RISHABH

Data Sheet

RISH LM1340

Multifunction Meter

Measure | Control | Record | Analyze | Optimize

Data Sheet

RISH LM1340

RISH LM1340 measures important electrical parameters in 3 phase 4 wire, 3 phase 3 wire, 2 phase 2 wire, 1 phase 3 wire and 1 phase 2 wire Network. It displays many parameters at a glance. It measures electrical parameters like Active / Reactive / Apparent energy, Reactive Quadrant wise energy and all basic parameter. The instrument has two optional digital outputs available as pulse or alarm with programmable pulse duration and width. This instrument also has two optional digital inputs for monitoring the external contact status, pulse counting and/or energy accumulation according to tariff.

Applications:

- Internal Energy billing/monitoring/auditing
- Sub-metering
- Electrical load monitoring
- Genset, Test Benches and Laboratories

Product Features:

True RMS Measurement

True RMS measurement with Sampling rate of 128 samples per cycle upto 31 Harmonic.

Relay Output (optional)

Potential free, very fast acting relay contact configurable for following:

Pulse output which can be used to drive an external counter for energy measurement.

Limit (alarm) switch. Limit output also configurable for three logical combination of parameters.

Timer output which can be used to operate relay in cyclic manner.

Pre-Paid Cost based energy tripping.

Switch for **unhealthy three phase load**.

Remote Relay Control using MODBUS.

Pre-Paid Cost Based Energy Tripping

This feature allows to trip the load whose energy has crossed the required threshold of the configured tariff amount.

The user just needs to set the energy, top-up amount and the rate per unit (kilo) of energy.

Health Monitoring of Three Phase Load

This feature is applicable only for Three phase load (such as a Three phase motor) which can be monitored for phase failure, phase reversal, voltage & current unbalance, under frequency, under voltage, over voltage and over current.

Further, set a relay in this mode and use it for indication / guard against such faults.

Direct remote access(Optional)

Remote configuration of the Instrument and access of measured parameter via Modbus RS485 or Ethernet.

Higher Max System Power Limit

Upto 9000 MVA (L-N) max system power is measurable.

Min-Max Values

Min-Max Voltage, Current, Active/Reactive/Apparent Power, Power factor, Phase angle, Frequency.

Dual Tariff

2 Tariff based on digital input available.

Energy as per IEC 62053 and IEC 61557-12 (Edition 2.0)

Active Energy accuracy Class 0.5S (Class 0.2S Optional) as per IEC 62053-22 and Class 0.5 (Class 0.2 Optional) as per IEC 61557-12, Reactive Energy accuracy Class 2 as per IEC 62053-23 and IEC 61557-12 and Apparent Energy accuracy Class 1 as per IEC 61557-12.

Independent Import and Export Energy counter. Active energy (kWh), Reactive energy (kVArh), Apparent energy (kVAh) measurement of system as well as phase-wise.

Quadrant wise Reactive energy (kVArh) measurement of system as well as phase wise.

Digital Inputs

2 Digital Inputs (Optional) can be configured as:

Status to indicate if the input is present or not.

Pulse Counter for counting pulses from external sources.

Tariff Input to store separate energy counters on the basis of digital inputs present.

THD and Individual Harmonics Measurement

The instrument measures per phase THD and individual harmonic up to 31st harmonics for voltage & current .

Total Demand Distortion

Instrument measures system current TDD (Total Demand Distortion) as per IEEE-519.

User Assignable Screens

Instrument measures more than 85 parameters and these parameters are displayed through different screens, out of which user can select minimum 1 no. and maximum 10 nos. of screens as per application requirement.

LCD

The LCD has 3 line 5 digit and 1 Line 9 Digit seven segment display with bright white backlit. Special symbols, units and bar graph are provided for effective user interface. Indications for current reversal, communication status, active tariff, digital inputs and pulse outputs status are available on screen.

Old Values

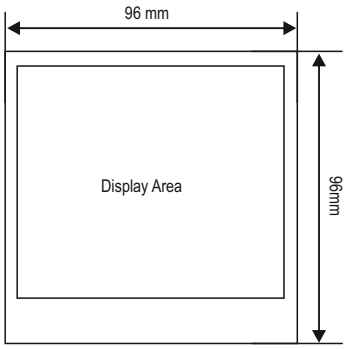
Old value storage after Reset.

Compliance to International Standards

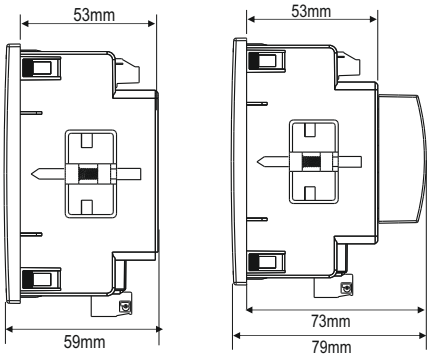
Compliance to International Safety standard IEC 61010-1- 2010.

EMC Compliance to International standard IEC 61326.

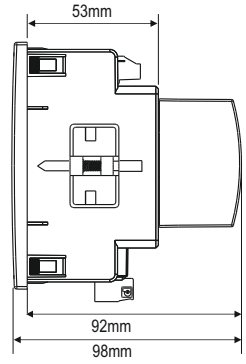
Dimensions Details



Front View

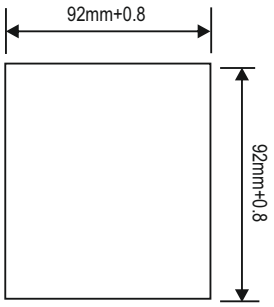


a) None b) RS485 / Ethernet



c) Ethernet + 2DI + 2DO

Side View



Panel Cutout

Technical Specifications:

Input Voltage:

Nominal input voltage (Vn)	100VLL to 600 VLL AC RMS
Programmable on site	57.5VLN to 346.42 VLN AC RMS
System PT primary values	100VLL to 1200kVLL programmable on site
Measuring Range	20%....120% of nominal value
Overload Withstand	2 x Nominal value for 1 second, repeated 10 times at 10 second intervals
Overload Indication	"-OL-" >121% of Nominal value
Nominal input voltage burden	< 0.3VA approx. per phase (at nominal 240V)

Input Current:

Nominal input current(In)	1A / 5A programmable on site
System CT primary values	1A to 9999A programmable on site
Measuring Range	1%....200% of nominal value (1%....180% of nominal value for CF = 2)
Overload Withstand	20 x Nominal value for 1 second, repeated 5 times at 5 minute intervals
Overload Indication	"-OL-" >205% of Nominal value
Nominal input current burden	< 0.3VA approx. per phase

Auxiliary Supply:

Higher Auxiliary supply range	100-550V AC/DC (230V AC/DC nominal)
As per IEC 61557-12	100-320V AC/DC (230V AC/DC nominal)
Lower Auxiliary supply range	12-60V AC/DC (24 V AC /48 V DC nominal)
Aux Supply frequency	45 to 66 Hz range
Auxiliary Supply burden (at nominal value)	
With Add-on RS485 card	< 6VA approx.
With Add-on Ethernet card	< 8VA approx.

Operating Measuring Ranges:

Current (Energy Measurement)	1....200% of nominal value
Starting current	0.1% of Nominal
Voltage	20... 120% of nominal value
Power Factor	0.5 Lag ... 1... 0.8 Lead
Frequency	40Hz to 70Hz

Reference Conditions for Accuracy:

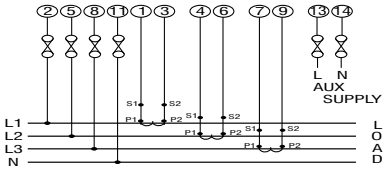
Reference temperature	23°C +/- 2°C
Input Waveform	Sinusoidal (distortion factor 0.005)
Input frequency	50/60 Hz ± 2%
Auxiliary supply frequency	50/60 Hz ± 1%
Total Harmonic Distortion	THD_V <= 50% upto 31st Harmonic at Vn THD_I <= 200% upto 31st Harmonic at In THD_I <= 180% upto 31st Harmonic at In
CF=2	
Voltage range	20%.....120% of nominal value
Current range	10%.....200% of nominal value

Display Specification:

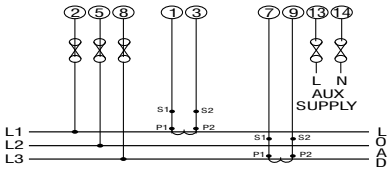
Display	3 Line 5 Digit and 1 Line 9 Digit seven segment LCD with Backlit
Response time to step input	1 sec approx.
LED Indications	Integration of energy (Impulse)
Display scrolling	Automatic/Manual (Programmable)
Push buttons	4 Buttons

Electrical Connection

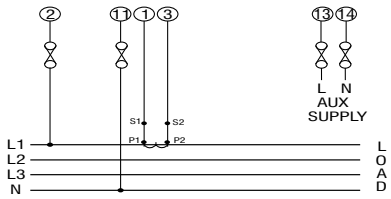
Network Types :



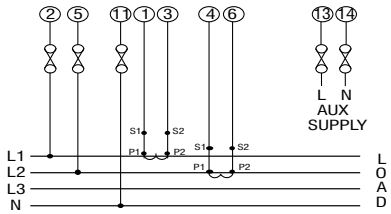
a) 3 Phase 4 Wire



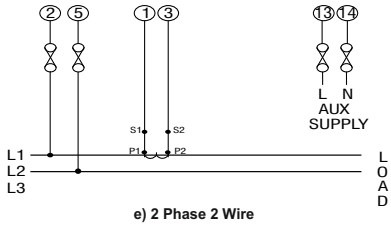
b) 3 Phase 3 Wire



c) 1 Phase 2 Wire



d) 1 Phase 3 Wire



e) 2 Phase 2 Wire

Wiring Guidelines

Solid with Pin type lugs (sq. mm)	1 to 2.5
Stranded with Pin type lugs (sq. mm)	1 to 2.5
Torque value (Nm) 1. Aux and Voltage terminals 2. Current terminals 3. RS485, DI and Relay terminals	 0.5 to 0.6 0.4 to 0.5 0.3 to 0.4
Length available for lug entry in terminal (mm)	9.5

Note:
1. It is recommended that the wires used for connections to the instrument should have lugs soldered at the end i.e., the connections should be made with Lugged wires for secure connections.
2. For MODBUS B refers to positive, A refers to Negative and G refers to ground.

Accuracy:

Active Energy (Bidirectional)
IEC 62053-22 : Standard-Class 0.5S (Optional-Class 0.2S)
IEC 61557-12 : Standard-Class 0.5 (Optional-Class 0.2 for 5A In (Class 0.5 for 1A In))
Apparent Energy : Class 1 as per IEC 61557-12
Reactive Energy (Bidirectional): Class 2 as per IEC 62053-23 and IEC 61557-12

	Standard	Optional
Voltage	± 0.5% of Nominal value	± 0.2% of Nominal value
Current	± 0.5% of Nominal value	± 0.2% of Nominal value
Active Power	± 0.5% of Nominal value	± 0.2% of Nominal value
Re-Active Power	± 1.0% of Nominal value	± 1.0% of Nominal value
Apparent Power	± 0.5% of Nominal value	± 0.2% of Nominal value
Frequency	± 0.1% of Mid frequency	± 0.1% of Mid frequency
Power Factor/ angle	±3°	±3°
THD (V/I) w.r.t. fundamental	±5% (upto 31st Harmonics)	±5% (upto 31st Harmonics)
Individual Harmonics	±5% (upto 31st Harmonics)	±5% (upto 31st Harmonics)

Applicable Standards:

Electromagnetic Compatibility	IEC 61326 - 1, Table 2 (Influence on Measured Quantity-Voltage: 1% of V_{nom},Current: 5% of I_{nom})
Immunity	IEC 61000-4-2,-3,-4,-5,-6,-8,-11
Emission	CISPR 11
Safety	IEC 61010-1-2010
IP for water & dust	IEC 60529
Pollution degree	2
Installation category	III
High voltage test	
All Circuit Vs Surface	4kV RMS, 50Hz for 1min
Input / Aux Vs Others	3.3kV RMS, 50Hz for 1min
DI/Relay/RS485/USB Vs Others	3.3kV RMS, 50Hz for 1min
DI Vs DI / Relay Vs Relay	2.2kV RMS, 50Hz for 1min
Environmental:	
Operating temperature	-20 to +70°C
Storage temperature	-40 to +85°C
Relative humidity	0... 95% (non condensing)
Warm up time	Minimum 3 minute
Shock (As per IEC 60068-2-27)	Half sine wave, Peak acceleration 30gn (300 m/s^2), duration 18ms
Vibration	10... 150...10 Hz, 0.15mm amplitude
Altitude	< 2000 m
Number of Sweep cycles	10 per axis
Enclosure	IP 20 (Terminal side) and IP54(Front side)
Installation:	
Mechanical Housing	Lexan 940(polycarbonate), Flammability Class V-0 acc. to UL 94, self extinguishing, non dripping, free of halogen
Mounting Position	Panel Mounted (96X96)
Connection Element	Conventional screw type terminal with indirect wire terminals
Connection Terminal	4 mm^2 solid or 2.5 mm^2 stranded cable
Weight	320 grams approx.
Interfaces:	
Impulse Led	For Energy testing
2 Digital Input (Optional)	20... 300 VAC / 10... 60 VDC, Optical couplers, Min pulse width 10ms, Min length between 2 pulses 18ms, VA < 0.25VA at 240 VAC
2 Digital Output (Optional)	Type - Relay, 250 VAC, 5 A AC / 30VDC, 5A DC Programmable Pulse Duration and Pulse Width
Modbus (Optional)	Rs485, max 1.2Km : 4.8,9.6,19.2,38.4,57.6kbps
Ethernet (Optional)	Ethernet access on Modbus TCP/IP Protocol

Measured Parameter System wise:

✓ : Available × : Not Available ✓[4]: L3 Not applicable

Sr No	Parameters	3Phase 4Wire	3Phase 3Wire	1Phase 2Wire	1Phase 3Wire	2Phase 2Wire
1	System Import Active Energy[1]	✓	✓	✓	✓	✓
2	L1, L2, L3 Import Active Energy[1]	✓	×	×	✓[4]	×
3	System Export Active Energy[1]	✓	✓	✓	✓	✓
4	L1, L2, L3 Export Active Energy[1]	✓	×	×	✓[4]	×
5	System Total Active Energy[1]	✓	✓	✓	✓	✓
6	L1, L2, L3 Total Active Energy[1]	✓	×	×	✓[4]	×
7	System Inductive Reactive Energy[1]	✓	✓	✓	✓	✓
8	L1, L2, L3 Inductive Reactive Energy[1]	✓	×	×	✓[4]	×
9	System Capacitive Reactive Energy[1]	✓	✓	✓	✓	✓
10	L1, L2, L3 Capacitive Reactive Energy[1]	✓	×	×	✓[4]	×
11	System Total Reactive Energy[1]	✓	✓	✓	✓	✓
12	L1, L2, L3 Total Reactive Energy[1]	✓	×	×	✓[4]	×
13	System Apparent Energy[1]	✓	✓	✓	✓	✓
14	L1, L2, L3 Apparent Energy[1]	✓	×	×	✓[4]	×
15	System Q1 Reactive Energy[1]	✓	✓	✓	✓	✓
16	L1, L2, L3 Q1 Reactive Energy[1]	✓	×	×	✓[4]	×
17	System Q2 Reactive Energy[1]	✓	✓	✓	✓	✓
18	L1, L2, L3 Q2 Reactive Energy[1]	✓	×	×	✓[4]	×
19	System Q3 Reactive Energy[1]	✓	✓	✓	✓	✓
20	L1, L2, L3 Q3 Reactive Energy[1]	✓	×	×	✓[4]	×
21	System Q4 Reactive Energy[1]	✓	✓	✓	✓	✓
22	L1, L2, L3 Q4 Reactive Energy[1]	✓	×	×	✓[4]	×
23	System Q1+Q2 Reactive Energy[1]	✓	✓	✓	✓	✓
24	L1, L2, L3 Q1+Q2 Reactive Energy[1]	✓	×	×	✓[4]	×
25	System Q3+Q4 Reactive Energy[1]	✓	✓	✓	✓	✓
26	L1, L2, L3 Q3+Q4 Reactive Energy[1]	✓	×	×	✓[4]	×
27	System Q1+Q3 Reactive Energy[1]	✓	✓	✓	✓	✓
28	L1, L2, L3 Q1+Q3 Reactive Energy[1]	✓	×	×	✓[4]	×
29	System Q2+Q4 Reactive Energy[1]	✓	✓	✓	✓	✓
30	L1, L2, L3 Q2+Q4 Reactive Energy[1]	✓	×	×	✓[4]	×
31	System Net active total Energy[1]	✓	✓	✓	✓	✓
32	System Apparent Energy while active import[1]	✓	✓	✓	✓	✓
33	System Apparent Energy while active export[1]	✓	✓	✓	✓	✓
34	System Active Power (kW)[3]	✓	✓	✓	✓	✓
35	L1,L2,L3 Active Power (kW)[3]	✓	×	×	✓[4]	×
36	System Total Re-active Power (kVAr)[3]	✓	✓	✓	✓	✓
37	L1,L2,L3 Total Re-active Power (kVAr)[3]	✓	×	×	✓[4]	×
38	System Fundamental Re-active Power (kVAr)[2]	✓	✓	✓	✓	✓
39	L1,L2,L3 Fundamental Re-active Power (kVAr)[2]	✓	×	×	✓[4]	×
40	System Distorted Re-active Power (kVAr)[2]	✓	✓	✓	✓	✓
41	L1,L2,L3 Distorted Re-active Power (kVAr)[2]	✓	×	×	✓[4]	×
42	System Apparent Power (kVA)[3]	✓	✓	✓	✓	✓
43	L1,L2,L3 Apparent Power (kVA)[3]	✓	×	×	✓[4]	×
44	System Power Factor[3]	✓	✓	✓	✓	✓
45	L1,L2,L3 Power Factor[3]	✓	×	×	✓[4]	×
46	System Displacement Power Factor[2]	✓	✓	✓	✓	✓
47	L1,L2,L3 Displacement Power Factor[2]	✓	×	×	✓[4]	×
48	System Reactive Power Factor[2]	✓	✓	✓	✓	✓
49	L1,L2,L3 Reactive Power Factor[2]	✓	×	×	✓[4]	×
50	System LF Factor SgnQ(1-(P/S))[2]	✓	✓	✓	✓	✓
51	L1,L2,L3 LF Factor SgnQ(1-(P/S))[2]	✓	×	×	✓[4]	×
52	System Phase Angle[3]	✓	✓	✓	✓	✓

Measured Parameter System wise:

✓ : Available × : Not Available ✓[4]: L3 Not applicable

Sr No	Parameters	3Phase 4Wire	3Phase 3Wire	1Phase 2Wire	1Phase 3Wire	2Phase 2Wire
53	L1,L2,L3 Phase Angle[3]	✓	×	×	✓[4]	×
54	Current Demand	✓	✓	✓	✓	✓
55	kVA Demand	✓	✓	✓	✓	✓
56	Import kW Demand	✓	✓	✓	✓	✓
57	Export kW Demand	✓	✓	✓	✓	✓
58	Inductive Var Demand	✓	✓	✓	✓	✓
59	Capacitive Var Demand	✓	✓	✓	✓	✓
60	Max Current Demand	✓	✓	✓	✓	✓
61	Max kVA Demand	✓	✓	✓	✓	✓
62	Max Import kW Demand	✓	✓	✓	✓	✓
63	Max Export kW Demand	✓	✓	✓	✓	✓
64	Max Inductive Var Demand	✓	✓	✓	✓	✓
65	Max Capacitive Var Demand	✓	✓	✓	✓	✓
66	Run Hour	✓	✓	✓	✓	✓
67	On Hour	✓	✓	✓	✓	✓
68	Number of Interruptions	✓	✓	✓	✓	✓
69	System Voltage[3]	✓	✓	✓	✓	✓
70	L1,L2,L3 Voltage[3]	✓	×	×	✓[4]	×
71	L12,L23,L31 Voltage[3]	✓	✓	×	✓[4]	×
72	System Voltage THD	✓	✓	✓	✓	✓
73	L1-L2-L3 Voltage THD	✓	✓	×	✓[4]	×
74	System Current[3]	✓	✓	✓	✓	✓
75	L1,L2,L3 Current[3]	✓	✓	×	✓[4]	×
76	System Current THD	✓	✓	✓	✓	✓
77	L1-L2-L3 Current THD	✓	✓	×	✓[4]	×
78	Individual Harmonics VL1(Up to 31st Harmonics)	✓	✓	✓	✓	✓
79	Individual Harmonics VL2 (Up to 31st Harmonics)	✓	✓	×	✓	×
80	Individual Harmonics VL3 (Up to 31st Harmonics)	✓	✓	×	×	×
81	Individual Harmonics IL1(Up to 31st Harmonics)	✓	✓	×	✓	×
82	Individual Harmonics IL2(Up to 31st Harmonic)	✓	✓	×	✓	×
83	Individual Harmonics IL3(Up to 31st Harmonics)	✓	✓	×	×	×
84	System Current TDD	✓	✓	✓	✓	✓
85	Neutral Current (Calculated)	✓	×	×	✓[4]	×
86	Frequency[3]	✓	✓	✓	✓	✓
87	RPM	✓	✓	✓	✓	✓
88	Phase Sequence Indication	✓	✓	×	×	×
89	Current Reversal Indication	✓	×	✓	✓[4]	×
90	Phase (V-I) Absent Indication	✓	×	×	✓[4]	×
91	Tariff Source 1 Energy Count	✓	✓	✓	✓	✓
92	Tariff Source 2 Energy Count	✓	✓	✓	✓	✓
93	Tariff Source 3 Energy Count	✓	✓	✓	✓	✓
94	Tariff Source 4 Energy Count	✓	✓	✓	✓	✓
95	Tariff Source 5 Energy Count	✓	✓	✓	✓	✓
96	Tariff Source 6 Energy Count	✓	✓	✓	✓	✓
97	Old Max A Demand[2]	✓	✓	✓	✓	✓
98	Old Max VA Demand[2]	✓	✓	✓	✓	✓
99	Old Max kW Import Demand[2]	✓	✓	✓	✓	✓
100	Old Max kW Export Demand[2]	✓	✓	✓	✓	✓
101	Old Max Var Inductive Demand[2]	✓	✓	✓	✓	✓
102	Old Max Var Capacitive Demand[2]	✓	✓	✓	✓	✓
103	Old System Import Active Energy[2]	✓	✓	✓	✓	✓
104	Old L1-L2-L3 Import Active Energy[2]	✓	×	×	✓[4]	×

Measured Parameter System wise:

✓ : Available × : Not Available ✓[4]: L3 Not applicable

Sr No	Parameters	3Phase 4Wire	3Phase 3Wire	1Phase 2Wire	1Phase 3Wire	2Phase 2Wire
105	Old System Export Active Energy [2]	✓	✓	✓	✓	✓
106	Old L1-L2-L3 Export Active Energy [2]	✓	×	×	✓[4]	×
107	Old System Inductive Reactive Energy [2]	✓	✓	✓	✓	✓
108	Old L1-L2-L3 Inductive Reactive Energy [2]	✓	×	×	✓[4]	×
109	Old System Capacitive Reactive Energy [2]	✓	✓	✓	✓	✓
110	Old L1-L2-L3 Capacitive Reactive Energy [2]	✓	×	×	✓[4]	×
111	Old System Apparent Energy [2]	✓	✓	✓	✓	✓
112	Old L1-L2-L3 Apparent Energy [2]	✓	×	×	✓[4]	×
113	Old Run Hour [2]	✓	✓	✓	✓	✓
114	Old On Hour [2]	✓	✓	✓	✓	✓
115	Old Number of Interruptions [2]	✓	✓	✓	✓	✓
116	VLN Unbalance [2]	✓	×	×	×	×
117	VLL Unbalance [2]	✓	✓	×	×	×
118	Current Unbalance [2]	✓	✓	×	×	×

Note:

1. Energy on display is auto ranging & unit for Energy parameters on modbus are dependent on CT PT ratio or unit selected by user.
2. Parameters are available only on modbus.
3. Min-Max parameters are also available.

Order Code:

Ordering Information	MA3L -	1	3	01	01	X	X	X	0000
Meter Interface	None					A			
	RS485					B			
	Ethernet					C			
	RS485 - 2DI - 2DO					D*			
	Ethernet - 2DI - 2DO					F*			
Auxiliary Supply	Lower Aux.						L		
	Higher Aux.						H		
Accuracy	Accuracy Class 0.2S							2	
	Accuracy Class 0.5S							5	

*Note : The options are available with Accuracy Class 0.2S only.

Order Code Example:

MA3L-130101DH20000
Lm1340 3 Phase input with input voltage 100-600VLL, 1A/5A internal CT, with Rs485, 2 DI, 2 Relay Output and Auxiliary Voltage 100 to 550 V AC DC, with accuracy class 0.2s.

RISHABH

Specifications may change without prior notice

Measure Control Record Analyze Optimize

RISHABH INSTRUMENTS LIMITED

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