Vertical base mount and horizontal pedestal mounted multi-stage regenerative turbine pumps represent the most economical high performance alternative for low flow (2 to 38 GPM) applications involving moderate to high pressures (heads to 2300 feet).

By combining the latest concepts in hydraulic turbine pump design with precision computer controlled manufacturing, M50 Series pumps deliver high efficiency operation even at low NPSH. Costs are controlled by efficient manufacturing processes, use of standard motors, and highly optimized pump designs. Maintenance costs are kept to a minimum by combining an easily serviceable design with the use of high quality components to provide long life.

Water Passage Design
MTH masters one of the most critical design considerations of regenerative turbine pumps - the shaping of water passageways to achieve maximum capacity and pressure while minimizing horsepower requirements. By optimizing water passageway cross-sectional profiles for each impeller, MTH improves both efficiency and pressure in the M50 Series, and exceeds the standards realized by previous techniques.

Impeller Profile
One of the most notable improvements in regenerative turbine pump technology, incorporated in M50 Series pumps, involves the ability to determine the optimum impeller width and blade length. These factors have a significant effect on the required horsepower versus pressure curve for regenerative turbine pumps. By optimizing these for each pump, peak efficiency is improved and "off peak" horsepower requirements are reduced as well.

Impeller Blades
After the most favorable impeller profile has been determined for a particular water passageway cross-section, MTH calculates the number of blades needed to maximize the performance of that pump. The blade design in M50 Series pumps increases both efficiency and design pressure without incurring the manufacturing difficulties associated with producing contoured blade impellers. State-of-the-art computer controlled machines simplify manufacturing of the various MTH impellers utilized in the M50 Series. The result is a high performance pump providing efficiency characteristics exceeding those of much more expensive units.

NPSH Requirements
M50 Series regenerative turbine pumps meet low net positive suction head (NPSH) requirements without efficiency loss. This is achieved by keeping the inlet fluid velocity low and then gently accelerating to passageway velocities. Special ramps are responsible for this gentle fluid entry into the impeller blades and account for the high inlet efficiency of the M50 Series pumps.

Low NPSH Requirements
L50 Series regenerative turbine pumps have exceptionally low NPSH requirements, making them ideally suited for applications where very little inlet head is available.

This reduced NPSHR provided by the L50 Series is obtained by using a first stage centrifugal style impeller with inlet flow paths shaped to maintain a constant fluid velocity. This reduces entry losses to the impeller as well as maintaining efficiency. A multi-vane diffuser is used in conjunction with the centrifugal impeller for balancing radial loads and extracting the maximum pressure from the first stage. Pressure and flow produced by the NPSH inducer assures that the succeeding stages are adequately fed.

### STANDARD MATERIALS

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<th>PART</th>
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<th>ALL BRONZE</th>
<th>STAINLESS STEEL</th>
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<td>Buna N</td>
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<td>Viton</td>
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<tr>
<td>Seals</td>
<td>Buna/Ceramic</td>
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<td>Silicon Carbide Seal Seat &amp; External Seal Flush</td>
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<td>C30 - P30 5 to 30 HP</td>
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* Suction Pressure Plus a Percentage of Differential Pressure

### Engineering Specifications

**M50 • L50 SERIES**

The contractor shall furnish (and install as shown on the plans) an MTH (M50) (L50) Series (horizontal) (vertical base mount) close coupled (horizontal pedestal mounted) regenerative turbine type pump model _____ size ____ of (BRONZE FITTED) (ALL IRON) (ALL BRONZE) (316 STAINLESS STEEL) construction. Each pump shall have a capacity of ____GPM when operating at a total head of ____feet. Suction pressure will be ____feet with a liquid temperature of ____degrees F.

The pump is to be furnished with a mechanical seal with stainless steel metal parts, (Buna) (EPR) (Teflon) (Viton) elastomers, (ceramic) (ni-resist) (silicon carbide) (tungsten carbide) seat and carbon washer. Pump will have shaft sleeve or stainless steel shaft which will prevent pumped fluid from contacting motor shaft.

The L50 Series pump shall be low NPSHR inducer style design with a centrifugal radial vane design impeller and a multi-vane diffuser for balancing radial loads. The pump shall be vertically split design with replaceable external channel rings that have water passageways accurately machined into each ring. The suction and discharge will have (NPT) (SAE) (BSP) (ISO) threads located in the top vertical position for self-venting and shall be cast separately from one another. The impeller(s) shall be hydraulically self-centering and no external adjustment shall be necessary.

The close coupled pump shall be mounted to a standard NEMA ____HP ____phase ____Hertz ____volt ____RPM (horizontal) (vertical), (open drip proof) (totally enclosed) (explosion proof) motor. Each pump shall be tested at the specified capacity and head prior to shipment. The motor shall be sized to prevent overloading at the highest head condition listed in the specifications.

The pedestal mounted pump shall be mounted on a bearing pedestal with sealed, grease lubricated ball bearings having a two year minimum design life under a maximum pump differential pressure of 1000 PSI, and the shaft shall be of a stainless steel material. Pump and motor shall be mounted on a common steel baseplate, flexible coupled with coupling guard to a standard horizontal NEMA ____HP ____phase ____Hertz ____volt ____RPM (open drip proof) (totally enclosed) motor. Coupling alignment shall be checked after installation. Each pump shall be tested at the specified capacity and head prior to shipment. The motor shall be sized to prevent overloading at the highest head condition listed in the specifications.
## M50 • L50 SERIES

### Performance Curves

**M50 • L50 Series**

**3450 RPM**

**NOTES**

- Usable Operating Range
- Refer to Factory for Operation in this Range
- Refer to Individual Curves for Horsepower and NPSH Requirements

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M50 • L50 SERIES
Performance Curves

M50 • L50 Series 2880 RPM

U.S. GALLONS PER MINUTE

HEAD IN FEET

M50 • L50 Series 2880 RPM

U.S. GALLONS PER MINUTE

HEAD IN FEET

NOTES
- Usable Operating Range
- Refer to Factory for Operation in this Range
- Refer to Individual Curves for Horsepower and NPSH Requirements
Recommended Operating Range
Refer to Factory for Operation in this Range
*Add .43 horsepower for L50B Inducer Models
Horsepower data is valid for 1.0 specific gravity fluids only
M50 • L50 SERIES
Performance Curves

2880 RPM

M50B • L50B

HEAD IN FEET

0 2 4

U.S. GALLONS PER MINUTE

0 1 2 3 4

NPSH IN FEET

0 5

BHP

0.0 0.5 1.0 1.5 2.0 2.5 3.0

M50B NPSHR
L50B NPSHR

NOTES

Recommended Operating Range
Refer to Factory for Operation in this Range

*Add .26 horsepower for L50B Inducer Models
Horsepower data is valid for 1.0 specific gravity fluids only

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M50 • L50 SERIES

Performance Curves

3450 RPM

M50C • L50C

M50 • L50 SERIES PUMPS

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NOTES
- Recommended Operating Range
- Refer to Factory for Operation in this Range
- Add .45 horsepower for L50C Inducer Models
- Horsepower data is valid for 1.0 specific gravity fluids only

M51C  L51C
M52C  L52C
M53C  L53C
M54C  L54C
M55C  L55C
M50C NPSHR
L50C NPSHR

U.S. GALLONS PER MINUTE

0 1 2 3 4 5 6

HEAD IN FEET
0 500 1000 1500 2000 2500

NPSH IN FEET
0 5 10

BHP
0 1 2 3 4 5

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M50 • L50 SERIES
Performance Curves

M50C • L50C

2880 RPM

M50C • L50C

M54C • L54C

M53C • L53C

M52C • L52C

M51C • L51C

M50C NPSHR

L50C NPSHR

U.S. GALLONS PER MINUTE

HEAD IN FEET

NPSH IN FEET

BHP

M51C • L51C*

M54C • L54C*

M53C • L53C*

M52C • L52C*

M51C • L51C*

NOTES
Recommended Operating Range
Refer to Factory for Operation in this Range
*Add .27 horsepower for L50C Inducer Models
Horsepower data is valid for 1.0 specific gravity fluids only

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M50 • L50 SERIES
Performance Curves

M50D • L50D
3450 RPM

M53D • L53D
M54D • L54D
M55D • L55D
M52D • L52D
M51D • L51D
M50D NPSHR
L50D NPSHR

U.S. GALLONS PER MINUTE

HEAD IN FEET

0 1 2 3 4 5 6 7 8
0 500 1000 1500 2000 2500

NPSH IN FEET

0 5 10 15

BHP

0 1 2 3 4 5 6

NOTES
Recommended Operating Range
Refer to Factory for Operation in this Range
*Add .49 horsepower for L50D Inducer Models
Horsepower data is valid for 1.0 specific gravity fluids only

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M50 • L50 SERIES
Performance Curves

M50D • L50D
2880 RPM

NOTES
Recommended Operating Range
Refer to Factory for Operation in this Range
*Add .29 horsepower for L50D Inducer Models
Horsepower data is valid for 1.0 specific gravity fluids only

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M50 • L50 SERIES
Performance Curves

3450 RPM

M50E • L50E

M51E • L51E

M52E • L52E

M53E • L53E

M54E • L54E

M55E • L55E

NOTES

Recommended Operating Range
Refer to Factory for Operation in this Range

*Add .57 horsepower for L50E Inducer Models

Horsepower data is valid for 1.0 specific gravity fluids only

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M50 • L50 SERIES
Performance Curves

M50E • L50E

2880 RPM

U.S. GALLONS PER MINUTE

HEAD IN FEET

NPSH IN FEET

BHP

M51E • L51E

M52E • L52E

M53E • L53E

M54E • L54E

M55E • L55E

M50E NPSHR

L50E NPSHR

NOTES
Recommended Operating Range
Refer to Factory for Operation in this Range
*Add .33 horsepower for L50E Inducer Models
Horsepower data is valid for 1.0 specific gravity fluids only

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M50 • L50 SERIES
Performance Curves

M50G • L50G

3450 RPM

U.S. GALLONS PER MINUTE

HEAD IN FEET

0 2 4 6 8 10 12 14

0 2 4 6 8 10 12 14

BHP

NPSH IN FEET

0 5 10 15

NOTES
- Recommended Operating Range
- Refer to Factory for Operation in this Range
- * Add .62 horsepower for L50G Inducer Models
- * Horsepower data is valid for 1.0 specific gravity fluids only

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Dated May 2011
M50 • L50 SERIES
Performance Curves

M50G • L50G

NOTES
Recommended Operating Range
Refer to Factory for Operation in this Range
*Add .35 horsepower for L50G Inducer Models
Horsepower data is valid for 1.0 specific gravity fluids only

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NOTES

- Recommended Operating Range
- Refer to Factory for Operation in this Range

*Add .70 horsepower for L50J Inducer Models

Horsepower data is valid for 1.0 specific gravity fluids only
M50 • L50 SERIES
Performance Curves

U.S. GALLONS PER MINUTE

HEAD IN FEET

NPSH IN FEET

BHP

M50J • L50J

M51J • L51J

M52J • L52J

M53J • L53J

M54J • L54J

M55J • L55J

M50J NPSHR

L50J NPSHR

NOTES

Recommended Operating Range
Refer to Factory for Operation in this Range
*Add .38 horsepower for L50J Inducer Models
Horsepower data is valid for 1.0 specific gravity fluids only
M50 • L50 SERIES
Performance Curves

M50L • L50L

3450 RPM

U.S. GALLONS PER MINUTE

HEA IN FEET

NPSH IN FEET

M50L • L50L

M53L • L53L

M54L • L54L

M55L • L55L

M50L NPSHR

L50L NPSHR

NOTES

Recommended Operating Range
Refer to Factory for Operation in this Range

*Add .81 horsepower for L50L Inducer Models
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M50 • L50 SERIES
Performance Curves

M50L • L50L

2880 RPM

NOTES
Recommended Operating Range
Refer to Factory for Operation in this Range
*Add .43 horsepower for L50L Inducer Models
Horsepower data is valid for 1.0 specific gravity fluids only

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M50 • L50 SERIES

Performance Curves

U.S. GALLONS PER MINUTE

HEAD IN FEET

NPSH IN FEET

BHP

NOTES

Recommended Operating Range
Refer to Factory for Operation in this Range
*Add .86 horsepower for L50M Inducer Models
Horsepower data is valid for 1.0 specific gravity fluids only

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M50 • L50 SERIES
Performance Curves

**M50M • L50M**

- **2880 RPM**

**NOTES**

- **Recommended Operating Range**
- Refer to Factory for Operation in this Range
- *Add .46 horsepower for L50M Inducer Models*
- Horsepower data is valid for 1.0 specific gravity fluids only

---

U.S. GALLONS PER MINUTE

**HEAD IN FEET**

**NPSH IN FEET**

**BHP**

---

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M50 • L50 SERIES
Performance Curves

3450 RPM

U.S. GALLONS PER MINUTE

HEAD IN FEET

0  5  10  15  20  25  30  35

0  5  10  15  20  25  30  35

BHP

NOTES
Recommended Operating Range
Refer to Factory for Operation in this Range
*Add .97 horsepower for L50P Inducer Models
Horsepower data is valid for 1.0 specific gravity fluids only
M50 • L50 SERIES
Performance Curves

2880 RPM

NOTES
Recommended Operating Range
Refer to Factory for Operation in this Range
*Add .53 horsepower for L50P Inducer Models
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M50 • L50 SERIES
Performance Curves

M50R • L50R

3450 RPM

U.S. GALLONS PER MINUTE

HEAD IN FEET

NPSH IN FEET

M51R • L51R
M52R • L52R
M53R • L53R
M54R • L54R
M55R • L55R
M50R • L50R
M50R NPSHR
L50R NPSHR

NOTES

Recommended Operating Range
Refer to Factory for Operation in this Range
*Add 1.08 horsepower for L50R Inducer Models
Horsepower data is valid for 1.0 specific gravity fluids only

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M50 • L50 SERIES
Performance Curves

U.S. GALLONS PER MINUTE

0  5  10  15  20  25  30  35  40

HEAD IN FEET

0  500  1000  1500  2000

NPSH IN FEET

0  5  10  15

BHP

0  5  10  15  20  25  30

M50R • L50R

M50R NPSHR

L50R NPSHR

NOTES
Recommended Operating Range
Refer to Factory for Operation in this Range
*Add .61 horsepower for L50R Inducer Models
Horsepower data is valid for 1.0 specific gravity fluids only
### Dimensions

#### M50 • L50 SERIES PUMPS WITHOUT INDUCER

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### Notes

- All dimensions in inches. May vary ± 1/4 inches.
- Not for construction purposes unless certified.
- *See motor price sheet for C-AH dimension (varies depending on motor enclosure).
- Model M52 shown in Multistage Dimensions. Model M51 shown in Single Stage Dimensions.
M50 • L50 SERIES

Dimensions

**M50 SERIES BASE MOUNTED CLOSE COUPLED WITH C3 MOTOR (WITHOUT INDUCER)**

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**L50 SERIES BASE MOUNTED CLOSE COUPLED WITH C3 MOTOR (WITH INDUCER)**

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**NOTES**

All dimensions in inches. May vary ± 1/4 inches. Not for construction purposes unless certified.

*See motor price sheet for C-AH dimension (varies depending on motor enclosure)
## M50 • L50 SERIES

### Dimensions

#### M50 SERIES BASE MOUNTED CLOSE COUPLED WITH C30 MOTOR (WITHOUT INDUCER)

| FRAME | C-AH | 2F | E | H | G | D | W | S | P | L | S | P | L | S | P | L | S | P | L |
|-------|------|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 184   | 13/4 | 5/2 | 3 3/4 | 3/8-16 | 1 3/16 | 5 1/4 | 12 | 7 1/2 | 13 1/2 | 28 | 10 | 16 | 30 | 12 1/2 | 18 1/2 | 32 | 15 | 21 | 35 |
| 213   | 15 1/2 | 5 1/2 | 3 3/4 | 4 1/4-16 | 1 3/16 | 5 1/4 | 12 | 7 1/2 | 14 1/4 | 32 | 10 | 16 3/4 | 40 | 15 1/2 | 21 3/4 | 40 |
| 215   | 17 | 7 | 4 1/4-16 | 3/8-16 | 1 3/16 | 5 1/4 | 12 | 7 1/2 | 14 1/4 | 32 | 10 | 16 3/4 | 40 | 15 1/2 | 21 3/4 | 40 |
| 254   | 19 3/4 | 8 1/4 | 5 1/2-13 | 1 3/16 | 6 1/4 | 15 | 17 1/2 | 15 | 35 | 15 | 17 1/2 | 40 | 12 1/2 | 20 1/2 | 40 | 15 | 22 1/2 | 45 |
| 256   | 21 1/2 | 10 | 5 1/2-13 | 1 3/16 | 6 1/4 | 15 | 17 1/2 | 15 | 35 | 15 | 17 1/2 | 40 | 12 1/2 | 20 1/2 | 40 | 15 | 22 1/2 | 45 |
| 284   | 22 | 9 1/2 | 5 1/2 | 1/2-13 | 1 3/16 | 7 | 15 | 17 1/2 | 15 | 35 | 15 | 17 1/2 | 40 | 12 1/2 | 20 1/2 | 45 | 15 | 23 | 45 |
| 286   | 23 1/2 | 11 | 5 1/2 | 1/2-13 | 1 3/16 | 7 | 15 | 17 1/2 | 15 | 35 | 15 | 17 1/2 | 40 | 12 1/2 | 20 1/2 | 45 | 15 | 23 | 45 |

#### L50 SERIES BASE MOUNTED CLOSE COUPLED WITH C30 MOTOR (WITH INDUCER)

| FRAME | C-AH | 2F | E | H | G | D | W | S | P | L | S | P | L | S | P | L | S | P | L | S | P | L |
| 184   | 13 3/4 | 5 1/2 | 3 3/4 | 3/8-16 | 2 1/4 | 5 1/4 | 12 | 8 7/16 | 15 7/16 | 30 | 10 | 15 16 | 17 1/6 | 17 15/16 | 32 | 13 7/16 | 20 7/16 | 35 | 15 | 15 16 | 22 15/16 | 40 |
| 213   | 15 1/2 | 5 1/2 | 4 1/4-16 | 3/8-16 | 2 1/4 | 5 1/4 | 12 | 8 7/16 | 16 3/16 | 35 | 10 | 15 16 | 18 11/16 | 35 | 13 7/16 | 21 3/16 | 40 | 15 | 15 16 | 23 11/16 | 40 |
| 215   | 17 | 7 | 4 1/4-16 | 3/8-16 | 2 1/4 | 5 1/4 | 12 | 8 7/16 | 16 3/16 | 35 | 10 | 15 16 | 18 11/16 | 35 | 13 7/16 | 21 3/16 | 40 | 15 | 15 16 | 23 11/16 | 40 |
| 254   | 19 3/4 | 8 1/4 | 5 | 1/2-13 | 2 1/4 | 6 1/4 | 15 | 8 7/16 | 15 16 | 40 | 10 | 15 16 | 19 7/16 | 40 | 13 7/16 | 21 15/16 | 45 | 15 | 15 16 | 24 17/16 | 45 |
| 256   | 21 1/2 | 10 | 5 | 1/2-13 | 2 1/4 | 6 1/4 | 15 | 8 7/16 | 16 15 | 40 | 10 | 15 16 | 19 7/16 | 40 | 13 7/16 | 21 15/16 | 45 | 15 | 15 16 | 24 17/16 | 45 |
| 284   | 22 | 9 1/2 | 5 1/2 | 1/2-13 | 2 1/4 | 7 | 15 | 8 7/16 | 17 16 | 40 | 10 | 15 16 | 19 15 | 45 | 13 7/16 | 22 7/16 | 45 | 15 | 15 16 | 24 15/16 | 50 |
| 286   | 23 1/2 | 11 | 5 1/2 | 1/2-13 | 2 1/4 | 7 | 15 | 8 7/16 | 17 16 | 40 | 10 | 15 | 19 15 | 45 | 13 7/16 | 22 7/16 | 45 | 15 | 15 16 | 24 15/16 | 50 |

### Notes

- All dimensions in inches. May vary ± 1/4 inches.
- Not for construction purposes unless certified.
- *See motor price sheet for C-AH dimension (varies depending on motor enclosure)
M50 • L50 SERIES
Dimensions

M50 • L50 SERIES PUMP END ONLY WITH P3 BEARING PEDESTAL

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PUMPS WITHOUT INDUCER

PUMPS WITH INDUCER

M50 • L50 SERIES PUMP END ONLY WITH P30 BEARING PEDESTAL

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PUMPS WITHOUT INDUCER

PUMPS WITH INDUCER

NOTES
All dimensions in inches. May vary ± 1/4 inches. Not for construction purposes unless certified.
### M50 Series Dimensions

![Diagram of M50 Series Dimensions]

#### M50 Series Base Mounted Assembly with P3 Bearing Frame (Without Inducer)

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*Refer to T51 Series*

**All M50 Models**

**Model M51**

**Model M52**

**Model M53**

**Model M54**

**Model M55**

#### M50 Series Base Mounted Assembly with P3 Bearing Frame (With Inducer)

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**All L50 Models**

**Model L51**

**Model L52**

**Model L53**

**Model L54**

**Model L55**

#### L50 Series Dimensions

![Diagram of L50 Series Dimensions]

### Notes

- All dimensions in inches. May vary ± 1/4 inches.
- Not for construction purposes unless certified.
- *See motor price sheet for C dimension (varies depending on motor enclosure)
### M50 SERIES BASE MOUNTED ASSEMBLY WITH P30 BEARING FRAME (WITHOUT INDUCER)

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### L50 SERIES BASE MOUNTED ASSEMBLY WITH P30 BEARING FRAME (WITH INDUCER)

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**Notes:**
- All dimensions in inches. May vary ± 1/4 inches.
- Not for construction purposes unless certified.
- *See motor price sheet for C dimension (varies depending on motor enclosure)