



RISHABH
INSTRUMENTS
Measure, Control & Record with a Difference

QUALITY ASSURANCE
F-31, MIDC Satpur,
Nasik-422007
Tel: +91-253-2202250

REPORT NO.: RIPL/QA/DPM/001

ISSUE DATE: 6th Sept, 2007

TYPE TEST REPORT

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CUSTOMER: ---

Customer Ref. No. : ---

Date of Testing: 20/06/2007 to 26/07/2007

DESCRIPTION OF SAMPLE :

Name: Digital Panel meter
Model: RISH DPM 96ADC
Specification: Input : 0 ... 20 mA, 4 ... 20 mA
Display Range : 1999
Auxiliary supply – 230 V AC, 50 Hz(+10%, -20%)

No. of Samples : 01

Sample Identification : Sr. No. : 07/07/0004, PCB Version – 49578 – A(Display)
49577-A(Base)

COMPLIANCE SPECIFICATION:

IS 13875: Terms, definition and test methods
IEC 1010: Device safety
Product Operating Instructions and datasheet

TEST SPECIFICATION: As per report attached.

REMARKS:

The sample has passed all the specified tests and complies the specifications tested to..

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CHECKED BY:

APPROVED BY:





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SUMMARY OF TESTS:

Sr. No	Test procedures	Requirement	Observation	Remark
1. PERFORMANCE TESTS				
1.	Intrinsic Accuracy Test : Accuracy to be checked at 5 points and calculate error observed at each point.	Observed Error should be within specified accuracy limits.	See Table 1	Compliance
2.	Variation due to mains supply voltage Variation. Measurement is to be taken at 230V and at +10% (253V) , -15% (195.5V) and calculate variation in readings.	Variation should not exceed Accuracy Class.	See Table 2	Compliance
3.	Variation due to frequency of mains supply. Measurement is to be taken at 230V, 50Hz and at 47 Hz & 60 Hz and calculate variation in readings.	Variation should not exceed Accuracy Class.	See table 3	Compliance
4.	Variation due to self heating At reference conditions apply input and take reading at 1 st min and 30 th min.	Variation should not exceed class index	See table 4	Compliance
5.	Influence of Storage temperature. Keep the meter de-energized for 2hr each at -25 °C and 70°C. Take readings after each at reference conditions after recovery period of at least 2hr. Calculate error.	Observed Error should be within specified accuracy limits.	See table 5	Compliance
6.	Variation due to operating temperature. Take readings at reference conditions. Then vary the temperature to 0°C and keep DUT for 2hrs and take readings thereafter. Repeat the procedure for 55°C.	Observed variation should not exceed Accuracy Class.	See table 6	Compliance
7.	Measurement of mains consumption Measure the consumption of mains supply at full scale input, 230 V Aux Voltage.	Observed consumption should be less than specified (5.5 W).	Observed mains consumption is 2.35 VA	Compliance

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Sr. No	Test procedures	Requirement	Observation	Remark
8.	Measurement of Input consumption Measure the current consumption at input at full scale input in both the ranges	Observed consumption should be less than specified (<600 mV)	At 0 ... 20 mA Range : 120.33mV, At 4 ... 20 mA range : 149.81 mV	Compliance
9.	Measurement of input impedance Measure the input current at full scale and calculate the impedance as $Z = V \times I$	-----	At 0 ... 20 mA range : 6.02Ω At 4 ... 20 mA Range : 7.49Ω	Compliance
10.	Influence due to continuous overload Apply overload of 120% of Range for 2 hrs in each Range. Take readings and calculate error in each Range	Observed error should not exceed class index. Overload should not cause damage to the meter.	See table 9	Compliance
11.	Influence due to continuous operation. Keep meter ON with Full scale input for 12 hrs and take readings initially and after. Calculate variation.	Variation should not exceed class index	See table 10	Compliance
12.	Influence due to vibration Put DUT for vibration test a per IS 13875. Check DUT visually and functionally.	Vibration should not cause any mechanical damage. Meter should function properly.	See Table 11	Compliance
13.	Variation due to magnetic field of external origin Keep meter on test jig observe any change in display with and without magnetic field.	Observed variation in display should not exceed class index	No significant variation in display observed.	Compliance
14.	High Voltage test Apply 2.2 kV AC for 1 min between 1. All the terminals and body. 2. Aux Supply terminals and Input Terminals.	No breakdown should occur.	No breakdown observed	Compliance
15.	Insulation resistance test Measure the insulation resistance between the measuring terminals and the body of the instrument.	---	1. Between Aux Supply and Input : 10 GΩ 2. Between Body and Input + Aux : 20 GΩ	Compliance

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Sr. No.	Test procedures	Requirement	Observation	Remark
16.	Verification of features			
16.1	Display span adjust	Span can be adjusted by the Pots at rear side	As specified	Compliance
16.2	Selection of input range	Range selection by input choice	Range can be selected directly from input connector	Compliance
16.3	Full scale adjustment	20% to 100% of full scale value (1999)	1. For 0 ... 20 mA range : 145 to 1999. 2. For 4 ... 20 mA : 109 to 1999.	Compliance
16.4	Decimal point selection	Selection by short links at the front of Display	As specified	Compliance
16.5	Negative display indication	By "-" sign	As specified	Compliance
16.6	Overload indication	Last 3 digit blank	As specified	Compliance

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Table 1 Intrinsic error test

1.1 For range 0 ... 20 mA, Display 0 ... 1999

Test Points	0%	25%	50%	75%	100%
	000	499	999	1499	1999
Display	0	500	1000	1499	1999
Observed error	0	1	1	0	0
Allowed Error	3	3	3	3	3

1.2 For range 4 ... 20 mA, Display 0 ... 1999

Test Points	0%	25%	50%	75%	100%
	000	499	999	1499	1999
Display	0	498	999	1499	1999
Observed error	0	-1	0	0	0
Allowed Error	3	3	3	3	3

Table 2 : Variation due to mains Supply Voltage variation

2.1 at 0 ... 20 mA range, Display : 0 ... 1999

Test Points	0%	25%	50%	75%	100%
Display at 230 V	0	498	999	1499	1999
Display at 253 V	0	498	999	1499	1999
Observed variation	0	0	0	0	0
Allowed variation	3	3	3	3	3

Test Points	0%	25%	50%	75%	100%
Display at 230 V	0	498	999	1499	1999
Display at 195.5 V	0	498	999	1499	1999
Observed variation	0	0	0	0	0
Allowed variation	3	3	3	3	3

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2.2 at 4 ... 20 mA Range, Display : 0 ... 1999

Test Points	0%	25%	50%	75%	100%
Display at 230 V	0	499	999	1499	1999
Display at 253 V	0	499	999	1499	1999
Observed variation	0	0	0	0	0
Allowed variation	3	3	3	3	3

Test Points	0%	25%	50%	75%	100%
Display at 230 V	0	499	999	1499	1999
Display at 195.5 V	0	499	999	1499	1999
Observed variation	0	0	0	0	0
Allowed variation	3	3	3	3	3

Table 3 : Variation due to mains supply frequency Variation

31 at 0 ... 20 mA range, Display : 0 ... 1999

Test Points	0%	25%	50%	75%	100%
Display at 230 V	0	498	999	1499	1999
Display at 253 V	0	498	999	1499	1999
Observed variation	0	0	0	0	0
Allowed variation	3	3	3	3	3

Test Points	0%	25%	50%	75%	100%
Display at 230 V	0	498	999	1499	1999
Display at 195.5 V	0	498	999	1499	1999
Observed variation	0	0	0	0	0
Allowed variation	3	3	3	3	3

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3.2 at 4 ... 20 mA Range, Display : 0 ... 1999

Test Points	0%	25%	50%	75%	100%
Display at 230 V	0	499	999	1499	1999
Display at 253 V	0	499	999	1499	1999
Observed variation	0	0	0	0	0
Allowed variation	3	3	3	3	3

Test Points	0%	25%	50%	75%	100%
Display at 230 V	0	499	999	1499	1999
Display at 195.5 V	0	499	999	1499	1999
Observed variation	0	0	0	0	0
Allowed variation	3	3	3	3	3

Table 4 : Variation due to self heating

4.1 at 0 ... 20 mA range, Display : 0 ... 1999

Test Points	0%	25%	50%	75%	100%	90%
	000	499	499	1499	1999	1799
Display at 1st min.	0	500	1000	1499	1999	1800
Display at 30th min.	0	500	1000	1499	1999	1800
Observed Variation	0	0	0	0	0	0
Allowed Variation	3	3	3	3	3	3

4.2 at 4 ... 20 mA Range, Display : 0 ... 1999

Test Points	0%	25%	50%	75%	100%	90%
	000	499	499	1499	1999	1749
Display at 1st min.	0	499	999	1499	1999	1749
Display at 30th min.	0	498	999	1499	1999	1749
Observed Variation	0	-1	0	0	0	0
Allowed Variation	3	3	3	3	3	3

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Table 5 : Influence due to Storage Temperature

5.1 Influence of -25°C Temperature

5.1.1 at 0 ... 20 mA range, Display : 0 ... 1999

Test Points	0%	25%	50%	75%	100%
	000	499	999	1499	1999
Display	0	498	999	1499	1999
Observed error	0	-1	0	0	0
Allowed Error	3	3	3	3	3

5.1.2 at 4 ... 20 mA Range, Display : 0 ... 1999

Test Points	0%	25%	50%	75%	100%
	000	499	999	1499	1999
Display	0	499	999	1499	1998
Observed error	0	0	0	0	-1
Allowed Error	3	3	3	3	3

5.2 Influence of 70°C Temperature

5.2.1 at 0 ... 20 mA range, Display : 0 ... 1999

Test Points	0%	25%	50%	75%	100%
	000	499	999	1499	1999
Display	0	500	1000	1499	1999
Observed error	0	1	1	0	0
Allowed Error	3	3	3	3	3

5.2.2 at 4 ... 20 mA Range, Display : 0 ... 1999

Test Points	0%	25%	50%	75%	100%
	000	499	999	1499	1999
Display	0	499	999	1498	1998
Observed error	0	0	0	-1	-1
Allowed Error	3	3	3	3	3

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Table 6 : Variation due to operating Temperature

6.1 Variation at 0°C Temperature

Test Points	0%	20%	40%	60%	80%	100%
	000	399	799	1199	1599	1999
Display at 23°C	0	398	798	1198	1598	1998
Display at 0°C	0	399	800	1201	1602	1983
Observed Variation	0	1	2	3	4	-15
Allowed Variation	9	23	23	23	23	23

6.2 Variation at 55°C Temperature

Test Points	0%	20%	40%	60%	80%	100%
	000	399	799	1199	1599	1999
Display at 23°C	0	398	799	1199	1600	1999
Display at 0°C	2	399	800	1201	1601	1999
Observed Variation	2	1	1	2	1	0
Allowed Variation	13	32	32	32	32	32

Table 9 : Influence due to continuous overload

9.1 at 0 ... 20 mA range, Display : 0 ... 1999

Test Points	0%	25%	50%	75%	100%
	000	499	999	1499	1999
Display	0	498	999	1499	1999
Observed error	0	-1	0	0	0
Allowed Error	3	3	3	3	3

9.2 at 4 ... 20 mA Range, Display : 0 ... 1999

Test Points	0%	25%	50%	75%	100%
	000	499	999	1499	1999
Display	0	498	999	1499	1998
Observed error	0	-1	0	0	-1
Allowed Error	3	3	3	3	3

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Table 10 : Influence due to continuous operation

Test Points	0%	25%	50%	75%	100%
	000	499	999	1499	1999
Readings at 1st min	001	498	999	1499	1999
readings after 6 hrs	000	499	999	1498	1998
Observed error	0	0	0	-1	-1
Allowed error	3	3	3	3	3

Table 11 : Influence due to Vibration

11.1 at 0 ... 20 mA range, Display : 0 ... 1999

Test Points	0%	25%	50%	75%	100%
	000	499	999	1499	1999
Display	0	498	999	1499	1999
Observed error	0	-1	0	0	0
Allowed Error	3	3	3	3	3

11.2 at 4 ... 20 mA Range, Display : 0 ... 1999

Test Points	0%	25%	50%	75%	100%
	000	499	999	1499	1999
Display	0	499	999	1499	1998
Observed error	0	0	0	0	-1
Allowed Error	3	3	3	3	3

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