

# Circular Lifting Magnets Type : LRX

## LRX & LRX - SUPER

"ELEKTROMAG" lifting magnets for heavy duty application are designed on the basis of research in this specialized field. The most favourable dimensioning of all components was determined by thorough mathematical and measuring studies of all factors affecting on performance. Experiments on models and fullscale prototypes were carried out to determine such features as usable and stray magnetic flux; influence of field line length and iron cross section; temperature drop from hottest point to magnet surface; thermal properties of the entire magnet; suitability of materials and production methods.

All **ELEKTROMAG** lifting magnets are of weatherproof design for outdoor use. Completely sealed submersible models are available for dipping into water-field containers or underwater salvage and similar work.

## MAGNET BODY



Mechanical construction of **ELEKTROMAG** high capacity lifting magnets is very sturdy to meet toughest demands in service. The one piece magnet body is cast from high-grade dynamo steel. Underneath, between centre and outer poles, the magnet body is closed by sturdy, cast and rib-reinforced non-magnetic austenitic manganese steel plate. Fastening at the centre pole is effected by means of a shrunk-on ring, and at the outer pole by locking ring.

The standard three-fall chain suspension, designed with common suspension ring is rated to meet all normal duty load. Special change are available on request for extremely heavy loads.

Two lugs for guide ropes are fitted as standard.

## COILS

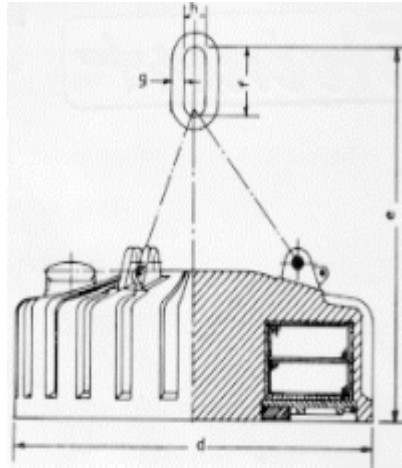
Standard exciter coils are wound with Anodised aluminium conductor or fiber glass covered varnish bonded aluminium conductor. Coils wound with anodised aluminium conductor offer the following advantages:

1. greater filling factor
2. Better heat conductivity.
3. Higher resistance to thermal strain.

Coils are cast into their magnet body with a special resin compound of excellent heat conductivity and thus rigidly fixed in position. In special cases, coil can be furnished with copper conductor. Use of special resins loaded with fillers as sealing compound ensures reliable conduction of heat to the magnet surface, maintaining high magnet performance over long, continuous service. All insulation materials confirm to class "H" .

**DUTY CYCLE**

The permissible relative duty factor is 75% / 10 mins. or 60% /10 mins. depending on magnet construction and application. The standard operating voltage is 220 volts DC. Magnets for extra heavy duty or handling of hot materials are available on request.



**ELECTRICAL ACCESSORIES**

The following electrical accessories are required with the lifting magnet and are available from **ELEKTROMAG**.

1. Transformer rectifier set or DC generator.
2. Contactor Panel.
3. Cable reeling drum.
4. Master controller.

**TABLES FOR CIRCULAR LIFTING MAGNETS TYPE : LRX & LRX-SUPER**

TYPE	POWER INPUT APPROX. P. COLD CLASS "H"	WT. APPROX. KG.	DIMENSION					MAX. LOAD CAPACITY OF CHAIN
	KW		D	E	F	G	H	KG.
	1	2	3	4	5	6	7	8
LRX 11	8	1520	1144	1029	260	36	140	17000
LRX 13	10.5	2320	1346	1084	260	36	140	17000
LRX 14	12.5	2850	1446	1278	340	45	180	21000
LRX 15	14	3380	1539	1355	350	51	190	26000
LRX 16	14.5	3550	1600	1355	350	51	190	26000
LRX 17	18	5320	1737	1461	350	51	190	26000
LRX 18	20	6130	1830	1492	350	51	190	26000
LRX 20	23.5	8150	2049	1599	350	51	190	26000
LRX 22	27.5	10600	2245	1650	350	51	190	26000
LRX 15 SUPER	21	5000	1550	1518	350	51	190	26000
LRX 16 SUPER	23	6100	1680	1550	350	51	190	26000
LRX 18 SUPER	26	8900	1850	1680	350	51	190	26000
LRX 20 SUPER	28	12000	2059	1850	350	51	190	26000
LRX 22 SUPER	33	17000	2266	2121	400	57	200	40000

TYPE	TEAR-OFF FORCE			LIFTING CAPACITIES AT SERVICE TEMP.				
	MAGNET d	MAGNET d	MAGNET d	SLAB ingot	PIG	COST IRON scrap grade 3a	Solid scrap grade 24	SHORT STEEL TURNINGS grade 40
	300 COLD daN	300 WARM daN	20 WARM daN	Kg.	Kg.	Kg.	Kg.	Kg.
	9	10	11	12	13	14	15	16
LRX 11	-	29300	-	14700	800	700	650	300
LRX 13	-	44000	-	22000	1250	1100	1000	500
LRX 14	-	52500	-	26300	1500	1300	1200	600
LRX 15	-	61000	-	30500	1750	1500	1400	700
LRX 16	-	62000	-	31000	1800	1550	1450	725
LRX 17	-	79000	-	39500	2350	2050	1900	950
LRX 18	-	89000	-	44500	2650	2350	2200	1100
LRX 20	-	112000	-	56000	3300	3000	2800	1350
LRX 22	-	137000	-	68500	4000	3700	3500	1700
LRX 15 SUPER	88000	80000	12000	40000	2250	2250	2000	1100
LRX 16 SUPER	100000	93000	13500	46500	2760	2700	2500	1250
LRX 18 SUPER	124000	116000	17000	58000	3600	3400	3100	1600
LRX 20 SUPER	154000	145000	21000	72500	4300	4200	3900	2000
LRX 22 SUPER	186000	178000	25000	89000	5200	4900	4700	2300

### IMPORTANT NOTES ON TABLE

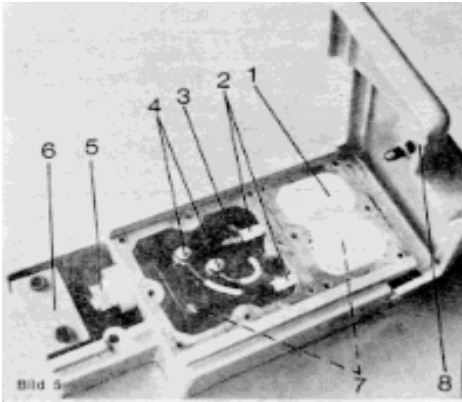
Rated power input for cold magnets listed in column 2 governs selection of suitable electrical equipments. In continuous service heating of the exciter winding reduces input power.

The figure in column 8 give the max. capacity of the chain suspension.  
1 daN = 0.918 Kg.

Tear-off forces listed in columns 9, 10, and 11 relate to a level, solid, thick slab and an air gap corresponding to 1/300 and 1/20 resp. of outer magnet diameter.

Lifting capacities listed in column 12 to 16 are average values which may be exceeded or not be reached. In actual duty, since the volume seized in each lifting operation depends largely on type, shape, alloy, distribution and piling of the material.

### **CABLE TERMINAL BOX**



The cable terminal box is of robust construction to meet toughest practical service and it consists of the following parts :

- 1.Cast compartment (back) for exciter coil connection.
- 2.Line connections from back to front compartment.
- 3.Front compartment for connecting the cable.
- 4.Terminal board for connecting the cable.
- 5.Gland bolt for sealing the cable.
- 6.Cable collar to limit load on cable.
- 7.Back and front compartment covers are fitted with watertight gaskets, secured with socket head screws.
- 8.Solid and fracture-proof protective cover made of cast steel incl. set screw.

This cable terminal box is constructed for durability. However, it is only fully efficient and secure when the cable is held by the gland bolt, also when the two compartments are closed tightly by means of the covers, and when the protective cover is secured by the

### **ELECTRICAL SWITCHGEAR**

Switchgear used for the control of lifting magnets must be provided with adequate protective gear to limit the voltage generated when the inductive exciter circuit is switched off. Provisions must also be made for a brief counter flow current surge to de-energise the system and throw off the load.

We supply a wide range of plant and switch gear to feed magnets from 3-phase or DC power mains or generators, in standard and special purpose models to suit all requirements.

To ensure continuity of operation and guard against the danger of accidents in case of power failure, we also supply complete equipments for stand-by or buffer battery operation.

Where the crane driver cannot keep the magnet under visual observation ( e.g. special magnets used for raising material under water) electronic instrumentation can be fitted giving optical or acoustic signals to indicate that the load has been seized or released.

**Note :** The design, dimensions and specifications are subject to alterations without prior notice due to constant development for better performance.