

Manual Supplement

Manual Title:	165X Users	Supplement Issue:	3
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This supplement contains information necessary to ensure the accuracy of the above manual. This manual is distributed as an electronic manual on the following CD-ROM:

CD Title:	165X
CD Rev. & Date:	9/2003
CD PN:	1674214

Change #1

On page 29, replace the second Note with the following:

Note

Model 1651 does not allow the Auto selection.

On page 33, replace step 2, with the following:

2. Press 1 to select the RCD current rating (10, 30,100, 300 or 500 mA).

On page 49, under *Loop and Line Impedance, (Z_l)*, add the following to the table:

Maximum Test Current @ 400 V	20 A for 10 ms
Maximum Test Current @ 230 V	12 A for 10 ms

Replace the third table with the following:

Range	Resolution	Accuracy*
20 Ω	0,01 Ω	± (3% + 10 digits)
200 Ω	0,1 Ω	± 3%
2000 Ω	1 Ω	± 6% **
*Valid for resistance of neutral circuit <20 Ω		
**Valid for mains voltage >200 V		

On page 51, under RCD Testing, add the following:

For all RCD testing, Earth electrode resistance must be less than 100 Ω .

On page 52, delete the entire *Tripping Speed Test (ΔT)* table.

On page 53, under *Tripping Speed Test (ΔT)*, delete “Models 1652 and 1653”.

In the first table, replace the last row with the following:

10-30 mA	X 5	$\pm 10\%$ -0%
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In the second table, under **Trip Time Accuracy**, replace “digit” with “ms” in all occurrences.

On page 54, under Earth Resistance Test (R_E), Model 1653 Only, add the following:

This product is intended to be used to measure installations in process plants, industrial installations and residential applications.

Change #2

On page 50, under Range change:

From: 0 to 10 kA

To: 0 to 50 kA

Change #3

On page 25, add step 7, and page 27, add step 5, as follows:

If the mains is too noisy, ERR 5 will be displayed. (The measured value accuracy is degraded by the noise.) Press the down arrow to display the measured value. Press the up arrow to return to the ERR 5 display.

Change #4

On page 47, under Electrical Measurement Specifications, add the following tables:

Tables for the determination of maximum or minimum display values considering maximum instrument operating error per EN61557-1, 5.2.4.

Insulation Resistance

50 V		100 V		250 V		500 V		1000 V	
Limit Value	Maximum Display Value	Limit Value	Maximum Display Value	Limit Value	Maximum Display Value	Limit Value	Maximum Display Value	Limit Value	Maximum Display Value
1	1.12	1	1.12	1	1.3	1	1.3	1	1.3
2	2.22	2	2.22	2	2.4	2	2.4	2	2.4
3	3.32	3	3.32	3	3.5	3	3.5	3	3.5

4	4.42	4	4.42	4	4.6	4	4.6	4	4.6
5	5.52	5	5.52	5	5.7	5	5.7	5	5.7
6	6.62	6	6.62	6	6.8	6	6.8	6	6.8
7	7.72	7	7.72	7	7.9	7	7.9	7	7.9
8	8.82	8	8.82	8	9.0	8	9.0	8	9.0
9	9.92	9	9.92	9	10.1	9	10.1	9	10.1
10	11.02	10	11.02	10	11.2	10	11.2	10	11.2
20	22.02	20	22.02	20	22.2	20	22.2	20	22.2
30	33.02	30	33.2	30	33.2	30	33.2	30	33.2
40	44.02	40	44.2	40	44.2	40	44.2	40	44.2
50	55.02	50	55.2	50	55.2	50	55.2	50	55.2
		60	66.2	60	66.2	60	66.2	60	66.2
		70	77.2	70	77.2	70	77.2	70	77.2
		80	88.2	80	88.2	80	88.2	80	88.2
		90	99.2	90	99.2	90	99.2	90	99.2
		100	110.2	100	110.2	100	110.2	100	110.2
				200	220.2	200	220.2	200	220.2
						300	347	300	345
						400	462	400	460
						500	577	500	575
								600	690
								700	805
								800	920
								900	1035
								1000	1150

Continuity

Limit Value	Maximum Display Value
0.2	0.16
0.3	0.25
0.4	0.34
0.5	0.43
0.6	0.52
0.7	0.61
0.8	0.7
0.9	0.79
1	0.88
2	1.78
3	2.68
4	3.58
5	4.48
6	5.38
7	6.28
8	7.18
9	8.08
10	8.98
20	17.98
30	26.8

Loop Tests

Loop Zi		Loop Re	
Limit Value	Maximum Display Value	Limit Value	Maximum Display Value
2	1.72	2	1.82
3	2.57	3	2.72
4	3.42	4	3.62
5	4.27	5	4.52
6	5.12	6	5.42
7	5.97	7	6.32
8	6.82	8	7.22
9	7.67	9	8.12
10	8.52	10	9.02
20	17.02	20	18.02
30	25.52	30	27.2
40	34.02	40	36.2
50	42.52	50	45.2
60	51.02	60	54.2
70	59.52	70	63.2
80	68.02	80	72.2
90	76.52	90	81.2
100	85.02	100	90.2
200	170.02	200	180.2
300	257	300	272
400	342	400	362

500	427	500	452
600	512	600	542
700	597	700	632
800	682	800	722
900	767	900	812
1000	852	1000	902
2000	1702	2000	1802

RCD Tests

RCD Time		RCD Current	
Limit Value	Maximum Display Value	Limit Value	Maximum Display Value
20	18.1	0.5	0.43
30	27.1	0.6	0.52
40	36.1	0.7	0.61
50	45.1	0.8	0.7
60	54.1	0.9	0.79
70	63.1	1	0.88
80	72.1	2	1.78
90	81.1	3	2.68
100	90.1	4	3.58
200	180.1	5	4.48
300	271	6	5.38
400	361	7	6.28
500	451	8	7.18
600	541	9	8.08

700	631	10	8.98
800	721	20	17.98
900	811	30	26.8
1000	901	40	35.8
2000	1801	50	44.8
		60	53.8
		70	62.8
		80	71.8
		90	80.8
		100	89.8
		200	179.8
		300	268
		400	358
		500	448
		600	538
		700	628
		800	718
		900	808
		1000	898

Earth Tests

Limit Value	Maximum Display Value
10	8.8
20	17.8
30	26.8
40	35.8
50	44.8
60	53.8
70	62.8
80	71.8
90	80.8
100	89.8
200	179.8
300	268.0
400	358.0
500	448.0
600	538.0
700	628.0
800	718.0
900	808.0
1000	898.0
2000	1798.0