CL-5 SERIES FUNCTION CODES

COOPER Power Systems

Function Code	Function	Security Level Change/Reset
FORWARD CONTROL SETTINGS		
0	Operation Counter (Q, R_, R¯, 1, 2, 3, 4, 5, 6)*	3*
1	Set Voltage	2
2	Bandwidth, volts	2
3	Time Delay, seconds	2
4	Line Compensation Resistance, volts	2
5	Line Compensation Reactance, volts	2
INSTANTANEOUS METERING		
6	Load Voltage, Secondary	
7	Source Voltage, Secondary	
8	Compensated Voltage, Secondary	
9	Load Current, Primary, amperes	
10	Load Voltage, Primary, kV	
11	Source Voltage, Primary, kV	
12	Tap Position & Percent Regulation (TP, %)	3
13	Power Factor	
14	kVA Load	
15	kW Load	
16	kvar Load	
17	Line Frequency	
18	Voltage Harmonics (THD, 3, 5, 7, 9, 11, 13), percent	
19	Current Harmonics (THD, 3, 5, 7, 9, 11, 13), percent	
FORWARD DEMAND METERING		
20	Load Voltage (H-D, T; L-D, T; P)	1
21	Compensated Voltage (H-D, T; L-D, T, P)	1
22	Load Current (H-D, T; L-D, T; P), amperes	1
23H	Power Factor @ Max kVA Demand	
23L	Power Factor @ Min kVA Demand	
24	kVA Load (H-D, T; L-D, T; P)	1
25	kW Load (H-D, T; L-D, T; P)	1
26	kvar Load (H-D, T; L-D, T; P)	1
27	Max Tap Pos & Max % Boost (TP-D, T; %)	1
28	Min Tap Pos & Max % Buck (TP-D, T; %)	1
29	Source Voltage **(H-D, T; L-D, T; P)	
REVERSE DEMAND METERING		
30	Load Voltage (H-D, T; L-D, T; P)	1
31	Compensated Voltage (H-D, T; L-D, T; P)	1
32	Load Current (H-D, T; L-D, T; P), amperes	1
33H	Power Factor @ Max kVA Demand	
33L	Power Factor @ Min kVA Demand	
34	kVA Load (H-D, T; L-D, T; P)	1
35	kW Load (H-D, T; L-D, T; P)	1
36	kvar Load (H-D, T; L-D, T; P)	1
37	Source Voltage**(H-D, T; L-D, T; P)	
MASTER METERING & TAP POSITION INDICATION RESET		
38	Reset	1
CONFIGURATION		
39	Source Voltage Calculation 0 = Off, 1 = On; 1 = Type A, 2 = Type B	2
40	Regulator Identification	2
41	Regulator Configuration 0 = Wye, 1 = Delta Lag, 2 = Delta Lead	2
42	Control Operating Modes 0 = Sequential, 1 = Time Integrating, 2 = Voltage Averaging	2
43	System Line Voltage, volts	2
44	Overall P.T. Ratio	2
45	C.T. Primary Rating, amps	2
46	Demand Time Interval, minutes	2
49	Tap Changer Selection 0 = Quik Drive, 1 = Spring/Direct Drive	
CALIBRATION		
47	Voltage Calibration, volts	3
48	Current Calibration, amps	3
CALENDAR/CLOCK		
50	Date & Time Set (D, T, 1, 2, 3, 4, 5, 6) 1 = Year, 2 = Month, 3 = Day, 4 = Hour, 5 = Minute, 6 = Second	3

Notes:
H-D, T = Highest (maximum) value since last reset, date & time
L-D, T = Lowest (minimum) value since last reset, date & time
P = Present value
THD = Total Harmonic Distortion
TPI = Tap position indication

Function Code	Function	Security Level Change/Reset
REVERSE CONTROL SETTINGS		
51	Set Voltage, volts	2
52	Bandwidth, volts	2
53	Time Delay, seconds	2
54	Line Compensation, Resistance, volts	2
55	Line Compensation, Reactance, volts	2
56	Reverse Sensing Mode 0 = Locked Forward, 1 = Locked Reverse 2 = Reverse Idle, 3 = Bi-Directional 4 = Neutral Idle, 5 = Co-Generation 6 = Reactive Bi-directional	2
57	Reverse Threshold %	2
COMMUNICATIONS		
60	Channel 1 (Data Port) Baud Rate	2
61	Control Communication Protocol XX.03 = Data 2179	
62	Channel 1 (Data Port) Status	
63	Channel 2 (Comm Port) Status	
64	Control Communications Address	2
65	Channel 2 (Comm Port) Baud Rate	2
66	Comm Port Handshake Mode	2
67	Comm Port Resynch Time Chars.	2
68	Comm Port Transmit Enable Delay (On, Off)	2
69	Blocking Status 0 = Normal, 1 = Blocked	2
VOLTAGE REDUCTION		
70	Voltage Reduction Mode 0 = Off, 1=Local/Digital Remote, 2 = Analog Remote (Latching), 3 = Pulse 10 = Off, 11 = Local/Digital Remote, 12 = Analog Remote (Latching), 13 = Pulse (Utilizing 10-13 activates tap to neutral)**	2
71	% Voltage Reduction In Effect (Read Only)	
72	Local Reduction %	2
73	Remote #1 %	2
74	Remote #2 %	2
75	Remote #3 %	2
76	# of Pulse Reduction Steps	2
77	% of Voltage Reduction Per Pulse Step	2
79	Soft ADD-AMP limits** 0 = Off, 1 = On; High limit; Low limit;	2
VOLTAGE LIMITER		
80	Voltage Limiting Mode 0 = Off, 1 = High Limit Only 2 = High and Low Limits	2
81	High Voltage Limit, volts	2
82	Low Voltage Limit, volts	2
METERING PROFILE RECORDER		
85	Profile Period (5, 10, 15, 30, 60, 90, 120 min.)** 1 = Parameter 1, 2 = Parameter 2, 3 = Parameter 3, 4 = Parameter 4, 5 = Data Retrieval Mode (0 = Off, 1 = On)	1
WATCHDOG DIAGNOSTICS		
89	Firmware Version #	
90	Number of Defaults	
91	Self Test	
93	Number of EEPROM Corrections	3
94	Number of Resets	3
95	System Status Code (Read Only) 0 All Systems Good 1 EEPROM Write Failure 2 EEPROM Erase Failure 3 Frequency Detection Failure 4 No Sampling Interrupt-Failure 5 Analog-To-Digital Converter-Failure 6 Invalid Critical Parameters-Failure 7 No Input Voltage Detected-Warning 8 No Output Voltage Detected-Failure 9 No Input & Output V Detected-Failure 10 TPT No Neutral Sync Signal-Warning	
SECURITY ACCESS		
92	Security Override (1 = Override 1, etc.)	3
96	Level 1 Security Code	3
97	Level 2 Security Code	3
98	Level 3 Security Code	3
99	ENTER SECURITY CODE	

Q = Quantity of operations since last change
R_ = Date of last counter change
R¯ = Time of last counter change
* Change/Reset and Sub-function codes only on CL-5E control
** CL-5E only

See next page for more function codes

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COOPER Power Systems

DISPLAY

To turn display ON, press any key.

To turn display OFF and reset security to base level, press DISPLAY OFF key.

ACCESSING FUNCTION CODES

Three Ways

A. One-Touch. Access Function Codes 0-9 directly by pressing keys 0-9, or . . .
B. Use SCROLL keys to scroll up and down through function codes, or . . .
C. Press FUNCTION key, the function code number, and the ENTER key.

SETTINGS & CONFIGURATIONS

To Change:

1. Access Security Level 3.
2. Access appropriate Function Code.
3. Press CHANGE key. "_____c" appears on LCD.
4. Key in new value.
5. Press ENTER key.
6. When "c" disappears, value is changed.

CLOCK

Four hyphens in the middle of the display indicate ---- that the calendar/clock needs to reset.

To Set the Date & Time:

1. Access Security Level 2.
2. Access Function Code 50.
3. Read Month and Date.
4. Scroll up and read Hour and Minute.
5. If any are incorrect, scroll up to the appropriate subfunction and change to the correct value.

TAP POSITION

To Set Present Tap Position:
First Way - Pass Through Neutral

1. If regulator is not at neutral, manually raise or lower tap changer to neutral.

Second Way - Change FC 12P

1. Access Security Level 3.
2. Access Function Code 12.
3. Read FC 12P, Present Tap Position.
4. Change to proper value based on Position Indicator.

SECURITY

To Access Security:

1. Press FUNCTION key.
2. Key in 99.
3. Press ENTER key.
4. Key in Security Code.
5. Press ENTER key.
6. "FUNC___" on display indicates security has been accessed.

METERING & TAP POSITION RESET

To Reset a Single Value:

1. Access Security Level 1. (Not necessary if Security Override = 1, 2, or 3.)
2. Access Function Code, H or L value.
3. Press RESET key.
4. Value and Date/Time have been reset.

To Reset all Demand and TP Values:

1. Access Security Level 1. (Not necessary if Security Override = 1, 2 or 3.)
2. Access Function Code 38.
3. "donE" on display indicates that all demand and tap position High & Low values and the dates/times have been reset to their Present values.

USING A VOLTMETER

1. Connect an accurate true RMS-responding voltmeter to the voltmeter terminals.
2. On the keypad, press FUNCTION, 47, ENTER.

Notes

A. The voltage read at Function 47 is the voltage (without harmonics) at the voltmeter terminals.
B. A THD of 14% will cause voltage at terminals to be only 1% higher than Function Code 47.

KEY ENTRY ERRORS

The word "ERROR" on the display indicates that a key entry error has been made. The error codes are defined as follows:

1 = Input Value too Low.
2 = Input Value too High.
3 = Improper Security to Change.
4 = Invalid Security Code.

FAILURE

1. Access FC 95 for the failure reason. If FC95=10 the Tap Position Tracking function is out of synchronization.
2. Tap the regulator to neutral or change FC 12P to equal the present position of the Position Indicator.

NOTE:

This reference sheet is not meant to replace the instruction manual S225-10-10. The manual should be read before using equipment.

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