



URNS-COUNTING DIAL

(for use with Helicaiohm Pots. and Multi-turn Pots.)

SAKAE Turns-counting Dials are designed for use with Helicalohm Potentiometers and multi-turn potentiometers and have an elegant appearance and rigid construction offering an easy reading, smooth rotation and accurate counting. There are a plenty of models: **MA, MB, MF, MG** in analog type and **DA, DB, DC** in digital type. In particular, **MF** and **DB** dials have a unique internal mechanism with a

special flexible coupling incorporated, which we developed (several patents obtained and designs registered) and adopted first of all in the world to solve the traditional troubles such as irregular rotation and uneven torque resulting from inaccurate mounting of the potentiometer on dial.

THE NOMENCLATURE OF SAKAE TURNS-COUNTING DIAL

S MB 10 - 25 B 6 - ○○○○

Special Specifications

S means the turns-counting dial with special mechanical specifications of graduation not applicable to our standard. (Model **MA** is only available to special specifications.)

Type

MB means a kind of model among our 7 models of turns-counting dial. The 8 models are **MA, MB, MF, MG, DA, DB** and **DC**.

Number of Turns

10 means 10 full turns-counting type. The 6 standard numbers of turns are available, namely, 3, 5, 10, 15, 20 and 100, but subject to a limit from each model, it is convenient to use the dial with same number of turns as that of multi-turn potentiometer to be combined.

4 digits branch number to be used for specific requirements.

Fitting Shaft Diameter

6 means the mounting hole of 6mm dia. to be suitable for the pot, with 6mm dia. shaft. The 5 standard mounting holes are available, namely, 3mm, 3.175mm, 4mm, 6mm and 6.35mm, but a single model is not always furnished with all of these 5 sizes of holes. (Model **MA** has always 6mm dia. hole and therefore, this indication is not necessary.)

Lock

B means that the lock lever is fitted to lock the dial rotation at any desired position. No lock lever is fitted unless **B** is given.

Diameter

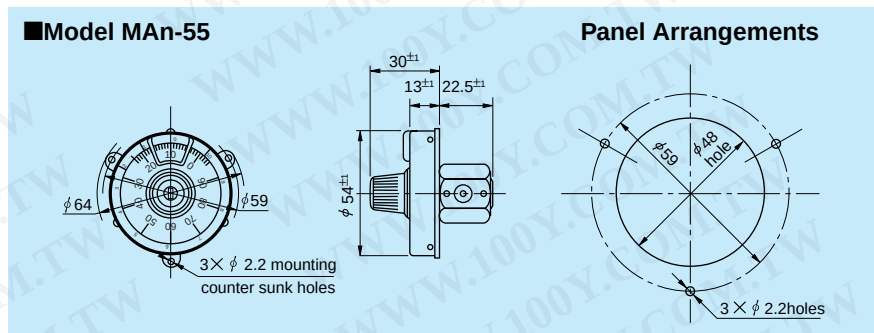
25 means the approximate outer diameter of the dial body in metric system. The 9 standard diameters are available, namely, 15mm, 22mm, 24mm, 25mm, 26mm, 27mm, 30mm, 46mm and 55mm.

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SELECTION GUIDE

Kind of Reading	Type	Diameter (mm)	Model No.	Features
Analog	MA	Ø55	MA-55	You can read the number of turns-counting precisely in outer graduations which rotate continuously relating to the shaft rotation without any intervals. Special graduations are available in this series.
	MB	Ø26, Ø31	MB-25, MB-30	Popular sized dials with rigid construction for general use.
	MF	15×18.5 25×29 Ø22, Ø46	MF-15, MF-25, MF-22, MF-46	Most advanced dials in the world. Even the unskilled can easily mount it with the potentiometer on the panel because this dial has a special flexible coupling inside, of which device is patented. (U.S.A. PAT. No. 4197765)
		15×18.5	MF-15D	Popular low-cost item without flexible coupling.
	MG	Ø22	MG-22	This low-cost popular type dial can be mounted on every kind of pots. and 2 kinds of lock mechanism are available.
Digital	DA	Ø24	DA-24	Smallest digital dial with easiness to operate. 3 digits of figures give you precise indication of number of turns-counting of the pot. mounted.
	DB	26×43.5	DB-26	Rectangular digital dial with flexible coupling incorporated as in MF dial.
		26×43.5	DB-26D	Popular low-cost item without flexible coupling.
	DC	Ø27×31.5	DC10-27	Low-cost round-shaped digital dial.
		Ø30.5×31.5	DC10-27F	Same as above, but recessed mounting type.

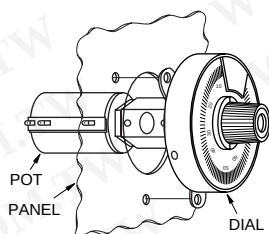
●Standard Dimensions



●General Specifications

Model No	Number of Turns-Counting.	Matching Shaft Dia. (mm)		Combinable Helicalohm Pot. (Matching shaft length of 18.5mm)	Lock Device	Operating Temperature Range	Mass (Approx. g)
		Standard	Special				
MAn-55	3, 5, 10 15, 20	6	6.35	25HP 46HD	No	-55°C ~ +105°C	90

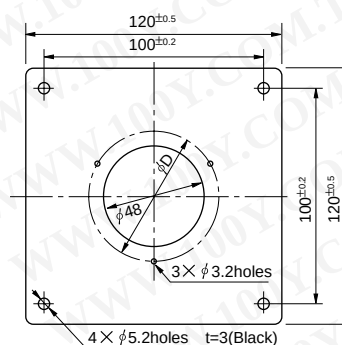
How to mount MA Series



Model **MA** Series counting dial employs special adaptor for being mounted on Helicalohm pot. and its use requires a considerable skill or technique. If a dial is ordered together with our Helicalohm Potentiometer, these will be combined at **SAKAE** and will be supplied in one unit.

●Special Specifications Available

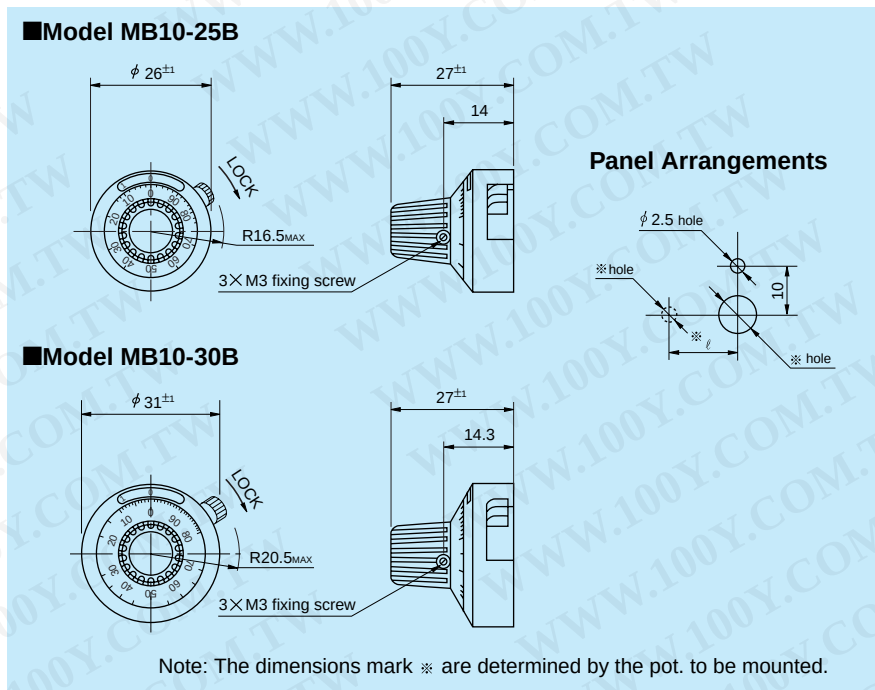
- Special graduations to your request.
- Acrylic resin cover fitted.
- Special mounting panel as shown on the right-hand drawing fitted.



Model No.	D ± 0.1 (mm)
For MAn-55	59

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●Standard Dimensions



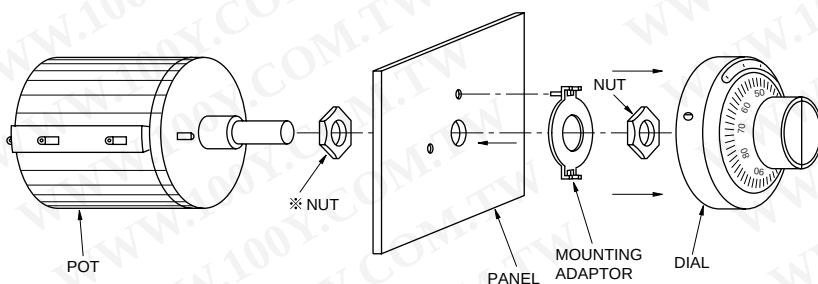
●General Specifications

Model No	Number of Turns-Counting.	Matching Shaft Dia. (mm)		Combinable Helicalohm Pot. (Matching shaft length of 25mm)	Lock Device	Operating Temperature Range	Mass (Approx. g)
		Standard	Special				
MB10-25B	10	4, 6	3, 3.175 6.35	10HP 20HP 12HHP 12HP 25HP 20HHP 12HPC 46HD	YES	-30 °C ~ +60 °C	20
MB10-30B	10	4, 6	6.35		YES	-30 °C ~ +60 °C	20

●Special Specifications Available

Special colors on housing and spin plate on the top of the knob (Black, etc.).

How to mount MB Series



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Note: The nut with a mark ※ is not always used depending on the kind of potentiometer and the thickness of the panel to be mounted.

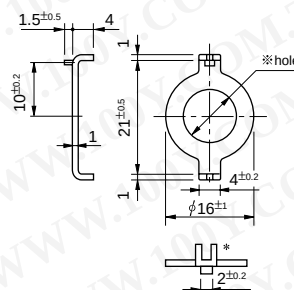
In case of mounting Model MB Series counting dials on Helicalohm pot., the mounting adaptor of these counting dials and Helicalohm potentiometers are fixed on the panel according to the illustration given above. The shaft of the Helicalohm pot. is turned anticlockwise

to its limit and is put into the mounting hole of the dial which was already set at "0". The shaft of the Helicalohm pot. is secured by the screw positioned on the knob of the dial. With this, the mounting is completed.

Mounting Adaptor for use with MB Series

The inner diameters of the mounting adaptor is different to the diameters of the shaft of the potentiometers to be mounted and therefore, please use the mounting adaptor supplied with the dial itself. When mounting the dial on potentiometer, the 2-finger projections (*) of mounting adaptor are inserted in the receiving holes prepared on the base plate of dial firmly, by adjusting the gap between 2-finger projection (*) with a screwdriver. There is possibility where some irregular turns of dial may take place if the adjustment of this gap is insufficient.

For Model MB



Note: The dimensions of mark * are determined by the potentiometer to be mounted.

SPECIALLY ORDERED DIALS

The following items discontinue to manufacture as our standard items and however, we can manufacture them as specially ordered items.

**Model
MA10-100**



(Outer dia. is 100mm.)

**Model
MC10-46B**



(Outer dia. is 46mm.)

**Model
MD10-30B**



(Outer dia. is 32mm.)

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Model MF10-15XB



Model MF10-15YB



Model MF20-22B



Model MF10-25YB

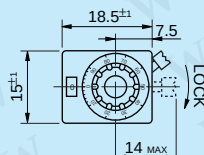


Model MF20-46B

Standard Dimensions

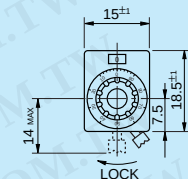
Model MF10-15XB

Model MF10-15XBD (without flexible coupling)

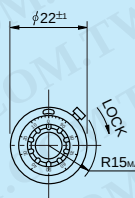


Model MF10-15YB

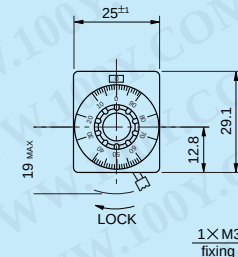
Model MF10-15YBD (without flexible coupling)



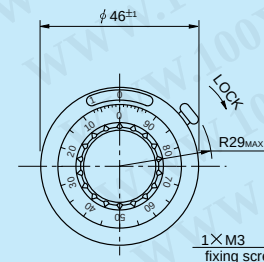
Model MF20-22B



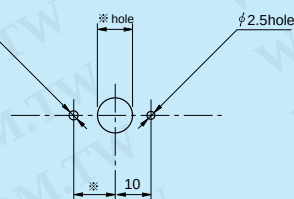
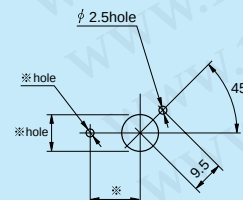
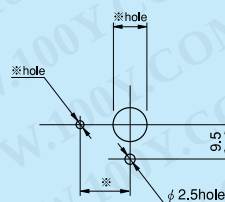
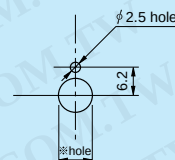
Model MF10-25YB



Model MF20-46B



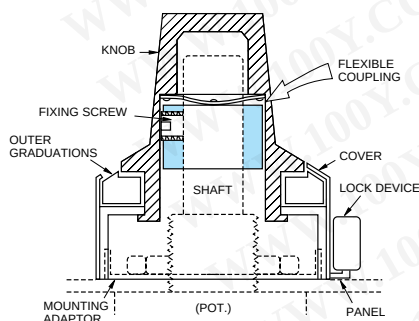
Panel Arrangements



Note: The dimensions of mark ※ are determined by the pot. to be mounted.

Construction of MF Dial

Flexible coupling incorporated



SAKAE MF dial is provided with a flexible coupling situated between the shaft of the potentiometer to be mounted and inner dial knob and therefore, the connection is entirely free and only the force of rotating direction is transmittable. With such unique device, traditional trouble such as irregular rotation and ununiform torque due to inaccurate mounting of the potentiometer on dial can be easily solved. Even the unskilled can mount this MF dial and you can save the labor cost using this MF dial.

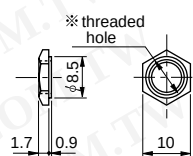
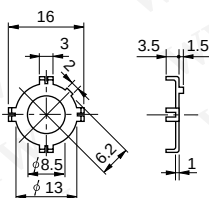
CAUTION: When rotating MF dial mounted with multi-turn potentiometer with over 20N (2kgf.) force, the flexible coupling may be damaged or broken. So, please take care of this fact during its operation.

General Specifications

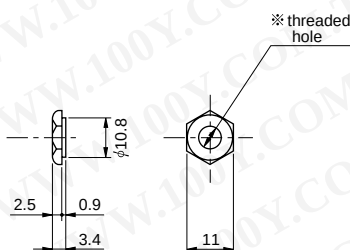
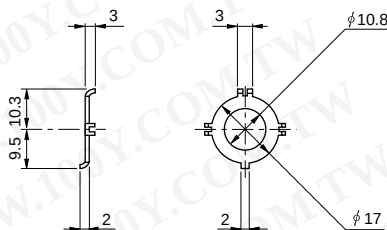
Model No	Number of Turns-Counting.	Matching Shaft Dia. (mm)		Combinable Helicalohm Pot. (Matching shaft length of 25mm)			Patented Flexible Coupling	Lock Device	Operating Temperature Range	Mass (Approx. g)
		Standard	Special							
MF10-15B	10	3	3.175, 4	10HP	25HP	12HP	YES	YES	-30 °C ~ +60 °C	15
MF10-15BD				12HHP	12HPC		NO			
MF20-22B	20	6	3, 3.175, 4, 6.35	10HP	12HHP		YES	YES	-30 °C ~ +60 °C	25
				12HP	12HPC	25HP				
MF10-25B	10	4, 6	3, 3.175, 6.35	20HHP	20HP	46HD	YES	YES	-30 °C ~ +60 °C	50
				22HHP	22HP					
MF20-46B	20	6	6.35	20HP	25HP	20HHP	YES	YES	-30 °C ~ +60 °C	50
				22HP	46HD	22HHP				

Mounting Adaptors for use with MF & DB Series

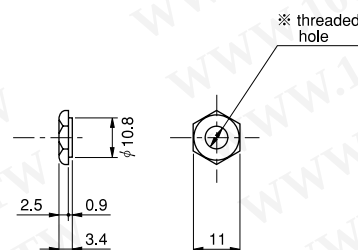
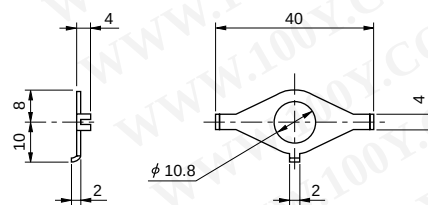
■For Model MF10-15B
 ■For Model MF10-15BD



■For Model MF20-22B
 ■For Model MF10-25B
 ■For Model DB10-26B

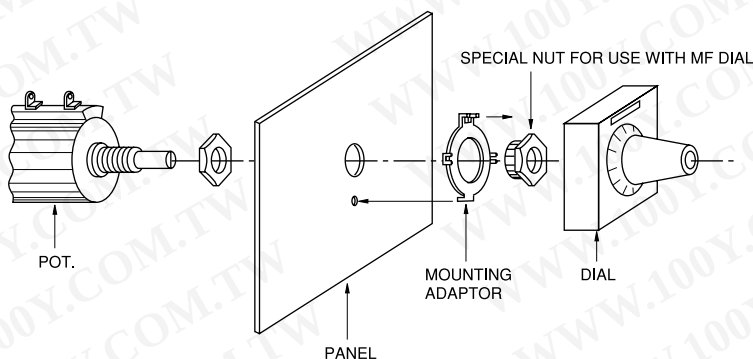


■For Model MF20-46B



Note: The dimensions of mark ※ are determined by the potentiometer to be mounted.

How to mount MF Series

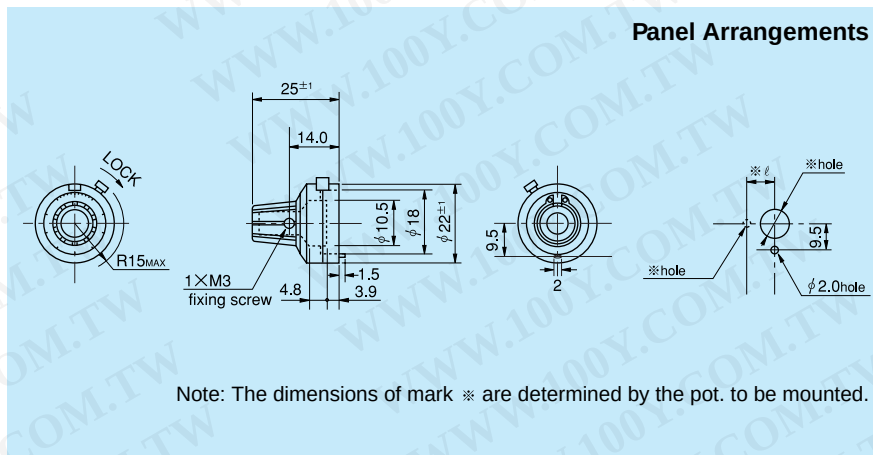


The mounting adaptor as well as specially shaped nut only for use with Model MF Series Dials and Helicalohm pot. are fixed on the panel according to the illustration given above.

The shaft of the Helicalohm pot. is turned anticlockwise to its limit and is put into the mounting hole of the dial which was already set at "0" At the same time, 4

projections of the mounting adaptor are inserted in 4 receiving holes prepared on the base plate of the dial and then all parts should be pressed to the panel firmly to eliminate any space. The shaft of the potentiometer is fixed by the hexagonal nut positioned in the knob of the dial by screwing it with an attached hexagonal wrench. With this, the mounting is completed.

●Standard Dimensions



●General Specifications

Model No	Number of Turns-Counting	Matching Shaft Dia. (mm)		Combinable Helicalohm Pot. (Matching shaft length of 25mm)	Lock Device	Operating Temperature Range	Mass (Approx. g)
		Standard	Special				
MG20-22B	20	6	3, 3.175 4, 6.35	10HP 12HP 12HPC 20HP 22HP 25HP 46HD 12HHP 20HHP 22HHP	YES	-30℃ ~ +60℃	5

●Mechanism of Lock Device

Note: 2 kinds of lock device on MG dial are available and please select them in accordance with your application.

Model MG20-22B...Locking is gradually made.

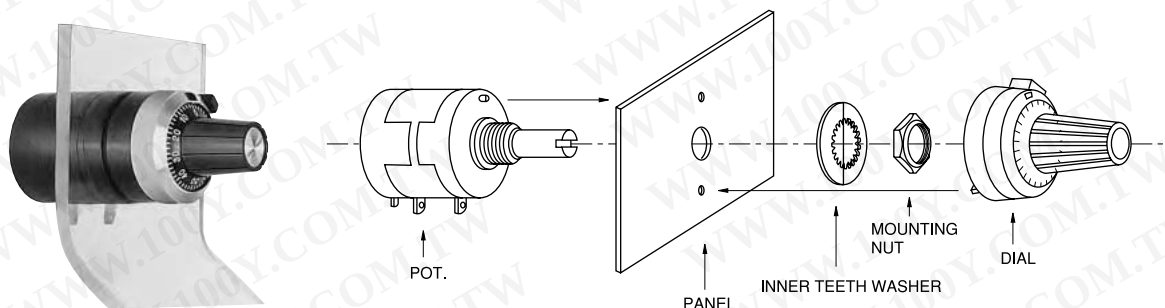
Model MG20-22BA...Locking is suddenly made.

Unless otherwise specified, we will supply model MG20-22B.

●Special Specifications Available

Outer case and knob in different color (Black, Gray, etc.), 100 divisions in inner graduation (Possible read out of 1/1,000 in 10-turn pot.).

How to mount MG Series



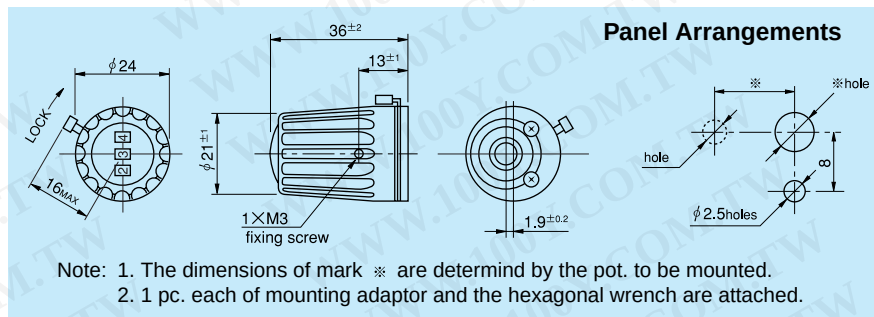
After the potentiometer is fixed to the panel using the mounting nut, the shaft of the potentiometer is turned anticlockwise to its limit and is put into the mounting hole of the dial which was already set at "0". The shaft of the potentiometer is secured by the screw positioned at the knob of the dial with the attached hexagonal wrench.

With this, the mounting is completed.

Please note that before mounting, holes are to be prepared on the panel according to the panel arrangements above.



Standard Dimensions



General Specifications

Model No	Number of Turns-Counting	Matching Shaft Dia. (mm)		Combinable Helicalohm Pot. (Matching shaft length of 25mm)	Lock Device	Operating Temperature Range	Mass (Approx. g)
		Standard	Special				
DA10-24B	10	6	6.35	20HP 22HP 25HP 46HD 20HHP 22HHP	YES	-30℃ ~ +85℃	40

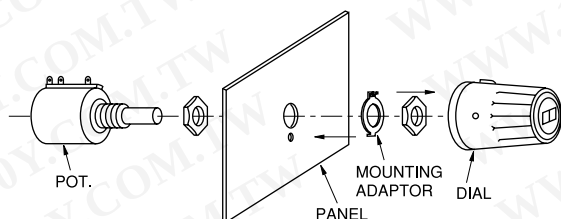
Note: 1. Standard color of knob is black.

2. In case of using the combination of model 46HD, please specify the shaft length of model 46HD as 25mm. (Standard shaft length of model 46HD is 28mm.).

Special Specifications Available

Knob in white color, Specially marked in face plate such as with a decimal point, comma, etc., DA dial without lock device.

How to mount DA Series



The mounting adaptor of Model DA Series Digital Counting Dial and the Helicalohm pot. are fixed on the panel according to the illustration given left. The shaft of the Helicalohm pot. is turned anticlockwise to its limit and is put into the mounting hole of the dial which was already set at "000". The shaft of the Helicalohm pot. is secured by the screw positioned at the knob of the dial with the attached hexagonal wrench. With this, the mounting is completed.

CAUTION:

Do not rotate the fixing screw over 180° with the hexagonal wrench when removing Helicalohm pot. from Model DA Series Digital Counting Dial. Otherwise, inner neighbouring plastic gear may be damaged.

Recessed Mounting Adaptor

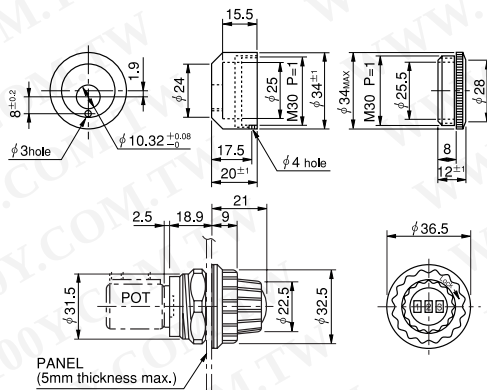
The following 2 kinds of Recessed Mounting Adaptors are available on option in Model DA dial.

When using this recessed mounting adaptor, please place an order for the potentiometer, digital turns-counting dial and recessed mounting adaptor in one set for assembling them at SAKAE and we will be supplied in one unit.

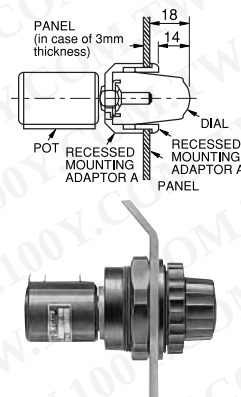
Adaptor A (without lock device)



Adaptor B (with lock device)



How to mount



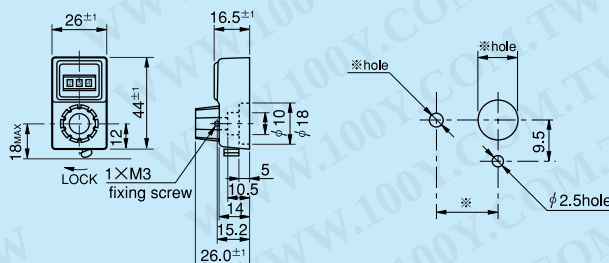
Note: 1 pc. each of mounting nut and rubber washer are attached.



Standard Dimensions

Model DB10-26B•DB100-26B

Panel Arrangements

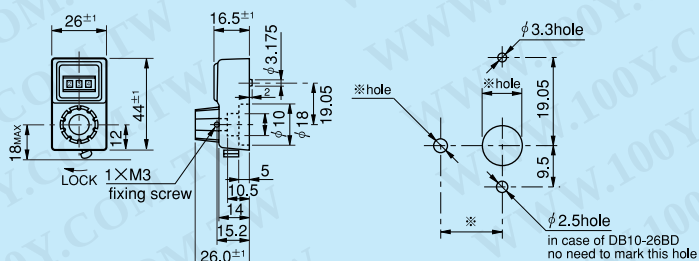


Note: 1. The dimensions of mark * are determined by the pot. to be mounted.
 2. Dimensions of mounting adaptor are mentioned in page 54.

Model DB10-26BA•DB100-26BA

(with an anti-rotation pin on the rear side of the case)

Model DB10-26BD (with an anti-rotation pin on the rear side of the case and without a flexible coupling)



Note: The dimensions of mark * are determined by the pot. to be mounted.

General Specifications

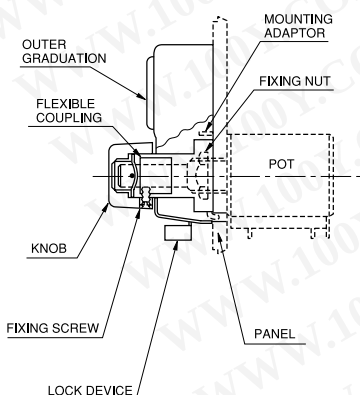
Model No	Number of Turns-Counting.	Max. Indication	Matching Shaft Dia. (mm)		Combinable Helicalohm Pot. (Matching shaft length of 25mm)	Standard Color of Case	Flexible coupling	Lock Device	Operating Temperature Range	Mass (Approx. g)
			Standard	Special						
DB10-26B	10	999	6	3, 3.175 4, 6.35	20HP 46HD 22HP 20HHP 22HHP 25HP	Ivory	Yes	Yes	-30℃ ~ +85℃	60
DB10-26BA	10	999				Silver	Yes			
DB10-26BD	10	999				Silver	No			
DB100-26B	100	9999				Ivory	Yes			

Note: DB10-26BD version does not attach mounting adaptor and nut, because such mounting hardware does not need when mounting this dial and the potentiometer.

Special Specifications Available

Special colors on housing and spin plate on the top of the knob (Black, etc.), Specially marked in face plate such as with a decimal point, comma, etc., Inclined readout window type.

Construction of DB Dials and How to mount DB Dials.



The mounting adaptor as well as specially shaped nut only for use with Model DB series Dials and Helicalohm pot. are fixed on the panel according to the illustration given left.

The shaft of the Helicalohm pot. is turned anticlockwise to its limit and is put into the mounting hole of the dial which was already set at "000". At the same time, 3 projections of the mounting adaptor are inserted in 3 receiving holes prepared on the base plate of the dial and then all parts should be pressed on the panel firmly to eliminate any space. The shaft of the potentiometer is fixed by the hexagonal nut positioned in the knob of the dial by screwing it with an attached hexagonal wrench. With this, the mounting is completed.

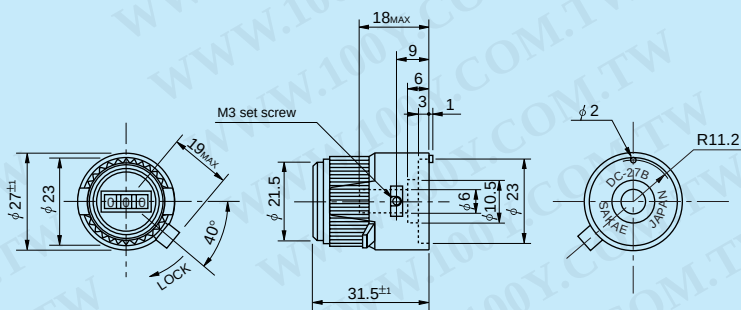
CAUTION: When rotating DB dial with a flexible coupling mounted with multi-turn potentiometer with over 20N (2kgf.), the flexible coupling may be damaged or broken. So, please take care of this fact during its operation.



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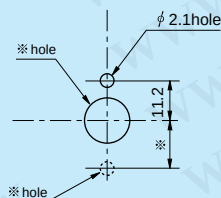
●Standard Dimensions

■Model DC10-27B•DC10-27BK



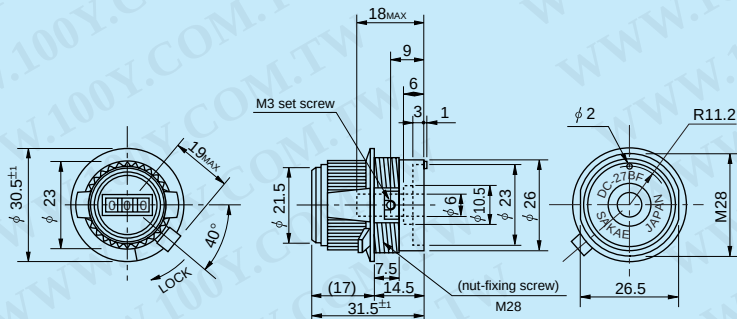
Note: One additional nut is attached as standard accessory.

Panel Arrangements



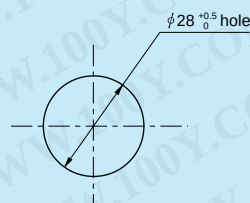
Note: The dimensions and positions of mark ※ are determined by the pot. to be mounted.

■Model DC10-27BF•DC10-27BFK



Note: Fixing nut, washer and fixing nut or fixing plate are attached as standard accessory.

Panel Arrangements



●General Specifications

Model No	Number of Turns-Counting.	Max. Indication (Min. readout)	Matching Shaft Dia. (mm)		Combinable Helicalohm Pot. (Matching shaft length: 18.5~20.6mm) n=Number of turns	Mounting Method (See Page 59)	Operating Temperature Range	Lock Device	Mass (Approx. g)
			Standard	Special					
DC10-27B DC10-27BK	10	999 (1/5000)	6 6.35	3 3.175 4	22HP-n, 22HP-nN, 25HP-nD, 22HHP-n, 22HHP-nN, 22H (H) P-n (E)	1	-30℃ ~ +60℃	Yes	30
DC10-27BF DC10-27BFK	10	999 (1/5000)	6 6.35	3 3.175 4	22HP-n, 22HP-nN, 22HHP-n, 22H (H) P-n (E)	2	-30℃ ~ +60℃	Yes	30
					25HP-nD, 22HHP-nN 22H (H) P-n (E)	3			

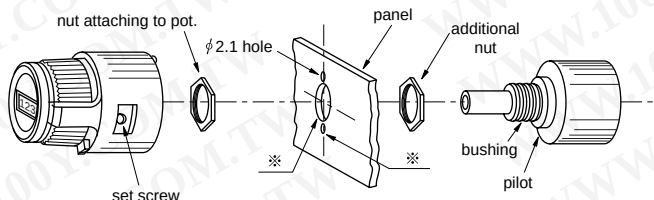
Note: When mounting the pot. not mentioned in the above table with this dial, please use the shaft length of 20mm.

HOW TO MOUNT DC SERIES

DC series dials are mounted as per the following sketches (Mounting Method 1-3): Firstly, the shaft of potentiometer is turned anti-clockwise to its limit and after the graduation of DC dial is adjusted to "000", the shaft of potentiometer is secured by the set screw positioned at the knob of the dial with the attached hexagonal wrench. With this, the mounting is completed.

Mounting Method 1.

(DC10-27B)
(DC10-27BK)

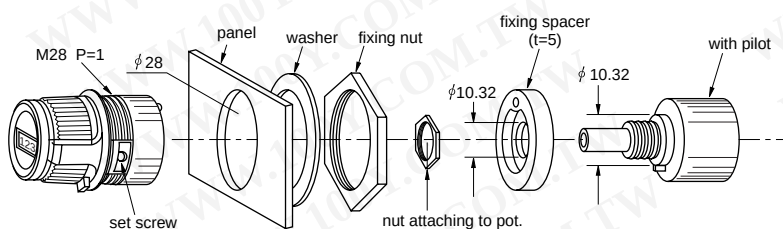


(Note 1)—The dimensions of mark * are determined by the pot. to be mounted.

(Note 2)—For our models 22HP-n, 22HP-nN, 22H (H) P-n (E), 22HHP-n and 22HHP-nN, please use with panel thickness of below 3mm. In this case, please note the hole diameter for combining potentiometer means a bushing diameter, not pilot diameter. For panel thickness of below 1.6mm, please use an additional nut.

Mounting Method 2.

(DC10-27BF)
(DC10-27BFK)

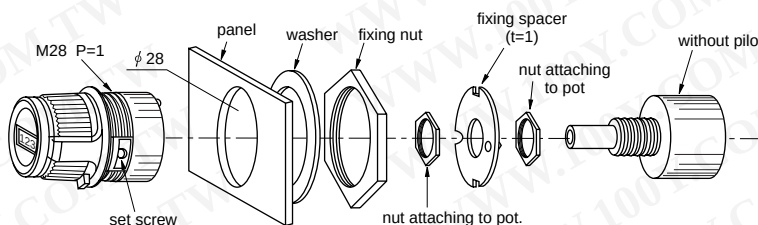


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(In case of combining)
22HP-n, 22HP-nN,
22HHP-n, 22HHP-nN
22H (H) P-n (E)

Mounting Method 3.

(DC10-27BF)
(DC10-27BFK)



(In case of combining 25HP-nD)
(and other pots. (with 20mm)
long shaft)

(Note 3)—Dials and pots. are supplied separately.

(Note 4)—For models DC10-27BF and DC10-27BFK, we can supply potentiometer and dial combined at our side on request with extra charge.

SPECIALLY ORDERED DIALS

Model SMG20-22B



- Shortened height of "h" (h=21.5mm)
- Recessed mounting is possible.
- Inner graduation is 100 divisions.

Model SDB10-26B



- Easy read out from inclined window.
- Rigid construction.

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