

Magnetic Drive Couplings & Stirrers



Your Research Partner

Leak tight Solutions



Introduction

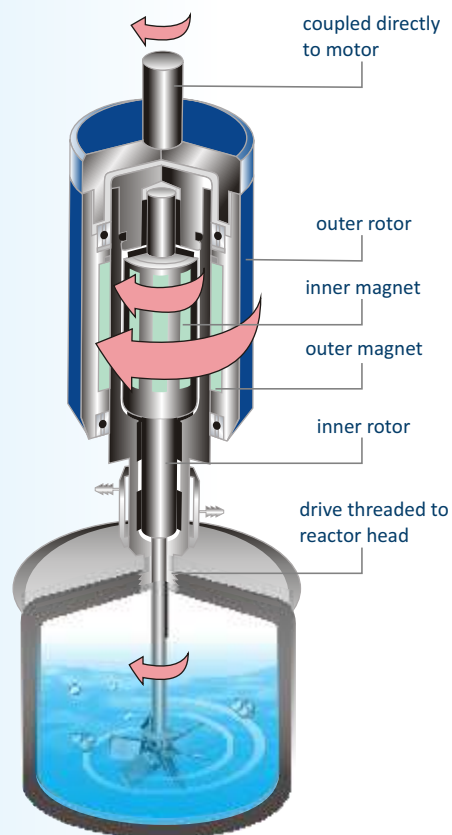
AMAR Equipments are pioneers & largest manufacturers of high pressure reactors & magnetic drive coupling in India. These couplings are extremely useful for high pressure or high vacuum applications where leakages are not permitted for continuous running. They have replaced the gland & mechanical sealing.

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 to 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.

Benefits of Magnetic Drive Coupling Over Gland / Mechanical Sealing

- The gland/mechanical sealing need replacement after every 200-1000 hrs of working depending on application & have limitation of maximum pressure whereas magnetic drive can run virtually life long without leakage & can be designed for pressures upto 5000psi & also magnetic drive coupling has no spares that wears out & need replacement
- 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 implies zero breakdown & zero maintenance, hence large savings in maintenance costs for years
- Safe while using toxic & hazardous chemicals as its leakage is totally prevented
- No waste of expensive liquids through leakage
- Almost no losses since these are friction free in synchronous operations
- Minimum vibration transmission & hence smooth running
- The coupling is flexible & hence any over load results in coupling slippage, thus preventing any breakage of coupling, shaft or failure of motor



Cross-Sectional view of Magnetic drive connected to reactor vessel.



500 ltr. reactor with magnetic coupling



Magnetic drive coupled to 2 Ltr. glass vessel

Magnetically Coupled Lab. Stirrer



Salient Features

- Top mounted compact Inline Motor & Magnetic Drive
- Zero leakage during rotation under vacuum & under pressure
- Ideal for any lab using stirrers under vacuum
- Life long maintenance free
- Suitable for shaft sealing of any metal / glass reactors from 50ml - 25Litres sizes
- Max. pressure from full vacuum upto 6 bar for glass reactors & 350 bar or more for metal reactors
- MOC offered : SS 316, Hastelloy C, Monel, Titanium, etc.
- No external rotation, rotation inside housing
- Noiseless, Vibration free with infinite variable speed regulator & indicator
- No stand for motor mounting required
- Light weight & economical
- PMDC / Brushless DC Motor option available
- Available in Torque capacities upto 8 N-m

Applications - Magnetic Drive

- Any agitation application under vacuum or high pressure
- Suitable for 50ml-5000Ltrs reactors
- Stirring in glass/metal vessels
- Fermentors
- Retrofitting existing gland / mechanical seal for reactors of any make & size with little modifications



Models - Magnetic Drive

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

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



M-Series

M-Series

MG-Series

MM-Series

MMG-Series

Various Models as per Torque Capacity

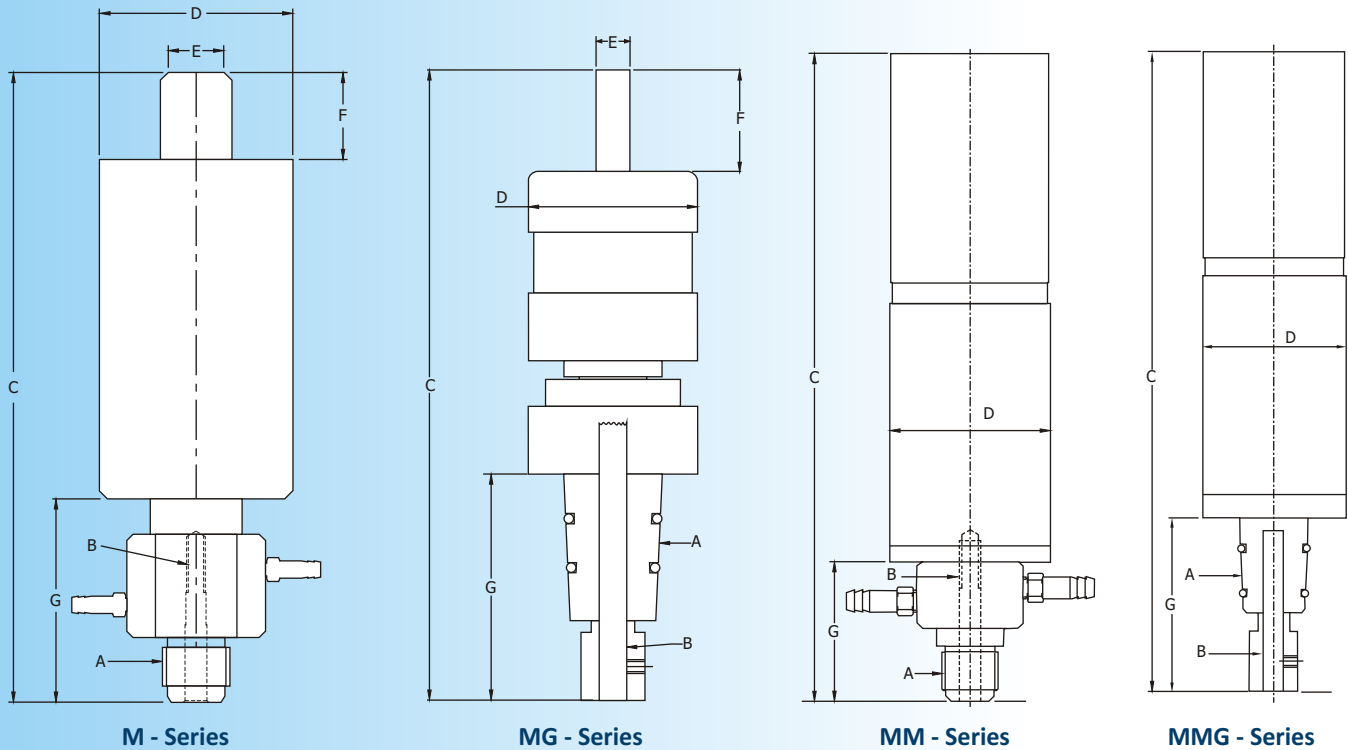
Sr. No.	Static Torque Capacity					Can be used For Reactor sizes
	Model No.	Kg-cm.	N-m.	N-cm.	Lb-in.	
(a)	M08/MM08	8	0.785	78.5	6.93	50ml-700ml
(b)	M20/MM20	20	1.96	196	17.4	50ml-2Ltrs.
(c)	M40/MM40	40	3.92	392	34.7	400ml-2Ltrs.
(d)	M80/MM80	80	7.85	785	69.4	5Ltrs.
(e)	M200	200	19.6	1960	170	10-100Ltrs.
(f)	M400	400	39.2	3920	340	200-500Ltrs.
(g)	M900	900	88.3	8830	780	500-1000Ltrs.
(h)	M1800	1800	177	17700	1562	1000-2000Ltrs.
(i)	M2700	2700	265	26500	2344	2000-5000Ltrs.
(j)	MG08/MMG08	8	0.785	78.5	6.93	50ml-5Ltrs. (Glass vessel)
(k)	MG20/MMG20	20	1.96	196	17.4	5Ltrs.-25Ltrs. (Glass vessel)
(l)	MG40/MMG40	40	3.92	392	34.7	10Ltrs.-25Ltrs. (Glass vessel)
(m)	MG80/MMG80	80	7.85	785	69.4	10Ltrs.-25Ltrs. (Glass vessel)

Note: Magnetic drives of higher torque capacity for reactors of any make can be designed on request. Higher torque drives (than recommended) can be used for particular reactor size for viscous liquids.

Technical Specifications

Description	Standard	Optional
M.O.C wetted parts	SS-316	Hastelloy C, Monel, Titanium, etc.
Max. Allowable Working Pressure	Full Vacuum to 350bar (kg/cm ²) for (a) to (d), 100bar / (Kg/cm ²) for (e) & (f), 50 bar (kg/cm ²) for (g) to (i), full vacuum to 6 bar for (j) to (m)	Upto 350 bar (kg/cm ²) for (e) & (f) 100 bar/ (Kg/cm ²) for (g) to (i)
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) to (d) & (j) to (m) 750 for (e) & (f) 500 for (g) to (i)	Upto 3000rpm for (a) to (d) & (j) to (m) 1500 rpm for (e) & (f)

Overall Dimensions



Sr. No.	Model No.	Drive End Connections A	Shaft End Connections (B)	C mm	D mm	E mm	F mm	G mm
(a)	M08/MM08	1/4" BSPP(M) / 3/8" BSPP(M)	1/4" BSF(F) / 5/16" BSF(F)	158/279	45/63	10/-	30/-	50/50
(b)	M20/MM20	3/8" BSPP(M) / 1/2" BSPP(M)	1/4" BSF(F) / 5/16" BSF(F)	182/315	54/63	22/-	27/-	59/62
(c)	M40/MM40	1/2" BSPP(M)	5/16" BSF(F)	194/347	63/85	22/-	27/-	62/62
(d)	M80/MM80	1/2" BSPP(M)	5/16" BSF(F)	244/440	63/85	22/-	27/-	62/62
(e)	M200	1" / 1 1/4" BSPP(M)	1/2" / 3/4" BSF(F) / M 30	277/282	100	35	34	97/102/216
(f)	M400	1 1/4" BSPP(M)	3/4" BSF(F) / M 30	352	100	35	34	102/216
(g)	M900	2 1/2" BSPP(M)	Ø 50 with Keyway	410	177	50	53	345
(h)	M1800	2 1/2" BSPP(M)	Ø 60 with Keyway	550	177	50	53	298
(i)	M2700	2 1/2" BSPP(M)	Ø 60 with Keyway	520	192	50	53	298
(j)	MG08/MMG08	NS 29/32, NS 45/40, B34	8 mm I/D & 5/16" BSF (F)	169/288	45/63	10/-	30/-	65/65
(k)	MG20/MMG20	NS 29/32, NS 45/40, B34	8 mm I/D & 5/16" BSF (F)	199/327	45/63	10/-	30/-	65/65
(l)	MG40/MMG40	NS 29/32, NS 45/40, B34	8 mm I/D & 5/16" BSF (F)	196/341	63/85	22/-	27/-	46/46
(m)	MG80/MMG80	NS 29/32, NS 45/40, B34	8 mm I/D & 5/16" BSF (F)	246/434	63/85	22/-	27/-	46/46

Since development is a continuous process, the above specs can change without prior notice.

Note: (a) For inquiry specify the model no., M.O.C, pressure & end connections for shaft & drive if different from standard.

(b) Drive & Shaft end connections can be custom built to NPT, flanged, taper joints as per requirement.

(c) Generally Magnetic Drive Coupling or Stirrers are not supplied with shaft & impellers however the same can be offered on special request.

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temperatures after the reaction is over. It circulates water to the internal cooling coil of reactors. It is a very essential feature for highly exothermic or runaway reactions. Cooling starts automatically if the rate of heating rises suddenly. It comes with monoblock pump, tank, pipeline & flexible hose pipes with QRC & is mounted on the autoclave trolley itself. Normal tap water cooling

is not effective at higher temperature due to steam back pressure whereas autocooling system gives positive pump pressure.

It is used to reduce the autoclave temp. to as low as upto -30°C from room temp. to carry out reactions at lower temp. It consists of single/double stage compressors, expansion valve, condensor, stirrer, circulation pump with control panel to control the temp. of the chilling bath. Chilling media/oil is chilled in the bath and then circulated to the internal coil /jacket of the autoclave.

This system is used to control the overshoot in the autoclave & to cool it rapidly to lower temperatures after the reaction is over. It circulates water to the internal cooling coil of reactors. It is a very essential feature for highly exothermic or runaway reactions. Cooling starts automatically if the rate of heating rises suddenly. It comes with monoblock pump, tank, pipeline & flexible hose pipes with QRC & is mounted on the autoclave trolley itself. Normal tap water cooling

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It is a single tube SS-316 (0.01m² area) heat exchanger used to reflux the condensate back into the reactor & vent off the uncondensed vapours. Optionally receiver can be offered to collect the condensate separately. Reflux condensor with receiver can be offered in different M.O.C & sizes.

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