No. 26023A

COMPLETE PLAN

ORDER No.

SPEC No.

DELIVERY PLACE

ORDER RECEIVED No.

SENDING IN September 22, 2017

TOYO KEIKI CO., LTD.
HEAD OFFICE
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SECTION CHIEF	CHECK	STAFF
K. Shirasaki	M. Teramoto	T. Ota

1. CONTENTS

	NAME	TYPE	RATING	REQ. NO.	PRINT CLASS-IFICATION	PRINT No.	NOTE
				Specification of photo electric -type meter relay (1～3)			
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1	SOURCE BOX	RG-3	4 TERMINALS		Outside view	MS-12975	
2	Meter relay	MPC-10	∞～5 ～0.2～0 MΩ		Outside view	MS-11028A	H Setting Source:AC 110V
2	SOURCE BOX	RG-3	4 TERMINALS		Outside view	MS-12975	
3	Meter relay	MPC-12	∞～5 ～0.2～0 MΩ		Outside view	MS-9654B	H Setting Source:AC 110V
3	SOURCE BOX	RG-3	4 TERMINALS		Outside view	MS-12975	
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4	Meter relay	MPV-11	∞～50 ～2～0 kΩ		Outside view	MS-11959	H Setting Source DC24V
4	SOURCE BOX	M-4A	5 TERMINALS		Outside view	MS-11219A	
5	Meter relay	MPC-10	∞～50 ～2～0kΩ		Outside view	MS-11028A	H Setting Source DC24V
5	SOURCE BOX	M-4A	5 TERMINALS		Outside view	MS-11219A	

6	Meter relay	MPC-12	∞～50 ～2～0kΩ		Outside view	MS-9654B	H Setting Source DC24V
6	SOURCE BOX	M-4A	5 TERMINALS		Outside view	MS-11219A	
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7	INSULATION RESISTANCE MONITOR	IS-2			Outside view	MS-12618	
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2.1 SPECIFICATIONS (1～3)

(1) Mounting	:	On the 1～6 mm thick Fe or NFe panel, vertically. (MPV-11)
	:	On the 2.0 mm thick Fe Panel, verically. (MPC-10)
	:	On the 3.2 mm thick Fe Panel, verically. (MPC-12)
(2) Cover color	:	N-1.5 by Munsell notation. (Black)
(3) Meter input	:	DC 0 ～ 250 μA
(4) Accuracy	:	Within±5% (0.05～1MΩ), Within±10% (1MΩ～∞)
(5) Shape of Pointer	:	Spear type (Black)
(6) Standard	:	JIS C 1102－2:1997

2.2 SPECIFICATIONS (4～6)

(1) Mounting	:	On the 1～6 mm thick Fe or NFe panel, vertically. (MPV-11)
	:	On the 2.0 mm thick Fe Panel, verically. (MPC-10)
	:	On the 3.2 mm thick Fe Panel, verically. (MPC-12)
(2) Cover color	:	N-1.5 by Munsell notation. (Black)
(3) Meter input	:	DC 0 ～ 6 mA
(4) Accuracy	:	Within±5% (0.5～10kΩ), Within±10% (10kΩ～∞)
(5) Shape of Pointer	:	Spear type (Black)
(6) Standard	:	JIS C 1102－2:1997

2.3 SPECIFICATIONS (8～10)

(1) Mounting	:	On the 1～6 mm thick Fe or NFe panel, vertically.
(2) Cover color	:	N-1.5 by Munsell notation. (Black)
(3) Meter input	:	DC 0 ～ 1 mA
(4) Accuracy	:	Within±5% (0.05～1MΩ), Within±10% (1MΩ～∞)
(5) Shape of Pointer	:	Spear type (Black)
(6) Standard	:	JIS C 1102－2:1997

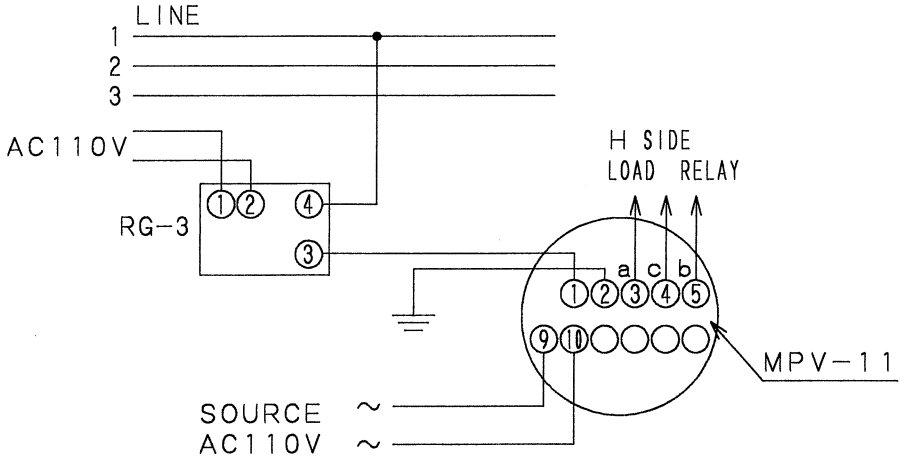
No. 26023A

Specification of photo electric-type meter relay 1

1. Outline This meter relay is non-contact-controller and designed as detector for automatic alarm device or automatic control systems and operated by photo electric off-on circuit.

2. Specifications

(1) Type : MPV-11 cover color (Munsell notation) : N-1.5 (Black)
(2) Rating scale : ∞～5～0.2～0 MΩ full scale value : DC 0～250 μA
(3) Division of graduation : _____ divisions , value of unit division : _____
(4) Type of operation pointer : passing , H setting value variable
(5) Scale length : approx. 170 mm , approx. 240° scale
(6) Mounting panel : Fe , NFe 1～6 mm thick , position ⊥
(7) Accuracy : ± 5 % of indication (restricted to 0.05～1MΩ)
± 10 % of indication (other range)
(8) Accuracy of off-on operation
(A) pick-up (on-operation) : ± 1.5 % of scale length
(B) dead band (off-operation) : 1.0 % of scale length
note : (A) and (B) are added each other
(9) Pointer shape : Spear type (Black)
Setting pointer : Delta type color : H side ··· Red
(10) Setting range : All range of scale
(11) Contact structure H side : 1 ab
(12) Contact capacity : AC 220 V 3A (non-inductive load)
(13) Source voltage : AC 110 V ± 10 % , Power loss : 1.5 VA
(14) Dielectric strength
(A) To withstand AC 2000 V (50/60Hz) 1 minute applied between electric circuit and body.
(B) To withstand AC 500 V (50/60Hz) 1 minute applied between relay circuit and other electric circuit.
(15) Insulation resistance
Over 10 MΩ measured by 500 V megger under normal temperature (5～35 ℃) and humidity (40～80 %). (between electric circuit and body)
(16) Ambient temperature : -10～55 ℃
(17) Accessories : RG-3
(18) Other characteristics : conformed with JIS C 1102



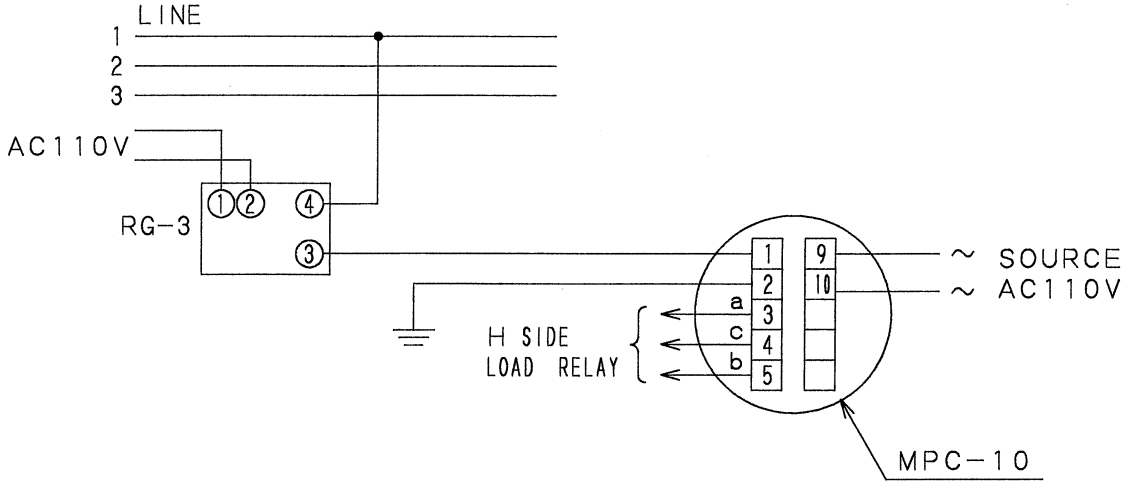
No. 26023A

Specification of photo electric-type meter relay 2

1. Outline This meter relay is non-contact-controller and designed as detector for automatic alarm device or automatic control systems and operated by photo electric off-on circuit.

2. Specifications

(1) Type : MPC-10 cover color (Munsell notation) : N-1.5 (Black)
(2) Rating scale : ∞～5～0.2～0 MΩ full scale value : DC 0～250 μA
(3) Division of graduation : _____ divisions , value of unit division : _____
(4) Type of operation pointer : passing , H setting value variable
(5) Scale length : approx. 80 mm , approx. 80° scale
(6) Mounting panel : Fe 2 mm thick , position ⊥
(7) Accuracy : ± 5 % of indication (restricted to 0.05～1MΩ)
± 10 % of indication (other range)
(8) Accuracy of off-on operation
(A) pick-up (on-operation) : ± 1.5 % of scale length
(B) dead band (off-operation) : 1.0 % of scale length
note : (A) and (B) are added each other
(9) Pointer shape : Rod type (Black)
Setting pointer : Rod type color : H side … Red
(10) Setting range : All range of scale
(11) Contact structure H side : 1 ab
(12) Contact capacity : AC 100 V 1A (non-inductive load)
(13) Source voltage : AC 110 V ± 10 % , Power loss : 1.5 VA
(14) Dielectric strength
(A) To withstand AC 2000 V (50/60Hz) 1 minute applied between electric circuit and body.
(B) To withstand AC 500 V (50/60Hz) 1 minute applied between relay circuit and other electric circuit.
(15) Insulation resistance
Over 10 MΩ measured by 500 V megger under normal temperature (5～35 ℃) and humidity (40～80 %). (between electric circuit and body)
(16) Ambient temperature : -10～55 ℃
(17) Accessories : RG-3
(18) Other characteristics : conformed with JIS C 1102

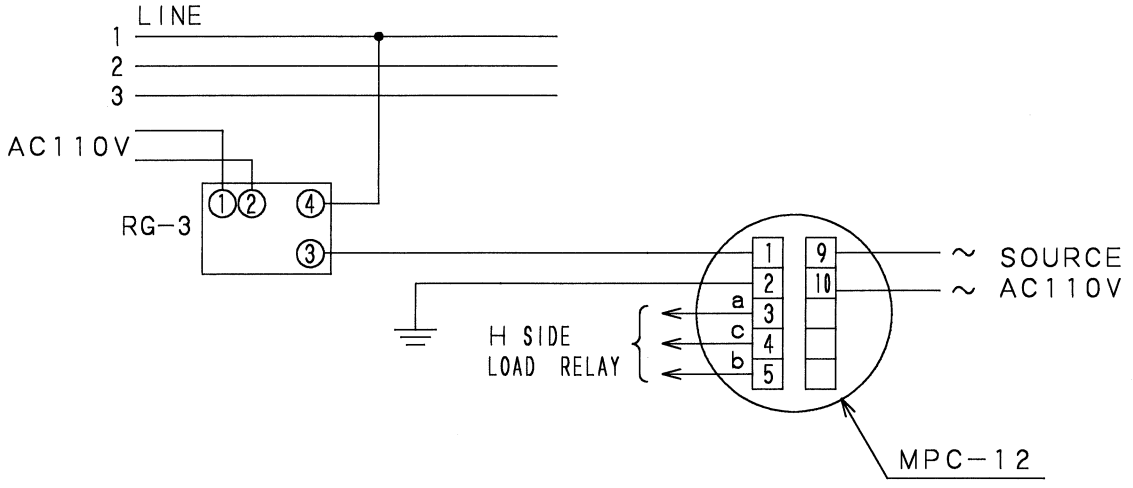


No. 26023A

Specification of photo electric-type meter relay 3

1. Outline This meter relay is non-contact-controller and designed as detector for automatic alarm device or automatic control systems and operated by photo electric off-on circuit.

2. Specifications
   (1) Type : MPC-12 cover color (Munsell notation) : N-1.5(Black)
   (2) Rating scale : ∞～5～0.2～0 MΩ full scale value : DC 0～250 μA
   (3) Division of graduation : _____ divisions , value of unit division : _____
   (4) Type of operation pointer : passing , H setting value variable
   (5) Scale length : approx. 100 mm , approx. 85° scale
   (6) Mounting panel : Fe 3.2 mm thick , position ⊥
   (7) Accuracy : ± 5 % of indication (restricted to 0.05～1MΩ)
   ± 10 % of indication (other range)
   (8) Accuracy of off-on operation
   (A) pick-up (on-operation) : ± 1.5 % of scale length
   (B) dead band (off-operation) : 1.0 % of scale length
   note : (A) and (B) are added each other
   (9) Pointer shape : Rod type(Black)
   Setting pointer : Rod type color : H side … Red
   (10) Setting range : All range of scale
   (11) Contact structure H side : 1 ab
   (12) Contact capacity : AC 100 V 1A (non-inductive load)
   (13) Source voltage : AC 110 V ± 10 % , Power loss : 1.5 VA
   (14) Dielectric strength
   (A) To withstand AC 2000 V(50/60Hz) 1 minute applied between electric circuit and body.
   (B) To withstand AC 500 V(50/60Hz) 1 minute applied between relay circuit and other electric circuit.
   (15) Insulation resistance
   Over 10 MΩ measured by 500 V megger under normal temperature (5～35 ℃) and humidity (40～80 %). (between electric circuit and body)
   (16) Ambient temperature : -10～55 ℃
   (17) Accessories : RG-3
   (18) Other characteristics : conformed with JIS C 1102

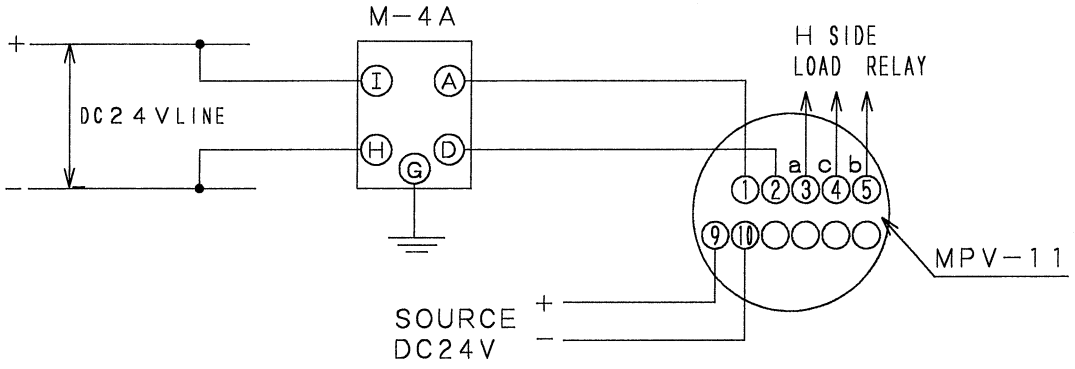


No. 26023A

Specification of photo electric-type meter relay 4

1. Outline This meter relay is non-contact-controller and designed as detector for automatic alarm device or automatic control systems and operated by photo electric off-on circuit.

2. Specifications
   (1) Type : MPV-11 cover color (Munsell notation) : N-1.5 (Black)
   (2) Rating scale : ∞～50～2～0 kΩ full scale value : DC 0～6 mA
   (3) Division of graduation : _____ divisions , value of unit division : _____
   (4) Type of operation pointer : passing , H setting value variable
   (5) Scale length : approx. 170 mm , approx. 240° scale
   (6) Mounting panel : Fe , NFe 1～6 mm thick , position ⊥
   (7) Accuracy : ± 5 % of indication (restricted to 0.5～10kΩ)
   ± 10 % of indication (other range)
   (8) Accuracy of off-on operation
   (A) pick-up (on-operation) : ± 1.5 % of scale length
   (B) dead band (off-operation) : 1.0 % of scale length
   note : (A) and (B) are added each other
   (9) Pointer shape : Spear type (Black)
   Setting pointer : Delta type color : H side ··· Red
   (10) Setting range : All range of scale
   (11) Contact structure H side : 1 ab
   (12) Contact capacity : AC 220 V 3A (non-inductive load)
   (13) Source voltage : DC 24 V ± 10 % , Power loss : 80 mA
   (14) Dielectric strength
   (A) To withstand AC 2000 V (50/60Hz) 1 minute applied between electric circuit and body.
   (B) To withstand AC 500 V (50/60Hz) 1 minute applied between relay circuit and other electric circuit.
   (15) Insulation resistance
   Over 10 MΩ measured by 500 V megger under normal temperature (5～35 ℃) and humidity (40～80 %). (between electric circuit and body)
   (16) Ambient temperature : -10～55 ℃
   (17) Accessories : M-4A
   (18) Other characteristics : conformed with JIS C 1102

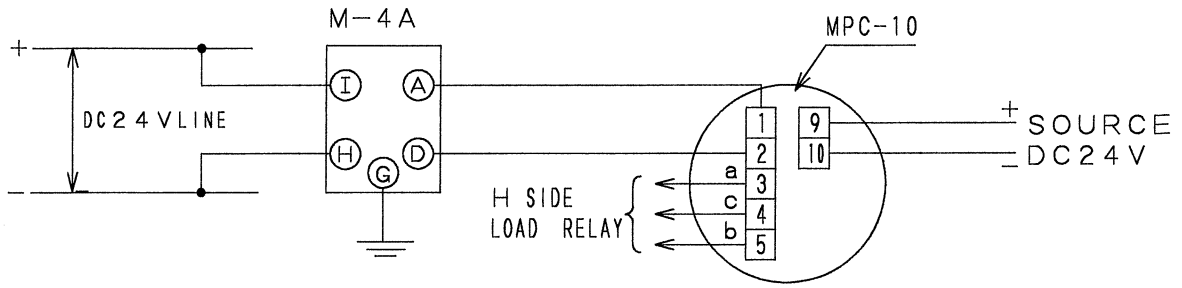


No. 26023A

Specification of photo electric-type meter relay 5

1. Outline This meter relay is non-contact-controller and designed as detector for automatic alarm device or automatic control systems and operated by photo electric off-on circuit.

2. Specifications
   (1) Type : MPC-10 cover color (Munsell notation) : N-1.5 (Black)
   (2) Rating scale : ∞～50～2～0 kΩ full scale value : DC 0～6 mA
   (3) Division of graduation : _____ divisions , value of unit division : _____
   (4) Type of operation pointer : passing , H setting value variable
   (5) Scale length : approx. 80 mm , approx. 80° scale
   (6) Mounting panel : Fe 2 mm thick , position ⊥
   (7) Accuracy : ± 5 % of indication (restricted to 0.5～10kΩ)
   ± 10 % of indication (other range)
   (8) Accuracy of off-on operation
   (A) pick-up (on-operation) : ± 1.5 % of scale length
   (B) dead band (off-operation) : 1.0 % of scale length
   note : (A) and (B) are added each other
   (9) Pointer shape : Rod type (Black)
   Setting pointer : Rod type color : H side … Red
   (10) Setting range : All range of scale
   (11) Contact structure H side : 1 ab
   (12) Contact capacity : AC 100 V 1A (non-inductive load)
   (13) Source voltage : DC 24 V ± 10 % , Power loss : 80 mA
   (14) Dielectric strength
   (A) To withstand AC 2000 V (50/60Hz) 1 minute applied between electric circuit and body.
   (B) To withstand AC 500 V (50/60Hz) 1 minute applied between relay circuit and other electric circuit.
   (15) Insulation resistance
   Over 10 MΩ measured by 500 V megger under normal temperature (5～35 ℃) and humidity (40～80 %). (between electric circuit and body)
   (16) Ambient temperature : -10～55 ℃
   (17) Accessories : M-4A
   (18) Other characteristics : conformed with JIS C 1102



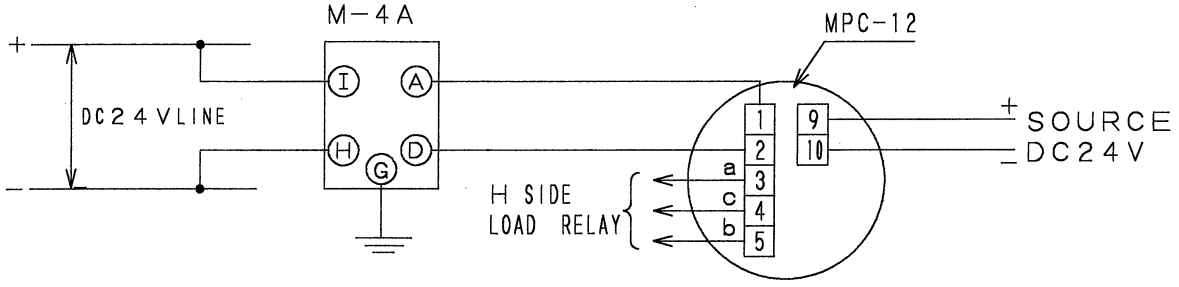
No. 26023A

Specification of photo electric-type meter relay 6

1. Outline This meter relay is non-contact-controller and designed as detector for automatic alarm device or automatic control systems and operated by photo electric off-on circuit.

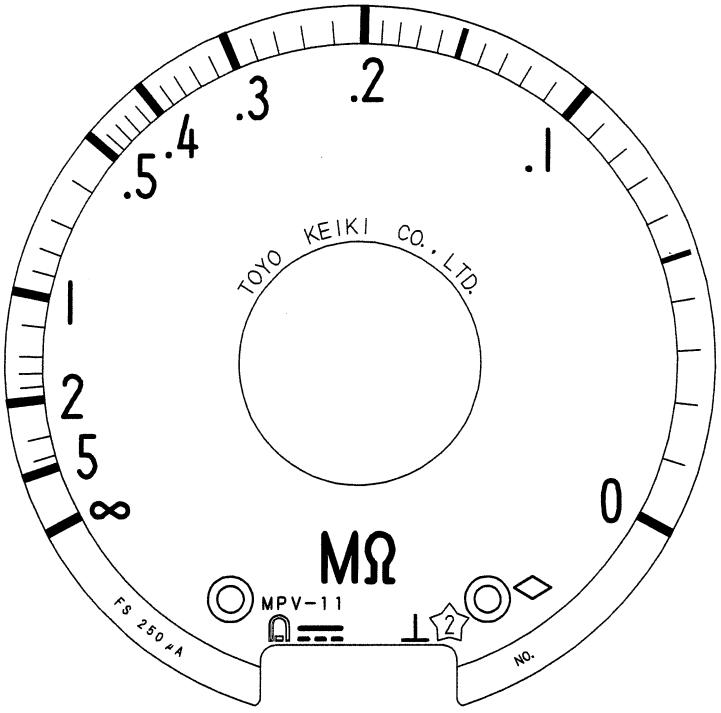
2. Specifications

(1) Type : MPC-12 cover color (Munsell notation) : N-1.5 (Black)
(2) Rating scale : ∞～50～2～0 kΩ full scale value : DC 0～6 mA
(3) Division of graduation : _____ divisions , value of unit division : _____
(4) Type of operation pointer : passing , H setting value variable
(5) Scale length : approx. 100 mm , approx. 85° scale
(6) Mounting panel : Fe 3.2 mm thick , position ⊥
(7) Accuracy : ± 5 % of indication (restricted to 0.5～10kΩ)
± 10 % of indication (other range)
(8) Accuracy of off-on operation
(A) pick-up (on-operation) : ± 1.5 % of scale length
(B) dead band (off-operation) : 1.0 % of scale length
note : (A) and (B) are added each other
(9) Pointer shape : Rod type (Black)
Setting pointer : Rod type color : H side … Red
(10) Setting range : All range of scale
(11) Contact structure H side : 1 ab
(12) Contact capacity : AC 100 V 1A (non-inductive load)
(13) Source voltage : DC 24 V ± 10 % , Power loss : 80 mA
(14) Dielectric strength
(A) To withstand AC 2000 V(50/60Hz) 1 minute applied between electric circuit and body.
(B) To withstand AC 500 V(50/60Hz) 1 minute applied between relay circuit and other electric circuit.
(15) Insulation resistance
Over 10 MΩ measured by 500 V megger under normal temperature (5～35 ℃) and humidity (40～80 %). (between electric circuit and body)
(16) Ambient temperature : -10～55 ℃
(17) Accessories : M-4A
(18) Other characteristics : conformed with JIS C 1102



Scale drawing

ITEM 1



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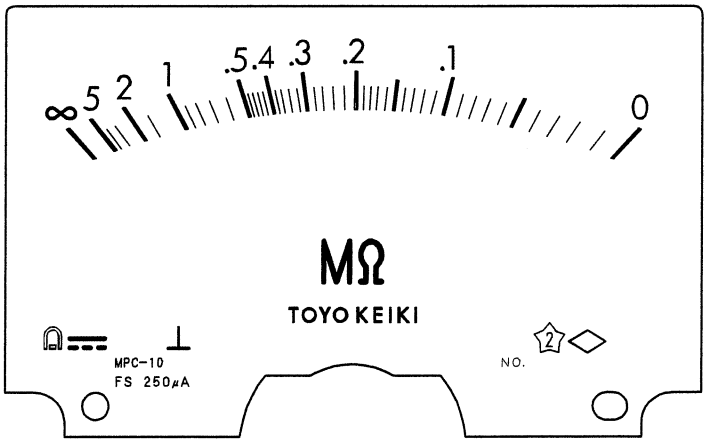

Scale drawing

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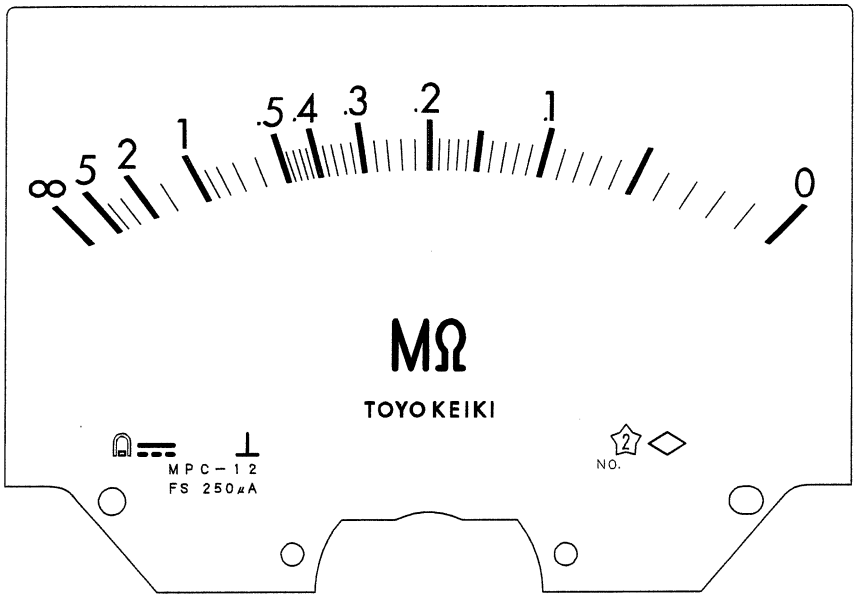

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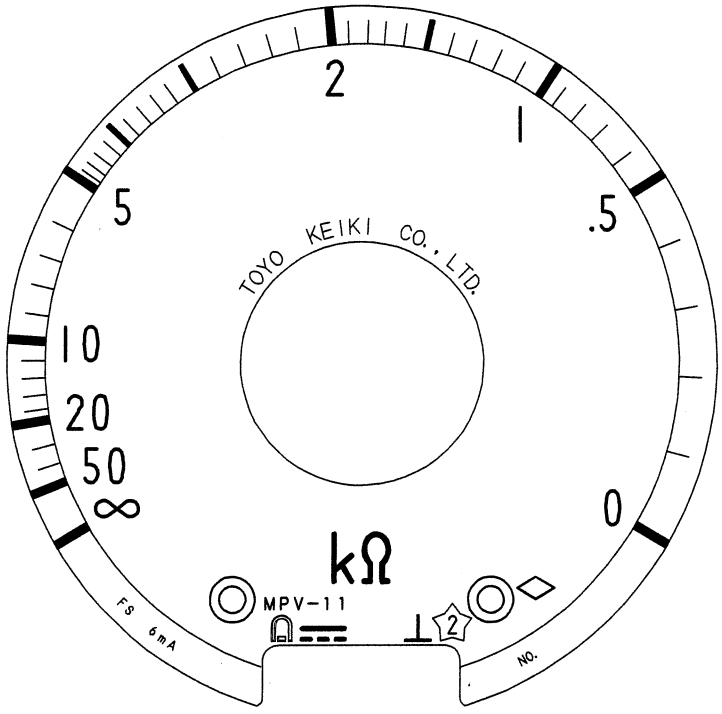

Scale drawing

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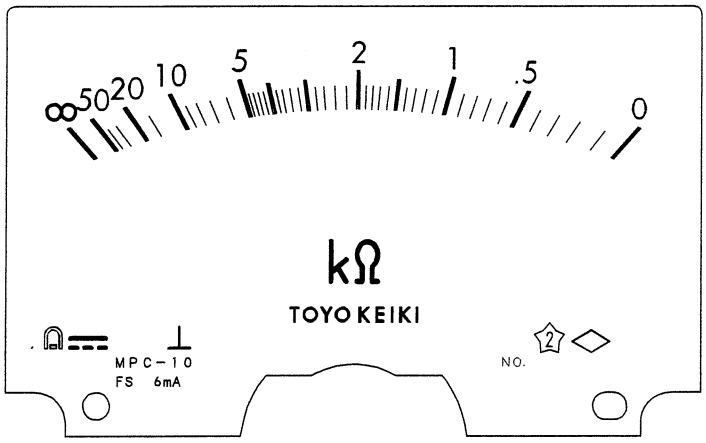

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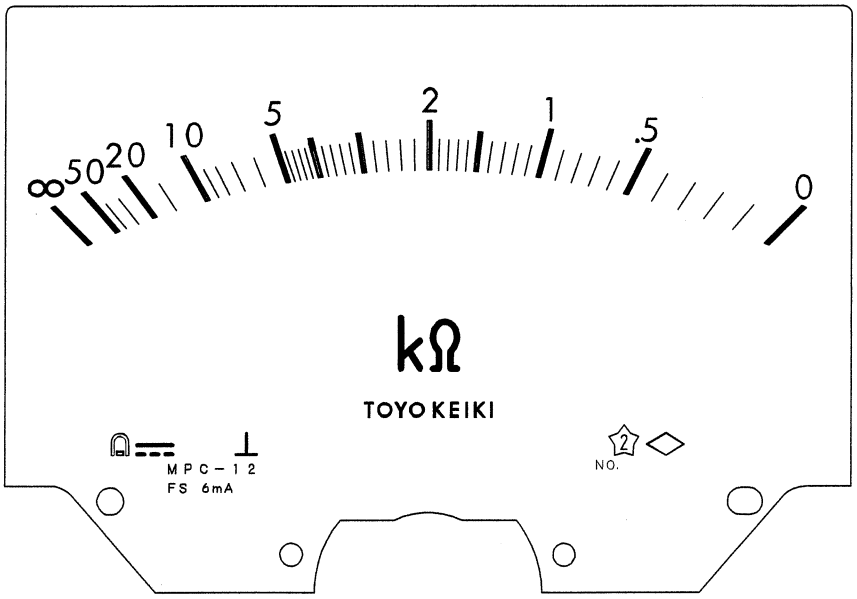
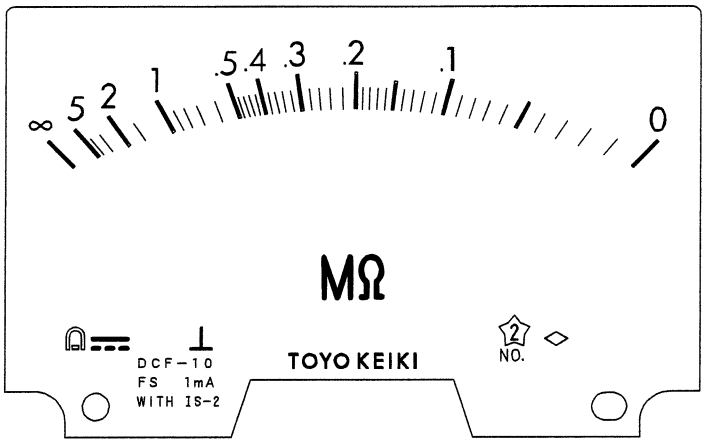


Scale drawing

ITEM 8



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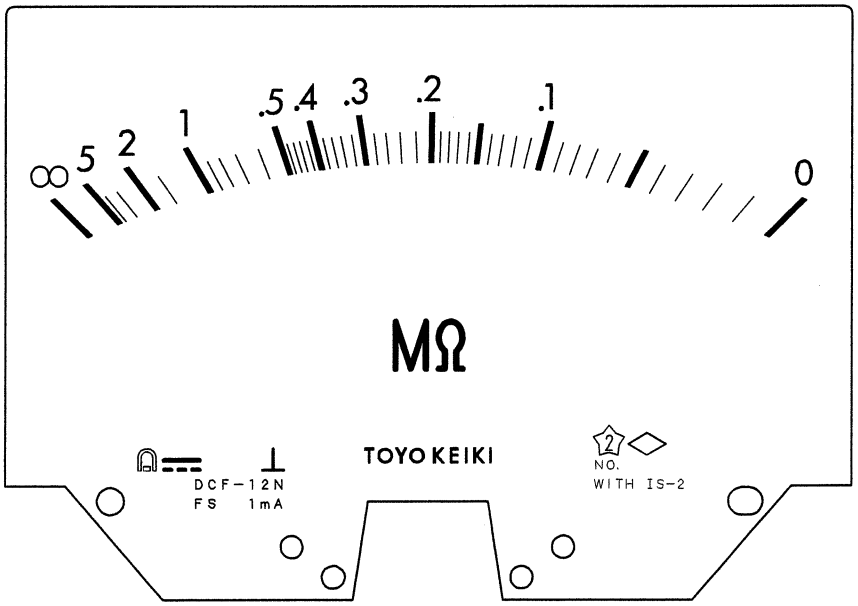
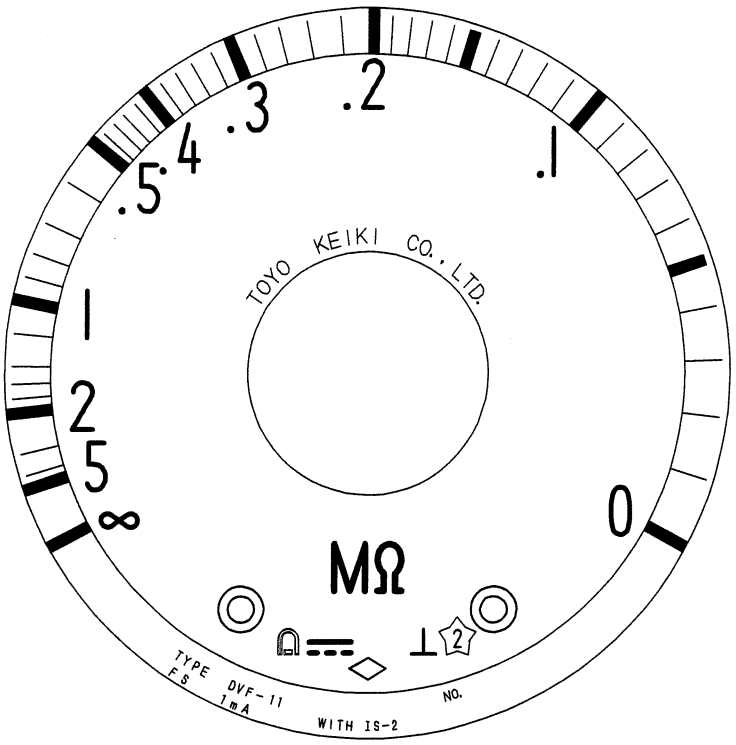


Scale drawing

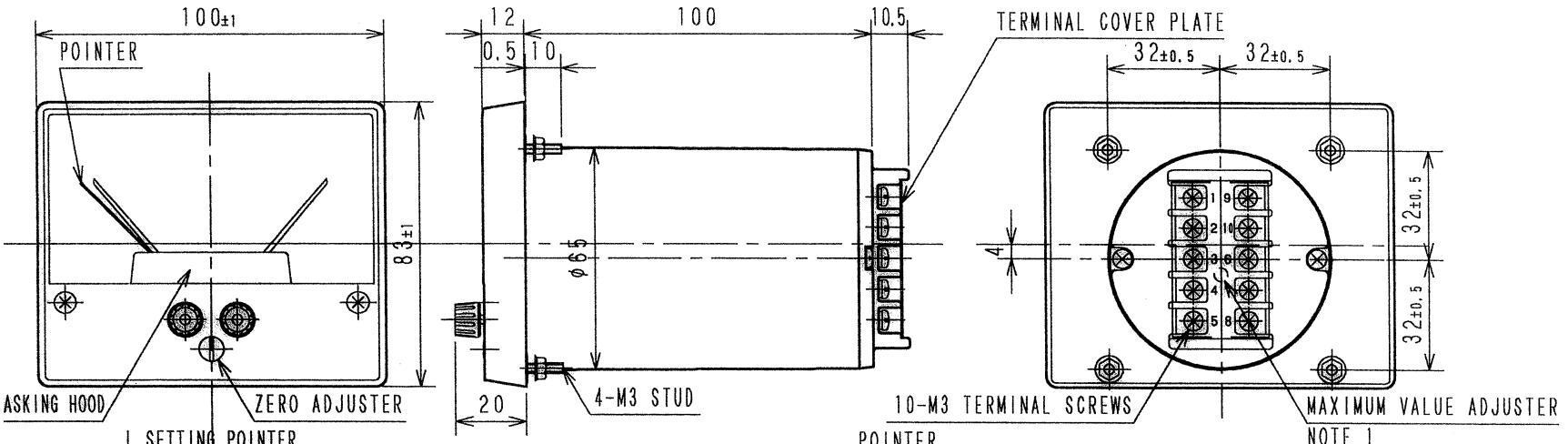
ITEM 10

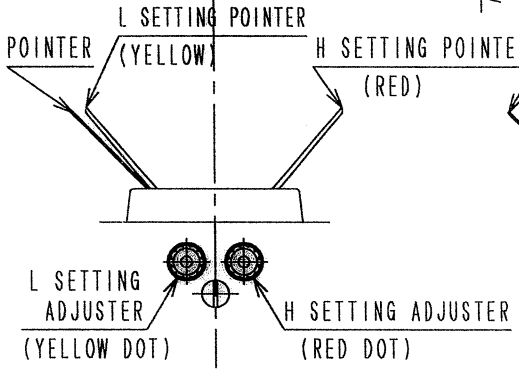


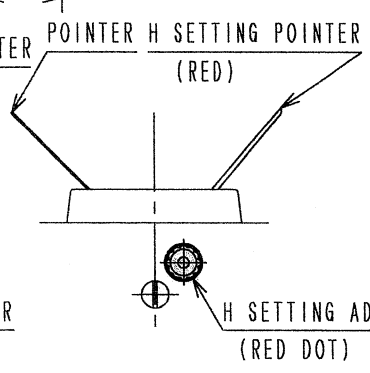
MS-11959

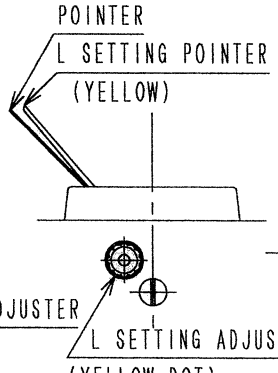
MARK | NO | DATE | DESCRIPTION | BY
3RD. ANGLE PROJECTION
SCALE / | DIM IN mm
CLASSIFICATION
1330
TYPE
MPV-11
TITLE
PHOTOELECTRIC-TYPE METER RELAY
APPROVED K. Kamiguchi
CHECKED S. Enishi
DRAWN T. Ohe
DESIGNED
DATE AUG. 17, 1995
TOYO KEIKI CO., LTD.
DRAWING NO.
MS-11959
※ FULL SCALE ADJUSTER (BUILT IN TYPE ONLY BY MPV-11V)
8-M3 TERMINAL SCREWS
TERMINAL COVER
COMPOSITION OF TERMINAL
METER INPUT H SIDE
(+) (−)
POWER SOURCE
⑨⑩ AC100V~115V
⑨⑪ AC200V~230V
⑨⑩ DC ○○V
4-M6 SCREWS
MASKING HOOD(BLACK)
LESS THAN 33
ZERO ADJUSTER
H SETTING KNOB
H SETTING POINTER(RED)
POINTER
MASKING HOOD
PANEL CUTOUT
4-φ7
45±0.5
45±0.5
45±0.5
45±0.5
130
110±1.5
111±1.5
11.5
8
24
0.5
14.5
φ100
φ102

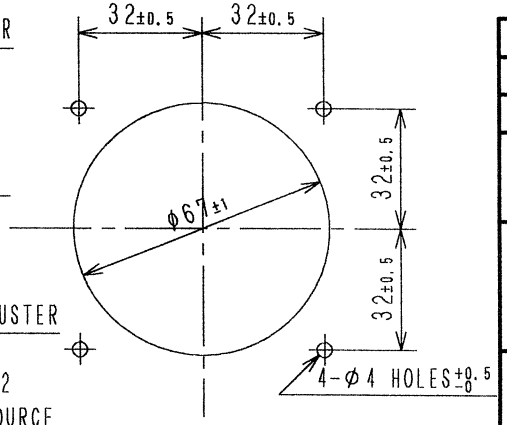
MS-11028A



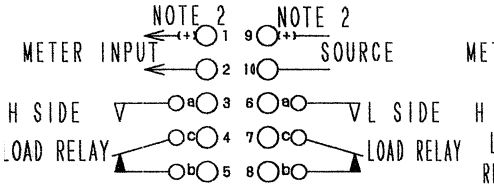




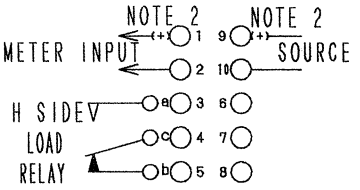




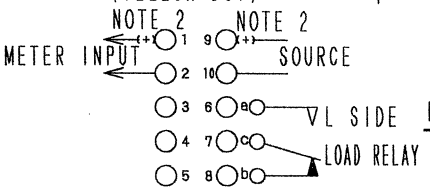
PANEL CUTOUT



IN CASE OF H,L(DOUBLE) SETTING



IN CASE OF H(SINGLE) SETTING



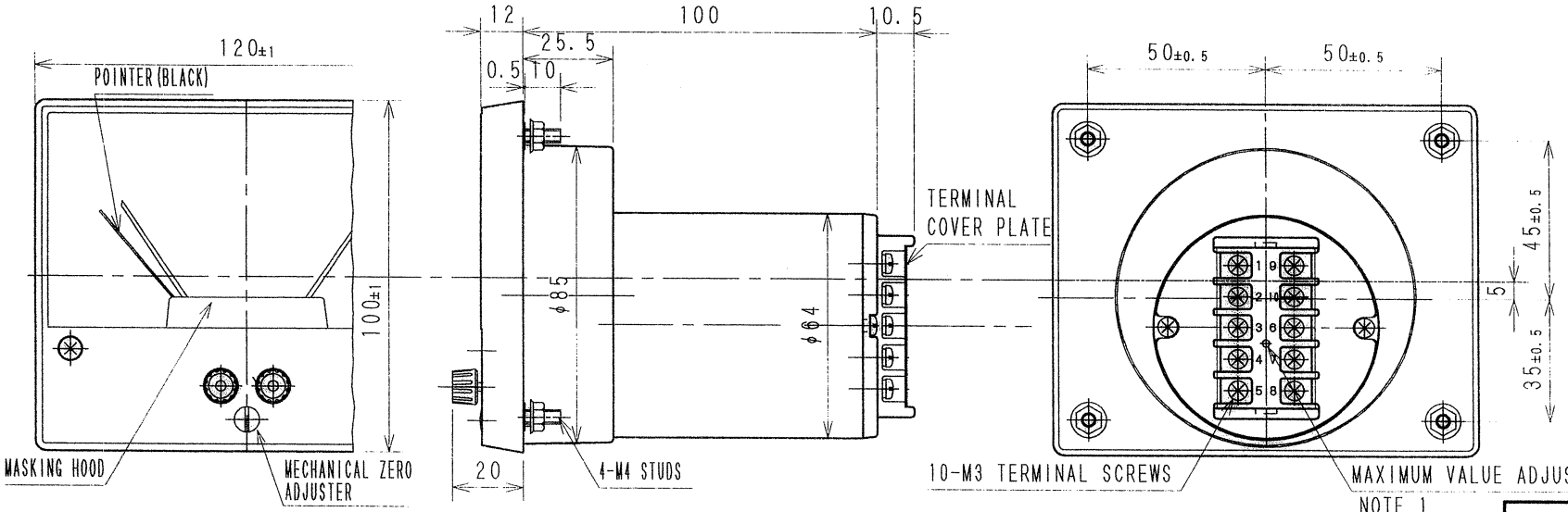
IN CASE OF L(SINGLE) SETTING

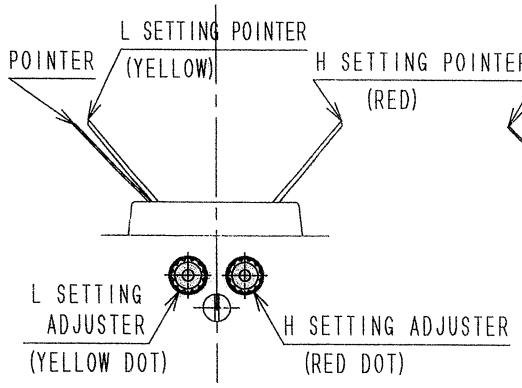
NOTE 1)WE UTILIZE MAXIMUM VALUE ADJUSTER ONLY IN TYPE MPC-10V METER.
2)POLARITY MARKS ARE EFFECTIVE IN CASE METER INPUT OR SOURCE IS DIRECT CURRENT.

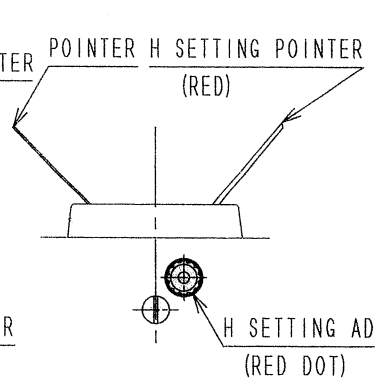
MARK	NO	DATE	DESCRIPTION	BY
3RD. ANGLE PROJECTION				
SCALE /		DIM IN mm		
CLASSIFICATION 1310				
TYPE MPC-10				
TITLE NON CONTACT METER RELAY				
APPROVED	K. Komaguchi			
CHECKED	S. Onishi			
DRAWN	T. Minamiyama			
DESIGNED	S. Onishi			
DATE Sept. 17, 1996				
TOYO KEIKI CO., LTD.				
DRAWING NO. MS-11028A				

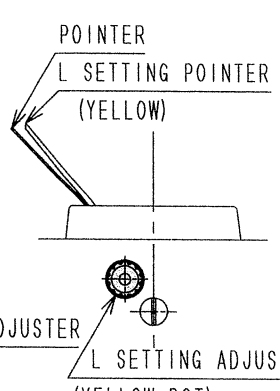
MS-9654B

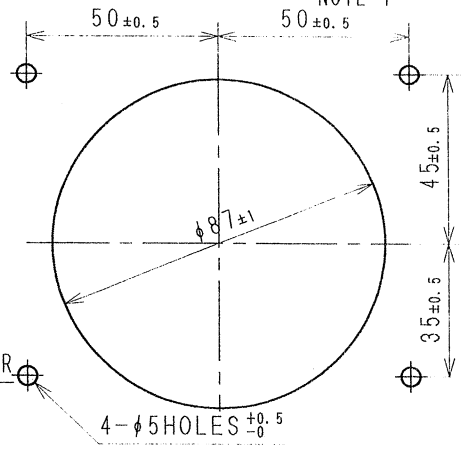
Dimensional tolerance ±3% min. 0.3mm

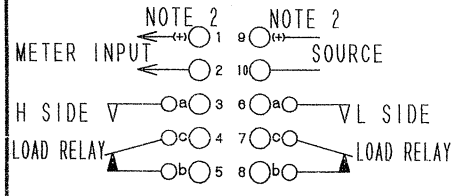




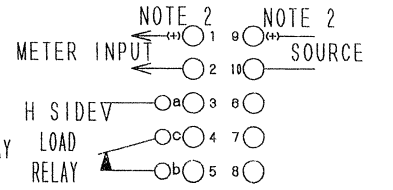




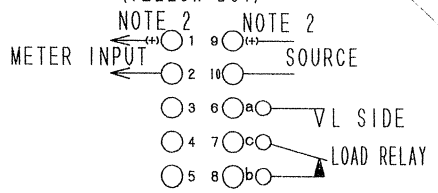




IN CASE OF H, L (DOUBLE) SETTING



IN CASE OF H (SINGLE) SETTING



IN CASE OF L (SINGLE) SETTING

NOTE 1) WE UTILIZE MAXIMUM VALUE ADJUSTER ONLY IN TYPE MPC-12V METER.

2) POLARITY MARKS ARE EFFECTIVE IN CASE METER INPUT OR SOURCE IS DIRECT CURRENT.

MARK	NO	DATE	DESCRIPTION	APP.	CHE.	DRA.

3RD. ANGLE PROJECTION

SCALE 1 : 2 | DIM IN mm

CLASSIFICATION
1310

TYPE
MPC-12

TITLE
WITH TERMINAL COVER
NON CONTACT METER RELAY

APPROVED	K. Yokoi
CHECKED	M. Teramoto
DRAWN	T. Minamizama
DESIGNED	S. Onishi
DATE	January 5, 2002

TOYO KEIKI CO., LTD.

DRAWING NO.
MS-9654B

MS-12975

Dimensional tolerance ±3% min. 0.3mm

MARK	NO	DATE	DESCRIPTION	APP.	CHE.	DRA.
△	2	2017 9.4	Correct termin al number	K.S		T.O

REVISIONS

3RD. ANGLE PROJECTION

SCALE 1 : 2 DIM IN mm

CLASSIFICATION

1410

TYPE

RG-3

TITLE

GROUNDING RESISTANCE METER SOURCE BOX OUTSIDE VIEW

APPROVED	K. Yokoo
CHECKED	M. Okamoto
DRAWN	M. Okamoto
DESIGNED	M. Okamoto
DATE	April 7, 2003
TOYO KEIKI CO., LTD.	
DRAWING NO.	MS-12975

MS-11219A

Note) The terminal arrangement shows one example.

MARK	NO	DATE	DESCRIPTION	BY

3RD. ANGLE PROJECTION

SCALE 1:2 | DIM IN mm

CLASSIFICATION

1800

TYPE

M-4A

TITLE

POWER SUPPLY BOX
for Grounding
resistance meter

APPROVED	H. Yoshida	
CHECKED	M. Tsumoto	
DRAWN	T. Ota	
DESIGNED	T. Ota	

DATE April 6, 2009

TOYO KEIKI CO., LTD.

DRAWING NO.

MS-11219A

MS-12618

MARK	NO	DATE	DESCRIPTION	BY
3RD. ANGLE PROJECTION				
SCALE 1/2	DIM IN mm			
CLASSIFICATION 1410				
TYPE IS-2				
TITLE INSULATION RESISTANCE MONITOR OUTSIDE VIEW				
APPROVED				
CHECKED				
DRAWN				
DESIGNED				
DATE July 29,1999				
TOYO KEIKI CO.,LTD.				
DRAWING NO. MS-12618				

MS-12619

MARK	NO	DATE	DESCRIPTION	BY
3RD. ANGLE PROJECTION				
SCALE 1/2		DIM IN mm		
CLASSIFICATION 3300				
TYPE IS-2				
TITLE INSULATION RESISTANCE MONITOR CONNECTION DIAGRAM				
APPROVED				
CHECKED				
DRAWN				
DESIGNED				
DATE July 29,1999				
TOYO KEIKI CO.,LTD.				
DRAWING NO. MS-12619				

MS-7615A

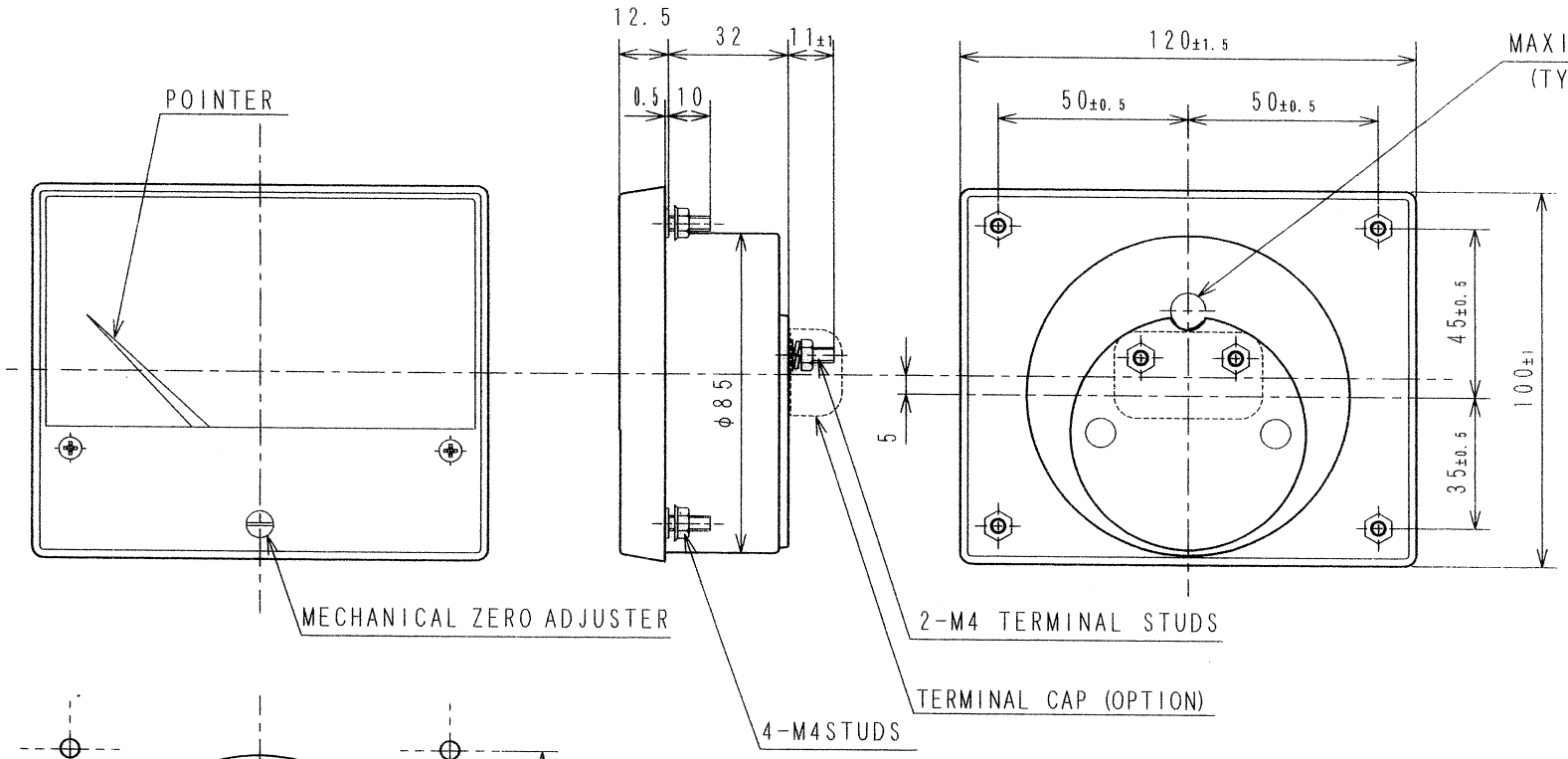
NOTE 1 : WE UTILIZE MAXIMUM VALUE ADJUSTER ONLY IN TYPE □CF-10V METER.(□:D,S,C)

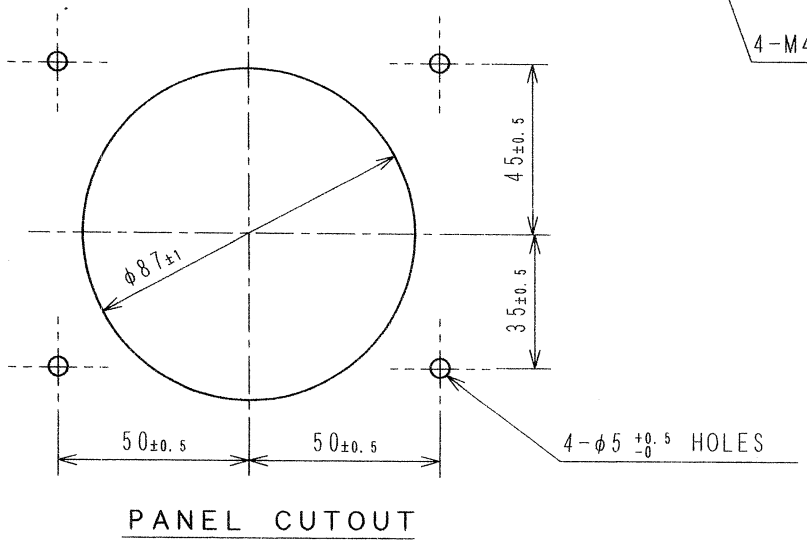
NOTE 2 : M5 TERMINAL SCREWS ARE EFFECTIVE ONLY TO TYPE ACF-10 (10~30A) AC AMMETER.

MARK	NO	DATE	DESCRIPTION	BY
3RD. ANGLE PROJECTION				
SCALE 1/2		DIM IN mm		
CLASSIFICATION 1210				
TYPE □CF-10				
TITLE PANEL METER WITH TERMINAL CAP				
APPROVED	K. Kawada			
CHECKED	S. Endo			
DRAWN	K. Morigama			
DESIGNED				
DATE May 12,1994				
TOYO KEIKI CO.,LTD.				
DRAWING NO. MS-7615A				

MS-7436-1 | A

Dimensional tolerance ±3% min. 0.3mm





PANEL CUTOUT

MARK	NO	DATE	DESCRIPTION	APP.	CHE.	DRA.
			ADDITION TERMINAL COVER			

3RD. ANGLE PROJECTION

SCALE 1 : 2 | DIM IN mm

CLASSIFICATION
1210

TYPE
□CF-12N

TITLE
PANEL METER
OUTSIDE VIEW

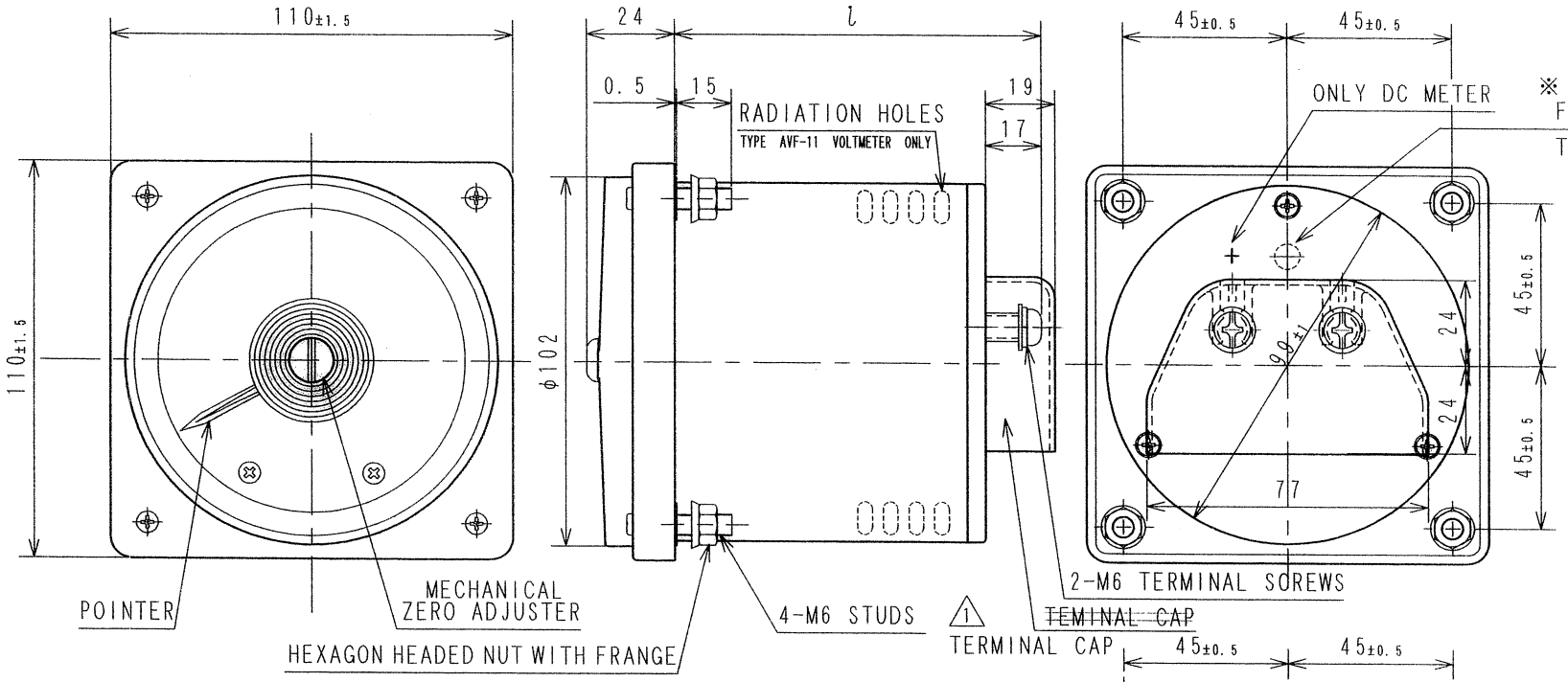
APPROVED	K. Shinozaki
CHECKED	T. Tsujiyama
DRAWN	A. Kawamura
DESIGNED	S. Ichihara
DATE	February 24. 2015

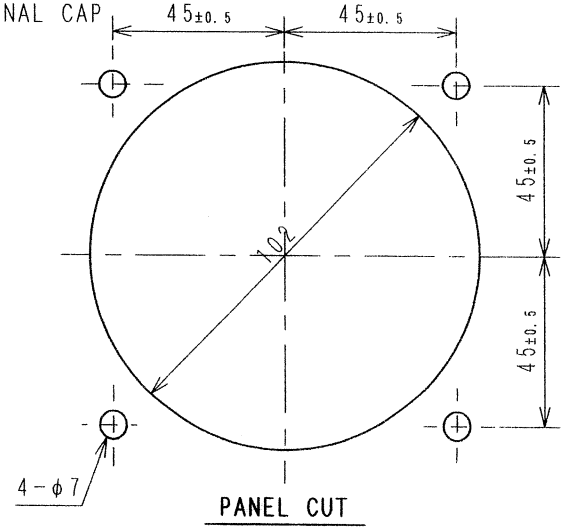
TOYO KEIKI CO., LTD.

DRAWING NO.
MS-7436-1 | A

MS-7614 D

Dimensional tolerance ±3% min. 0.3mm





	TYPE	OPERATING PRINCIPLE	ℓ	F.S.ADJUSTER
1	DVF-11	PERMANENT-MAGNET MOVING COIL TYPE	102	×
2	SVF-11	Rectifier type	102	
3	CVF-11	Rectifier type	102	
4	SeVF-11	ELECTRONIC DEVICE TYPE	102	
5	FVF-11	ELECTRONIC DEVICE TYPE	102	
6	AVF-11	Moving iron type	129	
7	DVF-11V	PERMANENT-MAGNET MOVING COIL TYPE	102	○
8	SVF-11V	Rectifier type	102	
9	CVF-11V	Rectifier type	102	

MARK	NO	DATE	DESCRIPTION	APP.	CHE.	DRA.
△1	1	2013 7.10	amendment	W.Y		T.T

3RD. ANGLE PROJECTION

SCALE 1 : 2 | DIM IN mm

CLASSIFICATION
1220

TYPE
□VF-11

TITLE
PANEL METER
WITH TERMINAL CAP

APPROVED	K. YOKOI
CHECKED	M. TERAMOTO
DRAWN	M. KITANO
DESIGNED	S. ONISHI
DATE	Jun 23. 2003

TOYO KEIKI CO., LTD.

DRAWING NO.
MS-7614 D