Autoclave Engineers
Division of Snap-tite, Inc.

The World Leading Provider of High Pressure Equipment for Research and Industry since 1945!

MAG075 Inline

MagneDrive® Series

At a Glance

Minimum Static Torque: 7 inch-lbs. (791 N-mm)

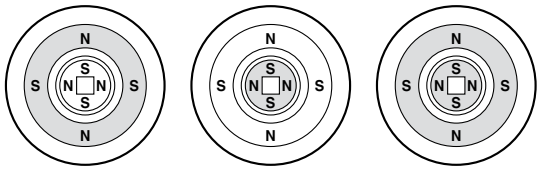
Material of Construction: 316 Stainless Steel or Hastelloy® C276

Maximum Pressure: 6000 psi @ 850° F or 5000 psi @ 950° F (414 bar @ 454° C or 344 bar @ 510° C)

Principle

The MagneDrive® agitator uses rare earth magnets, permitting packless mixing at higher speeds and with higher viscosity fluids. Outer drive magnets, rotated by a direct coupled motor exert powerful attraction on the encapsulated inner magnet assembly. As the outer drive magnets are rotated, the inner magnets are actuated, resulting in rotation of the agitator shaft.

The MagneDrive® Principle



External driver magnets

Encapsulated driver magnet assembly and sealed rotor shaft

Outer magnets are rotated by a motor, thus rotating inner magnets and rotor shaft.

Application and Benefits

The MagneDrive® Agitator is recognized worldwide as a highly efficient method of promoting chemical reactions and catalyst testing among gases, liquids and solids in high pressure autoclaves. It can be mated with any number of optional impellers, including our Dispersimax® turbine type gas dispersion impeller or with any spinning catalyst reactor baskets that are housed within a pressurized vessel. Custom engineering of impeller designs can be performed based on developed horsepower, viscosity, critical speed and other key factors associated with specific processes that need contamination-free, pack-less agitation.

Contamination-free mixing- Packless design eliminates shaft packing and need for lubrication.

Zero leakage to atmosphere- The MagneDrive® is a sealed system, closed to the atmosphere, so even sensitive fluids can be processed safely.

Continuous, high speed operation- No need to shut down in mid-reaction to change failed packing.

Liquid Cooled- Water cooling (user supplied) for over-temperature protection of magnets and bearings. Cooling flow is not always required and can vary depending on vessel operating temperature and drive speed.

Features

- Capable of mixing vessel sizes from 100 ml up to 4000 ml.
- Operating pressures as high as 6000 psi @ 850° F (414 bar @ 454° C).
- Direct in-line motor eliminates belts, reduces size, and creates nearly silent operation.
- Compact design with up to 7 in-lb (791 N-mm)[3] of static torque.
- Designed for simple disassembly and maintenance. Bearings can be replaced with minimal effort.
- Carbon graphite (Purebon®) and Fluoropolymer with Carbon Fiber (FPCF) bearings available.
- Motors available up to 1/2 Hp[2].
- Various impellers available separately. Contact factory for details.

General Specifications

Maximum Speed: 3300 rpm[1]

Material of Construction: All wetted parts 316 SS or Hastelloy C-276. For information on other materials, please consult factory.

Bearing Material: Purebon® 658RCH.[4], Purebon® 3310.[4] or Fluoropolymer with Carbon Fiber.

Maximum Pressure at Connection: 6000 psi @ 850º F or 5000 psi @ 950º F (414 bar @ 454º C or 344 bar @ 510º C)

Maximum Temperature at Magnet Zone: 300° F (149°C)[5]

Maximum Temperature at Connection: 950° F (510°C)

Tachometer Pick-up: Magnetic hall effect sensor, pulse output

Shaft and Impeller: Supplied with standard length shafts. Customization is available. Autoclave Engineers offers a wide selection of impellers including the Dispersimax® gas dispersion system. Please consult factory for more information.

Liquid Cooling: Required for over-temperature protection of magnets and bearings. User supplied, standard water service, 0.3 gpm (1.1 lpm) min. flow rate.

Liquid Cooling Connections: 1/4" copper tube inlet and outlet.

[1] Maximum speeds may be limited by motor mixing requirements and shaft vibration, including critical speed.

[2] Motor horsepower should be sized at least 25% higher than the intended application requirement.

[3] To determine horsepower at a certain speed, use the formula:

$$hp = \frac{T \times n}{63{,}025}$$

where: T=torque in inch-lbs, n=speed in rpm

[4] Purebon is a registered Trademark of Pure Carbon.

[5] The magnets are stabilized at 300° F (149° C). When the temperature of the magnets exceeds the stabilizing temperature for an extended period, loss of magnetic torque will occur. Some of this loss is not reversible and torque will not regenerate.

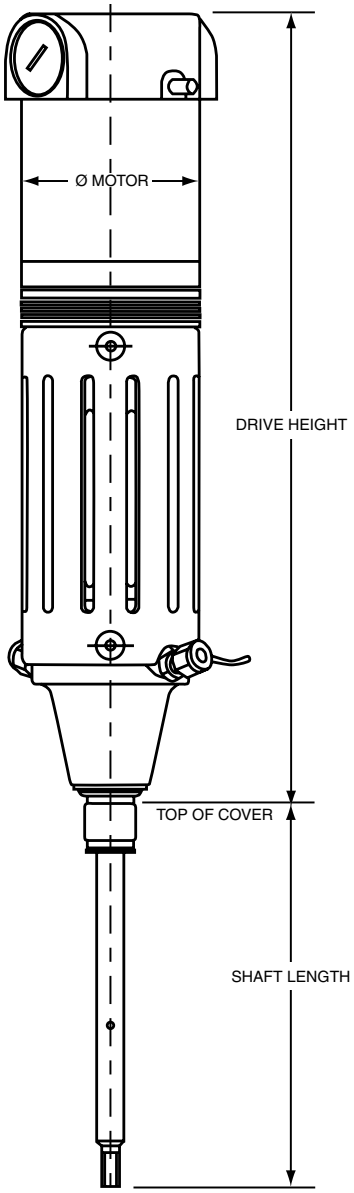
Supporting Information

Dimensions

Please refer to the following sections of the catalog for complimentary products and additional technical details. *See the MAG075 Ordering Guide on the back cover to configure a drive for your specific application.*

MAG075 Inline Magnedrive Drawings	Drawing Number
316 Stainless Steel	40C-0513
Hastelloy® C-276	40C-0998
Cover Connection	10C-7227

Magnedrive Dimesions					
Motor Type	Motor Dia.(Ø)		Drive Height		Shaft Length
	inches	mm	inches	mm	
1/8 HP DC General Purpose	3.41	86.6	15.09	383.3	See Ordering Guide
1/3 HP DC General Purpose	3.41	86.6	17.32	439.9	
1/2 HP Air Motor	3.65	92.7	13.82	351.0	



1/8 HP drive with Autoclave Engineers connection and typical shaft shown.
Consult drawings (chart above) for additional dimensions.

Ordering Guide

MAG075 _ _ _ _ _ _ _ _ _ _ _
A A B B C D E F G G G

AA-Material	
SS	316 SS
HC	Hastelloy®[1] C-276
BB-Size	
1I	1" Magnet Stack (7 in-lb Static Torque)
C- Bearing	
1	Purebon® 658RCH[2]
2	FPCF (Flouropolymer with Carbon Fiber)
3	Purebon® 3310[2]
D- Inline Motor	
D	1/8 HP 0-130 VDC Variable Speed General Purpose (2500 rpm max.)
E	1/3 HP 0-130 VDC Variable Speed General Purpose (2500 rpm max.)
F	Air Motor - Manual Speed Adjust (1/2 HP using 60 psi (4.1 bar) air @ 3000 rpm max.)
G	Air Motor - Electronic Speed Adjust 4-20 ma Input (1/2 HP using 60 psi (4.1 bar) air @ 3000 rpm max.)
E- Speed Sensor	
0	None
2	Intrinsically Safe Speed Sensor (No Barrier Provided)
F- Approvals	
0	None
C	CE Mark
GGG-Drive Shaft	
000	None (Shaft Purchased Separately)
See Table Below	Shaft Options for Standard Stirred Reactors

Vessel Style	Volume (ml)	Shaft Length (See Dimensional Fig.)		Shaft Style Ordering Code	
		Inches	mm	Dispersamax	Solid
Bolted Closure	100	4.76	120.9	D01	S01
	300	8.51	216.2	D02	S02
	500	7.03	178.6	D03	S03
	1000	11.16	283.5	D04	S04
EZE-Seal	100	4.38	111.3	D05	S05
	300	8.09	205.5	D06	S06
	500	6.13	155.7	D07	S07
	1000	10.25	260.4	D08	S08
Zipper Closure	500	7.24	183.9	D09	S09
	1000	11.40	289.6	D10	S10
Bolted Closure, EZE-Seal, Zipper Closure	2000	8.63	219.2	D11	S11
	4000	14.88	378.0	D12	S12

NOTES:

[1] HASTELLOY® is a registered trademark of Haynes International Inc.

[2] Purebon® is a registered trademark of Morgan AM & T Inc.

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