



S91 / S91-400

MOTOR MULTI-PROTECTION RELAY

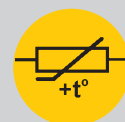
Highlights

- **Front diagnostics via LED and display**
- **Simplified settings and adjustments via trimmer and front selector**
- **Current measurement up to 16 A directly or by Current Transformer**
- **Maximum rated voltage 660 Vac (F-F)**
- **Motor control input 195 ÷ 255 Vac (S91); 400 Vac ± 10 % (S91-400)SPDT Relay @ 250 Vac - 8 A**
- **Alarm, temperature, power factor, maximum current, minimum voltage or phase failure management**

S91 and S91-400 are protection devices for electric motors that allows the detection of wrong phase sequence or lack of a phase, of the excess current consumption, no-load operation with the power factor measurement.

Equipped with rotary programming switches and a display of alarm signaling, the device is characterized by an input for PTC to protect the motor from overtemperature and enable input for starting the engine. S91 operates in 3 operation modes: single-phase or three-phase, maximum current range 5 or 16 A, operation with or without PTC. Main applications are protection of single-phase or three-phase pumps for possible rotor stop and for overtemperature as well as device failure detection of mechanical transmission (e.g. belts or chains) with protection against transmission system lockdown.

In case the neutral is not available, S91-400 version (with rated voltages up to 400 Vac) allows the device to be powered directly on the phases, without having to insert a reducing transformer.



PTC Input

5 - 16 A

Max current range



Three-phase / Single-phase measurement



MOTOR MULTIPROTECTION RELAY

TECHNICAL DATA

GENERAL DATA

Power supply	195 ÷ 255 Vac (S91); 400 Vac ± 10 % (S91-400)
Power consumption	1,5 W (max)
Withstand voltage	2,5 kV
Pulse withstand voltage	4 kV
Rated insulation voltage	600 V (cat II); 300 V (cat III)
Protection degree	IP20
Operating temperature	-20 ÷ +65°C
Mounting	35mm DIN rail IEC EN60715
Weight	250 g
Dimension (wxhxd)	53,5 x 73 x 90 mm
Case	UL94 V0, color ral7035
Norms	EN61000-6-4, EN61000-6-2, EN61010-1

WARNINGS AND SETTINGS

LED status indicators	Relay status Device disabled; Inhibit time (slow rotation); Motor in rotation (fast rotation); PTC sensor line short-circuited; PTC sensor line interrupted; Phase failure or minimum voltage alarm; Phase sequence alarm; Maximum current alarm; Minimum P.F. alarm; Temperature alarm
Front panel display	
Front panel selector	Single-phase or three-phase measurement; maximum current range 5 or 16 A; operation with or without PTC
Front panel trimmer adjustment	Setting auto reset time, inhibition time, minimum power factor, trip time, max current
Motor activating/deactivating	Enabling input with inhibition time setting

CURRENT MEASUREMENT

Insertion type	Direct or by Current Transformer
Rated current	16 Aac
Current measurement limits	0,1 ÷ 16 Aac, accuracy < 5%
Input type	Shunt
Measurement type	TRMS
Continuous thermal limit	16 Aac
Pulse thermal limit	45 Aac per 1 s
Dynamic limit	200 Aac per 10 ms
Self-consumption	1,3 W
Phase failure intervention	< 200 ms

VOLTAGE MEASUREMENT

Rated voltage Ue	347 (L-N) / 600 (L-L) Vac Cat II; 277 (L-N) / 480 (L-L) Vac Cat III
Voltage measurement limits	60 ÷ 660 Vac, accuracy < 5%
Frequency limits	50 – 60 Hz ± 5%
Connection Modes	L1-L2-L3 o L-N
Power failure threshold	80 Vac (single phase and three-phase)
Phase difference max - min	>20% (three-phase only)

MOTOR CONTROL INPUT

Rated voltage	195 ÷ 255 Vac (S91); 400 Vac ± 10 % (S91-400)
Operating limits	0,85 ÷ 1,1 of rated voltage
Power consumption/dissipation	0,17 W
Minimum command duration	≥40 ms

RELAY OUTPUT

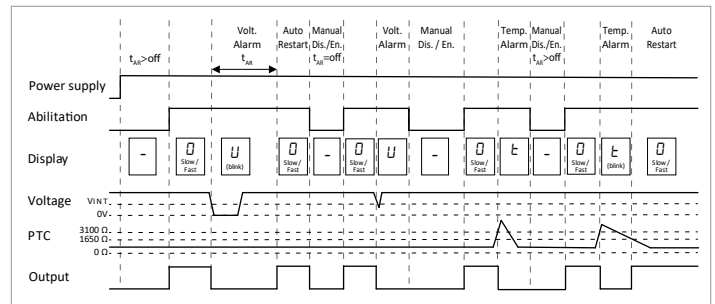
Type	SPDT
Working voltage	250 Vac
Working current	8 A

PTC MEASUREMENT

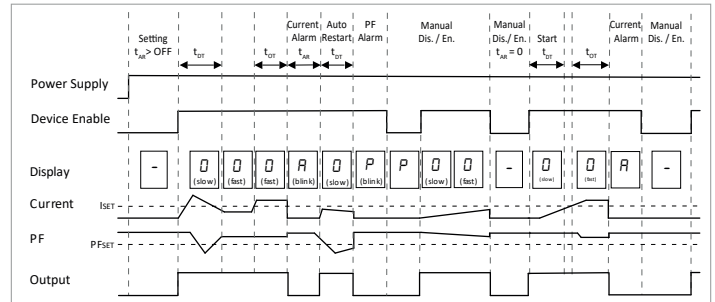
Input	Non insulated from power network, max cable length 30 m
Accuracy	1650 ÷ 3100 Ω; error < 5%
Short circuit detection	<25Ω±5Ω
Open circuit detection	>14 Ω±0,2kΩ

OPERATING DIAGRAM

VOLTAGE / PTC

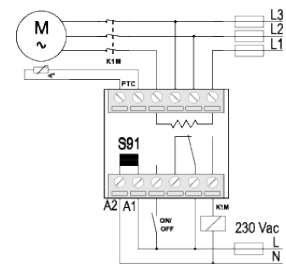


CURRENT / POWER FACTOR

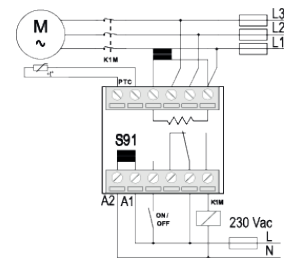


CONNECTION EXAMPLES

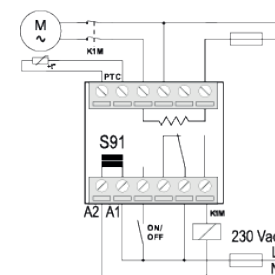
THREE-PHASE MOTOR WITH DIRECT CURRENT MEASUREMENT



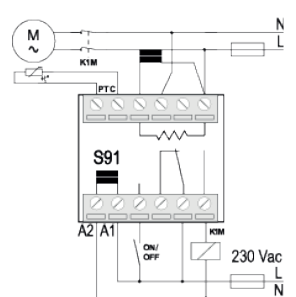
THREE-PHASE MOTOR WITH CURRENT MEASUREMENT WITH AMMETER TRANSFORMER



SINGLE-PHASE MOTOR WITH DIRECT CURRENT MEASUREMENT



SINGLE-PHASE MOTOR WITH CURRENT MEASUREMENT WITH AMMETER TRANSFORMER



ORDER CODES

Code	Description
S91	Motor multi-protection relay, 195 ÷ 255 Vac
S91-400	Motor multi-protection relay, 400 Vac ± 10 %