som at first appearance. The special features are that, possibility of laundry touching the vanes is eliminated as much as possible and, in addition, because centrifugal force of water is made strong in order to increase the capacity, washing ability is superior and also laundry will not be damaged.

(2) Reason that Two Rotating Vanes are Used

Washing action can be done even when there is only one ratating vane. However, in this case, because suction of water is done on one side only, laundry will collect near the rotating vane making possibility of contact great. Moreover, because rotating motion of laundry will be strong near the rotating vane but weak on the other side, there will be a tendency of the laundry being twisted. In general, with rotary agitator type washers, from the fact that laundry is washed by laundry making a rotating motion together with the water, if even a little more laundry is put in, rotating vane will rotate but the laundry will not rotate. When special care is not taken on this point, there will be fear of damaging the laundry near the rotating vanes. In Type W 361, by using two rotating vanes, rotation of the laundry is very smooth and also through this, capacity is doubled and so it is possible to wash a large quantity of laundry at one time.

Also, the reason that the centres of the two rotating vanes are shifted apart by about 10 mm. is for making the rotating motion of laundry large which helps to prevent inequalities of washing and twists.

(3) Adoption of Special Bearings

For the rotating vanes, special bearing are used in the tank wall by which leakage of water is perfectly prevented. With the hitherto rotary agitator type, sleeve bearings are generally used in which artificial rubber is used for prevention of water leakage, but, as rotation of vanes if comparatively high being several hundred R.P. M., wear of bearings quickens wear of the artificial rubber and it has been the tendency of shortening the life by leakage of water which causes deterioration of lubricating oil circulation or corrosion of shaft after usage of short periods. However, in Type W 361, in order to make it semi-permanent, ball bearings are adopted for bearings and sealed off by water-resisting and alkali-resisting grease of superior quality. Also, by using bellows in the water-tight parts, water leakage is completely prevented.

(4) Porcelain Tub

As the washer tank is enamelled in pure white, it looks neat and is easy to clean. Moreover, there is no fear of corrosion and the construction is robust.

(5) Easy Handling and Long Life

Because construction is simple, faults do not occur and it will do to simply clean the tank after usage and no oiling is required. Because maintenance is so simple, the washer will withstand a long period of usage.

(By Yoichiro Sasaki, Tech. Dept.,
Merchandise Design Branch)

WIDE ANGLE TYPE SWITCHBOARD INSTRUMENTS

Fuji Denki's switchboard instruments are manufactured in four types as shown in Fig. 1.

(A) 140 m/m Rectangular normal type.
(B) 100 m/m Rectangular normal type.
(C) 140 m/m Rectangular wide angle type.
(D) 100 m/m Rectangular wide angle type.

(A) of above is one of our standard products. The production of (B) has started quite recently for installation in miniature switchboard and has already been introduced to our customer in the Fuji Electric Journal, Volume 27. No. 7 Japanese editions. The latter (C) and (D) belong among our most recent products and therefore is introduced in this review. It's special features are a wide deflecting angle of 250° which has never been produced before, especially (C) is aimed to improve exactness of scale reading compared with (A), and (D) is designed to lessen the size of the switchboard and to maintain the readability of (A). Special note should be given (D) which is the smallest wide angle meter ever produced in our country.

SPECIAL FEATURES

(1) The scale length is in twice of that of ordinary type meters of the same dimension. The 140 m/m wide angle meter has a scale of 240 m/m and the 100 m/m wide angle meter a scale of 150 m/m assuring easy and exact reading of the scale.

(2) In other words, the meter dimensions of one with a certain dimension scale can be remarkably lessened making possible reduction of the switchboard size without missing readings and allows centerized supervision at the switchboard by fewer persons.

(3) As the pointer and the scale are set on the same level, parallax errors can be elliminated. The scale surface is well lighted and the damping is suitable. Therefore it is possible to read the scale precisely and quickly.

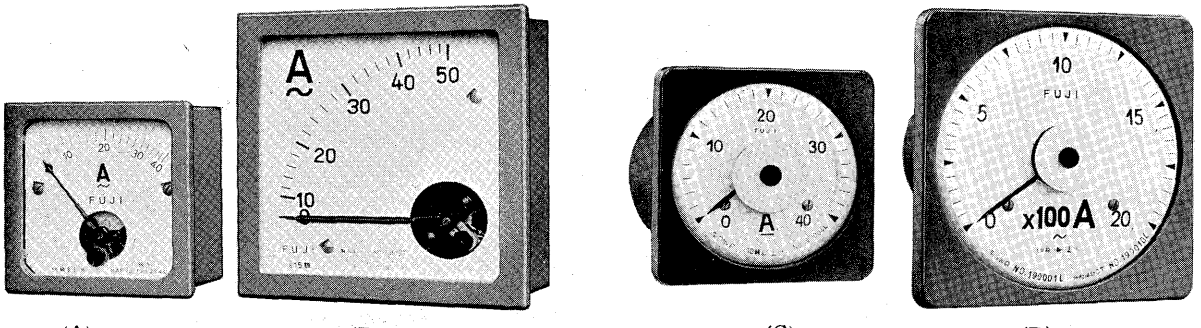
(4) The modern design of the meters enhance the up-to-date appearance of the switchboard. The screw bolt heads do not appear on the surface of the panel board.

(5) The characteristics fully satisfy the general conditions required for the 1.5 class or 1.0 class of accuracy in JIS-C-1102.

(6) The outline dimension is as in Fig. 2. Installation is easily done by five round holes, in spite of they being of the flush type.

KINDS

The standard types of our wide angle meters are as shown in table 1, but we have omitted detailed descriptions of derivative uses such as a speed meter, thermometer and water level indicator.



(A) (B) (C) (D)

(A) 100m/m Rectangular normal type
(B) 140m/m Rectangular normal type
(C) 100m/m Rectangular wide angle type
(D) 140m/m Rectangular wide angle type

Fig. 1. Outer View of the Fuji Switchboard Instruments

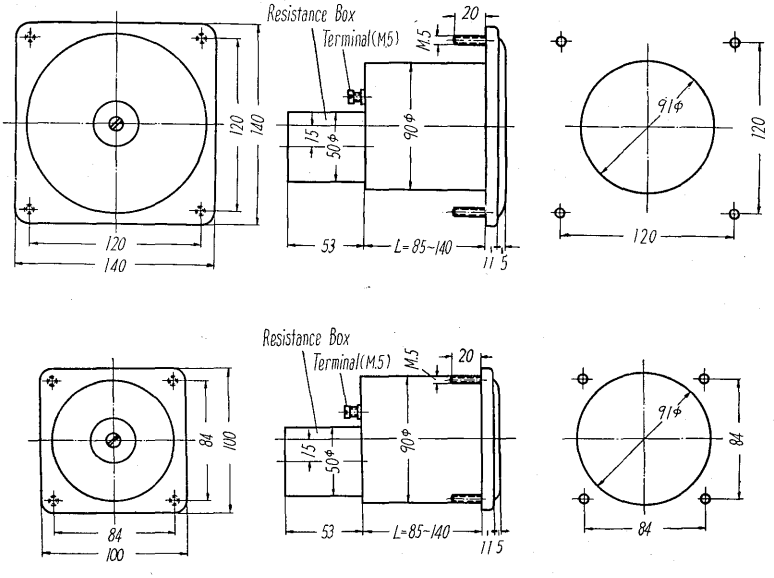


Fig. 2. Outline Dimensions and Drilling Plans of Wide Angle type Instruments

Table 1. List of the Wide Angle type Switchboard Instruments

Kinds of meter	Model angle 140 m/m	Model angle 100m/m	Type	Connection	Standard scale	Standard rating	Accessories fitted, outside.
D.C. Ammeter	DWQ	DWF	Moving Coil	Install in the shunt for direct connection	0.1 .....30A	60mV	—
				For connect with the shunt.	Over 30A		The shunt
D.C. Voltmeter	DWQ	DWF	〃	Install in the multiplier for connection	10—500V	10mA	—
				For connect with the multiplier	Over 500V		The multiplier
A.C. Ammeter	GWQ	GWF	Rectifier	For direct connection	1 .....30A		Auxiliary C.T.
				For connect with C.T.	5A×Ratio of C.T.	5A	C.T. & AuxiliaryC.T.
A.C. Voltmeter	GWQ	GWF	〃	For direct connection	50 .....500V		—
				For connect with P.T.	150 V×Ratio of P.T.	150V	P.T.
Three phase watt-meter	OIIWQ	OIIWF	Dynamo-meter	For connect with P.T. and C.T.	1 kW×Ratio of P.T.×Ratio of C.T.	110V 5A	P.T., C.T.
Three phase var merer	OIIWQ	OIIWF	〃	〃	1 kVar×Ratio of P.T.×Ratio of C.T.	110V 5A	〃
Power factor meter	KWQ	KWF	Dynamo-meter ratiometer	〃	0....1....0....1 Cos φ	110V 5A	〃
Frequency meter	RWQ	RWF	Induction dynamo-meter	Direct or connection with P.T.	±2.5C ±5C	110V	(P.T.) Impedance box
Ratio meter	QWQ	QWF	Moving coil ratio-meter	Coupled with transmitter		6V. d.c.	—
Position indicator	SWQ	SWF	Selsyn	〃		110V	—
Synchronoscope	SWQ	SWF	〃	Direct or connection with P.T.	SLOW←0→Fast	110V	(P.T.) Resistor
Phase rotation indicator	PWQ	PWF	Revolving magnet field	〃	Lag← →Lead	110V	(P.T.)

(By Seiichi Ishibashi, Tech. Dept., Measuring Instrument Branch.)