



MONITORING RELAYS

APPLICATION EXAMPLES

2025



THREE-PHASE MONITORING RELAYS

Description

Our advanced relays safeguard motors and equipment from common electrical faults, enhancing the reliability and efficiency of your operations. By detecting and addressing issues such as over voltage, under voltage, phase sequence errors, phase failure, and asymmetry, our relays provide comprehensive protection and peace of mind.

Main Applications

INDUSTRIAL MACHINERY



HVAC



COMPRESSED AIR



MOTOR & POWER PLANT



SOLAR POWER SYSTEM



PUMP



THREE-PHASE MONITORING RELAYS – HOW IT WORKS ?

- A three-phase control relay is an essential device for monitoring and protecting three-phase electrical systems.
- **How it works ?**
- Phase monitoring:
 - The relay continuously monitors all three phases of the power supply. It checks that each phase is present, in the correct sequence and balanced.
- Anomaly Detection:
 - If a phase is missing, if the order of the phases is incorrect or if a voltage imbalance is detected, the relay triggers an alarm or cuts the power supply to protect the connected equipment
- Equipment protection :
 - If a fault is detected, the relay can activate protective devices such as circuit breakers to prevent damage to motors, transformers and other sensitive equipment.



WIND-POWERED GENERATORS

Application Description

The **three-phase monitoring relays** detects over voltage and under voltage in power generated by a wind-powered generator. This can be applied also to solar power system.

It can be used to individually set and output over voltage and under voltage alarms.



HVAC*

Application Description

A **three-phase monitoring relay*** in a HVAC system prevent the system from incorrect voltage or phasing. It ensures system protection.

The purpose is to avoid any damage caused due to voltage irregularities. The **three-phase monitoring relay** act to shut down the system when there are anomalies.



MOTORS

Application Description

As soon as the **three-phase monitoring relay*** detects an anomaly (absence of phase, order of the phases reversed, abnormal tension), It gives order to the system to act to protect the motor.



MOBILE COMPRESSORS

Application Description

We can use a **three-phase monitoring relay*** to check simultaneously the order of the phases in a compressors. If an inversion about the phases is detected, the relay change its state and gives the order to the system to act consequently.

It avoids an inversion of direction, often destroying on screw compressor.

The use of **three-phase monitoring relay*** is particularly used for any portable material.



MOTORIZED STAIRCASE

Application Description

In a motorized staircase, the **three-phase monitoring relay*** check simultaneously the order of the phases. If an inversion about the phases is detected, the relay of exit changes state and gives order to the system to act consequently.



PUMP

Application Description

We can use a **three-phase monitoring relay*** to protect the pump. The relay will change state if it detects :

- an absence of 1 or more phases
- a drop in voltage
- a reversal of the direction of rotation of the phases

VOLTAGE MONITORING RELAYS

Description

Ensure Voltage Stability: Protect your equipment from voltage fluctuations with our single-phase voltage monitoring relays. Detect over and under voltage conditions to maintain optimal performance and prevent damage. Available for low voltage (0.2 - 60 V) and high voltage (15 - 600 V) applications

Main Applications

PUMP



Monitoring for overloads and idling of pumps

CONTROL PANEL



Voltage monitoring in control panels for precision equipment

MOTOR



Monitoring for voltage drops to prevent damage

LOAD BANKS



Check If Battery is loaded

VOLTAGE MONITORING RELAYS – HOW IT WORKS ?

- A single-phase voltage control relay is designed to monitor and protect electrical equipment against voltage variations.
- **How its works ?**
- Voltage Monitoring:
 - The relay continuously measures the voltage of the single-phase network. It compares this voltage to predefined thresholds to detect overvoltage and undervoltage.
- Anomaly Detection:
 - If the voltage exceeds the defined thresholds (overvoltage) or falls below (undervoltage), the relay triggers an alarm or cuts the power supply to protect the connected equipment
- Reset:
 - Some relays allow an automatic or manual reset once the voltage returns to acceptable levels.



COMMUNICATION BASES

Application Description

Communications bases must be carefully monitored because the effects of a power outage or voltage drop would be highly detrimental to communications. This is why the **voltage monitoring relays*** monitors the control panel power supply for over voltage and under voltage levels.



LOW-VOLTAGE GENERAL DISTRIBUTION SYSTEM

Application Description

A low-voltage general distribution system always has a main channel and a secondary channel in the event of disjunction of the main channel.

A **voltage monitoring relay*** is positioned on the main channel detects disjunction and can inform the automatism or order the passage in minor channel (emergency channel)

CURRENT MONITORING RELAYS

Description

Safeguard your equipment with our single-phase current monitoring relays. Detect abnormal current levels to prevent overheating and equipment failure. Suitable for low currents (2 - 500 mA) and high currents (0.1 - 10 A). Integrated current transformer available for 2 - 20 A.

Main Applications

WATER & WASTE



MATERIAL HANDLING



HVAC



LOAD BANKS



PUMP



BUILDING AUTOMATION



CURRENT MONITORING RELAYS – HOW IT WORKS ?

- A current monitoring relay is a device used to monitor and protect electrical circuits by detecting variations in current.
- **How its works ?**
- Current Monitoring:
 - The relay continuously measures the current flowing in the circuit. It compares this value to a predefined threshold.
- Anomaly Detection :
 - If the current exceeds the threshold (overload) or falls below it (undercurrent), the relay triggers an action, such as cutting off the power supply or activating an alarm.
- Reset:
 - Some relays allow an automatic or manual reset once the current returns to acceptable levels



TRAVELLING CRANE

Application Description

In a travelling crane, use a **current monitoring relays*** with a motors, inhelp to detect a too heavy load.

Indeed, as the motors increase his power, the current becomes higher than the fixed threshold and the contact relay change its state.



PUMP

Application Description

A **current control relay**^{*}, can measure the current in a pump. The goal is to detect idling during under-intensity or pump blockage in the event of over-intensity.

In the event of over- or undercurrent, the output relays will change state and instruct the system to shut down.

LIQUID LEVEL MONITORING RELAYS

Description

Our range includes several types of level control relay, including models HNM, ENR, ENRM. The HNM uses resistive probes to detect the levels of conductive liquids.

They are commonly used in tank management systems, water treatment plants, and other industrial applications where accurate control of liquid levels is crucial.

Main Applications

INDUSTRIAL PUMPS



IRRIGATION SYSTEM



FOOD & BEVERAGE



LIQUID LEVEL RELATED EQUIPMENT



DIVERSE WATER EQUIPMENT



WATER TREATMENT PLANTS



LIQUID LEVEL MONITORING RELAYS – HOW IT WORKS ?

- A liquid level monitoring relays is a device used to monitor and regulate the level of liquids in a tank or container.
- **How its works ?**
- Level Monitoring:
 - The relay uses sensors (probes) to measure the liquid level.
 - These sensors can be electrodes, floats or ultrasonic sensors. Crouzet uses electrode technology to measure the conductivity of the liquid between 2 points.
- Level detection :
 - When the level reaches a predefined threshold (high or low), the relay changes state to activate or deactivate an electrical circuit. For example, it can start or stop a pump.
- Protection and control:
 - The relay can protect equipment by preventing pumps from running dry or tanks from overflowing. This ensures safe and efficient operation of fluid management systems.



WELL / TANKS

Application Description

In every installation with a **well, basin or tanks**, it is key to control the level containing. Particularly if a pumping system is used, in order to ensure that the pump does not run dry.

Crouzet **liquid level monitoring relay (HNM)**, are the best candidate to monitor levels in wells, basins, tanks, etc. to ensure the pumping system protection.



FONTAINS

Application Description

A **liquid level monitoring relays** can be used to maintain a water level sufficient to the correct operation. It can be apply to :

- A pump
- A water jet

The goal is to avoid an idle run, often destroying for these pumps and in all the cases stop the process.



SWIMMING POOL

Application Description

The use of a swimming pool requires a control of the level for the reason following:

- To maintain a level in order to compensate for the losses due to the evaporation of water, as well as the losses related to the swimmers leaving and entering water.
- Some effect swimming pool " overflow type" often requires several levels in order to carry out the various effect need

We can use a **liquid level monitoring relays** to satisfy this use



IRRIGATION SYSTEM

Application Description

In an irrigation system or a cistern, we need to know the level of water inside system. The **liquid level monitoring relays** , help us to get this information. The goal is to determine if we need to pump more or not in an underground sources to maintain a correct level.



WATER AND TREATMENT PLANT

Application Description

In wastewater treatment plants, **liquid level monitoring relays** control pumps to manage wastewater levels, ensuring efficient treatment and preventing overflows.



INDUSTRIAL PUMP

In industrial pumps, a **liquid level monitoring relays*** can be used to protect the pump. Here is some example :

- Dry run protection: when the liquid level is too low to stop the pump from running dry,
- Overflow prevention: when the liquid level is too high to stop the pump
- Automatic regulation: maintain a constant liquid level by switching the pump on or off according to pre-set levels.
- Drain and fill systems: Activate the pump to empty a tank when it reaches a certain level. , All for filling systems, they can activate the pump to fill a tank when the level is too low.

FREQUENCY & SPEED MONITORING RELAYS

Description

Ensure your systems operate within the desired frequency range with our single-phase frequency and speed monitoring relays. Monitor frequency variations around 50 Hz (40 - 60 Hz) or 60 Hz (50 - 70 Hz) to prevent equipment malfunction and mechanical failures, ensuring smooth and efficient operations

Main Applications

POWER GENERATION



TRANSMISSION AND DISTRIBUTION SYSTEM



RENEWABLE ENERGY



INDUSTRIAL AND COMMERCIAL FACILITIES



FREQUENCY MONITORING RELAYS– HOW IT WORKS ?

- A frequency control relay is an essential device for monitoring and protecting electrical networks by detecting frequency variations.
- **How its works ?**
- Frequency monitoring:
 - The relay continuously measures the frequency of the electric current in the network. It compares this frequency to predefined thresholds
- Anomaly Detection :
 - If the frequency falls outside acceptable limits (too high or too low), the relay triggers an alarm or activates a protection mechanism. This can include deactivating certain equipment or modifying the network load to bring the frequency back to a safe level
- Equipment protection :
 - If an anomaly is detected, the relay can protect sensitive equipment by preventing damage caused by frequency fluctuations.



MOBILE POWER GENERATING UNIT

Application Description

In a framework production of electricity by a power generating unit, the frequency must be control for remains in an operating range and avoid an electric material destruction.

The relay **HHZ**^{*} measures the frequency, if this one is not be included in the preset range, the relay will change state to protect the electric equipment's.



EMERGENCY GENERATOR

Application Description

In infrastructures equipped with emergency generators, **frequency monitoring relays*** ensure that the generator provides a stable frequency, even in the event of fluctuations in demand.



RENEWABLE ENERGY

Application Description

For households using renewable energy sources such as solar panels, **frequency monitoring relays*** help manage frequency variations due to intermittent production



MANUFACTURING PLANTS

Application Description

Frequency monitoring relays* protect production machines against frequency fluctuations, ensuring continuous, uninterrupted production.



VENTILATION AND AIR CONDITIONING SYSTEMS

Application Description

In large industrial installations, **frequency monitoring relays*** ensure that ventilation system motors operate reliably and efficiently.



CRANES AND LIFTING EQUIPMENT

Application Description

Frequency monitoring relays* monitor crane motors to ensure they operate at a stable frequency, preventing sudden stops or breakdowns.

SPEED MONITORING RELAYS

Description

Control motor speeds with speed monitoring relays. Detect speed deviations to prevent equipment malfunction and mechanical failures, ensuring smooth and efficient operations

Main Applications

ROTATING EQUIPMENT



Detect overspeed, underspeed or window monitoring for motors

BELT



Check the speed of the chain or belt to detect any blockages or overloads

SPEED MONITORING RELAYS– HOW IT WORKS ?

- A speed monitoring relay is a device used to monitor and regulate the speed of electric motors and other mechanical equipment.
- **How its works ?**
- Speed Monitoring:
 - The relay uses a speed sensor (discrete sensors) to continuously measure the current speed of the motor or equipment.
 - The process cycle monitored is a succession of pulses characterized by a two-state signal: high and low. The speed is measured by measuring the duration of this signal, starting from the first change of state detected (rising or falling edge).
- Comparison with Target Speed :
 - The measured speed is compared with a predefined target speed. If the current speed differs from the target speed, the relay triggers an alarm.



JACKS

Application Description

The principle is to detect the rotation of the jacks, and to bring under control the jacks between them if a defect occur.

If the number of revolutions is lower than the regulated threshold, the **speed monitoring relay*** of control informs the defect, and the automatism reacted in function « stop »



CONVOYER

Application Description

In order to check the correct operation of a conveyor, it is desirable to control the passage of product or/and the rotation of a belt to detect a blocking, a stuffing of product or a breakage of a drive belt.

An inductive detector detects the passage of the target at a frequency not null. If problem of rotation (broken belt, stuffing...) the frequency of passage of the parts is null. The **speed monitoring relay*** detect this change of frequency gives the order of one defect to the installation.



CRUSHING EQUIPMENT

Application Description

The purpose of grinding is to crush materials of varying degrees of hardness.

Measuring the current does not always allow us to check whether the grinder is blocked. We can complete this solution by controlling the rotation of the equipment.

To do this, we can place an inductive sensor to detect the passage of a target. In the event of a rotation fault, the information is transmitted to the **speed monitoring relay***, which declares a fault alarm.



THANK YOU

