

Magnetic Drive

Couplings, Mixers & Agitators

For High Pressure / High Vacuum Distillation



Leak Tight Solutions

Magnetic Drive Coupling, Mixers & Agitator


Introduction

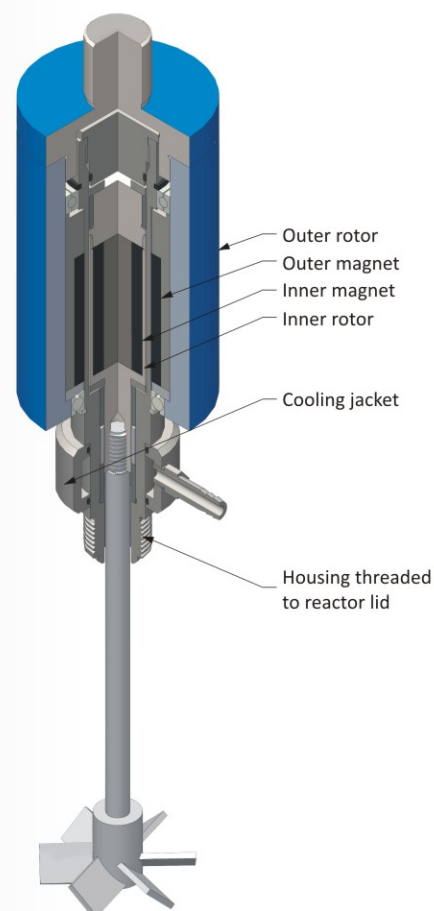
AMAR Equipments are pioneers, largest manufacturer & exporters of high pressure reactors & magnetic drive coupling in India. These couplings are extremely useful for high pressure or high vacuum applications where leakages are not permitted through shaft for continuous running. They have replaced the gland & mechanical sealing for critical applications.

Construction & Working

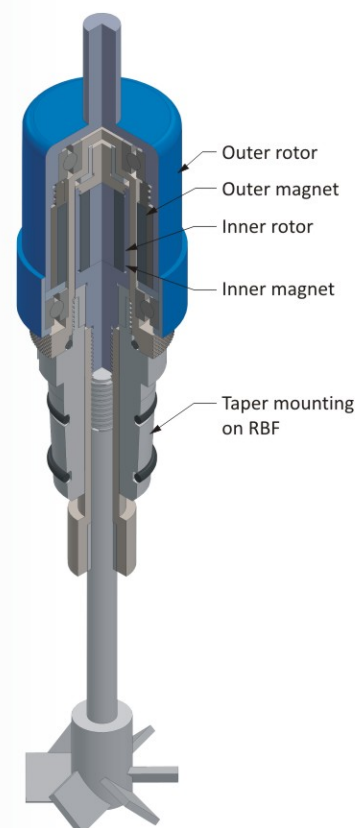
It is a zero leakage maintenance free coupling directly driven by the motor. It consists of external magnet rotor, which is driven by the motor. A stationary shell is threaded / bolted / mounted on reactor head & completely isolates the external rotor from the inner rotor. As the external rotor rotates, the internal also rotates in synchronism. The reactor's shaft is threaded / bolted to the inner rotor. High energy permanent (rare earth) magnets are fixed inside the inner & outer rotors. A water cooling jacket protects the magnets & other components from excessive temperature arising from the reactor.

Salient features

- Suitable for full vacuum to 700 bar pressure
- Magnetic drive couplings, mixers & agitators available for 50 ml - 10,000 ltr reactors
- High torque magnetic drive from 0.8 to 600 Nm
- Materials of SS316, Hastelloy C, inconel, monel, titanium, tantalum, PEEK etc. for resistance to various chemicals
- Magnetic drive coupling / mixers with taper end connections for glass reactors for high vacuum distillation
- Compact inline motor & magnetic couplings for 50 ml - 100 ltr reactors
- Magnetic drive coupling, mixers & agitator offered with CE, ATEX , UL/CSA certification on request
- The gland/mechanical sealing need replacement after every 200-1000 hrs of working depending on application & have limitation of maximum pressure where as magnetic drive can run virtually life long without leakage & can be designed for pressures upto 700 bar
- Very useful for long or round the clock reactions as in gland/mechanical sealing if there is any leakage midway, the whole batch may go waste
- Zero leakage hence zero maintenance & zero breakdown for years
- Noiseless, vibration free & flexible hence overload results in coupling slippage safe guarding the motor
- Safe for toxic / hazardous & expensive chemicals
- No friction losses hence lower power consumption
- Suitable for glass/metal reactors / autoclaves / fermentors etc.
- Retrofitting existing gland / mechanical seal with magnetic coupling for reactors of any make & size with little modifications
- Reactor mounting end connections & shaft connections customizable



Cross-sectional view of magnetic drive coupling for high pressure application (M series)



Cross-sectional view of magnetic drive coupling for high vacuum distillation (MG Series).

Magnetic Drive Couplings / Mixers for High Vacuum Distillation

- Amar Equipments are the pioneers to introduce magnetic drive couplings for high vacuum distillation in round bottom flask (RBF) in India since 2000. The leakage of vacuum due to distillation using conventional PTFE bush / tape results in contamination of the product. This is totally avoided by using zero leakage magnetic coupling / mixers with suitable taper / glass joints like B24, B34, B/NS29/32, B/NS45/40 etc. These coupling are cost effective & guarantees superior product quality without any contamination. Clients can buy **MG series** coupling from Amar with their existing stirrer or alternately **MMG series** compact inline vibration free motor & coupling in their existing RBF.
- Available for 100 ml to 50 ltr RBF /glass reactors
- These coupling / mixers can withstand full vacuum during continuous running
- Materials: SS316, Hastelloy C, PEEK, etc.
- Suitable upto 1500 rpm

Note: Amar does not supply RBF assembly or external stirrer with the coupling / mixers. Stirrer shafts & impellers can be optionally provided in different materials.



Magnetic Drive Couplings / Mixers for High Pressure

- Full vacuum to 700 bar pressures
- For reactors from 50 ml - 10,000 ltr
- Magnetic drive & stirrer wetted parts of SS316, Hastelloy C, inconel, monel, titanium, tantalum etc.

M-Series & Agitators

- Magnetic drive couplings for metal reactors upto 10,000 ltr
- High torque couplings upto 600 Nm
- Threaded or flanged end connections
- All the magnetic drive models for metal / glass can be provided with suitable agitator
- Agitator assembly consists of motor, variable frequency motor speed regulator, magnetic drive coupling, suitable drive mounting, shaft and different types of impellers viz pitch blade turbine, anchor, hollow shaft with gas induction impeller, ruston turbine, propeller, helical impeller etc.

MM-Series

- Compact inline motor and magnetic drive coupling with speed indicator & regulator
- For 50 ml - 50 ltr metal / glass reactors
- Torque capacities upto 12 Nm
- No external rotation, rotation inside housing
- No separate motor / stand / stirrer required
- Light weight & economical
- Full vacuum to 700 bar pressure



Models - Magnetic Drive

- M-Series : Magnetic drives for metal autoclaves / reactors
- MG-Series : Magnetic drives for glass round bottom flasks / reactors
- MM-Series : Inline motor & magnetic drive for metal autoclaves / reactors
- MMG-Series : Inline motor & magnetic drive for glass round bottom flasks / reactors

Note: The number after the series indicates the static torque capacity in Kg-cm



Various Models as per Torque Capacity

Sr. No.		Static torque capacity		For reactor volume	
	Model No.	Kg-cm.	N-m.	Standard	Optional
(a)	M08/MM08	8	0.78	50 ml - 250 ml	—
(b)	M20/MM20	20	1.96	500 ml - 5 ltr	50 ml - 250 ml
(c)	M40/MM40	40	3.92	—	500 ml - 5 ltr
(d)	M80/MM80	80	7.85	10 - 25 ltr	500 ml - 5 ltr
(e)	M120/MM120	120	11.7	50 - 100 ltr	5 - 25 ltr
(f)	M200	200	19.6	—	5 - 25 ltr
(g)	M400	400	39.2	100 - 10,000 ltr upto 20 hp motor & 300 rpm	
(h)	M600	600	58.8		
(i)	M1200	1200	117.6		
(j)	M2400	2400	235.2		
(k)	M3600	3600	352.8		
(l)	M4800	4800	470.4		
(m)	M6000	6000	588		
For high vacuum distillation in round bottom flask					
(n)	MG08/MMG08	8	0.78	500 ml - 10 ltr	—
(o)	MG20/MMG20	20	1.96	15 - 30 ltr	500 ml - 10 ltr
(p)	MG40/MMG40	40	3.92	35 - 50 ltr	15 - 30 ltr
(q)	MG80/MMG80	80	7.85	55 - 75 ltr	35 - 50 ltr
(r)	MG120/MMG120	120	11.7	80 - 100 ltr	55 - 75 ltr

Note:

a) Magnetic drives of higher torque capacity (for reactors of any make can be designed on request. Drives with torque higher / lower than recommended can be used for particular reactor size depending on motor hp / viscosities / stirrer design etc.

b) For enquiry specify the model no., material, pressure & end connection for shaft & drive.

Technical Specifications

Description	Standard	Optional
M.O.C wetted parts	SS-316	Hastelloy C, Monel, Inconel, Zirconium, Titanium, Tantalum, PEEK etc.
Design pressure*	Full Vacuum to 200 bar for (a) - (d), 100bar for (e) - (g), 50 bar for (h) - (m), full vacuum for (n) - (r)	Upto 700 bar for (a) - (d), upto 350 bar for (e) - (g) 100 bar for (h) - (m)
Max. Working Temperature	200°C & upto 500°C if cooling jacket provided, glass vessel magnetic drives i.e. MG series are without cooling jacket.	--
Maximum RPM	1450 for (a) - (e) & (n) - (r) 750 for (f) & (g) 500 for (h) - (m)	Upto 3000 rpm for (a) - (d) & (n) - (r)

*for PEEK MOC, design pressure upto 10 bar & for MG & MMG series full vacuum only.

More than 5000 couplings under operation world wide



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Since 1974.

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