ENGISO®
ENGINEERED SOLUTIONS

The V-MAG®

multipurpose neodyme magnet

The perfect product in an ever-changing environment

Over 4 million
V-Mag's installed

Problem Solving for Extreme Environments

ISO 9001
BUREAU VERITAS
Certification

Engiso ApS has been ISO 9001 certified by Bureau Veritas in the Sales of permanent magnets for mounting.

V-MAG©
Specifications

AVAILABLE IN TWO SIZES

V-MAG-70©
Size: 94x34x17mm
Lifting capacity: 70 kg / 155 lbs
Premounted bolt: 1xM6x15mm
Weight: 0,3 kg / 0,66 lbs

V-MAG-340©
Size: 175x60x21mm
Lifting capacity: 340 kg / 750 lbs
Premounted Bolt:
1xM8x15mm & 2xM6x15mm
Weight: 1,3 kg / 2,86 lbs

Engiso provide many types of solutions that are easily and readily deployed into current designs, businesses, systems or processes. They can be used immediately once installed or implemented. In such cases, the purpose of using a turnkey solution is to avoid the hassle and headache of setting up your own in-house solution or resources. Engiso can deliver an "All inclusive" solution tailored to the customer's exact needs or requests.

"Engiso consists of a mixture of project managers, engineers among others with several years of know-how from the wind sector. Our finest task is to deliver perfectly fitted solutions that exceed your demands. Our team brings new perspective and propels the ideas to meet the demands of the future."

"Drilling and welding the static install-method, has finally found its replacement."

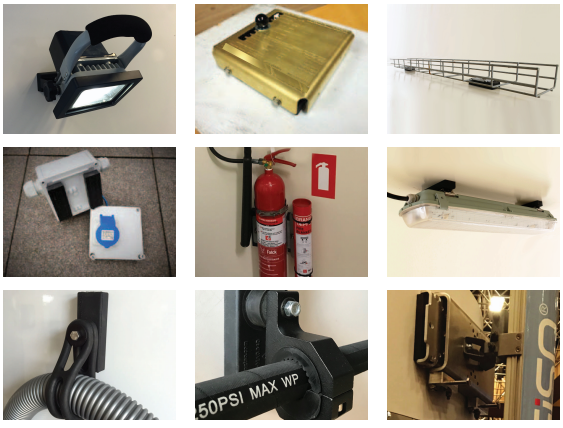
V-MAG©

The V-MAG© multipurpose Neodyme magnet is the perfect product in an ever-changing environment.

KEY FEATURES

- 12-years track record
- 2 million magnets in operation
- Best in test
- No welding required
- No surface treatment
- Optimal and fast retrofit
- Easily dismantled
- Assembly without special tools
- Wind- and weather-resistant
- UV-resistant
- Tailored design opportunities
- Does not lose magnetic force over time

1. No welding needed
2. No painting or modification needed
3. Easy and fast fitting/retrofit on existing constructions
4. Can be removed or relocated without damaging the construction
5. Rubber coated & permanent



The V-MAGs are constructed using Neodyme magnets, which are the strongest permanent magnets available, furthermore the Neodyme magnets does not lose its magnetic force over time. They are coated with a layer of black EPDM rubber which has outstanding heat, ozone and weather resistance. The size and color of the V-MAG can be tailored to the potential need of the costumer. Furthermore, they are delivered with pre-fitted A4 bolts in stainless steel, which allows for a custom fit.

CASE STUDY

V-MAG®

ENGISO® ENGINEERED SOLUTIONS

Client Profile

The Company provides its local customers with competitively priced, quality electric service. It serves members throughout 12 counties including Grundy, Harrison, Mercer and portions of Linn, Livingston, Daviess, Gentry, Putnam and Sullivan in Missouri and Wayne, Ringgold and Decatur counties in Iowa. The Company serves 6,720 meters and has over 2,100 miles of overhead distribution line and over 85 miles of underground line.

Project Description, Challenges, & Considerations

The project required the installation of an omni-directional antenna to supply 15 households in a rural Missouri with high speed internet. The challenges included ensuring the total cost of the installation offers a payback time of 18 months - and a positive cash flow for an additional 18 months based on current subscription amounts and technology.

ADDITIONAL CONSIDERATIONS INCLUDED:

- Ensuring the safety of the installation team working at high altitudes
- Favoring the use of existing tall structures in the area including city-owned water towers
- Preventing interference with the availability of safe drinking water to the residents
- Developing resilient, flexible solutions to contend with Midwest weather conditions ranging from extreme humidity, high winds, thunderstorms, and potential ice buildup

Approach Comparisons

Chosen ENGISO V-MAG® 340 Option

Securing to city owned water tower through magnetic application of antenna mount – *Extensive safety, speed, cost, payback, and installation benefits achieved*

Alternative Options

Utilizing or installing in-ground systems – *Cost prohibitive due to the remote locations of subscribers*

Erecting a new tower on city property – *Cost prohibitive due to the small number of subscribers contributing towards the business case*

Welding to the steel surface of the water tower – *Cost prohibitive, dangerous, laborious, and slow implementation*

PRODUCT SOLUTION UTILIZED:

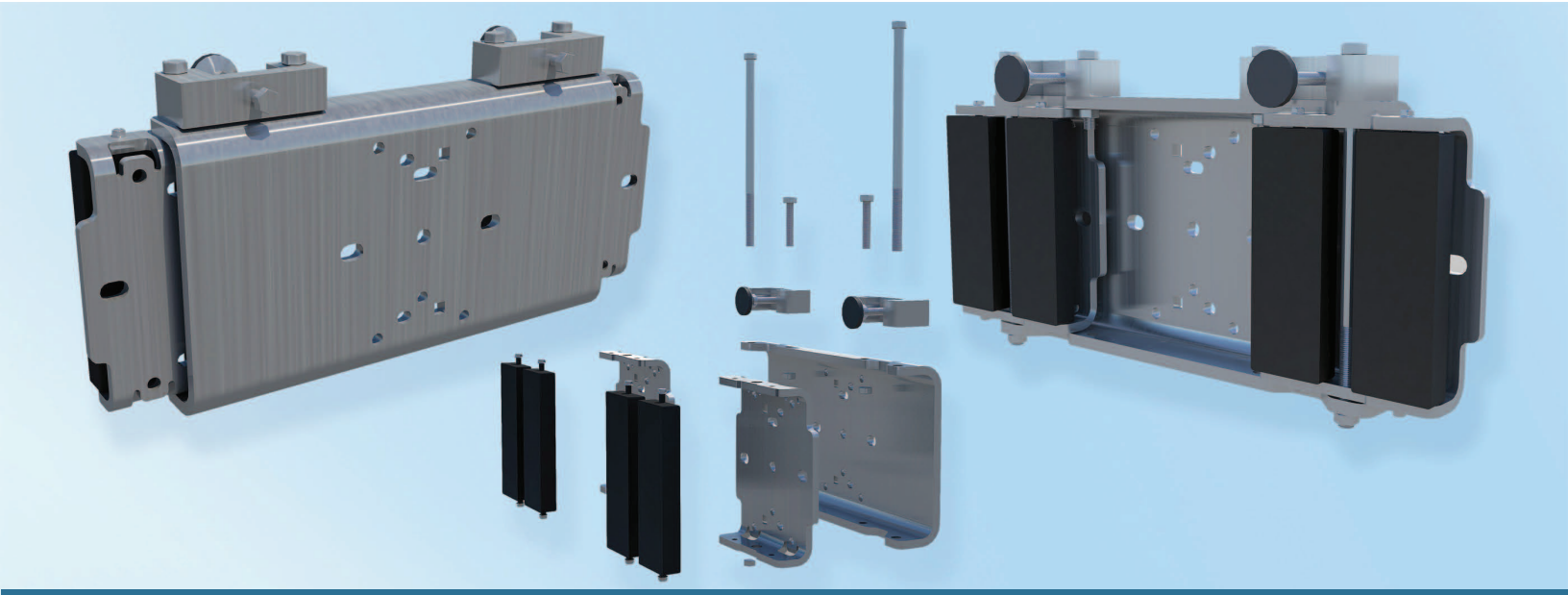
- ENGISO V-MAG® 340

PRODUCT SOLUTIONS DEVELOPED (as a result of lessons learned):

- ENGISO V-MAG® TBR 1500 – V-MAG® Universal Bracket with a pull force of 1500 lbs.
- ENGISO V-MAG® TBR 1500 W – V-MAG® Universal Bracket with a pull for of 1500 lbs. for extreme wind shear
- ENGISO V-MAG® TBR 3000 – V-MAG® Universal Bracket with a pull force of 3000 lbs. for extreme wind shear

"The ENGISO V-MAG® 340 magnets have been installed for 18 months and they have survived windy, stormy springs – long, hot, and dry summers - and cold, icy, snowy, winters without moving an inch. I would highly recommend working with Engiso to devise a magnet solution that is affordable, easy, and durable."

~ Terry White, Grundy Electric Cooperative



ENGISO V-MAG® TBR 3000

ADDITIONAL CONSIDERATIONS INCLUDED:

- Project sector mount and omni-directional antennas erected and secured to two separate water towers utilizing multiple ENGISO V-MAG® 340 for a permanent attachment to the steel water tower dome top
- Project cash flow and payback calculations exceeded performance management criteria
- Project withstood extreme environmental conditions including volatile storm seasons, +65 miles mph wind gusts, and direct lighting strikes – without moving an inch
- Re-painting of the water tower allows for temporary disconnect of the installation and subsequent re-installation utilizing the same components - significantly reducing total lifetime cost

LESSONS LEARNED:

- Required mounting bracket designs must be adaptable in order to capture curvature of tower dome
- Properly sourcing an engineered mounting system from one supplier like Engiso is easier than working with a fabricator on a unique design

USES OF THE ENGISO V-MAG INCLUDE:

- Condition Monitoring (CCTV)
- Wifi Extender
- Satellite Dish
- Radar System

Why Engiso?

Engiso is a Danish-founded engineered solutions company specializing in its V-MAG® series of high-powered neodymium magnets and industrial products for extreme environments. The company is comprised of advanced engineers, project managers, and consultants shaped by the demands of the Nordic offshore and onshore wind energy sectors. Engiso has consistently reduced costs, optimized worker health and safety, and generated sizable productivity gains for multinational corporations - with over 4 million installed worldwide.

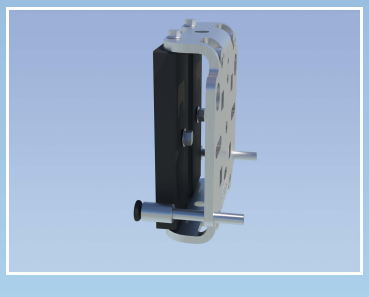
Engiso's key product, the ENGISO V-MAG®, a data-driven, non-penetrating and cost-effective magnetic alternative to conventional welding. Due to Engiso's high-quality design using neodymium magnets, the magnetic force is not lost over time. The ENGISO V-MAG® is a high-quality premium product with quick installment time and superior corrosion resistant properties. Most importantly, it does not disrupt the communications signal when mounted on a tower and can be easily moved by transferable installation.

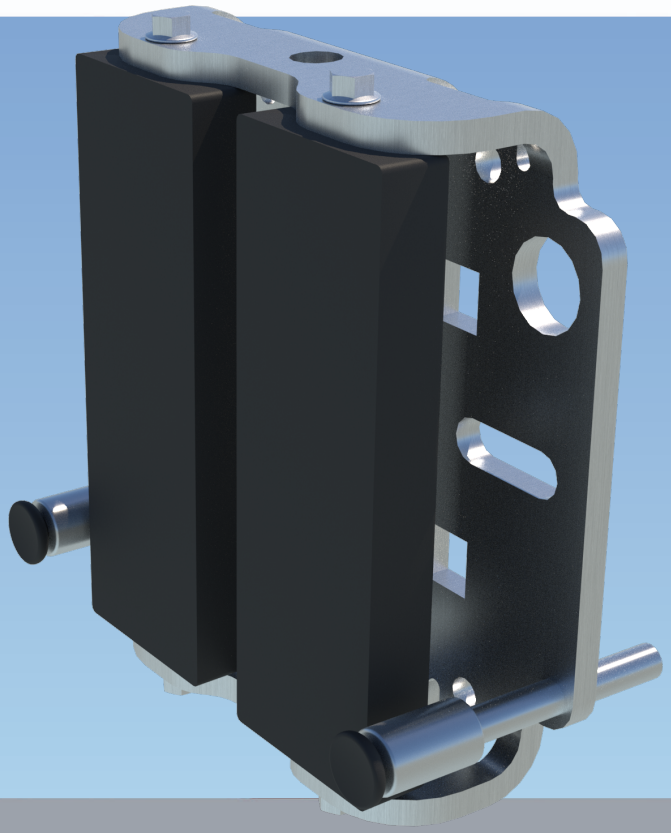
Engiso offers many types of manufactured solutions - transferable to wind power, telecommunications, maritime, oil and gas, and defense markets - that can be easily deployed into a current business, system or process. Engiso is based in Esbjerg, Denmark and Mukwonago, Wisconsin.

ENGISO®
ENGINEERED SOLUTIONS

Problem Solving for Extreme Environments

V-MAG®
TBR 1500





MAGNETIC BRACKET SYSTEM

Semi permanent, non-penetrating, non-destructive, magnetic mechanical interphase bracket system to be integrated between a ferrous steel surface and a product to be installed fast and efficient without having to weld.

WIND POWER

MARINE

DEFENSE

COMMUNICATIONS

OIL AND GAS

Engiso offers many types of solutions that are easily and readily deployed into a current business, system or process

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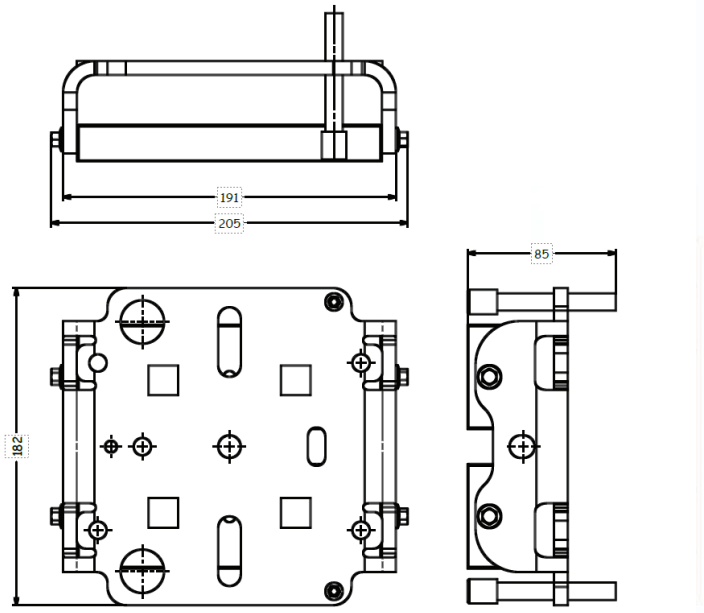
EUROPE: PHONE: **+45 70 23 00 75** EMAIL: **INFO@ENGISO.COM**



Mounting Surface:	Steel / Ferrous
Thickness (Min.):	¼" (6 mm)
Flat:	Yes
Convex - Max:	D > 5 feet
Concave - Max:	D > 5 feet
Paint thickness - Max:	11 mils (300 µm)

With steel thickness below ¼" (6 mm) the MAX Load Capacity is reduced, please contact ENGISO®.

With paint thickness greater than 11 mils (300 µm) the Max Load Capacity is reduced, please contact ENGISO®.

Technical Data TBR 1500

Temperature:	-40°F (-40°C) to +176°F(+80°C)
Humidity:	10% to 100% relative humidity according to IEC 60721 3K6
Warnings / Hazards:	Pinch, Crush & Pacemaker on / in, Product, Packaging & Manuals
Logo:	ENGISO® Engineered Solutions , V-MAG®

Size:	*Capacity:*	*Hardware:*
L: 8.0" (204 mm)	X: 220 Lbs. (100 kg.) Max. Horizontal Load	4 ea. M6 x .8" - SS
H: 6.7" (170 mm)	Y: 220 Lbs. (100 kg.) Max. Vertical Load	2 ea. M8 x .6" - SS
W: 1.8" (46 mm)	Z: 1500 Lbs. (680 kg.) Max. Perpendicular Load	1 ea. M10 Levelling Feet

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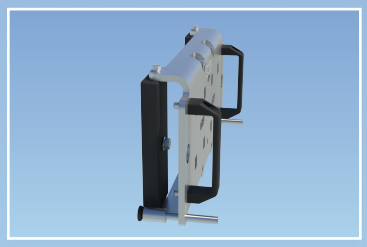
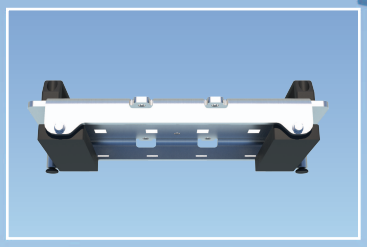
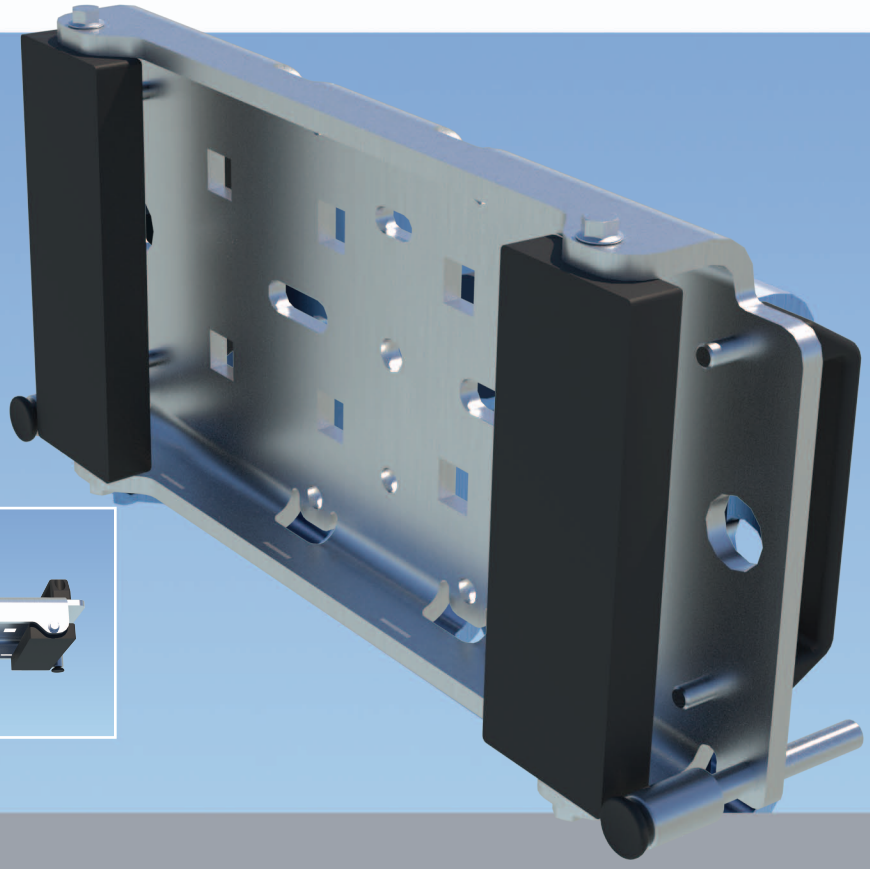
V-MAG®
TBR 1500W

multipurpose neodynium magnet







MAGNETIC BRACKET SYSTEM

Semi permanent, non-penetrating, non-destructive, magnetic mechanical interphase bracket system to be integrated between a ferrous steel surface and a product to be installed fast and efficient without having to weld.

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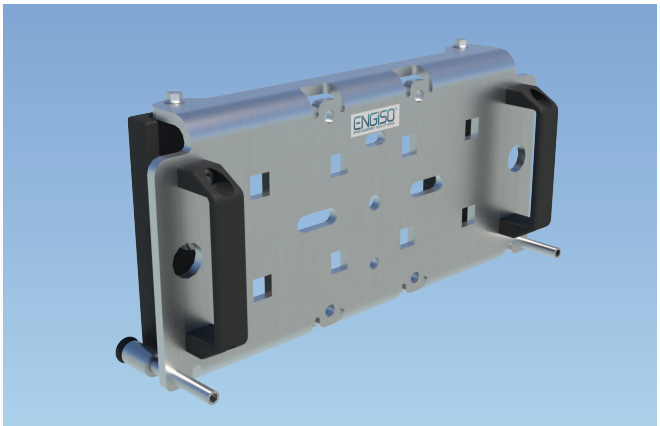

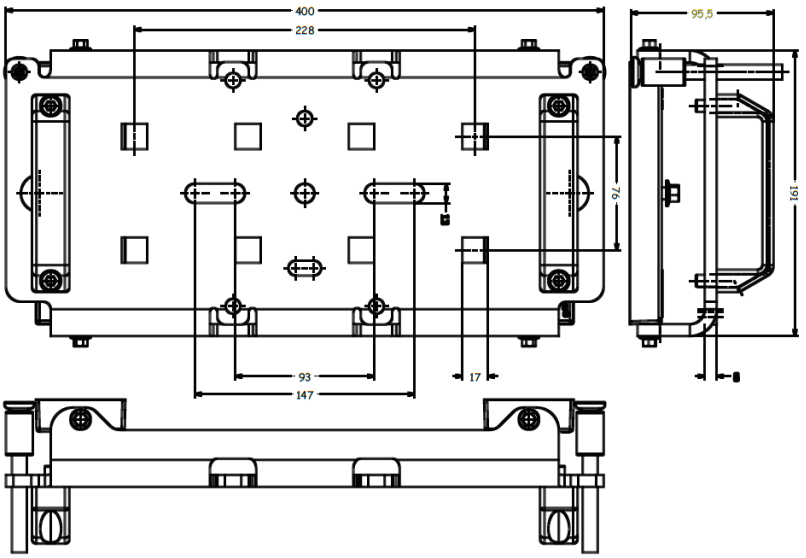

Mounting Surface:	Steel / Ferrous
Thickness (Min.):	¼" (6 mm)
Flat:	Yes
Convex - Max:	D > 7 feet
Concave - Max:	D > 7 feet
Paint thickness - Max:	11 mils (300 µm)

With steel thickness below ¼" (6 mm) the MAX Load Capacity is reduced, please contact ENGISO®.

With paint thickness greater than 11 mils (300 µm) the Max Load Capacity is reduced, please contact ENGISO®.

Technical Data TBR 1500W

Temperature:	-40°F (-40°C) to +176°F(+80°C)
Humidity:	10% to 100% relative humidity according to IEC 60721 3K6
Warnings / Hazards:	Pinch, Crush & Pacemaker on / in, Product, Packaging & Manuals
Logo:	ENGISO® Engineered Solutions , V-MAG®

Size:	*Capacity:*	*Hardware:*
L: 8.0" (204 mm)	X: 330 Lbs. (150 kg.) Max. Horizontal Load	4 ea. M6 x 0.8" - SS
W: 16.2" (410 mm)	Y: 220 Lbs. (100 kg.) Max. Vertical Load	2 ea. M8 x 0.6" - SS
H: 3.8" (96 mm)	Z: 1500 Lbs. (680 kg.) Max. Perpendicular Load	2 ea. M12 Levelling feet

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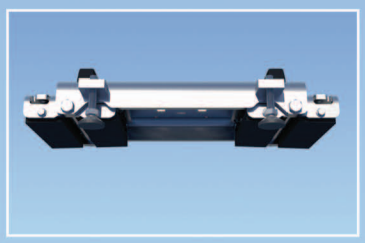
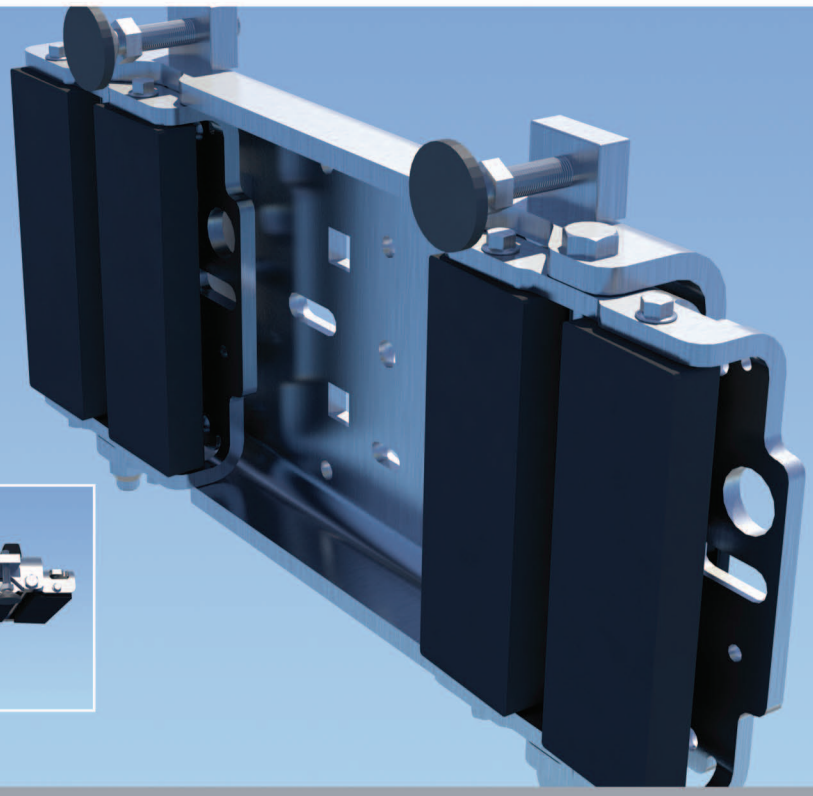
V-MAG®
TBR 3000

multipurpose neodynium magnet





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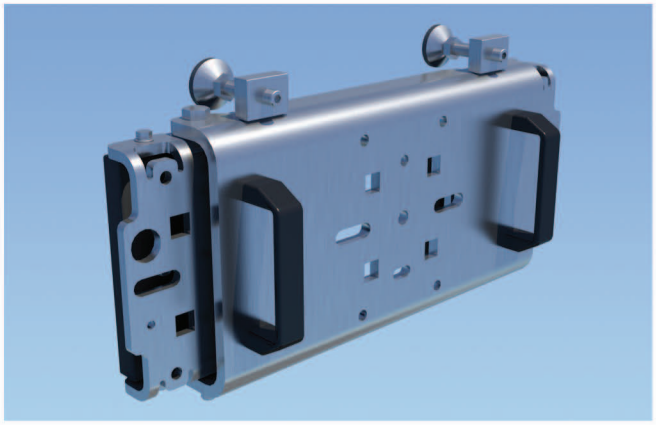

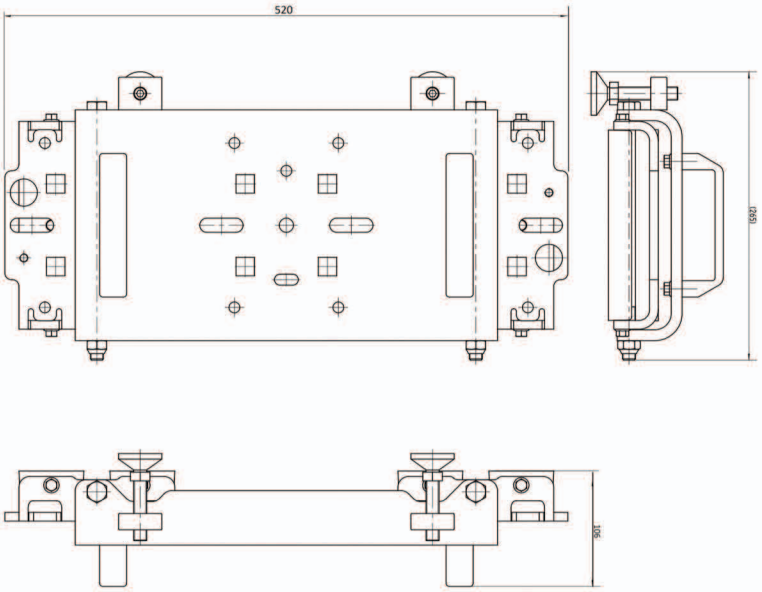

Mounting Surface:	Steel / Ferrous
Thickness (Min.):	¼" (6 mm)
Flat:	Yes
Convex - Max:	D > 8 feet
Concave - Max:	D > 8 feet
Paint thickness - Max:	11 mils (300 µm)

With steel thickness below ¼" (6 mm) the MAX Load Capacity is reduced, please contact ENGISO®.

With paint thickness greater than 11 mils (300 µm) the Max Load Capacity is reduced, please contact ENGISO®.

Technical Data TBR 3000

Temperature:	-40°F (-40°C) to +176°F(+80°C)
Humidity:	10% to 100% relative humidity according to IEC 60721 3K6
Warnings / Hazards:	Pinch, Crush & Pacemaker on / in, Product, Packaging & Manuals
Logo:	ENGISO® Engineered Solutions , V-MAG®

Size:	*Capacity:*	*Hardware:*
L: 10.4" (265 mm)	X: 440 Lbs. (200 kg.) Max. Horizontal Load	8 ea. M6 x 0.8" - SS
W: 20.5" (520 mm)	Y: 440 Lbs. (200 kg.) Max. Vertical Load	4 ea. M8 x 0.6" - SS
H: 4.2" (106 mm)	Z: 3000 Lbs. (1360 kg.) Max. Perpendicular Load	2 ea. M10 x 9.5" - SS
		2 ea. M12 Leveling feet

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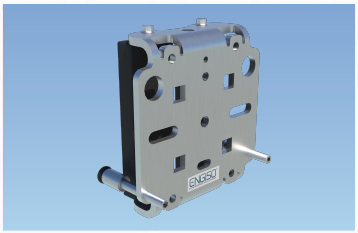
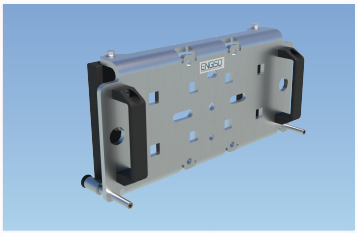
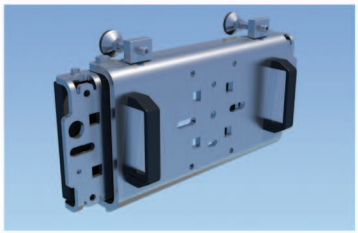
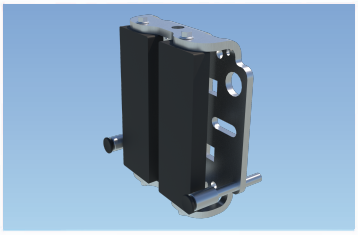
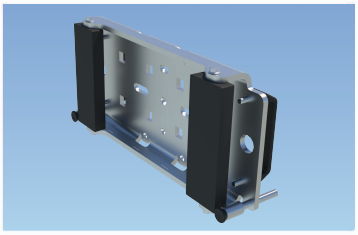
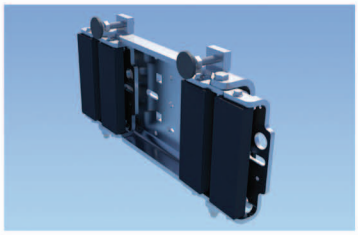
V-MAG® TBR Series - Comparison

	TBR 1500	TBR 1500W	TBR 3000
Mounting Surface View:			
Magnet Surface View:			
Bracket Size			
Length:	8.0" (204 mm)	8.0" (204 mm)	10.4" (265 mm)
Width:	6.7" (170 mm)	16.2" (410 mm)	20.5" (520 mm)
Height:	1.8" (46 mm)	3.8" (96 mm)	3.9" (98 mm)
MAX Load Capacity			
X - Horizontal:	220 Lbs. (100 kg.)	330 Lbs. (150 kg.)	440 Lbs. (200 kg.)
Y - Vertical :	220 Lbs. (100 kg.)	220 Lbs. (100 kg.)	440 Lbs. (200 kg.)
Z – Perpendicular :	1500 Lbs. (680 kg.)	1500 Lbs. (680 kg.)	3000 Lbs. (1360 kg.)
Mounting Surface:	Steel / Ferrous	Steel / Ferrous	Steel / Ferrous
Thickness (Min.):	¼" (6 mm)	¼" (6 mm)	¼" (6 mm)
Flat:	Yes	Yes	Yes
Convex - Max:	D > 5 feet	D > 7 feet	D > 8 feet
Concave - Max:	D > 5 feet	D > 7 feet	D > 8 feet
Paint thickness - Max:	11 mils (300 µm)	11 mils (300 µm)	11 mils (300 µm)

With steel thickness below ¼" (6 mm) the MAX Load Capacity is reduced, please contact ENGISO®.
With paint thickness greater than 11 mils (300 µm) the Max Load Capacity is reduced, please contact ENGISO®.

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Esteemed Client List Include Amongst Other:

Vestas · GE · SIEMENS · MAERSK · MHI VESTAS OFFSHORE WIND · FedEx

For more information, please contact:

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