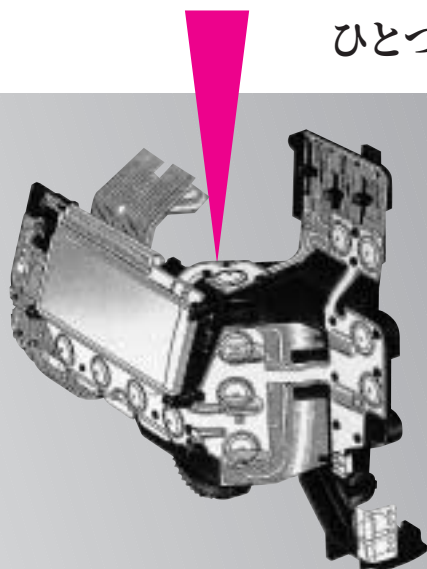


ELECTRONIC COMPONENTS CATALOG



Supporting the Next Generation of Design

ひとつ先のデザインをサポートします。



The Integrated Control Block (ICB) utilizes Noble's own Film Integration Technology (FIT).

FIT is the product of over 10 years of research and development, culminating in the development of smaller, lighter and more specialized electronic components.

Better designs, improved ergonomics, improved functionality and reliability, faster and more efficient production—Noble has brought together all of these elements to produce the industry's most advanced control panel interface.

ノーブルは、“Human Oriented Technology=人につながるテクノロジー (HOT)” に基づいた最先端のインターフェース“ICB (Integrated Control Block: 集積化操作ブロック)”を提案してきました。各種エレクトロニクス機器の小型・軽量・薄型化を10年以上にわたり支えてきたノーブル独自のフィルムインテグレーションテクノロジー (FIT) を応用。

設計者の意図するデザイン、機能、信頼性の向上、セットアップ工程の省力化、効率化など、求められるすべての要素を凝縮しながら、人と機器の最先端インターフェースの開発をサポートいたします。

Easily incorporated into your control panel design (Custom examples below)

要素技術の組み合わせは自由です。下記の写真は一例です。



IB-VC

Video cameras



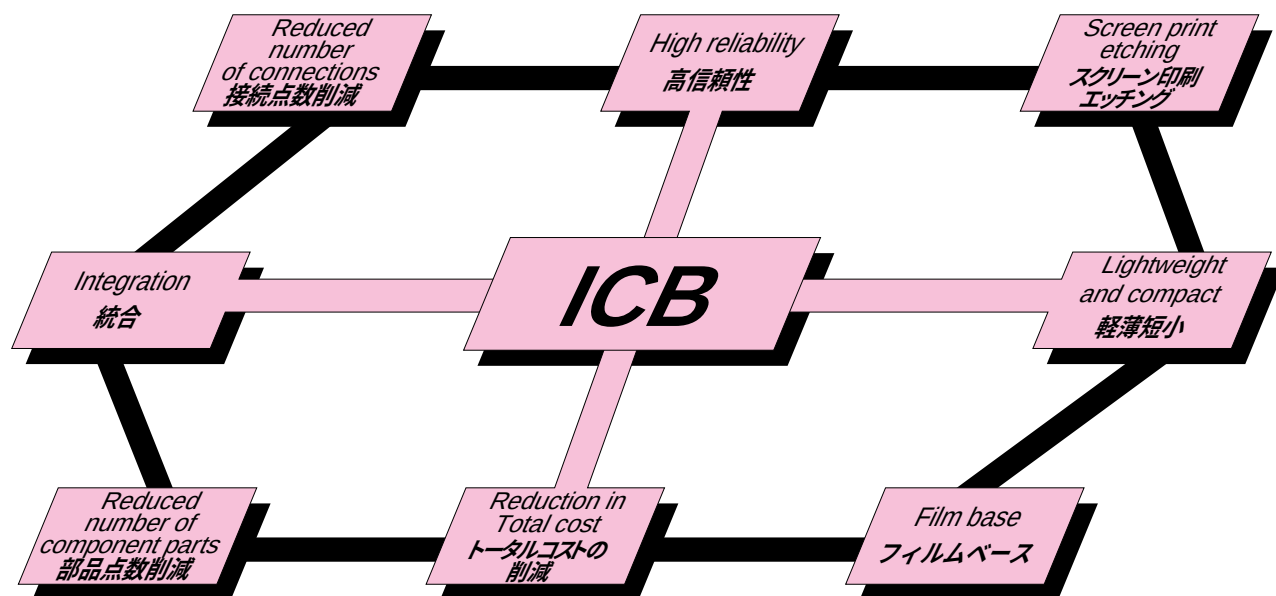
IB-VC

Video cameras



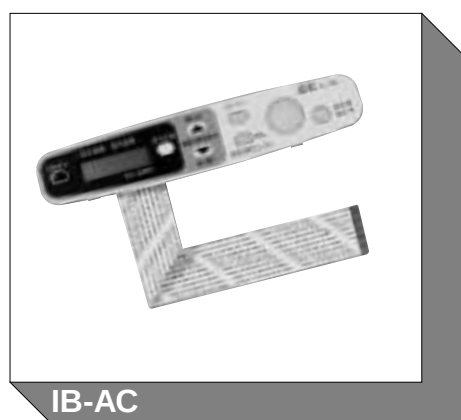
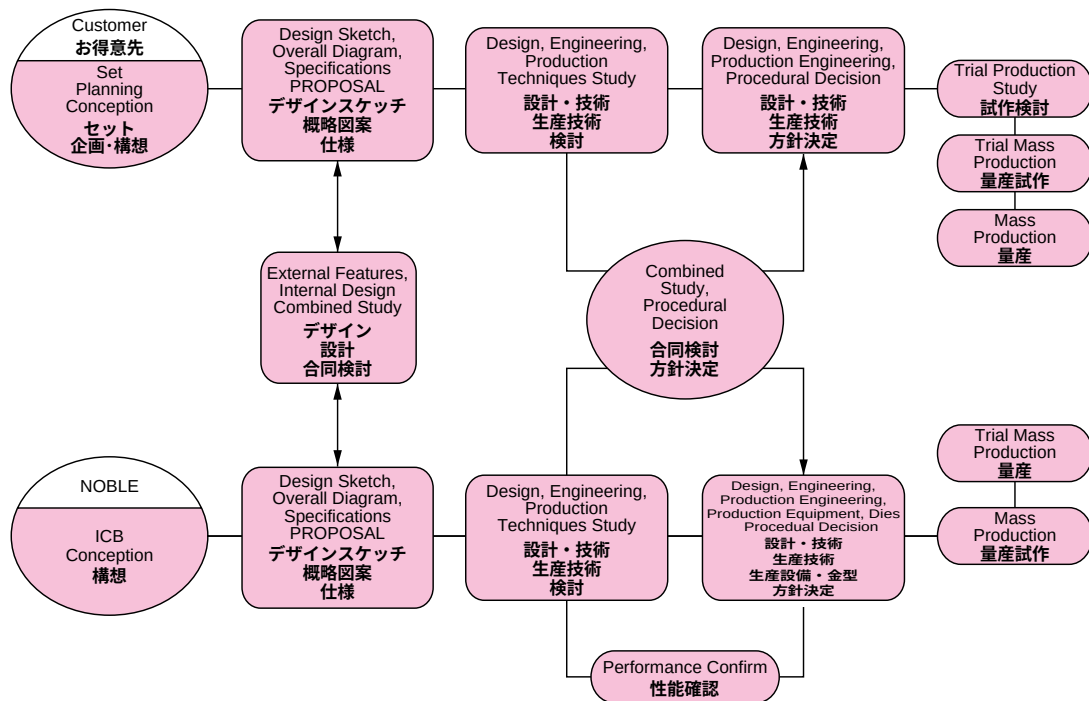
IB-VT

VCRs Videodisc players



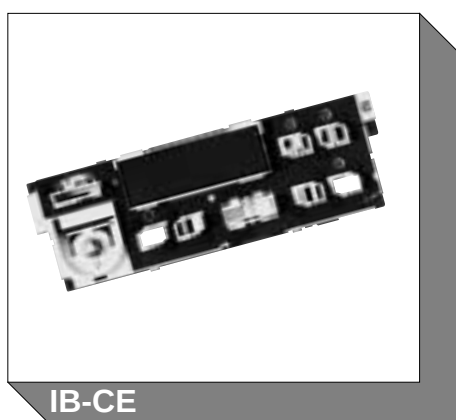
The ICB Development System

To incorporate your system needs into the ICB, we cooperate directly with you from the planning stages to the final product development.



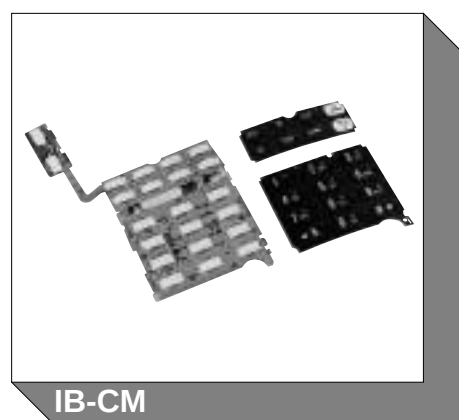
IB-AC

Air conditioners



IB-CE

Car electrical system equipment



IB-CM

Personal transceivers

- Specifications in this catalog are presented basically for informative purposes. We request the exchange of official approval drawings before placing order.
- 当カタログは参考仕様ですので、ご使用にあたっては正式納入仕様書の取り交わしをお願いします。

Miniature Potentiometers XV081,XV082

FEATURES

- High performance miniature potentiometer created by incorporating NOBLE's ICB(Integrated Control Block)film integration technology.
- Ideally suited for Headphone stereos,and other pocketable audio equipment.
- Film makes smooth rotational feeling possible.
- Reflow soldering type available consult NOBLE.

APPLICATIONS

Headphone stereos,Portable CD,CD-ROM,Game Machines,Liquid Crystal TVs,Electronic Pocket Notebook,Personal Computer・Word Processors,Pocket Radio,and other Pocketable Equipments.

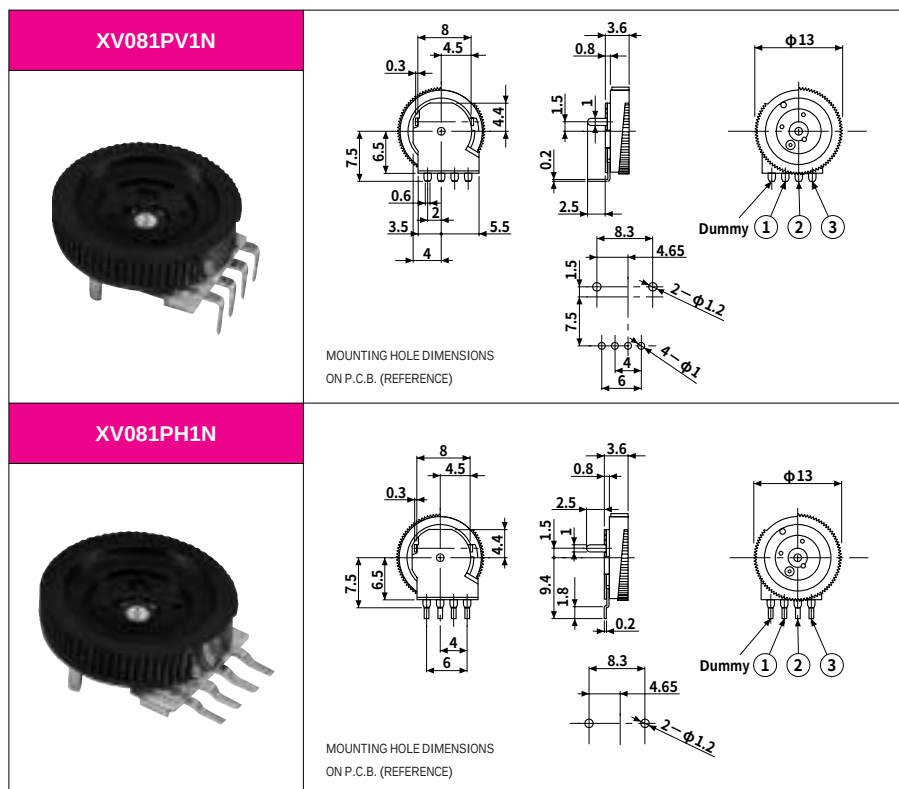
小型ポテンショメータ

特長

- ノーブルのICB(Integrated Control Block)思想のフィルムインテグレーションテクノロジーが生んだ薄型の小型ポテンショメータです。
- ヘッドホンステレオなどポータブルオーディオ機器に最適です。
- フィルムの採用により、なめらかな回転フィーリングが得られます。
- リフローはんだ付けタイプはご相談下さい。

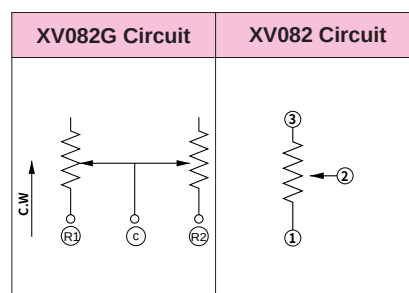
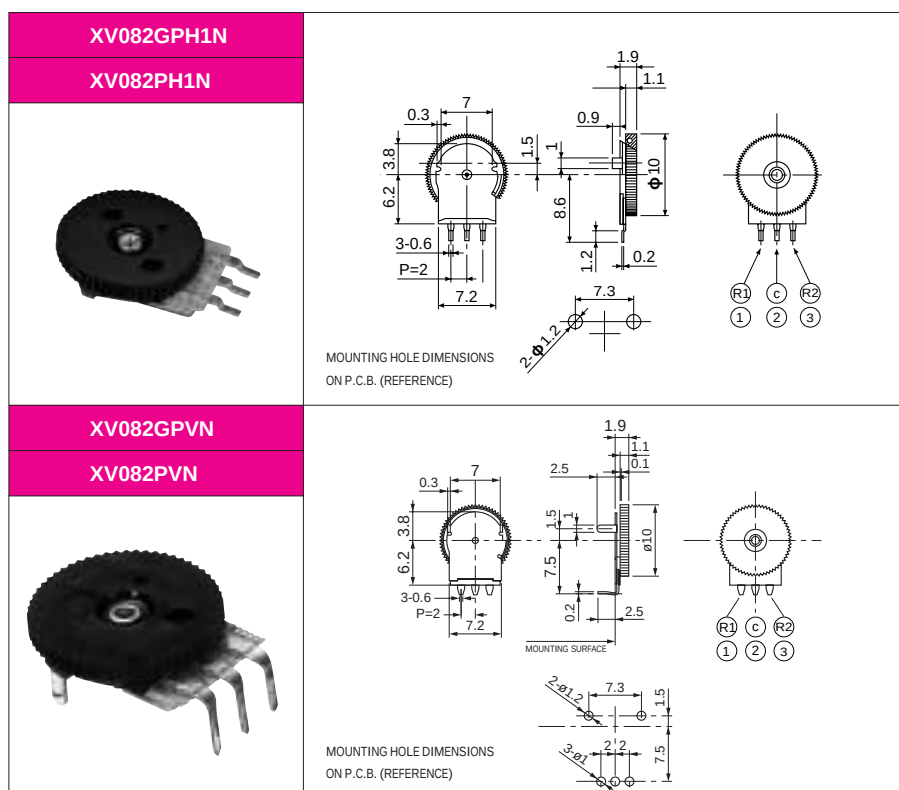
用途

ヘッドホンステレオ、ポータブルCD、CD-ROM、ゲーム機器、液晶テレビ、電子手帳、小形テレコ、パソコン、ワープロ 等。



SPECIFICATIONS

Total Rotational Angle 全回転角度	300±5°
Rotational Torque 回転トルク	1~10mN・m
Nominal Total Resistance 公称全抵抗値	1B: 2kΩ,5kΩ,10kΩ,20kΩ,50kΩ,100kΩ,200kΩ,500kΩ 15A/15C: 5kΩ,10kΩ,20kΩ,50kΩ,100kΩ,200kΩ,500kΩ
Total Resistance Tolerance 全抵抗値許容差	Within 20% of the nominal total resistance.
Resistance Taper 抵抗変化特性	1B(Linear),15A(Audio),15C(Revers Audio)
Maximum Operating Voltage 最高使用電圧	AC10V,DC10V
Rated Power 定格電力	0.05W



SPECIFICATIONS

	XV082G	XV082
Total Rotational Angle 全回転角度	120±5°	300±5°
Rotational Torque 回転トルク	1~10mN・m	
Nominal Total Resistance 公称全抵抗値	1B: 500Ω, 1kΩ, 2kΩ, 5kΩ, 10kΩ, 20kΩ, 50kΩ, 100kΩ, 200kΩ 15A/15C: 2kΩ, 5kΩ, 10kΩ, 20kΩ, 50kΩ, 100kΩ	1B: 2kΩ, 5kΩ, 10kΩ, 20kΩ, 50kΩ, 100kΩ, 200kΩ, 500kΩ 15A/15C: 5kΩ, 10kΩ, 20kΩ, 50kΩ, 100kΩ, 200kΩ, 500kΩ
Total Resistance Tolerance 全抵抗値許容差	Within 20% of the nominal total resistance	
Resistance Taper 抵抗変化特性	1B(Linear),15A(Audio),15C(Revers Audio)	
Maximum Operating Voltage 最高使用電圧	AC10V,DC10V	
Rated Power 定格電力	0.05W	

Miniature Potentiometers XV0107G,XV0106G

小型ポテンショメータ

FEATURES

- High performance miniature potentiometer created by incorporating NOBLE's ICB(Integrated Control Block)film integration technology.
- Ideally suited for Headphone stereos, and other pocketable audio equipment.
- Film makes smooth rotational feeling possible.

APPLICATIONS

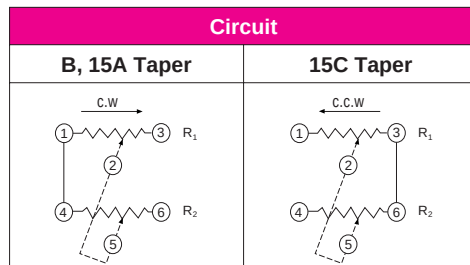
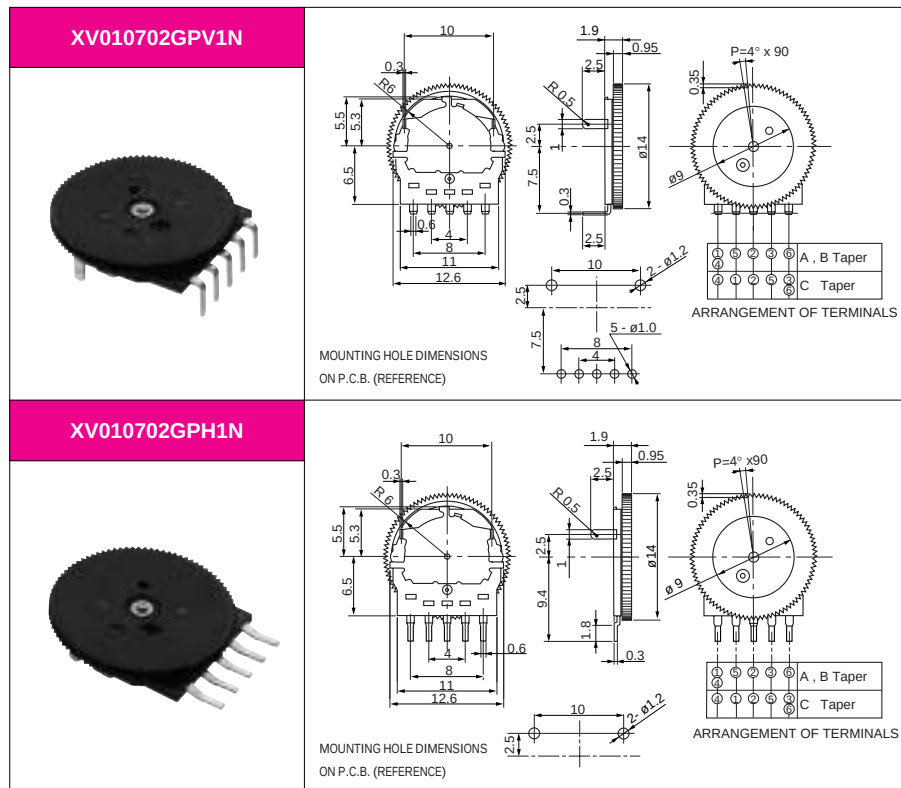
Headphone stereos, Portable CD, CD-ROM, Game Machines, Liquid Crystal TVs, Electronic Pocket Notebook, Personal Computer · Word Processors, Pocket Radio, and other Pocketable Equipments.

特長

- ノーブルのICB(Integrated Control Block)思想のフィルムインテグレーションテクノロジーが生んだ薄型の小型ポテンショメータです。
- ヘッドホンステレオなどポータブルオーディオ機器に最適です。
- フィルムの採用により、なめらかな回転フィーリングが得られます。

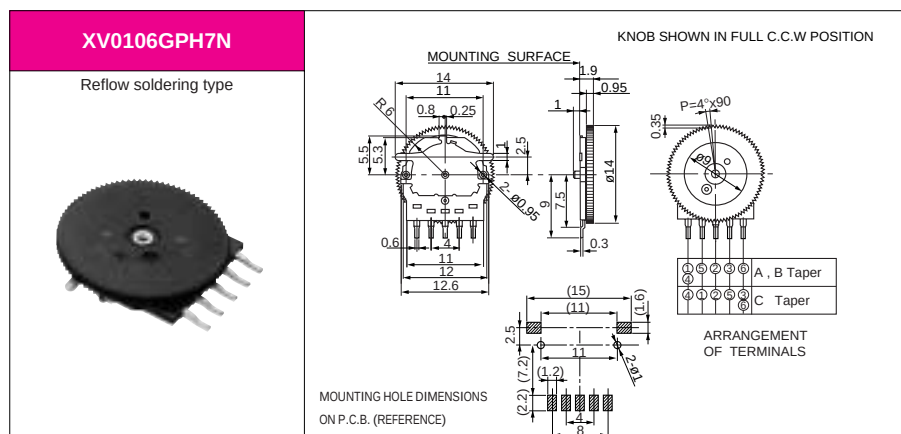
用途

ヘッドホンステレオ、ポータブルCD、CD-ROM、ゲーム機器、液晶テレビ、電子手帳、小形テレコ、パソコン、ワープロ 等。



SPECIFICATIONS

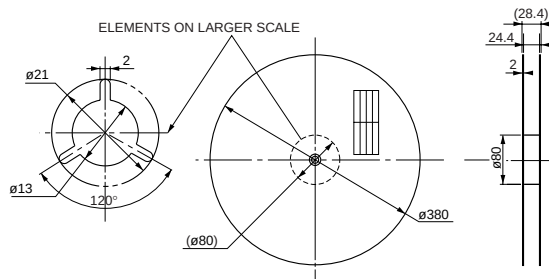
Total Rotational Angle	270 ± 5°
Rotational Torque	1 ~ 10mN · m
Nominal Total Resistance	1B: 1kΩ, 2kΩ, 5kΩ, 10kΩ, 20kΩ, 50kΩ, 100kΩ, 200kΩ, 500kΩ 15A/15C: 5kΩ, 10kΩ, 20kΩ, 50kΩ, 100kΩ, 200kΩ, 500kΩ
Total Resistance Tolerance	Within 20% of the nominal total resistance.
Resistance Taper	1B(Linear), 15A(Audio), 15C(Revers Audio)
Maximum Operating Voltage	AC10V, DC10V
Rated Power	0.05W
Tracking Error	Within ± 4dB at a range of 0 ~ -40dB except 1B taper.



SPECIFICATIONS

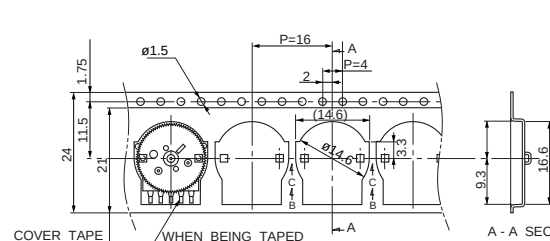
Total Rotational Angle	270 ± 5°
Rotational Torque	0.5 ~ 10mN · m
Nominal Total Resistance	1B: 1kΩ, 2kΩ, 5kΩ, 10kΩ, 20kΩ, 50kΩ, 100kΩ, 200kΩ, 500kΩ 15A/15C: 5kΩ, 10kΩ, 20kΩ, 50kΩ, 100kΩ, 200kΩ, 500kΩ
Total Resistance Tolerance	Within 25% of the nominal total resistance.
Resistance Taper	1B(Linear), 15A(Audio), 15C(Revers Audio)
Maximum Operating Voltage	AC10V, DC10V
Rated Power	0.05W
Tracking Error	Within ± 4dB at a range of 0 ~ -40dB except 1B taper.

REEL DIMENSION



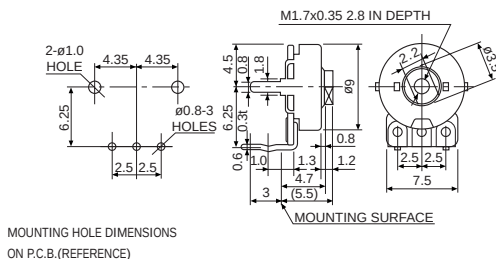
Taping (Hold 800 parts)
1Box = 5 Reel

TAPE, COVER TAPE

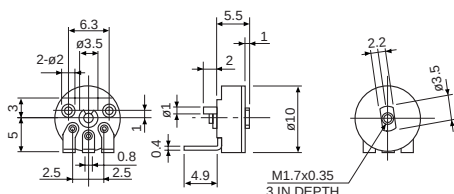


- Specifications in this catalog are presented basically for informative purposes. We request the exchange of official approval drawings before placing order.
- 当カタログは参考仕様ですので、ご使用にあたっては正式納入仕様書の取り交わしをお願いします。

小型ポテンシヨメータ



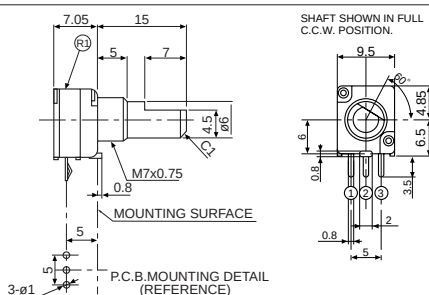
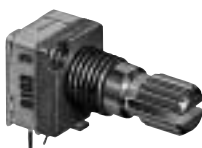
MOUNTING HOLE DIMENSIONS
ON P.C.B.(REFERENCE)



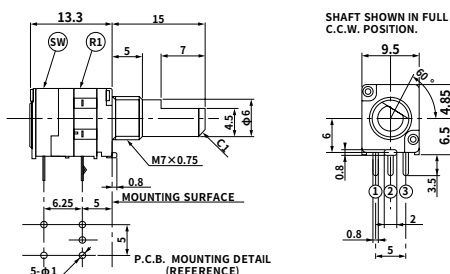
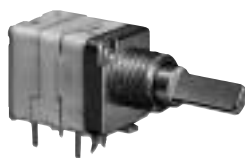
Total Rotational Angle 全回転角度	230 ± 5 °
Rotational Torque 回転トルク	1-10mN • m {10-102gf • cm}
Resistance Range 全抵抗値範囲	1kΩ - 500kΩ (taper B) 5kΩ - 250kΩ (other taper)
Rated Power 定格電力	0.05W (taper B) 0.025W (other taper)
Maximum Operating Voltage 最高使用電圧	AC10V, DC10V

Total Rotational Angle 全回転角度	200 ± 10 °
Rotational Torque 回転トルク	2-15mN • m {20-153gf • cm}
Resistance Range 全抵抗値範囲	1kΩ - 500kΩ (taper B) 1kΩ - 500kΩ (other taper)
Rated Power 定格電力	0.07W (taper B) 0.03W (other taper)
Maximum Operating Voltage 最高使用電圧	AC100V, DC100V (taper B) AC70V, DC70V (other taper)

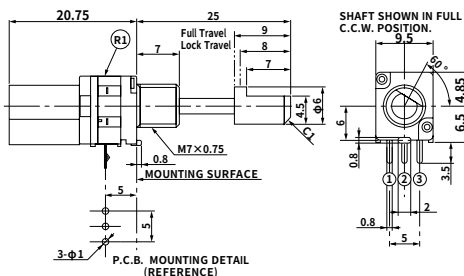
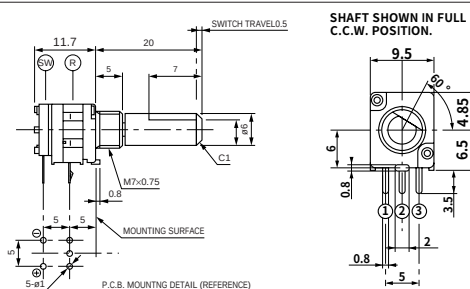
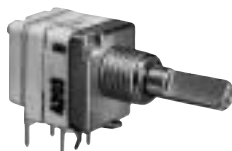
Single-Element



With Rotary Switch



(With Push-Momentary Switch)



Total Rotational Angle 全回転角度	300±5°
Rotational Torque 回転トルク	Single Shaft Type : 2 to 15 mN·m
Nominal Total Resistance 公称全抵抗値	20kΩ, 50kΩ, 100kΩ
Total Resistance Tolerance 全抵抗許容差	Within ±20% of the nominal total resistance
Resistance Taper 抵抗変化特性	1B, 3B, 15A
Rated Power 定格電力	0.05W
Maximum Operating Voltage 最高使用電圧	AC50V, DC10V

Switch Rating: DC16V 3A
(SPST)

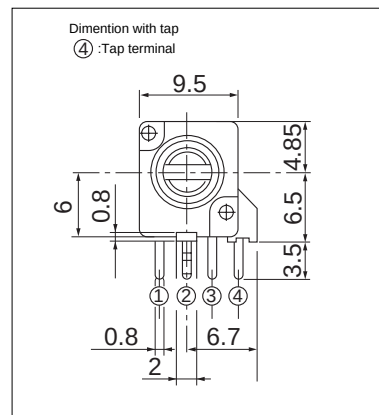
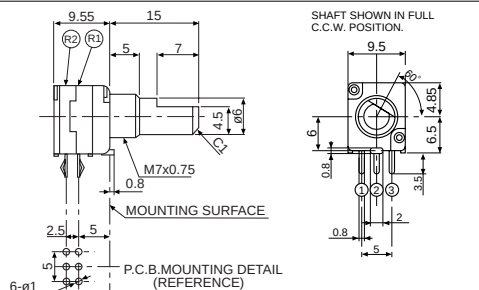
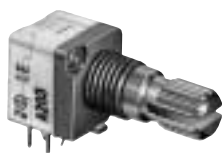
Switch Rating: DC12V 0.5A
(SPST)

- Specifications in this catalog are presented basically for informative purposes. We request the exchange of official approval drawings before placing order.
- 当カタログは参考仕様ですので、ご使用にあたっては正式納入仕様書の取り交わしをお願いします。

Multi-Section Potentiometer for Car-Audio

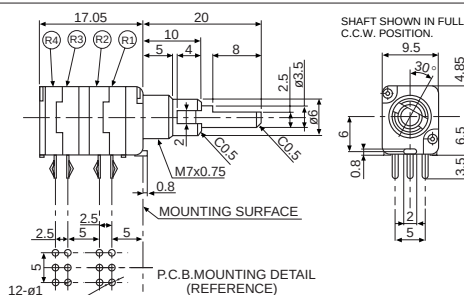
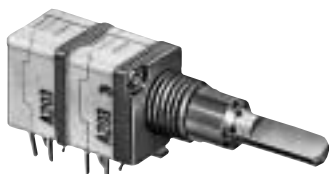
XVB93GPHPN

Dual-Element

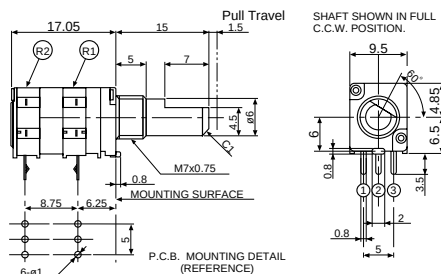
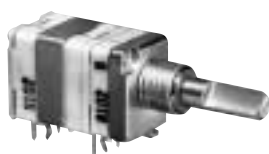


XVB93DG4PHPN

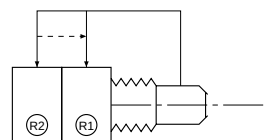
Dual Concentric Shaft
(Dual-Element) × 2



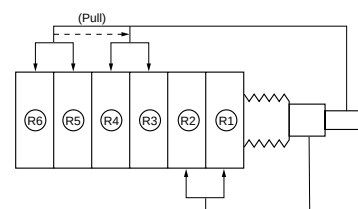
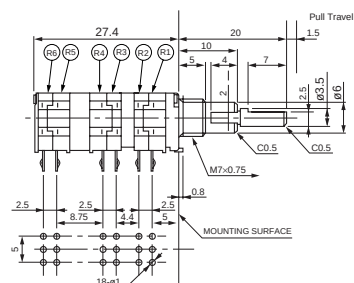
XVB93M3-5N



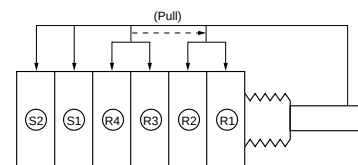
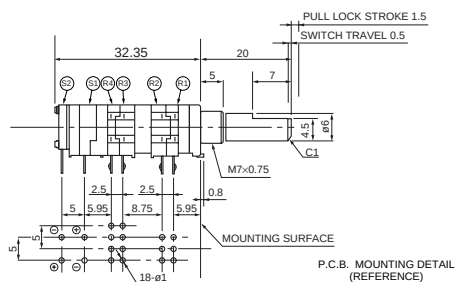
①: Pull Position Control
②: Normal-Position Control



XVB93DGM3-5N



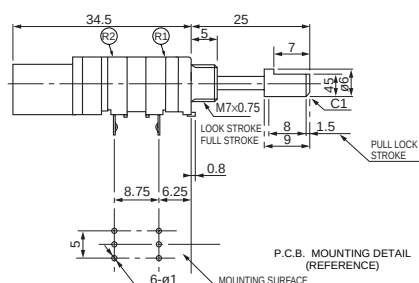
XVB93MG3-5S (C97SF + D98SG)



①: Rotary Switch
②: Push Momentary Switch

XVB93M1-5N

Push-Lock mechanism



- Specifications in this catalog are presented basically for informative purposes. We request the exchange of official approval drawings before placing order.
- 当カタログは参考仕様ですので、ご使用にあたっては正式納入仕様書の取り交わしをお願いします。

9mm Size Snap-In Insulated Shaft Potentiometers 9型絶縁軸スナップイン・ポテンショメータ

FEATURES

- High performance miniature potentiometer created by incorporating NOBLE's Film Integration Technology
- Film element provides smooth rotational feeling.

APPLICATIONS

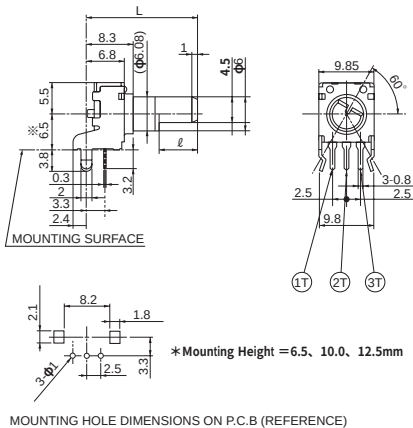
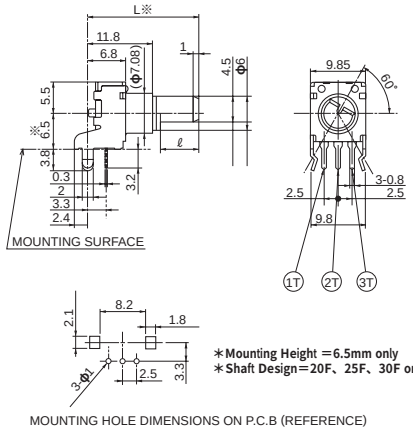
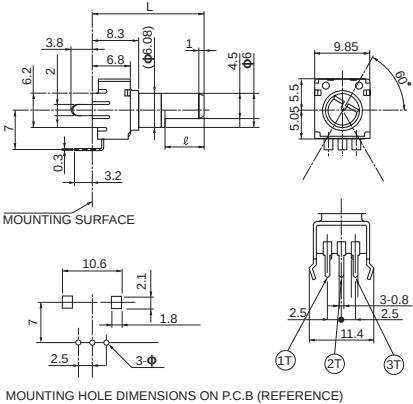
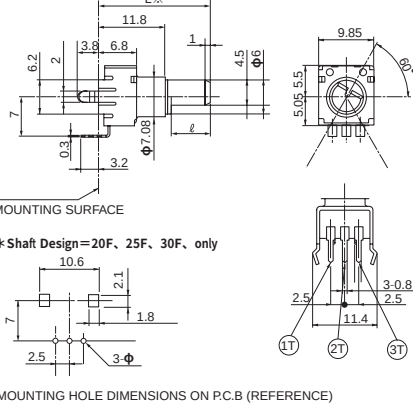
Component stereo, Audio mixer, Speaker volume adjustment, Visual equipment, Electronic musical instruments.

特長

- ノーブルのフィルムインテグレーションテクノロジーが生んだ小型高性能ポテンショメータです。
- フィルムの採用により、なめらかな回転フィーリングが得られます。

用途

小型コンポーネント、オーディオミキサー、スピーカー音量調整、映像機器、電子楽器。

Model	Dimensions	Unit:mm	Model	Dimensions	Unit:mm
XV09211NPP			XV09213NPP		
XV09211NPV			XV09213NPV		

Product Variation

製品の種類

Sleeve スリーブ	Mounting style 取付け方向	Mounting height 取付け高さ	Order Number 型式呼称
Without sleeve なし	Horizontal 横型	6.5mm	XV09211NPP
		10.0mm	XV09211NPJ
		12.5mm	XV09211NPD
With sleeve 付き	Vertical 縦型	—	XV09211NPV
		6.5mm	XV09213NPP
		—	XV09213NPV

*The rotation angle of the axis operation is 300 degrees. (The commodity of 280 degrees can be made)

*Center detent is available for all types.

*軸操作の回転角度は300度です。(280度の商品も作れます)

*センタークリック付きも可能です。

Example of indicating Order Number

注文番号の記載例

XV09211NPP 15F 1B10K CC

Product Variation
製品の種類

In case of ordering "Center detent"
センタークリック付きの指定

Indicating Resistance & Taper/10K-OHM 1B :
Select form Code Table-2
抵抗素子の仕様：Code Table-2参照

Indicating shaft length & type/15mmF : Select form Code Table-1
軸の長さ及び形状：Code Table-1参照

Code Table-1-1

Order Number	Shaft Type	Shaft length	
		L	ℓ
15F	F	15	6
20F	F	20	7
25F	F	25	12
30F	F	30	12
15U	U	15	6
20U	U	20	7
25U	U	25	7

*XV09213 is 20F, 25F, 30F only

Code Table-1-2 (Shaft Design)

Type F	Type U

Code Table-2

Order Number	Resistance&Taper	Order Number	Resistance&Taper	Order Number	Resistance&Taper
1B10K	10K-OHM 1B	15A10K	10K-OHM 15A	15C10K	10K-OHM 15C
1B20K	20K-OHM 1B	15A20K	20K-OHM 15A	15C20K	20K-OHM 15C
1B50K	50K-OHM 1B	15A50K	50K-OHM 15A	15C50K	50K-OHM 15C
1B100K	100K-OHM 1B	15A100K	100K-OHM 15A	15C100K	100K-OHM 15C

SPECIFICATION

主な仕様

Operating Temperature Range 使用温度範囲	-10 to 70°C
Rated Power 定格電力	0.05W
Maximum Operating Voltage 最高使用電圧	AC50V,DC20V
Nominal Total Resistance 公称全抵抗値	10kΩ,20kΩ,50kΩ,100kΩ
Total Resistance Tolerance 全抵抗値許容差	Within ±20% of the nominal total resistance
Resistance Taper 抵抗変化特性	1B,15A,15C
Insulation Resistance 絶縁抵抗	100MΩ at DC250V
Dielectric Strength 耐電圧	AC250V for 1 minute
Total Rotational Angle 全回転角度	300±5° (280±5° option: Model XV09212)
Rotational Torque 回転トルク	1 to 8 mN.m at (5 to 35°C)
Rotational Stop Strength of the Shaft シャフトの回転止め強さ	0.3 N.m
Push/Pull Strength of the Shaft シャフトの押し、引っ張り強さ	50N max.
Shaft Wobble シャフトのガタ	XV09211 : Less than 0.8x (L/20) mm XV09213 : Less than 0.5x (L/20) mm
Endurance(Sliding) 耐久性(しゅう動)	10,000 cycles

- Specifications in this catalog are presented basically for informative purposes.
We request the exchange of official approval drawings before placing order.
- 当カタログは参考仕様ですので、ご使用にあたっては正式納入仕様書の取り交わしをお願いします。

12,14mm Size Snap-In Insulated Shaft Potentiometers

12,14型絶縁軸スナップイン・ポテンショメータ

FEATURES

- Newly designed 12mm and 14mm size snap-in potentiometers to meet the electronics equipment trend for further miniaturization and lower profiles.
- High performance miniature potentiometer created by incorporating Noble's ICB (Integrated Control Block) film integration technology.
- Film makes smooth rotational feeling possible.
- Unit with or without bushing are available together with tap and detent.

APPLICATIONS

Various Potentiometers for volume, tone, balance and microphone volume control etc. of Radio, Radio-Cassette-Recorder (with or without CD), Amplifier, Mixer etc.

特 長

- エレクトロニクス機器の小型化、薄型化に対応して新しく設計されたスナップインタイプの12型、14型回転型ポテンショメータです。
- ノーブルのICB (Integrated Control Block) 思想のフィルム・インテグレーション・テクノロジーが生んだ小型高性能ポテンショメータです。
- フィルムの採用により、なめらかな回転フィーリングが得られます。

用 途

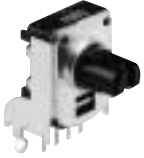
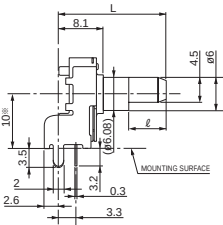
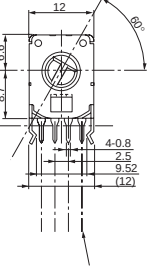
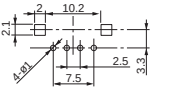
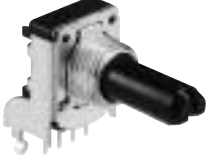
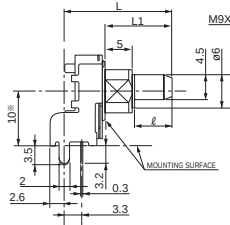
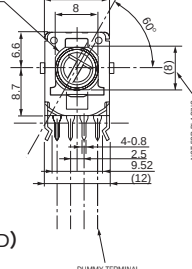
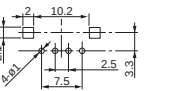
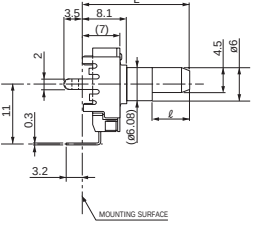
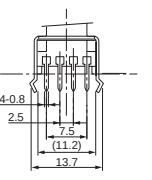
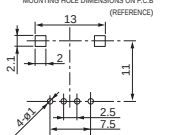
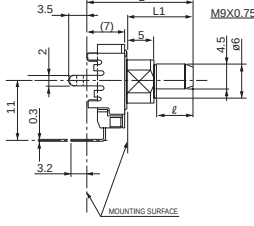
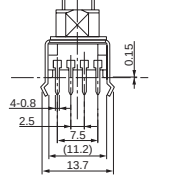
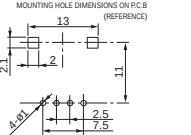
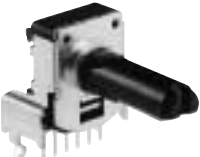
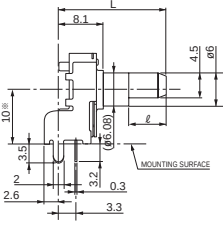
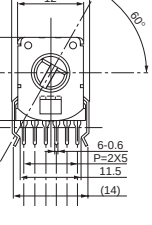
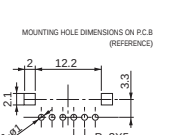
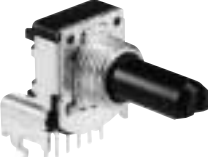
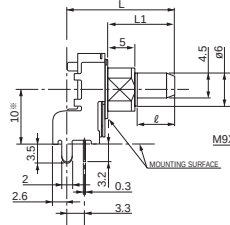
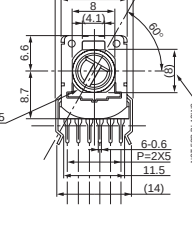
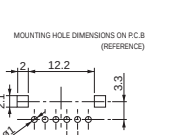
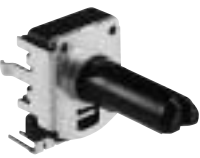
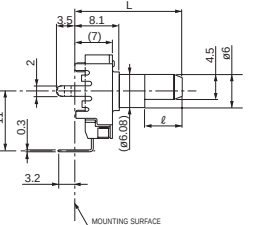
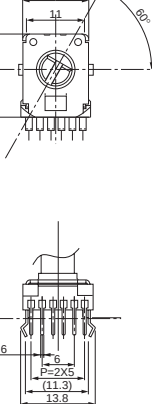
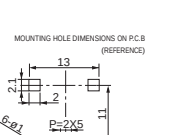
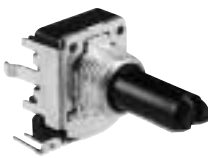
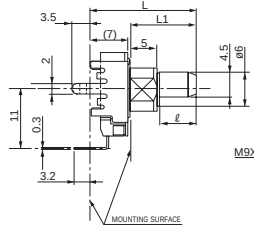
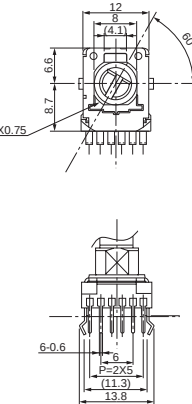
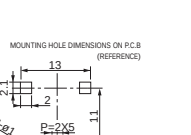
ラジオ、ラジオ付きカセットテープ (CD) レコーダ、アンプ、ミキサーなどの各種 (音量、トーン、バランス、マイク用などの) ボリュームです。

Product Variation

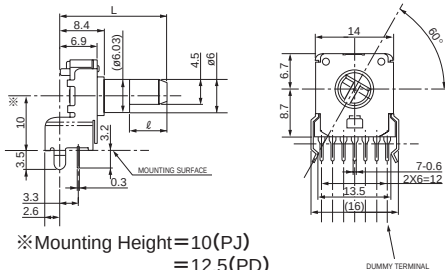
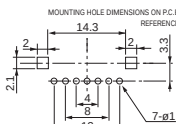
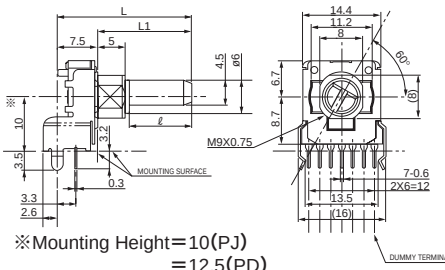
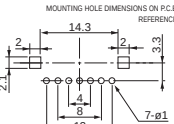
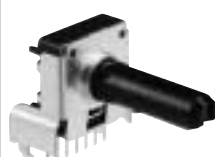
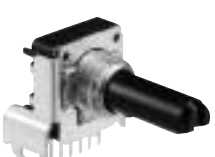
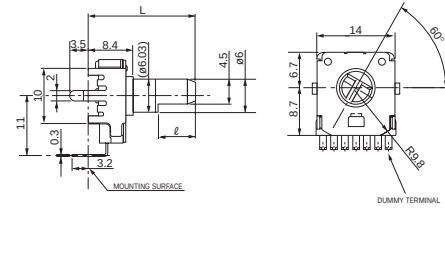
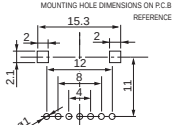
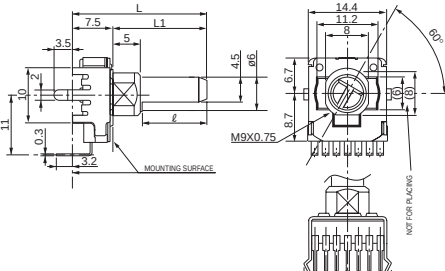
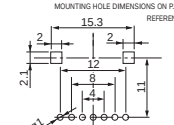
製品の種類

Size サイズ	Bushing or Sleeve 取付け方法	Mounting style 取付け方向	Mounting height 取付け高さ	Circuit Diagram 抵抗体の回路	Order Number 型式呼称	Relation No. 関連NO.	
12mm	Without Bushing	Horizontal 横型	10.0mm	Single-Element (Central tap is possible)	XV012111NPJ	①	
			12.5mm		XV012111NPD		
		Vertical 縦型	—		XV012111NPV	②	
					XV012113NPV	② Sleeve type	
		Horizontal 横型	10.0mm	Dual-Elements (High-Cut Tone)	XV012111GPJ	③	
			12.5mm		XV012111GPD		
		Vertical 縦型	—		XV012111GPV	④	
					XV012113GPV	④ Sleeve type	
		With Bushing	Horizontal 横型	10.0mm	Single-Element (Central tap is possible)	XVB12111NPJ	⑤
				12.5mm		XVB12111NPD	
			Vertical 縦型	—		XVB12111NPV	⑥
						Horizontal 横型	10.0mm
	12.5mm		XVB12111GPD				
	Vertical 縦型		—		XVB12111GPV	⑧	
		Without Bushing			Horizontal 横型	10.0mm	Dual-Elements (Without Tap)For Vol
	12.5mm		XV012211GPD				
	Vertical 縦型		—		XV012211GPV	⑩	
					XV012213GPV	⑩ Sleeve type	
	With Bushing	Horizontal 横型	10.0mm	Dual-Elements (Without Tap)For Tone	XV012311GPJ	⑪	
			12.5mm		XV012311GPD		
		Vertical 縦型	—		XV012311GPV	⑫	
					Without Bushing	Horizontal 横型	10.0mm
	12.5mm	XVB12211GPD					
	Vertical 縦型	—		XVB12211GPV		⑭	
				XV012313GPV		⑭ Sleeve type	
	With Bushing	Horizontal 横型	10.0mm	Dual-Elements (Without Tap)For Tone	XVB12311GPJ	⑮	
			12.5mm		XVB12311GPD		
		Vertical 縦型	—		XVB12311GPV	⑯	
					14mm	Without Bushing	Horizontal 横型
	12.5mm	XV014111GPD					
Vertical 縦型	—	XV014111GPV	⑱				
With Bushing	Horizontal 横型	10.0mm	XVB14111GPJ	⑲			
		12.5mm	XVB14111GPD				
	Vertical 縦型	—	XVB14111GPV	⑳			
Without Bushing	Horizontal 横型	10.0mm	Dual-Elements (With Tap) For Vol	XV014112GPJ		㉑	
		12.5mm		XV014112GPD			
	Vertical 縦型	—		XV014112GPV		㉒	
With Bushing	Horizontal 横型	10.0mm		XVB14112GPJ		㉓	
		12.5mm		XVB14112GPD			
	Vertical 縦型	—		XVB14112GPV		㉔	

*Center detent is available for all types.

Model	Dimentions	Unit:mm	Model	Dimentions	Unit:mm
XV012111NPJ XV012111GPJ	   ※Mounting Height=10(PJ) =12.5(PD) MOUNTING HOLE DIMENSIONS ON P.C.B (REFERENCE) 		XVB12111NPJ XVB12111GPJ	   ※Mounting Height=10(PJ) =12.5(PD) MOUNTING HOLE DIMENSIONS ON P.C.B (REFERENCE) 	
XV012111NPV XV012111GPV	   ※Mounting Height=10(PJ) =12.5(PD) MOUNTING HOLE DIMENSIONS ON P.C.B (REFERENCE) 		XVB12111NPV XVB12111GPV	   ※Mounting Height=10(PJ) =12.5(PD) MOUNTING HOLE DIMENSIONS ON P.C.B (REFERENCE) 	
XV012211GPJ XV012311GPJ	   ※Mounting Height=10(PJ) =12.5(PD) MOUNTING HOLE DIMENSIONS ON P.C.B (REFERENCE) 		XVB12211GPJ XVB12311GPJ	   ※Mounting Height=10(PJ) =12.5(PD) MOUNTING HOLE DIMENSIONS ON P.C.B (REFERENCE) 	
XV012211GPV XV012311GPV	   ※Mounting Height=10(PJ) =12.5(PD) MOUNTING HOLE DIMENSIONS ON P.C.B (REFERENCE) 		XVB12211GPV XVB12311GPV	   ※Mounting Height=10(PJ) =12.5(PD) MOUNTING HOLE DIMENSIONS ON P.C.B (REFERENCE) 	

- Specifications in this catalog are presented basically for informative purposes.
We request the exchange of official approval drawings before placing order.
- 当カタログは参考仕様ですので、ご使用にあたっては正式納入仕様書の取り交わしをお願いします。

Model	Dimintions	Unit:mm	Model	Dimintions	Unit:mm
XV014111GPJ	 ※Mounting Height=10(PJ) =12.5(PD) MOUNTING HOLE DIMENSIONS ON P.C.B REFERENCE 		XVB14111GPJ	 ※Mounting Height=10(PJ) =12.5(PD) MOUNTING HOLE DIMENSIONS ON P.C.B REFERENCE 	
XV014112GPJ			XVB14112GPJ		
 ⑪			 ⑲		
XV014111GPV	 Mounting Height=10(PJ) =12.5(PD) MOUNTING HOLE DIMENSIONS ON P.C.B REFERENCE 		XVB14111GPV	 Mounting Height=10(PJ) =12.5(PD) MOUNTING HOLE DIMENSIONS ON P.C.B REFERENCE 	
XV014112GPV			XV014112GPV		
 ⑱			 ⑳		

Example of indicating Order Number

注文番号の記載例

XV012311GPJ 15F 15A10K CC

Product Variation
製品の種類

In case of ordering "Center detent"
センタークリック付きの指定

Indicating Resistance & Taper/10K-OHM 15A :
Select form Code Table-2
抵抗素子の仕様: Code Table-2参照

Indicating shaft length & type/15mmF : Select form Code Table-1
軸の長さ及び形状: Code Table-1参照

Code Table-1-1

Without Bush

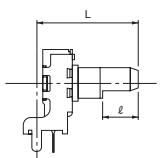
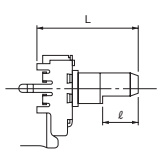
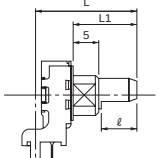
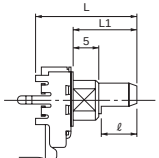
With Bush

Order Number	Shaft length		Order Number	Shaft length		
	L1	ℓ		L	L1	ℓ
15F	15	4.5	20F	20	12.5	7
20F	20	7	22.5F	22.5	15	7
25F	25	12	25F	25	17.5	12
30F	30	12	27.5F	27.5	20	12
			30F	30	22.5	12

Code Table-1-2 (Shaft Design)

Without Bushing

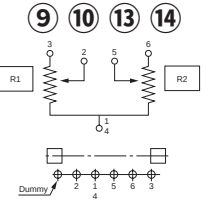
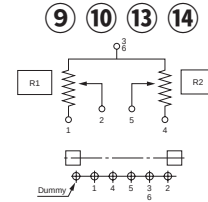
With Bushing

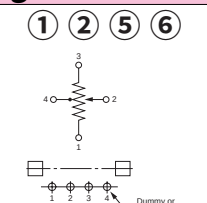
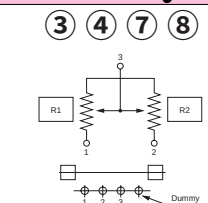
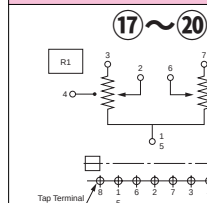
 	 
---	---

■ Code Table-2-1 (①~⑩)

Order Number	Resistance&Taper	Order Number	Resistance&Taper
1B10K	10K-OHM 1B	15C10K	10K-OHM 15C
1B20K	20K-OHM 1B	15C20K	20K-OHM 15C
1B50K	50K-OHM 1B	15C50K	50K-OHM 15C
1B100K	100K-OHM 1B	15C100K	100K-OHM 15C
15A10K	10K-OHM 15A	3B10K	10K-OHM 3B
15A20K	20K-OHM 15A	3B20K	20K-OHM 3B
15A50K	50K-OHM 15A	3B50K	50K-OHM 3B
15A100K	100K-OHM 15A	3B100K	100K-OHM 3B

■ Code Table-2-2 (Circuit)

Dual-Elements(For Vol)	Dual-Elements(For Tone)
 (1B, 3B, 15A Taper)	 (15C Taper)

Single-Element	Dual-Elements (For High-Cut Tone)	Dual-Elements (With Tap)
 (Option: 15C Taper)	 (Option: 15C Taper)	 (3BM, 15AM Taper)

■ 2-1 (⑪~⑳) With Tap

Order Number	Resistance&Taper
3BM10K	10K-OHM 3BM
3BM20K	20K-OHM 3BM
3BM50K	50K-OHM 3BM
3BM100K	100K-OHM 3BM
15AM10K	10K-OHM 15AM
15AM20K	20K-OHM 15AM
15AM50K	50K-OHM 15AM
15AM100K	100K-OHM 15AM
15CM10K	10K-OHM 15CM
15CM20K	20K-OHM 15CM
15CM50K	50K-OHM 15CM
15CM100K	100K-OHM 15CM

*15AM, 15CM Taper is option type.

■ SPECIFICATION

	① ② ⑤ ⑥	③ ④ ⑦ ⑧	⑨ ～ ⑩	⑪ ～ ⑫
Operating Temperature Range 使用温度範囲	- 10 to 70°C			
Rated Power 定格電力	0.05W	Operating Current 1mA AC only 最高使用電流 1mA	0.05W	
Maximum Operating Voltage 最高使用電圧	AC50V,DC20V	DC20V		
Nominal Total Resistance 公称全抵抗値	10kΩ, 20kΩ, 50kΩ, 100kΩ			
Total Resistance Tolerance 全抵抗値許容差	Within ±20% of the nominal total resistance			
Resistance Taper 抵抗変化特性	1B, 15A, 15C, 3B			3BM, (15AM, 15CM)
Insulation Resistance 絶縁抵抗	100MΩ at DC500V	100MΩ at DC250V		
Dielectric Strength 耐電圧	AC500V for 1 minute	AC300V for 1 minute		
Tracking Error 相互偏差	-	For volume control : Within ± 3dB at a range of 0~40dB. Except for 1B Taper. For tone control : Within ± 2dB at center.		
Total Rotational Angle 全回転角度	300±5° C			
Rotational Torque 回転トルク	3 to 20 mN.m at (5 to 35°C)			
Rotational Stop Strength of the Shaft シャフトの回転止め強さ	Without Bushing=0.5N.m With Bushing=0.6N.m			
Push/Pull Strength of the Shaft シャフトの押し、引張り強さ	80N max.			
Endurance(Sliding) 耐久性(しゅう動)	15,000 cycles	10,000 cycles	15,000 cycles	

- Specifications in this catalog are presented basically for informative purposes.
We request the exchange of official approval drawings before placing order.
- 当カタログは参考仕様ですので、ご使用にあたっては正式納入仕様書の取り交わしをお願いします。

Ultra-long Life Potentiometer 高寿命ポテンシヨメータ

FEATURES

- Ultra-long Life Potentiometer developed for game machines.
- Excellent smooth operation low torque.

APPLICATIONS

- Controllers for Video Game.
- Position Sensors for Personal robot.

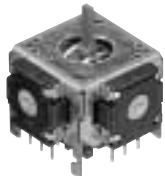
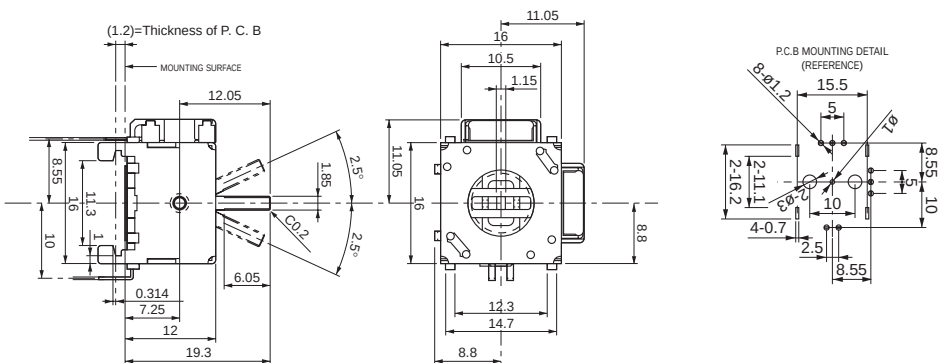
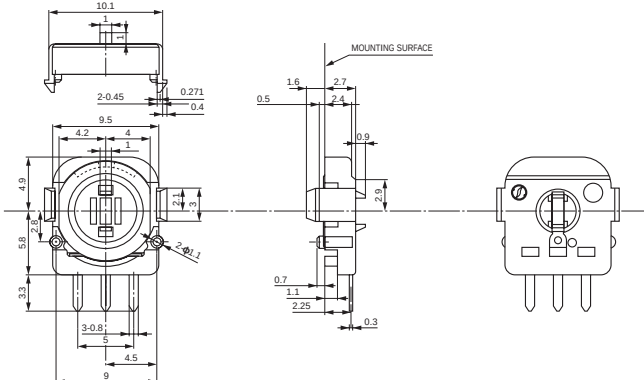
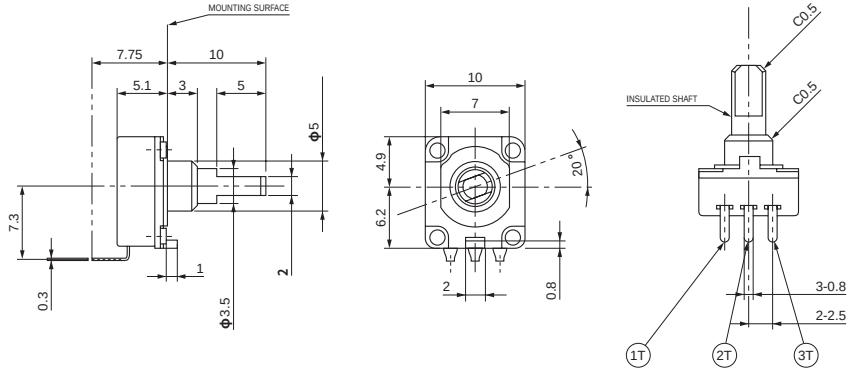
特 長

- ゲーム機器用に設計された高寿命可変抵抗器です。
- 操作性に優れた低トルク仕様です。

用途

- ゲーム機器などの操作部。
- パーソナルロボットなどの関節部位置センサー。

Order Number	Function	機能	Drawing NO. 図番
XVL161-7.3FF-0B10K	- Joystick Control. - With Push- Momentaly Switch (SPST)	- ジョイスティック操作 - プッシュオンスイッチ付き (SPST)	①
XV09912PHNSL-0B30K	Potentiometer to be used in Joystick Control.	ジョイスティック機構に取り付ける可変抵抗器です。	②
XV09411N10FF-0B5K	Rotary type.	回転操作	③
TR133N10FF-0B10K	Rotary type.	回転操作	④
XVJ09-Y0004	Slide type.	スライド操作	⑤

Model	Dimintions	Unit:mm
XVL161 (With Push Momentary Switch) (Lever reset type) 		
XV09912 		
XV09411 		

Surface Mount Trimmer Potentiometer (Metal-glazed Type) TMC Series

FEATURES

- Space Saving Size
- Easily adjusts with standard screwdriver.
- Metal-glaze resistance element gives excellent stability and protection against environmental factors.
- Can be mounted to a circuit board with adhesive.
- Designed for reflow soldering.
- Supplied in 8mm tape for automatic assembly equipment.

APPLICATIONS

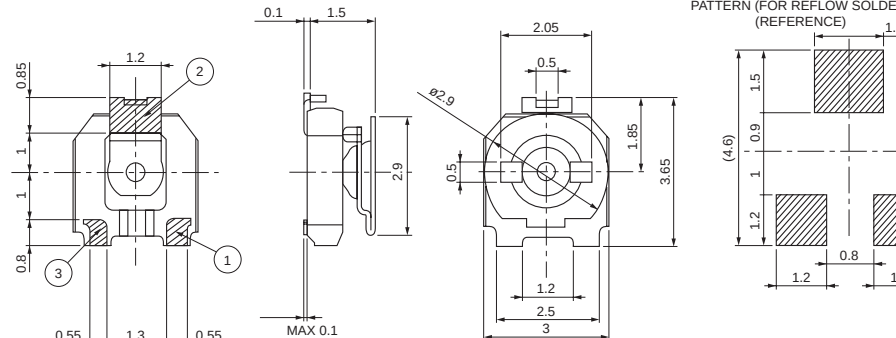
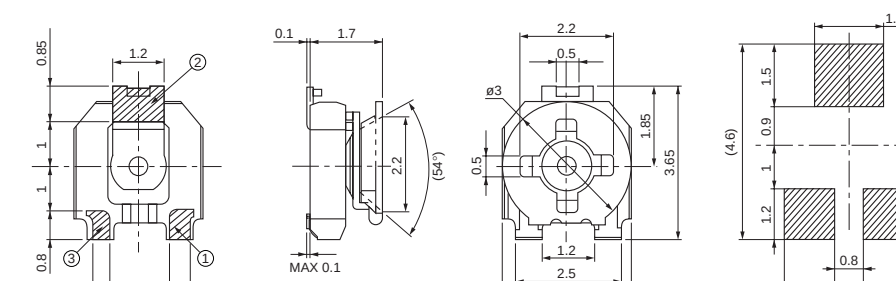
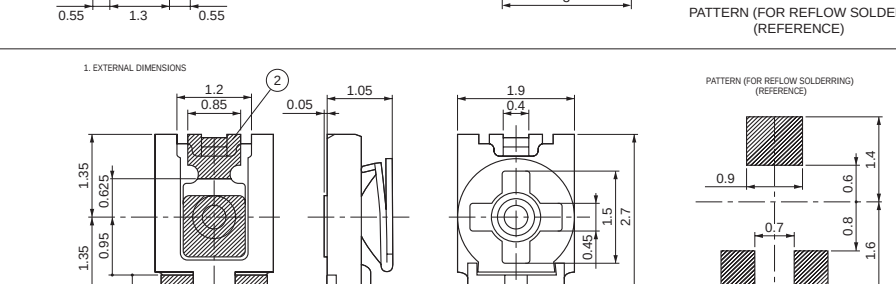
CAMERA built-in VCR, 8mm VCR, VCR camera, still camera, headphone stereos, LCD television, disk drive, bar code equipments, rader detectors, hand held equipments.

特 長

- 小型でしかも薄型です。
- 素子には、メタルグレース抵抗体を使用していますので、安定性、耐候性に優れています。
- リフローはんだ付けに対応。

用途

カメラ一体型VTR、8mmVTRカメラ、スチールカメラ、ヘッドホンステレオ、液晶テレビ、フロッピーディスクドライブ装置、その他高密度実装が要求される民生・産業用機器。

TMC3K 	 PATTERN (FOR REFLOW SOLDERING) (REFERENCE)
TMC3KJ 	 PATTERN (FOR REFLOW SOLDERING) (REFERENCE)
TMC2KJ 	 1. EXTERNAL DIMENSIONS PATTERN (FOR REFLOW SOLDERING) (REFERENCE)

■ SPECIFICATIONS

	TMC3K	TMC2K
Total Rotational Angle 全回転角度	Endless (effective rotational angle 250 ±20 °)	Endless (effective rotational angle 260 ±20 °)
Rotational Torque 回転トルク	1～20mN・m	0.5～20mN・m
Nominal Total Resistance 公称全抵抗値	100Ω, 220Ω, 470Ω, 1kΩ, 2.2kΩ, 4.7kΩ, 10kΩ, 22kΩ, 47kΩ, 100kΩ, 220kΩ, 470kΩ, 1MΩ, 2.2MΩ	100Ω, 220Ω, 470Ω, 1kΩ, 2.2kΩ, 4.7kΩ, 10kΩ, 22kΩ, 47kΩ, 100kΩ, 220kΩ, 470kΩ, 1MΩ, 2.2MΩ
Total Resistance Tolerance 全抵抗値許容差	Within ±25% of the nominal total resistance	Within ±25% of the nominal total resistance
Resistance Taper 抵抗変化特性	taper B(Linear)	taper B(Linear)
Rated Power 定格電力	0.1W	0.1W
Maximum Operating Voltage 最高使用電圧	AC20V,DC20V	AC20V,DC20V
Resistance Temperature Coefficient 抵抗温度係数	Within ±250ppm/°C	Within ±250ppm/°C

- Specifications in this catalog are presented basically for informative purposes.
We request the exchange of official approval drawings before placing order.
- 当カタログは参考仕様ですので、ご使用にあたっては正式納入仕様書の取り交わしをお願いします。

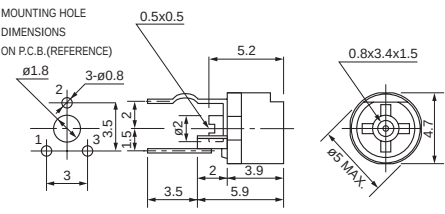
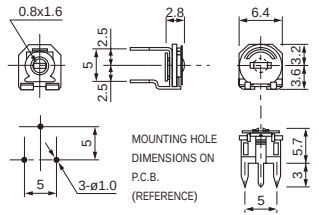
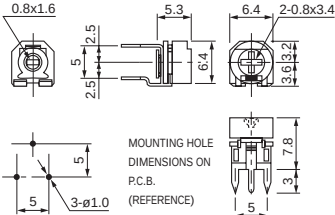
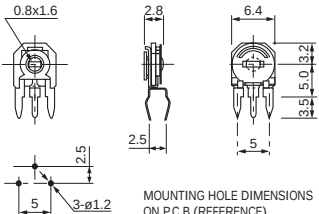
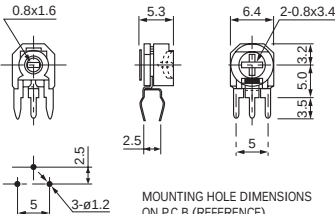
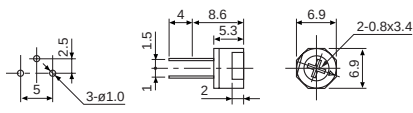
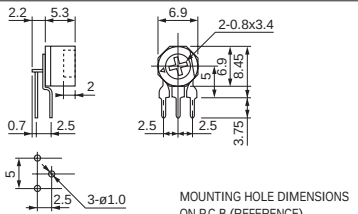
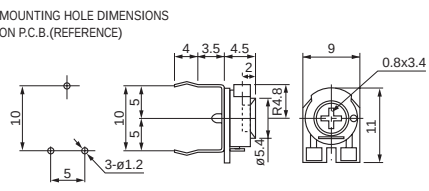
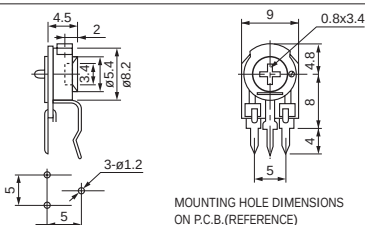
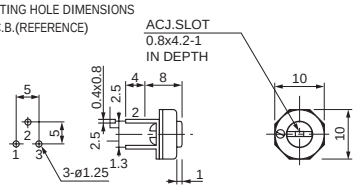
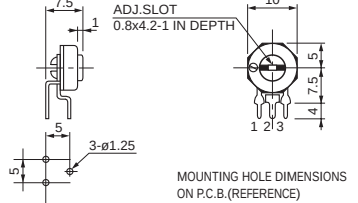
Metal-glazed Trimmer Potentiometers メタルグレース半固定ポテンショメータ

FEATURES

- Excellent stability and environmental resistance by utilization of a metal glazed resistor element.
- Miniature, yet with high power handling capabilities.

特長

- メタルグレース抵抗素子の採用で安定性、耐候性に優れています。
- 小型、高電力形です。

VM5CK-PV (with Dust-proof Knob) 	 MOUNTING HOLE DIMENSIONS ON P.C.B.(REFERENCE)				
VM6CK-PV 	 MOUNTING HOLE DIMENSIONS ON P.C.B.(REFERENCE)	VM6CK-PV(1S) (with Knob) 	 MOUNTING HOLE DIMENSIONS ON P.C.B.(REFERENCE)		
VM6CK-PH 	 MOUNTING HOLE DIMENSIONS ON P.C.B.(REFERENCE)	VM6CK-PH(1S) (with Knob) 	 MOUNTING HOLE DIMENSIONS ON P.C.B.(REFERENCE)		
TM64K2(PV) (with Dust-proof Knob) 	 MOUNTING HOLE DIMENSIONS ON P.C.B.(REFERENCE)	TM64K2(PH) (with Dust-proof Knob) 	 MOUNTING HOLE DIMENSIONS ON P.C.B.(REFERENCE)		
TM8KV2-1S (with Dust-proof Knob) 	 MOUNTING HOLE DIMENSIONS ON P.C.B.(REFERENCE)	TM8KH1-1S (with Dust-proof Knob) 	 MOUNTING HOLE DIMENSIONS ON P.C.B.(REFERENCE)		
TM10K(PV) (with Dust-proof Knob) 	 MOUNTING HOLE DIMENSIONS ON P.C.B.(REFERENCE) ACJ.SLOT 0.8x4.2-1 IN DEPTH	TM10K(PH) (with Dust-proof Knob) 	 MOUNTING HOLE DIMENSIONS ON P.C.B.(REFERENCE) ADJ.SLOT 0.8x4.2-1 IN DEPTH		

	VM5CK	VM6CK	TM64K	TM8K	TM10K
Total Rotational Angle 全回転角度	200±20°	200±10°	200±10°	260±10°	200±10°
Rotational Torque 回転トルク	2-20mN·m {20-204gf·cm}	3-30mN·m {31-306gf·cm}	3-25mN·m {31-255gf·cm}	3-30mN·m {31-306gf·cm}	3-35mN·m {31-357gf·cm}
Resistance Range 全抵抗値範囲	100Ω-1MΩ (taper B)	200Ω-1MΩ (taper B)	100Ω-1MΩ (taper B)	200Ω-1MΩ (taper B)	100Ω-1MΩ (taper B)
Total Resistance Tolerance 全抵抗値許容差	±25%	±20%	±20%	±20%	±20%
Rated Power 定格電力	0.2W	0.3W	0.3W	0.5W	0.5W
Maximum Operating Voltage 最高使用電圧	AC 100V, DC 100V	AC 100V, DC 100V	AC 100V, DC 100V	AC 250V, DC 250V	AC 200V, DC 200V
Temperature Coefficient 温度係数	Less than 100kΩ: ±200ppm/°C 100kΩ to 1MΩ: ±300ppm/°C	±200ppm/°C (500Ω-100kΩ)	±200ppm/°C (500Ω-100kΩ)	±200ppm/°C (200Ω-100kΩ)	±300ppm/°C
Operating Life 耐回転性	50 cycles	50 cycles	50 cycles	100 cycles	100 cycles

MR Sensors (TDM Series)

Magneto-Resistance Device
High-Sensitivity in Weak Magnetic Fields and
High-Speed Response Capability are Offered Together

FEATURES

- Compact and light weight.
- Ferromagnetic thin films made from a permalloy or a nickel-cobalt alloy as an element
 - High sensitivity in a weak magnetic field like 8kA/m{100 Oe}
 - Higher response speed and higher resolution than the methods with a coil or a ray
 - By virtue of its directional sensitivity, adverse influences of leaked magnetic fields are to be alleviated
- No mechanical wear due to non-contact type
- Low power consumption

APPLICATIONS

Capstan motors for VCR, Camcorder and DAT, Servo motors for Copier and Printer, Motors for NC machine, etc.

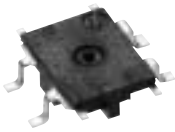
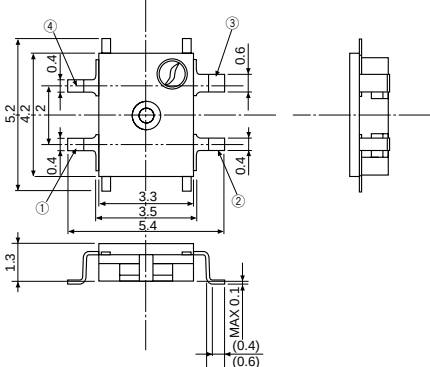
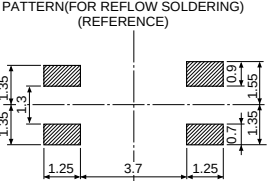
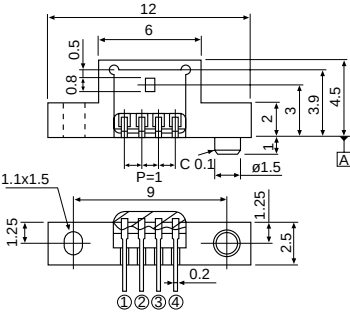
磁気抵抗素子MRセンサ (TDMシリーズ) 低磁界感度と高速応答性を両立

特長

- 小型軽量です。
- 素子はパーマロイまたはニッケルコバルト合金の強磁性体の薄膜を使用しています。
 - 8kA/m{100Oe}程度の低磁場で高感度を得ることができます。
 - コイルや光を用いた方式と異なり、応答速度が速く、高い分解能をもっています。
- 感度に指向性があるため、有害な漏洩磁界の影響を軽減することができます。
- 非接触形のため機械的摩耗がありません。
- 低消費電力です。

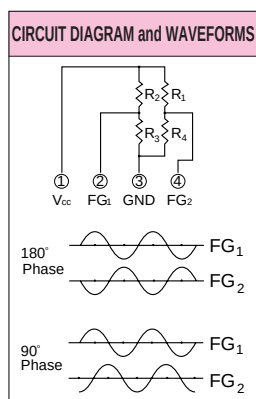
用途

VTR、ビデオカメラ、DAT用などキャプスタンモータ、複写機及びプリンタ用サーボモータ、NCマシンなど。

TDM0203 (Surface Mount type)  Taping (Holds, 3000 parts)	 PATTERN (FOR REFLOW SOLDERING) (REFERENCE) 
TDM0404 	 Holder and Terminals to be led out are custom designs.

SPECIFICATIONS

	TDM0203	TDM0404
Operating Temperature Range 使用温度範囲	-30~80 °C	-30~80 °C
Rated Voltage 定格電圧	DC 5V (Max Operating Voltage DC12V)	DC 5V (Max Operating Voltage DC12V)
Input Resistance 入力抵抗値	1,800 Ω ± 30%	1,000 Ω ± 30%
Magneto-resistance Variation (Magnetic Sensitivity) 磁気抵抗変化率	2%min. at a magnetic field intensity of 8kA/m {100 Oe}	2%min. at a magnetic field intensity of 8kA/m {100 Oe}
Neutral Point Voltage 中点電圧	2,500 ± 30mV When 5V DC applied across input terminals	2,500 ± 30mV When 5V DC applied across input terminals



- Specifications in this catalog are presented basically for informative purposes.
We request the exchange of official approval drawings before placing order.
- 当カタログは参考仕様ですので、ご使用にあたっては正式納入仕様書の取り交わしをお願いします。

Rotary Encoders XRE Series

FEATURES

- High performance switches created by incorporating NOBLE's Film Integration Technology.
- Film element provides smooth rotational feeling.

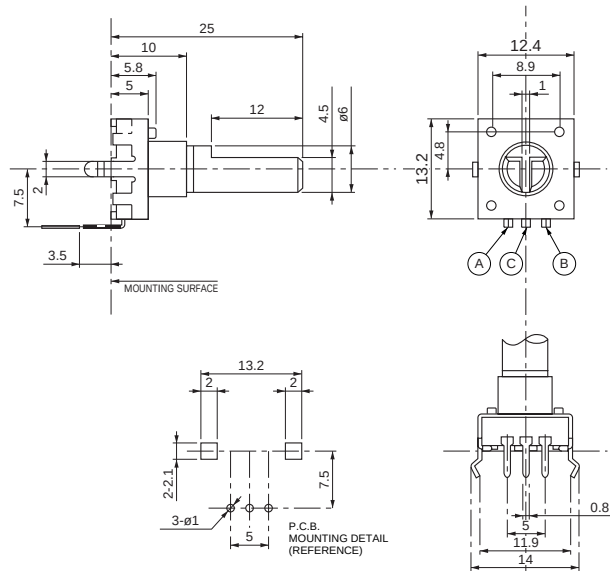
ロータリエンコーダ

特長

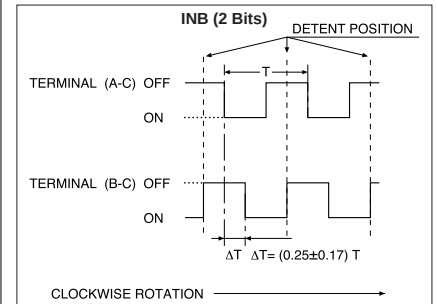
- ノーブルのフィルムインテグレーションテクノロジーが生んだ小型高性能信号スイッチです。
- フィルムの採用により、なめらかな回転フィーリングが得られます。

XRE0121PVB

(Insulated Shaft)
(Bracket Type)

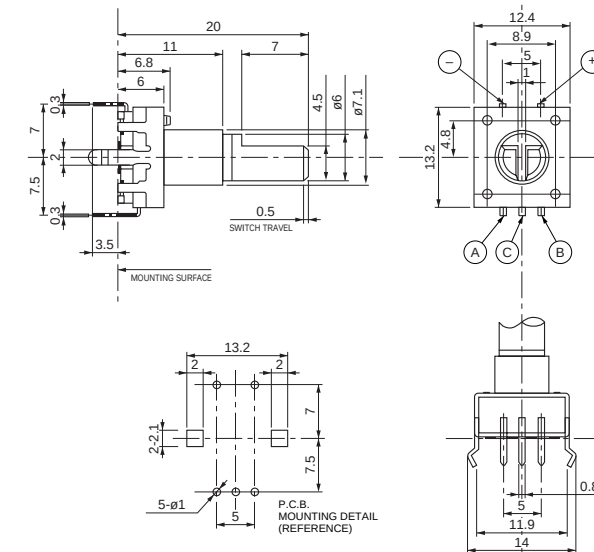
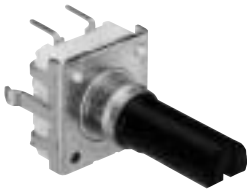


INCREMENTAL OUTPUT SIGNAL (for 24PC Type)

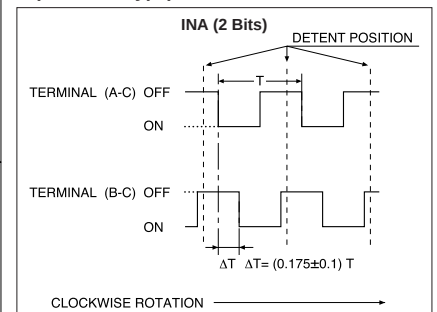


XRE0122PVB

(Insulated Shaft)
(Bracket Type)
(with Push-Momentary Switch)



INCREMENTAL OUTPUT SIGNAL (for 12 PC Type)



SPECIFICATIONS

	24PC Type	12PC Type
Type of Output Signal 出力信号の種類	INB (2 Bits)	INB (2 Bits)
Operating Temperature Range 使用温度範囲	-10 to 70°C	-10 to 70°C
Rated Voltage/Rated Current 定格電圧/電流	DC 5V 0.5mA	DC 5V 0.5mA
Resolution 分解能	24 Pulses/360°	12 Pulses/360°
Total Rotational Angle 全回転角度	360° Endless	360° Endless
Detent Position and Angle クリック数、角度	24 Detents 15±3°	12 Detents 30±3°
Detent Torque クリックトルク	3 to 20 mN·m	3 to 20 mN·m
Rotational Life 耐久性 (しゅう動)	30,000 cycles	30,000 cycles

Specification of Push-Momentary Switch

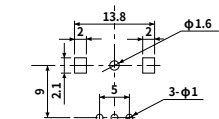
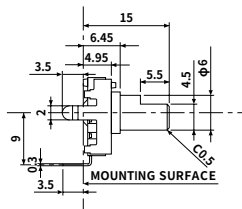
Circuit 回路	SPST
Rated Voltage/Rated Current 定格電圧/電流	DC 5V 10mA
Contact Resistance 接触抵抗	100mΩ max.
Insulation Resistance 絶縁抵抗	10MΩ min. at DC 50V
Dielectric Strength 耐電圧	AC 50V for 1 minute
Travel 移動量	0.5mm
Operating Force 動作力	3 ± 1.5 N
Operational Life 耐久性	20,000 actuations

Rotary Encoders RE Series

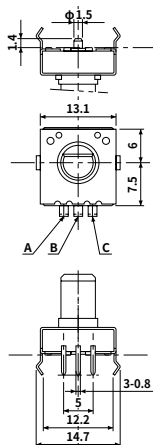
ロータリエンコーダ

RE0131PVB

(Insulated Shaft)
(Bracket Type)

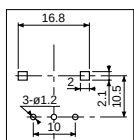
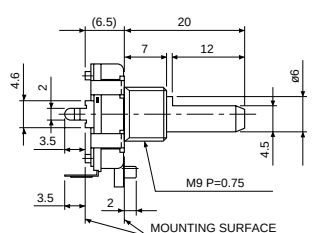
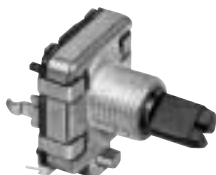


P.C.B MOUNTING DETAIL (REFERENCE)

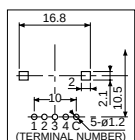


REB161PVB

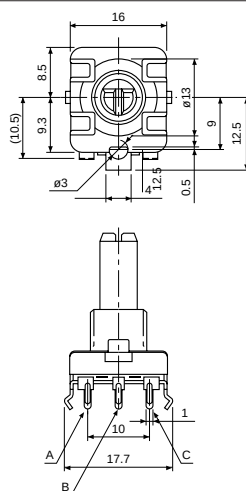
(Insulated Shaft)



2Bits
P.C.B MOUNTING DETAIL
(REFERENCE)

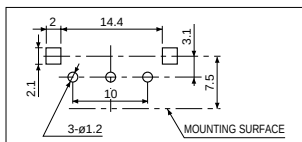
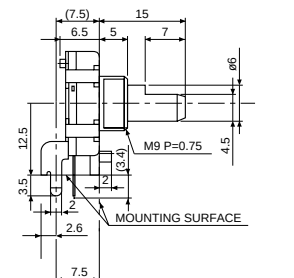


4Bits
P.C.B MOUNTING DETAIL
(REFERENCE)

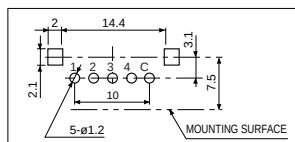
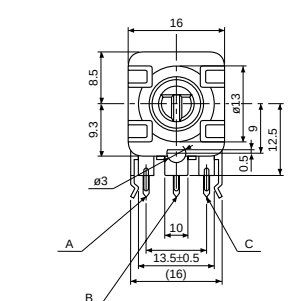


REB161PHD

(Insulated Shaft)

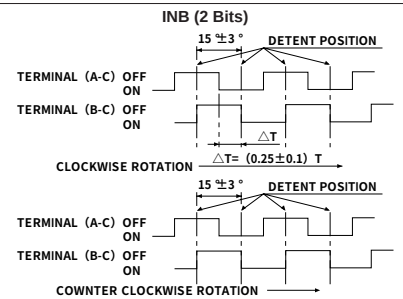


2Bits
P.C.B MOUNTING DETAIL (REFERENCE)

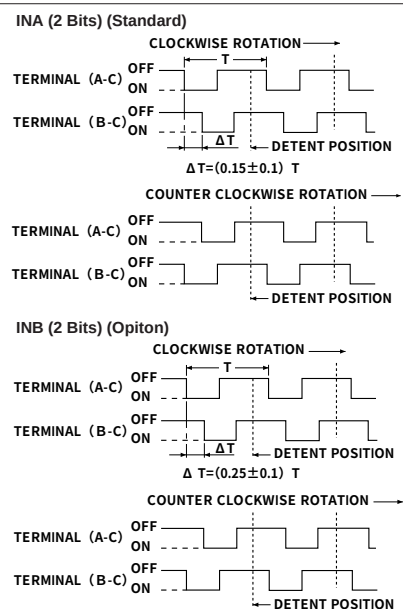


4Bits
P.C.B MOUNTING DETAIL (REFERENCE)

INCREMENTAL OUTPUT SIGNAL (for RE0131)



INCREMENTAL OUTPUT SIGNAL (for REB161)



SPECIFICATIONS

	RE0131	REB161	
Type of Output Signal 出力信号の種類	INB (2 Bits)	INA, INB (2 Bits)	GRY (4 Bits)
Operating Temperature Range 使用温度範囲	-10 to 70°C	-10 to 70°C	
Rated Voltage/Rated Current 定格電圧/電流	DC 5V 0.5mA	DC 5V 0.5mA	DC 12V 4mA
Resolution 分解能	12 Pulses/360°	24 Pulses/360°	4Bits 16 Pulses/360°
Total Rotational Angle 全回転角度	360° Endless	360° Endless	360° Endless
Detent Position and Angle クリック数、角度	24 Detents 15±3°	24 Detents 15±3°	16 Detents 22.5±3°
Detent Torque クリックトルク	1.5 to 15 mN·m	3 to 20 mN·m	
Rotational Life 耐久性 (しゅう動)	50,000 cycles	100,000 (INA) 50,000 (INB) cycles	50,000 cycles

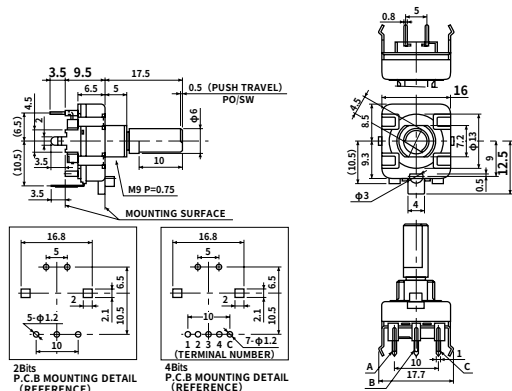
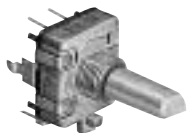
- Specifications in this catalog are presented basically for informative purposes.
We request the exchange of official approval drawings before placing order.
- 当カタログは参考仕様ですので、ご使用にあたっては正式納入仕様書の取り交わしをお願いします。

Rotary Encoders RE Series

ロータリエンコーダ

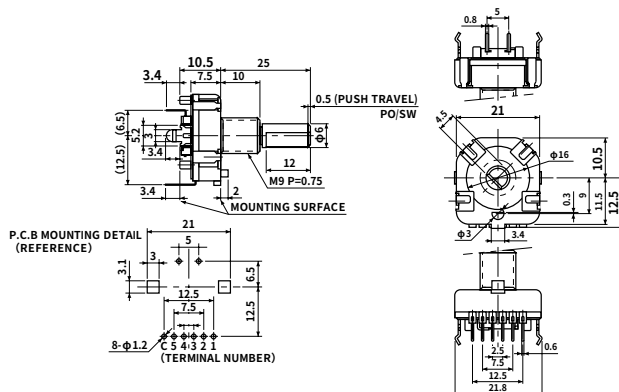
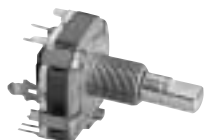
REB162PVBS

(With Push-Momentary Switch)



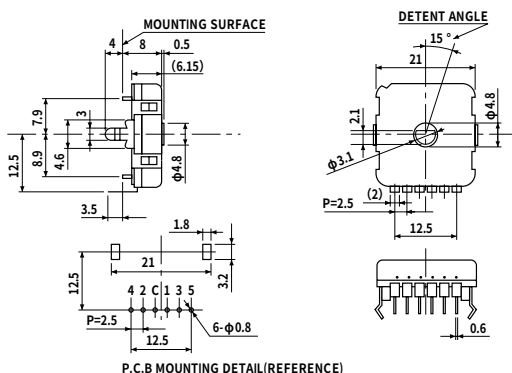
REB202PVBS

(With Push-Momentary Switch)



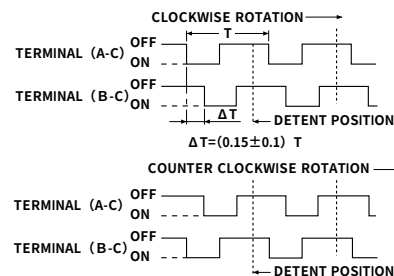
RE0201PVB

(Shaft-less)

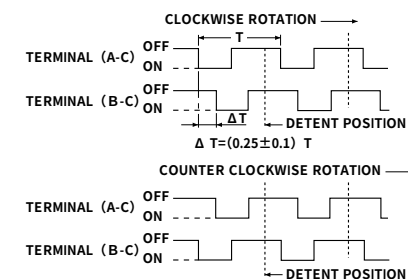


INCREMENTAL OUTPUT SIGNAL (For REB162)

INA (2 Bits) (Standard)



INB (2 Bits) (Option)



Specification of Push-Momentary Switch (For REB162, REB202)

Circuit 回路	SPST
Rated Voltage/Rated Current 定格電圧/電流	DC 16V 20mA
Contact Resistance 接触抵抗	100mΩ max.
Insulation Resistance 絶縁抵抗	10MΩ min. at DC 100V
Dielectric Strength 耐電圧	AC 100V for 1 minute
Travel 移動量	0.5mm
Operating Force 動作力	5 ± 1.5 N
Operational Life 耐久性	10,000 actuations

OUTPUT SIGNAL (Pulse Type)

GRAY CODE (For REB162, RE0201, REB202)

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Terminal Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
		○	○			○	○			○	○			○	○			○	○			○	○			○	○			○	○	
			○	○	○	○				○	○	○	○					○	○	○	○			○	○	○	○			○	○	
					○	○	○	○		○	○	○	○	○	○	○	○					○	○	○	○	○	○	○			○	○
									○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

○=ON

Terminal Number C=Common

*1, *2: GRAY code for REB162 and REB202 start at the position number 2.

SPECIFICATIONS

	REB162	RE0201	REB202
Type of Output Signal 出力信号の種類	INA, INB (2 Bits)	GRAY *1 (4 Bits)	GRAY (5 Bits)
Operating Temperature Range 使用温度範囲	-30 to 80°C	-30 to 80°C	-10 to 70°C
Rated Voltage/Rated Current 定格電圧/電流	DC 5V 0.5mA	DC 5V 0.5mA	DC 12V 10mA
Resolution 分解能	24 Pulses/360°	15 Positions/300°	24 Positions/360°
Total Rotational Angle 全回転角度	360° Endless	300±5°	360° Endless
Detent Position and Angle クリック数、角度	24 Detents 15±3°	15 Detents 21.4±5°	24 Detents 15±3°
Detent Torque クリックトルク	5 to 25 mN·m	5 to 25 mN·m	10 to 30 mN·m
Rotational Life 耐久性 (しゅう動)	50,000 cycles	30,000 cycles	10,000 cycles

Jog Shuttle Switches RDS Series

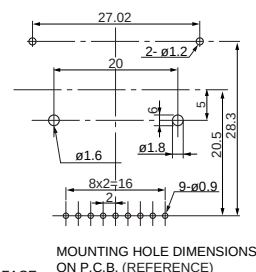
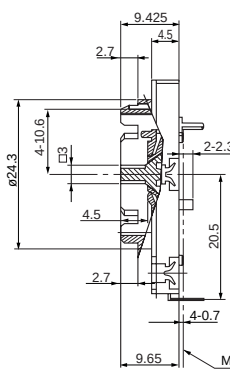
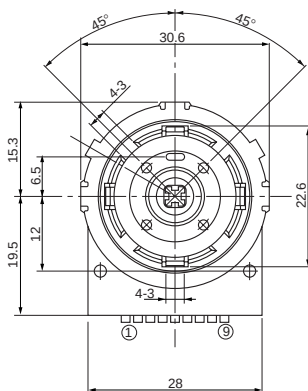
ジョグシャトル・スイッチ

外軸：パルススイッチ 内軸：5方向スイッチ

Outer Shaft : Pulse Switch (2Bit Output Signal = 360° Endless (30° step))

Inner Shaft : 5 Direction Push-switch

RDS-Y0003

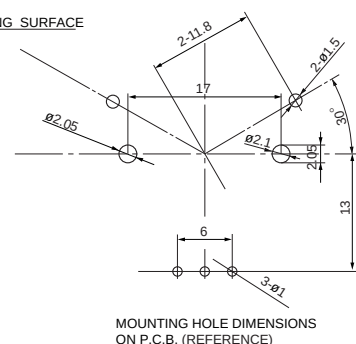
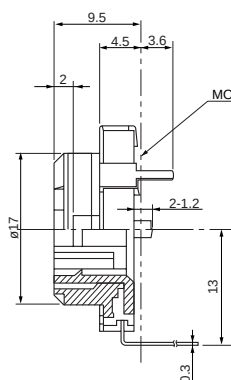
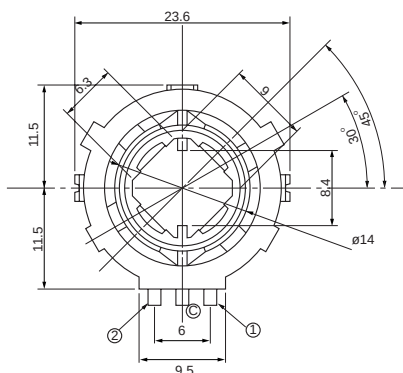


外軸：パルススイッチ 内軸：中空構造

Outer Shaft : Pulse Switch (2Bit Output Signal = 360° Endless (36° step))

Inner Shaft : Shaft-Less (Hollow)

RDS-Y0008

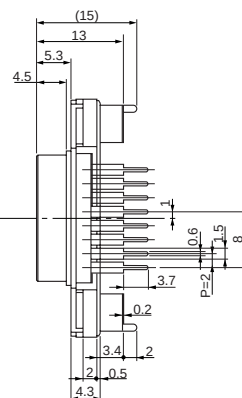
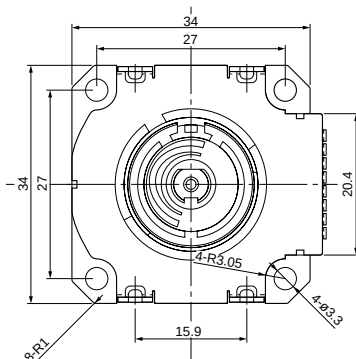


外軸：シャトルスイッチ 内軸：ジョグスイッチ(センター復帰式)

Outer Shaft : Jog part (± 80° at Center position)

Inner Shaft : Pulse Switch (2Bit Output Signal = 360° Endless (36° step))

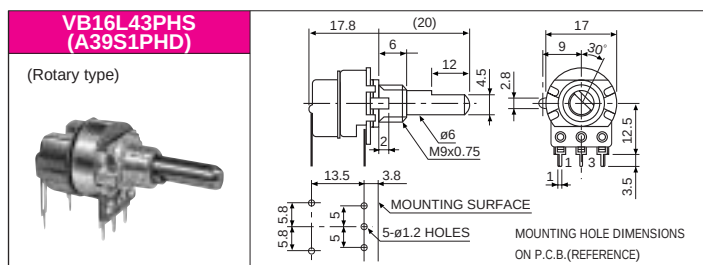
RDS-Y0004



We prepare Hollow (without inner Shaft) type, RDS-Y0013

- Specifications in this catalog are presented basically for informative purposes.
We request the exchange of official approval drawings before placing order.
- 当カタログは参考仕様ですので、ご使用にあたっては正式納入仕様書の取り交わしをお願いします。

交流電源スイッチ（可変抵抗器付き）



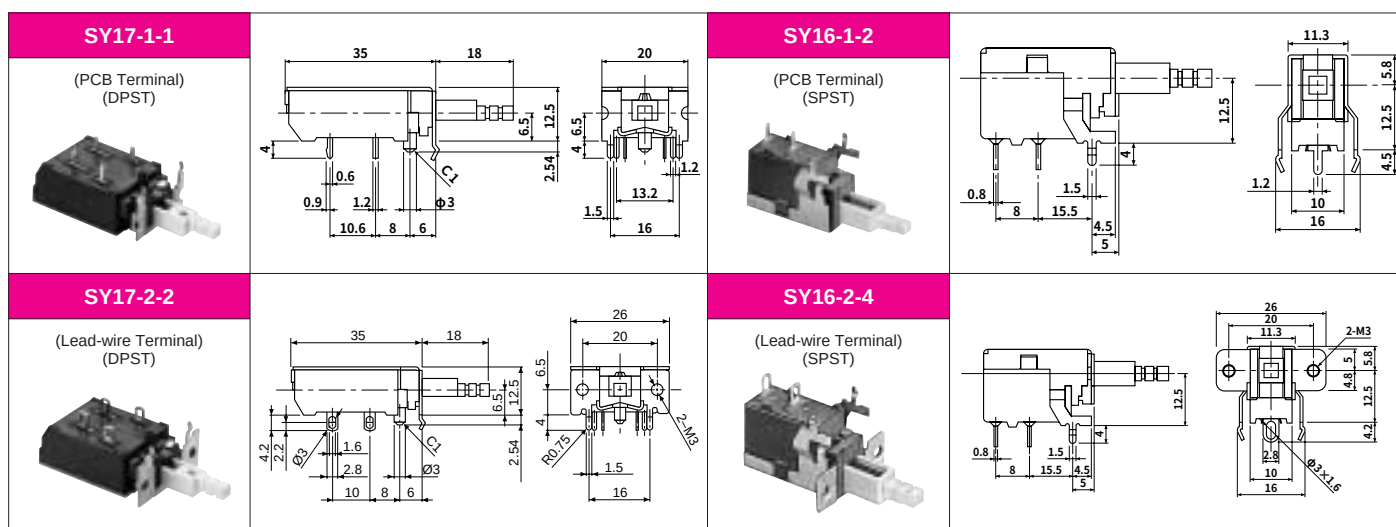
交流電源スイッチ（プッシュ操作）

APPLICATIONS

Television, monitors, AV system and other electronic equipment.

用途

テレビ、モニターテレビ、AV機器など

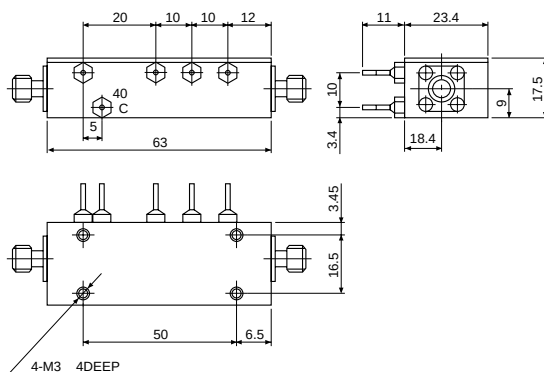


交流電源スイッチ規格一覧表

Operation	Combined Function	Series Number	Pole & Throw	Terminals		Listed undr Safety Standards						
				Solder Lug	PCB Lug	Electronics Appliance	General Appliance	UL	CSA	VDE	SEMKO	BS
						Applicable Load Life Tests						
						Test B	Test A	Test C	Test C	Test D	Test D	Test D
						125VAC (A)				250VAC		
Rotary Types	w/16mm pot. (VB16L43)	B39S1 A39S1	SPST	○	○	1	3	—	—	—	—	—
Push-Lock Types	SY17	U1D1	DPST	○	○	5	10	TV8	TV8	8A/128A Class Iu	8A/128A Class Iu	8A/128A Class Iu
		U1S1	SPST									
	SY16	U99S2	SPST	○	○	5	10	TV5	TV5	5A/80A Class Iu	5A/80A Class Iu	—
		U99S1				3	6	TV3	TV3	3A/48A Class Iu	3A/48A Class Iu	—

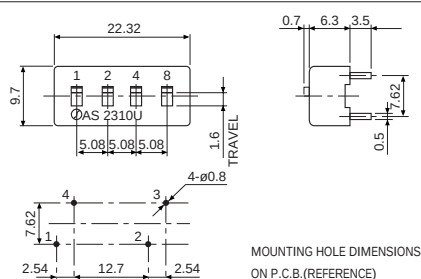
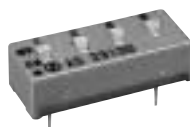
高周波用アッテネータ

(Programmable type)



Impedance インピーダンス	50Ω
Attenuation 減衰量	10, 20, 20 and 20dB step combined to 70dB max 1, 2, 4 and 8dB step combined to 15dB
Frequency 使用周波数	DC-2GHz (50Ω)
Rated Power 定格電力	500mW

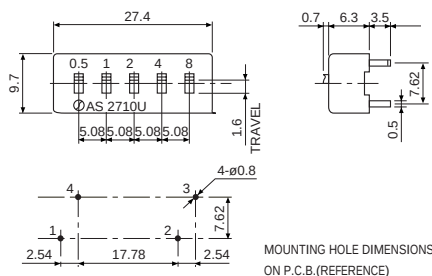
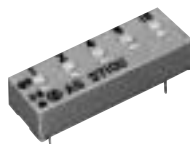
(Slide switch type)



Impedance インピーダンス	600Ω±2.5% unbalanced T
Attenuation 減衰量	Combination of 1, 2, 4, 8dB; 15dB total
Frequency 使用周波数	DC-150kHz
Rated Power 定格電力	50mW

1.2 : Common terminal

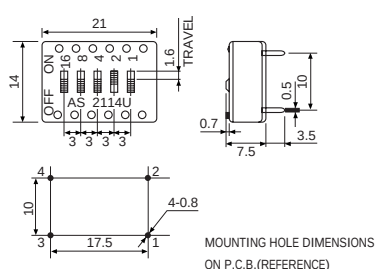
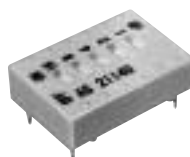
(Slide switch type)



Impedance インピーダンス	600Ω ±2.5% unbalanced T
Attenuation 減衰量	Combination of 0.5, 1, 2, 4, 8dB;15.5dB total Combination of 1, 2, 4, 8, 16dB; 31dB total
Frequency 使用周波数	DC-150kHz
Rated Power 定格電力	50mW

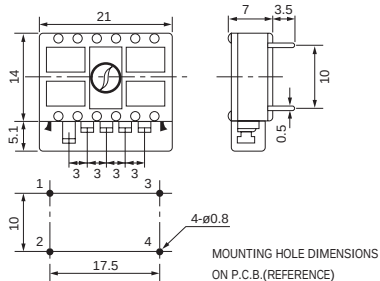
1.2 : Common terminal

(Slide switch type)

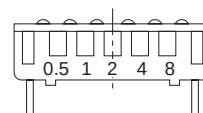


Impedance インピーダンス	600Ω ± 2.5% balanced O 600Ω ± 2% unbalanced T
Attenuation 減衰量	Combination of 0.5, 1, 2, 4, 8dB; 15.5dB total Combination of 1, 2, 4, 8, 16dB; 31dB total
Frequency 使用周波数	DC-150kHz
Rated Power 定格電力	50mW

2.4 : Common terminal



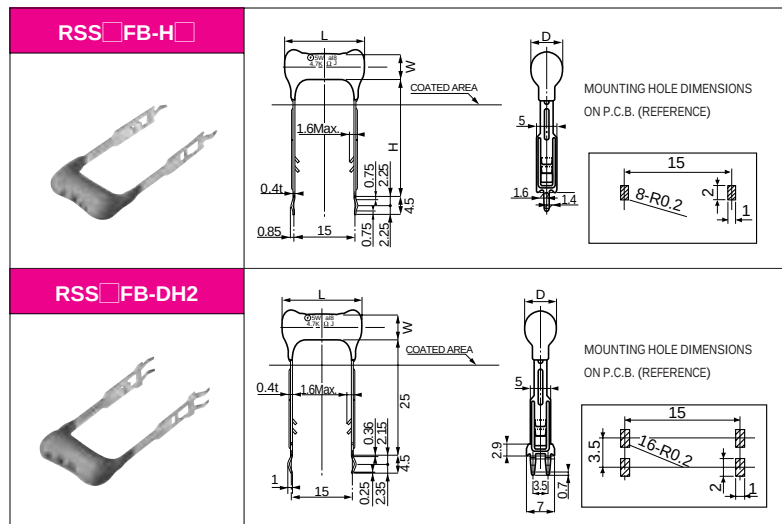
プルスイッチ式
Pull Switch Type



- Specifications in this catalog are presented basically for informative purposes.
We request the exchange of official approval drawings before placing order.
- 当カタログは参考仕様ですので、ご使用にあたっては正式納入仕様書の取り交わしをお願いします。

酸化金属被膜固定抵抗器

Vertical Mount/Snap-in Terminal RSSFB

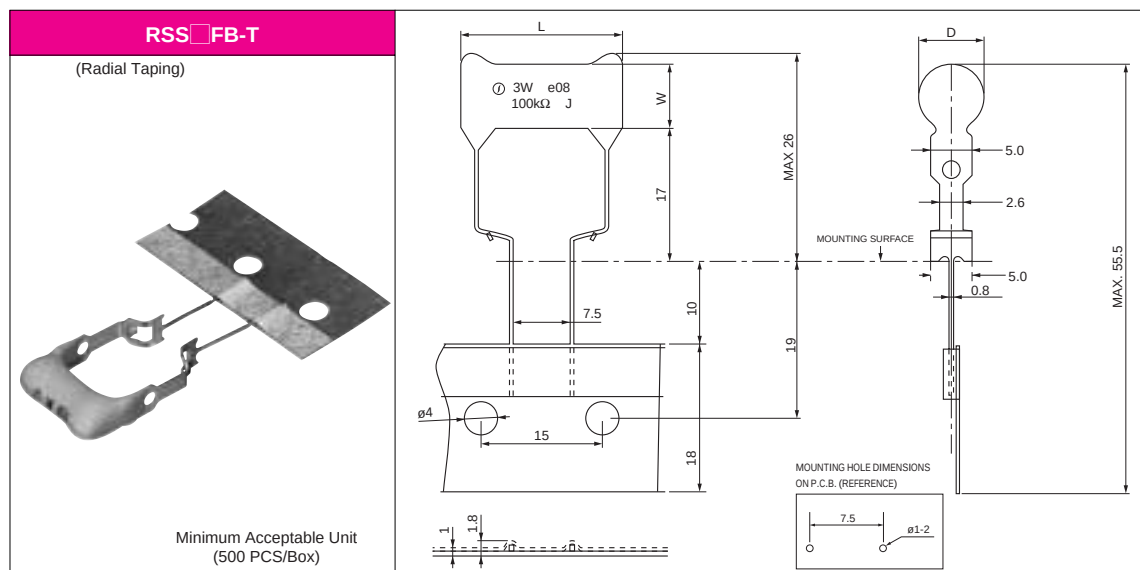


FEATURES

- These vertical mount resistors are equipped with self-standing, snap-in terminals having many advantages:
 - (a) The surface area of the terminals has been increased which enhances their heat dissipating capacity.
 - (b) The difference in thermal conductivity between the lead material (Cu) and the snap-in terminal (Fe) creates a lower board temperature rise.
 - (c) Increased terminal strength in comparison to standard axial leaded resistors.
- Valuable board space is greatly increased.
- These resistors exhibit a low inductive component with excellent high frequency response.

特 長

- スナッピン端子を装着した自立型です。
- リード線端子からスナッピン端子に変更することにより
 - (1) 端子の表面積が大きくなり放熱性が向上しました。
 - (2) リード線端子の材質 (Cu) とスナッピン端子の材質 (Fe) との熱伝導の差が基板の温度上昇を減少させました。
 - (3) 端子強度が向上しました。
- 軽量、小型タイプでスペースファクターが向上しました。
- インダクタンスが小さく高周波特性に優れています。

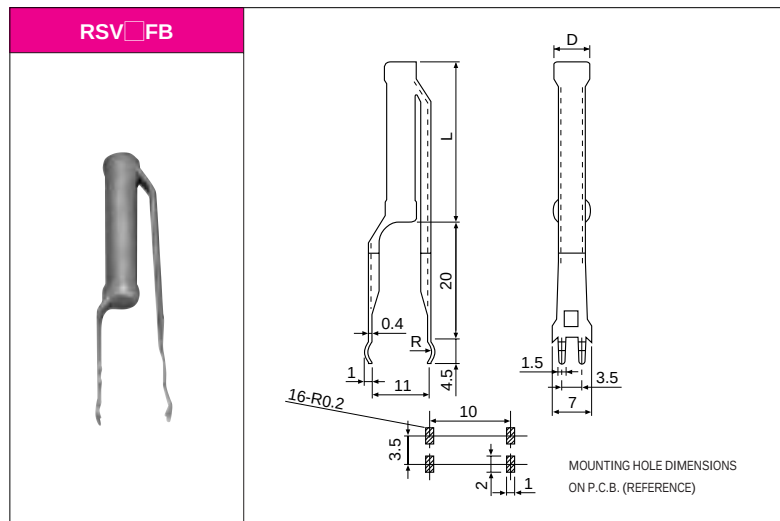


RATINGS AND DIMENSIONS

Model	Rated Power(W)	Maximum Operating Voltage (V)	Maximum Continuous Overload Voltage(V)	Maximum Intermittent Overload Voltage(V)	Resistance Range (Ω) E24 Series	Resistance Tolerance	Terminal Type	Dimensions(mm)				
								L	D	W	H	
RSS3FB	3	500	600	750	0.22 to below 10	K(±10%)	H1 H2 DH2	17	7.0	7.5	H1=15 H2=25 H2=25	Minimum order is 1,000 units.
					10-100K	J(±5%)			7.0	7.5		
RSS5FB	5	500	800	1500	1 to below 10	K(±10%)	H1 H2 DH2	19	7.5	8.0	H1=15 H2=25 H2=25	
					10-100K	J(±5%)			7.5	8.0		

RNS type (metal film type) is supplied for 3W, ratings at less than 1Ω.

Upright/Vertical Mount/Snap-in Terminal RSVFB



FEATURES

- Upright/Vertical mount resistors equipped with self-standing, snap-in terminals have valuable board space increased greatly.
- Only 10mm terminal pitch and light weight.
- Two types of 7W and 5W are available.
- Improved elasticity of snap-in terminals and 2 legs construction at the tip of each terminal make smooth insertion possible and have self-standing stability increased.
- These resistors exhibit a low inductive component with excellent high frequency response.
- Flame-proof coating prevent resistors from emitting smoke.
- Terminals equipped with heat dissipating fins creates a lower board temperature rise.
- Patents Pending.

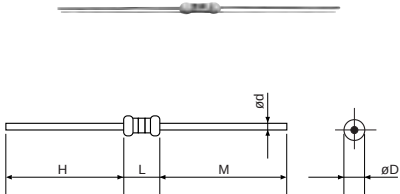
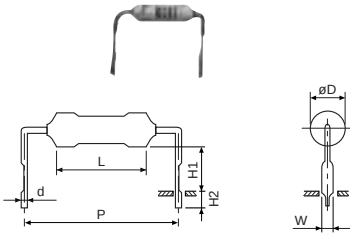
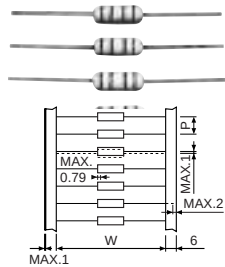
APPLICATIONS

TVs, Monitors, Printers, Switching Regulators, Power supplies, etc.

RATINGS AND DIMENSIONS

Model	Rated Power(W)	Maximum Operating Voltage (V)	Maximum Continuous Overload Voltage(V)	Maximum Intermittent Overload Voltage(V)	Resistance Range (Ω) E24 Series	Resistance Tolerance	Terminal Type	Dimensions(mm)		
								L	D	
RSV5FB	5	500	800	1500	1 to below 10 10-100K	K(±10%) J(±5%)	DH	20	8.0	Minimum order is 1,000 units.
RSV7FB	7	500	800	1500	1 to below 10 10-100K	K(±10%) J(±5%)	DH	30	8.0	

RSMFB

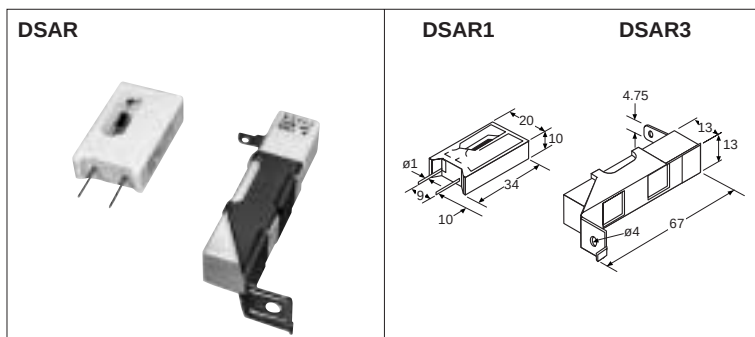
Straight Type					L2 Forming Finished Type					Tape type				
														
					Products marked 1/2 are L-finished type.									
Model	Dimensions (mm)				Dimensions (mm)							Dimensions (mm)		Packaging Type
	L	D	d±0.02	H	L	D	d±0.02	P±1	H1±1	H2±1	W	W±1	P±0.5	
RSM1/2FB	6.4	2.3±0.5	0.6	27 min	6.4	2.3±0.5	0.6	10.0	7.0	5.5	1 min	26 or 52	5	TR (reel type) TB (binding type)
RSM1FB	9.0	2.8±0.5	0.8	27 min	9.0	2.8±0.5	0.8	12.5	7.0	5.5	1.25 min	52	5	
RSM2FB	12.0	4.0±1	0.8	27 min	12.0	4.0±1	0.8	15.0	7.0	5.5	1.25 min	52	5	
RSM3FB	15.0	5.5±1	0.8	38±3	15.0	5.5±1	0.8	20.0	8.0	5.5	1.25 min	63	10	

Model	Rating				Minimum Number of Units per Package				Minimum order is 1,000 units			
	Rated Power 70°C (W)	Maximum Operating Voltage(V)	Resistance Range (Ω) (E24 series)	Resistance Tolerance	Straight Type	L2 Forming finished type (Products marked 1/2 are L-finished type)	Taped type		E24 Series Table			
							TB	TR				
RSM1/2FB	0.5	250	0.2-47K	J(±5%)	100	500	2,000	3,000	10	18	33	56
RSM1FB	1.0	350	0.2-68K		100	500	2,000	3,000	11	20	36	62
RSM2FB	2.0	350	0.2-100K		100	500	2,000	3,000	12	22	39	68
RSM3FB	3.0	350	0.2-120K		100	500	1,000	1,000	13	24	43	75
									15	27	47	82
									16	30	51	91

Below 10Ω will be metal film resistor our type RNM.

- Specifications in this catalog are presented basically for informative purposes. We request the exchange of official approval drawings before placing order.
- 当カタログは参考仕様ですので、ご使用にあたっては正式納入仕様書の取り交わしをお願いします。

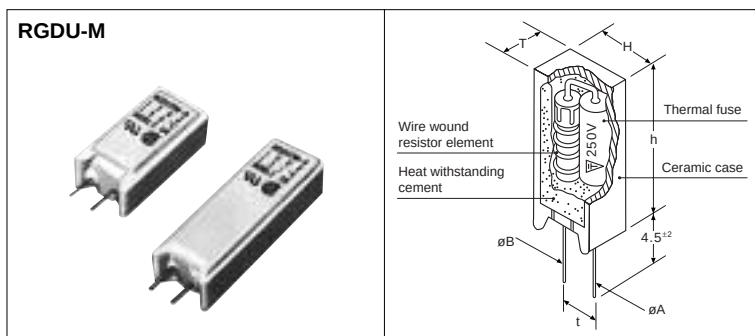
Surge Absorber DSAR Series



サージアブソーバ

Flashover Voltage	180-3600V depending on model
Insulation Resistance	10 ⁹ Ω min.
V-t Characteristics	1μsec max. (1.2 × 50μsec waveform)
Electrostatic Capacity	1pF max.
Internal Connection	DSA Discharge element RGS5 Continuous current blocking resistor

Thermal Fuse Resistor RGD-M, RGDU-M, RGD Series

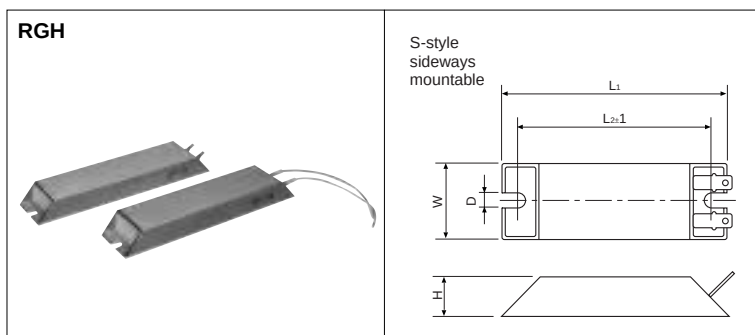


温度ヒューズ抵抗器

Model	Rated Power (A)	Dimensions (mm)						Fusing Temperature Code	Resistance Range (Ω)
		H	T	h	t	A	B		
RGD 2M	2	12	7	21	5	0.6	0.8	0 (95°C)	0.22~ 270
RGD 3M		12	8	26	5	0.6	0.8	1 (110°C)	0.27~ 680
RGD 5M		13	9	26	5	0.6	0.8	3 (126°C)	0.27~ 680
RGD 7M		13	9	38.5	5	1.0	1.0	4 (130°C)	0.68~1200
RGD 10M		16	13	35	7.5	1.0	1.0	5 (145°C)	1.0 ~1800
RGDU 5M	2	13	9	26	5	0.6	0.8	1 (110°C)	1.0 ~ 100
RGDU 7M		13	9	38.5	5	1.0	1.0	3 (126°C)	1.0 ~ 100
								4 (130°C)	
								5 (145°C)	

10A thermal fuse is built in RGD2~RGD10.
UL Standard 1412, File No. E62418. (RGDU Types)
CSA Standard File No. LR85971-The Fusing temperatures are: 1 (115°C), 3 (131°C), 4 (135°C), 5 (150°C)

Metal-Clad Resistor RGH Series



メタルクラッド抵抗器

All dimensions in mm.

Model	Rated Power	L ₁	L ₂	W	H	D	Weight (approximate)
RGH 60	60W	115	100	40	20	5.3	110g
RGH 80	80W	140	125	40	20	5.3	160g
RGH 100	100W	165	150	40	20	5.3	200g
RGH 120	120W	190	175	40	20	5.3	240g
RGH 150	150W	215	200	40	20	5.3	290g
RGH 200	200W	215	200	50	25	5.3	460g
RGH 250	250W	240	225	50	25	5.3	540g
RGH 300	300W	215	200	60	30	5.3	700g
RGH 400	400W	265	250	60	30	5.3	930g
RGH 500	500W	335	320	60	30	5.3	1000g
RGH1000	1000W	400	385	100	50	5.3	3300g
RGH1500	1500W	450	435	120	60	5.3	5000g

The RGH1000 and the RGH1500 have 4 installation grooves.

Various Types of Metal-Clad Resistor RGH



Photo shows an example of custom-made product. Consult us for custom designs.

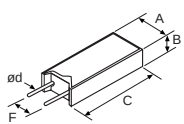
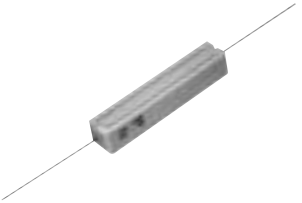
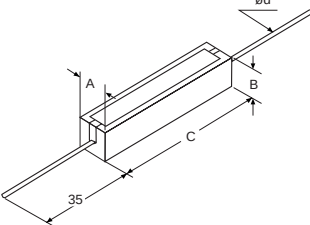
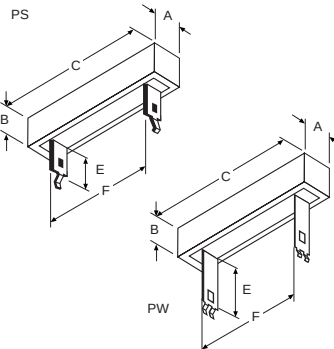
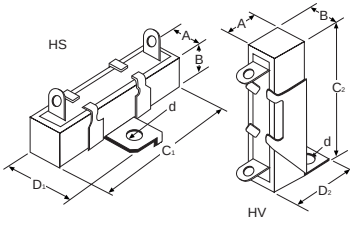
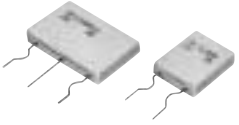
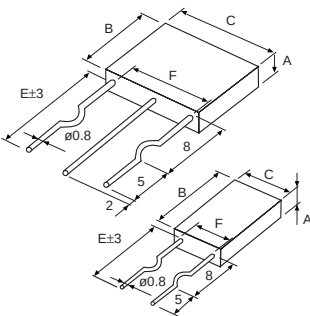
Antifreeze-Plate Type-Heaters RPH Series



2 types of 10W and 20W are available
Suitable for hot water-supply facilities and others

Cement-Filled Fixed Resistors

セメント充填固定抵抗器

RGG 	
RGB-L 	
RGB-PS RGB-PW 	
RGB-HS, HV With Bracket 	
RGC 	

Model	Rated Power (W)	Resistance Range (Ω)	Dimensions (mm)				
			A	B	C	F	φd
RGG2	2	0.22-270	11	7	21	5	0.8
RGG3	3	0.27-680	12	8	26	5	0.8
RGG5	5	0.27-680	13	9	26	5	0.8
RGG7	7	0.68-1,200	13	9	38.5	7.5	1.0
RGG10	10	1-1,800	16	13	35	7.5	1.0
RGG20	20	1.5-2,700	20	13	45	7.5	-

The RGG 20 terminal forms differ so consult us for further details.

Model	Rated Power (W)	Resistance Range (Ω)	Dimensions (mm)		
			A/B	C	φd
RGB2	2	0.22-270	6.3	18	0.8
RGB3	3	0.27-680	8	23	0.8
RGB5	5	0.27-680	9.5	23	0.8
RGB7	7	0.68-1,200	9.5	36	0.8
RGB10	10	1-1,800	9.5	48	0.8
RGB15	15	1.2-2,200	13	48	1.0
RGB20	20	1.5-2,700	13	63.5	1.0

Model	Rated Power (W)	Resistance Range (Ω)	Dimensions (mm)			
			A/B	C	E	F
RGB5PS	5	0.27-680	9.5	28	10	15
RGB7PS	7	0.68-1,200	9.5	36	10	22.5
RGB10PS	10	1-1,800	9.5	48	10	35
RGB15PS	15	1.2-2,200	13	48	15	33
RGB20PS	20	1.5-2,700	13	63.5	15	49
RGB5PW	5	0.27-680	9.5	28	22	15
RGB7PW	7	0.68-1,200	9.5	36	22	22.5
RGB10PW	10	1-1,800	9.5	48	22	35
RGB15PW	15	1.2-2,200	13	48	30	33
RGB20PW	20	1.5-2,700	13	63.5	30	49

Model	Rated Power (W)	Resistance Range (Ω)	Dimensions (mm)					
			A/B	C ₁	C ₂	D ₁	D ₂	φd
RGB10H	10	1-1,800	9.5	48	48	25	23.5	4
RGB15H	15	1.2-2,200	13	48	57	28.5	27	4
RGB20H	20	1.5-2,700	13	63.5	63.5	28.5	27	4
RGB30H	30	1.8-3,300	19	75	83	38	36	4.2
RGB40H	40	2.2-4,700	19	90	90	38	36	4.2

HS is equipped with a horizontal mounting bracket, and HV with a vertical mounting bracket.

Model	Rated Power (W)	Resistance Range (Ω)	Dimensions (mm)					Element count
			A	B	C	E	F	
RGC2	2	0.1-1	5	9	14	13	9	Single
RGC3	3	0.1-1	5	13	14	13	9	
RGC5	5	0.1-1	5	17	14	13	9	
RGC22	2+2	0.1-1	5	9	26	13	18	Twin
RGC33	3+3	0.1-1	5	13	26	13	18	
RGC55	5+5	0.1-1	5	17	26	13	18	
RGC771	7+7	0.1-0.39	5	20	26	13	18	

Twin-type has two elements at very close resistance values and the same TCR, and is best suited for the final-stage emitters resistor of a stereo power amplifier.

双子形は、抵抗値の相互バラツキが小さく、温度係数も揃っていますので、ステレオパワーアンプの終段エミッター抵抗として最適です。

- Specifications in this catalog are presented basically for informative purposes. We request the exchange of official approval drawings before placing order.
- 当カタログは参考仕様ですので、ご使用にあたっては正式納入仕様書の取り交わしをお願いします。

Surge Resistor RMH series 耐サージ抵抗器

FEATURES

- RMH is a resistor by which the circuit damage by the rushing into current such as the inducement thunders is reduced.
- Recognition passing goods of UL,BSI,VDE standard.

APPLICATIONS

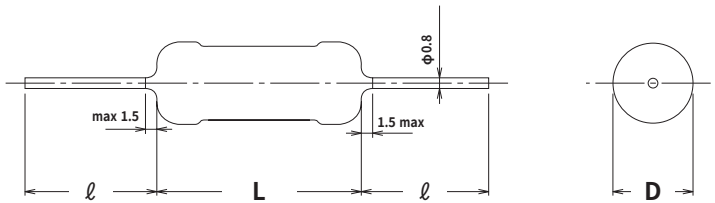
Televisions,CRT display etc.(Power supply circuit)(High voltage circuit)

特 長

- 誘導雷などの突入電流による回路ダメージを軽減する抵抗器です。
- UL,BSI,VDE規格の認定合格品。

用 途

テレビ, CRTディスプレイなどの電源回路, 高電圧回路に最適です。

Order Number (Example)				Dimentions				Unit:mm
RMH025FB1MΩ-J RMH05FB100kΩ-J RMH1FB8.2MΩ-J								
Model	L	D	l	Rated Power	Resistance Range	Resistance Tolerance	Reference Standard	
RMH025FB	6.4±1	2.3±0.5	25±3	0.25W	56kΩ~8.2MΩ (E12 Series)	J (±5%)	-	
RMH05FB	9.0±1	2.8±0.5	25±3	0.5W	82kΩ~8.2MΩ *1 (E12 Series)	J (±5%)	UL1676 *1	
RMH1FB	9.5±1	3.5±0.5	25±3	1W	1MΩ~33MΩ (E12 Series)	J (±5%)	VDE,BS1	

*1:UL Reference is 1MΩ~8.2MΩ (Resistance Range.)

SPECIFICATIONS

	RMH025FB	RMH05FB	RMH1FB
Maximum Operating Voltage 最高使用電圧	700V	700V	4,000V
Maximum Intermittent Overload Voltage 最高断続過負荷電圧	1,000V	1,000V	5,000V
Resistance Temperature Characteristics 抵抗温度特性	±350ppm/°C		
Anti-surge Test 耐サージ	10,000pf 3KV 10cycle	10,000pf 10KV 10cycle at 100kΩ~.	1,000pf 10KV 50cycle

Sparking plug and Frame rod 点火プラグ・フレームロッド

FEATURES

- It is Sparking plug and Frame rod for the gas and the oil equipment.
- Custom product.

APPLICATIONS

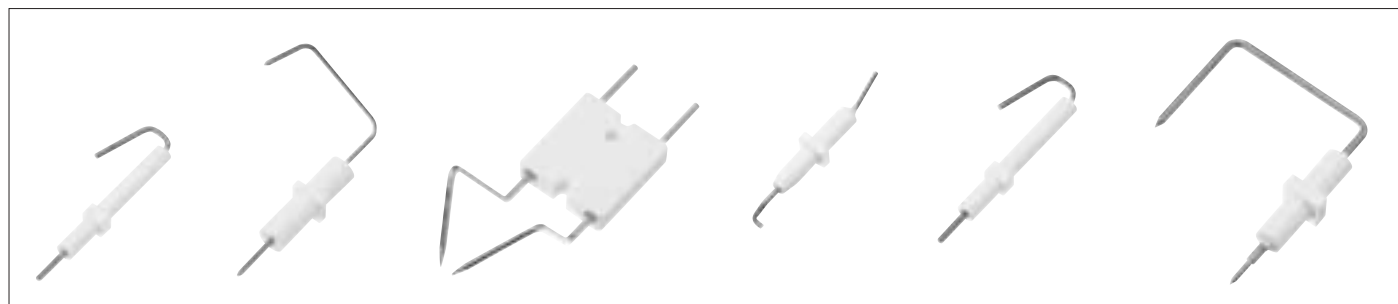
Hot water supply machine, heater, Gas oven,etc.

特 長

- ガス・石油機器用の点火プラグ・フレームロッドです。
- カスタム仕様です。

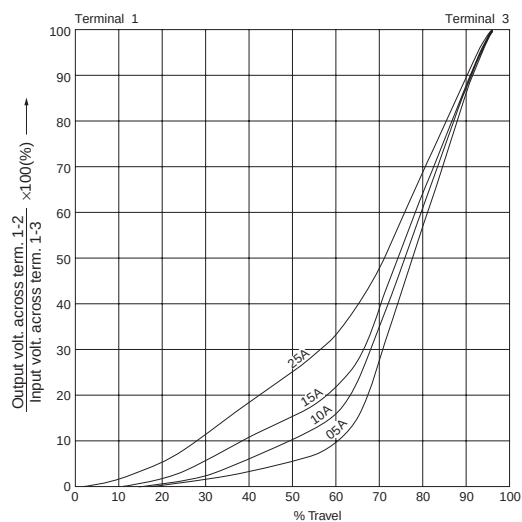
用 途

給湯器, 暖房機, ガスレンジなど。

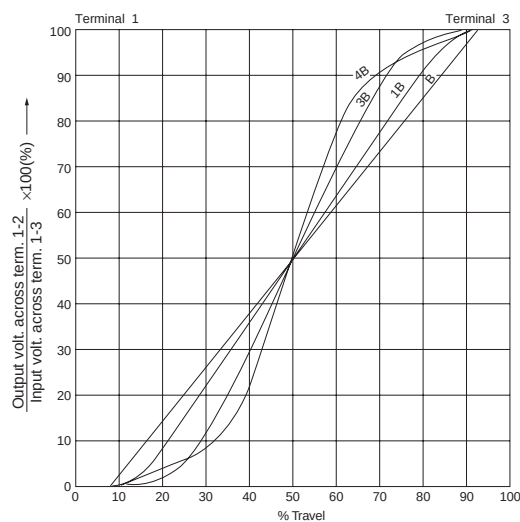


Resistance taper (Reference) ポテンショメータの抵抗変化特性（参考）一覧

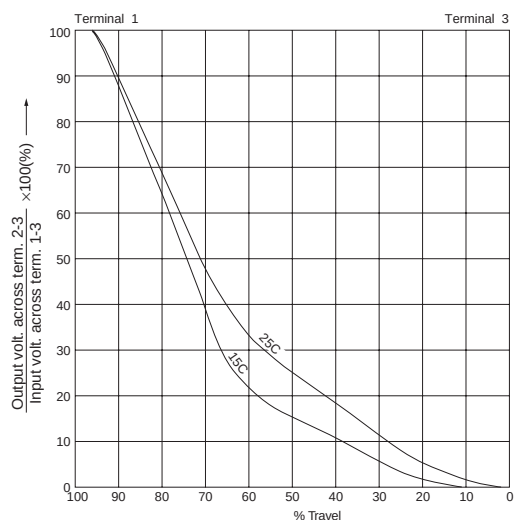
A type



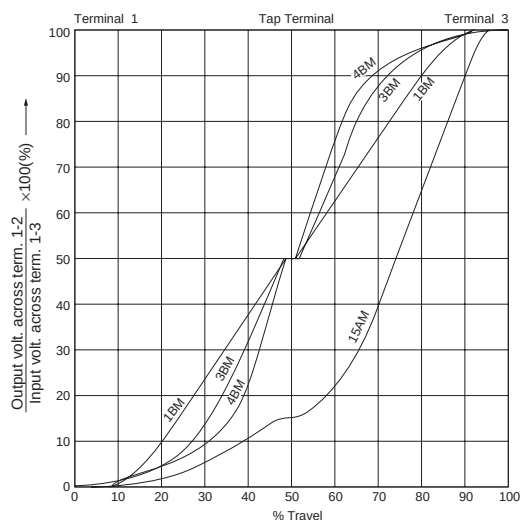
B type



C type



with 50% Tap

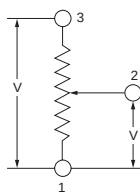


Caution for Product Handling

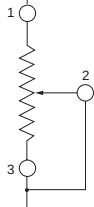
Recommended Circuits (Potentiometers) :

- Basically, employ potentiometers for the voltage control per Fig. (A) below. The current control per Fig. (B) should be limited to special cases, such as for the contrast control of TV.
- When putting a direct current (DC) through the resistor element, the Fig. (C) circuit configuration is recommended. Fig. (D) may invite abnormal resistance value alterations.

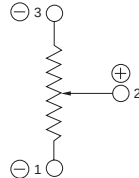
(A)



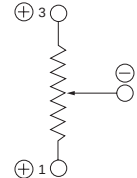
(B)



(C)



(D)



製品ご使用上の注意

可変抵抗器ご使用の回路について

- 図Aの電圧調整形でご使用下さい。図Bの電流調整形はテレビのコントラスト用など特殊なものに限ります。
- 抵抗体に直流電流を流す場合、図Cの使い方をおすすめします。図Dの使い方は、抵抗値の異常な変化を生じる場合があります。



Notice:

- Specifications and design in this catalog are subject to change without notice for product improvement or other purposes.
- Specifications in this catalog are presented basically for informative purposes. We request the exchange of official approval drawings before placing order.

注記:

- 製品改良などにより、外観および記載事項の一部を予告なく変更する場合があります。
- 当カタログは参考仕様ですので、ご使用にあたっては正式な納入仕様書の取り交わしをお願いします。

帝国通信工業株式会社 TEIKOKU TSUSHIN KOGYO CO., LTD.

本社 川崎市中原区荻宿335番地 〒211-8530
営業本部 電話 (044)433-7511(代)
FAX (044)434-3622

大阪営業所 吹田市新芦屋上1-17 〒565-0804
電話 (06)6877-4951
FAX (06)6877-3718

TEIKOKU TSUSHIN KOGYO CO., LTD.

Head Office: 335 Kariyado, Nakahara-ku,
Kawasaki, 211-8530 Japan
Phone: +81-44-411-3211
FAX: +81-44-434-3622
Osaka Office: 1-17 Shin-ashiya Kami, Suita, 565-0804 Japan
Phone: +81-6-877-4951
FAX: +81-6-877-3718

NOBLE U.S.A., INC.

5450 Meadowbrook Industrial Court,
Rolling Meadows, IL 60008 U.S.A.
Phone: +1-847-364-6038
FAX: +1-847-364-6045
www.nobleusa.com

SINGAPORE NOBLE ELECTRONICS PTE., LTD

Alexandra Distripark, Block 3, #07-14/17,
Pasir Panjang Road, Singapore 118483.
Phone: +65-2726251
FAX: +65-2734088

HONG KONG NOBLE ELECTRONICS CO., LTD.

Unit A, 10/F China Harbour Bldg., 370-374 King's
Road North Point, Hong Kong
Phone: +852-25703639
FAX: +852-28071425

NOBLE TRADING (SHANGHAI) CO., LTD.

Suite 1002, Outer Gaoqiao Building, 6 Jilong Lu,
Outer Gaoqiao Free Trade Zone, Shanghai, China.
Phone: +86-21-58690925
FAX: +86-21-58690925

TAIWAN NOBLE ELECTRONIC CO., LTD.

158, Shan Ying Road, Kuei Shan, Tao Yuan, Taiwan
Phone: +886-3-3327174
FAX: +886-3-3200608

NOBLE ELECTRONICS (THAILAND) CO., LTD.

60/80 Moo 19. Navanakorn Industrial Estate Phase 3.
Phaholyothin Road. Tambol Klong Nueng, Amphur
Klong Luang, Pathumthani 12120, Thailand
Phone: +66-2-529-1446
FAX: +66-2-529-1681