

# 7SG17 Rho 3

Multifunction Protection Relays

## Document Release History

This document is issue 2010/02. The list of revisions up to and including this issue is:

Pre release

2010/02	Document reformat due to rebrand

## Software Revision History

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## 1 SYSTEM CONFIGURATION MENU

SETTING	RANGE	DEFAULT
Active settings group	1 - 8	1
Settings group edit / view	1 - 8	1
Copy group	From *	From G1 to G2
Power system frequency	50Hz or 60Hz	50Hz
P/F rating (I <sub>n</sub> )	1A or 5A	1A
E/F rating (I <sub>n</sub> )	1A or 5A	1A
P/F CT ratio	5 to 10,000 step 5 : 1 or 5	300:1
E/F CT ratio	5 to 10,000 step 5 : 1 or 5	300:1
Current display	xI <sub>n</sub> , PRIMARY or SECONDARY	xI <sub>n</sub>
Maximum demand	1 to 60 minutes step 1	15 min
Set identifier	Up to 16 alphanumeric characters	RHO 3
Set alarm 1	Up to 13 alphanumeric characters	ALARM 1
Set alarm 2	Up to 13 alphanumeric characters	ALARM 2
Set alarm 3	Up to 13 alphanumeric characters	ALARM 3
Set alarm 4	Up to 13 alphanumeric characters	ALARM 4
Set alarm 5	Up to 13 alphanumeric characters	ALARM 5
Set alarm 6	Up to 13 alphanumeric characters	ALARM 6
Set alarm 7	Up to 13 alphanumeric characters	ALARM 7
Set alarm 8	Up to 13 alphanumeric characters	ALARM 8
Set alarm 9	Up to 13 alphanumeric characters	ALARM 9
Calendar - set date	DD/MM/YY	01/01/99
Clock - set time	HH:MM:SS	00:00:00
Clock sync. from status	Seconds or Minutes	Minutes
Default screen timer	10 sec, 60 sec, 5 min, 1 hour	5 min
Change password	4 alphanumeric characters	NONE

\*From any group to any other group

## 2 THERMAL PROTECTION MENU

SETTING	RANGE	DEFAULT
G <sub>n</sub> thermal overload setting (I <sub>th</sub> )	0.20 - 2.00 x I <sub>n</sub> step 0.01	1.05 x I <sub>n</sub>
G <sub>n</sub> NPS weighting factor (K)	0.0 - 10.0 step 0.1	3.0
G <sub>n</sub> heating time constant (τ <sub>η</sub> )	0.5 - 100.0 mins step 0.5	10.0 mins
G <sub>n</sub> starting time constant (τ <sub>s</sub> )	0.50 - 1.50 x t <sub>h</sub> step 0.05	1.00 x τ <sub>η</sub>
G <sub>n</sub> cooling time constant (τ <sub>c</sub> )	1 - 100 x t <sub>h</sub> step 1	10 x τ <sub>η</sub>
G <sub>n</sub> hot/cold curve ratio	OFF, 5 - 100% step 5	OFF
G <sub>n</sub> thermal capacity alarm setting	OFF, 50 - 100% step 1	OFF
G <sub>n</sub> load increase alarm setting	OFF, 0.50 - 1.00 x I <sub>q</sub> step 0.05	OFF
G <sub>n</sub> thermal restart inhibit setting	OFF, 20 - 100% step 1	50%
G <sub>n</sub> motor start current (I <sub>START</sub> )	1.5 - 10.0 x I <sub>q</sub> step 0.1	3.0 x I <sub>q</sub>
G <sub>n</sub> motor stop current (I <sub>STOP</sub> )	0.05 - 0.20 x I <sub>q</sub> step 0.05	0.10 x I <sub>q</sub>
G <sub>n</sub> stall withstand delay 1 (t <sub>s1</sub> )	1 - 250 secs step 1 sec, OFF	OFF
G <sub>n</sub> stall withstand delay 2 (t <sub>s2</sub> )	1 - 250 secs step 1 sec, OFF	OFF
G <sub>n</sub> CB fail time delay1	OFF, 0.01 - 20 sec step 0.01	OFF
G <sub>n</sub> CB fail time delay2	OFF, 0.01 - 20 sec step 0.01	OFF

### 3 OVER/UNDER CURRENT PROTECTION MENU

SETTING	RANGE	DEFAULT
Gn Phase fault alarm setting ( $I_{HA}$ )	OFF, 0.5 - 20 x $I_n$ step 0.1	OFF
Gn Phase fault alarm delay ( $t_{HA}$ )	0.00 - 1.00 sec step 0.01, 1.0 - 30.0 sec step 0.1	0.00 sec
Gn Phase fault trip setting ( $I_{HS}$ )	OFF, 0.5 - 20 x $I_n$ step 0.1	10 x $I_n$
Gn Phase fault trip delay ( $t_{HS}$ )	0.00 - 1.00 sec step 0.01, 1.0 - 30.0 sec step 0.1	0.00 sec
Gn Earth fault alarm setting ( $I_{EA}$ )	OFF, 0.005 - 1.000 x $I_n$ step 0.005	OFF
Gn Earth fault alarm delay ( $t_{EA}$ )	0.00 - 1.00 sec step 0.01, 1.0 - 30.0 sec step 0.1	0.00 sec
Gn Earth fault trip setting ( $I_{EF}$ )	OFF, 0.005 - 1.000 x $I_n$ step 0.005	0.1 x $I_n$
Gn Earth fault trip delay ( $t_{EF}$ )	0.00 - 1.00 sec step 0.01, 10. - 30.0 sec step 0.1	0.00 sec
Gn Earth fault inhibit setting ( $I_{EI}$ )	OFF, 4.0 - 10 x $I_n$ step 0.1	OFF
Gn Undercurrent alarm setting ( $I_{UA}$ )	OFF, 0.10 - 1.50 x $I_n$ step 0.05	OFF
Gn Undercurrent alarm delay ( $t_{UA}$ )	0.2 - 30.0 sec step 0.1	0.2 sec
Gn Undercurrent trip setting ( $I_{UC}$ )	OFF, 0.10 - 1.50 x $I_n$ step 0.05	OFF
Gn Undercurrent trip delay ( $t_{UC}$ )	0.2 - 30.0 sec step 0.1	0.00 sec

### 4 PHASE UNBALANCE PROTECTION MENU

SETTING	RANGE	DEFAULT
Gn Phase unbalance type	Phase difference, NPS, OFF	OFF
Gn Phase difference setting	0.10 - 0.40 x $I_q$ step 0.01	0.10 x $I_q$
Gn NPS setting	0.10 - 0.40 x $I_q$ step 0.01	0.10 x $I_q$
Gn Unbalance time multiplier	0.025 - 2.000 step 0.025	1.000
Gn Unbalance min. Op. time	0.1 - 2.0 secs step 0.1	1.0 sec

### 5 NUMBER OF STARTS PROTECTION MENU

SETTING	RANGE	DEFAULT
Gn Max. number of starts	OFF, 1 - 20 step 1	OFF
Gn Max. starts period	1 - 60 mins step 1	15 mins
Gn Start inhibit delay	1 - 60 mins step 1	15 mins
Gn Min. time between starts	OFF, 1 - 60 mins step 1	OFF

### 6 TEMPERATURE PROTECTION MENU

SETTING	RANGE	DEFAULT
Temperature input type	RTD (100Ω Pt), RTD (100 Ω Ni), RTD (120 Ω Ni), RTD (10 Ω Cu), RTD (Other), Thermistor (NTC), Thermistor (PTC), None	None
Temp input fail protection	ON, OFF	OFF
Temp input 1 alarm setting	OFF, 0 - 250°C step 1 (1), or 100 - 350 Ω step 1 (2), or 100 - 1000 Ω step 10, 1100 - 30000 Ω step 100 (3)	OFF
Temp input 1 trip setting	As above	OFF
Temp input 1 gating	None, Temp Input 1, ... , Temp Input 8	None
...	...	...
Temp Input n alarm setting	OFF, 0 - 250°C step 1 (1), or 100 - 350 Ω step 1 (2), or 100 - 1000 Ω step 10, 1100 - 30000 Ω step 100 (3)	OFF

Temp input n trip setting	As above	OFF
Temp input n gating None,	Temp Input 1, .. , Temp Input 8	None
...	...	...
Temp Input 8 alarm setting,	OFF	OFF
	0 - 250°C step 1 (1),	
	or 100 - 350 Ω step 1 (2),	
	or 100 - 1000 Ω step 10, 1100 -	
	30000 Ω step 100 (3)	
Temp Input 8 trip setting	As above	OFF
Temp Input 8 gating None,	Temp Input 1, .. , Temp Input 8	None

Notes: (1) Settings applied where named RTD types are selected.  
 Settings applied where other RTD types are selected.  
 Settings applied where thermistors are selected.

## 7 OUTPUT CONFIGURATION MENU

SETTING	RANGE	DEFAULT
Gn Protection. healthy	RL1..RL7	RL1
Gn Thermal overload trip	RL1..RL7	RL2
Gn Thermal alarm capacity	RL1..RL7	RL4
Gn Thermal overload alarm	RL1..RL7	RL5
Gn Load increase alarm	RL1..RL7	RL6
Gn Restart inhibit	RL1..RL7	RL3
Gn Motor start alarm	RL1..RL7	RL7
Gn Stall delay 1 Trip	RL1..RL7	RL2
Gn Stall delay 2 Trip	RL1..RL7	RL2
Gn Phase fault alarm	RL1..RL7	None
Gn Phase fault trip	RL1..RL7	RL2
Gn Earth fault alarm	RL1..RL7	None
Gn Earth fault Trip	RL1..RL7	RL2
Gn Undercurrent alarm	RL1..RL7	None
Gn Undercurrent trip	RL1..RL7	RL2
Gn Phase Unbalance trip	RL1..RL7	RL2
Gn Status 1	RL1..RL7	None
Gn Status 2	RL1..RL7	None
Gn Status 3	RL1..RL7	None
Gn Status 4	RL1..RL7	None
Gn Status 5	RL1..RL7	None
Gn Status 6	RL1..RL7	None
Gn Status 7	RL1..RL7	None
Gn Status 8	RL1..RL7	None
Gn Status 9	RL1..RL7	None
Gn CB fail 1	RL1..RL7	None
Gn CB fail 2	RL1..RL7	None
Gn Temp input 1 alarm	RL1..RL7	None
Gn Temp input 1 trip	RL1..RL7	None
Gn Temp input 2 alarm	RL1..RL7	None
Gn Temp input 2 trip	RL1..RL7	None
Gn Temp input 3 alarm	RL1..RL7	None
Gn Temp input 3 trip	RL1..RL7	None
Gn Temp input 4 alarm	RL1..RL7	None
Gn Temp input 4	RL1..RL7	None
Gn Temp input 5 alarm	RL1..RL7	None
Gn Temp input 5 trip	RL1..RL7	None
Gn Temp input 6 alarm	RL1..RL7	None
Gn Temp input 6 trip	RL1..RL7	None
Gn Temp input 7 alarm	RL1..RL7	None
Gn Temp input 7 trip	RL1..RL7	None
Gn Temp input 8 alarm	RL1..RL7	None
Gn Temp input 8 trip	RL1..RL7	None
Gn Temp input fail alarm	RL1..RL7	None

Gn Trip counter alarm	RL1..RL7	None
Gn SI2 alarm	RL1..RL7	None
Gn start counter alarm	RL1..RL7	None
Gn Run-time hours alarm	RL1..RL7	None
Gn Hand	RL1..RL7	None

## 8 STATUS CONFIGURATION MENU

SETTING	RANGE	DEFAULT
Settings group select	S1..S9	None
Gn Inverted inputs	S1..S9	None
Gn Thermal protection inhibit	S1..S9	None
Gn Stall protection inhibit	S1..S9	None
Gn Phase fault inhibit	S1..S9	None
Gn Earth fault inhibit	S1..S9	None
Gn Unbalance inhibit	S1..S9	None
Gn Undercurrent inhibit	S1..S9	None
Gn No. of starts inhibit	S1..S9	None
Gn Temp protection inhibit	S1..S9	None
Gn Not accel.	S1..S9	None
Gn Trip circuit fail	S1..S9	None
Gn Alarm 1	S1..S9	None
Gn Alarm 2	S1..S9	None
Gn Alarm 3	S1..S9	None
Gn Alarm 4	S1..S9	None
Gn Alarm 5	S1..S9	None
Gn Alarm 6	S1..S9	None
Gn Alarm 7	S1..S9	None
Gn Alarm 8	S1..S9	None
Gn Alarm 9	S1..S9	None
Gn Waveform trig	S1..S9	None
Gn $\Sigma I^2$ update	S1..S9	None
Gn Clock sync	S1..S9	None
Gn Reset flag & outputs	S1..S9	None
Gn Status 1 P/U delay	0 - 2.00 sec step 10ms	0.02 sec
	2.10 sec - 20.00 sec step 100ms	
	21 sec - 300 sec step 1 sec	
	360 sec - 3600 sec step 60 sec	
	3900 sec - 14400 sec step 300 sec	
Gn Status 1 D/O delay	As above	0.00 sec
Gn Status 2 P/U delay	As above	0.02 sec
Gn Status 2 D/O delay	As above	0.00 sec
Gn Status 3 P/U delay	As above	0.02 sec
Gn Status 3 D/O delay	As above	0.00 sec
Gn Status 4 P/U delay	As above	0.02 sec
Gn Status 4 D/O delay	As above	0.00 sec
Gn Status 5 P/U delay	As above	0.02 sec
Gn Status 5 D/O delay	As above	0.00 sec
Gn Status 6 P/U delay	As above	0.02 sec
Gn Status 6 D/O delay	As above	0.00 sec
Gn Status 7 P/U delay	As above	0.02 sec
Gn Status 7 D/O delay	As above	0.00 sec
Gn Status 8 P/U delay	As above	0.02 sec
Gn Status 8 D/O delay	As above	0.00 sec
Gn Status 9 P/U delay	As above	0.02 sec
Gn Status 9 D/O delay	As above	0.00 sec

## 9 COMMUNICATIONS INTERFACE MENU

SETTING	RANGE	DEFAULT
Comms baud rate	75, 110, 150, 300, 600, 1200, 2400, 19200, 4800, 9600,	19200
Comms parity	NONE, EVEN	EVEN
Relay address	0 - 254	0
Line idle	LIGHT ON, LIGHT OFF	LIGHT OFF
Data echo	OFF, ON	OFF

## 10 DATA STORAGE MENU

SETTING	RANGE	DEFAULT
Gn Fault trigger	RL1..RL7	RL2
Gn Waveform configuration	1 x 10 sec, 10 x 1 sec	10 x 1
Gn Waveform trig	TRIP, START, STATUS, OFF	OFF
Gn Waveform pre-trigger	OFF, 10%-100% step 10%	10%
Clear all waveforms	NO, YES (Confirmation required)	NO
Clear all events	NO, YES (Confirmation required)	NO
Clear all faults	NO, YES (Confirmation required)	NO

## 11 MAINTENANCE MENU

SETTING	RANGE	DEFAULT
Thermal capacity reset	NO, YES (Confirmation required)	NO
Start protection reset	NO, YES (Confirmation required)	NO
Trip counter alarm	OFF, 1 - 999 step 1	OFF
Trip counter reset	NO, YES (Confirmation required)	NO
$\Sigma I^2$ Alarm	OFF, 10 - 100 step 1 MA2, 200 - 20000 step 100 MA2, 21000 - 100000 step 1000 MA2	OFF
$\Sigma I^2$ Reset		
Start counter alarm	OFF, 1 - 999 step 1 OFF	
Start counter reset	NO, YES (Confirmation required)	NO
Run-time hours alarm	OFF, 1 - 100 step 1 110 - 1000 step 10 1100 - 10000 step 100 11000 - 100000 step 1000	OFF
Run-time hours reset	NO, YES (Confirmation required)	NO
Maximum demand reset	NO, YES (Confirmation required)	NO
O/P relay test	Any output relay option	OFF