

Electronic phase loss and rotation monitoring relays for three-phase applications

- Universal voltage monitoring (U_N from 208 V to 480 V, 50/60 Hz)
- Phase loss monitoring, even under phase regeneration
- Positive safety logic - Make contact opens if the relay detects an error
- 2 versions:
1 CO relay output, 6 A (17.5 mm wide), and
2 CO relay output, 8 A (22.5 mm wide)
- 35 mm rail (EN 60715) mount
- European patent pending for the innovative principle at the root of the 3 phase monitoring and error survey system (70.61)

Screw terminal



For outline drawing see page 10

Contact specification

Contact configuration		1 CO (SPDT)	2 CO (DPDT)
Rated current/Maximum peak current	A	6/15	8/15
Rated voltage/ Max. switching voltage	V AC	250/400	250/400
Rated load AC1	VA	1500	2000
Rated load AC15	VA	250	400
Single phase motor rating (230 V AC)	kW	0.185	0.3
Breaking capacity DC1: 30/110/220 V	A	3/0.35/0.2	8/0.3/0.12
Minimum switching load	mW (V/mA)	500 (10/5)	300 (5/5)
Standard contact material		AgSnO ₂	AgNi

Supply specification

Nominal system voltage (U_N)	V AC (50/60 Hz)	208...480	208...480
Rated power	VA (50 Hz)/W	8/1	11/0.8
Operating range	V AC (50/60 Hz)	170...500	170...520

Technical data

Electrical life at rated load AC1	cycles	100 · 10 ³	60 · 10 ³
Switch-off delay time	s	0.5	0.5
Switch-on lock-out time	s	0.5	0.5
Power-on activation time	s	< 2	< 2
Insulation between supply and contacts (1.2/50 μs)	kV	5	5
Dielectric strength between open contacts	V AC	1000	1000
Ambient temperature	°C	-20...+60	-20...+60
Protection category		IP 20	IP 20

Approvals (according to type)



70.61

Three-phase (208...480)V
voltage monitoring:

- Phase loss
- Phase rotation



70.62

Three-phase (208...480)V
voltage monitoring:

- Phase loss
- Phase rotation



Ordering information

Example: 70 series, three-phase voltage monitoring relay, 1 output, supply voltage 380...415 V AC.

70.31.8400.2022

Series ————

Type ————

1 = 1 phase AC line monitoring
3 = 3 phase AC line monitoring
4 = 3 phase + neutral AC line monitoring
6 = 3 phase loss and rotation monitoring

No. of poles ————

1 = 1 pole
2 = 2 pole

Supply version ————

8 = AC (50/60 Hz)

Supply voltage ————

230 = 220...240 V (70.11)
400 = 380...415 V (70.31/41/42)
400 = 208...480 V (70.61/62)

D: Fault memory option
0 = No fault memory
2 = Fault memory function selectable

C: Time delay setting
0 = Fixed switch-off delay
2 = Adjustable switch-off delay
3 = Adjustable switch-off delay and asymmetry

B: Contact circuit
0 = CO

A: Detection values
0 = Non-adjustable detection values
2 = 2 adjustable detection values

Codes

70.11.8.230.2022	70.42.8.400.2032
70.31.8.400.2022	70.61.8.400.0000
70.41.8.400.2030	70.62.8.400.0000

Monitoring and function overview

	70.11	70.31	70.41	70.42	70.61/62
Supply system type	Single phase system	3-phase systems	3-phase systems	3-phase systems	3-phase systems
Nominal voltage 50/60 Hz	V 220...240	380...415	380...415	380...415	208...480
Undervoltage with/without memory (selectable)	•	•	—	•	—
Overvoltage with/without memory (selectable)	•	•	—	•	—
Window Mode with/without memory (selectable)	•	•	—	•	—
Window Mode without memory	—	—	•	—	—
Phase loss	—	•	•	•	•
Phase rotation	—	•	•	•	•
Phase asymmetry	—	—	•	•	—
Neutral loss (selectable)	—	—	•	• (fixed)	—

Technical data

Insulation		70.11/31/41/42		70.61/62	
Between supply and contacts	dielectric strength	V AC	2500	3000	
	impulse (1.2/50 µs)	kV	4	5	
Between open contacts	dielectric strength	V AC	1000	1000	
	impulse (1.2/50 µs)	kV	1.5	1.5	
EMC specifications					
Type of test		Reference standard			
Electrostatic discharge	contact discharge	EN 61000-4-2		4 kV	
	air discharge	EN 61000-4-2		8 kV	
Radiated electromagnetic field	80...1000 MHz	EN 61000-4-3		10 V/m	
	1...2.8 GHz	EN 61000-4-3		5 V/m	
Fast transients (burst 5/50 ns, 5 and 100 kHz)	on supply terminals	EN 61000-4-4		4 kV	
Voltage pulses on supply terminals (surge 1.2/50 µs)	common mode	EN 61000-4-5		4 kV	
	differential mode	EN 61000-4-5		4 kV	
Radiofrequency common mode voltage (0.15...230 MHz)	on supply terminals	EN 61000-4-6		10 V	
Voltage dips	70% U _N	EN 61000-4-11		25 cycles	
Short interruptions		EN 61000-4-11		1 cycle	
Radiofrequency conducted emissions	0.15...30 MHz	CISPR 11		class B	
Radiated emissions	30...1000 MHz	CISPR 11		class B	
Terminals		solid cable		stranded cable	
Max. wire size	mm ²	1 x 6 / 2 x 4		1 x 4 / 2 x 2.5	
	AWG	1 x 10 / 2 x 12		1 x 12 / 2 x 14	
Screw torque	Nm	0.8			
Wire strip length	mm	9			
Other data		70.11	70.31/41	70.42/61/62	
Power lost to the environment	without output current	W	0.8	0.9	1
	with rated output current	W	2	1.2	1.4