CERTIFICATE OF CALIBRATION

Issued By Transmille Ltd. **Certificate Number** EXAMPLE

Date of Issue 13 June 2007

UKAS CALIBRATION
0324

Approved Signatory

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☐ Signatory 1 ☐ Signatory 2 ☒ Signatory 3

Customer : EXAMPLE

Date Received : 06 June 2007

Instrument :

System ID :	EXAMPLE
Description :	Electrical Test Calibrator
Manufacturer :	Transmille
Model Number :	3200HGA
Serial Number :	EXAMPLE
Procedure Version :	3.10/N

Job Number : EXAMPLE

Environmental Conditions

Temperature : 20°C +/- 1°C
Relative Humidity : 50% +/- 20%
Mains Voltage : 240V +/- 12V
Mains Frequency : 50Hz +/- 1Hz

Comments

Instrument was allowed to stabilise for at least 12 hours before calibration.
Instrument calibrated with Bond lead supplied
4 Wire kelvin connections were used for ohms measurements below 10kOhms
Tests marked # are not UKAS accredited have been included for completeness

Calibration Information

The instrument was calibrated against laboratory standards whose values are traceable to recognised National Standards. The uncertainty limits quoted refer to the measured values only, with no account being taken of the instruments ability to maintain its calibration.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Calibrated By : EXAMPLE **Date of Calibration :** 13 June 2007

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AFTER ADJUSTMENT RESULTS

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Test Title	Applied Value	Reading	Uncertainties
Insulation Resistance			
10kΩ	10.000 0kΩ	10.000 0kΩ	430mΩ
20kΩ	20.000 0kΩ	20.001 2kΩ	610mΩ
30kΩ	30.000 0kΩ	29.995 0kΩ	730mΩ
40kΩ	40.000 0kΩ	40.002 2kΩ	860mΩ
60kΩ	60.000 0kΩ	59.981 9kΩ	1.1Ω
100kΩ	100.000kΩ	99.965kΩ	2Ω
200kΩ	200.000kΩ	199.945kΩ	4.1Ω
400kΩ	400.000kΩ	399.830kΩ	7.6Ω
600kΩ	600.000kΩ	599.808kΩ	11Ω
1MΩ	1.000 00MΩ	1.000 06MΩ	22Ω
2MΩ	2.000 00MΩ	1.999 77MΩ	170Ω
3MΩ	3.000 00MΩ	2.999 77MΩ	250Ω
4MΩ	4.000 00MΩ	4.001 51MΩ	330Ω
5MΩ	5.000 00MΩ	5.001 75MΩ	410Ω
6MΩ	6.000 00MΩ	5.986 08MΩ	500Ω
7MΩ	7.000 00MΩ	6.985 86MΩ	580Ω
8MΩ	8.000 00MΩ	7.985 75MΩ	660Ω
9MΩ	9.000 00MΩ	8.987 56MΩ	740Ω
10MΩ	10.000 0MΩ	9.972 5MΩ	830Ω
20MΩ	20.000 0MΩ	19.948 4MΩ	13kΩ
30MΩ	30.000 0MΩ	29.923 9MΩ	19kΩ
40MΩ	40.000 0MΩ	39.887 4MΩ	25kΩ
50MΩ	50.000 0MΩ	50.019 2MΩ	32kΩ
60MΩ	60.000 0MΩ	59.969 0MΩ	38kΩ
70MΩ	70.000 0MΩ	69.967 3MΩ	44kΩ
80MΩ	80.000 0MΩ	79.926 1MΩ	51kΩ
90MΩ	90.000 0MΩ	89.874 8MΩ	57kΩ
100MΩ	100.000MΩ	99.786MΩ	64kΩ
200MΩ	200.000MΩ	199.252MΩ	1.6MΩ
400MΩ	400.000MΩ	398.933MΩ	3.2MΩ
600MΩ	600.00MΩ	603.39MΩ	4.9MΩ
800MΩ	800.00MΩ	803.81MΩ	6.5MΩ
1GΩ	1.000 0GΩ	0.994 1GΩ	8.1MΩ
2GΩ#	2.000GΩ	2.002GΩ	8.9MΩ
4GΩ#	4.00GΩ	4.01GΩ	18.1MΩ
6GΩ#	6.00GΩ	5.89GΩ	27MΩ
8GΩ#	8.00GΩ	7.90GΩ	36MΩ
10GΩ#	10.00GΩ	9.90GΩ	45MΩ

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Test Title	Applied Value	Reading	Uncertainties
Continuity Resistance **Connection to the 3200 insulation test terminals was made using 4 wire ohms with the system nulled when shorted at the terminals. The readings recorded are the resistance measured at the terminals and include any residual resistance of the 3200.**			
20mΩ	20.0mΩ	19.0mΩ	260uΩ
200mΩ	200.0mΩ	205.7mΩ	270uΩ
210mΩ	210.0mΩ	215.9mΩ	270uΩ
220mΩ	220.0mΩ	224.8mΩ	270uΩ
230mΩ	230.0mΩ	232.8mΩ	270uΩ
240mΩ	240.0mΩ	243.5mΩ	270uΩ
250mΩ	250.0mΩ	253.5mΩ	270uΩ
260mΩ	260.0mΩ	258.5mΩ	270uΩ
270mΩ	270.0mΩ	266.6mΩ	270uΩ
280mΩ	280.0mΩ	286.2mΩ	270uΩ
290mΩ	290.0mΩ	296.5mΩ	270uΩ
300mΩ	300.0mΩ	304.9mΩ	270uΩ
400mΩ	400.0mΩ	401.1mΩ	270uΩ
500mΩ	500.0mΩ	483.0mΩ	270uΩ
600mΩ	600.0mΩ	604.3mΩ	270uΩ
700mΩ	700.0mΩ	696.5mΩ	270uΩ
800mΩ	800.0mΩ	782.1mΩ	270uΩ
900mΩ	900.0mΩ	896.5mΩ	270uΩ
1Ω	1.000 0Ω	0.998 2Ω	270uΩ
2Ω	2.000 0Ω	1.998 0Ω	270uΩ
4Ω	4.000 0Ω	3.984 9Ω	290uΩ
6Ω	6.000 0Ω	5.992 9Ω	310uΩ
8Ω	8.000 0Ω	7.993 7Ω	330uΩ
10Ω	10.000 0Ω	9.992 3Ω	350uΩ
20Ω	20.000 0Ω	19.989 8Ω	890uΩ
100Ω	100.000Ω	99.985Ω	2.3mΩ
1kΩ	1.000 00kΩ	0.999 87kΩ	17mΩ
Continuity Current			
100mA	100.0mA	100.0mA	120uA
200mA	200.0mA	200.0mA	120uA
300mA	300.0mA	300.4mA	240uA

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Test Title	Applied Value	Reading	Uncertainties
AC Voltage Output			
100 Volts Nom @ 50Hz	101.4V	101.4V	140mV
200 Volts Nom @ 50Hz	202.7V	202.6V	150mV
Line Volts @ 50Hz	240.1V	240.1V	160mV
300 Volts Nom @ 50Hz	304.1V	303.9V	190mV
400 Volts Nom @ 50Hz	405.1V	405.2V	230mV
Insulation Resistance Voltage Measurement			
50V	50.0V	50.0V	120mV
100V	100.0V	100.0V	120mV
250V	150.0V	149.9V	120mV
250V	200.0V	199.7V	120mV
250V	250.0V	250.0V	120mV
500V	500.0V	500.0V	120mV
1000V	1 000.0V	1 000.0V	120mV
Insulation Resistance Current Measurement			
0.500mA	0.500mA	0.499mA	4uA
1.000mA	1.000mA	1.000mA	4uA
Loop Resistance			
Loop impedance was measured using 4 wire ohms connections between the earth pin of the 3200 loop test socket and the earth pin of the 3200 mains supply lead. The supply loop impedance was manually entered as zero and the measurement system was nulled. The recorded readings are the differences recorded from the zero value.			
Loop Res.	0.055 7Ω	0.055 7Ω	1mΩ
Loop Res.	0.110 6Ω	0.110 6Ω	1.1mΩ
Loop Res.	0.226 8Ω	0.226 5Ω	1.1mΩ
Loop Res.	0.340 8Ω	0.340 7Ω	1.2mΩ
Loop Res.	0.504 7Ω	0.504 7Ω	1.3mΩ
Loop Res.	1.003 8Ω	1.004 1Ω	1.5mΩ
Loop Res.	5.085 1Ω	5.084 8Ω	3.5mΩ
Loop Res.	9.965 7Ω	9.965 5Ω	6mΩ
Loop Res.	100.355Ω	100.355Ω	18mΩ
Loop Res.	998.610Ω	998.600Ω	35mΩ
RCD Current			
10mA @ 50Hz	10.00mA	10.01mA	20uA
30mA @ 50Hz	30.00mA	30.00mA	80uA
100mA @ 50Hz	90.00mA	90.01mA	150uA
100mA @ 50Hz	100.00mA	100.06mA	160uA
100mA @ 50Hz	110.00mA	110.09mA	170uA
300mA @ 50Hz	300.0mA	299.9mA	840uA
1000mA @ 50Hz	1 000.0mA	1 001.2mA	1.7mA
2000mA @ 50Hz	2 000.0mA	2 000.3mA	3mA

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Test Title	Applied Value	Reading	Uncertainties
RCD Trip current			
150mA @ 300mA Range	150.0mA	149.8mA	240uA
RCD Trip time			
20ms	20.0ms	19.5ms	0.5ms
40ms	40.0ms	39.5ms	0.5ms
200ms	200.0ms	199.6ms	0.5ms
400ms	400.0ms	400.0ms	0.5ms
900ms	900.0ms	900.0ms	8.1ms
PAT : Insulation Resistance			
The PAT Insulation Resistance is produced from the same decade resistance arm as used for the Insulation Resistance output. The following Tests are only to confirm the operation of the output switching. For the Full range of values, use the Insulation measurements on this certificate.			
1MΩ	1.000 00MΩ	1.000 06MΩ	22Ω
2MΩ	2.000 00MΩ	1.999 63MΩ	170Ω
4MΩ	4.000 00MΩ	4.001 39MΩ	330Ω
6MΩ	6.000 00MΩ	5.985 73MΩ	500Ω
8MΩ	8.000 00MΩ	7.985 24MΩ	660Ω
10MΩ	10.000 0MΩ	9.971 6MΩ	830Ω
PAT : Earth Bond Resistance			
The resistances recorded include the resistance of the PAT test mains lead (approx 25milliohms)			
PAT Lead No	1 000a	1 732a	
PAT Lead Resistance	25.0mΩ	23.8mΩ	260uΩ
Bond Res.	0.044 9Ω	0.045 0Ω	1mΩ
Bond Res.	0.103 6Ω	0.103 6Ω	1mΩ
Bond Res.	0.157 8Ω	0.157 9Ω	1.1mΩ
Bond Res.	0.274 4Ω	0.274 4Ω	1.1mΩ
Bond Res.	0.388 7Ω	0.388 6Ω	1.2mΩ
Bond Res.	0.552 6Ω	0.552 6Ω	1.3mΩ
Bond Res.	1.052 0Ω	1.052 0Ω	1.5mΩ
Bond Res.	5.132 0Ω	5.133 0Ω	3.5mΩ
Bond Res.	10.015 6Ω	10.015 7Ω	6mΩ
Bond Res.	100.425Ω	100.426Ω	18mΩ
Bond Res.	1 002.130Ω	1 002.118Ω	35mΩ
PAT : Earth Bond Current			
100mA @ 50Hz	0.100A	0.100A	1.2mA
10A @ 50Hz	8.00A	8.00A	15mA
10A @ 50Hz	10.00A	10.00A	16mA
20A @ 50Hz	20.00A	20.01A	22mA
PAT: LOAD TESTS			
S/C TEST	0.00Ω	0.39Ω	10mΩ
O/C TEST	---	Pass	
0.13KVA TEST	440.0Ω	439.4Ω	0.1Ω
PAT: LEAKAGE CURRENT TEST			
Leakage @ 240V	2.000mA	2.000mA	9.3uA
Leakage @ 240V	4.700mA	4.710mA	9.3uA

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Test Title	Applied Value	Reading	Uncertainties
Leakage @ 240V	7.700mA	7.720mA	9.3uA

End of results