



**RISHABH  
INSTRUMENTS**

Measure, Control & Record with a Difference

**QUALITY ASSURANCE**  
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REPORT NO.: RIPL/QA/DPM/72/144/01

ISSUE DATE: 10<sup>th</sup> July, 2009

**TYPE TEST REPORT**

PAGE 1 of 9

CUSTOMER: ---

Customer Ref. No. : ---

Date of Testing: 04/07/09-09/07/09

**DESCRIPTION OF SAMPLE :**

Name: Digital Panel meter  
Model: RISH DPM 72/144 (4 1/2)  
Specification: Input : 0 ... 20 mA, 4 ... 20 mA  
Display Range : 19999  
Auxiliary supply – 110V DC (+10%, -10%)  
Accuracy: 0.2%+1dgt

No. of Samples : 02

Sample Identification : A & B

**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..

**TESTED BY:**

**CHECKED BY:**

**APPROVED BY:**

  
12/7/09

## SUMMARY OF TESTS:

Sr. No	Test procedures	Requirement	Observation	Remark
<b>1. PERFORMANCE TESTS</b>				
1.	<b>Intrinsic Error Test :</b> 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.	<b>Variation due to supply voltage Variation.</b> Measurement is to be taken at 110V and at +10% (121V) , -10% (99V) and calculate variation in readings.	Variation should not exceed Accuracy Class.	See Table 2	Compliance
3.	<b>Variation due to self heating</b> At reference conditions apply input and take reading at 1 <sup>st</sup> min and 30 <sup>th</sup> min.	Variation should not exceed class index	See table 3	Compliance
4.	<b>Variation due to operating temperature.</b> 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 50°C.	Observed variation should not exceed Accuracy Class.	See table 4	Compliance
5.	<b>Influence due to vibration</b> Put DUT for vibration test a per IS 13875. Check DUT visually and functionally.	Observed variation should not exceed Accuracy Class.	See table 5	Compliance
6.	<b>Variation due to magnetic field of external origin</b> Keep meter on test jig observe any change in display with and without magnetic field.	Observed variation in display should not exceed class index	See table 6	Compliance
7.	<b>Variation due to change in relative humidity.</b> Take readings at reference conditions. Then vary the humidity to 20%RH and keep DUT for 2hrs and take readings thereafter. Repeat the procedure for 75%RH	Variation should not exceed class index	See table 7	Compliance
8.	<b>Influence error resulting from change in position.</b> Keep the meter at +10 deg. Position as far as the upper and lower limit of the rated range.Repeat the procedure for -10 deg.position	Variation should not exceed class index	See table 8	Compliance

Sr. No	Test procedures	Requirement	Observation	Remark
9.	<b>Influence due to continuous overload</b> 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
10.	<b>Storage Temp. Test</b> Keep the meter de energized condition for 2hrs at -40 deg.cel. Keep the meter at reference condition for 2 hrs. After 2 hrs calculate the error. Repeat the same procedure for 80 deg.cel.	Observed error should not exceed class index. Overload should not cause damage to the meter.	See table 10	Compliance
11.	<b>Measurement of mains consumption</b> Measure the consumption of mains supply at full scale input, 110 VDC Aux Voltage.	Observed consumption should be less than specified (5.5 W).	Observed mains consumption is (1)1.4W, (2)1.42W	Compliance
12.	<b>Measurement of Input consumption</b> 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 : (1)123.52mV (2)126.11mV	Compliance
13.	<b>High Voltage test</b> Apply 1 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
14.	<b>Insulation resistance test</b> Measure the insulation resistance between the measuring terminals and the body of the instrument.	---	1Between Aux Supply and Input : 20 GΩ 2Between Body and Input + Aux : 30 GΩ	Compliance
15.	<b>Verification of features</b>			
15.1	<b>Display span adjust</b>	Span can be adjusted by the Pots at rear side	As specified	Compliance
15.2	<b>Selection of input range</b>	Range selection by input choice	Range can be selected directly from input connector	Compliance
15.3	<b>Decimal point selection</b>	Selection by short links at the front of Display	As specified	Compliance
15.4	<b>Overload indication</b>	Last 4 digit blank	As specified	Compliance

Tested By :

*Rha*

Checked By: *mykx*

Table 1: Intrinsic error test

For range 0 ... 20 mA, Display 0 ... 19999

Test Points	0% 0000	25% 4999	50% 9999	75% 14999	100% 19999
Display A	-0001	5004	10007	15006	19998
Observed Error	-1	5	8	7	-1
Display B	0003	5007	10006	15002	19989
Observed Error	3	8	7	3	-10
Allowed error ( $\pm$ dgt)	41	41	41	41	41

Table 2 : Variation due to Supply Voltage variation(110V, $\pm$ 10%)

at 0 ... 20 mA range, Display : 0 ... 19999

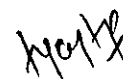
Test Points	0% 0000	25% 4999	50% 9999	75% 14999	100% 19999
Display at 110V (A)	-0001	5004	10007	15006	19998
Display at 121V (A)	0000	5005	10008	15007	19999
Observed variation	-1	1	1	1	1
Display at 110V (B)	0003	5007	10006	15002	19989
Display at 121V (B)	0003	5007	10006	15001	19989
Observed variation	0	0	0	-1	0
Allowed variation ( $\pm$ dgt)	41	41	41	41	41

Test Points	0% 0000	25% 4999	50% 9999	75% 14999	100% 19999
Display at 110V (A)	-0001	5004	10007	15006	19998
Display at 99V (A)	0000	5006	10008	15008	19999
Observed variation	-1	2	1	2	1
Display at 110V (B)	0003	5007	10006	15002	19989
Display at 99V (B)	0004	5008	10007	15002	19991
Observed variation	1	1	1	0	2
Allowed variation ( $\pm$ dgt)	41	41	41	41	41

Tested By :



Checked By :



**Table 3 : Variation due to self heating**

at 0 ... 20 mA range, Display : 0 ... 19999

Test Points	0% 0000	25% 4999	50% 9999	75% 14999	100% 19999
Display A@1 <sup>st</sup> Min	-0001	5004	10007	15006	19998
Display A@30 <sup>th</sup> Min	0000	5005	10008	15009	OL
Observed variation	-1	1	1	3	-
Display B@1 <sup>st</sup> Min	0003	5007	10006	15003	19989
Display B@30 <sup>th</sup> Min	0004	5009	10008	15005	19995
Observed variation	1	2	2	2	6
Allowed variation (±dgt)	41	41	41	41	41

**Table 4: Variation due to operating Temperature**

at 0 ... 20 mA Range, Display : 0 ... 19999

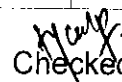
Test Points	0% 0000	25% 4999	50% 9999	75% 14999	100% 19999
Display A@23deg.c.	0001	5005	10011	15008	OL
Display A@0deg.c.	0001	5010	10019	15018	OL
Observed variation	0	5	8	10	-
Allowed variation (±dgt)	91	91	91	91	91
Display B@23deg.c.	0003	5010	10011	15010	19999
Display B@0deg.c.	0002	5010	10014	15011	OL
Observed variation	-1	0	3	1	-
Allowed variation (±dgt)	91	91	91	91	91

Test Points	0% 0000	25% 4999	50% 9999	75% 14999	100% 19999
Display A@23deg.c.	0001	5009	10013	15012	OL
Display A@50deg.c.	-0002	5002	10010	15012	OL
Observed variation	-1	-7	-3	0	-
Allowed variation (±dgt)	107	107	107	107	107
Display B@23deg.c.	0002	5009	10010	15005	19997
Display B@50deg.c.	0006	5016	10018	15020	OL
Observed variation	4	7	8	15	-
Allowed variation (±dgt)	107	107	107	107	107

Tested By :



Checked By :



**Table 5 : Influence due to Vibration**

at 0 ... 20 mA range, Display : 0 ... 19999

Test Points	0% 0000	25% 4999	50% 9999	75% 14999	100% 19999
Display A	-0001	5003	10006	15007	OL
Observed Error	-1	4	7	8	
Display B	0002	5006	10005	15003	19996
Observed Error	2	7	6	4	-3
Allowed error ( $\pm$ dgt)	41	41	41	41	41

**Table 6 : Variation due to magnetic field of external origin**

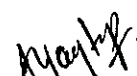
at 0 ... 20 mA range, Display : 0 ... 19999

Test Points	0% 0000	25% 4999	50% 9999	75% 14999	100% 19999
Display A					
Without field	-0001	5004	10007	15008	OL
With field	-0001	5005	10007	15009	OL
Observed variation	-1	1	0	1	--
Display B					
Without field	0002	5006	10005	15003	19996
With field	0002	5006	10005	15004	19997
Observed variation	0	0	0	1	1
Allowed variation ( $\pm$ dgt)	41	41	41	41	41

Tested By :



Checked By:



**Table 7 : Variation due to change in relative humidity**

at 0 ... 20 mA range, Display : 0 ... 19999

**Variation at 23 deg.45%RH**

Test Points	0% 0000	25% 4999	50% 9999	75% 14999	100% 19999
Display A@55%	0002	5007	10011	15011	OL
Display A@45%	-0001	5005	10009	15006	OL
Observed variation	-1	-2	-2	-5	-
Display B@55%	0003	5008	10011	15008	19998
Display B@45%	0003	5009	10012	15005	19997
Observed variation	0	1	1	-3	-1
Allowed variation (±dgt)	41	41	41	41	41

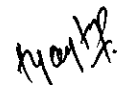
**Variation at 23 deg.65%RH**

Test Points	0% 0000	25% 4999	50% 9999	75% 14999	100% 19999
Display A@55%	0002	5007	10011	15011	OL
Display A@65%	0001	5006	10011	15008	OL
Observed variation	-1	-1	0	-3	-
Display B@55%	0003	5008	10011	15008	19998
Display B@65%	0004	5008	10012	15009	19999
Observed variation	1	0	1	1	1
Allowed variation (±dgt)	41	41	41	41	41

Tested By :



Checked By :



**Table 8 : Variation due to change in position.**

**Variation at -10 deg.**

at 0 ... 20 mA range, Display : 0 ... 19999

Test Points	0% 0000	25% 4999	50% 9999	75% 14999	100% 19999
Display A@ ref.position	-0001	5004	10007	15006	19998
Display A@ -10deg position	-0001	5004	10007	15006	19998
Observed Error	0	0	0	0	0
Display B@ ref. position	0003	5007	10006	15002	19989
Display B@ -10deg position	0003	5007	10007	15002	19991
Observed Error	0	0	1	0	2
Allowed error ( $\pm$ dgt)	41	41	41	41	41

**Variation at +10 deg.**

Test Points	0% 0000	25% 4999	50% 9999	75% 14999	100% 19999
Display A@ ref.position	-0001	5004	10007	15006	19998
Display A@ +10deg position	-0001	5005	10007	15008	19999
Observed Error	0	1	0	2	1
Display B@ ref. position	0003	5007	10006	15002	19989
Display B@ +10deg position	0002	5008	10007	15003	19990
Observed Error	-1	1	1	1	1
Allowed error ( $\pm$ dgt)	41	41	41	41	41

Tested By :



Checked By:





**Table 9 - Influence due to continuous overload**

at 0 ... 20 mA range, Display : 0 ... 19999

Test Points	0% 0000	25% 4999	50% 9999	75% 14999	100% 19999
Display A(Before overload)	0001	5004	10007	15006	19998
Display A(After overload)	0002	5008	10013	15013	OL
Observed Error	1	4	6	7	--
Display B(Before overload)	0003	5007	10006	15002	19998
Display B(After overload)	0004	5007	10008	15004	19999
Observed Error	1	0	2	2	1
Allowed error ( $\pm$ dgt)	41	41	41	41	41

**Table 10 – Storage Temp. Test**

at 0 ... 20 mA range, Display : 0 ... 19999

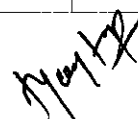
Test Points	0% 0000	25% 4999	50% 9999	75% 14999	100% 19999
Display A@-40deg.cel.	0003	5008	10011	15012	OL
Display A@23 deg.cel	-0001	5005	10008	15006	OL
Observed variation	-2	-3	-3	-6	-
Display A@80 deg.cel	0003	5007	10011	15008	19998
Display A@23 deg.cel.	0002	5008	10009	15005	19997
Observed variation	-1	1	-2	-3	-1
Allowed variation ( $\pm$ dgt)	41	41	41	41	41

Test Points	0% 0000	25% 4999	50% 9999	75% 14999	100% 19999
Display B@-40deg.cel.	0004	5009	10012	15011	OL
Display B@23 deg.cel	-0002	5006	10009	15005	OL
Observed variation	-2	-3	-4	-6	-
Display B@80 deg.cel	0004	5006	10010	15009	19999
Display B@23 deg.cel.	0002	5008	10009	15005	19997
Observed variation	-2	2	-1	-4	-2
Allowed variation ( $\pm$ dgt)	41	41	41	41	41

Tested By :



Checked By:



# RISH DPM 72/144 B<sub>N</sub> - Digital Panel Meter

## Measuring ranges

Short time overload : - 2 times of rated I/P Current for 0.5 Sec, for 5 times after interval of 15 Sec.  
 Continuous overload : -120% of rated I/P current for 2 Hrs.

Version	B
Input current < 600 mV	0...20 mA
Input current < 600 mV	4...20 mA

Current DC  
 0 ... 20 mA: Terminals 1 and 2  
 4 ... 20 mA: Terminals 1 and 3 plus  
 Jumper between terminals 5 and 6  
 Terminals 7 to 11 (with jumpers)

Setting the decimal point

Power supply	Direct voltage DC	5V +/- 10%	max 5.5W approx. (isolated)
		12V +/- 10%	max 5.5W approx. (isolated)
		24V +/- 10%	max 5.5W approx. (isolated)
		48V +/- 10%	max 5.5W approx. (isolated)
		110V +/- 10%	max 5.5W approx. (isolated)
		220V +/- 10%	max 5.5W approx. (isolated)
	Alternating voltage AC	24V +10%, -15%	max 5.5W approx. (isolated)
		115V + 10% -15%	max 5.5W approx (isolated)
		230V + 10% -15%	max 5.5W approx (isolated)
	*For DC voltage version isolation is 1 KV, for AC voltage version isolation is 2 KV		
Ambient conditions	Operating temperature	0 ... 50 °C	
	Storage temperature	-40 ... 80 °C	
	Humidity	45 ...65 RH (Non condensing)	
Dimensions and Weights	Front Bezel	Plastic (Polycarbonate)	
	Housing	Metalic CRCA EDD	
	Bezel size	72 mm x 144 mm DIN 43 718	
	Panel cut-out	138 +0.8 mm x 66 + 0.6 mm	
	Overall depth	145 mm	
	Weight	1000 g. approx.	
	Connections	plug-in screw terminal block	
Sundry			

## Accuracy

Versions B:	Measuring Accuracy DC	< 0.2% + 1 digit
	Temperature coefficient	100 ppm/ °C, plus
	Zero point drift	100 ppm/ °C
	Range adjustment span	from 10% to 100% of range

Digital input HOLD selectable by rear jumper position 7



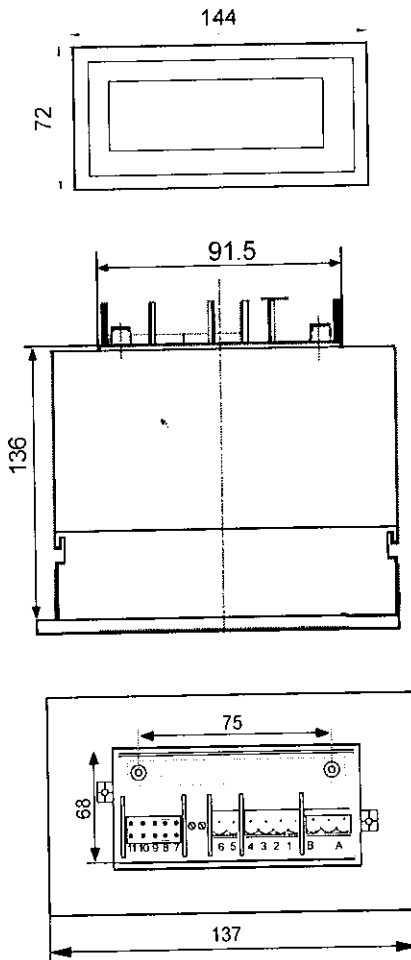
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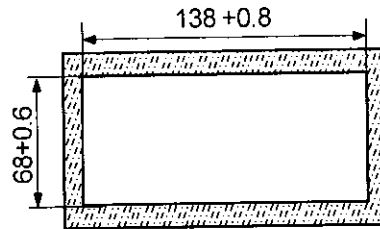
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# RISH DPM 72/144 B<sub>N</sub> - Digital Panel Meter

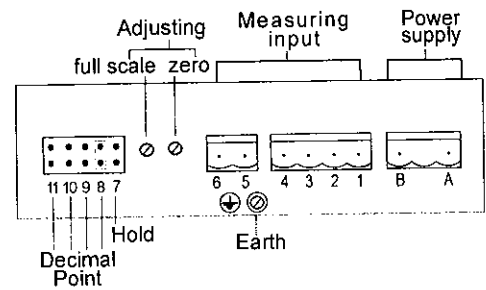
## Design & Installation



Installation Cut-out



Connections:



Mounting Position

## Ordering Informations

Order Details	Example
Type	RISH DPM 72/144 B <sub>N</sub>
Measuring input:	0... 20 mA
Display :	0... 19999
Display caption :	A
Options :	
Supply Voltage :	24 V DC



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