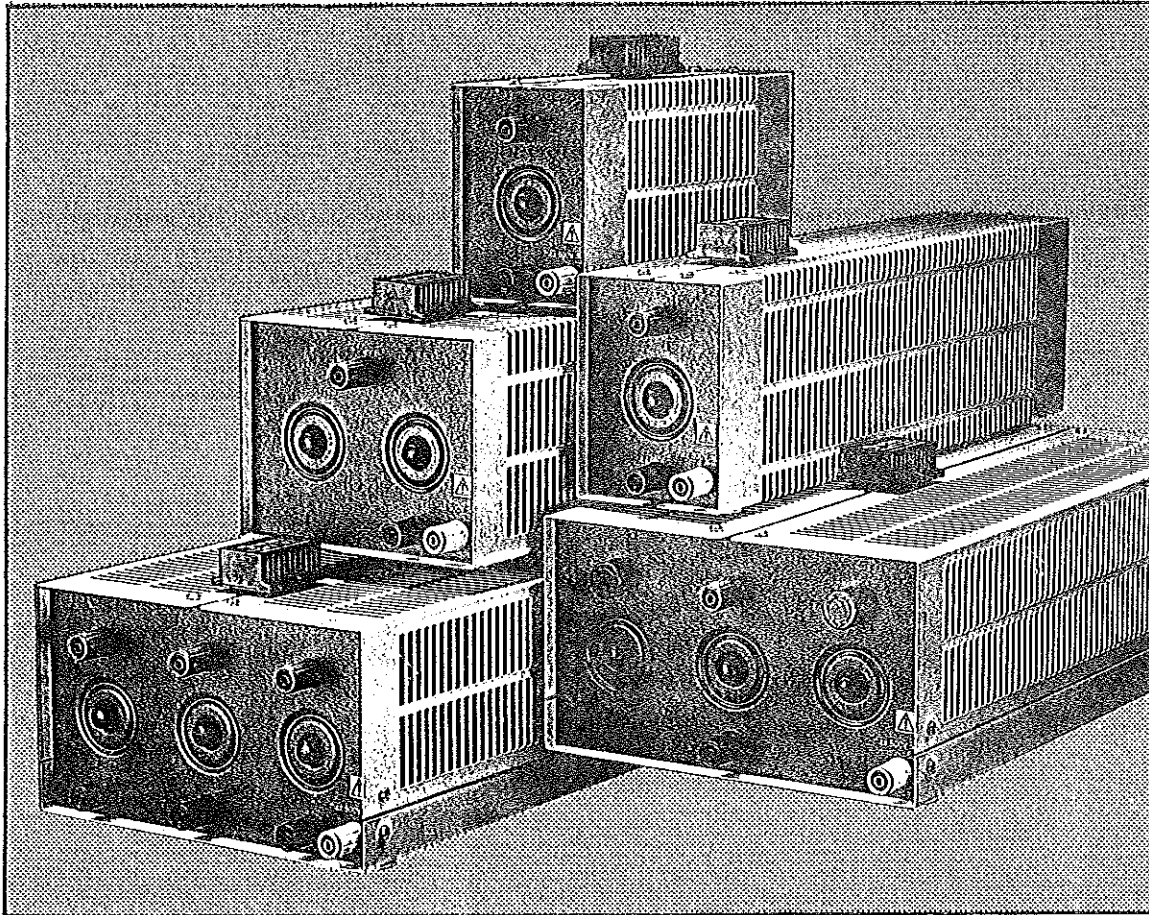


PG1.1 - PG1.2 - PG1.3 - PG2.1 - PG2.2

Variable Resistors



PRN 162
PRN 322
PRN 642
PRN 962
PRN 3/322

$1 \Omega \div 10 \text{ k}\Omega$
 $160 \text{ VA} \div 960 \text{ VA}$

CE
EN 61010-1

Application

These table type variable resistors are indispensable aids, designed for varying dc and ac currents or voltages in a wide range of the electrical industry, such as testing the electric circuits of motor vehicles, applications in the laboratory and education and other. The units can be operated as rheostats or potentiometers.

The principle part of the various types of these variable wire-wound resistors are their cores of a pyrostatic ceramic material wound with resistance wire from 1Ω to $10 \text{ k}\Omega$ in compliance with the Renard series. Intermediate values can be provided by connecting the resistance coils of some of the types in parallel.

Common Technical Data

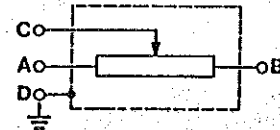
Rated resistance	see tables
Resistance tolerance	$\pm 10 \%$
Allowed permanent and intermittent load at 23°C ambient temperature	see tables
Insulation resistance	$> 3 \times 10^9 \Omega$
Earthing resistance	$< 0,1 \Omega$
Allowed voltage at terminals	max. 600 V \bar{R}
Allowed voltage between terminals (applied to PRN 3/322)	max. 700 V \bar{R}
Breakdown voltage against casing	$> 2500 \text{ V}\sim$
Protection degree	IP 20
Construction according to	EN 61010-1

Use instructions



- heating of handling parts and metal case exceeds allowed temperatures (nominal load $> 15 \text{ min}$)
- natural air cooling is required and easy inflammable parts must be removed
- carrying by terminals not allowed

Variable resistors can be used as variable load or as potentiometer:



a) as variable load

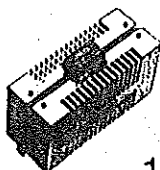

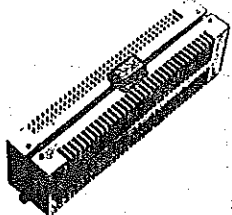
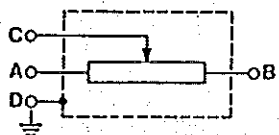
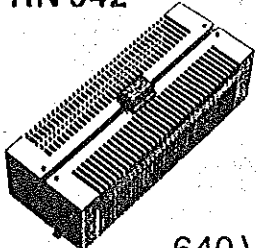
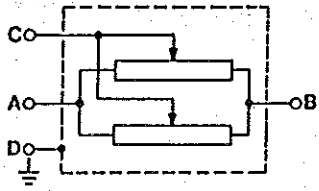
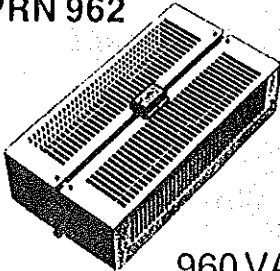
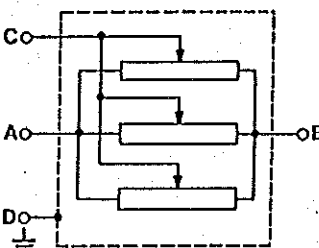
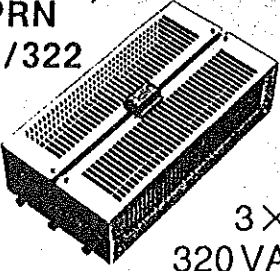
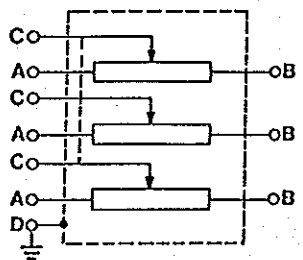
Terminals used: A (black) and C (red), or B (black) and C (red). By moving slider's contact the resistance changes.

b) as potentiometer

The voltage is applied between terminals A and B, to terminal C is connected output connection.

During usage permitted current and temperature overloading must not be exceeded. Variable resistors must be carefully earthed before use (terminal D). Variable resistors must be stored in dry places. Variable resistors must be dried in a stove for at least one hour at a temperature from 40° to 50°C before usage, if they had been stored under humid conditions. Once every two years, it is recommended that the slide gullied be smeared with a contact cream (Wacker-Chemie 511 mittel).

TECHNICAL SPECIFICATIONS

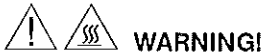
Type	Description	Scheme	Resist. (Ω)	$I_{max.}$ (A)	
				permanent	15 min.
 <p>160 VA</p>	Small handy version		1	13	18
			3,3	7	10
			10	4	5,7
			33	2,2	3,1
			100	1,25	1,8
			330	0,7	1,0
			1000	0,4	0,57
			3300	0,22	0,31
 <p>320 VA</p>	Version for usual loadings. One resistance coil in a housing.		1	18	25
			3,3	10	14
			10	5,7	8
			33	3,1	4,4
			100	1,8	2,5
			330	1,0	1,4
			1000	0,57	0,8
			3300	0,31	0,44
			10000	0,18	0,25
			 <p>640 VA</p>	Version for high loadings. Two parallelly connected resistance coils, in a housing. Sliding pieces are mechanically and electrically connected.	
1,6	20	28			
5	11,4	16			
16,5	6,2	8,7			
50	3,6	5			
165	2	2,8			
500	1,1	1,6			
1650	0,63	0,9			
5000	0,36	0,5			
 <p>960 VA</p>	Version for very high loadings. Three parallelly connected resistance coils, in a housing. Sliding pieces are mechanically and electrically connected.		0,33	54	76
			1,1	30	42
			3,33	17	24
			11	9,3	13
			33	5,4	7,6
			110	3	4,2
			333	1,7	2,4
			1100	0,98	1,4
			3330	0,54	0,76
 <p>3 x 320 VA</p>	Three phase version with resistance coils 3 x 320 VA. Sliding pieces are mechanically connected.		3x 1	3x 18	3x 25
			3x 3,3	3x 10	3x 14
			3x 10	3x 5,7	3x 8
			3x 33	3x 3,1	3x 4,4
			3x 100	3x 1,8	3x 2,5
			3x 330	3x 1,0	3x 1,4
			3x 1000	3x 0,57	3x 0,8
			3x 3300	3x 0,31	3x 0,44
			3x 10000	3x 0,18	3x 0,25

VARIABLE RESISTORS

Application

These table type variable resistors are indispensable aids, designed for varying d.c. and a.c. currents or voltages in a wide range of the electrical industry, such as testing the electric circuits of motor vehicles, applications in the laboratory and education and other. The units can be operated as rheostats or potentiometers.

Use instructions

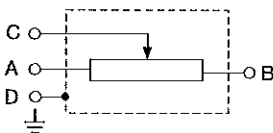


WARNING!

By operating of resistors to be considered:

1. Heating of handling parts exceeds allowed temperatures:
 - at nominal load > 15 min (valid for PRN 642, PRN 962, PRN 3/322),
 - at overload (see table) > 12 min (valid for PRN 322) and > 8 min (valid for PRN 642, PRN 962, PRN 3/322).
2. Heating of metal case exceeds allowed temperatures in approx. half of defined time.
3. Care and suitable thermal protection for hand is recommended at changing of resistance, when overheat is involved.
4. Higher temperatures don't effect on function of product.
5. Natural air cooling is required and easy inflammable parts must be removed.
6. Carrying by terminals not allowed.

Variable resistors can be used as variable load or as potentiometer:



a) as variable load

Terminals used: A (black) and C (red), or B (black) and C (red). By moving slider's contact the resistance changes.

b) as potentiometer

The voltage is applied between terminals A and B, to terminal C is connected output connection. The permitted current and other provisions must be respected during usage. Variable resistors must be carefully earthed before use (terminal D). Variable resistors must be stored in dry places. Variable resistors must be dried in a stove for at least one hour at a temperature from 40° to 50°C before usage, if they had been stored under humid conditions. Once every two years, it is recommended that the slide gulle be smeared with a contact cream (Wacker-Chemie 511 Mittel).

RESISTANCES VARIABLES

Emploi

Les résistances variables bobinées s'emploient comme moyens de réglage de courants ou de tensions c.c. et c.a. lors des différents essais et contrôles de charges dans l'électrotechnique l'électricité d'automobile et pour l'enseignement technique. Elles peuvent être utilisées comme chunts ou comme potentiomètres.

Instructions d'emploi

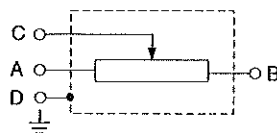


IMPORTANT!

Lors de l'emploi des résistances, tenir compte de:

1. La température permise sur la poignée de la coulisse est dépassée:
 - chez charges nominales de > 15 min (pour les PRN 642, PRN 962 et PRN 3/322);
 - chez surcharges (voir le tableau) de > 12 min (pour le PRN 322) et de > 8 min (pour les PRN 642, PRN 962 et PRN 3/322)
2. La température permise du boîtier est dépassée pendant approximativement les demi temps cités ci-dessus.
3. Lors d'un emploi de longue durée, faire attention à ce qu'au cours de réglage de la résistance les mains soient proprement protégées contre la chaleur.
4. Les températures élevées n'influencent pas le fonctionnement des résistances.
5. Ecarter de l'ambiance de travail toute matière inflammable et assurer le refroidissement le plus naturel possible des résistances.
6. Il est interdit de tenir les résistances par les bornes lors du transport.

Les résistances variables bobinées peuvent être employées comme:



a) résistance variable

Où les bornes employées sont A (noire) et C (rouge) ou B (noire) et C (rouge). On change la résistance en déplaçant la coulisse.

b) potentiomètre

On branche la tension entre les bornes A et B et le consommateur sur la borne C. Lors de l'emploi, tenir compte du courant permis spécifié et des autres spécifications. Avant l'emploi, il est obligatoire de mettre les résistances variables à la terre (borne D). Enmagasiner dans des endroits secs. Si les résistances ont été dans une atmosphère humide pendant une longue durée, séchez-les dans un four à la température de 40 à 50°C pendant une heure. Tous les deux ans il est recommandable d'enduire le guide de coulisse d'une graisse de contact (Wacker-Chemie 511 Mittel).

RESISTENZE VARIABILI

Applicazioni

Queste resistenze variabili da tavolo, sono di grande aiuto nelle prove di laboratorio per variare tensione o corrente in a.c. oppure in d.c. La resistenza può essere utilizzata sia come reostato che come potenziometro.

Istruzioni per l'uso

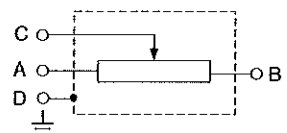


ATTENZIONE!

Nell'utilizzo delle resistenze tenere conto di quanto segue:

1. La temperatura massima ammessa sulla staffa della guida è superata:
 - nei carichi nominali a > 15 min (vale per PRN 642, PRN 962 e PRN 3/322);
 - nei carichi (vedi tabella) a > 12 min (vale per PRN 322) e a > 8 min (vale per PRN 642, PRN 962 e PRN 3/322).
2. La temperatura ammessa sui mantelli delle resistenze è superata in circa la metà dei suddetti tempi.
3. L'uso prolungato richiede un'adeguata precauzione nella regolazione della resistenza, ovv. un'adeguata protezione termica per la mano.
4. L'aumento delle temperature non ha effetto sul funzionamento delle resistenze.
5. Asportare dall'ambiente di lavoro tutte le sostanze facilmente infiammabili ed assicurare un quanto migliore raffreddamento naturale delle resistenze.
6. Il trasporto delle resistenze prendendole per la boccia di collegamento non è ammesso.

La resistenza può essere utilizzata sia come carico variabile che come potenziometro:



a) Uso come carico variabile

Usare i terminali A (nero) e C (rosso), oppure B (nero) e C (rosso). Muovendo il cursore la resistenza cambia da zero al massimo valore.

b) Uso come potenziometro

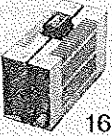
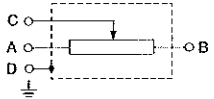
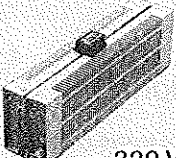
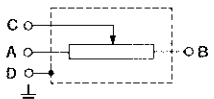
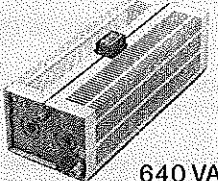
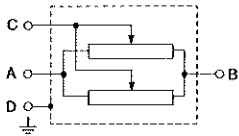
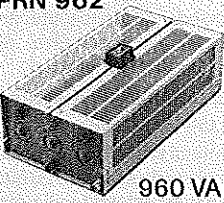
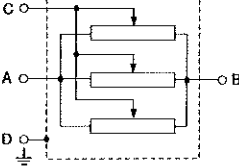
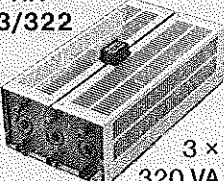
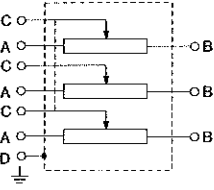
La tensione viene applicata ai terminali A e B, al terminale C è collegata l'uscita. Durante l'uso tener conto della corrente tollerata prescritta e delle altre specifiche. Collegare sempre a terra la resistenza usando il terminale D. In caso di presenza di umidità, mettere la resistenza in forno a 40° per almeno un'ora. Ogni due anni è consigliabile di passare sulla pista della resistenza prodotto anti ossidante, al fine di prolungare il buon funzionamento.



METREL®

Measuring and Regulation Equipment, Ltd - Horjul, Slovenia

TECHNICAL SPECIFICATIONS - SPECIFICATIONS TECHNIQUES - CARATTERISTICHE TECNICHE

Type Type Tipo	Description Description Descrizione	Scheme Schéma Schema	Resist. (Ω)	I _{max} (A)	
				permanent	15 min.
PRN 162  160 VA	Small handy version. Exécution convenable pour petites charges. Versione maneggevole per carichi minori.		1	13	18
			3.3	7	10
			10	4	5.7
			33	2.2	3.1
			100	1.25	1.8
			330	0.7	1.0
			1000	0.4	0.57
3300	0.22	0.31			
PRN 322  320 VA	Version for usual loadings. One resistance coil in a housing. Exécution convenable pour charges normales. Une bobine dans le boîtier. Versione per carichi abituali. Un avvolgimento di resistenza nel contenitore.		1	18	25
			3.3	10	14
			10	5.7	8
			33	3.1	4.4
			100	1.8	2.5
			330	1.0	1.4
			1000	0.57	0.8
3300	0.31	0.44			
PRN 642  640 VA	Version for high loadings. Two parallel connected resistance coils, in a housing. Sliding pieces are mechanically and electrically connected. Exécution pour grandes charges. Deux bobines liées en parallèle. Les coulisses sont liées mécaniquement et électriquement. Versione per carichi maggiori. Due avvolgimenti di resistenza collegati in parallelo nel contenitore. Le guide hanno collegamento meccanico ed elettrico.		0.5	36	50
			1.6	20	28
			5	11.4	16
			16.5	6.2	8.7
			50	3.6	5
			165	2	2.8
			500	1.1	1.6
1650	0.63	0.9			
5000	0.36	0.5			
PRN 962  960 VA	Version for very high loadings. Three parallel connected resistance coils, in a housing. Sliding pieces are mechanically and electrically connected. Exécution pour grandes charges. Trois bobines liées en parallèle dans le boîtier. Les coulisses sont liées mécaniquement et électriquement. Versione per grossi carichi. Tre avvolgimenti di resistenza collegati in parallelo nel contenitore. Le guide hanno collegamento meccanico ed elettrico.		0.33	54	76
			1.1	30	42
			3.33	17	24
			11	9.3	13
			33	5.4	7.6
			110	3	4.2
			333	1.7	2.4
1100	0.98	1.4			
3330	0.54	0.76			
PRN 3/322  3 x 320 VA	Three phase version with resistance coils 3x320 VA. Sliding pieces are mechanically connected. Exécution triphasée avec bobines de 3x320 VA. Les coulisses sont interliées mécaniquement. Versione a tre fasi con avvolgimenti di resistenza 3x320 VA. Le guide hanno collegamento meccanico.		3x 1	3x 18	3x 25
			3x 3.3	3x 10	3x 14
			3x 10	3x 5.7	3x 8
			3x 33	3x 3.1	3x 4.4
			3x 100	3x 1.8	3x 2.5
			3x 330	3x 1.0	3x 1.4
			3x 1000	3x 0.57	3x 0.8
			3x 3300	3x 0.31	3x 0.44
			3x 10000	3x 0.18	3x 0.25

Common Technical Data

Rated resistance	see tables
Resistance tolerance	± 10 %
Allowed permanent and intermittent load at 23 °C ambient temperature	see tables
Insulation resistance	> 3 × 10 ⁹ Ω
Earthing resistance	< 0.1 Ω
Allowed voltage at terminals	max. 600 V~
Allowed voltage between terminals (applied to PRN 3/322)	max. 700 V~
Breakdown voltage against casing	> 2500 V~
Protection degree	IP 20
Construction according to	EN 61010-1

Données techniques communes

Résistance nominale	selon le tableau
Tolérance de résistance	± 10 %
Charge permanente permise à la température ambiante de 23 °C	selon le tableau
Résistance d'isolation	> 3 × 10 ⁹ Ω
Résistance de mise à la terre	< 0,1 Ω
Tension permise sur les bornes	max. 600 V~
Tension permise entre les bornes (pour PRN 3/322)	max. 700 V~
Tension de rupture contre le boîtier	> 2500 V~
Degré de protection	IP 20
Construction d'après la norme	EN 61010-1

Dati tecnici comuni

Resistenza nominale	vedi tabella
Tolleranza	± 10 %
Carico di corrente permanente ammesso	vedi tabella
Resistenza di isolamento	> 3 × 10 ⁹ Ω
Resistenza di terra	< 0,1 Ω
Tensione massima applicabile ai terminali	max 600 V~
Tensione ammessa fra i morsetti (per PRN 3/322)	max 700 V~
Tensione isolamento custodia metallica	> 2500 V~
Grado di protezione	IP 20
Norme internazionali	EN 61010-1