

# PICTURE FRAME SHAPE INSTRUMENT

## FK SERIES

### OUTLINE

FK series is a Picture Frame Shape Instruments meter, which only the scale part is in front of panel. This series have 2 types, FK-7 and FK-5.

FK series is one of measurement instrument suitable for electric and electronic equipment. Adoption with knife-edge pointer and it can also use with high accuracy mirror scale plate. In addition, this series meter is with superior quality, be fully satisfied with high reliability and also with standard JIS C 1102-1~9 (IEC 60051-1 matching) strong as vibrating and impulse.



FK - 5C



FK - 7C

### FEATURES

- ▶ High quality and high performance meter.
- ▶ Adopting transducer with electronics technology, more model product is expanding.
- ▶ Received indicator for physical value scale also can be manufacture.
- ▶ Meter with mirror knife-edge pointer also can be manufacture.
- ▶ Meter material is flame retardant.
- ▶ One-touch installation.

# Picture Frame Shape Instrument - FK Series

## TYPE CODE DESIGNATION

F (1) K - (2) C (3) - (4)

**(1)** Type of measurand

Mark	Measurand	Operation Principle
M	DC current, voltage	Permanent magnet moving coil
X	DC receiving indicator	Permanent magnet moving coil
Y	AC receiving indicator	Rectifier
C	AC current, voltage	Rectifier/ RMS value rectifier
W	AC power	Transducer
WVB	Reactive power (balanced)	Transducer
WV	Reactive power (unbalanced)	Transducer
PB	Power factor (balanced)	Transducer
P	Power factor (unbalanced)	Transducer
A	Frequency meter	Transducer

**(2)** Shape

Mark	Picture-Frame Shape Meter
7	127 × 73
5	100 × 57

**(3)** Special Specification

Mark	Specification
H	SCR
C	Cycle Control

**(4)** Kind of Circuit

Mark	Circuit
12	Single phase
13	Single phase 3-wire
33	Three phase 3-wire
34	Three phase 4-wire

\*Please specify this circuit for AC power, Reactive power & Power factor

## Picture Frame Shape Instrument - FK Series

### COMMON STANDARD SPECIFICATIONS

ITEM		SPECIFICATION	
Standard		JIS C 1102:2007 [Electric Indicating Meter Direct Acting Type]	
		IEC 60051-1 Compliant	
Class		Refer to [List of FK series]	
Support system		Taut band system	
Swing angle of meter		86°	
Dimensions meter from front		FK-7C: 127×73mm	
		FK-5C: 100×57mm	
Length of scale		FK-7: 87mm	
		FK-5: 72mm	
Color of scale plate		White	
Pointer		Knife-edge (Red)	
Installation posture		Vertical (⊥)	
Material panel		Iron & non-iron plate	
Thickness panel		4mm or less	
Color of cover		Black (Munsell N1.5)	
Material of case		Cover: Phenol resin (FK-7C), ABS resin (FK-5C)	
Insulation resistance		Between electric circuit and outer case	DC500V, 50MΩ or more
Voltage test		Between electric circuit and outer case	AC3320V, between 5sec.
Safety requirements	Standard	JIS C 1010-1	
	Insulation	Between electric circuit and outer case: Base of insulation	
	Use	For indoor use (Cubicle etc.)	
	High altitude	2000m or less	
	Pollution	Pollution level 2	
	Measure category	CATIII	
	Max. circuit voltage	600V (Ammeter)	
Operated temperature/ Humidity limit		-10~55°C, Average day temperature 40°C or less, 25~85%RH (Reference to steel ship rules ambient temperature 45°C)	
Storage temperature range		-20~70°C	

### STANDARD SCALE DIVISION

Max. scale value (10-time)		1	1.5	2	2.5	3	4	5	6	7.5	8	9
Type	FK-7C	50	75	40	50	60	80	50	60	75	80	45
	FK-5C	50	30	40	50	30	40	50	30	37.5	40	45

# Picture Frame Shape Instrument - FK Series

## COMMON SPECIAL SPECIFICATIONS (Please Specify)

ITEM		SPECIFICATION
Scale	Color line	Red, Green, Yellow (please specify)
	Extend scale	FCK: 2~5-time extend
	Color area (bar)	Red, Green, Yellow (please specify)
	Double scale	Please specify
	Double seal	Please specify
	Max. scale division	7-type:100 division; 5-type: 80 division
	Mirror	Please specify
	Special mark	Please specify
Vibration proof specification	Vibration	2~10Hz amplitude 15mm p-p 2~55Hz, 29.4m/s <sup>2</sup>
	Shock	147m/s <sup>2</sup> , 30-time
Tropical specification	Rust preventative 「FOR TROPICS」 will display at the name plate	
Pointer	Rod-shape (black) combine use with multiple scale etc.	
Control pointer	—	
Installation posture	Horizontal or Inclined (specify the angle)	
Flame-retardant materials	Cover	—
Protection circuit of meter	Overcurrent	Specify for necessary tolerated dose
	Overvoltage	
Part of extended scale	Voltmeter	Up to ±10%, ±20%, ±30% of central scale value 75% or more of scale length
	Ammeter	Up to 20% of upper limit value of effective measuring range 95% or more of scale length
		Up to 50% of upper limit value of effective measuring range 75% or more of scale length
For SCR control waves	AC current, AC voltage, Frequency	
For cycle control use	AC current, AC voltage (Rectifier Type)	
Scale (single item)	Not JIS mark	
Color of cover	Please specify	
Others	Please consultation with us for the special frequency	

## PURCHASE SPECIFICATIONS

### Item to Specify When Purchase

<ol style="list-style-type: none"> <li>1).Type Name</li> <li>2).Rated (Max. scale/ Input) *1</li> <li>3).Color of cover</li> <li>4).Terminal cover (specify if require)</li> <li>5).Units</li> <li>6).Options (Refer to Common Special Specification)</li> <li>7).Test report (specify useful frequency and number of copies require)</li> </ol> <p>*1. For max.scale value watt meter or var meter, please refer to List of Standard Max. Scale Value. Please specify frequency for power factor meter according to the specification.</p>
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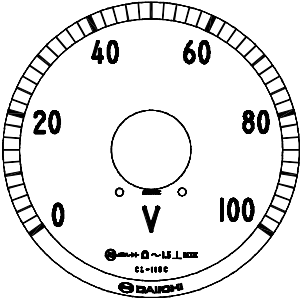
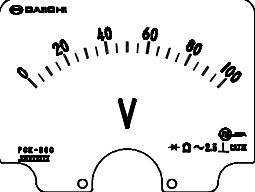
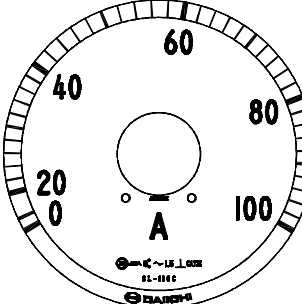
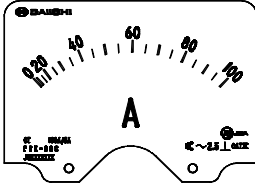
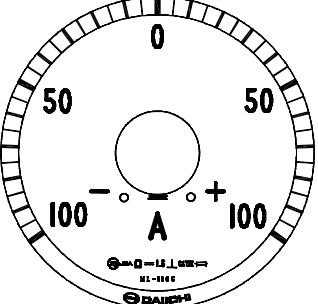
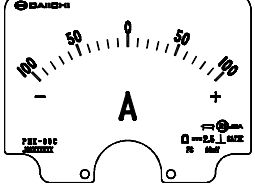
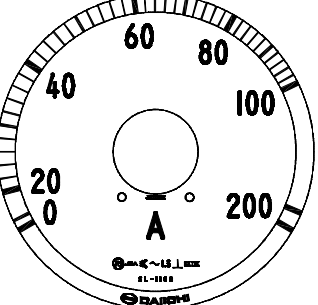
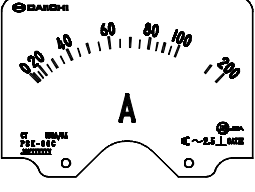
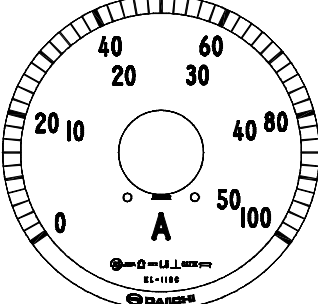
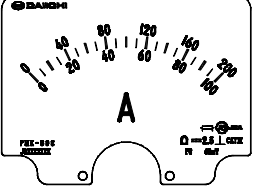
## Picture Frame Shape Instrument - FK Series

### LIST OF FK SERIES

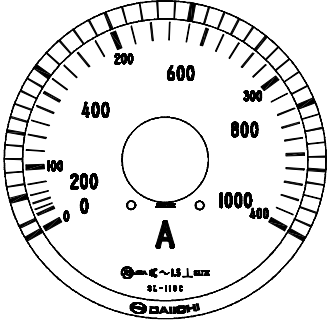
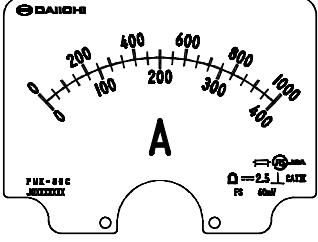
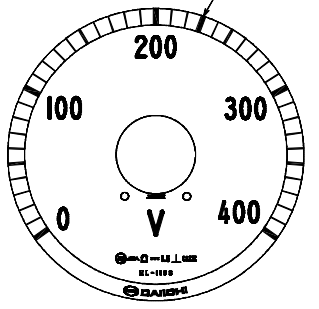
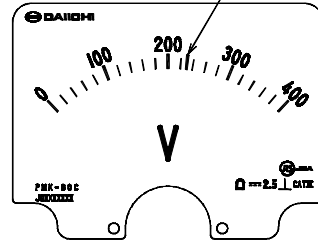
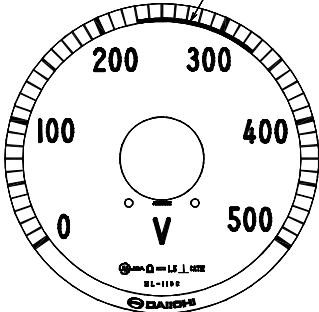
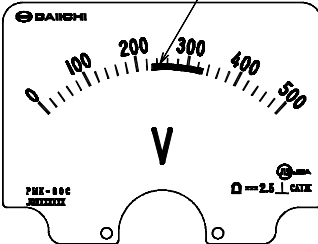




MODEL		FK - 7 C		FK - 5 C		
Product	Principle	Type	Class	Type	Class	
DC Ammeter	Moving coil	FMK-7C	1.5	FMK-5C	2.5	
DC Voltmeter		FMK-7C	1.5	FMK-5C	2.5	
DC Receiving Indicator	Moving coil	FXK-7C	1.5	FXX-5C	2.5	
AC Receiving Indicator	Rectifier	FYK-7C	1.5	FYK-5C	2.5	
AC Ammeter	Rectifier	FCK-7C	1.5	FCK-5C	2.5	
AC Voltmeter		FCK-7C	1.5	FCK-5C	2.5	
Watt Meter	Single phase	Transducer	FWK-7C-12	1.5	FWK-5C-12	2.5
	Single phase 3-wire		FWK-7C-13	1.5	FWK-5C-13	2.5
	3 phase		FWK-7C-33	1.5	FWK-5C-33	2.5
	3 phase 4-wire		FWK-7C-34	1.5	FWK-5C-34	2.5
Var Meter	Single phase	Transducer	FWVK-7C-12	1.5	FWVK-5C-12	2.5
	3 phase (balanced)		FWVBK-7C-33	1.5	FWVBK-5C-33	2.5
	3 phase (unbalanced)		FWVK-7C-33	1.5	FWVK-5C-33	2.5
	3 phase 4-wire		FWVK-7C-34	1.5	FWVK-5C-34	2.5
Power Factor Meter	Single phase	Transducer	FPK-7C-12	5.0	FPK-5C-12	5.0
	3 phase (balanced)		FPBK-7C-33		FPBK-5C-33	
	3 phase (unbalanced)		FPK-7C-33		FPK-5C-33	
	3 phase 4-wire (balanced)		FPBK-7C-34		FPBK-7C-34	
	3 phase 4-wire (unbalanced)		FPK-7C-34		FPK-5C-34	
Frequency Meter	Transducer	FAK-7C	1.0	FAK-5C	1.0	

► Keep in mind please, Transducer type meter does transitional indication at voltage input start.

# EX. SCALE

Scale Specification	Wide Angle Meter Ex.: L-110C	Square Shape Meter Ex.: PK-80C
<b>Standard Scale</b> Scale digit: Black Scale line : Black Unit mark : Black Scale division : Refer to standard lancet shape pointer division		
Moving iron type can be left out the lower value part of scale Scale division : Refer to standard lancet shape pointer division		
<b>± Scale Meter (Both Side Deflect Meter)</b> Scale digit: Black Scale line : Black Unit mark : Black		
<b>Extend Scale (2-Fold Extend)</b> Scale digit: Black ; Extend part: Red Scale line : Black ; Extend part: Red Unit mark : Black		
<b>Single Scale Double Seal Meter</b> Scale digit: Black Scale line : Black Unit mark : Black Standard place a seal of scale figure : Higher value will display at inside & smaller value will display at outside		

# EX. SCALE

Scale Specification	Wide Angle Meter Ex.: L-110C	Square Shape Meter Ex.: PK-80C
<p><b>Double Scale Double Seal</b></p> <p>Scale digit: Black Scale line : Black Unit mark : Black Scale division : Refer to standard lancet shape pointer division Standard place a seal of scale figure : Higher value will display at outside &amp; smaller value will display at inside For wide angle meter : Higher value will display at inside &amp; smaller value will display at outside</p>		
<p><b>Coloring Scale (Color Line)</b></p> <p>Scale color line : Red, Yellow, Green Possible combine the color line &amp; color figure to use for double scale</p>		
<p><b>Color Belt</b></p> <p>Color Belt : Red, Yellow, Green</p>		
<p><b>Scale line and Scale figure</b></p> <p>1) Type of scale line Scale figure will print at main line Please refer to standard lancet shape pointer division &amp; standard knife shape pointer division</p> <p>2) Figure of scale : Max. 4-digit (9999) If 10000 is exceed, unit will be change like 6.6kV or use multiple like <math>36 \times 1000 \text{min}^{-1}</math></p> <p>3) Please have a consultation with us if scale division is different with standard division (odd scale) Please specify for Max. division</p> <p>4) Display 「0」 will be left out if the scale figure after decimal point is Zero. (like scale figure 1 as below)</p> <p>5) Display 「0」 will be left out if the scale figure before decimal point is Zero. (like scale figure 0.5 as below)</p> <p>Ex. : For range value 1.5</p>	 <p>Main Line    Center Line    Thin Line</p>	 <p>Main Line    Center Line    Thin Line</p>
 <p>Wide Angle Meter Scale will display by 「1.0」 for wide angle meter (except BRL &amp; RL series)</p>	 <p>Square Share Meter BRL &amp; RL series is same scale as square share meter</p>	

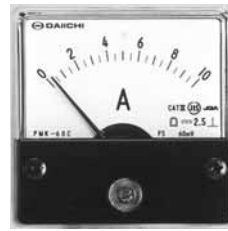


## § Wide Angle METER §

### STANDARD DIVISION OF LANCET-SHAPED POINTER



L series



PK series

MODEL	L-65C PK-60C, 80C, 100C LK-8C, 10C BRL-110CH Instant Meter		RL-80C PK-120C LK-12C F-10	
MAX. SCALE VALUE	SCALE DIVISION DIAGRAM	DIV.	SCALE DIVISION DIAGRAM	DIV.
1		20		20
1.5		30		30
2		20		40
2.5		25		25
3		30		30
4		20		40
5		25		25
6		30		30
7.5		15		37.5
8		16		40
9		18		45



## § Wide Angle METER §



LK series



F series



F series

MODEL	RL-110C BRL-110CH Utility meter		F-15, 17 Note) 4-digit scale of 2T is not manufacturable. L-110C L-80C EL-110C		
	MAX. SCALE VALUE	SCALE DIVISION DIAGRAM	DIV.	SCALE DIVISION DIAGRAM	DIV.
1	*2	0 2 4 6 8 10	50	*2	0 2 4 6 8 10
1.5		0 5 10 15	30	*8	0 5 10 15
2	*2	0 5 10 15 20	40		0 5 10 15 20
2.5	*4	0 5 10 15 20 25	50		0 5 10 15 20 25
3		0 10 20 30	30	*8	0 5 10 15 20 25 30
4	*2	0 10 20 30 40	40		0 10 20 30 40
5	*4	0 10 20 30 40 50	50		0 10 20 30 40 50
6		0 20 40 60	30	*8	0 10 20 30 40 50 60
7.5		0 20 40 60 75	37.5	I-110 & I-80: 37.5 DIVISION *9	0 20 40 60 75
8		0 20 40 60 80	40		0 20 40 60 80
9		0 30 60 90	45	*5	0 20 40 60 80 90

## § Wide Angle METER §

### STANDARD DIVISION OF KNIFE-EDGE POINTER

MODEL	PK-60C, 80C, 100C LK- 8C, 10C FK- 5C,		PK-120C LK- 12C FK- 7C		
	MAX. SCALE VALUE	SCALE DIVISION DIAGRAM	DIV.	SCALE DIVISION DIAGRAM	DIV.
1	0 2 4 6 8 10		50	0 2 4 6 8 10	50
1.5	0 5 10 15		30	0 2 4 6 8 10 12 14 15	75
2	0 5 10 15 20		40	0 5 10 15 20	40
2.5	0 5 10 15 20 25		50	0 5 10 15 20 25	50
3	0 10 20 30		30	0 5 10 15 20 25 30	60
4	0 10 20 30 40		40	0 10 20 30 40	80
5	0 10 20 30 40 50		50	0 10 20 30 40 50	50
6	0 20 40 60		30	0 10 20 30 40 50 60	60
7.5	0 20 60 60 75		37.5	0 20 40 60 75	75
8	0 20 40 60 80		40	0 20 40 60 80	80
9	0 30 60 90		45	0 30 60 90	45

- ▶ Division line part of is omitted for moving iron type meter.
- ▶ For scale extended meter, red color line and numbers of extended part.
- ▶ Have a consultation with us for +/- meter, notation of max. scale value, multiple scale meter, etc.
- ▶ \*1, becomes 15 divisions for scale extended ammeter PK-60C, PK-80C and LK-8C.
- ▶ \*2, becomes 20 divisions for scale extended ammeter PK-120C, LK-12C, F-10, 15, 17, RL-80C and RL-110C.
- ▶ \*3, becomes 15 divisions for scale extended ammeter PK-120C, LK-12C, F-10, 15, 17 and RL-80C.
- ▶ \*4, becomes 25 divisions for scale extended ammeter RL-110C.
- ▶ \*5, seal numbers: 0, 30, 60, 90 for type meter F-15, and 17.
- ▶ \*6, becomes 16 divisions for scale extended ammeter PK-120C, LK-12C, F-10, RL-80C.
- ▶ \*7, becomes 18 divisions for scale extended ammeter PK-120C, LK-12C, F-10, RL-80C.
- ▶ \*8, becomes 30 divisions for scale extended ammeter F-15, 17.
- ▶ \*9, becomes 37.5 divisions for scale extended ammeter F-15, 17.