



## PUNCHED GRID RESISTORS



BCH ELECTRIC LIMITED



## PUNCHED GRID RESISTORS

BCH un-breakable Punched Grid Resistors features an all welded current path for heavy duty applications. The units have been made robust, versatile and yet economical for use as starting or speed control resistors for complete range of AC and DC motors.

The resistor unit can meet the need of any industrial applications like :

- Neutral grounding
- AC / DC Cranes
- Steel Mills
- Slipring Motor starting



### Features

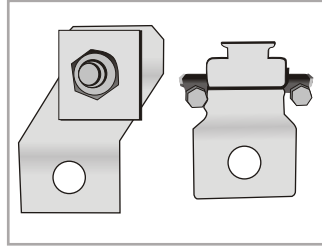
- Un-breakable Chromium Steel alloy grids in Superior FeCrAL grade AISI406. Corrosion and vibration resistant.
- The low temperature coefficient of (0.00022 ohms/ohm/°c) resistance results in negligible change in resistance from cold to hot.
- The alloy has a high specific resistance - about 120 micro ohms cm. This results in 50% saving of the material by weight for the same value of resistance.
- Grid junction are TIG welded - continuous current path unaffected by vibrations.
- High capacity (upto 225A per bank) without paralleling.
- Steel and mica spacers.
- Terminals designed for 2 conductors.
- Compact and light in weight for equivalent current capacity of other type of grids.
- Sufficient number of tappings to simplify the adjustment of resistance.
- Resistance range from 0.1 Ohms minimum to 16 Ohms maximum per bank.
- Multiple resistors in mounting frame for open execution.
- Resistors in enclosure with protection category IP 33 or IP 11 or higher.
- Exclusive draw-out type enclosure.



## Parts of Punch Grid Resistors

**Grid element:**

Individual grids are stamped out of aluminium chromium steel alloy. The grids are in 3 patterns, i.e 5, 9 or no slots with different thickness of materials.

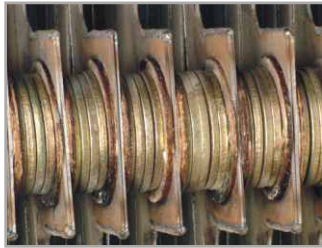


**Terminals:**

2 types of terminals are available depending on current rating.

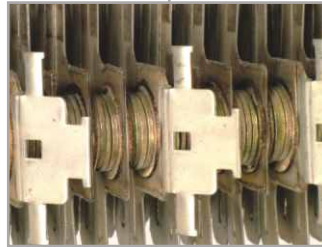
**Welded joints:**

All joints are T.I.G welded to provide a continuous current path ensuring low loss.



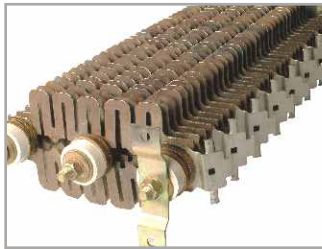
**Dual Terminal:**

The dual terminal taps for lower rating have 2 projections for connectors.



**Floating Rod design:**

Floating rod design in end plate is an exclusive feature which permits 'draw out' removal of grid assembly from frame. Allows for expansion and contraction of individual grids.

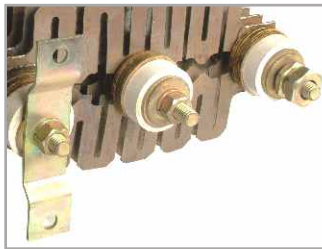


**Square Terminal:**

The square terminal taps for higher rating are flat and when provided with cast terminal clamps are suitable for a maximum of two 95 mm sq. solid wires.

**Three Rod Construction:**

Special 3 rod construction is used with the thin high resistance grids to provide extra mechanical stiffness.

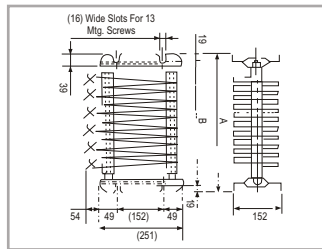


**End Frame:**

The formed end frame is designed to provide rigid support for grid assembly.

**Cooling:**

Unique positioning of the grids in the frame forms a staggered grid pattern for efficient cooling and heat transfer.



**Resistor Banks:**

Two standard bank sizes are available.

Bank Type	Dimensions (mm)		Weight (kg)
	A	B	
WL	673	635	22.7

**Notes:**

- Inter column connections are not in scope of BCH supply in given dimension.
- Bottom most bank assembly can be kept empty and terminals can be put in next unit to get higher distance from gland plate to terminals.
- We can also supply back to back assembly.



## Resistor Bank Assembly (draw-out)

Multiple resistance bank mounting frame is a sheet steel frame, sturdy in construction with welded top and bottom plates having corrosion resistant finish. They are available in different sizes to accommodate from 3 to 6 resistor banks and can be used with the WL bank. These mounting frames can be installed back to back and side by side and have provision for bolting to floor. Resistor bank can be stacked within the mounting frame and can be drawn out from the front quite easily, without disturbing the end plates.

## Enclosure

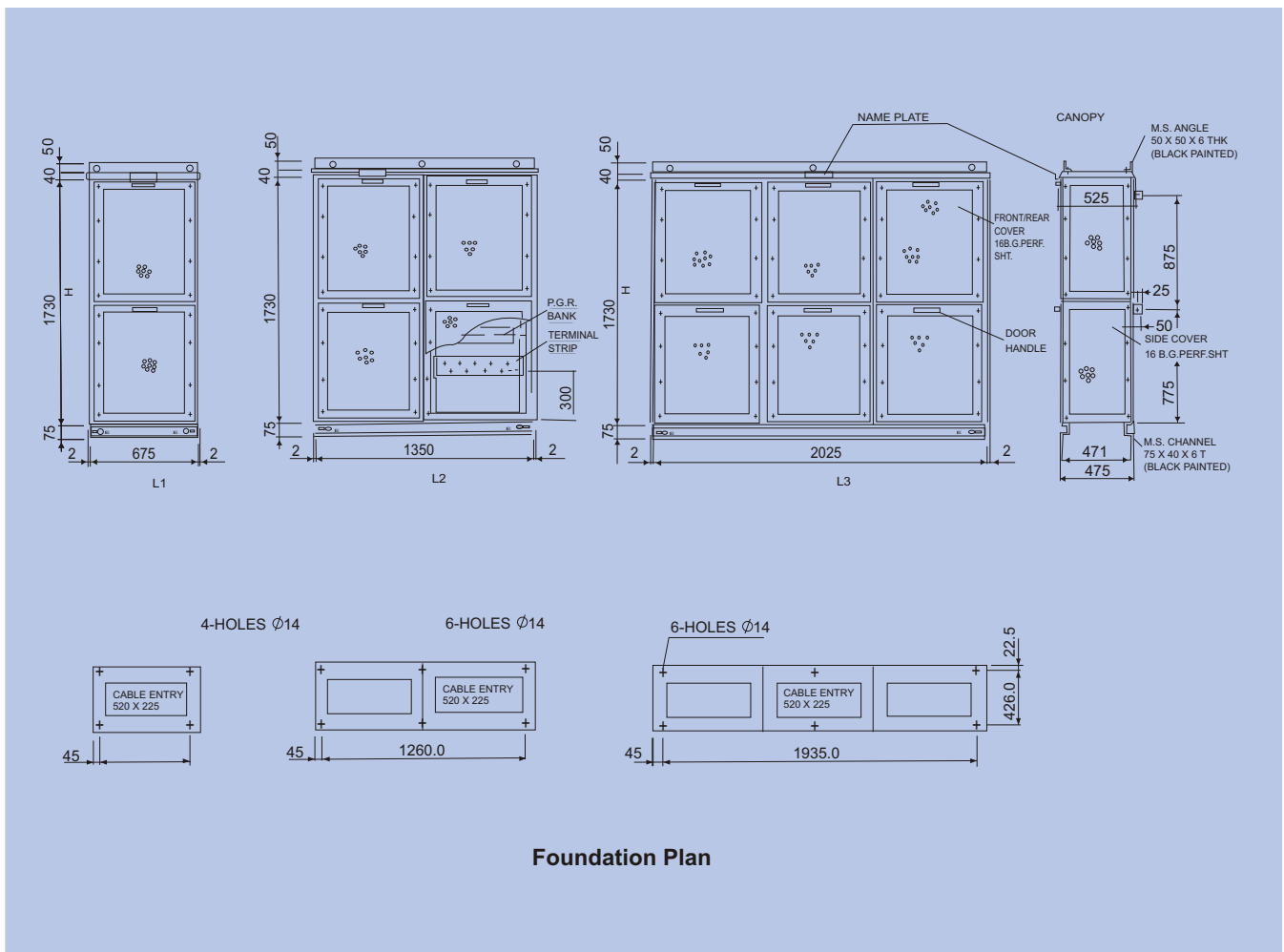
Sheet steel enclosures of IP-11 and IP-33 as per IS-2147 are available for stacked assemblies with adequate ventilation. IP-11 type enclosures are also available for back to back arrangement.

## Dimensions

Dimensions of the enclosures are as given below. Figure 1 gives the overall dimensional drawing for Punched grid resistor panel WL with integral terminal arrangement enclosure type IP 33 for single column & double column.

## Current ratings

Table I give continuous current rating, type of terminals, resistance per bank & resistance per tap, and total number of taps, based on NEMA requirements Table II & III gives the intermittent duty rating of WL type grids.



Foundation Plan

Fig 1 : Overall dimensions with IP 11 (WL Type)



**TABLE - I**

**Current Rating - WL Type Banks**

Cat. Code	Type of Terminal	Continuous		Resistance		No. of Taps
		Current Rating	Per Bank	Per Top		
WL 10	S	225	0.1	0.020		5
WL 12	S	200	0.125	0.025		5
WL 20	S	150	0.200	0.020		10
WL 25	S	134	0.250	0.025		10
WL 32	S	118	0.320	0.032		10
WL 40	S	113	0.400	**		7
WL 50	S	100	0.500	**		7
WL 62	S	84	0.625	0.062		10
WL 80	S	75	0.800	0.800		10
WL 100	S	67	1.000	0.100		10
WL 125	S	64	1.250	**		7
WL 160	S	57	1.600	**		7
WL 200	S	54	2.000	0.250		8
WL 250	S	48	2.500	0.320		8
WL 320	D	43	3.200	0.400		8
WL 400	D	40	4.000	0.400		10
WL 625	D	33	6.250	0.625		10
WL 800	D	29	8.000	0.800		10
WL 1200	D	21	12.0	1.20		10
WL 1600	D	19	16.0	1.60		10

S - Square Terminal      \*\* Non uniform tap values. Please contact our nearest sales office for details.  
D - Oval Terminal

**TABLE - II**

Cat. Code	Resistance Per Bank Ohms	Continuous Rating Amps	Temporary Rating (Amps)			
			30 Sec.	20 Sec.	10 Sec.	5 Sec.
WL 10	0.1	225	0.1	1250	1800	2500
WL 12	0.125	200	900	1175	1500	2200
WL 20	0.2	150	520	640	850	1200
WL 25	0.25	134	430	530	750	1000
WL 32	0.32	118	360	430	610	850
WL 40	0.4	113	350	425	600	840
WL 50	0.50	100	300	400	510	750
WL 62	0.62	84	280	315	440	700
WL 80	0.8	75	225	265	380	540
WL 100	1	67	180	215	310	420
WL 125	1.25	64	195	225	300	410
WL 160	1.6	57	160	195	280	380
WL 200	2	54	155	190	275	350
WL 250	2.5	48	120	1650	200	285
WL 320	3.2	43	95	122	165	235
WL 400	4	40	90	115	160	120
WL 500	5	35	85	98	150	205
WL 625	6.25	33	80	90	140	200
WL 800	8	29	75	85	120	190
WL 1200	12	21	41	49	65	94
WL 1600	16	19	33	40	58	80

**Note :** WM Type resistor banks also available. For details contact our nearest sales office.

**TABLE - III**

Cat. Code	Resistance Per Bank Ohms	Continuous Rating Amps	Intermittent Ratings (Amps)						
			60%.	40%.	25%.	15%	10%	5%	1%
WL 10	0.1	225	240	260	305	395	440	580	1380
WL 12	0.125	200	208	230	260	340	380	505	1160
WL 20	0.2	150	160	175	195	250	290	395	850
WL 25	0.25	134	140	150	170	210	250	340	720
WL 32	0.32	118	128	135	154	183	222	295	650
WL 40	0.4	113	120	123	140	170	200	275	600
WL 50	0.5	100	105	108	120	140	170	235	460
WL 62	0.62	84	90	96	110	130	160	220	400
WL 80	0.8	75	80	84	95	118	140	185	350
WL 100	1	67	70	73	80	96	112	155	320
WL 125	1.25	64	66	70	75	83	102	140	285
WL 160	1.6	57	59	62	68	80	96	126	265
WL 200	2	54	56	59	64	70	90	110	240
WL 250	2.5	48	49	51	55	63	75	98	210
WL 320	3.2	43	44	46	50	57	68	48	178
WL 400	4	40	41	42	45	51	60	75	160
WL 500	5	35	36	37	39	42	50	66	135
WL 625	6.25	33	34	35	37	40	46	59	120
WL 800	8	29	30	31	32	40	46	59	120
WL 1200	12	21	22	26	28	32	38	55	86
WL 1600	16	19	20	21	22	23	26	38	58

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