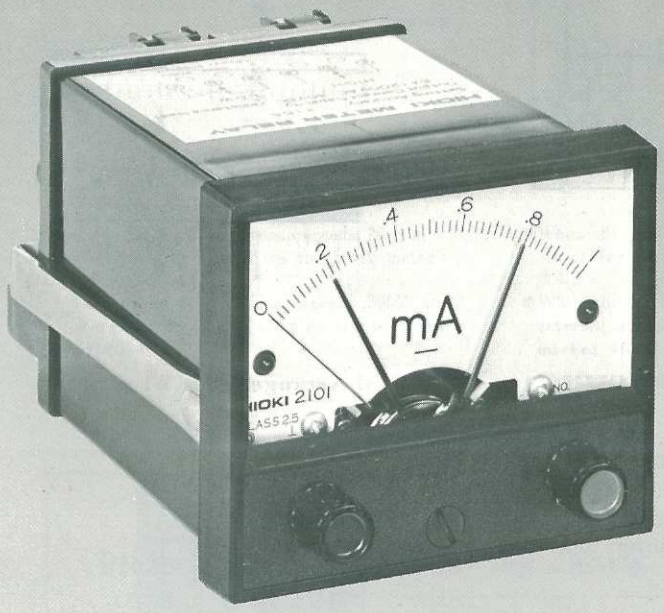
2101•2102 METER-RELAY

HIOKI

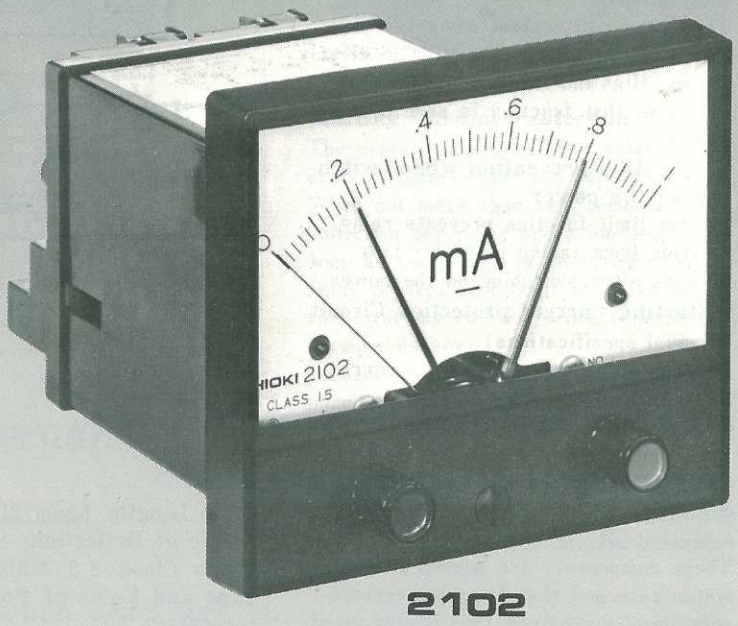
METER-RELAY

2101
2102

ELECTRONIC CONTACTLESS METER-RELAYS



2101



2102

■FEATURES

●Electronic function improves both accuracy and dependability

We have done away with the old oscillator and photoelectric systems in which the operating point was detected with reference to the position of the needle. Now the relay is operated directly by means of the input. This eliminates inaccurate function due to the needle deflecting too far or to friction.

●Plug-in relay replacement

Because the relay is a plug-in type it is easy to change over. Also the relay at 5A, 200V and resistance load has plenty of contact capacity.

●Very high sensitivity: 1μA, 10mV DC and 50mV AC

Since 1μA, 10mV DC and 50mV AC are standard specifications, this meter relay can be connected directly to the transducer of a thermocouple used in temperature measurement or similar equipment to greatly simplify the structure of the equipment.

●Function is clearly indicated with pilot lamps

The meter and control units are separate and the control condition in clearly shown. High and low are indicated by LEDs so that function is seen at a glance.

●Operation prevention when switching on the power

A time limit function prevents relay function from taking place for two seconds after switching on the power.

●Starting Current protection Circuit (Special specifications)

As protection against starting current there is also available a time limit device which protects by preventing relay function. (For details see the special specifications)

●Built-in power source unit and relay circuit

These components are housed in the meter case and therefore no separate relay box is required, thus saving considerable space and work time when installing.

●CORE MAGNET TAUT BAND type

A friction-free, highly accurate meter which is reliable even when subjected to the effect of external magnetic fields and steel panels.

●With output terminal (Special specification)

A 1V/F.S DC output is obtainable so that the meter relay can be connected to a recorder to record such data as load fluctuations.

■USES

●Malfunction detection, warning and automatic control in electrical control equipment.

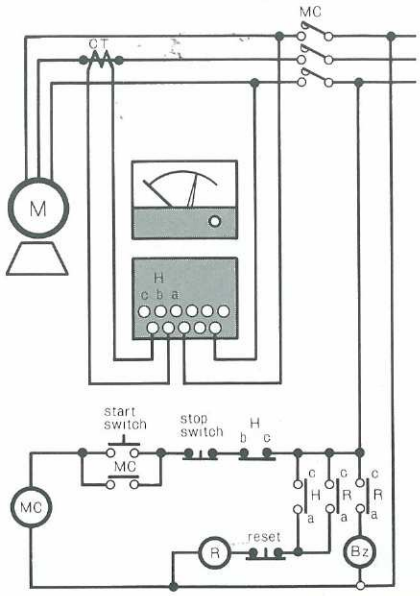
●In combination with temperature controllers.

●In detecting and warning of abnormal r.p.m. and overcurrent, etc., in rotary machines and for automatic control of the same.

●In automatic control, warning and detection related to pH and other physical property levels and other quantities.

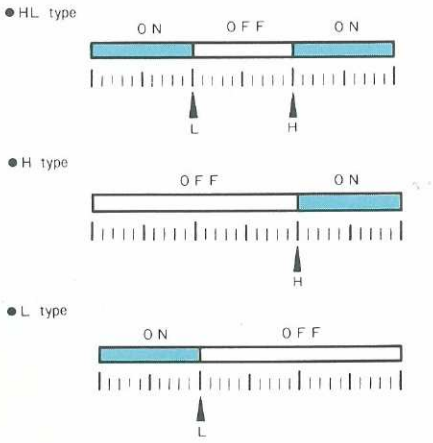
● Example: Prevention from overload motor operation

Meter-Relay equipped: With starting current protection circuit, H type, AC Rectifier type Ammeter



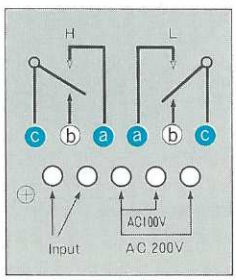
■STANDARD SPECIFICATIONS

Scale Length: 63mm (2101), 82mm (2102)
Angle of Deflection: 90°
Meter Class: 2.5 (2101), 1.5 (2102)
Type and Color of Pointer: 0.3φrod type; black
Scale Color: White
Cover: ABS resin and glass or Transparent acrylic resin
Front Color: Black
Base Material: ABS resin
Position in which instrument is set up: Vertically (⊥)
Meter Characteristics: Meet JIS C1102 requirements
Pointer Deflecting Range: Passing type-full scale
Type of Setting Pointers: Lance type; upper limit (H) pointer red and lower limit (L) pointer green
Effective Setting Range: Both H and L, full range
Setting Accuracy: ±1.5% of full scale (Not affected by meter error)
Dead Band: Within 0.5% of scale length
Minimum Setting Width: Within 3% of scale length
Relay Action: Continuous
Setting System: HL·H·L
Relay Power Delay Circuit: Approx. 2 sec.
Response Time: Approx. 0.5 sec.
Operating Power Voltage: 100/200V AC ±10%
Operating Temperature: 0°C~50°C
Output Contact Structure: H & L, one transfer each
Output Contact Capacity: 5A (200V AC, 30V DC resistance load)
Insulation Resistance: At least 500V, 10MΩ between electrical circuit and case
Power Consumption: Approx. 3W
Contact Operation: ■ shows ON and □ shows OFF range (Terminal arrangement: When ⓐ ⓒ terminals used.)



Terminal Arrangement (When power is off)

2101・2102



■DIRECT CURRENT TYPES

Standard specifications are 1μA DC or 10mV DC and for this reason it is possible to directly connect a transducer or a thermocouple etc., for temperature measurement.

	Full Scale Value	Approx. Sensitivity
AMMETERS	1 μA	50 mV
	10 〃	〃
	20 〃	〃
	50 〃	〃
	100 〃	〃
	200 〃	〃
	500 〃	〃
	※1 1 mA	〃
	2 〃	〃
	5 〃	〃
	10 〃	〃
	50 〃	〃
	100 〃	〃
	200 〃	〃
	500 〃	〃
	1 A	〃
	2 〃	〃
	5 〃	〃
	10 〃	〃
	20 〃	〃
	Segmental Scale 4—20mA	50 mV
VOLT-METERS	10 mV	100 kΩ/V
	15 〃	〃
	30 〃	〃
	※2 50 〃	〃
	100 〃	〃
	150 〃	〃
	300 〃	〃
	500 〃	10 kΩ/V
	1 V	〃
	1.5 〃	〃
	3 〃	〃
	5 〃	〃
	10 〃	〃
	15 〃	〃
	30 〃	〃
	50 〃	〃
	100 〃	〃
	150 〃	〃
	300 〃	〃
	Segmental Scale 1—5V	10 kΩ/V

- When the scale maximum exceeds 20A, an external shunt is used on the 50mV meter marked ※2.
- When the scale maximum exceeds 300V, an external multiplier is used on the 1mA meter marked ※1.

■AC RECTIFIER TYPES

50mV AC is standard specifications and up to 5A AC a transducer is not required.

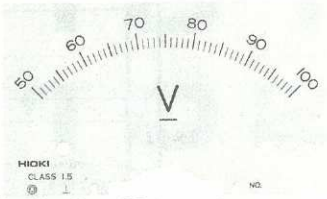
	Full Scale Value	Approx. Sensitivity
AMMETERS	200 μA	50 mV
	500 〃	〃
	※3 1 mA	〃
	2 〃	〃
	5 〃	〃
	10 〃	〃
	20 〃	〃
	50 〃	〃
	100 〃	〃
	200 〃	〃
	500 〃	〃
	1 A	〃
	2 〃	〃
	3 〃	〃
	※ 5 〃	〃
VOLT-METERS	50 mV	10 kΩ/V
	100 〃	〃
	150 〃	〃
	300 〃	〃
	500 〃	1 kΩ/V
	1 V	〃
	1.5 〃	〃
	3 〃	〃
	5 〃	〃
	10 〃	〃
	15 〃	〃
	30 〃	〃
	50 〃	〃
	100 〃	〃
	150 〃	〃
	300 〃	〃

- When the scale maximum exceeds 5A, a C·T is externally fitted to the 5A meter marked ※4.
- When the scale maximum exceeds 300V an external multiplier is used on the 1mA meter marked ※3.

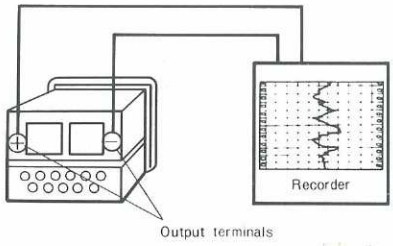
Frequency Response : AC A 10kHz
AC V 5kHz

■SPECIAL SPECIFICATIONS

Meter Class: Class 1.5 (2101)
Extended Scale: 2 times and 3 times
Segmental Scale: Except for 4-20mA and 1-5V, at least 40% range segmentation in relation to the full scale is possible.

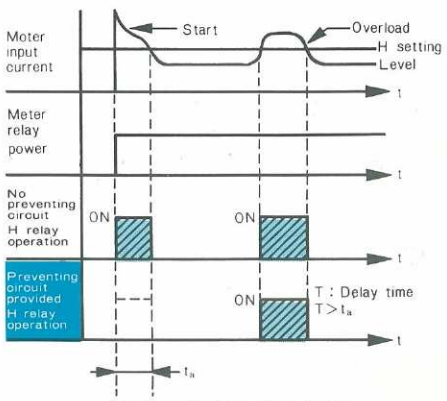


Double Deflection Meter: Can be manufactured
Input Impedance: Can be made up to 1MΩ/V
Response Time: Approx. 0.05 sec. (DC only), 1 sec. type can be made
Transducer Externally Fitted: RMS ammeter, voltmeter, wattmeter, Var meter, frequency meter and power factor meter
Setting Accuracy: ±1%
Output Terminals:
1V/F.S DC output. Make sure that the instrument connected has an input impedance of at least 1MΩ. Neither the input nor the output of the meter is earthed.



Starting Current Protection Circuit
The circuit incorporates a relay to protect against starting current.
When not more than two seconds is sufficient for relay operation delay, as soon as the power is switched on, the relay preventing circuit operates so that starting current protection circuit is unnecessary.
In order for this circuit to function normally, the meter relay should be switched on at the same time as the main equipment.

- When meter input is DC, can be varied from 1 to 10 sec.
- When meter input is AC, can be varied from 2 to 12 sec.



Relay operation time chart

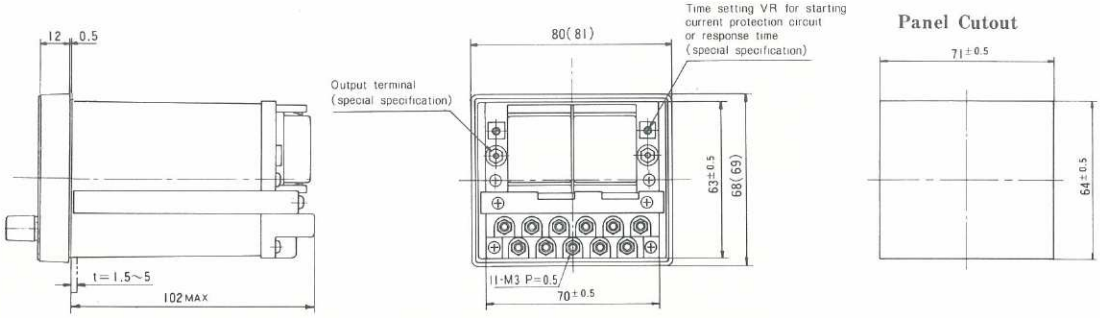
Please indicate the following clearly when ordering

1. Type and name required ex.) 2101. AC Rectifier type
2. Full scale value required ex.) DC 50μA, AC 150V
3. Setting system required (H, L or HL type)
4. Instrument cover required (ABS+glass or Acrylic resin)
5. Any special requirements

■DIMENSIONS

( ) : Acrylic resin Cover dimension

2101



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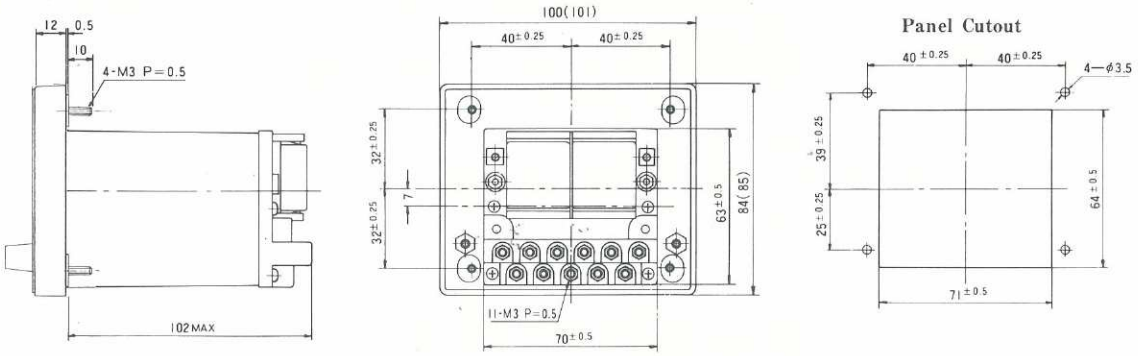

■CONCERNING STANDARD SCALE DIVISIONS

Standard scale divisions have been fixed for reading ease and taking into account the size of the scale plate (product name) and type of pointer as well as the full scale value and when the customer requires a full scale not provided for in the catalogue (i.e.a special order) we advise the use of the standard divisions.

Full Scale Value	0.3 φ rod type pointer		Lance type (Special spec.)	
	Div.	Scale	Div.	Scale
1 · 10·100	50	0 2 4 6 8 10	20	0 2 4 6 8 10
1.5·15·150	30	0 5 10 15	30	0 5 10 15
2 · 20·200	40	0 5 10 15 20	20	0 5 10 15 20
2.5·25·250	50	0 5 10 15 20 25	25	0 5 10 15 20 25
3 · 30·300	30	0 1 2 3	30	0 1 2 3
4.5·45·450	45	0 1 2 3 4 4.5	22.5	0 1 2 3 4 4.5
5 · 50·500	50	0 1 2 3 4 5	25	0 1 2 3 4 5
6 · 60·600	30	0 2 4 6	30	0 2 4 6
7.5·75·750	37.5	0 2 4 6 7.5	37.5	0 2 4 6 7.5
9 · 90·900	45	0 2 4 6 8 9	45	0 2 4 6 8 9

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