



**OPERATING INSTRUCTIONS
COP-F
(ANSI -810/81U)**



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COP-F Numeric Frequency Relay

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1.0 Introduction

- 16 Bit RISC, state of art, microcontroller based System.
- Fundamental measurement of all measured parameters with 1% accuracy of measured value (Not full scale)
Backlit LCD Display for easy reading and parameter settings. No need to consult the manual while programming the unit. All system parameters are user programmable
- All the inputs such as AC voltage and auxiliary voltage are completely isolated
- Fast Fourier Transformation to extract fundamental components of current and voltage to avoid spurious tripping
- Housed in 92X92mm Din Standard housing.

2.0 Protection, Supervision Salient Features

Protection

Two Stage, Under Frequency (COP-F, COP-UF)
Two Stage Over Frequency (COP-F, COP-OF)

Display and Measurement

- Display of Voltage and frequency

Salient Features

- Wide range SMPS auxiliary supply (supply range from 50 to 300 VAC/DC Or 8-35 VDC)
- Digital fast Fourier transformation.
- Two digital inputs for external reset and external blocking.
- One common trip contact
- Three programmable alarm contact
- Selectable auto / manual scroll of measurement

3.0 Output Contact

Four NO contact Contacts are available, one is reserved for tripping function, three are programmable for alarm function.

- Trip (NO Contact)
- Alarm 1 (NO Contact)
- Alarm 2 (NO Contact)
- Alarm 3 (NO Contact)

4.0 Front Panel Switch

COP-F has four switch provided on its front panel. Switch can have more than one functions assigned to them. The table below describes the operation of these.

S.No.	Switch Symbol	Switch Function	Description
1	↑	Next	Normal operation mode: In this mode this scrolls the displayed parameters. Programming Mode: It is used to select the next parameter to be programmed.
2	+	Increment	Programming Mode It's used to increment value of the selected parameters.
3	-	Decrement	Programming Mode It's used to decrement value of the selected parameters.
4	R	Reset	In manual reset option this Key is used to reset the faults LED and Contact output In it is used to reset the LED indication.
5	R & -	Programming Mode Entry	Press "R" Key and than press "-" while the "R" Key is

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			pressed to enter the programming mode.
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5.0 **Setting Procedure**

COP has provision to program the operating parameters.

Press “R” & “-“ switch simultaneously.

The LCD shall display, “Parameter Mode”

To enter parameter setting mode press **↑**.

To go to next menu press **+**.

The LCD shall display “Set Alarm”.

This menu can be entered by pressing **↑**.

To go to next menu press **+**.

The LCD shall display “Set Blocking”.

This menu can be entered by pressing **↑**.

6.0 **Parameter Mode**

Sl. No	Display	Explanation of parameter	Factory setting	Setting Range	Setting step
1	No of Cycles Avg	No of cycles for which frequency is measured for fault detection.	10	2-50	1
2	UF<	Under Frequency set value.	47.5	45-70 Hz	0.01 Hz
3	UF<Def Time	Definite time delay in seconds.	10	Tf min – 30 Sec Tf min depends on no. of cycles	0.01 Sec
4	UF<<	Under Frequency high set value.	46.5	45-70 Hz	0.01 Hz
5	UF<< Def Time	Definite time delay in seconds.	5	Tf min – 30 Sec Tf min depends on no. of cycles	0.01 Sec
6	OF>	Over Frequency value	51.0	45-70 Hz	0.01 Hz
7	OF> Def Time	Definite time delay in seconds.	10	0.01 – 20 Sec	0.01 Sec
8	OF>>	Over Frequency high set value.	52.0	45-70 Hz	0.01 Hz
9	OF>> Def Time	Definite time delay in seconds.	10	0.01 – 20 Sec	0.01 Sec
10	Block Voltage V/Vn	Lower limit of input voltage, below which frequency measurement is blocked	0.5	0.25- 1.5 V/Vn	0.01 V/Vn
11	Reset Delay	Delay time for resetting the trip contact, after fault clearance.	1	0.1- 20 Sec	0.1 Sec.
12	Disp Auto Scroll	Measurement display auto scroll or manual scroll selection	Auto Scroll On	Auto Scroll On / Auto Scroll off	
13	Trip Reset	Reset type for tripped LED indication	Manual	Auto / Manual	

7.0 **External Alarm Contact**

Alarm Contact 1,2 & 3 can be programmed / activated on different protection functions e.g. for activating alarm 1 on over frequency, set 1. **By default no alarm is active.** If the alarms are required, they have to be programmed at the time of installing the relay.

The protections on which alarms can be programmed are:

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Protection Function	Protection Symbol	Activated Alarm, default setting	Remark
Over Voltage Low Set (Not available in COP UF)	OF >	0	No Alarm activated on OF >
Over Voltage High Set (Not available in COP UF)	OF >>	0	No Alarm activated on OF >>
Under Voltage Low Set (Not available in COP OF)	UF <	0	No Alarm activated on UF <
Under Voltage High Set (Not available in COP OF)	UF <<	0	No Alarm activated on UF <<

8.0 Set Blocking Function

Group of Selected protection function can be disabled on activation of blocking input

(By externally shorting terminal 7 and 8)

e.g. If . UF >> and OF >> are programmed as enabled for blocking input then on shorting terminal 7 and 8 and High set over and under frequency protection will be blocked/disable.

Following are default settings

Protection Function	Protection Symbol	Blocking enable/Disable default setting	Remark
Over Voltage Low Set (Not available in COP UF)	OF >	Disable	Blocking function is disable
Over Voltage High Set (Not available in COP UF)	OF >>	Disable	Blocking function is disable
Under Voltage Low Set (Not available in COP OF)	UF >	Disable	Blocking function is disable
Under Voltage High Set (Not available in COP OF)	UF >>	Disable	Blocking function is disable

9.0 Reset – Auto / Manual

User can programme COP-F either as auto reset or manual reset relay.

- Auto Reset : The trip contact will reset automatically after Reset Delay, Indication will reset automatically after clearance of fault and expiry of reset delay.
- Manual Reset : The trip contact will reset automatically after Reset Delay, Indication will reset after pressing the reset button.

10.0 Terminal Description

Terminal Number	Description
1	Phase Voltage
2	Not Connected
3	Not Connected
4	Neutral
5	Not Connected
6	Not Connected
7	Common for external reset and blocking
8	External Block
9	External Reset
10	Auxiliary Supply (+ Ve/ Ph)
11	Auxiliary Supply (-Ve/N)
12	Not Connected
13	Trip NO Contact

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14	Trip NO Contact
15	Alarm 1 NO
16	Alarm 2 NO
17	Alarm 3 NO
18	Common terminal for Alarm 1,2 & 3.
19,20	Not Connected
21,22	Not Connected
23,24	Not Connected

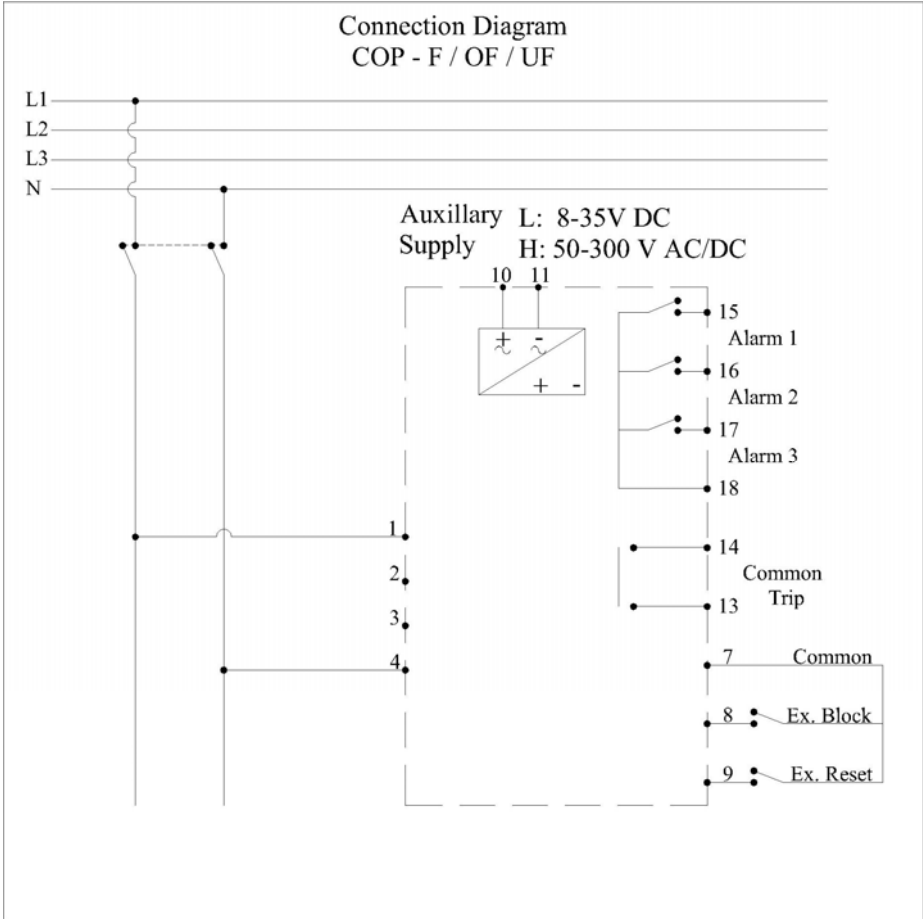
11.0 Model Selection Chart

Type	Protection	Rated Voltage	Auxilliary Voltage
COP	F : Under & Over Frequency U/F: Under Frequency O/F: Over Frequency	110/230 VAC	L: 8-35 VDC H: 50-300 VAC/DC

12.0 Technical specification

AC voltage withstand	330 VAC, Continuously, (Phase to neutral)
Frequency Range	40-70 Hz
Measurement Accuracy	
Voltage & Current	± 2%
Frequency	± 0.05 Hz.
Surge 1.2/50Usec	2.5KV
Auxiliary Voltage	8-35V/DC OR 50-300 V AC/DC
Contact Rating	230 VAC, 5A
Cut out Dimensions	90mm X 90mm
Depth	120mm

13.0 **Connection Diagram**



It is our endeavour to constantly upgrade our products, hence specifications are subject to change without any notice.