

Revalco®

Made in Italy

Adjustable transformers and
variable resistors



ADJUSTABLE TRANSFORMERS

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ADJUSTABLE TRANSFORMERS

GENERAL DESCRIPTION

The adjustable transformers are used for the continuous adjustment of single-phase and three-phase voltages.

They are used in electromechanical and electronic industries, in laboratories and schools.

Principally are used for:

- manual and automatic control of supplies in measurement switchboard
- speed control in rotating machines
- control of heating machines
- educational demonstrations in schools and colleges
- correctly regulate single-phase and three-phase voltages

In respect of thyristor regulators, the AC voltages control by using these adjustable transformers has the following advantages:

- don't cause frequency interferences
- the output voltage wave is perfectly sinusoidal
- high efficiency, low consumption

The adjustable transformers are available in two versions:

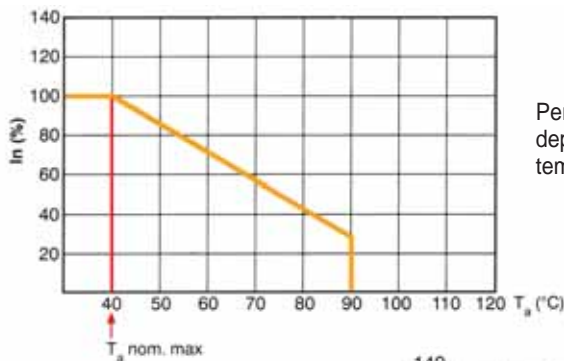
- protected by metallic case, usefull for the schools, laboratories, measurement tests
- open execution not protected to be mounted into electrical panels, control switchboards

Excluding the model HST which has the primary separate from the secondary winding, all the models are self-contained transformers.

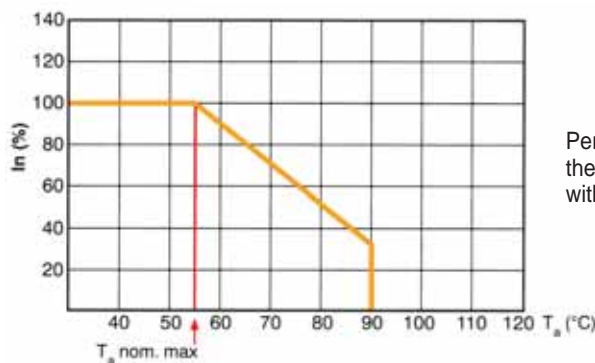
The adjustable transformers are made of high quality materials and manufactured using modern technology, so when the permissible load capacities are observed, no particular maintenance is required. With the standard version the cleaning of the slide surface only is required after long periods of use.

TECHNICAL CHARACTERISTICS

- The standard versions are supplied by 230V +10% input voltages. This voltage must never be higher than 6% of the nominal value to avoid possible increases of the temperature in the winding over the admitted limit. The secondary circuit conforms to standards VDE 0552/5.69, **must be protected against the short circuits by a fuse or thermic protection. The primary circuit must be protected by a time delayed fuse with proper range.**
- The standard working frequency is 50Hz. Models with frequency at 400Hz can be available on request; it should be understood however that the losses of the core caused by the magnetic hysteresis increases with the increase of the frequency.
- The nominal current load is permitted within the working temperatures from -15°C to $+40^{\circ}\text{C}$; in case of these limits are exceeded it is necessary to cool the transformer
- Test voltage is 2,5kV at 50Hz from the metallic parts and the points under voltage
- Protection degree: class I
- The protected models in metallic case (HSN and HTN) have the same technical characteristics of the open models; the only difference is in the working temperature that in this case is 30°C . In case of prolonged use (more than 4h continuous use) it is better to reduce the load of about 20% to avoid the overheating of the metallic case.
- In case of their use in presence of high temperatures, the maximum admissible current must be reduced of 15% every 10°C exceedent the max ambient temperature (40°C)

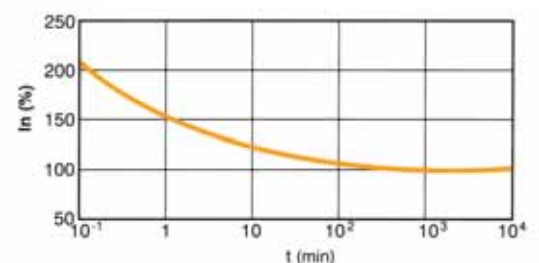


Permissible permanent load, depending by the environmental temperature



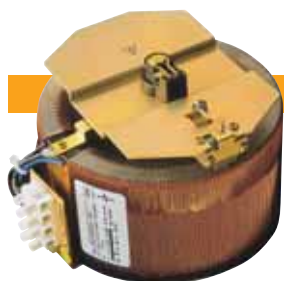
Permissible permanent load, depending by the environmental temperature in models with silver circuit

Permissible, depending on the operating time



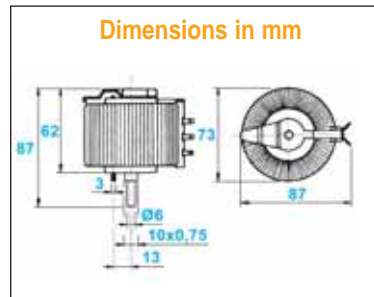
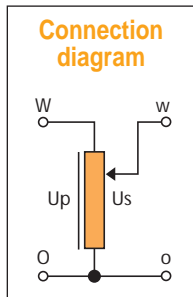
SINGLE-PHASE

OPEN EXECUTION



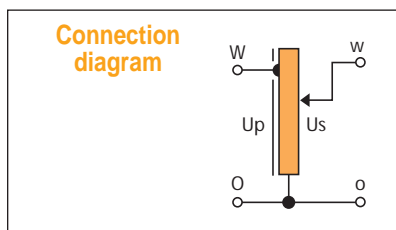
- 7HSG0011/48
- 7HSG0011/230

Up (V)	Us (V)	Is (A)	P (VA)	Weight (kg)
48	0.....48	5	240	1,2
230	0.....230	0,8	180	1,1



- 7HSG0022
- 7HSG0052
- 7HSG0102
- 7HSG0202
- 7HSG0302

Up (V)	Us (V)	Is (A)	P (VA)	Weight (kg)
230	0.....250	1,2	300	2,1
230	0.....250	2,5	620	3,5
230	0.....250	5	1250	5
230	0.....260	8	2080	7,4
230	0.....260	13	3380	10,5



h	l	Ød	a	c	e	f
102	130	8	97	80	5,4	118
105	135	8	130	110	8,3	151
123	153	8	130	110	8,3	151
123	153	8	155	127	8,3	175
123	158	8	210	165	8,3	233

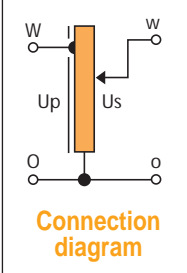
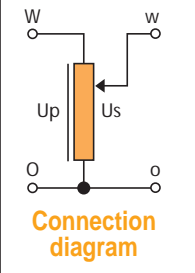
Dimensions in mm

- 7HSG230/1
- 7HSG230/1,25
- 7HSG230/1,6
- 7HSG230/2
- 7HSG230/2,5
- 7HSG230/3
- 7HSG230/4
- 7HSG230/4,5
- 7HSG230/6
- 7HSG230/8
- 7HSG230/10
- 7HSG230/12
- 7HSG230/18
- 7HSG230/23
- 7HSG230/32

Up (V)	Us (V)	I (A)	P (VA)
230	0.....230	1,0	230
230	0.....230	1,25	287
230	0.....230	1,6	368
230	0.....230	2,0	460
230	0.....230	2,5	575
230	0.....230	3,0	690
230	0.....230	4,0	920
230	0.....230	4,5	1035
230	0.....230	6,0	1380
230	0.....230	8,0	1840
230	0.....230	10,0	2300
230	0.....230	12,0	2760
230	0.....230	18,0	4140
230	0.....230	23,0	5290
230	0.....230	32,0	7360

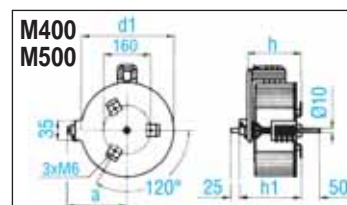
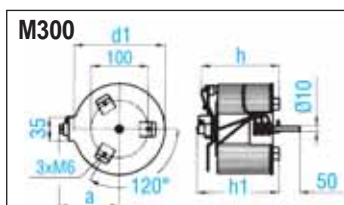
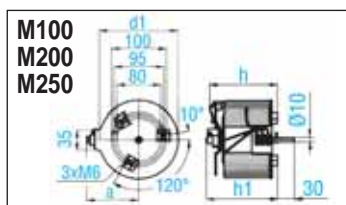
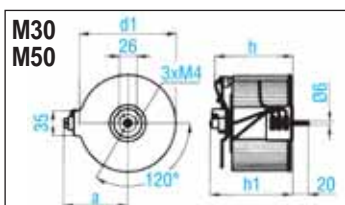
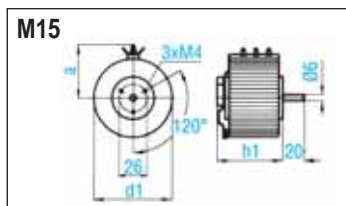
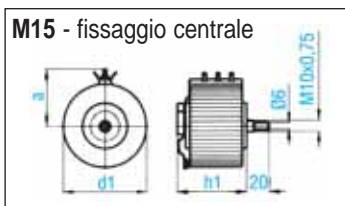
- 7HSG260/0,8
- 7HSG260/1
- 7HSG260/1,4
- 7HSG260/1,6
- 7HSG260/2
- 7HSG260/2,5
- 7HSG260/3
- 7HSG260/3,5
- 7HSG260/4,5
- 7HSG260/6,3
- 7HSG260/8
- 7HSG260/10
- 7HSG260/15
- 7HSG260/20
- 7HSG260/30

Up (V)	Us (V)	I (A)	P (VA)	Weight (kg)	Model
230	0.....260	0,8	208	1,4	M15
230	0.....260	1,0	260	1,4	M15
230	0.....260	1,4	364	2,4	M30
230	0.....260	1,6	416	2,4	M30
230	0.....260	2,0	520	2,4	M30
230	0.....260	2,5	650	3,5	M50
230	0.....260	3,0	780	3,5	M50
230	0.....260	3,5	910	4,6	M100
230	0.....260	4,5	1170	4,6	M100
230	0.....260	6,3	1638	7,0	M200
230	0.....260	8,0	2080	7,0	M200
230	0.....260	10,0	2600	9,2	M250
230	0.....260	15,0	3900	13,3	M300
230	0.....260	20,0	5200	14,0	M400
230	0.....260	30,0	7800	20,5	M500



	d1	h	h1	a
M15	80	-	68	49
M15	80	-	71	49
M30	100	98	100	74
M50	117	98	100	83
M100	125	120	121	86
M200	153	120	121	100
M250	174	120	121	110
M300	226	116	117	149
M400	230	110	120	156
M500	270	125	135	175

Dimensions in mm



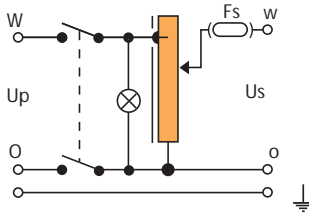
METALLIC CASE EXECUTION



- 7HSN0103
- 7HSN0203
- 7HSN0303
- 7HSN260/4,5
- 7HSN260/8
- 7HSN260/10
- 7HSN260/15
- 7HSN260/20
- 7HSN260/30

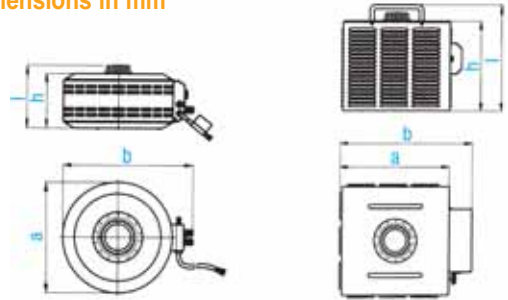
	Up (V)	Us (V)	I (A)	P (VA)	Weight (kg)	Model
	230	0.....250	5,0	1250	6,0	-
	230	0.....260	7,0	1820	8,5	-
	230	0.....260	13,0	3380	12,0	-
	230	0.....260	4,5	1170	4,4	M100
	230	0.....260	8,0	2080	8,1	M200
	230	0.....260	10,0	2600	11,5	M250
	230	0.....260	15,0	3900	20,8	M300
	230	0.....260	20,0	5200	22,4	M400
	230	0.....260	30,0	7800	32	M500

Connection diagram



Dimensions in mm

	a	b	h	l
7HSN0103	170	206	136	157
7HSN0203	202	240	136	157
7HSN0303	268	305	134	157
M100	170	220	135	155
M200	203	253	135	155
M250	270	320	135	155
M300	258	315	178	228
M400	318	348	178	228
M500	357	387	178	228



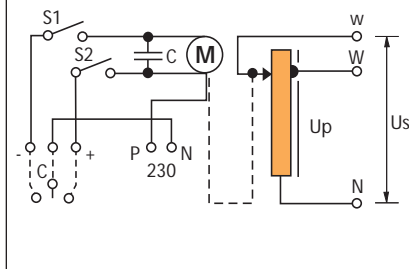
M100, M200, M250
7HSN0103, 7HSN0203, 7HSN0303

M300, M400, M500

MOTORISED EXECUTION

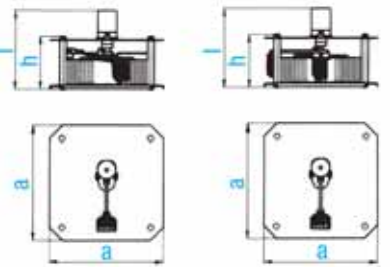


Connection diagram



Dimensions in mm

	a	h	l
M300	275	170	238
M400	310	170	238
M500	350	180	248



M300

M400, M500

	Up (V)	Us (V)	I (A)	P (VA)		Up (V)	Us (V)	I (A)	P (VA)	Weight (kg)	Model
— 7HSM230/18	230	0.....230	18,0	4140	— 7HSM260/15	230	0.....260	15,0	3900	16,7	M300
— 7HSM230/23	230	0.....230	23,0	5290	— 7HSM260/20	230	0.....260	20,0	5200	18,1	M400
— 7HSM230/32	230	0.....230	32,0	7360	— 7HSM260/30	230	0.....260	30,0	7800	25,0	M500

MOTORISATION

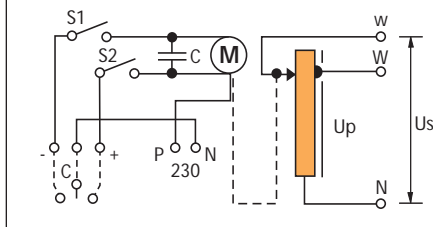
- The auxiliary power supply of the motor is 230VAC
- The travel time of the brushes to make one complete round is about 23 seconds
- Other transformers can be motorised using the correct motor choosing it between the following models



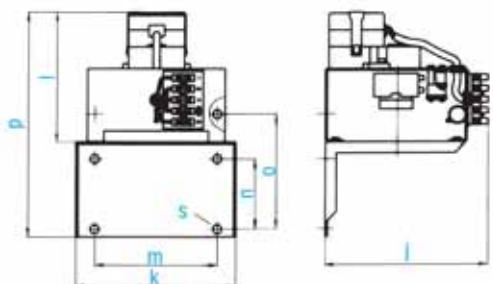
	Suitable for the models	Weight (Kg)
— 7HMA M50	M50	1,2
— 7HMA M100	M100	1,7
— 7HMA M200	M200	1,7
— 7HMA M250	M250	1,7

	j	k	l	m	n	o	p	s
	147	128	97	100	-	100	181	4,5
	176	180	107	150	90	-	237	9
	176	180	107	150	90	-	237	9
	176	180	107	150	90	-	237	9

Connection diagram



Dimensions in mm



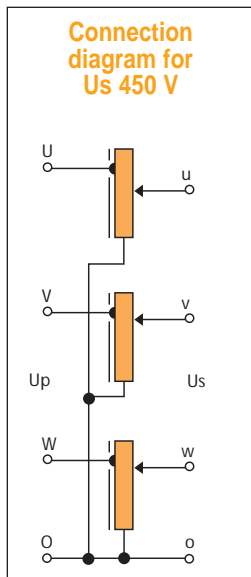
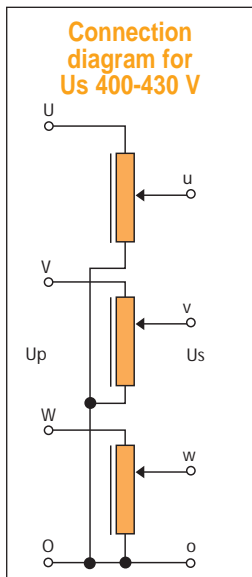
THREE-PHASE

OPEN EXECUTION

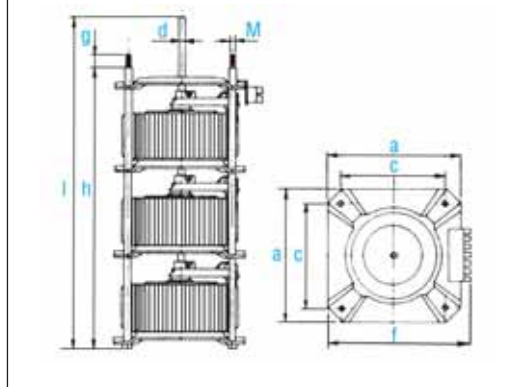
	Up (V)	Us (V)	Is (A)	P (VA)	Weight (kg)
7HTO0152	400 Y	0.....430	2,5	1900	11,5
7HTO0302	400 Y	0.....430	5,0 (6,5)	3700 (4800)	16,0
7HTO0702	400 Y	0.....450	8,0 (9,5)	6240 (7410)	23,5
7HTO0902	400 Y	0.....450	13,0 (16,0)	10140 (12480)	34,0

() = With cooling in oil

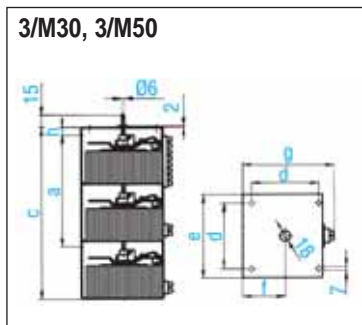
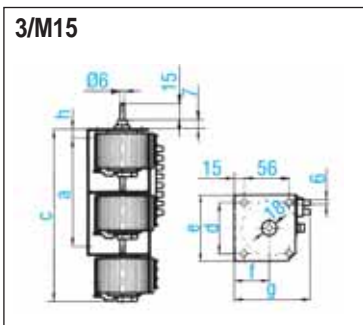
h	l	d	a	c	g	f	M
343	403	8	130	110	18	155	8
407	487	8	130	110	18	155	8
407	487	8	155	127	18	181	8
422	494	8	210	165	20	233	8



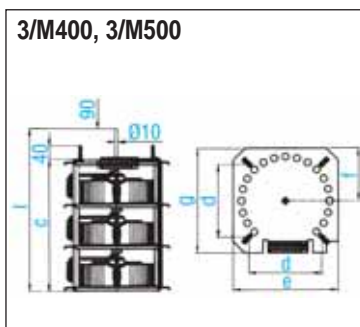
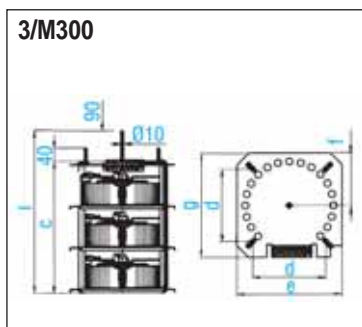
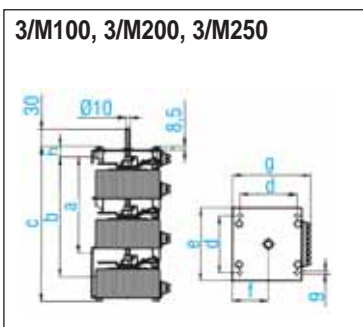
Dimensions in mm



	Up (V)	Us (V)	I (A)	P (VA)		Up (V)	Us (V)	I (A)	P (VA)	Weight (kg)	Model
7HTG400/1	400	0.....400	1,0	690	7HTG450/0,8	400	0.....450	0,8	624	4,9	3/M15
7HTG400/1,25	400	0.....400	1,25	861	7HTG450/1	400	0.....450	1,0	780	4,9	3/M15
7HTG400/1,6	400	0.....400	1,6	1104	7HTG450/1,4	400	0.....450	1,4	1092	8,1	3/M30
7HTG400/2	400	0.....400	2,0	1380	7HTG450/1,6	400	0.....450	1,6	1248	8,1	3/M30
7HTG400/2,5	400	0.....400	2,5	1725	7HTG450/2	400	0.....450	2,0	1560	8,1	3/M30
7HTG400/3	400	0.....400	3,0	2070	7HTG450/2,5	400	0.....450	2,5	1950	11,9	3/M50
7HTG400/4	400	0.....400	4,0	2760	7HTG450/3	400	0.....450	3,0	2340	11,9	3/M50
7HTG400/4,5	400	0.....400	4,5	3105	7HTG450/3,5	400	0.....450	3,5	2730	15,1	3/M100
7HTG400/6	400	0.....400	6,0	4140	7HTG450/4,5	400	0.....450	4,5	3510	15,1	3/M100
7HTG400/8	400	0.....400	8,0	5520	7HTG450/6,3	400	0.....450	6,3	4914	23,6	3/M200
7HTG400/10	400	0.....400	10,0	6900	7HTG450/8	400	0.....450	8,0	6240	23,6	3/M200
7HTG400/12	400	0.....400	12,0	8280	7HTG450/10	400	0.....450	10,0	7800	29,8	3/M250
7HTG400/18	400	0.....400	18,0	12420	7HTG450/15	400	0.....450	15,0	11700	45,5	3/M300
7HTG400/23	400	0.....400	23,0	15870	7HTG450/20	400	0.....450	20,0	15600	48,0	3/M400
7HTG400/32	400	0.....400	32,0	22080	7HTG450/30	400	0.....450	30,0	23400	70,5	3/M500



	a	b	c	d	e	f	g	h	l
3/M15	154	-	246	80	100	48	87	15	-
3/M30	234	-	323	80	100	55	110	15	-
3/M50	243	-	323	110	124	64	128	18	-
3/M100	243	284	370	110	130	67	134	21	-
3/M200	243	284	370	160	178	90	180	21	-
3/M250	243	284	370	160	178	90	180	21	-
3/M300	-	-	402	178	275	138	275	-	492
3/M400	-	-	402	249	310	155	310	-	492
3/M500	-	-	466	249	350	175	350	-	492

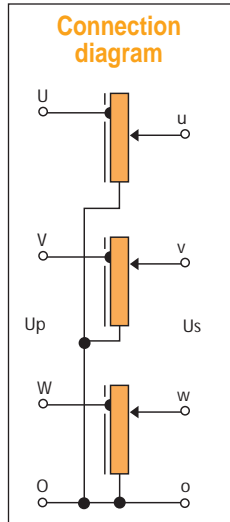


Dimensions in mm

METALLIC CASE EXECUTION



	Up (V)	Us (V)	I (A)	P (VA)	Weight (Kg)	Model
7HTN0703	400 Y	0.....450	7,0	5460	30,5	-
7HTN0903	400 Y	0.....450	13,0	10140	41,0	-
7HTN450/8	400 Y	0.....450	8,0	6240	28,6	3/M200
7HTN450/10	400 Y	0.....450	10,0	7800	35,2	3/M250
7HTN450/15	400 Y	0.....450	15,0	11700	51,7	3/M300
7HTN450/20	400 Y	0.....450	20,0	15600	54,8	3/M400
7HTN450/30	400 Y	0.....450	30,0	23400	79,0	3/M500



Dimensions in mm

	a	b	h	l
7HTN0703	185	200	468	506
7HTN0903	265	286	478	525
3/M200	240	285	380	420
3/M250	240	285	380	420
3/M300	285	315	480	520
3/M400	318	348	480	520
3/M500	357	387	540	590

3/M200, 3/M250
7HTN0703, 7HTN0903

3/M300, 3/M400
3/M500

MOTORISATION

- The auxiliary power supply of the motor is 230VAC
- The travel time of the brushes to make one complete round is about 23 seconds
- Other transformers can be motorised using the correct motor choosing it between the following models



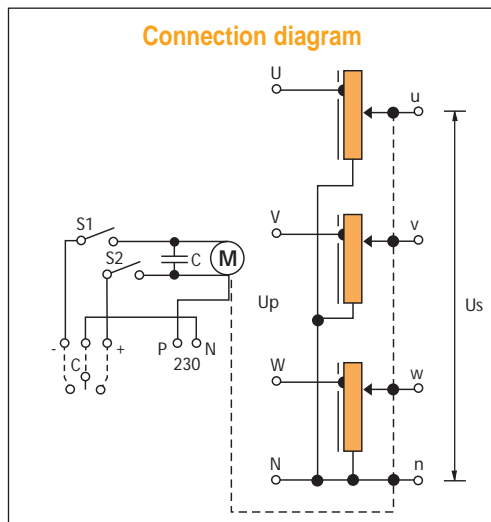
	Suitable for the models:	Weight (Kg)
7HMA 3/M50	3/M50	1,0
7HMA 3/M100	3/M100	1,0
7HMA 3/M200	3/M200	1,0
7HMA 3/M250	3/M250	1,0
7HMA 3/M300	3/M300	1,4
7HMA 3/M400	3/M400	1,4
7HMA 3/M500	3/M500	1,4

	j	k	l
	147	124	124
	147	124	148
	147	124	148
	147	124	148
	147	150	166
	147	194	209
	147	194	209

Dimensions in mm

3/M50, 3/M100, 3/M200, 3/M250

3/M300, 3/M400, 3/M500



ACCESSORIES

KNOBS



- **AMAN416** Knob for open adjustable transformer HSG0011 with shaft \varnothing 6mm
- **AMAN458** Knob for open adjustable transformer HSG0022 with shaft \varnothing 8mm
- **AMAN808** Knob for all other open adjustable transformers model HSG with shaft \varnothing 8mm and three-phase open adjustable transformers model HTO
- **AMAN456** Knob for open single-phase and three-phase adjustable transformer from model M15 to M50 with shaft \varnothing 6mm
- **AMAN810** Knob for open single-phase and three-phase adjustable transformer from model M100 to M500 with shaft \varnothing 10mm

GRADUATED SCALE PLATES



- **ASG1** Graduated scale plate for adjustable transformer HSG0011, HSG0022, M15 and M30
- **ASG2** Graduated scale plate for all other adjustable transformer

VARIABLE RESISTORS

GENERAL DESCRIPTION



These variable resistors are indispensable aids, designed for varying DC and AC currents and voltages in a wide range of the electric industries, such as testing the electric circuits of motor vehicles, applications in the laboratory, education and others.

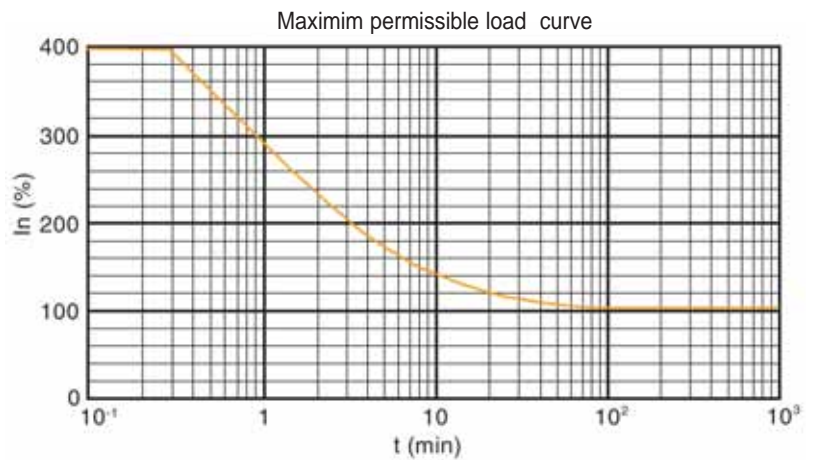
The units can be operated as rheostats or potentiometers.

The principle part of the various types of these variable wirewound resistors are their cores of a pyrostatic ceramic material wound with resistance wire from 1 ohm to 10kohm in compliance with the Renard series. Intermediate values can be provided by connecting the resistance coils of some of the types in parallel.

Non standard values and tolerances can be furnished on special request. Furthermore, bare coil bodies without coils (without casing) can be also supplied.

TECHNICAL CHARACTERISTICS

- Precision class $\pm 10\%$
- Insulation resistance: $> 5M\Omega$
- Earthing resistance: $< 0,1\Omega$
- Allowed voltage at terminals: max 800V $\overline{\overline{=}}$ / 750V rms
- Insulation voltage against casing: $> 1,5$ kV
- Insulation: Class B
- Protection degree: IP20
- Standards: DIN 41480-SE6 / DIN 40050 / VDE 0110

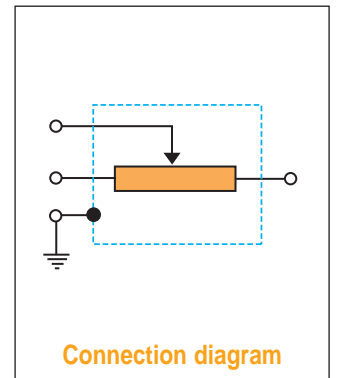
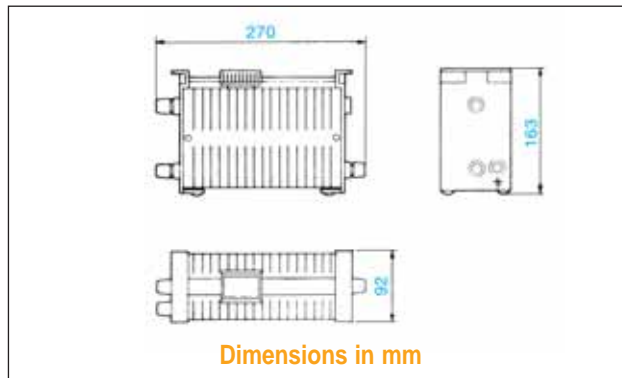


SINGLE-PHASE

7PRN162

- Power 160W
- Weight: from 1,8 to 2,1 Kg depending on the resistive value

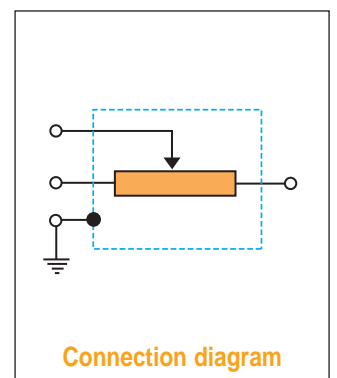
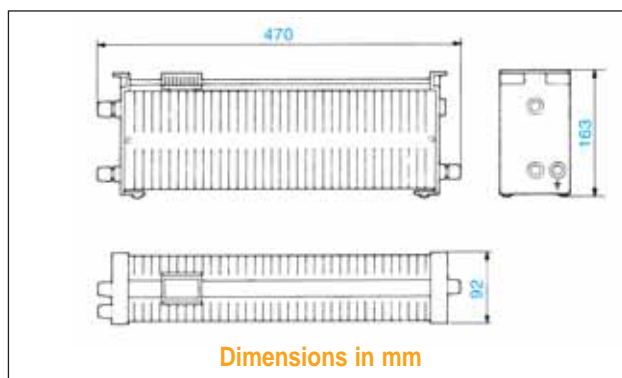
Resistive value (Ω)	Max admissible load (A)	
	continuous	15 min
1	13	18
3,3	7	10
10	4	5,7
33	2,2	3,1
100	1,25	1,8
330	0,7	1,0
1000	0,4	0,57
3300	0,22	0,31



7PRN322

- Power 320W
- Weight: from 3,3 to 3,9 Kg depending on the resistive value

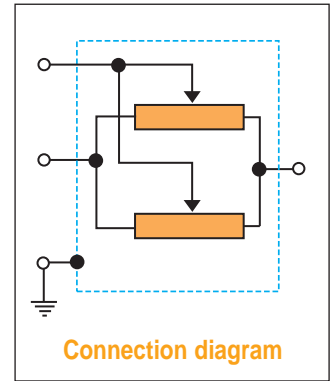
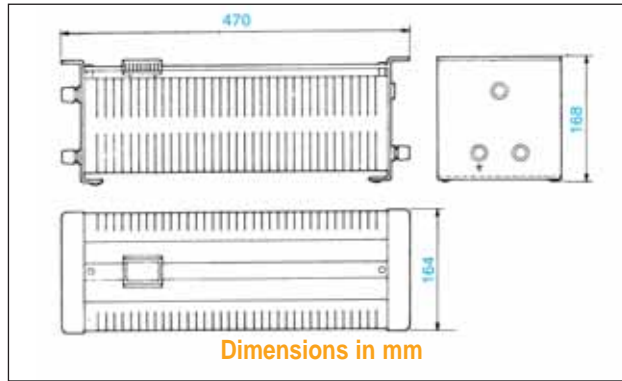
Resistive value (Ω)	Max admissible load (A)	
	continuous	15 min
1	18	25
3,3	10	14
10	5,7	8
33	3,1	4,4
100	1,8	2,5
330	1,0	1,4
1000	0,57	0,8
3300	0,31	0,44
10000	0,18	0,25



7PRN642

- Power 320W
- Weight: from 6,0 to 7,2 Kg depending on the resistive value

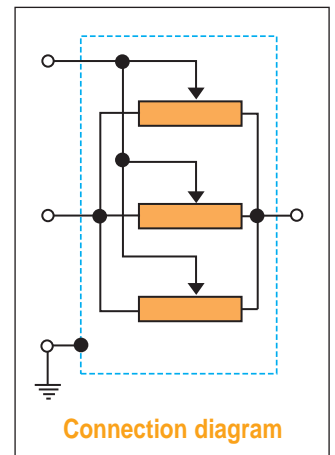
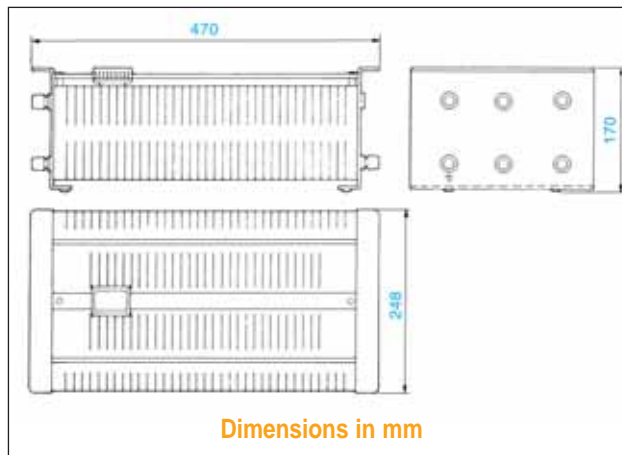
Resistive value (Ω)	Max admissible load (A)	
	continuous	15 min
0,5	36	50
1,6	20	28
5	11,4	16
16,5	6,2	8,7
50	3,6	5
165	2	2,8
500	1,1	1,6
1650	6,0	0,9
5000	0,36	0,5



7PRN962

- Power 960W
- Weight: from 8,2 to 10 Kg depending on the resistive value

Resistive value (Ω)	Max admissible load (A)	
	continuous	15 min
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	0,61

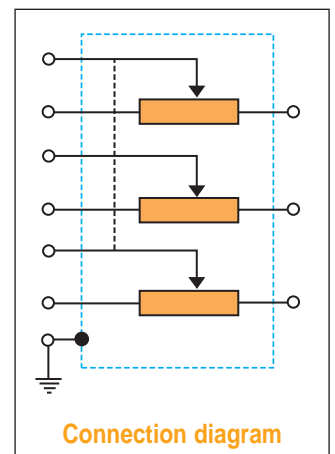
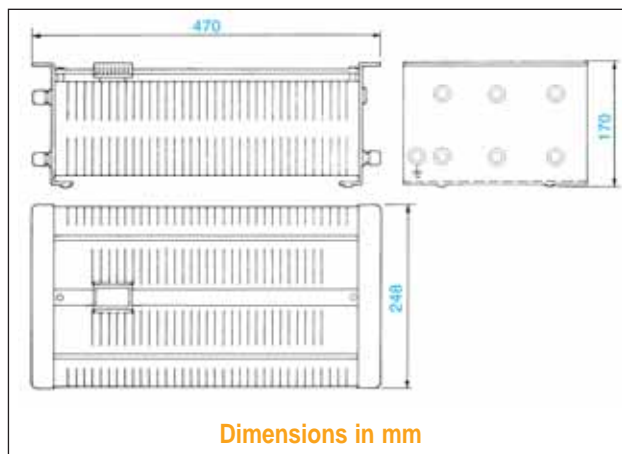


THREE-PHASE

7PRN3/322

- Power 3x320W
- Weight: from 8,2 to 10 Kg depending on the resistive value

Resistive value (Ω)	Max admissible load (A)	
	continuous	15 min
3x1	3x18	3x25
3x3,3	3x10	3x14
3x10	3x5,7	3x8
3x33	3x3,1	3x4,4
3x100	3x1,8	3x2,5
3x330	3x1,0	3x1,4
3x1000	3x0,57	3x0,8
3x3300	3x0,31	3x0,44
3x10000	3x0,18	3x0,25





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