Safe Operation and Maintenance Manual
Sicheres Betriebstechnikhandbuch
Manuel d'exploitation sûre et d'entretien
Manual de operación segura y del mantenimiento
Manuale di manutenzione e di funzionamento sicuro
安全操作和维修手册

Ultralift™ PLUS

Lifting Magnet
Anhebender Magnet
Aimant De Levage
Imán De Elevación
Magnete Di sollevamento
取消磁铁

ECLIPSE MAGNETICS

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1 General Information

Thank you for purchasing a Lifting Magnet from the Eclipse Magnetics Ultralift Plus range.

All Ultralift Plus lifters are tested and rated to provide a 3:1 safety factor if used as instructed within this manual (See Section 4)

This lifter conforms to the requirements of the Machinery Directive 98/37/EC, LOLER regulations (1998) and ASME B30.20.

The equipment, if used within the EC must be, stored, maintained and inspected in accordance with the requirements of PUWER (1998)

For areas outside the EC, the equipment must be used, stored, maintained and inspected in compliance with the applicable work standards, and other standards for suspended load handling.

BEFORE USE PLEASE CAREFULLY READ THIS MANUAL.

If in doubt call Eclipse Magnetics Customer Care **+44 (0)114 225 0600**.

The Safe Operation and Maintenance Manual is an integral part of this equipment and should be stored in a safe place in order not to damage or deface it.

It should be retained throughout the lifetime of the lifter.

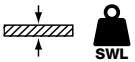
Should the lifter be re-sold, please ensure that the manual is supplied with the lifter.

The lifter should be periodically re-tested in accordance with local legislation and the inspection record updated accordingly (See Section 7).

2 Operation and Safety Instructions

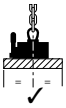
2.1 Symbols and terms used

SYMBOLS



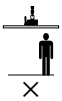
The Safe Working Load (Flat Plate)

The Safe Working Load (Round Bar)

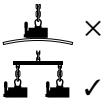


Correct orientation of Load

Do not lift people



Do not lift load over people



Do not lift loads exceeding the recommended length

Air Gap Warning (See Load Characteristics in Section 4)

TERMS

Poles	The two parallel mild steel surfaces on the base of the lifter.
Air-gap	Any non-ferrous material that prevents the poles contacting the load. Paint, rust, scale or even an uneven surface can constitute an air-gap.

2.2 Important Safety Information

ALWAYS

- Instruct new operators to read the handbook before using the Ultralift Plus Lifting Magnet.
- Follow the instructions
- Use the entire pole area
- Fully engage the lifter in the "ON" position before lifting the load
- Wear suitable protective work-wear when using this equipment
- Maintain the pole feet in a good condition
- Use the 'Safety Shim' to verify a safe lift (see Section 3.2)
- Remove the 'Safety Shim' after pre-test (see Section 3.2)
- Check the suitability of equipment used in conjunction with the lifter

⚠ NEVER

- Lift or transport people
- Lift loads while people are within the manoeuvring space
- Allow untrained personnel to operate the lifter
- Leave a load unattended
- Use the lifter outside the recommended operations
- Attempt to switch the lifter before setting down the load
- Position yourself beneath the lifted load
- Allow the load to sway
- Bring the load to a sharp and immediate stop
- Lift a load outside the capacity (SWL) of the lifter
- Lift a load with dimensions outside those recommended within this manual
- Alter the attitude of the load from horizontal to vertical
- Lift an unbalanced load
- Operate the lifter in temperatures higher than 80°C (176°F) and lower than -10°C (14°F)
- Operate the lifter in humidity higher than 80%
- Operate the lifter in explosive (EX) or static sensitive environment
- Submerse the lifter in water

2.3 Safety Features

THE ECLIPSE MAGNETICS ULTRALIFT PLUS LIFTING MAGNET HAS TWO PATENTED SAFETY FEATURES.

1 Safety Shim

The 'Safety Shim' allows the user to undertake a safety pre-test prior to the actual lift. This technique is fast, effective and will guarantee a safe lift providing the following rules are applied:

A The component must be equal to or thicker than the minimum material thickness stated both on the lifter and within this manual (Section 4). Should the lift meet this criteria then the pre-test will guarantee a safety factor of 3:1.

B If the material is less than the stated minimum thickness then a more suitable lifter should be used. (See the Eclipse Range of Thin Plate Lifters).

A 'Safety Shim' should only be used with the designated lifter from the Ultralift Plus range. It **MUST NOT** be used with any other sizes or any other makes of lifting magnet.

Safety Shims cannot be used on components with a curved contact face.

2 Safety Interlock

In order to prevent the inadvertent 'switching off' of the lifter Eclipse Magnetics have designed the Interlock System. Once under the load (See Specification Table in Section 4) the interlock mechanism will prevent the operating handle being moved to the 'Off' position. Testing of the mechanism should be carried out in accordance with the instructions contained in Section 5 (Periodic Testing).

2.4 Considerations for Use

The SWL data is generated by testing the magnetic lifters on a flat ground mild steel plate that has a thickness, equal to or greater than that specified on the Lifter Data Plate. This information is also shown in Section 4 of this manual.
The optimum performance of a magnetic lifter is achieved when the pole faces are in good condition and make intimate contact with a load of the recommended thickness. Consideration should always be made to the 'Size of the Load'. (Section 4 Technical Data).
Whilst the load weight may be within the SWL of the lifter as the unsupported area of the load increases natural flexing will occur due to its own weight. This could have an adverse effect on the safety of the lift. If in doubt always use a spreader beam and multiple lifters.

THERE ARE FOUR FACTORS THAT WILL REDUCE THE MAGNETIC CLAMPING FORCE:

1 Air Gaps
The high magnetic forces generated by the Ultralift Plus Lifting Magnet allow the lifter to clamp components through air gaps. However this will ALWAYS have an adverse effect on the lifter performance. Air gaps are generated in a number of ways. For example paint, dust, scale or even a poor surface finish constitutes an air gap. The effect of air gaps are shown within Section 4 of this manual. These graphs demonstrate the reduction in clamping force generated by the lifter as the air gap increases.

2 Load Thickness
Should the Ultralift Plus Lifting Magnet be used to lift plates thinner than recommended for the lifter there **will be**, dependent on the material thickness, a significant drop in clamping force. A selection of performance curves on 'thinner than recommended' material is in Section 4 (Technical Information) of this manual.

3 Material Types
Certain materials exhibit different characteristics in their ability to carry magnetism. For any material other than mild steel a **reduction factor** must be applied to calculate the clamping force.
Typically these are as follows:

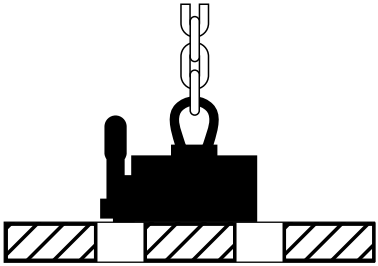
Ferrous Alloy Steels	**0.8**
High Carbon Steel	**0.7**
Cast Iron	**0.55**

For example Mild Steel SWL 250kg = Cast Iron 250kg × 0.55 = SWL 137kg

4 Contact Area

Maximum hold will only be achieved when the lifter has full contact area with the component to be lifted.

If the full face of the poles does not come into contact with the component to be lifted, for instance due to holes in the component, the performance will be reduced pro-rata.



3 Getting Started

It is important to familiarise yourself with all the features of the Eclipse Magnetics Ultralift Plus prior to use in a production environment.

The Ultralift Plus lifting magnet is delivered ready for use. Remove the lifter from the packaging and position on a mild steel plate (The Load). Care should be taken to ensure the load does not exceed the stated capacity of the lifter.

3.1 Understanding Your Lifter

The lifter is in the OFF position

To Switch the lifter ON
Depress the plunger on the handle and rotate 120˚ anti-clockwise beyond the safety pin. Release the plunger to complete the switching process. Ensure the lever is securely locked in place before commencing with the lift.

The Safety mechanism
Using a crane or hoist raise the load approximately 25mm/1" from the floor. Depress the plunger and attempt to switch off. The safety mechanism will prevent this movement. This demonstrates how inadvertent switching of the lifter is prevented when under load.

To Switch the lifter OFF
Return the load to the floor or support. Depress the plunger on the handle and rotate 120˚ clockwise to its stop position. Release the plunger to complete the switching process.

The lifter is in the OFF position

3.2 The 'Safety Shim Pre-Test'

1 Place the 'Safety Shim' onto the load.

2 Lower the Ultralift Plus Lifting Magnet onto the 'Safety Shim'.

3 Switch the Ultralift Plus Lifting magnet **ON** and lift the component a maximum of 25mm/1".

If this is achieved the test is successful.

If the lifter cannot lift the component then, subject to material thickness, use either a higher capacity lifter or multiple lifters and a spreader beam.

WARNING ⚠

DO NOT lift a load more than 25mm (1.00") with the 'Safety Shim' in place. ALWAYS remove the 'Safety Shim' after completing the pre-test.

3.3 Standard Operation

The lifter is in the OFF position

To Switch the lifter ON
Depress the plunger on the handle and rotate 120˚ anti-clockwise beyond the safety pin. Release the plunger to complete the switching process. Ensure the lever is securely locked in place before commencing with the lift.

To Switch the lifter OFF
Depress the plunger on the handle and rotate 120˚ clockwise to its stop position.
Release the plunger to complete the switching process.

WARNING ⚠

Even though the Ultralift Plus Lifting Magnet incorporates the Safety Mechanism as a protection to prevent the accidental release of a load, never attempt to switch the lifter **OFF** when a load is suspended. Only switch the Ultralift Plus lifter **ON** when it is in FULL contact with the load.

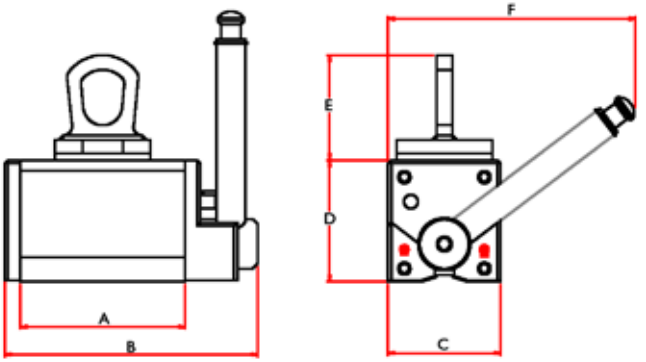
4 Technical Data

4.1 Model Types

			Dimensions (mm)						Flat Section			Round Section		
Model No	Self Weight (kg)	Safety Mechanism Activation Load (kg) (Additional to Lifter Weight)	A	B	C	D	E	F	SWL (kg)	Thickness Min (mm)	Length Max (mm)	SWL (kg)	Diameter Max (mm)	Length* Max (mm)
UL0125+	4	4	101	155	69	74	64	152	125	20	1500	50	200	1500
UL0250+	11	11	155	214	92	96	94	218	250	25	1500	100	300	1500
UL0500+	27	Self Weight	224	300	122	128	123	266	500	30	2000	200	400	2000
UL1000+	63	Self Weight	260	359	176	174	140	391	1000	45	3000	400	450	3000
UL2000+	157	Self Weight	368	477	233	227	195	493	2000	55	3000	800	600	3000

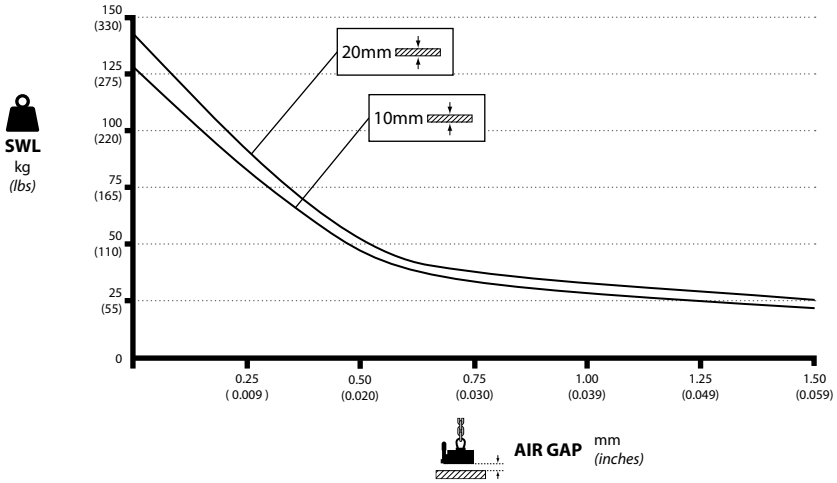
			Dimensions (inches)						Flat Section			Round Section		
Model No	Self Weight (lbs)	Safety Mechanism Activation Load (lbs) (Additional to Lifter Weight)	A	B	C	D	E	F	SWL (lbs)	Thickness Min (inches)	Length Max (inches)	SWL (lbs)	Diameter Max (inches)	Length* Max (inches)
UL0275+	8.8	8.8	4.0	6.1	2.7	2.9	2.5	6.0	275	0.8	60	110	8	60
UL0550+	24.2	24.2	6.1	8.4	3.6	3.8	3.7	8.6	550	1.0	60	220	12	60
UL1100+	59.4	Self Weight	8.8	11.8	4.8	5.0	4.8	10.5	1100	1.2	80	440	16	80
UL2200+	138.6	Self Weight	10.2	14.1	6.9	6.9	5.5	15.4	2200	1.8	120	880	18	120
UL4400+	345.4	Self Weight	14.5	18.8	9.2	8.9	7.7	19.4	4400	2.2	120	1760	24	120

⚠ ***The maximum stated length on Diameter is not at the maximum Diameter (Always work within stated SWL)**



4.2 Pull Gap Curves

UL0125+ (UL0275+)

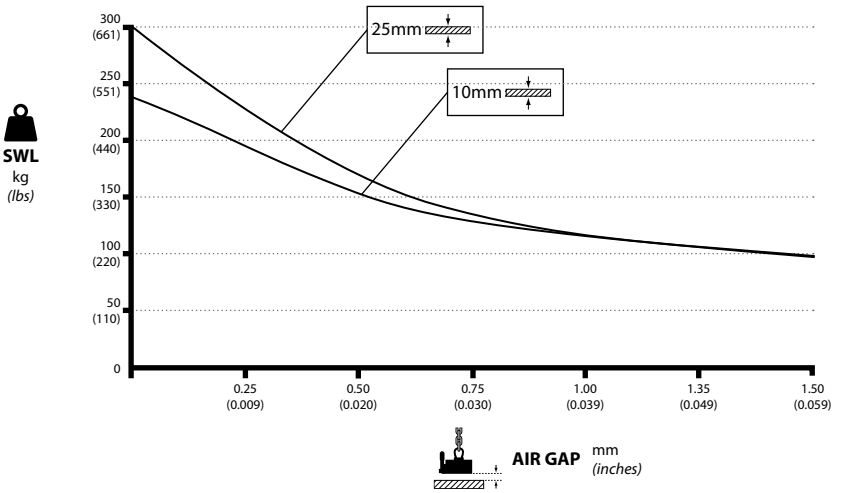


GUIDE TO TYPICAL PERFORMANCE

	Air-Gap (mm)				
	0	**0.2**	**0.5**	**0.7**	**1**
Material Thickness (mm)	**SWL (kg)**				
10	128	88	42	32	30
15	140	90	43	33	32
20	143	92	45	37	35

	Air-Gap (inches)				
	0	**0.008**	**0.020**	**0.028**	**0.039**
Material Thickness (inches)	**SWL (lbs)**				
3/8	283	195	92	70	66
5/8	309	198	96	73	70
3/4	316	202	99	81	77

UL250+ (UL0550+)

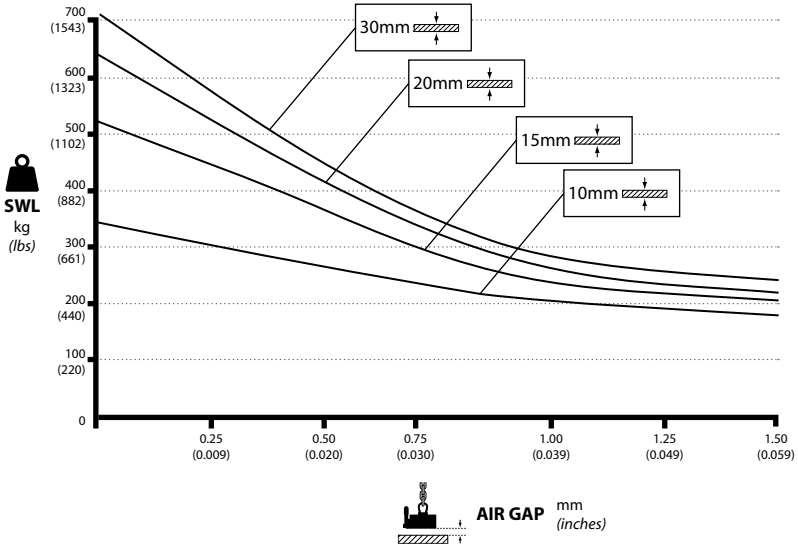


GUIDE TO TYPICAL PERFORMANCE

	Air-Gap (mm)				
	0	0.2	0.5	0.7	1
Material Thickness (mm)	SWL (kg)				
10	240	203	152	135	117
15	278	233	157	140	118
20	288	212	160	130	118
25	302	238	168	142	122

	Air-Gap (inches)				
	0	0.008	0.020	0.028	0.039
Material Thickness (inches)	SWG (lbs)				
3/8	529	448	334	298	257
5/8	614	514	345	309	261
3/4	636	467	353	287	261
1	665	525	371	312	268

UL0500+ (UL1100+)

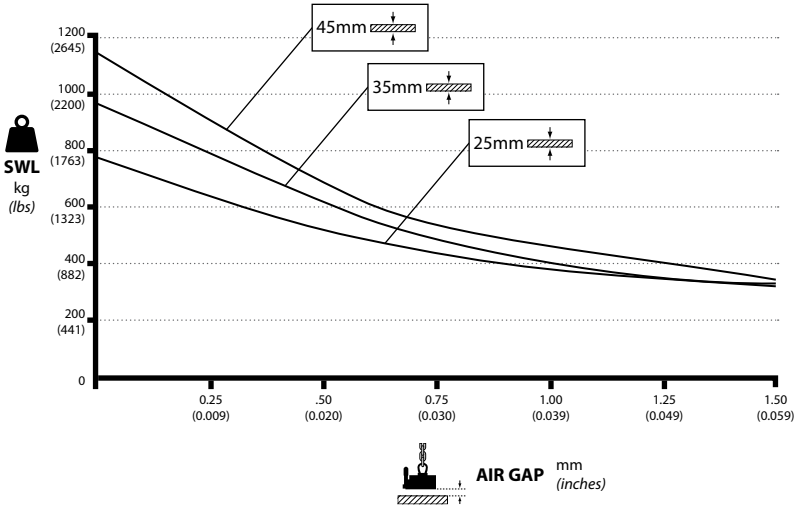


GUIDE TO TYPICAL PERFORMANCE

	Air-Gap (mm)				
	0	**0.2**	**0.5**	**0.7**	**1**
Material Thickness (mm)	**SWL (kg)**				
10	347	307	268	233	193
15	503	453	377	290	222
20	642	545	427	333	247
30	713	595	445	353	265

	Air-Gap (inches)				
	0	**0.008**	**0.020**	**0.028**	**0.039**
Material Thickness (inches)	**SWL (lbs)**				
3/8	764	676	592	514	426
5/8	1110	999	830	639	489
3/4	1415	1202	941	735	544
1 1/6	1573	1312	981	779	584

UL1000+ (UL2200+)

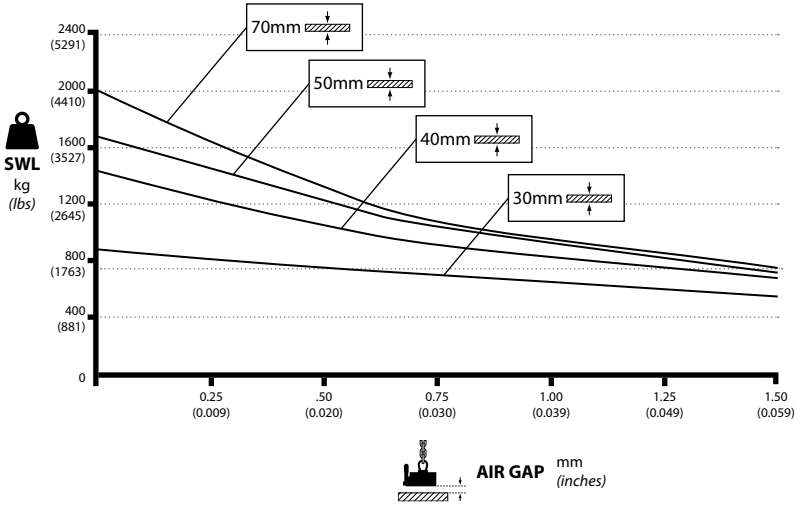


GUIDE TO TYPICAL PERFORMANCE

	Air-Gap (mm)					
	0	**0.2**	**0.5**	**0.7**	**1**	**2**
Material Thickness (mm)	**SWL (kg)**					
15	455	405	343	315	312	212
25	728	717	542	497	440	247
35	973	833	607	497	455	242
45	1142	948	663	537	460	255

	Air-Gap (inches)					
	0	**0.008**	**0.020**	**0.028**	**0.039**	**0.079**
Material Thickness (inches)	**SWL (lbs)**					
5/8	1003	893	757	694	687	467
1	1606	1580	1194	1095	970	544
1 3/8	2146	1837	1337	1095	1003	533
1 3/4	2517	2091	1462	1183	1014	562

UL2000+ (UL4400+)



GUIDE TO TYPICAL PERFORMANCE

	Air-Gap (mm)					
	0	**0.2**	**0.5**	**0.7**	**1**	**2**
Material Thickness (mm)	**SWL (kg)**					
30	847	750	617	588	540	417
40	1200	1113	922	817	750	460
50	1617	1378	1123	927	803	473
60	1910	1683	1300	1080	947	560
70	2003	1703	1343	1108	1000	567

	Air-Gap (inches)					
	0	**0.008**	**0.020**	**0.028**	**0.039**	**0.079**
Material Thickness (inches)	**SWL (lbs)**					
1 1/6	1867	1653	1360	1297	1190	919
1 1/2	2646	2454	2032	1800	1653	1014
2	3564	3039	2477	2043	1771	1044
2 1/4	4211	3711	2866	2381	2087	1235
2 3/4	4417	3755	2962	2443	2205	1249

5 Periodic Inspection

If the Magnetic Lifter is being used in the EC then it must be inspected and maintained in accordance with the requirements of PUWER (1998).
For areas outside the EC the Magnetic Lifter must be inspected and maintained in compliance with the applicable work standards, and other standards for suspended load handling.
Should the data plates become detached or damaged please contact Eclipse Magnetics immediately for replacement plates. In addition to statutory requirements, Eclipse Magnetics recommend the following:

MAINTENANCE SCHEDULE

	Frequency			
Operation	Daily	Weekly	Monthly	Annually
Inspect Pole Feet for damage	✓			
Inspect Lifting Eye for damage and security		✓		
Safety Mechanism operation		✓		
Inspect data plates for damage			✓	
Proof test SWL				✓

6 Warranty

The Eclipse Magnetics Ultralift Plus Lifting Magnet is covered by a 3-year warranty from the date of invoice and is subject to the Eclipse Magnetics standard terms and conditions of sale, a copy of which is available on request.

7 Performance Test Record

Your Ultralift Plus Lifting Magnet should be re-certified in accordance with the requirements of PUWER (1998) and LOLER (1998)
For areas outside the EC the Ultralift Plus Lifting Magnet must be inspected in compliance with the applicable work standards and other standards for suspended load handling. It is recommended that this inspection be carried out at an Eclipse Magnetics service centre.

EC Declaration of Conformity

Product Description
Manually switched permanent lifting magnet with safety interlock mechanism

Product Identification
Ultralift plus range identified as :
UL0125+, UL0250+, UL0500+, UL01000+, UL02000+
UL0275+, UL0550+, UL1100+, UL2200+, UL4400+

Eclipse Magnetics Ltd
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Sheffield
S9 1EW
England

We hereby declare that the product below has been declared in conformity with provisions of the following directives:

- **Machinery Directive 98/37/CE**
- **BS EN ISO 12100-1 Basic engineering principles**
- **BS EN 13155:2003 Cranes safety: non-fixed load lifting attachments**
- **SS7665601 Swedish standards for magnetic lifting devices**
- **ASME B30.20**

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