

RELAYS



Phase Protection Relays



FMFS



MTPR1



FSMK

Time Relays



FT-30



FT-60

Counters



FS72

Thermostats



FDT72



FDT96

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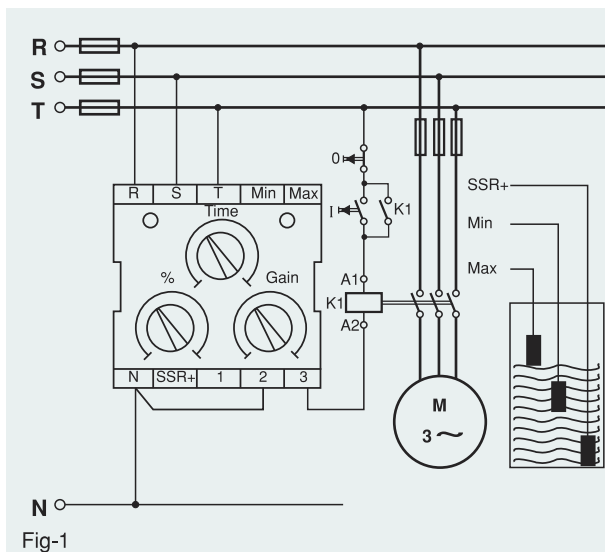
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Pic-1
FMFS Motor protection, phase sequence and liquid level relay

Connection diagram:



Motor Protection, Phase Sequence and Liquid Level Relay

FMFS control relay, which is manufactured multi-functional in accordance with CE, fulfills the following functions.

1. Voltage imbalance, phase cut-off:

Voltage of each phase is measured according to neutral. If a deviation more than the value adjusted in this measurement is observed, output relay is closed at the end of the adjusted time. Motor is protected against conditions like phase cut-off, voltage decrease and increase.

2. Phase sequence control:

The relay controls the phase sequence and closes the output relay if a fault is detected. The system is protected against phase sequence errors.

3. Liquid level control:

The relay controls level of the liquid via probes. When the liquid level goes below the minimum level, the output relay is opened. In order to open the relay again, the liquid level should achieve the maximum level. If there shall be no liquid level control, SSR+, Min. and Max. ends should be subject to short circuit.

Time button: If FMFS detects a voltage failure, the waiting time for setting the output relay "Off" condition.

% button: FMFS determines max % value (min = 176 V, max = 264V) any phase can deviate from 220 V.

Gain button: FMFS performs accuracy adjustment according to liquid material.

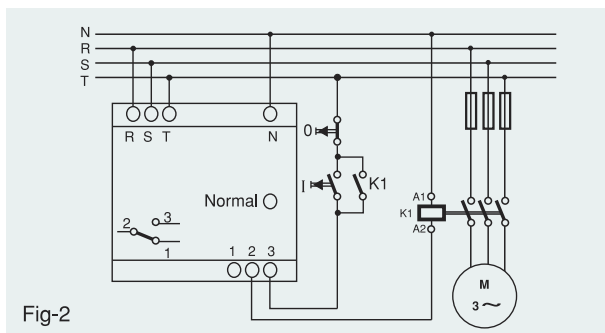
Technical Specifications:

Operating voltage	: 380 V AC 50 Hz
Relay contacts	: 1 NA , 1 NK
Contact power	: 250 V / 5 A AC
Warning	: Normally on led, which is off in case of fault
Assembly type	: Vertical in the panel or on the terminal box rail
Ambient temperature	: - 10°C, + 60°C
Delay time	: 0-5 sec
Voltage imbalance	: Adjustable (Max. 20%)
Order code	: 9HC-A0000-0000



Pic-2
MTPR1 Motor phase protection relay

Connection diagram:



MTPR1 Motor Phase Protection Relay:

Manufactured in accordance with CE. Protection functions fulfilled by the motor phase protection relay, which is intended to prevent failures in motors, are shown below.

1. Phase Cut-off:

Motor is disabled if it remains on 1 or 2 phases for any reason.

2. Voltage Imbalance:

Motor is disabled if neutral-phase voltage imbalance exceeds the level of 20% (optionally 40%).

Technical Specifications:

Operating voltage	: 220 V AC
Operating interval	: (0,8 - 1,2) x Un
Operating frequency (Hz)	: 50 / 60 Hz
Relay contacts	: 1 NA, 1NK
Ambient temperature	: -5°C, + 50°C
Warning	: Normally on led, which is off in case of fault
Assembly type	: Vertical in the panel or on the terminal box rail
Weight	: 0,25 kg
Voltage imbalance	: Optional 20% or 40%
Order code	: 9HB-A0000-0000

RELAYS



Pic-3

FSMK Phase Sequence and Motor Protection Relay

Connection Diagram:

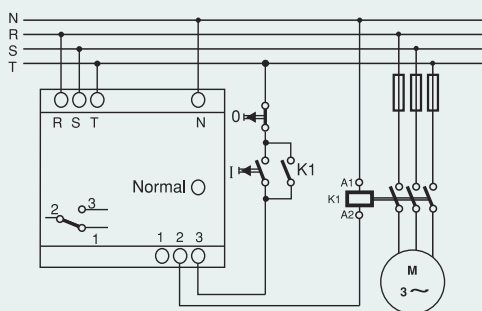


Fig-3

FSMK Phase Sequence and Motor Protection Relay

Manufactured in accordance with CE. Protection functions fulfilled by the phase sequence and motor protection relay, which is intended to prevent failures in electrical motors widely used at industrial facilities, are shown below.

1. Phase Cut-off :

Motor is disabled if it remains on 1 or 2 phases for any reason.

2. Voltage Imbalance:

Motor is disabled if neutral-phase voltage imbalance exceeds the level of 20% (optionally 40%).

3. Phase Sequence:

When phase sequence is reverse (when time of R, S and T is reverse), motor is not enabled. If the phase sequence is changed due to any reason, motor is disabled.

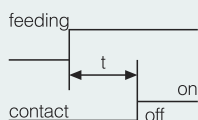
Technical Specifications:

Operating voltage	: 380 V AC
Operating interval	: (0,8-1,2) x Un
Operating frequency	: 50 - 60 Hz
Relay contacts	: 1 NA, 1 NK
Ambient temperature	: -5°C, + 50°C
Warning	: Normally on led, which is off in case of fault
Assembly type	: Vertical in the panel or on the terminal box rail
Weight	: 0,15 kg
Voltage imbalance	: Optional 20% or 40%
Order code	: 9HG-A0000-0000



Pic-4

FT-30 time relay



FT-30 time relay operating way

FT-30 Time Relay

Manufactured in accordance with CE. Time relays, which find a wide area of usage in industrial automation, are quite important for operation of automation mechanisms.

It operates delayed in drawing. After voltage application to relay, after waiting time delay (0-30 sec), auxiliary contact is shut down.

Technical Specifications:

Operating voltage	: 220 V AC, 24 V AC/DC
Relay contacts	: 1 NA, 1 NK
Contact power	: 250 V / 5 A AC
Warning	: On led while relay is drawn
Assembly type	: Assembly on terminal box rail or vertical bolting in the panel.
Ambient temperature	: - 10°C, + 60°C
Time adjustment	: 0-30 sec
Order code	: 9HD-A0001-0030

RELAYS



Fig-5
FT-60 Time Relay

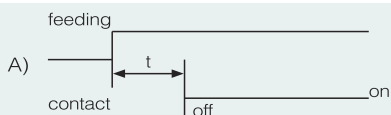
FT-60 Time Relay:

It is the multi-functional time relay manufactured in accordance with CE. Time relays, which find a wide area of usage in industrial automation, are quite important for operation of automation mechanisms.

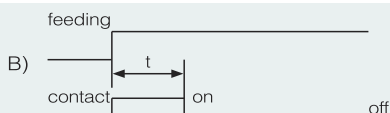
Technical Specifications:

Operating voltage	: 220 V AC, 24 V AC/DC
Relay contacts	: 1 NA , 1 NK
Contact power	: 250 V / 5 A AC
Warning	: On led while relay is drawn
Assembly type	: Assembly on terminal box rail or vertical bolting in the panel.
Ambient temperature	: - 10°C, + 60°C
Time adjustment	: 0-60 min.
X1 - X3	: Control input ends
X2 - a	: 24 V input ends
Order code	: 9HD-D0002-0060

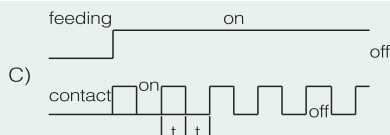
FT-60 Time Relay Operating Ways:



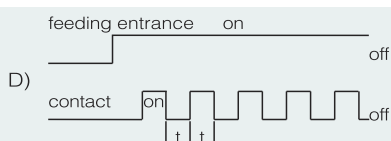
Delay in drawing depending on supply voltage



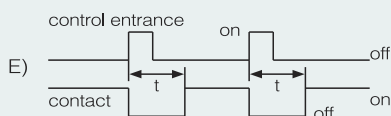
Delay in drawing depending on supply voltage



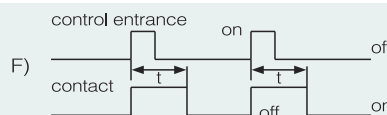
Flasher is initially on depending on supply voltage



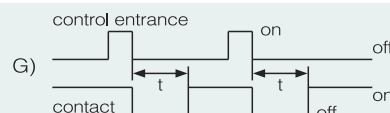
Flasher is initially on depending off supply voltage



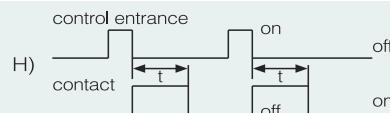
Delay in drawing depending on control input, active while control input is open



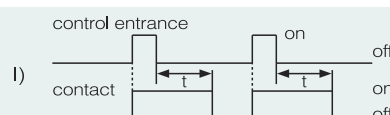
Delay in release depending on control input, active while control input is closed.



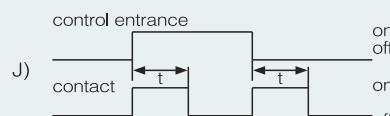
Delay in drawing depending on control input, active while control input is closed



Delay in release depending on control input, active while control input is closed



Delay in release depending on control input, relay is open while control input is open; t delay is processed and relay is closed when control input is closed.



Delay in release depending on control input, relay is open while control input is open and t delay is processed and it is closed at the end of the period; same operations are repeated when control input is closed.



Pic-6 FS72 Counter

FS72 Counter

Federal counter, which is manufactured in accordance with CE, counts depending on impulse input and multiplier factor. As the counting is performed under control of microprocessor, rate of errors is very low. FS 72 may keep program parameters and latest value for 10 years, even if there is an electricity failure. Pulse can be entered in FS 72 counter via encoder, proximity switch and contact. Input frequency is 130 Hz maximum.

Technical Specifications::

Operating voltage	: 220 V AC 50 Hz
Relay contacts	: 1 NA , 1 NK
Contact power	: 250 V / 5 A AC
Warning	: On led while relay is drawn
Assembly type	: In front of the panel
Ambient temperature	: - 10°C, + 60°C
Input frequency	: Max. 130 Hz.
Counting interval	: 000000 - 999999
Multiplier coefficient	: 00.0001 - 99.9999
Reset duration	: 0.01-99.99 sec
Sensor supply output	: 12 V DC
Dimensions	: 72x72
Order code	: 9KS-D0100-0000



Pic-7
FDT72 Thermostat

FDT72 Thermostat

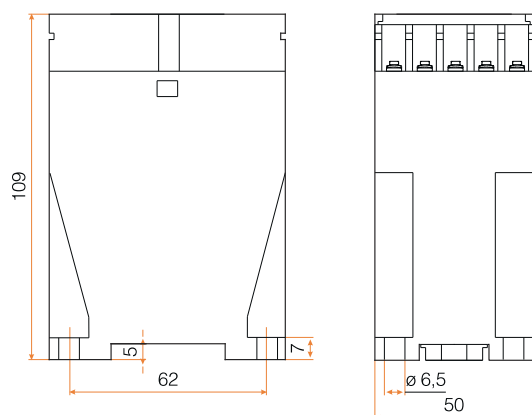
Federal Thermostats, which are manufactured in accordance with CE, operated in two manners as on-off and time-proportional control method. In On-off control method, when heat achieves the set value, thermostat relay is opened, when temperature value goes down to the set non-hysteria value, relay is closed again and continues operation in the desired area. When time-proportional control method is employed, device operates like in on-off control method 4°C below and above the set value. It is opened and closed in the selected control period at intermediate values.

Technical Specifications:

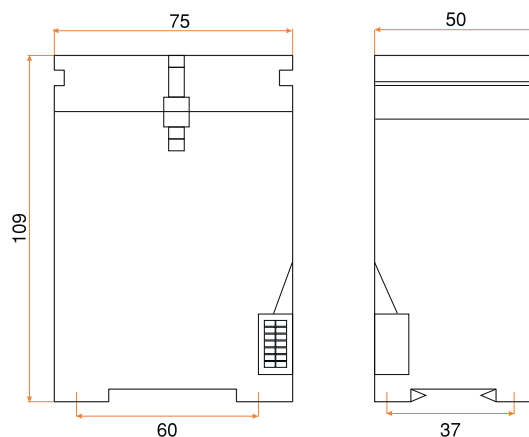
Operating voltage	: 220 V. AC. /50-60 Hz.
Measurement control interval:	0-400°C
Power consumption	: ≤ 3 W
Ambient temperature	: -10°C, +60°C
Temperature compensation	: 0-50°C
Hys interval	: 2°C, - 20°C (While On-Off control method is employed)
Control Period	: 10 sec. - 200 sec.
Control Output	: Relay (220 V. AC. 3A.)
Assembly type	1- On-Off control method 2- Time-proportional control method
Dimensions	: 72x72 (FDT 72) 96x96 (FDT 96)
Order code	: 9KT-D0110-0400 9KT-D0210-0400

RELAYS

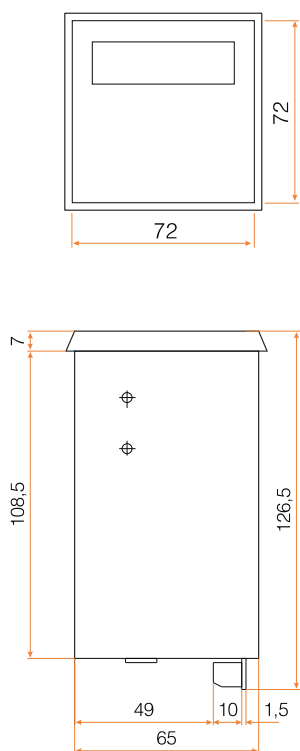
Motor Protection, Phase Sequence, Liquid Level Relay:



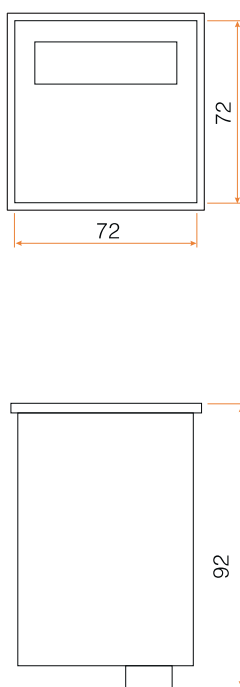
**Phase Sequence and Motor Protection Relay:
Motor Phase Protection Relay:
Time Relay:**



Counter



Thermostat (FDT72) :



Thermostat (FDT96) :

