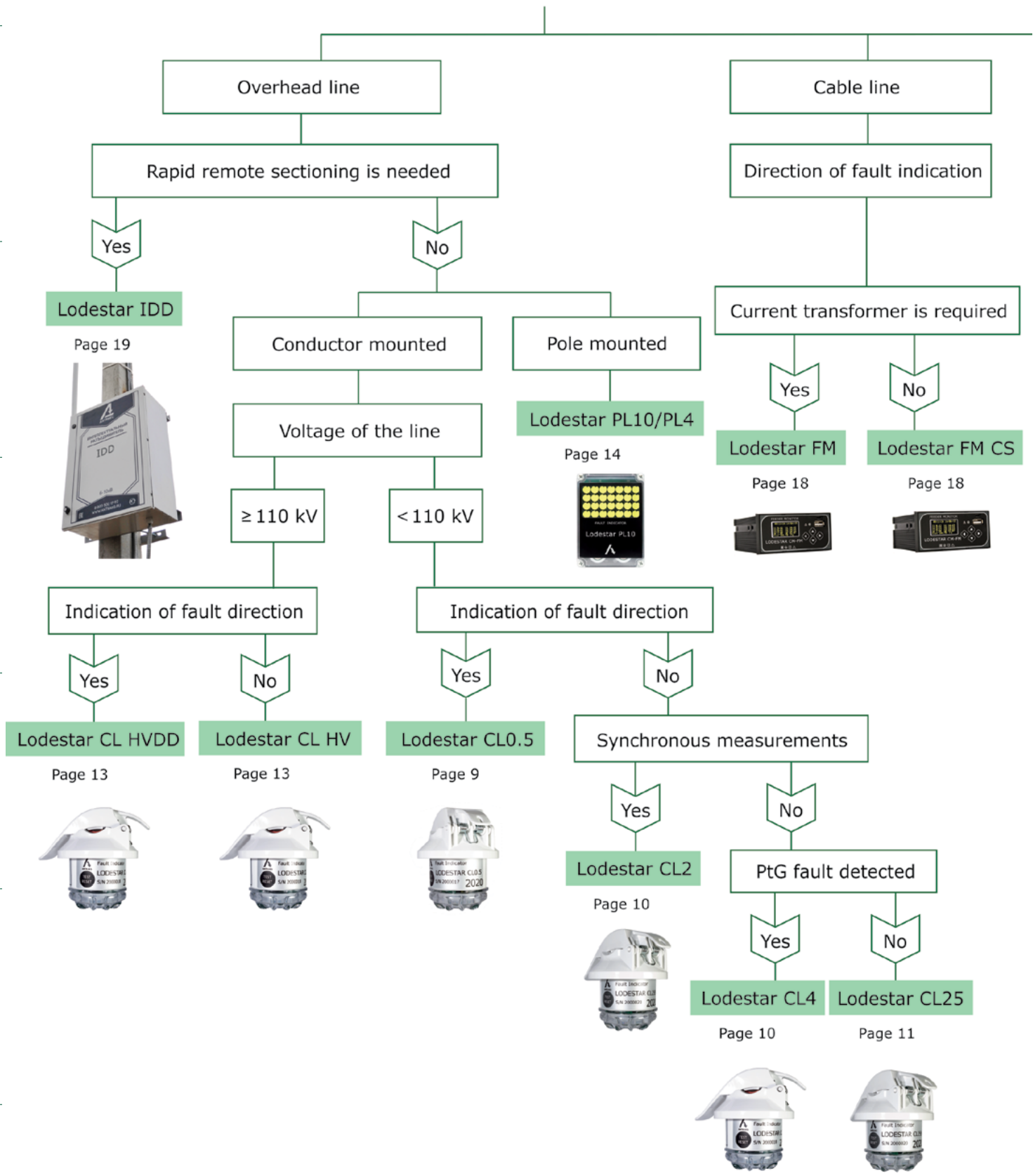
Intelligent Disconnector

KOMORSAN Monitoring System

OLTC Position Monitors

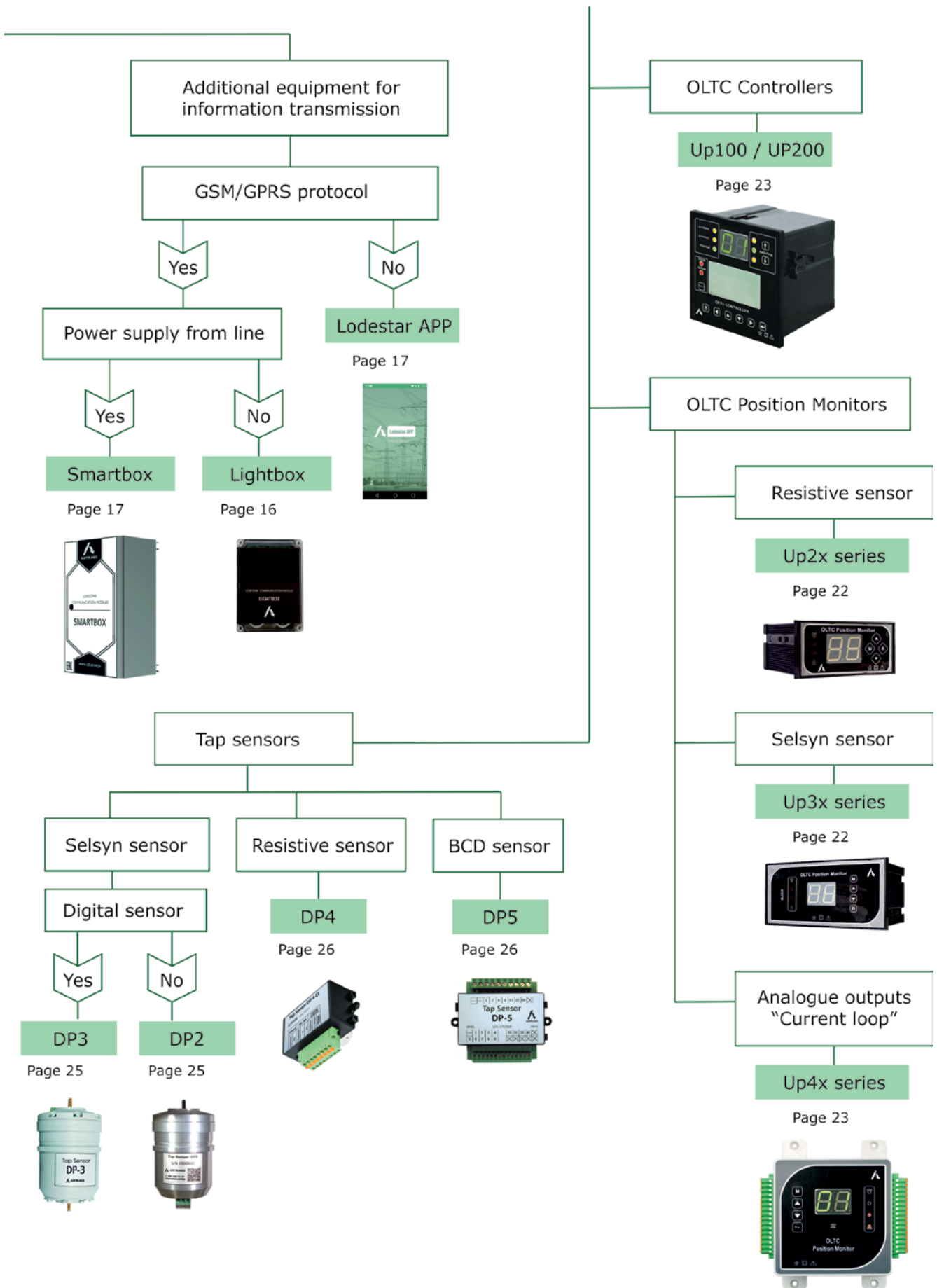
OLTC Controllers

Transformer Tap Sensors





Which OLTC control equipment do you need?



Overhead fault indicators

Feeder Monitors

Intelligent Disconnector

KOMORSAN Monitoring System

OLTC Position Monitors

OLTC Controllers

Transformer Tap Sensors



Company profile

Our Group consists of three companies, which are developing and deploying smart grid diagnostics for automation systems. This cooperation provides you with simple solutions in power system reliability enhancement.

ANTRAKS has extensive experience in the energy sector covering design, construction, manufacturing, installation and service. Working in close cooperation with customer, our engineers provide optimal solutions that satisfy the requirements of power generation and distribution organizations.

Worldwide distribution is supported by a highly qualified sales force and trade agents. There are own research and development department, SMD assembly lines, testing and measuring equipment, mechanical production facility and other manufacturing lines.

Our products meet the highest quality requirements. The devices have European quality certificates and are tested for steady work in difficult conditions in Russian and Swiss laboratories.

ANTRAKS provides integrated monitoring systems for overhead lines and underground power cables which are user friendly and include various application modules. These solutions greatly simplify a control engineer's work. Our devices operate in networks with isolated, compensated and solidly-grounded neutral.

For reliable operation of power substations equipment we provide OLTC Position Monitors and OLTC Controllers. Our devices can work together with the extremely large range of OnLoad Tap Changers and can be used anywhere. Using our devices, you can get position information and control OLTC electrical drives under automatic regulation of the power transformers transformation ratio.

Our solutions help to increase the reliability of resource companies power grids where every minute of equipment downtime bears considerable losses. We have implemented our systems in various oil, gas and gold mining companies. Modern resource processing enterprises, such as steel factories and refineries with their own power grids, also use our equipment for transformer substations and cable lines monitoring.

ANTRAKS strategy is to develop and implement technologies of the future to make your energy as reliable and effective as possible.



Overhead fault indicators

Feeder Monitors

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OLTTC Position Monitors

OLTTC Controllers

Transformer Tap Sensors



Overhead fault indicators range



Lodestar is an overhead line fault indicator that provide prompt fault localization and determination of faulty section. Lodestar fault indicators range determine the origin of any faults on the line providing 360° visibility. Ultra bright white and red LEDs enable them to locate faulty sections. Lodestar can send information to SCADA-server by 3G/4G.

Product Features of Lodestar overhead fault indicators range:

- Various modifications for 1 kV to 110 kV line voltage;
- Works in all types neutral grounding;
- Works in networks with frequency of 50 or 60Hz;
- Any type of installation: directly on the conductor or on the pole;
- Configuration is done via smartphone or KOMORSAN SCADA-system;
- Shows the faulty phase and types of the faults;
- High sensitivity. Top model can locate faults from 0.5A;
- 10-year battery;
- Simple installation and easy replacement.



Lodestar CL0.5

Lodestar CL0.5 was designed to work in isolated and compensated networks with extremely low levels of residual current. Lodestar CL0.5 has high accuracy of all types of faults detection.

The registering of faults is based on special intelligent algorithm, that makes possible to detect PtG fault and its direction from 0.5A. Real time sensors communication open up a wide range of communication sensors possibilities for data analysis.

Lodestar CL0.5 benefits:

- Detection of direction of all types of faults;
- Different indication patterns: via ultra bright LEDs, in SCADA system or in Lodestar App;
- Extended memory. More than 200 last events can be saved in the memory and displayed in Lodestar App;
- Super sensitivity. Detects all types of faults from 0.5A;
- Can be used in any types grids with any types of neutral grounding;
- Used in radial and double-fed lines;
- Auto-adjustable PtG detection – no need to tune the residual current threshold.





Lodestar CL2

Lodestar CL2 was designed especially for medium voltage utility overhead lines. It ensures 99% accuracy of detection of load currents from 2A. CL2 is provided with current and voltage unique measurement algorithms and outstanding fault detection capabilities. Three devices Lodestar CL2 located on different phases of the line perform synchronous vector measurements.

Lodestar CL2 can be integrated into an existing SCADA or smart grid system and can operate in various communication environments. Pole-mounted communication equipment (Smartbox or Lighthbox) receives and manages all data and acts as a receiver for communication environment.

Lodestar CL2 benefits:

- Can be used in networks with any types of neutral grounding;
- Detects and indicates all types of faults: phase to phase, phase to ground, multiple phase faults, permanent and transient faults;
- Vector calculations – synchronous measurement of currents – allow Lodestar to deal with phases as well as magnitudes;
- Minimum fault sensing PtG 2A;
- Flexible configuration – a rich set of configurable parameters enables adaptation to a variety of customer needs.

Lodestar CL4

Designed for fault detection with minimum load current 4A. This is a cost-effective and reliable solution for fixing an emergency process. Lodestar CL4 supports a range of communication options, including 3G or 4G LTE communications for a high speed data transfer. Lodestar CL4 devices operate independently of each other, transmitting information about the processes in each phase.

Lodestar CL4 benefits:

- Minimum fault sensing 4A;
- Identifies temporary and permanent faults;
- Registering and storing fault information such as timestamp, event type and measured values;
- Battery status control and indication.

Lodestar CL25B/CL25

Lodestar CL25/CL25B models is a simple solution for fault detection. Optimal factory settings allow CL25/CL25B to be used without any configurations in most cases. Just activate the device and place it on a conductor - CL25 will do its job in the best possible way.

Lodestar CL25B use radio channel and all settings can done remotely via Smartphone - no need to unmount device. For Lodestar CL25B there is a possibility to trasmit data via Communication box.

CL25 and CL25B fault indicators operate independently of each other. It means that current and voltage values can be read from each phase separately.

Lodestar CL25/CL25B benefits:

- Brightest Light 360° Visibility - 3 ultra bright wide-angle LEDs provide overlapping fields of light;
- Simple installation - using a single hot stick;
- Easy to replace - no additional settings are required;
- Dynamically changing sensitivity based on a load current;
- Minimum fault sensing 25A;
- Auto-Detect Network Frequency – intellectual algorithms allow it to work in networks with frequency of 50 or 60Hz without reconfiguration ;
- Enhanced resistance to interference conditions in the air.





Fault indicators for medium voltage OHL of Lodestar Series

Model	CL25	CL25B	CL4	CL2	CL0.5
Operating voltage	<70 kV				
MIN fault sensing	25A		4A	2A	0.5A
Absolute current threshold	100A, 250A, 500A, 1000A	25A to 1000A	20A to 1000A		
Differential current threshold	50%, 100%, 200%, 25A, 100A, 200A, 500A	25A to 500A, 50% to 500%	20A to 500A, 50% to 500%		
Response time	20 ms			20 ms	
Inrush resistance	0 to 200 ms			0 to 200 ms	
Fault detected	●	●	●	●	●
Phase to Phase	●	●	●	●	●
Single-phase short circuit			●	●	●
Phase to Ground					
Fault phase indication	●	●	●	●	●
Fault direction indication	No				●
Current withstand	25 kA / 500 ms				
Communication	No	Smartphone via BLE, 3G/4G to SCADA system via Combox			
Adjustable reset time	6, 12, 24, 48 hours	1h to 7d			1h to 7d
Reset	Time, Magnet Reenergized line	Smartphone with Lodestar App, Time, Combox, Reenergized line			
Test	Magnet	Remote, Magnet, Smartphone with Lodestar App			
Battery life	10 years			7 years	
Total indicating time	> 1000 hrs				
Temperature	-40° to +85° C				

Overhead fault indicators range

Feeder Monitors

Intelligent Disconnector

KOMORSAN Monitoring System

OLTC Position Monitors

OLTC Controllers

Transformer Tap Sensors

Fault indicators for high-voltage lines pole mounted

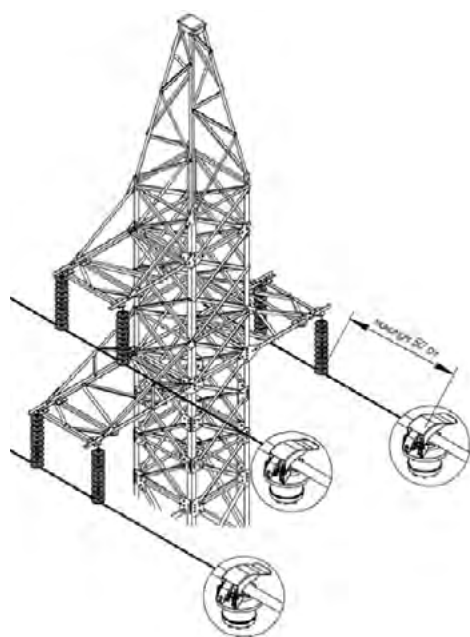
Lodestar CL HV/CL HVDD

Special models of fault indicators Lodestar CL HV for High voltage lines has high designed high noise immunity. Lodestar CL HV has only with visual indication. It is convenient to locate it in a well-viewed area, for example, at the entrance of overhead lines in a substation.

Lodestar CL HVDD detects a faulty event on overhead lines and determines the direction of emergency currents, which shows the maintenance team where the faulty section is located. It is very convenient for use on the border of different energy systems, state borders and before natural barriers (water etc.). It transfers all line parameters via GSM communication directly to the SCADA system, and sends event notifications via SMS and email to the maintenance team's smartphones. This will help you quickly find the place of damage in hard-to-reach areas.

Lodestar CL HV/CL HVDD benefits:

- All Lodestar HV indicators are equipped with a short-range radio channel of the Bluetooth Low Energy standard, which allows you to easily configure and adjust the settings from any smartphone with the PPI-3 software installed.
- It is possible to determine the status of the high-voltage line both visually, thanks to the LED indication, and using a portable remote control. (Smartphone with Lodestar App)
- CL HVDD could be easily configured from SCADA system KOMORSAN using communication unit (Smartbox, Lightbox).



Overhead fault indicators range

Feeder Monitors

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OLTC Position Monitors

OLTC Controllers

Transformer Tap Sensors



Pole mounted fault indicators range: Lodestar PL10/PL4

Pole mounted fault indicators Lodestar PL10 and Lodestar PL4 are designed for use in distribution networks 1-36kV. Electromagnetic flag is used for fault indication.

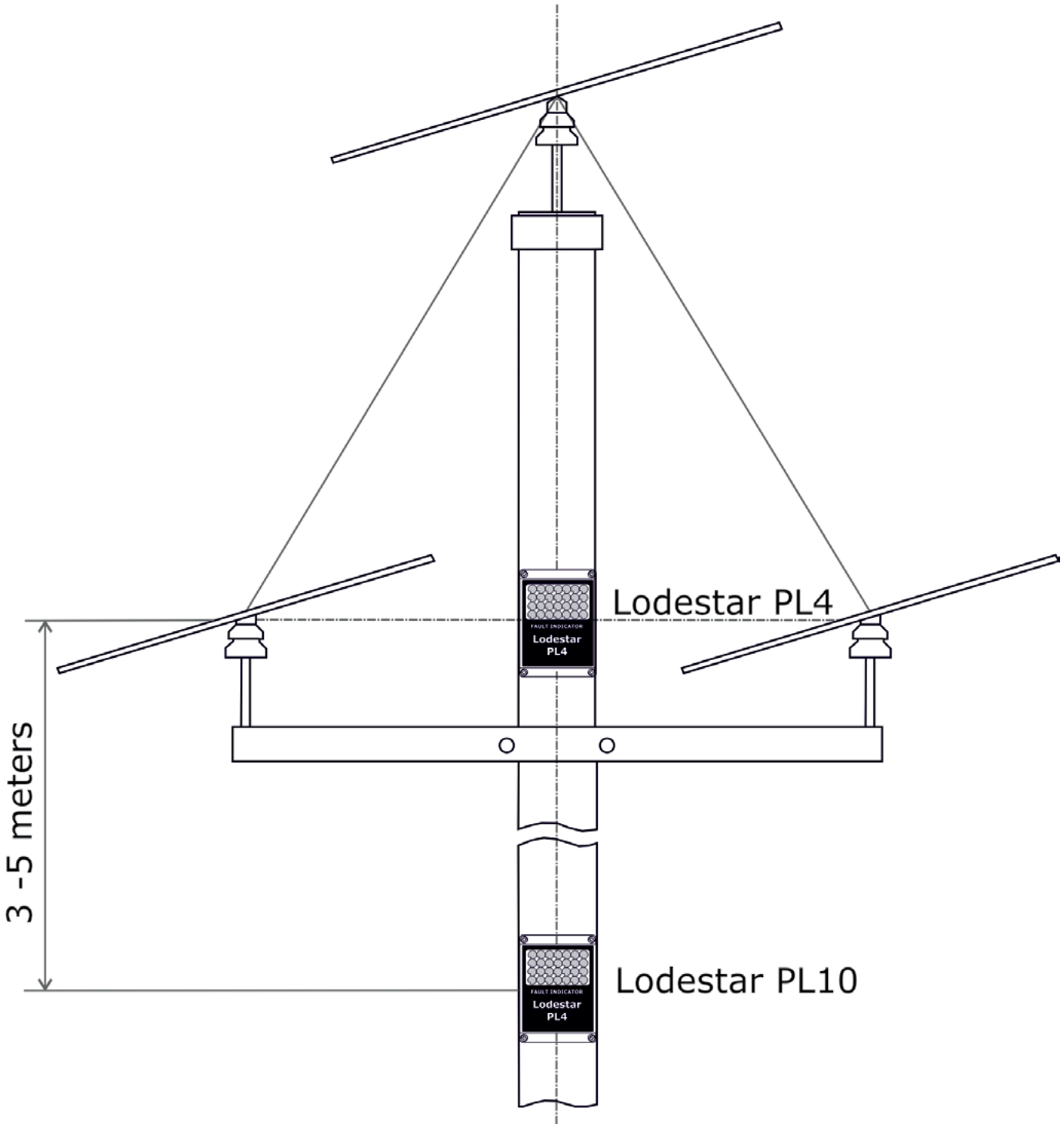
Depending on conductors geometry, different modifications shall be selected.

Lodestar PL10 mounts on a pole about 3-5 meters below conductors. So, it is more universal device suitable for Lodestar PL4 mounts on a pole between the conductors.



Lodestar PL10/PL4 benefits:

- Easy to install – pole mounted with a SIP mounting tape;
- Supplied with 7-year battery – no additional connections to a line are required;
- Optional communication possibility: 3G data transmission to the KOMORSAN system.



Overhead fault indicators range

Feeder Monitors

Intelligent Disconnect

KOMORSAN Monitoring System

OLTC Position Monitors

OLTC Controllers

Transformer Tap Sensors



Solutions for Remote Monitoring



We have developed several ways to control grid outage by means of effective and targeted coordination of the maintenance team. The ability to obtain information about current state of the grid in a fast and precise manner is crucial for timely coordination in case of a fault.

Two communication units - Lightbox and Smartbox - are a reliable pole-mountable solution that work together with mounted Lodestar to provide detailed information about fault events and the actual state of distribution and transmission overhead lines.

Lightbox Communication unit



Lightbox is the most effective tool for integration of fault information to KOMORSAN SCADA system that has own web interface for dispatcher desk management and notifications via sms and e-mail. The system can be integrated into any SCADA system using the IEC-104 Protocol.

Lightbox benefits:

- Minimal weight and size;
- Easy mounting - simple to position and connect;
- Battery is supplied. No need for external power sources;
- Extra fault indication via blinkers;
- Increased resistance to interference in the radio environment;
- Increased throughput of the data channel.

Overhead fault indicators range

Feeder Monitors

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OLTC Position Monitors

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Transformer Tap Sensors

Smartbox Communication unit

Thank for the use of Lodestar Smartbox standard industrial communication protocols, information from Lodestar devices is easily integrated into the existing network infrastructure of the power grid. Data exchange uses the IEC 60870-5-104 Protocol. To ensure information security, Lodestar Smartbox works with a wide range of network protocols, such as Ipsec, OpenVPN, and others.

Smartbox benefits:

- No need for batteries. Power supply from a 220V AC source, for example, a self-service transformer (OL type), or from a solar battery;
- External GSM antenna with high sensitivity;
- Possibility of equipping Smartbox with discrete inputs and outputs;
- Ethernet connection enabled.

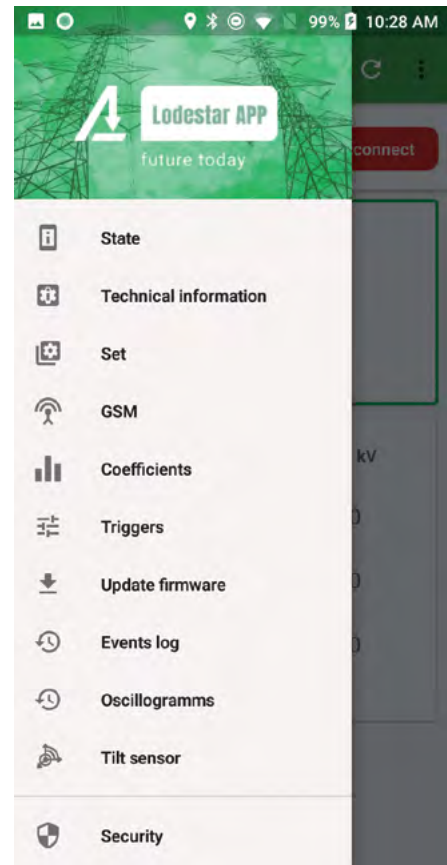
Lodestar App for Smartphones

Lodestar App for Smartphones allows the user to access data, test and reset fault indicators, modify settings or even update fault indicator firmware. With Lodestar App you can use smartphones with OS Android v7.0 or higher, that supports BLE protocol v4.1, or iPhones.

The Lodestar App allows remote communication with Lodestar devices up to 100m away in the open air. For short-range communication, a BLE (2.4 GHz) radio channel is used for data transmission.

Lodestar App benefits:

- Instant line currents can be viewed for each phase;
- View Lodestar events log - each fault stored in Lodestar memory can be read via Smartphone.



Overhead fault indicators range

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Feeder Monitors range



Feeder monitors are solution for network parameters control and damaged section determination in overhead and underground lines. High-precision measurements and phasor measurements allow to monitor the power grid distribution network in real time. Fast fixation and localization of faults allows optimization of monitoring system and reducing black-out times.

Lodestar FM/ Lodestar FM CS

Lodestar FM and Lodestar FM CS are universal devices for registration and analysis of fault processes in a network of any topology and neutral type. They could be installed on the control board of relay compartment of a switchgear of any type on panels and control cabinets of relay equipment and on control boards of the substation.

The functionality of model Lodestar FM CS is similar to model Lodestar FM, but it also has own easily mounted current sensors based on Rogowski coil that gives the following advantages:

- Current transformer does not have unnecessary load;
- It does not cause distortion when using a current transformer for measurements;
- It is used in substations where regular current transformers are not planned, installed or required.

Lodestar FM CS model has:

- Different absolute and differentiated current thresholds;
- Other measurement accuracy;
- Communication protocol IEC 60870-5-104 is added.

Lodestar FM/ Lodestar FM CS benefits:

- Locates Phase to Ground faults in networks with all types of neutral;
- Events journal and waveform memory;
- Uses standard CT/CV;
- GPS time synchronisation;
- Embedded backup battery;
- Compact size.

Intelligent Disconnecter

Intelligent disconnecter Lodestar IDD is designed for rapid remote sectioning of overhead power lines 6-10 kV and for detection of stable and unstable fault processes including all types of phase-to-ground faults. Integration of Lodestar IDD into power line automation system allows building an efficient and inexpensive line sectioning system.

Operational switching of sections of the electric circuit is performed by means of the automated drive located in the disconnecter's control cabinet. The status of the disconnecter is displayed on the dispatcher's control panel and directly on the disconnecter's control unit.

Lodestar IDD benefits:

- Selective detection of all types of emergency situation including phase-to-ground faults with low currents and unstable fault processes;
- Observability of each section of electrical grid through the use of fault indicators with the function of determination of fault currents direction;
- Automatic shutdown of a damaged section of the overhead line during the current-free pause of the reclosing;
- Fast power shutdown during transferring of information regarding a fault to a centralized system;
- Logical blocking of disconnecter's control if there is voltage and / or current;
- Remote control of grid section;
- Integration to user's SCADA system.





KOMORSAN monitoring system



System of power distribution network diagnostics – KOMORSAN - is designed for immediate detection of faults and transmission of fault data to dispatching point and targeted customers. The KOMORSAN system improves reliability, productivity and efficiency of distribution network.

The modular design of the KOMORSAN system enables customers to tailor the monitoring system meeting their own requirements: to deploy all modules of the KOMORSAN system, or to integrate data collecting and processing server KOMORSAN to existing SCADA. Large number of Lodestar fault indicators, feeder monitors and intelligent disconnectors can be monitored from a single KOMORSAN's server. All communication links are 100% controlled and any problems are notified in the System immediately.

The system consists of two key components:

1. KOMORSAN data collecting and processing server. Lodestar modifications which are equipped with GPRS modules, establish a TCP/ IP connection for data exchange. Cable fault locators can transmit data to KOMORSAN server via Modbus or IEC 60870-5-104 protocols.

2. The KOMORSAN Web Client software application for monitoring of distribution networks provides access to data collected from diagnostic devices which are equipped with communication modules. This software has geo-location tools that enable a user to control power lines with installed monitoring devices. Based on the network topology and fault information from indicators the KOMORSAN Web Client software visually demonstrates the information, which the operator to easily identify the fault location and its type.

KOMORSAN benefits:

- High level of usability, works with most operation systems;
- Sends fault information directly to maintenance crews via SMS and e-mail (optional);
- Can be integrated with a third-party SCADA system;
- Enables control of the status of installed Lodestar FCIs on a map.

Overhead fault indicators

Feeder Monitors

Intelligent Disconnector

KOMORSAN monitoring system

OLTC Position Monitors

OLTC Controllers

Transformer Tap Sensors

OLTC Position Monitors



On-load tap changer (OLTC) position monitors indicate position of OLTC drives from various manufacturers and transfer information regarding drive position to SCADA system in digital and analogue view. ANTRAKS OLTC position monitors, which named UP, can work together with a large range of the On-Load Tap Changers.

UP Monitors family contains a number of devices, form very simple models suitable for solving particular problems to complex multifunctional devices that can be employed anywhere. Using our devices one can receive position information from any type of OLTC

and transmit it via digital or analog outputs.

- Alarm of boundary, first and last taps of drive position (UP23, UP25, UP31 and UP41);
- Additional discrete outputs for signals about following events: first or last drive's tap are reached, tap switching, reaching of boundary tap position (UP23, UP25, UP31 and UP41);
- Digital output RS-485 (RS-232), used by the MODBUS RTU/ASSII Protocol, allows you to transmit information about the position of the OLTC drive to SCADA and configure the device when connected to a computer;
- Additional analogue output "Current loop" (0-5mA, 0-20mA or 4-20mA) for transmission of information on drive to SCADA position (UP23, UP25, UP31 and UP41);
- Possibility to compensate electrical resistance of connecting wires and work in configuration mode when the transformer is turned-on and located in the fixed position on one tap (UP23 and UP25).

UP benefits:

- Wide Range of Products family – one can choose a device that exactly fits to his system or use the same universal modes for different situations;
- Wide range of input types – Synchro transmitter, Current loop output, Resistive sensor, BCD encoder, RS-485;
- Wide range of data outputs – RS-232, RS-485, Analog current loop, Relay outputs, Block output signal;
- Highly configurable.



Overhead fault indicators

- Alarm of boundary, first and last taps of drive position
- Additional discrete outputs for alarms about following events: first or last drive's tap are reached, tap switching, reaching of boundary tap position;

Feeder Monitors

- Digital output RS-485 (RS-232) used by MODBUS RTU/ASCII protocol that allows transferring the information on position of OLTC's drive to SCADA system and configuring the device from PC;
- Additional analogue output "Current loop" (for transmission of information on drive to SCADA).

Intelligent Disconnectors

UP2x series

UP2x series designed for drives with resistive sensor:

- MZ-2, MZ-4;
- MR, EM and ED-S;
- SAV1-1600-245/ 245-013;
- PDP-1, PDP-4 with replacement of selsyn sensor by resistant sensor of drive position DP-2;
- PDP-5L and any other drives equipped by resistant sensors with number of taps not more than 99.



KOMORSAN Monitoring System

UP2 series devices have possibility to compensate electrical resistance of connecting wires and work in configuration mode when the transformer is turned-on and located in the fixed position on one tap.

Universal position monitor UP 25 has all available inputs and outputs integrated in one device. Such "single-device approach" ensures both indication of transformer step data on the control switchboard and transfer of such data to Process Control Systems (PCS) and other automatization systems. The device can be easily set up for different sensor types; even if you change your drive unit it is not necessary to change the indicator. Versatility and availability of different kinds of outputs allow the device to be integrated with any PC.

OLTC Position Monitors

OLTC Controllers

UP3x series

OLTC UP3x series compatible with selsyn sensor:

- Compatible drives PDP-4, PDP-4U; MA-1, MAK-1 and any other drives equipped by sensors BD404 or BD1404 with number of taps not more than 99;
- Possibility to set initial angle of selsyn sensor when transformer is



Transformer Tap Sensors



turned-on and fixed on a tap;

- Indication of first/last and boundary taps of drive position by means of LEDs;
- Analogue output "Current loop" (0-5mA, 0-20mA or 4-20mA) upon customer's request.

UP4x series

UP4x series compatible with analogue outputs "Current loop" designed for work with the drives:

- MR, EM and ED-S;
- MZ-2, MZ-4 with replacement of a standard resistive sensor by the digital sensor of drive position monitor DP4 manufactured by ANTRAKS equipped by analogue output "Current loop";
- PDP-4 and others motor drivers designed for use with selsyn sensor.

Selsyn sensor in this case shall be replaced by tap position sensor DP3 with analogue output "Current loop";

- Other motor drives with resistant sensors with analogue output "Current loop" (0-5mA, 0-20mA or 4-20mA).



OLTC Controllers

On-load tap changer (OLTC) controllers are the main part of the power equipment monitoring and control system. They continuously control status of switching devices of transformers with smoothly or sharply changing loads at 35-750 kV substations.

Controllers UP100 and UP200 operates with any type of sensors of OLTC drive position without additional adapters. Additional adapters are not needed.

Exploitation of controllers are comfortable for substation personnel due to availability of separate screens displaying information on OLCT drive's taps and information on transformer's parameters. They are connected to transformers with nominal secondary voltage 100V and nominal secondary current 1A or 5A.

Combination of controller and indicator functions results into multiple enhancement of operation control's OLTC electrical drive reliability additional adjustment settings emergency diagnosis settings space saving on the control switchboard. Dimensions of the devices are 144x144x90mm. They could be supplied in several modifications: with digital or analogue outputs or with analogue output (0...20 mA).





UP100 and UP200 benefits:

- Control of commands execution and operability of switching unit of OLTC;
- Blocking of OLTC drives in case of:
 - Detection of overload;
 - Detection of three U0 exceedance;
 - Decrease of Voltage below U_{min} ;
 - External relay blocking signals are received;
- Emergency alarm for blocking the operation of the of OLTC drive;
- OLTC drive operability control;
- Changing of device's internal settings and operating mode. Rapid change of setpoints maintaining the voltage from one value to another;
- Transmitting current existing parameters, configure and modify setpoints through digital interfaces, USB/RS-485 or analogue interface "Current loop" in SCADA.

OLTC Controllers UP100:

UP100 measures parameters of input analogue signals:

- Linear voltage of the section;
- Voltage of zero sequence of buses section;
- Input current of one of the bus section phases;
- Input current for one of the phases via the busbar section switch.

OLTC Controllers UP200:

Exploitation of UP200 ensures:

- Simultaneous monitoring of two bus systems;
- Quick switching of regulation from one bus section to the other;
- Synchronous control of three switching mechanisms for separate control over three phases of transformer;
- Measurement of parameters of input analog signals:
 - linear voltage of controlled and regulated bus section;
 - voltage of zero sequence of controlled and regulated bus section;
 - input current of one phase of regulated bus section;
 - current of one phase via sectional switch of regulated bus section;
 - current of one phase via sectional switch of controlled bus section.

DP Transformer Tap Sensors

DP Transformer tap sensors can be installed in the transformer changer drive. These sensors are available in two types of enclosures:

- With dimensions similar to those of the BD404 / BD1404 synchro transmitter;
- 45 x 88 x 62 mm - which is the optimum solution for replacement of resistive sensors based on circular selectors (for example, MZ-2, MZ-2).

The sensors represent both purely resistive sensors and multifunctional sensors with analog (0-5mA, 0-2mA, 4-20mA, 0-5V, 0-24V) and digital outputs (RS-232, RS-485).

Tap sensor DP2

Tap sensor DP2 is designed to determine the position of the PDP4 drive and other drives that work with the selsin sensor and selsin receiver. The DP2 sensor is installed instead of the selsin sensor and is a resistive sensor of the drive rotation angle. It is intended for connection to position indicators of the RPN type LKM, UP2x series to drives designed for the selsin sensor (type RNT-13, PDP-4, etc).

Provides the ability to connect automatic protection and control of the transformer manufactured by Siemens and ABB.



Tap sensor DP3

Tap sensor DP3 is designed to determine actual transformer tap on load. This sensor can be used with PDP1, PDP4, MA-1 and RNT-13 drives, as well as the other drives that can be completed with synchro transmitters (BD404 or BD1404) or other sensors with the dimensions of BD404/ BD1404 type sensors. Tap sensor DP3 is a metal cylinder with chamfers for installation needs. Overall dimensions and mounting points of DP3 type sensor are the same as those of BD404 or BD1404 synchro transmitters. Sensor DP3 is a drive turn angle encoder with signal conversion circuit, it can be installed instead of a synchro transmitter.

Sensor DP3 has several different interfaces in order to transmit the drive





Overhead fault indicators

turn angle. These are: interface RS-485 for the transformer tap data transfer to PCS or to UP 25 OLTC Position Monitors in digital form via MODBUS protocol. Current analog interface "current loop" 4-20A, 0-5mA or 0-20mA is designed for the transformer tap data transferring to UP 25 OLTC Position Monitors or PCS by additional transmitters. Analog interface 0-5V or 0-24V for transformer tap data transfers to UP 25 or to PCS via additional transmitters.

Feeder Monitors

While using this interface sensor DP3 can function as a resistive sensor of MZ-2, MZ-4, EM1, MR, and ED-S drives. In this case the sensor can be used to connect Siemens and ABB transformer protection and control automatics together with drives of PDP-1, PDP-4, MA-1, and RNT-13 types and others.

Intelligent Disconnector



Tap sensor DP4

Tap sensor DP4 is designed to determine actual transformer tap on load. This sensor may be connected to the MZ- 2, MZ-3, MZ-4 type drives. Sensor DP4 is an electronic sensor of drive turn angle with a signal conversion circuit. It can be used instead of a resistive sensor.

KOMORSAN Monitoring System

Sensor DP4 has several interfaces in order to transmit the drive turn angle. These are: interface RS-485 for the transformer tap data transfer to PCS or UP 25 OLTC Position Monitors in digital form via MODBUS protocol. "Current loop" analog

current interface 4-20 A, 0-5 mA or 0-20 mA is designed for the transformer tap data transfer to UP 25 OLTC Position Monitors or PCS by additional transmitters.

OLTC Position Monitors

Analog interface 0-5 V or 0-24 V is used for the transformer tap data transfer to UP 25 or PCS by additional transmitters. When using this interface, sensor DP4 can function as a resistive sensor of MZ-2, MZ-4, EM1, MR and ED-S drives, the sensor can be used to connect Siemens and ABB transformer protection and control automatics to drives.

OLTC Controllers




Tap sensor DP5

Drive position sensor DP5 is designed to determine actual transformer tap on load. This sensor can be connected to SMA-7, SMA-9, SHM, EM-1, MR and ED drives with the number of contacts corresponding to the number of drive positions. The sensor converts OLTC step number into BCD code. Sensor DP5 has a BCD-output to deliver transformer tap data to UP 25 OLTC Position Monitors

(to display the OLTC step number on the control switchboard) or to SCADA-system.

Feeder Monitors range

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2020