MADEP

RESISTANCES DE FREINAGE

FAIBLE ET MOYENNE PUISSANCE

INDICE IP ELEVE IP55 ET IP 65

- SRF
- RFF
- SFO
- RFH

MOYENNE ET FORTE PUISSANCE

INDICE IP MOYEN IP20

- BDR
- BRE série économique app.ascsnseurs
- BRR faible bruit -
- BDC faible bruit - cémentées

TRES FORTE PUISSANCE REFROIDIE PAR EAU

- RHO faible volume

RESISTANCES DE FREINAGE

catalogue condensé

S.I.R. Società Italiana Resistor

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SRF

1. **FEATURES**

The SRF style resistors are products of good quality designed to achieve suitable level of protection and an elevated dielectric strength.

The special construction technology makes use only of inorganic materials so as to permit confidence of use beyond 400°C and to ensure a good endurance to adiabatic impulses. These characteristics and the mounting facility make the SRF style essential where high reliability is required even in heavy duties as:

- **braking resistors**
- **inverter**
- **snubber**
- **capacity discharge**

The SRF resistors provides two different housing: aluminium and zinc plated steel. It's to notice that power rating of the aluminium one can be respectively increased and reached using a suitable heat sink.

2. **MAIN CHARACTERISTICS**

Characteristics		SRF 100	SRF 150	SRF 120	SRF 180	SRF 250	SRF 350	SRF 170	SRF 171	SRF 172	SRF 173	SRF 174	SRF 175
Power rating (P_r) with heat sink[(a)]	W	100	150	120[(a)]	180[(a	250	350	165	210	305	400	500	600
IP level		IP 55		IP 55		IP 55		IP 55					
Thermostat 160°c option [(b)]		yes		yes		yes		yes					
Cable length	cm	25		30		30		30					
Dielectric strength @ 50 Hz [(C)]	V	3.000 V_{rsm} x 1 min		3.000 V_{rsm} x 1 min		3.000 V_{rsm} x 1 min		3.000 V_{rsm} x 1 min					
Insulation resistance @ 2.500 V_{dc}	MΩ	≥ 200		≥ 200		≥ 200		≥ 200					
Short term overload		$5P_r$ x 5 sec - $10P_r$ x 3 sec - $20P_r$ x 1 sec											

Notes:

(a) Ref. SRF120-180: no heat sink. Ref to other SRF codes: heat seat thermal resistance has to de set in order to max allowable temperature.(normal range: 150°C÷200°C).

(b) S.I.R. coding system provides a **"T" additional letter for external thermostat and "C" for internal one**. Depending by specific types, about SRF resistor both internal and external options or the internal one only are applicable.

(c) **customized values can be provided.**

Characteristics		SRF 650	SRF 950	SRF 1350	SRF 600	SRF 900	SRF 1300	SRF E550	SRF E850	SRF E1250	SRF 601	SRF 901	SRF 1301	SRF 2001
Power rating (P_r) with heat sink [(a)]	W	650	950	1.350	600	900	1.300	550[(a)]	850[(a)]	1250[(a)]	600	900	1.300	2.000
IP level		IP 55			IP33			IP 55	IP 33		IP 33			
Thermostat 160°c option [(b)]	-	yes			yes			yes			yes			
Cable length	cm	30			30			30			30			
Dielectric strength @ 50 Hz [(c)]	V	3.000 V_{rsm} x 1 min			2.800 V_{rsm} x 1 min [(d)]			2.500 V_{rsm} x 1 min			2.800 V_{rsm} x 1 min [(c)]			
Insulation resistance @ 2.500 V_{dc}	MΩ	≥ 200			≥ 200			≥ 200			≥ 200			
Short term overload		$5P_r$ x 5 sec - $10P_r$ x 3 sec - $20P_r$ x 1 sec												

Notes:

(a) ref to shown SRF codes: heat sink thermal resistance has to be set in accordance to max allowable temperature (normal range: 150°C÷200°C).

(b) S.I.R. coding system provides a "**T" additional letter for external thermostat and "C" for internal one**. Depending by specific types, about SRF resistor both internal and external options or the internal one only are applicable.

(c) **customized values can be provided**.

(d) 3.000 V_{rsm} x 1 min is available

SRF

3. OTHER CHARACTERISTIC

Characteristics		SRF 100	SRF 150	SRF 120	SRF 180	SRF 250	SRF 350	SRF 170	SRF 171	SRF 172	SRF 173	SRF 174	SRF 175
Temperature rise @ Pr	°C	370		330		350		400					
Max. power with water cooled heat sink	W	150	200	---	---	400	500	180	230)	340	440	540	650
Max. power without heat sink	W	50	75	---		---		---					
Thermal resistance of heat sink	°C/W	≤ 0,3		---		---		---					
Absorbed energy @ 250°C ΔT	KJ	8	10	50	75	18	24	29	34	54	74	96	120
Absorbed energy in 5 sec overload	KJ	4	6	6	9	6,5	9	7,5	10	15	20	23	25
Resistance range (a)	min Ω	0,39	0,47	2 ,0	4,0	0,47	0,68	1,8	2	2,7	3,3	4,7	5,4
	max Ω	1000	1.500	250	300	300	400	470	620	820	1.000	1.300	1.800
Resistance tolerance		± 5%		± 5%		± 5%		± 5%					
Parasitic capacity (from 1 to 100 kHz)	pF	100	150	100	140	150	200	60	65	100	140	180	230
Max working voltage	KV	1,5	2,0	1,0		1,5	2,0	1,2	1,5	1,8	2,5	2,8	3,0
Time constant	min	9		12		14		11		12			

Notes:

(a) **customized values can be provided**.

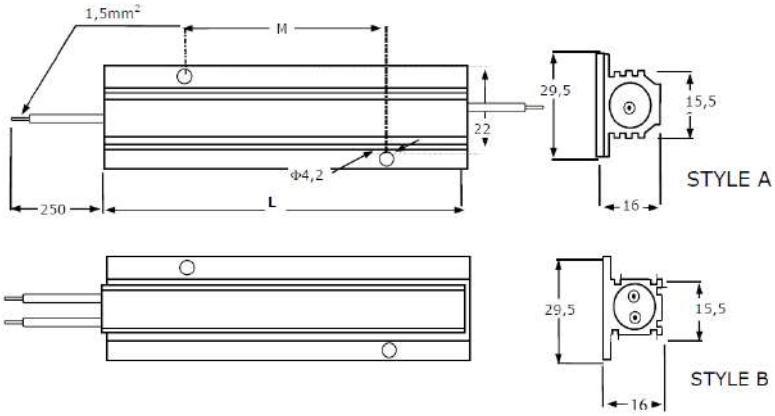
Characteristics		SRF 650	SRF 950	SRF 1350	SRF 600	SRF 900	SRF 1300	SRF E550	SRF E850	SRF E1250	SRF 601	SRF 901	SRF 1301	SRF 2001
Temperature rise @ P_r	°C	390			390			390			390			420
Max. power with water cooled heat sink	W	---	---	---	650	950	1.400	650	950	1.300	---	---	---	---
Max. power without heat sink	W	390	560	800	300	400	550	250	350	550	300	400	550	800
Thermal resistance of heat sink	°C/W	≤ 0,3	≤ 0,2	≤ 0,1	---			---			---			
Absorbed energy @ 250°C ΔT	KJ	90	120	150	35	50	75	35	50	75	35	50	75	85
Absorbed energy in 5 sec overload	KJ	15	22	30	3	4	5,5	3	4	5,5	15	20	28	40
Resistance range (a)	min Ω	5,6	6,8	6,8	5,6	6,0	6,8	10	12	15	2,0	2,0	3,3	8
	max Ω	150	200	250	150	150	200	100	100	150	150	200	250	300
Resistance tolerance		± 5%			± 5%			± 5%			± 5%			
Parasitic capacity (from 1 to 100 kHz)	pF	120	190	250	90	110	150	90	110	150	90	110	150	160
Max working voltage	KV	1,0			1,0			1,0			1,0			1,2
Time constant	min	15			10			10			10			11

Notes:

(a) customized values can be provided.

SRF

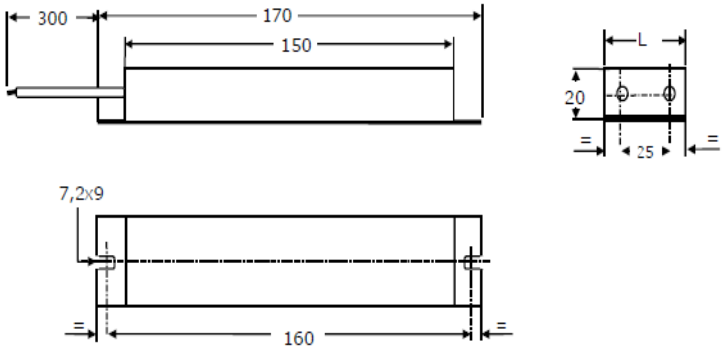
SRF 100 & 150
SRFC 100 & 150



Style (*)	M [mm]	L [mm]
SRF 100	60	120
SRF 150	120	180

(*) shown dimensions are valid for SRF resistors with thermostat option too.

SRF 120 & 180
SRFC 120 & 180

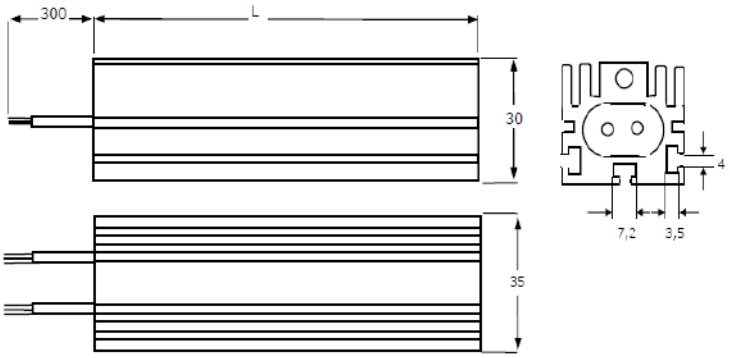


Style (*)	L [mm]	Weight [g]
SRF 120	42	350
SRF180	65	540

(*) shown dimensions are valid for SRF resistors with thermostat option too.

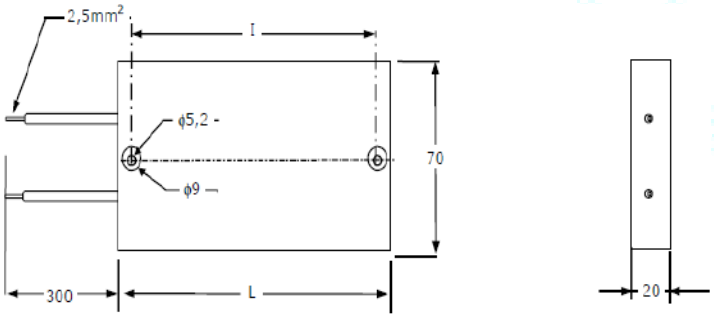
SRF

SRF 250 & 350
SRFC 250 & 350
SRFT 250 & 350



Style (*)	L [mm]
SRF 250	150
SRF 350	200
(*) shown dimensions are valid for SRF resistors	

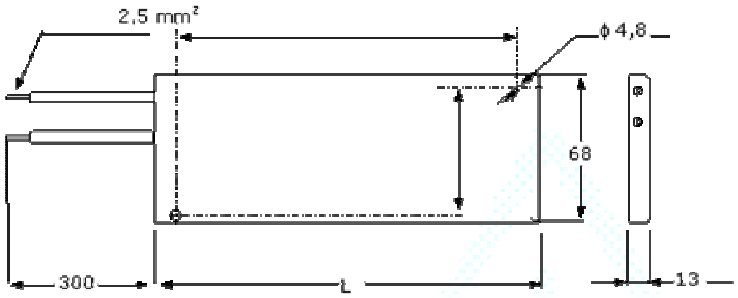
SRF 650 , SRF 950 , SRF 1350
SRFC 650 , SRFC 950 , SRFC 1350



Style (*)	I [mm]	L [mm]	Weight [g]
SRF 650	140	155	450
SRF 950	190	205	600
SRF 1350	240	255	750
(*) shown dimensions are valid for SRF resistors with thermostat option too.			

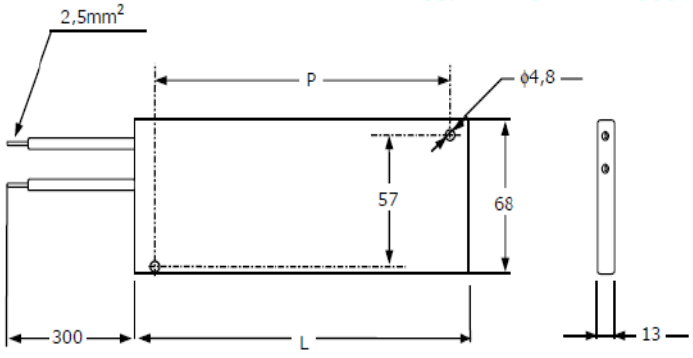
SRF

SRF E550 , SRF E850 , SRF E1250
SRFT E550 , SRFT E850 , SRFT E1250
SRFC E550 , SRFC E850 , SRFC E1250



Style (*)	L [mm]	L [mm]
SRF E550	102	81
SRF E850	145	124
SRF E1250	195	174
(*) shown dimensions are valid for SRF resistors with thermostat option		

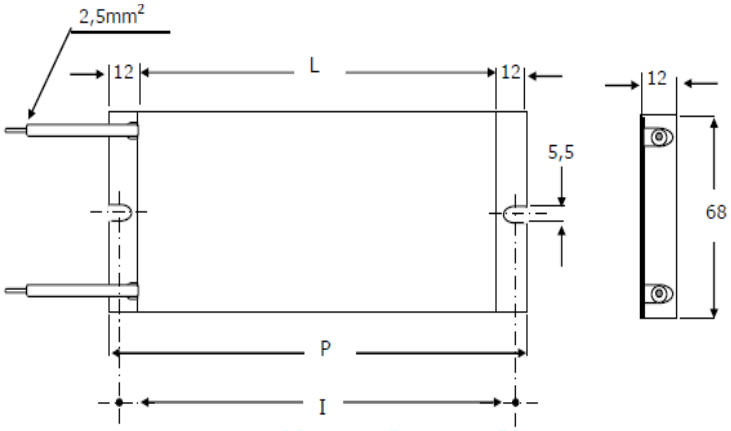
SRF 600 , SRF 900 , SRF 1300
SRFT 600 , SRFT 900 , SRFT 1300
SRFC 600 , SRFC 900 , SRFC 1300



Style	L [mm]	P [mm]
SRF 600	102	81
SRF 900	145	124
SRF 1300	195	174
(*) shown dimensions are valid for SRF resistors with thermostat option too.		

SRF

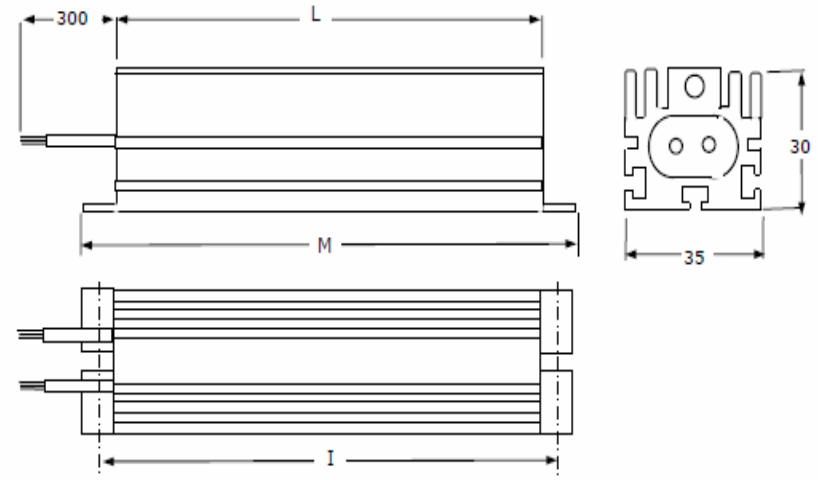
SRF 601 , SRF 901 , SRF 1301 , SRF 2001
SRFC 601 , SRFC 901 , SRFC 1301 , SRFC 2001



Style	L [mm]	P [mm]	M [mm]	I ± 2 [mm]
SRF 601	105	129	68	118
SRF 901	150	174	68	165
SRF 1301	198	222	68	200
SRF 2001	198	222	100	213

(*) shown dimensions are valid for SRF resistors with thermostat option too.

SRF 17x , SRFT 17x , SRFC 17x



	SRF 170	SRF 171	SRF 172	SRF 173	SRF 174	SRF 175
M [mm]	90	105	155	200	260	320
L [mm]	70	85	135	180	240	300
I [mm]	78÷92	92÷96	142÷146	187÷191	247÷251	307÷311

(*) shown dimensions are valid for SRF resistors with thermostat option too.

RFF

1. **FEATURES**

The RFF style resistors have been designed in order to achieve high level of protection and an elevated dielectric strength. The case is in nickel plated steel.

The special construction technology makes use only of inorganic materials so as to permit confidence of use beyond 400°C and to ensure a good endurance to adiabatic impulses. These characteristics and the mounting facility make the RFF style essential where high reliability is required even in heavy duties as:

- **braking resistors**
- **inverter**
- **snubber**
- **capacity discharge**

RFF housing is nickel plated steel; it's to take in account that power rating can be significantly improved using a suitable heat sink**.**

Two product families, whose difference is on the mounting shape, have been planned.

2. **MAIN CHARACTERISTICS**

Characteristics		RFF 201	RFF 202	RFF 301	RFF 302
Power rating (P_r)	W	200		300	
IP level		IP 55		IP 55	
Thermostat 160°c option [A]		yes		yes	
Cable length	cm	250		250	
Dielectric strength @ 50 Hz [b]	V	4.000 V_{rsm} x 1 min		4.000 V_{rsm} x 1 min	
Insulation resistance @ 2.500 V_{dc}	MΩ	≥ 200		≥ 200	
Short term overload		8P_r x 5 sec		8P_r x 5 sec	

Notes:

(a) S.I.R. coding system provides a **"C" additional letter for thermostat**. On RFF type only internal option is applicable; in this case the related code is RFFC.

(b) **customized values can be provided.**

3. OTHER CHARACTERISTIC

Characteristics		RFF 201	RFF 202	RFF 301	RFF 302
Temperature rise @ P_r	°C	370		370	
Max. power with water cooled heat sink	W	450		600	
Max. power with 1°C/W heat sink	W	350		500	
Absorbed energy @ 250°C ΔT	KJ	40		50	
Resistance range [a]	min	0,39		0,87	
	max	5.000		8.200	
Resistance tolerance		±5%		±5%	
Parasitic capacity (from 1 to 100 kHz)	pF	400		600	
Max working voltage	KV	2		2	
Time constant	min	18		18	

Notes:

(a) **customized values can be provided.**

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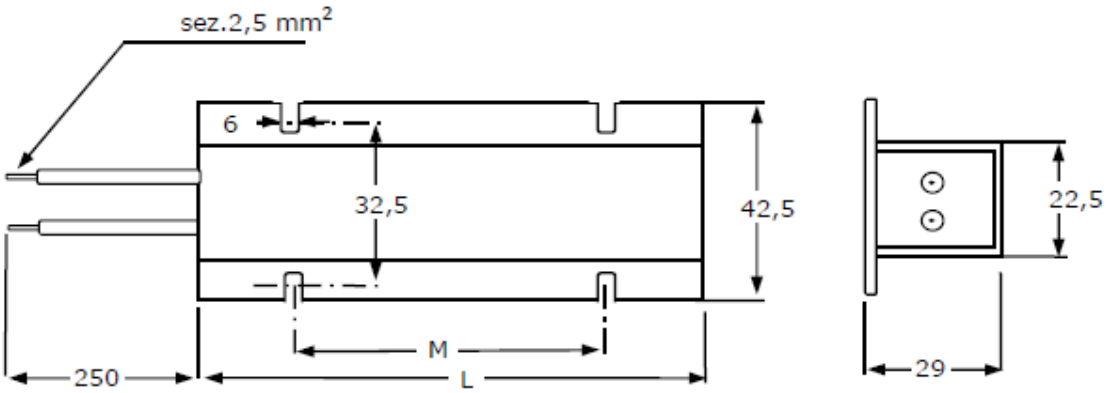
RFF

RFF201 , RFF301

RFFC201 , RFFC301

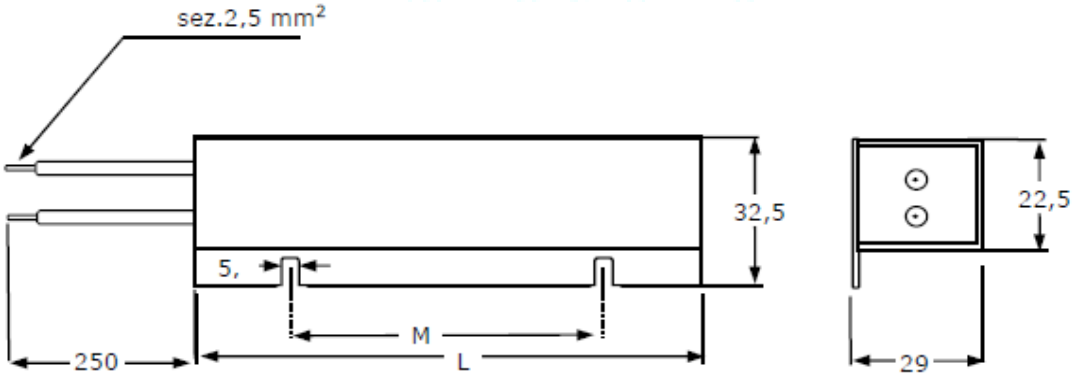


Style (*)	M [mm]	L [mm]
RFF201	100	150
RFF301	150	200

(*) shown dimensions are valid for RFFC style too.

RFF202 , RFF302

RFFC202 , RFFC302



Style (*)	M [mm]	L [mm]
RFF202	100	150
RFF302	150	200

(*) shown dimensions are valid for RFFC style too.

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SFO

1. **FEATURES**

The SFO style resistors are products designed to achieve suitable level of protection and an elevated dielectric strength.

The special construction technology uses inorganic materials such to let applications beyond 400°C and to ensure a good endurance to adiabatic impulses. These characteristics and the mounting ease make the SFO style essential where high reliability is required even in heavy duties as:

- **braking resistors**
- **inverter**
- **snubber**
- **capacity discharge**

The SFO resistors are aluminium housed; it's to notice that the power rating can be increased and using a suitable heat sink.

2. **MAIN CHARACTERISTICS**

Characteristics		SFO 100	SFO 150	SFO 200	SFO 300	SFO 450	SFO 600
Power rating (P_r)[a]	W	100	150	200	300	450	600
IP level		IP 55					
Thermostat 160°c option [b]		yes					
Dielectric strength @ 50 Hz [c]	V	3.000 V_{rsm} x 1 min					
Insulation resistance @ 2.500 V_{dc}	MΩ	≥ 200					
Short term overload		8P_r x 3sec - 4P_r x 5sec - 15P_r x 1sec					

Notes:

(a) with 0,7 °C/W heat sink.

(b) S.I.R. coding system provides a **"C" additional letter for thermostat**. About SFO type only internal option is applicable; in case of thermostat the related code is SFOC.

(c) **customized values can be provided.**

3. OTHER CHARACTERISTIC

Characteristics			SFO 100	SFO 150	SFO 200	SFO 300	SFO 450	SFO 600
Temperature rise @ Pr		°C	300			320		
Max. power with water cooled heat sink		W	150	200	270	350	530	700
Max. power without heat sink		W	80	120	150	200	350	450
Absorbed energy @ 250°C ΔT		KJ	7	10	12,5	50	120	140
Resistance range [a]	min	Ω	4,7		4,7	4,7		
	max		100		200	250		
Resistance tolerance			± 5%					
Max working voltage		KV	2.0					

Notes:

(a) **customized values can be provided.**

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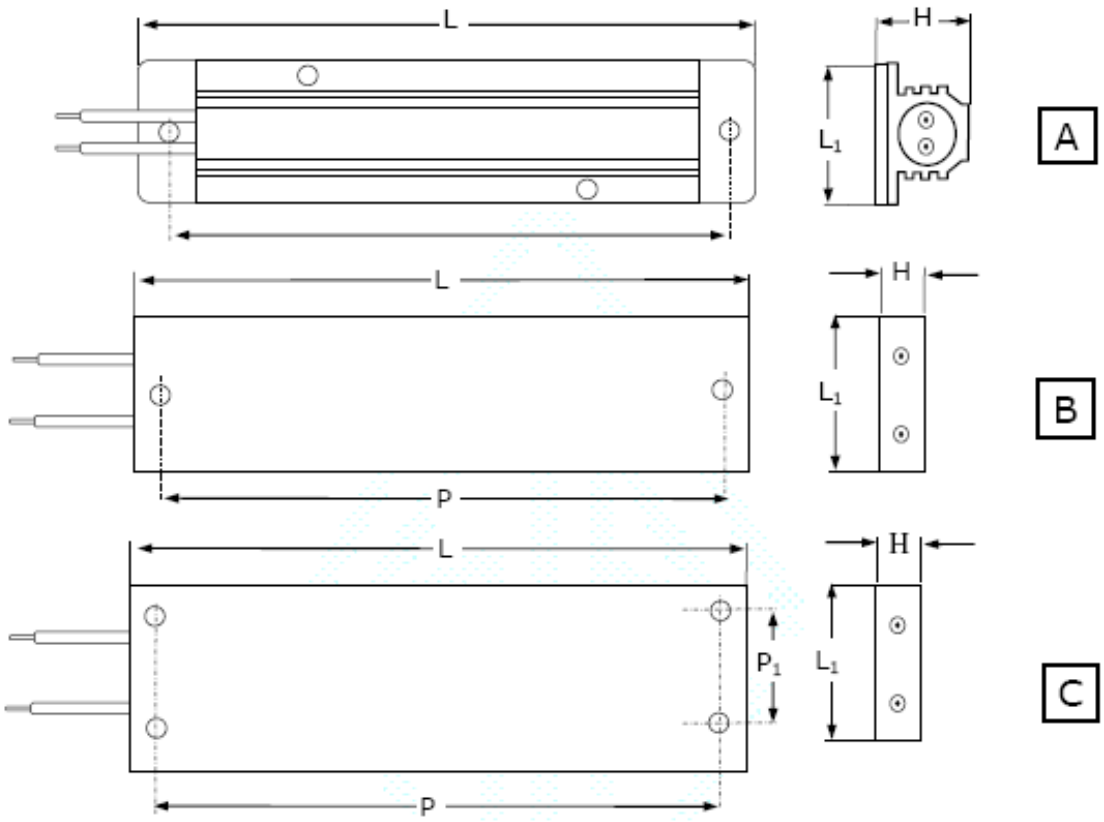
SFO

SFO 100 , SFO 150 , SFO 200 , SFO 300 , SFO 450 , SFO 600
SFOC 100 , SFOC 150 , SFOC 200 , SFOC 300 , SFOC 450 , SFOC 600



Standard Cable Length 300 mm

Fastening holes Φ 5,2mm

STYLE	L	L_1	P	P_1	H	Drawing
SFO100	112	30	100	-	19	A
SFO150	192	30	180	-	19	A
SFO200	232	30	220	-	19	A
SFO300	205	40	180	-	15	B
SFO450	205	70	180	45	20	C
SFO600	245	70	220	45	20	C

(*) shown dimensions are valid for SFOC resistors too.

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RFH

1. FEATURES

The RFH style resistors have been designed to achieve high performances on protection level (IP55), dielectric strength, power dissipation and withstanding to adiabatic pulses.

These characteristics make RFH resistors very valuable for applications where high reliability is required, even in heavy duties, as:

- **braking resistors**
- **inverter**
- **snubber**
- **capacitor charge limiting.**

Special material resistant to temperature higher than 450°C are used. Moreover, the rated power can by improved using suitable heat sink.

2. MAIN CHARACTERISTICS

		RH 350	RFH 500	RFH750	RFH 1100	RFH 1000	RFH 1400	RFH 1900	RFH 1500	RFH 1800	RFH 2200
Power rating	KW	0,3	0,4	0,65	0,95	1,0	1,4	1,9	1,5	1,8	2,2
IP level		IP 55				IP 55-IP65			IP 54		
Thermostat 160°C optino [a]		yes				yes			yes		
Dielectric strength @ 50 Hz [b]	V	4.500 V_{rsm} x 1 min				4.500 V_{rsm} x 1 min			4.500 V_{rsm} x 1 min		
Insulation resistance @ 1000 Vdc	MΩ	> 500				> 200			> 200		
Short term overload		$5P_r$ x 5 sec $10P_r$ x 3 sec $20P_r$ x 1 sec				$5P_r$ x 5 sec $10P_r$ x 3 sec $20P_r$ x 1 sec			$5P_r$ x 5 sec $10P_r$ x 3 sec $20P_r$ x 1 sec		

Notes:

(a) S.I.R. coding system provides a **"T" additional letter for external thermostat and "C" for internal one**. Depending by specific types, about RFH resistor both internal and external options or the internal one only are applicable.

(b) **customized values can be provided**.

3. OTHER CHARACTERISTICS

			RH 350	RFH 500	RFH750	RFH 1100	RFH 1000	RFH 1400	RFH 1900	RFH 1500	RFH 1800	RFH 2200
Temperature rise @ Pr			365	375	375	385	380		410	410		
Suggested continuous power max.	W		300	400	650	950	750	1.100	1.300	1.100	1.300	2.000
Max. power without heat sink	W		350	500	750	1.100	---			---		
Max. power with heat sink	W		650	850	1.300	1.800	---			---		
Max. power with water cooled heat sink	W		750	1.000	1.500	2.200	---			---		
Thermal resistance of heat sink	MΩ		≤ 0,5	≤ 0,5	≤ 0,5	≤ 0,5	---			---		
Absorbed energy @ 250°C ΔT	KJ		50	70	100	150	450	600	750	500	550	1.000
Absorbed energy in 5 sec overload	KJ		20	28	40	60	36	55	85	55	55	83
Resistance range	Ω	min	1,0	1,0	2,2	2,2	6,8		10	6.8	6.8	10
		max	10.000	12.000	15.000	20.000	300			300	300	300
Tolerance for resistance values			± 5%				± 5%			± 5%		
Inductance @ 1000 Hz	µH		5÷50	7÷70	10÷100	20÷200	---			---		
Parasitic capacity (from 1 to 100 kHz	pF		250÷60	300÷75	450÷120	600÷200	200	220	250	250		
Maximum working voltage	V		1.500	2.500	3.000	3.000	1.200			1.200		1.500
Thermal time constant	min		18				15	16	19	16	18	27

Notes:

(a) **customized values can be provided**

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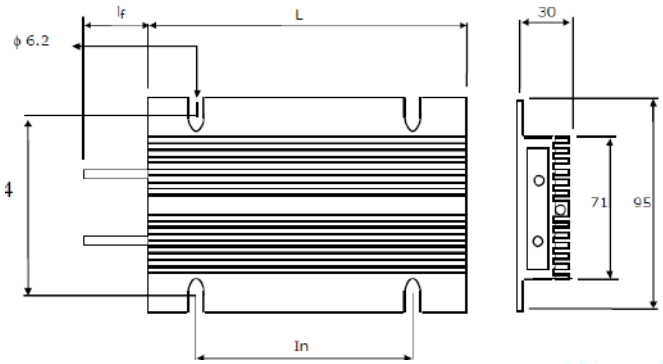
RFH

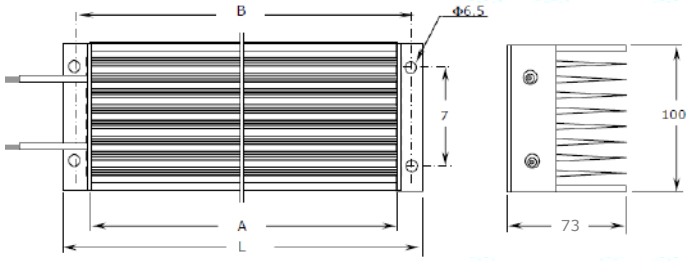
RHF 350 , RFH 500 , RFH 750 , RFH 1100
RHFT 350 , RFHT 500 , RFHT 750 , RFHT 1100
RHFC 350 , RFHC 500 , RFHC 750 , RFHC 1100



Style	L [mm]	In	Weight [g]
RFH 350	110	60	460
RFH 500	160	110	670
RFH 750	220	140	920
RFH 1100	320	240	1250

(*) shown dimensions are valid for RFH resistors with thermostat option too.

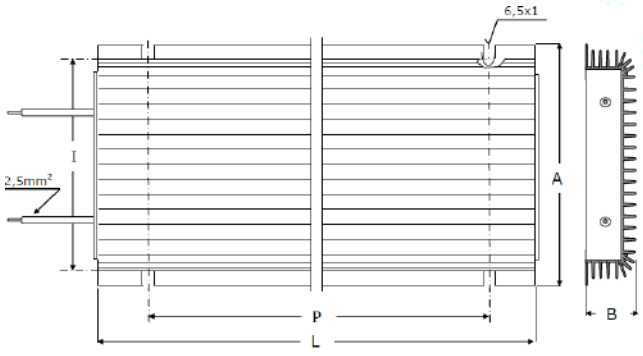
RFH 1000 , RFH 1400 , RFH 1900
RFHC 1000 , RFHC 1400 , RFHC 1900



Style (*)	L [mm]	A [mm]	B [mm]	Weight [g]
RFH 1000	246	202	230	2.500
RFH 1400	311	267	295	3.200
RFH 1900	366	322	350	4.000

(*) shown dimensions are valid for RFH resistors with thermostat option too.

RFH 1500 , RFH 1800 , RFH 2200
RFHC 1500 , RFHC 1800 , RFHC 2200



Style (*)	A [mm]	B [mm]	L [mm]	I ±3 [mm]	P [mm]	Weight [g]
RFH 1500	120	40	320	110	240	2.750
RFH 1800	120	40	380	110	300	3.000
RFH 2200	190	67	380	180	300	7.000

(*) shown dimensions are valid for RFH resistors with thermostat option too.

Leads standard length: 300 mm

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BDR

1. **FEATURES**

In the dynamic braking and for high continuous power values, it arises the needing for a protected resistors (or resistors group) to be employed like an independent unity.

The BDR resistors group has been designed in order to satisfy above needing,. Such group includes three product families whose whole is such to cover a significant power and IP level ranges.

Cases are made using punched or not plates, white zinc-galvanised finished.
Proper clamping connections have been provided.

2. **MAIN CHARACTERISTICS**

Characteristics		BDR-K0							BDR-K1							BDR-K2		BDR-K4		
		BDR2K0	BDR4K0	BDR5K0	BDR8K0	BDR12K0	BDR16K0	BDR24K0	BDR4K1	BDR8K1	BDR12K1	BDR16K1	BDR24K1	BDR32K1	BDR48K2	BDR64K2	BDR16K4	BDR24K4	BDR32K4
Power rating	KW	2	4	5	8	12	16	24	4	8	12	16	24	32	48	64	16	24	32
IP level		IP 20							IP 23						IP 21		IP 20		
Thermostat 160 °C option (a)		yes							yes						yes		yes		
Dielectric strength @ 50 Hz (b)	V	3.000 V_{rsm} x 1 min							4.000 V_{rsm} x 1 min						4.000 V_{rsm} x 1 min		4.000 V_{rsm} x 1 min		
Insulation resistance @ 2500 Vdc	MΩ	≥ 200							≥ 200						≥ 200		≥ 200		

Notes:

(a) S.I.R. coding system provides a **"T" additional letter for thermostat**. About BDR type only external option is applicable; in case of thermostat the related code is BDRT.

(b) **customized values can be provided**.

3. **OTHER CHARACTERISTICS**

Characteristics		BDR-K0							BDR-K1						BDR-K2		BDR-K4		
		BDR2K0	BDR4K0	BDR5K0	BDR8K0	BDR12K0	BDR16K0	BDR24K0	BDR4K1	BDR8K1	BDR12K1	BDR16K1	BDR24K1	BDR32K1	BDR48K2	BDR64K2	BDR16K4	BDR24K4	BDR32K4
Resistance range (a)	min Ω	1,0			1,0		2,2		1,0	2,2					3,3		3,3		
	max	60			100		100		60	100					100		100		
Tolerance for resistance values		± 10%							± 10%						± 10%		± 10%		
Overload		$10P_r$ x 5 sec $5P_r$ x 10 sec					$5P_r$ x 5 sec		$10P_r$ x 5 sec $5P_r$ x 10 sec				$8P_r$ x 5 sec $3P_r$ x 10 sec		$8P_r$ x 5 sec $3P_r$ x 10 sec		$8P_r$ x 5 sec $3P_r$ x 10 sec		
Connections	resistors	no. 2							no. 2						no. 2		no. 2		
	earth	no. 1							no. 1						no. 2		no. 2		
	thermostat	no. 2 (optional)							no. 2 (optional)						no. 2 (optional)		no. 2 (optional)		

Notes:

(a) **customized values can be provided**.

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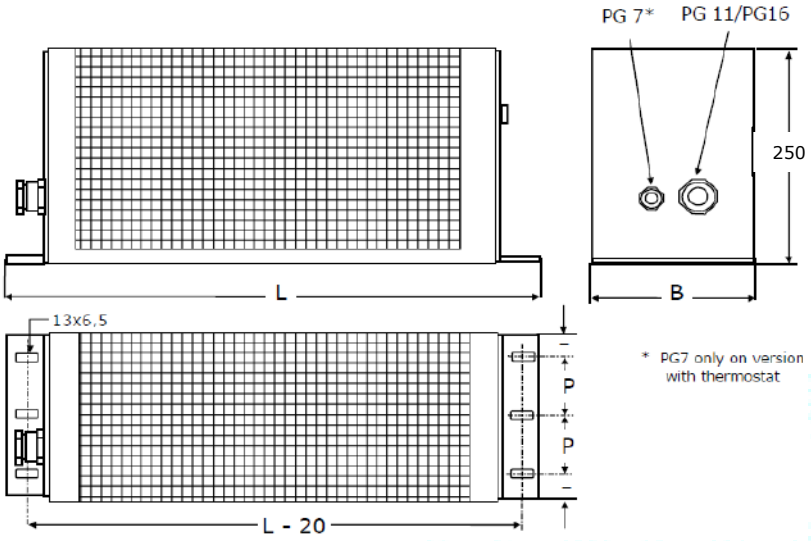
BDR

BDR 2K0 , BDR 4K0 , BDR 5K0 , BDR 8K0 , BDR 12K0,
BDR 16K0 , BDR 24K0 ,

BDRT 2K0 , BDRT 4K0 , BDRT 5K0 , BDRT 8K0 ,
BDRT 12K0 , BDR16K0 , BDRT 24K0

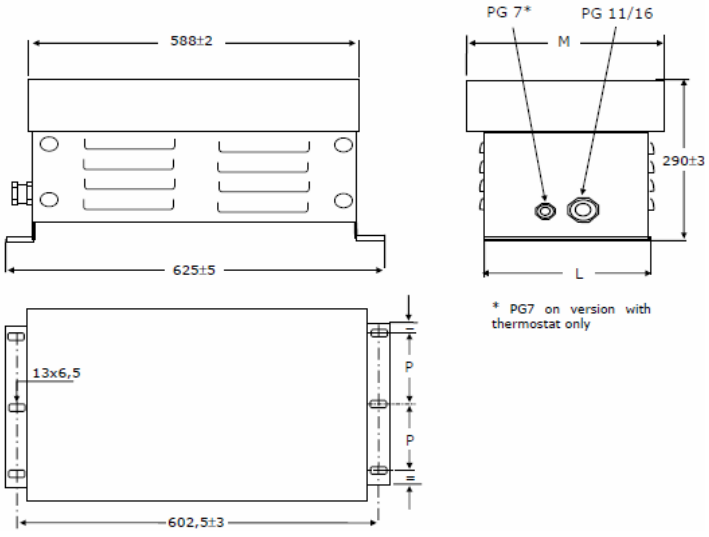


Style (*)	L ±3 [mm]	B [mm]	P [mm]
BDR2K0	498	100	40
BDR4K0	625	100	40
BDR8K0	625	160	60
BDR12K0	625	200	80
BDR16K0 (+)	625	160X2	60X2
BDR24K0 (+)	625	200X2	80X2

(*) shown dimensions are valid for BDRT style too.
(+) BDR16K0 and BDR24K0 are constituted by two 8K0 and 12K0 joint along L side.

BDR 4K1 , BDR 8K1 , BDR 12K1

BDRT 4K1 , BDRT 8K1 , BDRT 12K1



Style (*)	L [mm]	M [mm	P [mm]
BDR4K1	100	140	40
BDR8K1	160	200	60
BDR12K0	200	240	80

(*) shown dimensions are valid for BDRT style too.

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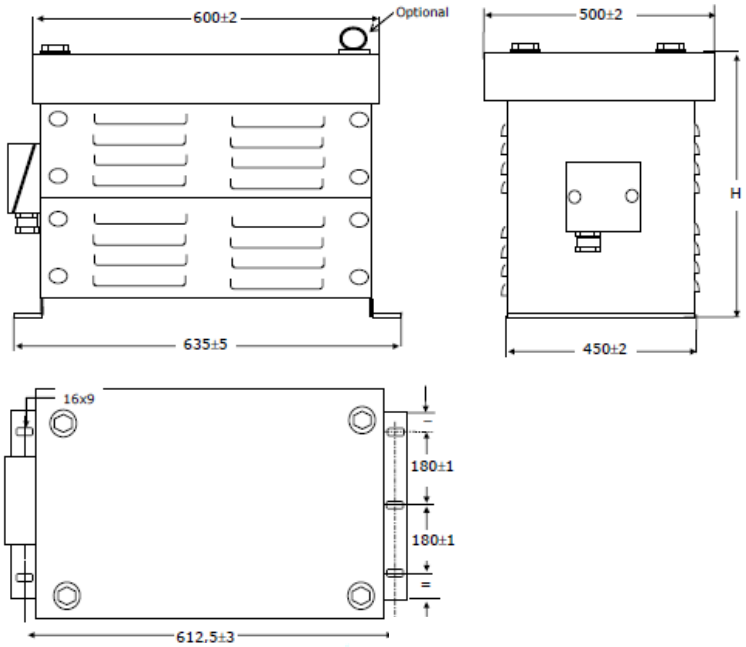
BDR

BDR 16K1 , BDR 24K1 , BDR 32K1

BDRT 16K1 , BDRT 24K1 , BDRT 32K1

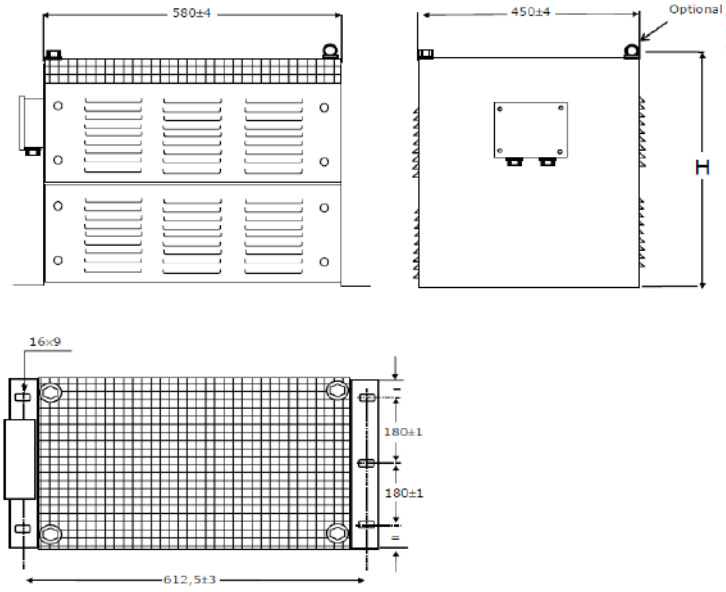


Style (*)	H ± 5 [mm]
BDR16K1	310
BDR24K1	550
BDR32K1	550

(*) shown dimensions are valid for BDRT style too.

BDR 16K4 , BDR 24K4 , BDR 32K4

BDRT 16K4 , BDRT 24K4 , BDRT 32K4



Style (*)	H ± 5 [mm]
BDR16K4	300
BDR24K4	540
BDR32K4	540

(*) shown dimensions are valid for BDRT style too.

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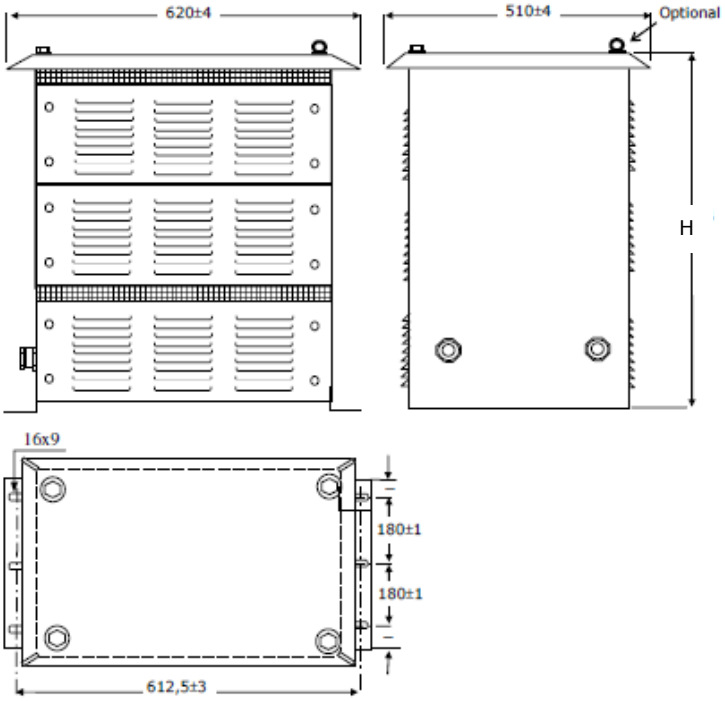
BDR

BDR 48K2, BDR 64K2

BDRT 48K2, BDRT 64K2



Style (*)	H ± 5 [mm]
BDR48K2	860
BDR64K2	1200

(*) shown dimensions are valid for BDRT style too.

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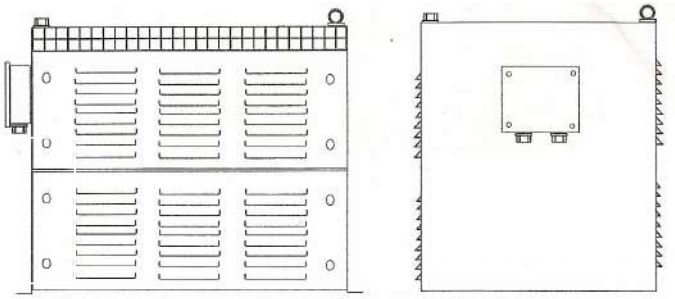
BDR

BDR 16 ÷ 32K

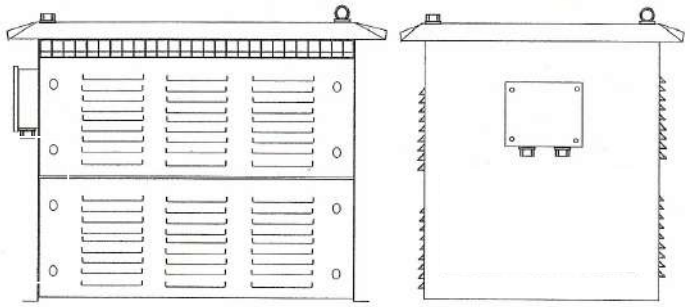
BDRT 16 ÷ 32K

CASES FOR DIFFERENT
IP LEVELS

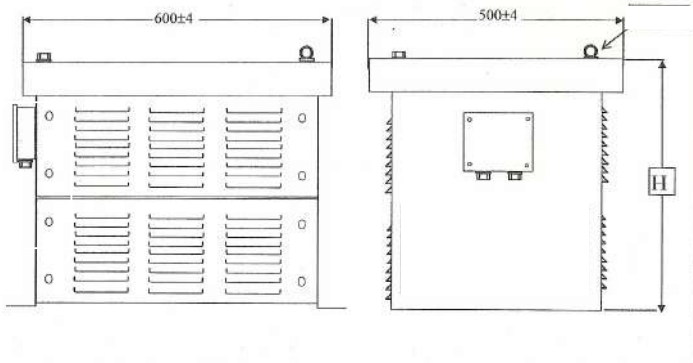
IP 20
case



IP 21
case



IP 23
case



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BRE

1. **FEATURES**

In the dynamic braking and for continuous power values till to 1,5 KW, it is often required a protected resistor easy to mount in the electric panels. BRE is **low cost** product designed for such application.

BRE resistors group includes two families: BREXX1 And BRE600+1000.

Main differences between the twos is about the internal resistor that's spiral on BREXX1 and ceramic on BRE600 + BRE1000. Secondly BREXX1 is provided with clamps, while BRE600 + BRE1000 are equipped with suitable cables.

2. **MAIN CHARACTERISTICS**

Characteristics		BREXX1			BRE600+1000	
		BRE601	BRE1001	BRE1501	BRE600	BRE1000
Power rating	KW	0,6	1,0	1,5	0,55	0,10
IP level		IP 20			IP 20	
Thermostat option (a)		yes			yes	
Dielectric strength @ 50 Hz (B)	V	3.000 V_{rsm} x 1 min			3.000 V_{rsm} x 1 min	
Insulation resistance @ 2500 Vdc	MΩ	≥ 200			≥ 200	

Notes:

(a) S.I.R. coding system provides a **"T" additional letter for thermostat**. About BRE type only external option is applicable; in case of thermostat the related code is BRET.

(b) **customized values can be provided**.

3. **OTHER CHARACTERISTICS**

Characteristics			BREXX1			BRE600+1000	
			BRE601	BRE1001	BRE1501	BRE600	BRE1000
Resistor range (a)	min	Ω	3,9	4,7	10	3,9	4,7
	max		150	270	330	1.000	1.000
Tolerance for resistance values			± 5%			± 5%	
Overload			8P_r x 5 sec 5P_r x 10 sec			10P_r x 5 sec 5P_r x 10 sec	
Connecting clamps	resistor		no. 2			n.a.	
	earth		no. 1				
	thermostat		no. 2 (optional)			no. 2 (optional)	
Cable length range (b)		cm	n. a.			400÷850	

Notes:

(a) (b) **customized values can be provided**.

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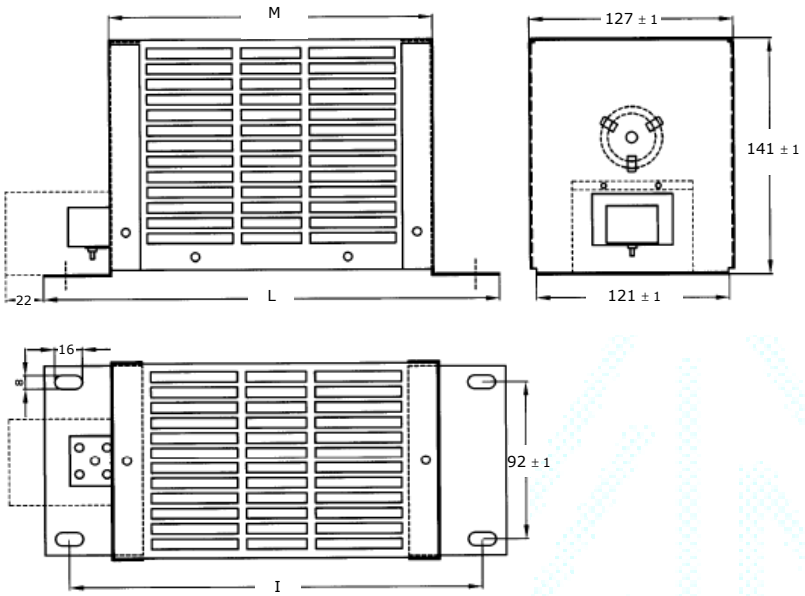
BRE

BRE 601 , BRE 1001 , BRE 1501

BRET 601 , BRET 1001 , BRET 1501

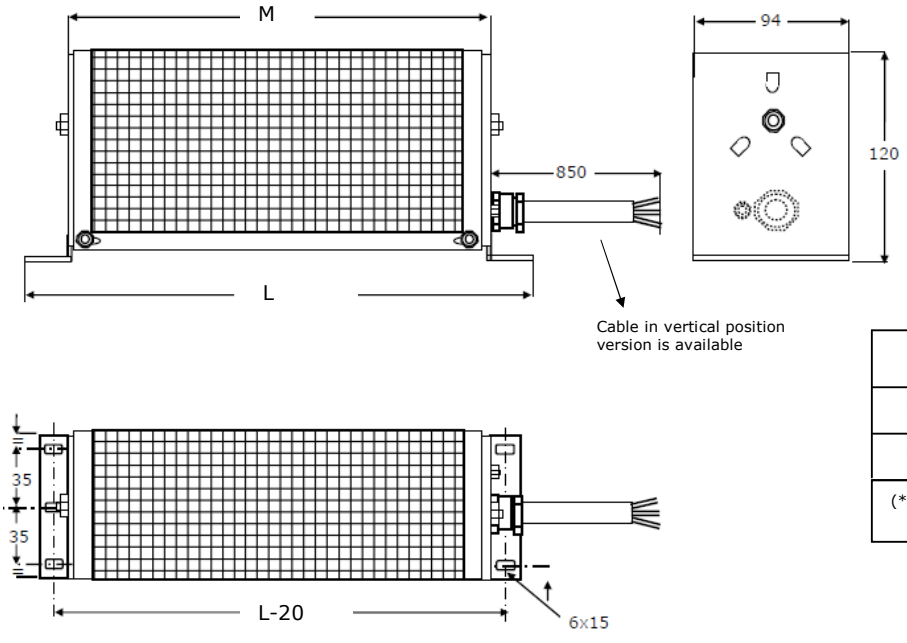


Style (*)	L ±1 [mm]	I ±1 [mm]	M [mm]
BRE 601	266	224	189
BRE 1001	345	303	268
BRE 1501	445	403	368

(*) shown dimensions are valid for BRET style too.

BRE 600 , BRE 1000

BRET 600 , BRET 1000



Style (*)	L ± 3 [mm]	M ± 3 [mm]
BRE 600	294	254
BRE 1000	444	404

(*) shown dimensions are valid for BRET style too.

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BRR

1. **FEATURES**

BRR resistors are braking resistors designed for power till 1,3 KW and that, like the BDR family can as independent unity. It's to notice the **low noise level** of such resistors.

Cases are made using punched plates, white zinc-galvanised finished.
Proper clamping connections have been provided.

2. **MAIN CHARACTERISTICS**

Characteristics		BRR500	BRR800	BRR1K0	BRR1K3
Power rating	KW	0,5	0,8	1,0	1,3
IP level		IP 20			
Insulation resistance @ 2500 V_{dc}	MΩ	≥ 200			
Dielectric strength @ 50 Hz [a]	V	3.000 V_{rsm} x 1 min			
Thermostat 160 °C option [b]		yes			

Notes:

(a) **customized values can be provided**

(b) S.I.R. coding system provides a **"T" additional letter for thermostat**. On BRR type only external option is applicable; in this case of thermostat the related code is BRRT.

3. **OTHER CHARACTERISTICS**

Characteristics			BRR500	BRR800	BRR1K0	BRR1K3
Resistance range [a]	min	Ω	2,2		2,2	
	max		5.000		10.000	
Tolerance fro resistance values			± 10%			
Overload		MΩ	$10P_r$ x 5 sec - $5P_r$ x 10 sec			
Connections	resistors		no. 2			
	earth		no. 1			
	thermostat		no. 2 (optional)			

Notes:

(a) **customized values can be provided**.

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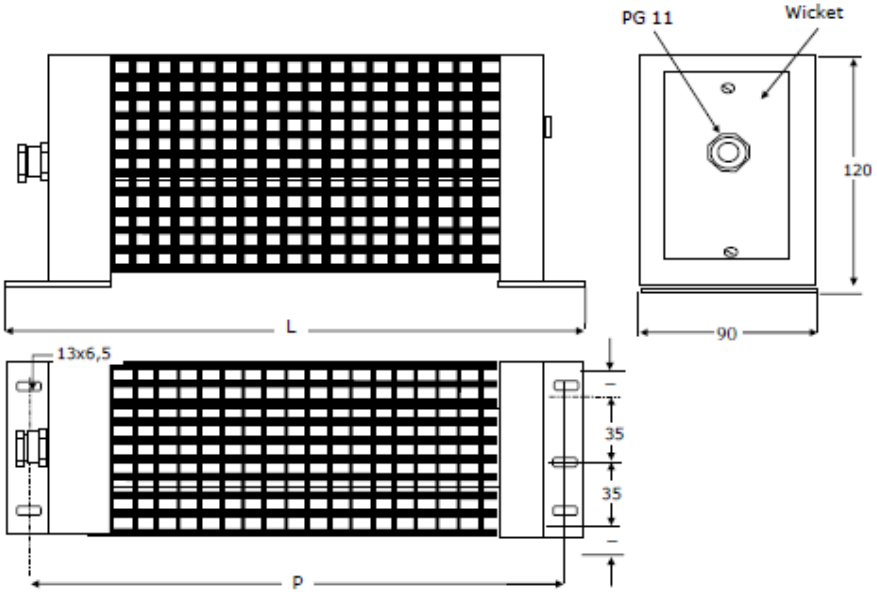
BRR

BRR500 , BRR800 , BRR1K0 , BRR1K3

BRRT500 , BRRT800 , BRRT1K0 , BRRT1K3



Style (*)	L ±3	P ±3
BRR 500	310	290
BRR 800	410	390
BRR 1K0	510	490
BRR 1K3	610	590
(*) shown dimensions are valid for BRRT style too.		

BDC

1. **FEATURES**

The BDC resistors have the same application as BDR ones, i.e. when in dynamic braking the needing for a protected resistors (or resistors group) to be employed like an independent unit arises .

Differently from BDR in order **to reduce the noise** caused by the brake current, BDC ones use cemented resistors.

BDC case is punched.

2. **MAIN CHARACTERISTICS**

Characteristics		BDC 2K0	BDC 4K0	BDC 8K0	BDC 12K0
Power rating (P_r)	W	2.200	4.000	7.000	10.000
IP level		20			
Thermostat 160 °C option [(a)]		yes			
Dielectric strength @ 50 Hz [(b)]	V	4.500 V_{rsm} x 1 min			
Insulation resistance @ 2.500 V_{dc}	MΩ	> 200			

Notes

(a) S.I.R. coding system provides a **"T" additional letter for thermostat**. On BDC type only external option is applicable; in this case of thermostat the related code is BDCT.

(b) **customized values can be provided.**

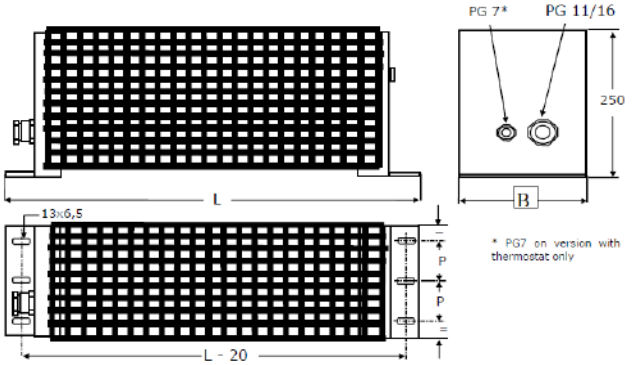
2. ELECTRICAL SPECIFICATION

			BDC 2K0	BDC 4K0	BDC 8K0	BDC 12K0
Power rating (P_r)		W	2.200	4.000	7.000	10.000
Resistance range	min	Ω	2			
	max		1.000			
Tolerance for resistance values		-	± 5%			
Overload		-	5P_r x 10 sec			
Connections	resistors	-	no. 2			
	earth	-	no. 1			
	thermostat	-	no. 2			

Notes

(a) **customized values can be provided**.

BDC 2K0, BDC 4K0, BDC 8K0, BDC 12K0
BDCT 2K0, BDCT 4K0, BDCT 8K0, BDCT 12K0



Style	L ± 3 [mm]	B [mm]	P [mm]	PG Style
BDC 2K0	498	100	40	11
BDC 4K0	625	100	40	11
BDC 8K0	625	160	60	11
BDC 12K0	625	200	80	16

(*) shown dimensions are valid for BDCT style too.

RHO

1. **FEATURES**

RHO resistors **(water cooled resistor)** have been designed in order to match **high power small volume** needs.

Peculiarity of these resistors is the cooling solution, that provides a cooling action directly on the resistor elements. Therefore, it's to underline that such cooling doesn't mean the using of water cooled heat sink, with significant advantages both on dimensional parameters and on cost.

2. **MAIN CHARACTERISTICS**

Characteristics		RHO6000	RHO25000
Power rating	KW	5,0	15,0
Dielectric strength @ 50 Hz (a)	V	6.000 V_{rsm} x 1 min	10.000 V_{rsm} x 1 min
Insulation resistance @ 1000 Vdc	MΩ	≥ 10.000	
Short term overload		$2P_r$ x 5 sec	

Notes:

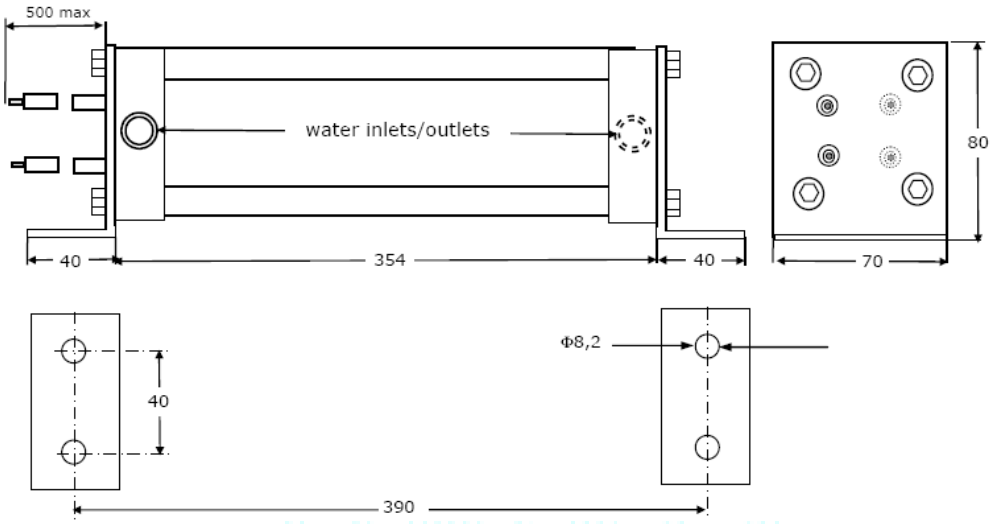
(a) **customized values can be provided**.

3. **OTHER CHARACTERISTICS**

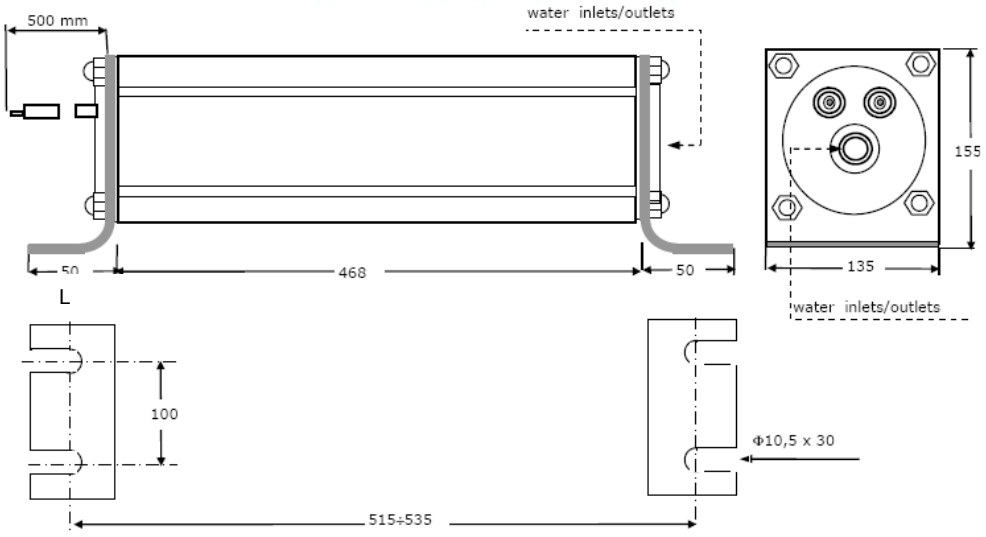
Characteristics			RHO6000	RHO25000
Max applicable power	continuous		6,0 KW	15,0 KW
	for 10 min max		8,0	25,0
Resistor range (a)	min	Ω	3,3	10,0
	max		300	2.000
Resistance tolerance			± 5%	
Parasitic capacity (from 1 to 100 kHz)		pF	300	---
Max working voltage		V	4.000	6.000
Cable length range (b)		cm		
Cooling fluid			water	deionized water
Cable length range (b)		mm	400÷1000	

RHO

RHO 6000



RHO 25000



500CC SERIES

Continuous power - 500W
Resistance - 3.9Ω to 120Ω

High performance braking resistors

A versatile range of low resistance 500W resistors, suitable for applications requiring a high power capability in a small space. The low audible noise of these resistors makes them particularly suitable for use in circuits operating within the audio frequency range within power electronic equipment.

Applications

- Dynamic braking
- Current limiting
- Crowbar
- Test loads

Features and benefits

- Rated for repetitive duty
- E12 values from 3R9 to 120R
- Complete with M5 connection hardware
- Low inductance element
- Optional mounting accessories
- Heatsink not required
- Rated for single shot duty
- Close tolerance (+/- 5%)
- Negligible audible noise
- Temperature stable element
- Optional connection accessories

Ordering information

Resistor part numbering

500CC	-	3R9	-	J	-	0
Series		**Resistance value**		**Tolerance**		**Variants**
500W coiled coil		3R9 = 3.9Ω, 4R7 = 4.7Ω, 5R6 = 5.6Ω, 6R8 = 6.8Ω, 8R2 = 8.2Ω, 10R = 10Ω, 12R = 12Ω, 15R = 15Ω, 18R = 18Ω, 22R = 22Ω, 27R = 27Ω, 33R = 33Ω, 39R = 39Ω, 47R = 47Ω, 56R = 56Ω, 68R = 68Ω, 82R = 82Ω, 100R = 100Ω, 120R = 120Ω Available values: E12 series		J = 5%		0 = standard product

Accessories

500CCR1	240mm long M8 threaded rod, complete with hardware, for mounting single coils
500CCR2	420mm long M8 threaded rod, complete with hardware, for mounting two coils
500CCR3	620mm long M8 threaded rod, complete with hardware, for mounting three coils
500CCB1	Pair of brackets for horizontal mounting of one, two or three coils on rod. Use in conjunction with either 500CCR1 or 500CCR2 or 500CCR3
500CCC1	Electrical connecting bar for coils mounted on a 75mm pitch
500CCC2	5m length of 1.5mm^2, 155˚C connecting cable
500CCC3	5m length of 2.5mm^2, 155˚C connecting cable

Electrical and thermal data

Resistance

5% tolerance E12 values from 3.9Ω to 120Ω are available
Resistance values are for DC and measured using negligible power.

Inductance

Inductance values for these coils are less than 20µH.
Contact Cressall for information about specific resistors.

Maximum operating voltage

1000V
DC or AC rms

Continuous power rating

500W with a 600ºC element temperature rise.
This power rating is based on a single horizontally mounted coil in free air.
Inadequate ventilation will reduce the power rating.
The availability of moving cool air will increase the power rating.
Contact Cressall for further information about specific resistors.

Short term power rating

The resistors have can handle much higher power in the form of single or repetitive pulses.
Contact Cressall for information about specific resistors.

Ambient temperature derating

0% at 25ºC
100% at 625ºC
Derate linearly.

Mechanical data

Connections

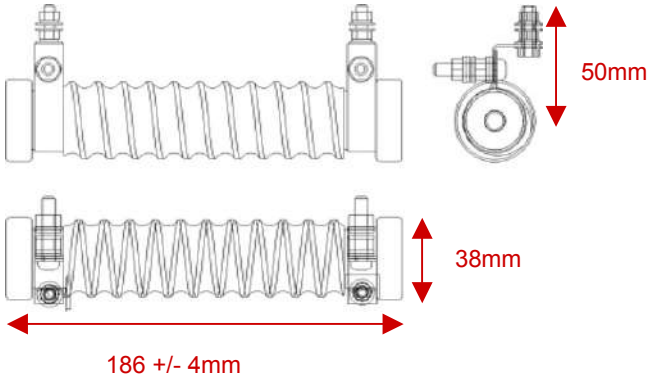
M5 bolted connections suitable for bus bars and crimps.
Crimps should be un-insulated, and cable should be rated for 155ºC.
Connecting bars are available.

Mounting

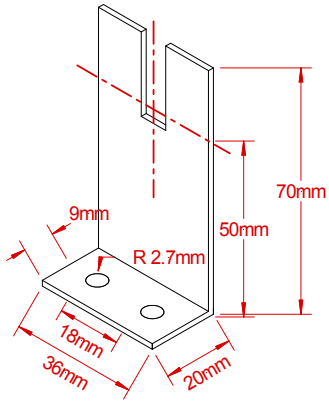
Maintain 50mm spacing between the resistor axis and nearby metallic non-flammable surfaces.
Maintain a 75mm axis spacing if mounting resistors next to each other.
Ensure adequate ventilation is provided.
Threaded rods are available, with hardware, for mounting one, two or three resistors.
Brackets are available for use with rods.

Dimensions

Resistor coils have a M8 clearance central hole.



Mounting brackets hold the resistor axis 50mm above the mounting surface.



Safety

Resistors get hot in normal operation. Use guards and warning labels where necessary. Avoid proximity to flammable materials. Do not cover. Provide adequate ventilation. Fault conditions in the circuit that feeds the resistor, or the resistor itself, may lead to excessively high temperatures. Restrict access to qualified personnel only.