

## KAKKU HEAVY DUTY RECTANGULAR LIFTING ELECTRO-MAGNETS SERIES KRM-H & KRM-C

### APPLICATION

**KAKKU** Heavy Duty Lifting Electro-magnet series KRM-H are specially designed to handle hot loads at temperature upto 600°C where as magnet series KRM-C are designed to lift loads in cold condition.

These rectangular electro-magnets are designed to handle long loads such as rails, beams, billets, blooms & pipes etc. Usually two or three electro-magnets suspended from one traverse beam are employed to lift such long loads.

### DESIGN AND CONSTRUCTIONAL FEATURES

- The lifting electro-magnets series KRM are provided with high permeability cast steel shell. The frame of the electro-magnet accommodates the coil, protected at the bottom with a non-magnetic plate to withstand the blows against loads being lifted. The pole pieces which are exposed to lifting

pressures, are manufactured from special wear resistant steel. The coil is assembled within the electro-magnets, such that it can resist shocks and vibrations. The gaps between shell and the coil are filled with a special heat-resistant Silicon Rubber compound to enhance the mechanical and electrical strength of the coil. The coils are manufactured from high conductivity annealed copper tape. Turn to turn insulation is suitable to withstand high temperatures.

- The non-magnetic plates are provided with sufficient insulation to protect the coils from the heat of the hot objects being lifted by the magnets. The terminal box is specially designed to protect the terminals from external damages. Each Lifting Magnet is provided with a device for voltage surge protection.
- When the electro-magnet works at higher than 50% duty factor, the voltage across the electro-magnet coil

should be decreased to the following value:

$$U = \frac{1555}{\sqrt{DF_a}} \quad (V)$$

Where  $DF_a$  = actual value of relative duty factor(DF)

### TECHNICAL DATA

|                                      |  |
|--------------------------------------|--|
| Rated Voltage                        | : 110 / 220V DC                              |
| Duty Factor                          | : 65% or more                                |
| Windings                             | : Copper                                     |
| Class of Insulation                  | : class – H / C                              |
| Other operating conditions           | : Height above sea level not over 2000 Mtrs. |
| Lifting Capacity & Power Consumption | : See table – A                              |
| Insulation Voltage                   | : 660V                                       |

### OPTIONAL EXTRAS

- Suitable series resistance for duty factor of more than 65%.

### ORDERING INFORMATION

- Specify type No.
- Shape Circular/ Rectangular
- Temperature of handling material (in °C)
- Specify optional extras if any.

### PRINCIPLE OF OPERATION

When the electro-magnet coil is energised, it is capable of lifting loads as indicated in Table A. The control panels supplied along-with the lifting magnets provides the reverse currents for demagnetisation.

**TABLE – A (Selection chart for rectangular magnets lifting Cold objects ) KRM-C**

| Magnet type<br>KRM-C | KW<br>(110V<br>DC) | Size<br>(L X W)<br>(in mm) | No. of Billets/ Blooms, standard length 6 meter, to be lifted with 2 rectangular magnets. |         |         |         |         | Weight of each Magnet (Kgs) | Weight of 2 Magnets with spreader beam |
|----------------------|--------------------|----------------------------|---|---------|---------|---------|---------|-----------------------------|--|
|                      |                    |                            | 100x100   | 130x130 | 160x160 | 200x200 | 250x250 |                             |  |
| 12032                | 1.68               | 900x485                    | 6   | 5       | 4       | -       | -       | 850                         | 2000                                   |
| 12042                | 1.98               | 1050x485                   | 8   | 6       | 5       | -       | -       | 950                         | 2300                                   |
| 12052                | 2.2                | 1260x485                   | 10  | 8       | 6       | -       | -       | 1100                        | 2600                                   |
| 13032                | 1.79               | 900x500                    | 6   | 5       | 4       | 3       | -       | 900                         | 2100                                   |
| 13042                | 2.14               | 1050x500                   | 8   | 6       | 5       | 4       | -       | 1000                        | 2400                                   |
| 13052                | 2.53               | 1260x500                   | 10  | 8       | 6       | 5       | -       | 1150                        | 2700                                   |
| 14042                | 2.2                | 1060x530                   | 8   | 6       | 5       | 4       | 3       | 1050                        | 2500                                   |
| 14052                | 2.64               | 1300x530                   | 10  | 8       | 6       | 5       | 4       | 1200                        | 2800                                   |

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Specific information about lifting capacities of electro-magnets series KHM as obtained from particular test or specific instance in service use is as follows

**TABLE – B (Selection chart for rectangular magnets lifting Hot objects having temperature upto 600 deg. C) KRM-H**

| Magnet type<br>KRM-H | KW<br>(110<br>V<br>DC) | Size<br>(L X W)<br>(in mm) | No. of Billets / Blooms, standard length 6 meter, to be lifted with 2 rectangular magnets. |         |         |         |         | Weight of each Magnet (Kgs) | Weight of 2 Magnets with spreader beam |
|----------------------|------------------------|----------------------------|--|---------|---------|---------|---------|-----------------------------|--|
|                      |                        |                            | 100x100  | 130x130 | 160x160 | 200x200 | 250x250 |                             |  |
| 12022                | 1.65                   | 800 x 485                  | 5  | 4       | 3       | -       | -       | 950                         | 2300                                   |
| 12032                | 1.91                   | 910x485                    | 6  | 5       | 4       | -       | -       | 1050                        | 2500                                   |
| 12042                | 2.3                    | 1050x500                   | 8  | 6       | 5       | -       | -       | 1200                        | 2800                                   |
| 12052                | 2.74                   | 1360x485                   | 10   | 8       | 6       | -       | -       | 1400                        | 3200                                   |
| 13032                | 2.09                   | 910x520                    | 6  | 5       | 4       | 3       | -       | 1060                        | 2500                                   |
| 13042                | 2.47                   | 1070x520                   | 8  | 6       | 5       | 4       | -       | 1190                        | 2750                                   |
| 13052                | 3                      | 1280x520                   | 10   | 8       | 6       | 5       | -       | 1360                        | 3120                                   |
| 14042                | 2.89                   | 1080x550                   | 8  | 6       | 5       | 4       | 3       | 1200                        | 2800                                   |
| 14052                | 3.43                   | 1300x550                   | 10   | 8       | 6       | 5       | 4       | 1400                        | 3200                                   |

*Product improvement is a continuous process at KAKKU. Hence data given in this catalogue is subject to revision without notice.*

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