



**MR Agitators**

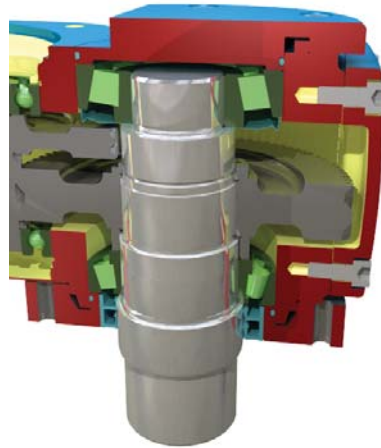
**Engineered for**

**Performance & Value**



# Reliability, Performance & Value

The MR model is the latest addition to Chemineer's line of high performance and reliable agitators. The MR agitator's gearbox is a proprietary, parallel-shaft, helical gear design that features minimum 30,000 hour L10 bearing life and an oversized output shaft for optimal performance and extended service life. Shaft speed selections are available from 7 to 380 rpm without the use of auxiliary reducers or electronic drives. When the MR gearbox is expertly matched with a wide variety of Chemineer impellers and other system components, MR agitators are capable of economically meeting your blending, dispersion, and other mixing needs.



## Gearbox Designed for Agitator Duty

Commercially available gearboxes for agitators in this size range normally have low-speed output shafts and bearing designs that are poorly suited to agitator duty. Commercial gearboxes typically use smaller diameter output shafts, resulting in the need to select larger and more expensive units to handle the torsional loads and bending moments produced by the hydraulic loads on agitator systems. These smaller output shafts and less robust bearing designs of commercial gearboxes also contribute to higher gear deflections, excessive vibration, higher maintenance costs, and a reduced life of many critical agitator

system components. The **MR gearbox addresses these concerns** by incorporating a larger output shaft straightened to exact tolerances and high capacity tapered roller bearings into its design. The rugged cast iron housing of the MR gearbox features a double lip seal to effectively contain the gearbox lubricant as well as a swing out seal change design that **saves maintenance labor and reduces downtime**. These design features **reduce the overall initial cost of the gearbox and other agitation system components and reduce the maintenance costs of the agitator**.

## Versatile Modular Design

The modular design of MR agitators makes them **well-suited for a variety of mixing applications**. MR agitators are designed to meet AGMA, OSHA, ANSI, IEC, DIN, EU and ATEX standards and requirements. They may be supplied with integral gearmotors, standard NEMA and IEC motors or explosion-proof motors. A variety of stuffing boxes or mechanical seals and many Chemineer custom pedestals, couplings, impellers, shafts, and steady bearings can be incorporated into

the MR design as well. This product can be mounted to support beams or similar structures for open tank operation or to pedestals, plates or flanges for closed tank operation. The MR agitator and all of its system components are included in the Chemineer Expert Design System (CEDs®), the industry leading agitator design and analysis software program. CEDs® helps insure that MR components are selected and configured for **optimal system performance and value**.

## Global Availability

To support the global manufacturing footprint of our customers, MR agitators are available in all major global markets with the same Chemineer assurance of reliability, performance and value. MR agitator gearboxes, mountings and system components are also interchangeable with the Chemineer Model 20 HT and GT agitators enabling customers to readily adapt or upgrade their agitator drives and system

components to changes in application requirements or operating environments.

With all of its versatility, MR agitators can become your global process system standard helping drive **efficiencies in procurement and reduce maintenance costs and replacement part investment.**

## Impeller Technology

Chemineer's impeller technology is effectively applied across your spectrum of applications ensuring successful, repeatable results from lab scale to full scale operations.

Chemineer's mixing expertise includes high flow, low shear liquid-liquid agitation, solids suspension, gas

dispersion, high shear blending and viscous mixing. Whether it is R&D or production phase, we have the expertise to solve your mixing challenges.

Impeller bulletin 710 is available with additional information.



SC-3



HE-3



XE-3



BT-6 Gas Dispersion



Maxflo W

# Features and Benefits

## Internal Shafting

### Features

- Oversized low speed shaft diameter and short bearing span reduce deflection and gear misalignment

### Benefits

- Extends seal and bearing life
- Lowers initial costs
- Lowers maintenance costs

## Gearing

### Features

- Double and triple reduction gearing for low gear loading and quiet operation
- Helical gearing

### Benefits

- Smooth operation
- Long service life
- Lowers energy costs

## Gearbox Lubrication

### Features

- Bath lubrication ensures adequate lubrication to gears and bearings at all operating speeds
- Standard R&O oils and greases
- Double lip seal

### Benefits

- Lowers initial costs
- Eliminates need for internal/external lubrication pumps
- Lowers installation and maintenance costs
- Lowers capital cost
- Maintains process fluid integrity

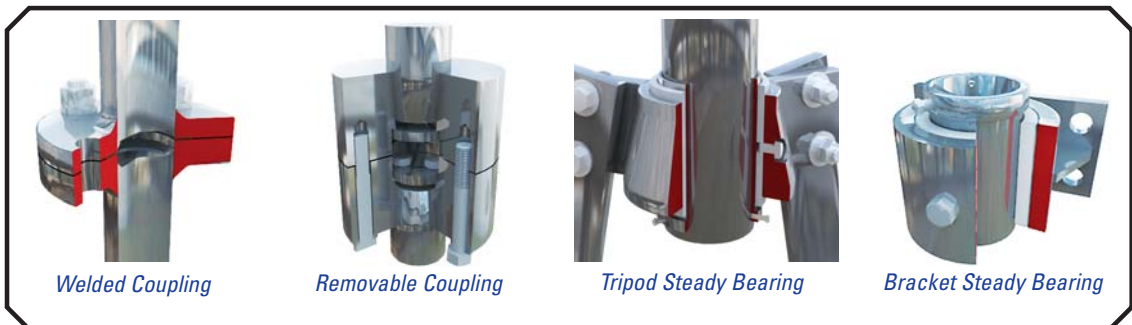
## Bearing Design

### Features

- Output shaft features tapered roller bearings and a short bearing span that provides greater capacity to handle bending and thrust loads
- Ball bearings, oil lubricated

### Benefits

- Extends service life
- Lowers maintenance costs
- Ensures cool operation and low maintenance



*In-Tank Coupling and Steady Bearing Options*

# Features and Benefits

## Seals

### Features

- Drop collar shaft support during seal change
- Swing out seal change design
- Variety of seal options from major mechanical seal vendors such as John Crane, Flowserve, Chesterton and AES
- Seal designs include cartridge single and double seals and split seals
- Low height pedestal design reduces shaft deflection at the seal
- Optional seal shut-off device

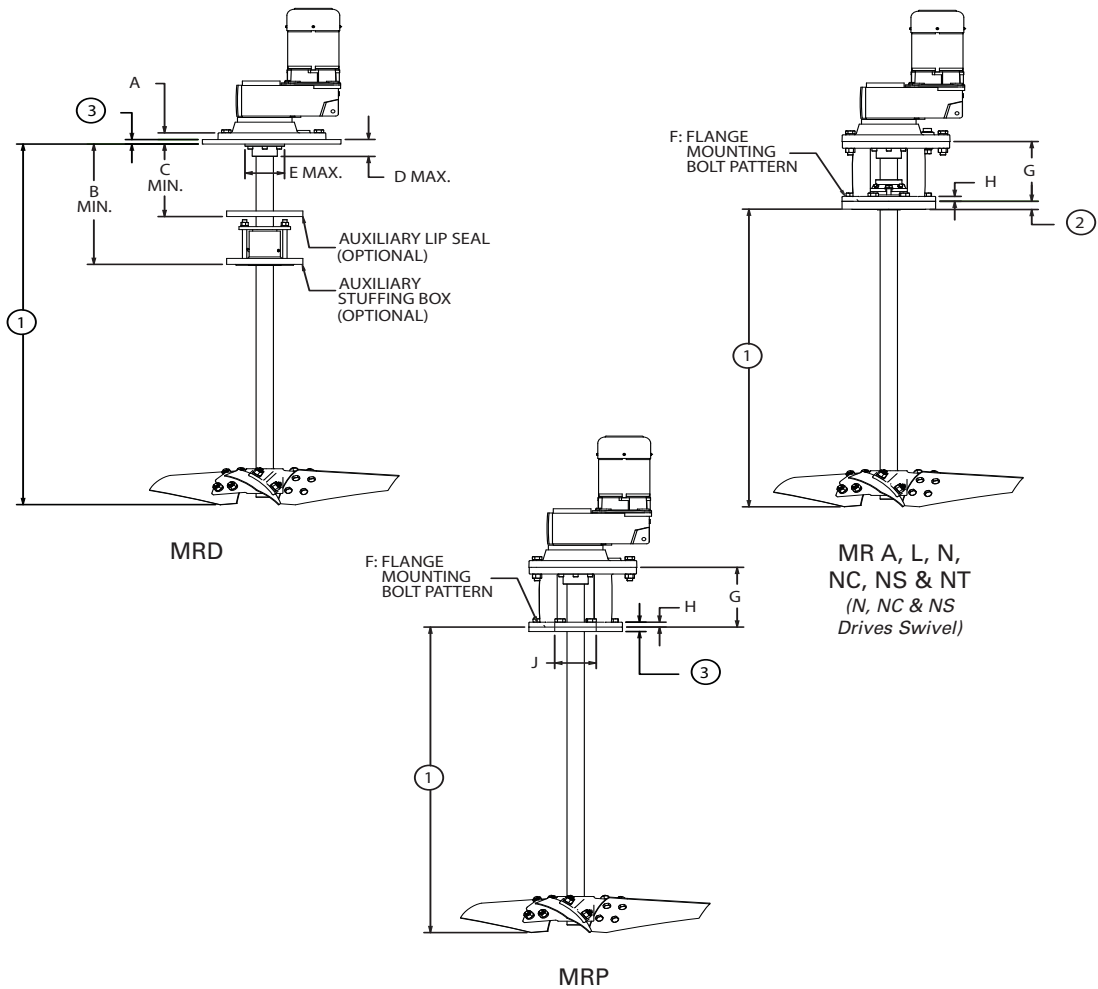
### Benefits

- Shaft drops easily by loosening coupling bolts, and engages by tightening the coupling bolts
- Shaft only drops 1/2" eliminating steady bearing disengagement
- No need to pull shaft up through gearbox or in-tank shaft supports
- No labor or parts required for special shaft support system
- No lifting and removing of gearbox, saving labor and downtime
- Seal vendor flexibility allows for lower parts inventory
- Long service life
- Reduces seal change out time and shaft wear
- Extends service life
- Minimizes downtime
- Eliminates operator exposure to hazardous vapors without draining the vessel



*Swing Out Seal Change*

# Dimensions



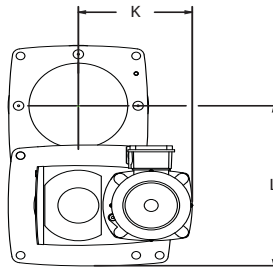
Agitator Dimensions									
CASE SIZE	A	B	C	D	E	F <sup>②</sup>	G	H	J
						Bolt Pattern			
11MR	1.12	16.00	8.00	2.81	5.71	8" - 150# ANSI (HOLES STRADDLE)	10.00	0.75	9.50
12MR									
13MR	1.50	20.00	8.00	4.00	7.48	10" - 150# ANSI (HOLES ON)	12.50	0.88	10.00
14MR									

- ① Agitator output speed, shaft diameter and extension, impeller design and other features not shown built to suit application.
- ② Alternate flange sizes are available
- ③ Both the D and P style agitators come with a steel base plate as standard. See Chemineer IOM manual for base plate dimensions.
- ④ These dimensions are only approximations, and may vary slightly depending on the motor options and the motor supplier chosen.

# Dimensions

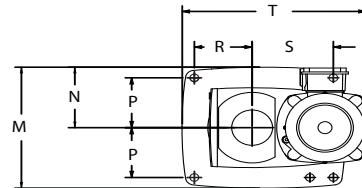
## Swivel Dimensions

CASE SIZE	K <sup>⊕</sup>	L
11MR	9.72	17.57
12MR	11.04	
13MR	13.03	22.61
14MR	15.02	



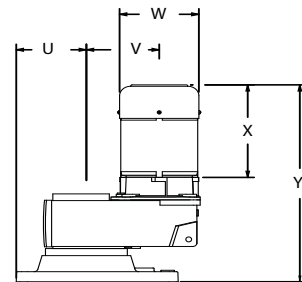
## Typical Drive Assembly Swivel Dimensions

(Drive assembly pivots at top of pedestal to allow change-out of mechanical seals. See I.O.M. for special motor conduit instructions)



## Motor Dimensions

FRAME SIZE	W <sup>⊕</sup>	X <sup>⊕</sup>	Y <sup>⊕</sup>				
			11MR	12MR	13MR	14MR	
NEMA	56C	7.75	13.11	25.75	26.84	28.78	29.78
	140TC	7.75	13.11	25.75	26.84	28.78	29.79
	180TC	9.25	16.24	30.03	31.97	35.51	36.51
	210TC	11.00	17.96	—	33.69	37.23	38.23
	250TC	12.75	22.25	—	—	41.52	42.53
	280TC	14.50	24.24	—	—	—	45.15
IEC	71	5.69	9.25	20.85	21.84	—	—
	80	6.61	10.66	23.05	24.04	—	—
	90	7.40	11.18	23.57	24.56	26.84	27.85
	100	7.72	13.15	26.21	27.20	29.76	30.77
	112	9.45	13.03	26.09	27.08	29.64	30.65
	132	10.16	16.73	—	32.00	35.58	36.59
	160	12.52	21.26	—	—	40.27	41.28
	180	14.37	23.31	—	—	57.40	58.40
INTEGRAL	71	5.43	9.06	17.20	18.18	—	—
	80	6.14	10.04	18.18	19.17	—	—
	90	6.92	11.65	19.79	20.78	22.28	23.27
	100	7.63	12.84	20.98	21.96	23.46	24.45
	112	8.58	13.74	21.88	22.87	24.37	25.36
	132	10.16	17.12	—	26.25	27.75	28.75
	160M/LMH	12.60	18.86	—	—	30.23	31.23
	160LH	12.60	20.42	—	—	31.81	32.80
	180MX/LX	12.60	20.42	—	—	—	32.80
	180MH/LH	14.09	24.52	—	—	—	36.90



## Drive Assembly Dimensions

CASE SIZE	M	N	P	R	S	T <sup>⊕</sup>	U	V
11MR	13.50	6.75	5.56	5.56	7.81	16.47	6.75	5.79
12MR						17.79		7.01
13MR	17.00	8.50	7.06	7.06	10.06	21.53	8.50	8.11
14MR						23.52		9.88



## Fluid Management Group

Chemineer, Inc. is part of the family of businesses that comprise the Fluid Management Group of Robbins & Myers, Inc. The Robbins & Myers Fluid Management Group is a leading provider of innovative fluid management solutions that deliver superior performance, long service life and exceptional value. The Group brings together its global resources — engineering, manufacturing, application expertise and cutting-edge, proprietary technology — to deliver high quality, dependable products, effective system solutions and responsive support services to benefit customers worldwide.

Satisfying a broad range of application needs, the Fluid Management Group focuses its resources on the oil and gas discovery and recovery, chemical process, water and wastewater, food, biofuels, pulp and paper, pharmaceutical and numerous other industries.

The Fluid Management Group's parent company, Robbins & Myers, Inc., supplies highly-engineered, critical equipment and systems for global energy, industrial, municipal, chemical and pharmaceutical markets. Robbins & Myers provides innovative products, application engineering expertise, customer support and a competitive cost structure that create value for its customers.



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