

# Hydra-Cell®

## Seal-less Pumps

**Versatile, Reliable Pumps for a Wide Range of Applications**



### M03 Series

- Pumps the full spectrum of low-to-high viscosity fluids.
- Features a seal-less design and horizontal disk check valves that enable the pump to handle abrasives and particulates that might damage or destroy other types of pumps.
- Simple, compact design reduces initial investment and lowers maintenance costs.
- Operational efficiencies reduce energy costs.
- Able to run dry without damage (or additional maintenance) to the pump in case of accident or operator error.
- Tolerates non-ideal operating conditions.
- Minimizes maintenance and downtime because there are no mechanical or dynamic seals, packing, or cups to leak, wear, or replace.

# M03 Series

Maximum Flow Rate: 3.1 gpm (11.7 l/min)

Maximum Pressure: 1200 psi (83 bar) for Metallic Pump Heads  
350 psi (24 bar) for Non-metallic Pump Heads



*M03 close-coupled with Brass pump head.*



*M03 close-coupled with Polypropylene pump head.*



*D03 shaft-driven with 316L Stainless Steel pump head.*

# M03 Series Performance

## Capacities

### Flow

Model	Max. Input rpm	Max. Flow @ 1000 psi (69 bar)	
		gpm	l/min
M03-X	1750	3.1	11.7
M03-E	1750	2.2	8.3
M03-S	1750	1.7	6.4
M03-B	1750	1.0	3.6
M03-G	1750	0.6	2.3

@ 1200 psi (83 bar)			
M03-E	1750	2.1	8.1
M03-S	1750	1.6	6.3
M03-B	1750	0.9	3.5
M03-G	1750	0.6	2.2

### Pressure

#### Maximum Inlet Pressure

250 psi (17 bar)

#### Maximum Discharge Pressure

Metallic Pump Heads:

M03-X to 1000 psi (69 bar)

M03-S, E, B, G to 1200 psi (83 bar)

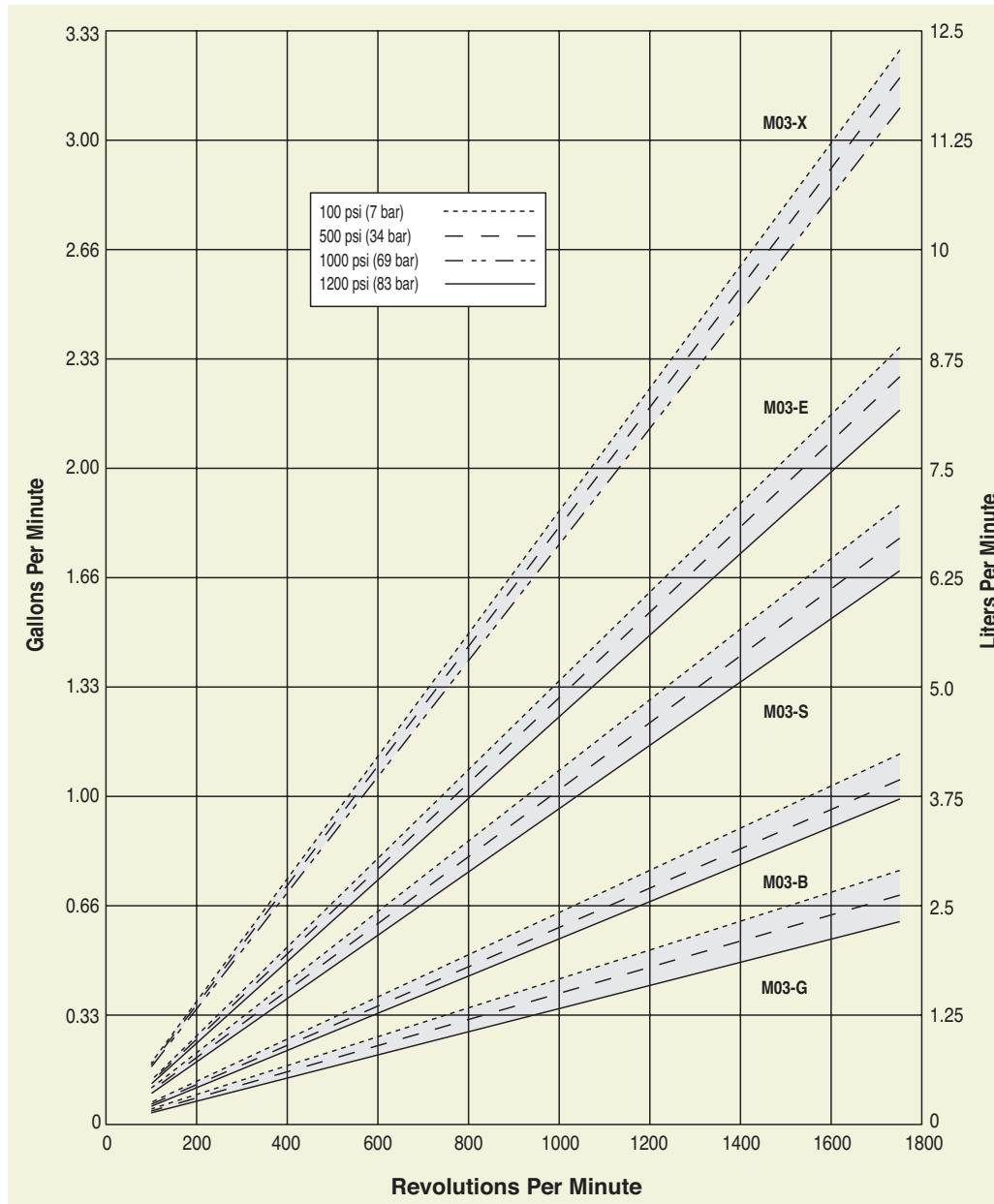
Non-metallic Pump Heads:

250 psi (17 bar) Polypropylene

350 psi (24 bar) PVDF

Performance and specification ratings apply to M03 Kel-Cell and D03 Shaft-driven configurations unless specifically noted otherwise.

## Maximum Flow at Designated Pressure



# M03 Series Specifications

## Flow Capacities @1000 psi (69 bar)

Model	rpm	gpm	l/min
M03-X	1750	3.10	11.73
M03-E	1750	2.18	8.25
M03-S	1750	1.69	6.40
M03-B	1750	0.96	3.63
M03-G	1750	0.62	2.35

## Delivery @1200 psi (83 bar)

Model	gal/rev	liters/rev
M03-E	0.0012	0.0046
M03-S	0.0009	0.0036
M03-B	0.0005	0.0020
M03-G	0.0003	0.0013

## Delivery @1000 psi (69 bar)

Model	gal/rev	liters/rev
M03-X	0.0018	0.0067
M03-E	0.0013	0.0047
M03-S	0.0010	0.0037
M03-B	0.0005	0.0021
M03-G	0.0004	0.0013

## Maximum Discharge Pressure

Metallic Heads:	M03-X to 1000 psi (69 bar)
	M03-S, E, B to 1200 psi (83 bar)
Non-metallic Heads:	250 psi (17 bar) Polypropylene
	350 psi (24 bar) PVDF

## Maximum Inlet Pressure 250 psi (17 bar)

## Maximum Operating Temperature

Metallic Heads:	250 °F (121 °C) - Consult factory for correct component selection for temperatures from 160 °F (71 °C) to 250 °F (121 °C).
Non-metallic Heads:	140 °F (60 °C)

## Maximum Solids Size 200 microns

## Inlet Port

Primary:	1/2 inch NPT
Secondary:	3/8 inch NPT (plugged from factory)

## Discharge Port 3/8 inch NPT

## Shaft Diameter

M03: 5/8 inch hollow shaft
D03: 7/8 inch (22.2 mm)

## Shaft Rotation Reverse (bi-directional)

## Bearings Precision ball bearings

## Oil Capacity 1.0 US quart (0.95 liters)

## Weight

Metallic Heads:	28 lbs. (12.7 kg)
Non-metallic Heads:	19 lbs. (8.6 kg)

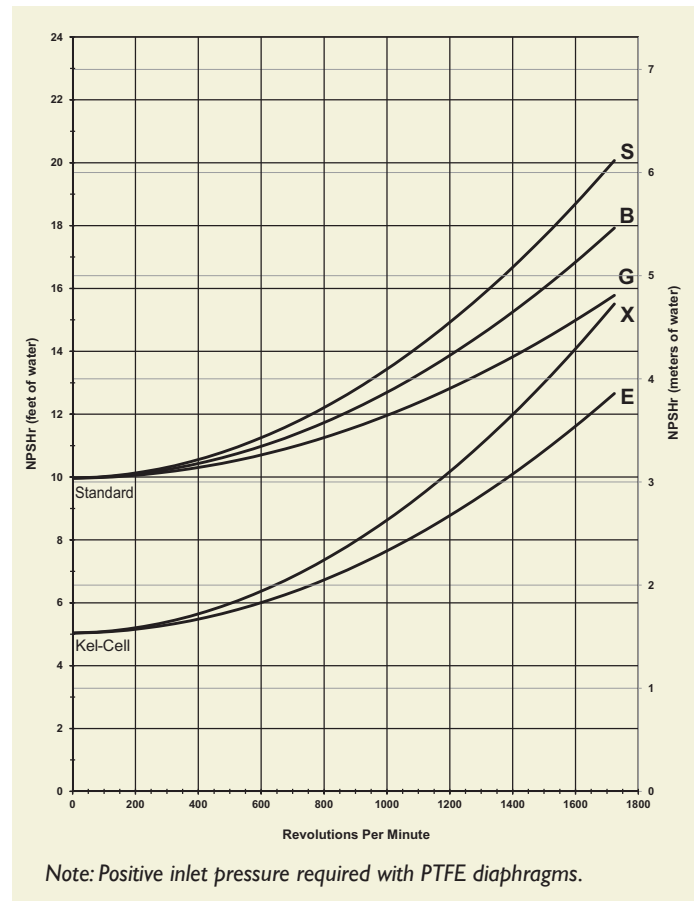
## Calculating Required Power

$$\frac{6 \times \text{rpm}}{63,000} + \frac{\text{gpm} \times \text{psi}}{1,460} = \text{electric motor hp}$$

$$\frac{6 \times \text{rpm}}{84,428} + \frac{\text{l/min} \times \text{bar}}{511} = \text{electric motor kW}$$

When using a variable frequency drive (VFD) controller, calculate the hp or kW at minimum and maximum pump speed to ensure the correct hp or kW motor is selected. Note that motor manufacturers typically de-rate the service factor to 1.0 when operating with a VFD.

## Net Positive Suction Head (NPSHr)

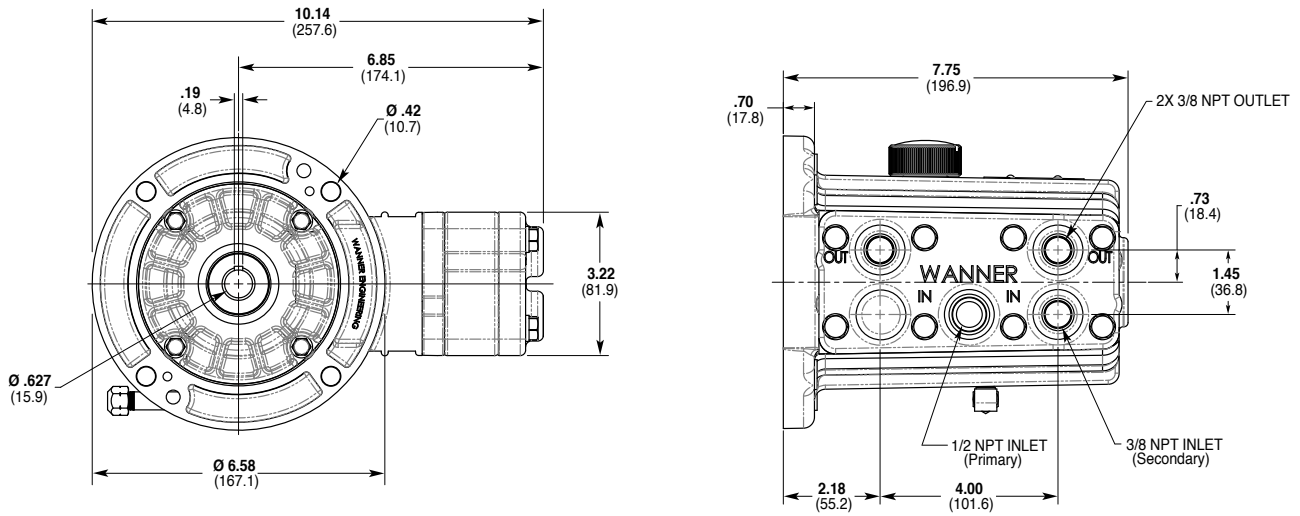


## Self-priming:

Each Hydra-Cell pump has different lift capability depending on model size, cam angle, speed, and fluid characteristics. To ensure that your specific lift characteristics are met, refer to the inlet calculations regarding friction, and acceleration head losses in your Hydra-Cell Installation & Service Manual. Compare those calculations to the NPSHr curves above.

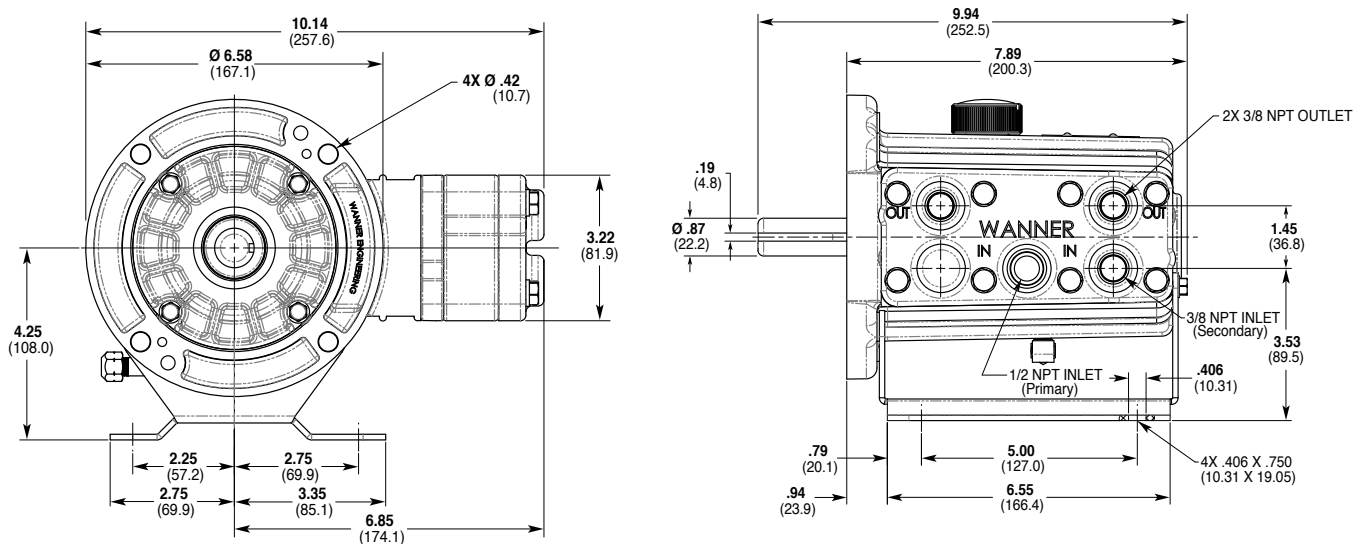
# M03 Series Representative Drawings

## M03 Models with Metallic Pump Head Inches (mm)



\* Add 0.38" (9.65mm) overall length where shown for manifold cover plate on non-metallic models and 0.20" (5.08mm) for bolt heads attaching the plate.

## D03 Models with Metallic Pump Head Inches (mm)



\* Add 0.38" (9.65mm) overall length where shown for manifold cover plate on non-metallic models and 0.20" (5.08mm) for bolt heads attaching the plate.

**Note:** Contact factory for additional drawings of specific models and configurations.

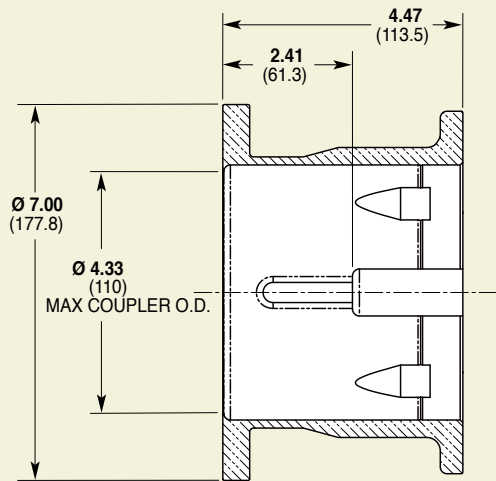
# M03 Series **Adapters/Valves**

## Pump/Motor Adapter Inches (mm)

### Part Number: A04-001-I202

Must be ordered separately for D03 models for use with 56C, I43TC and I45TC frame motors.

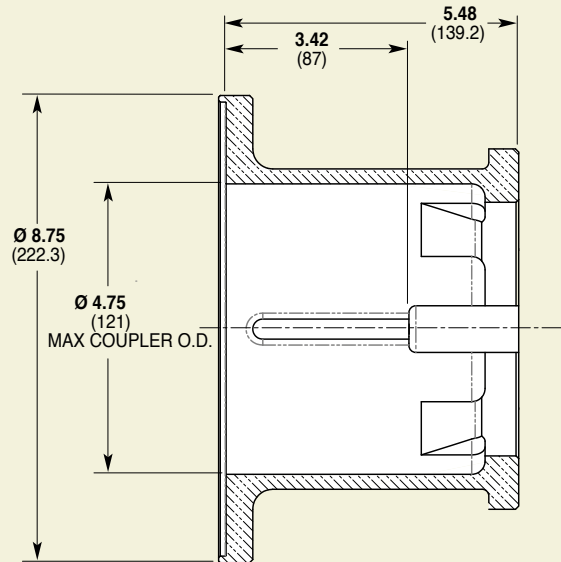
*Metric adapter available - consult factory.*



### Part Number: A04-002-I202

Must be ordered separately for D03 models for use with I82TC, I84TC, 2I3TC and 2I5TC frame motors.

*Metric adapter available - consult factory.*



## Valve Selection

A Hydra-Cell M03/D03 pumping system uses a C46 Pressure Regulating Valve.



*For complete specifications and ordering information, consult the Hydra-Cell Master Catalog.*

# M03 Series **How to Order**

## Ordering Information

1	2	3	4	5	6	7	8	9	10	11	12
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A complete M03 Series Model Number contains 12 digits including 9 customer-specified design and materials options, for example: M03XKSTHFECA.

Digit	Order Code	Description
<b>1-3</b>		<b>Pump Configuration</b>
	<b>D03</b>	Shaft-driven (NPT Ports)*
	<b>M03</b>	Close-coupled to NEMA 56C footed motor (NPT Ports) *Pump/motor adapters ordered separately. See previous page.
<b>4</b>		<b>Hydraulic End Cam</b>
	<b>X</b>	Max 3.1 gpm (11.7 l/min) @ 1750 rpm
	<b>E</b>	Max 2.2 gpm (8.3 l/min) @ 1750 rpm
	<b>S</b>	Max 1.7 gpm (6.4 l/min) @ 1750 rpm
	<b>B</b>	Max 1.0 gpm (3.6 l/min) @ 1750 rpm
<b>5</b>		<b>Pump Head Version</b>
	<b>A</b>	Standard NPT Ports (S, B & G cams)
	<b>K</b>	Kel-Cell NPT Ports (X & E cams)
<b>6</b>		<b>Pump Head Material</b>
	<b>B</b>	Brass
	<b>M</b>	PVDF
	<b>P</b>	Polypropylene
	<b>S</b>	316L Stainless Steel
<b>7</b>		<b>Diaphragm &amp; O-ring Material</b>
	<b>A</b>	Aflas diaphragm/PTFE o-ring
	<b>E</b>	EPDM (requires EPDM-compatible oil - Digit 12 oil code J)
	<b>G</b>	FKM
	<b>J</b>	PTFE (positive inlet pressure required for S, B, and G cams)
	<b>P</b>	Neoprene
<b>8</b>		<b>Valve Seat Material</b>
	<b>C</b>	Ceramic
	<b>D</b>	Tungsten Carbide
	<b>H</b>	17-4 Stainless Steel
	<b>S</b>	316L Stainless Steel
	<b>T</b>	Hastelloy C

Digit	Order Code	Description
<b>9</b>		<b>Valve Material</b>
	<b>C</b>	Ceramic
	<b>D</b>	Tungsten Carbide
	<b>F</b>	17-4 Stainless Steel
	<b>N</b>	Nitronic 50
	<b>T</b>	Hastelloy C
<b>10</b>		<b>Valve Springs</b>
	<b>E</b>	Elgiloy
	<b>S</b>	316L Stainless Steel
	<b>T</b>	Hastelloy C
<b>11</b>		<b>Valve Spring Retainers</b>
	<b>C</b>	Celcon
	<b>H</b>	17-7 Stainless Steel (used with metallic heads only)
	<b>M</b>	PVDF
	<b>P</b>	Polypropylene
	<b>T</b>	Hastelloy C (used with metallic heads only)
<b>12</b>		<b>Hydra-Oil</b>
	<b>A</b>	10W30 standard-duty oil
	<b>G</b>	5W30 cold-temp severe-duty synthetic oil
	<b>J</b>	EPDM-compatible oil
	<b>K</b>	Food-contact oil

### Consult the Hydra-Cell Master Catalog for:

- Motors, bases, couplings and other pump accessories
- Hydra-Oil selection and specification information
- Design considerations, installation guidelines, and other technical assistance in pump selection

# Hydra-Cell<sup>®</sup>

## Seal-less Pumps



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