

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 seals, packing or cups to leak 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



QUOTED MODEL

M03 Close-Coupled with 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)

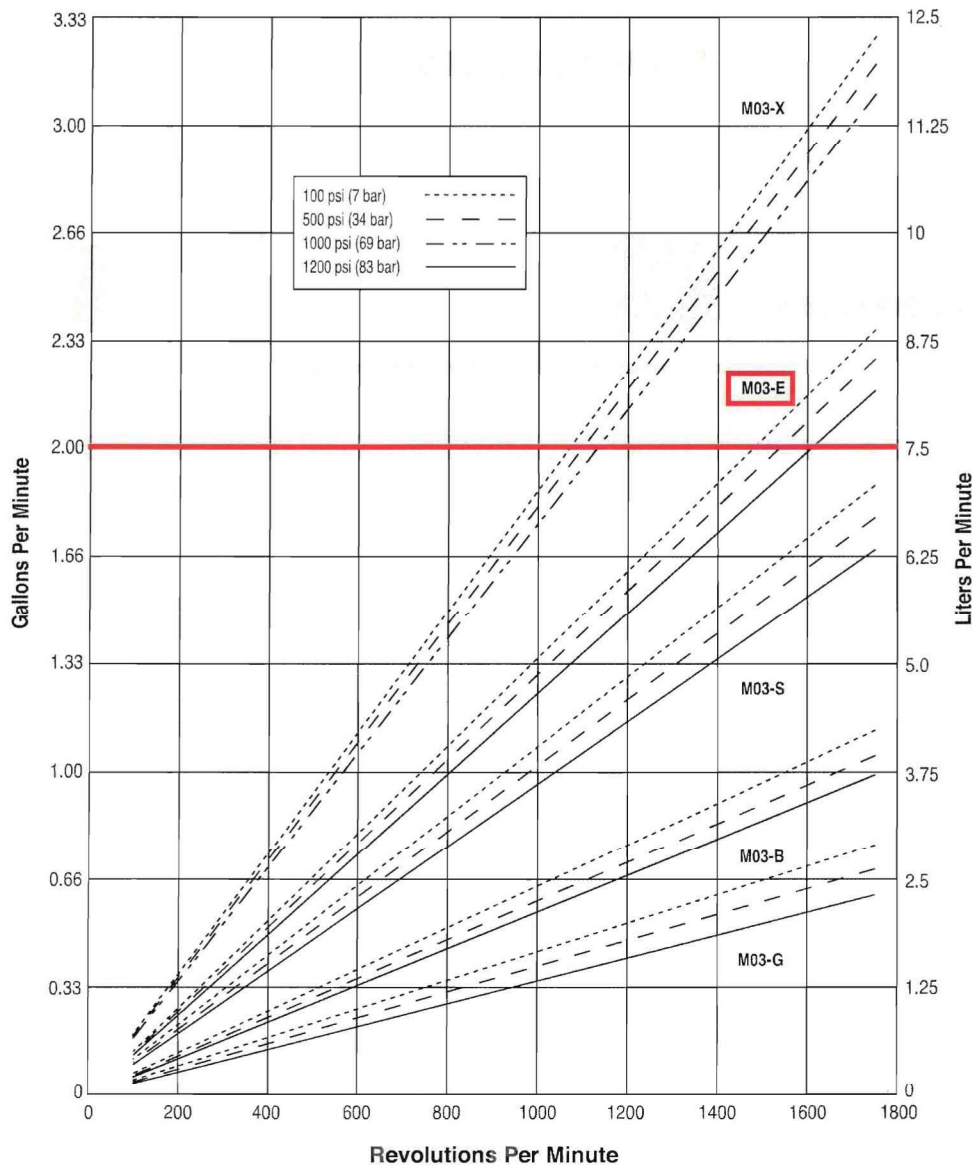
Non-metallic Pump Heads:

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 (15.9 mm) 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)

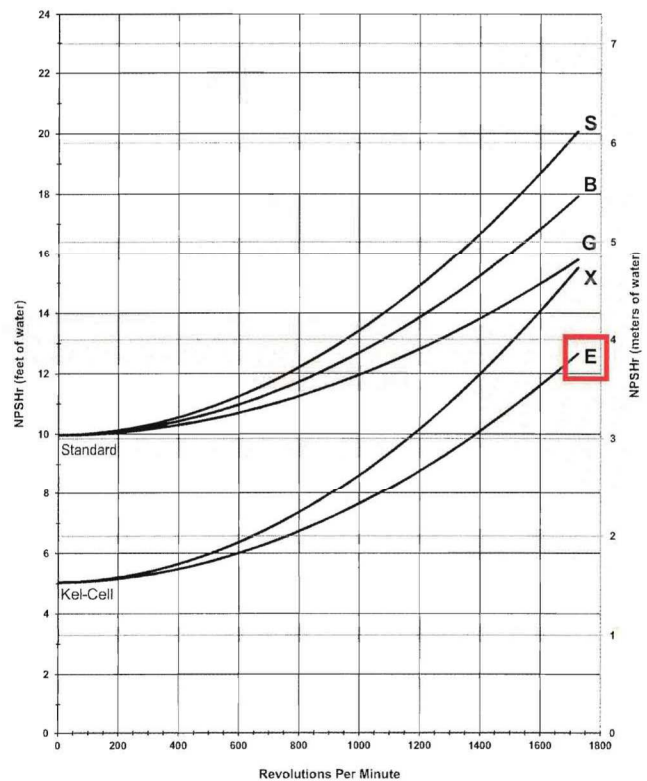
Calculating Required Power

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

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

When using a variable frequency controller (VFD) 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)



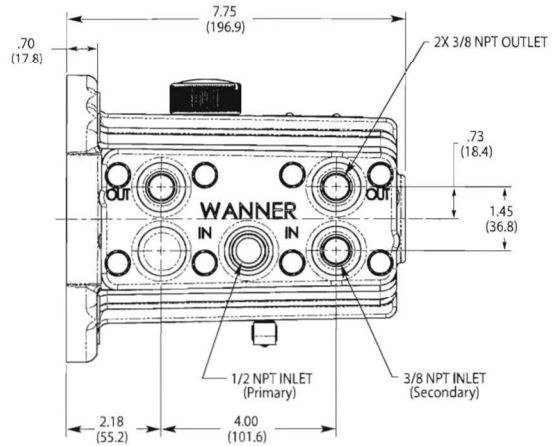
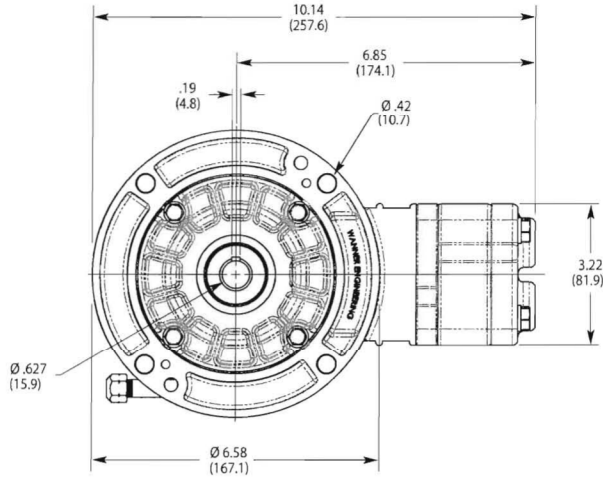
Note: Positive inlet pressure required with PTFE diaphragms.

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.

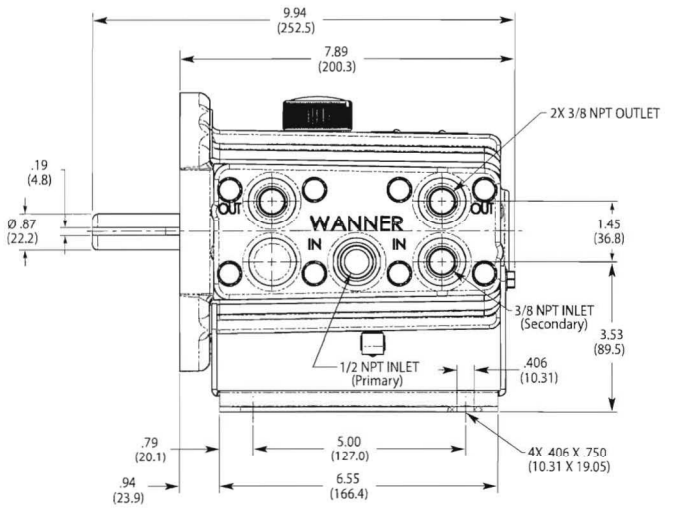
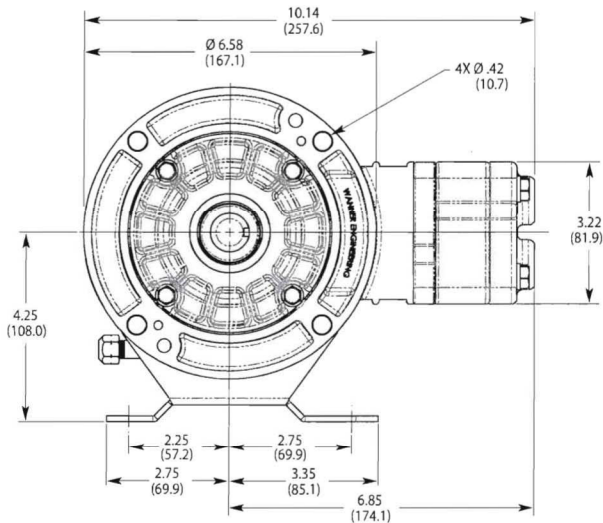
M03 Series Representative Drawings

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.

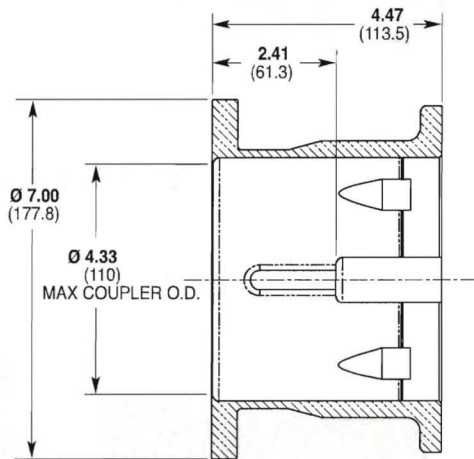
M03 Series Representative Drawings

Pump/Motor Adapter Inches (mm)

Part Number: A04-001-1202

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

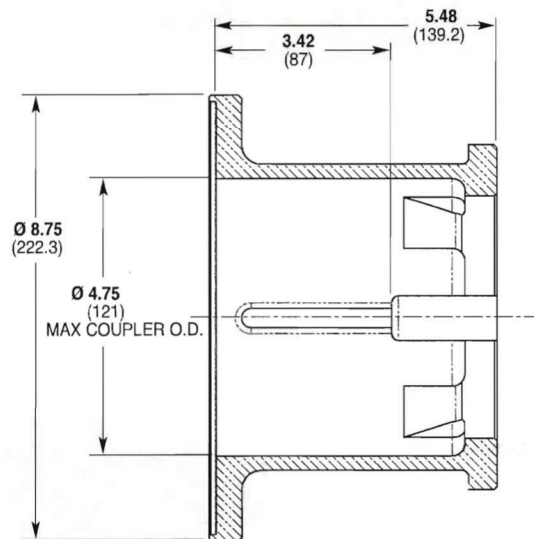
Metric adapter available - consult factory.



Part Number: A04-002-1202

Must be ordered separately for D03 models for use with I82TC, I84TC, 213TC and 215TC 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

QUOTED MODEL

1	2	3	4	5	6	7	8	9	10	11	12
M	0	3	E	K	S	T	S	N	E	M	K

A complete M03 Series Model Number contains 12 digits including 9 customer-specified design and materials options, for example: M03XKSTHFECA.

Digit	Order Code	Description
1-3	D03	Pump Configuration Shaft-driven (NPT Ports)*
	M03	Close-coupled to NEMA 56C footed motor (NPT Ports) *Pump/motor adapters ordered separately. See previous page.
4	X	Hydraulic End Cam Max 3.1 gpm (11.7 l/min) @ 1750 rpm
	E	Max 2.2 gpm (8.3 l/min) @ 1750 rpm
	S	Max 1.7 gpm (6.4 l/min) @ 1750 rpm
	B	Max 1.0 gpm (3.6 l/min) @ 1750 rpm
	G	Max 0.6 gpm (2.3 l/min) @ 1750 rpm
5	A	Pump Head Version Standard NPT Ports (S, B & G cams)
	K	Kel-Cell NPT Ports (X & E cams)
6	B	Pump Head Material Brass
	M	PVDF
	P	Polypropylene
	S	316L Stainless Steel
	T	Hastelloy CW12MW
7	E	Diaphragm & O-ring Material EPDM (requires EPDM-compatible oil - Digit 12 oil code J)
	G	FKM
	J	PTFE (available with X and E cams and standard A version only; cannot be used with Kel-Cell pumps)
	P	Neoprene
	T	Buna-N
	8	C
D		Tungsten Carbide
H		17-4 Stainless Steel
S		316L Stainless Steel
T		Hastelloy C

Digit	Order Code	Description
9	C	Valve Material Ceramic
	D	Tungsten Carbide
	F	17-4 Stainless Steel
	N	Nitronic 50
	T	Hastelloy C
10	E	Valve Springs Elgiloy
	S	316L Stainless Steel
	T	Hastelloy C
11	C	Valve Spring Retainers Celcon
	H	17-7 Stainless Steel
	M	PVDF
	P	Polypropylene
	T	Hastelloy C
	Y	Nylon
12	A	Hydra-Oil 10W30 standard-duty oil
	G	5W30 cold-temp severe-duty synthetic oil
	J	EPDM-compatible oil
	K	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

NOTES:

- Pump will be close coupled to a 1HP, 1800RPM, TEFC, 230/460V, 3 Phase motor.
- Pressure relief valve is included.

Hydra-Cell[®]

Seal-less Pumps

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Wanner International Ltd.

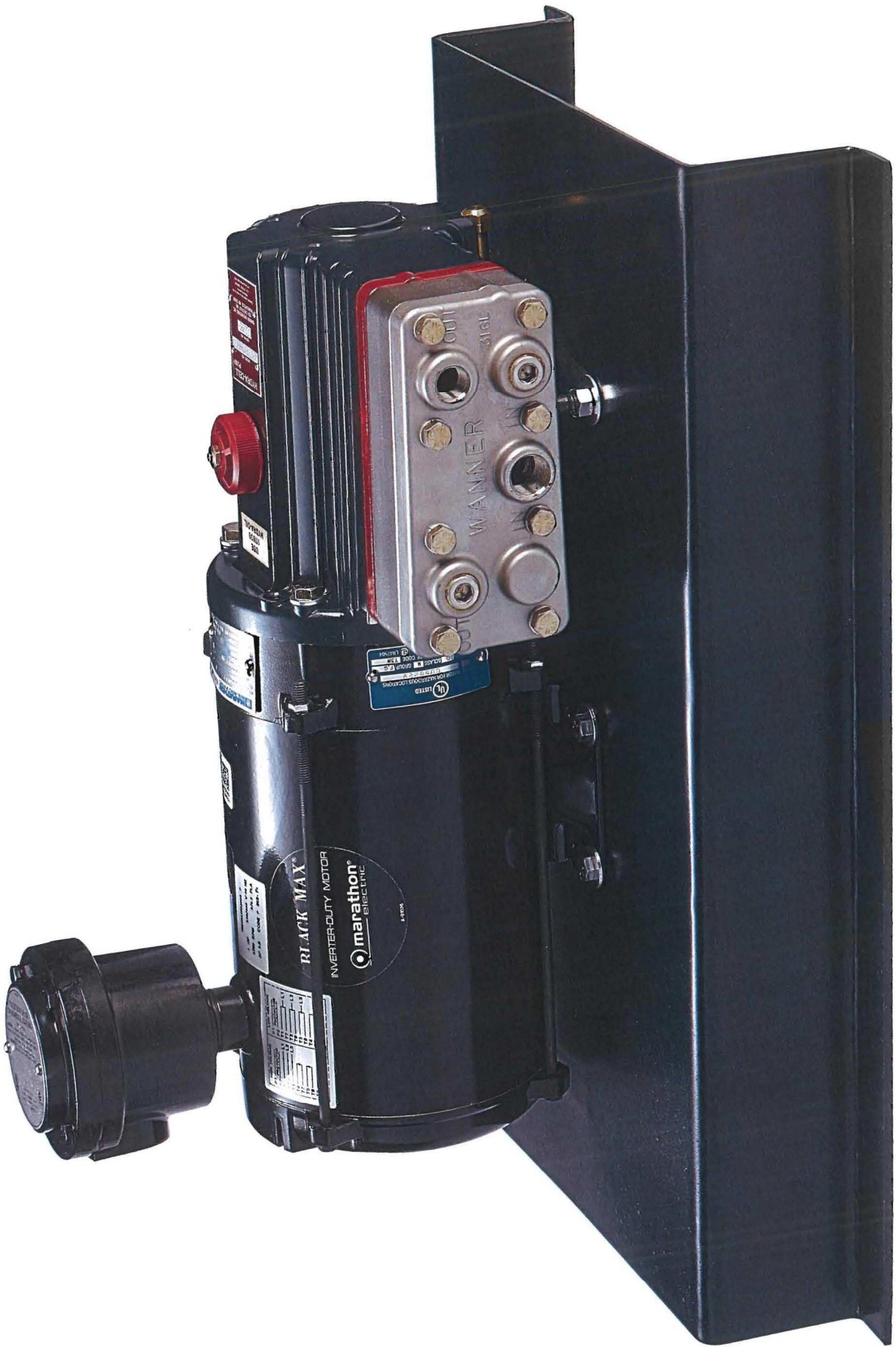
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WARRANTY INFORMATION
SEE USER MANUAL
TECHNICAL

EMERGENCY STOP

WARRANTY INFORMATION
SEE USER MANUAL
TECHNICAL

BLACK MAX
INVERTER-DUTY MOTOR
marathon
ELECTRIC

Model	HP	Volts	Phase	Frequency	Current (A)	Speed (RPM)
1/2	1/2	208-230	3	60	1.5	1725
3/4	3/4	208-230	3	60	2.0	1725
1	1	208-230	3	60	2.5	1725
1 1/2	1 1/2	208-230	3	60	3.5	1725
2	2	208-230	3	60	4.5	1725
3	3	208-230	3	60	7.0	1725
4	4	208-230	3	60	9.0	1725
5	5	208-230	3	60	11.0	1725
7 1/2	7 1/2	208-230	3	60	15.0	1725
10	10	208-230	3	60	19.0	1725
15	15	208-230	3	60	27.0	1725
20	20	208-230	3	60	36.0	1725
25	25	208-230	3	60	45.0	1725
30	30	208-230	3	60	54.0	1725
40	40	208-230	3	60	72.0	1725
50	50	208-230	3	60	90.0	1725
75	75	208-230	3	60	135.0	1725
100	100	208-230	3	60	180.0	1725

CERTIFICATION DATA SHEET

Model#: 56T17F5323 J
CONN. DIAGRAM: A-EE7308
OUTLINE: A-100140-706

WINDING#: ZT406 NONE 3
ASSEMBLY: F1 ONLY

TYPICAL MOTOR PERFORMANCE DATA

HP	KW	SYNC. RPM	F.L. RPM	FRAME	ENCLOSURE	KVA CODE	DESIGN
1&3/4	0.75&0.56	1800	1725&1425	56HC	TEFC	L	B

PH	Hz	VOLTS	FL AMPS	START TYPE	DUTY	INSL	S.F	AMB°C	ELEVATION
3	60/50	208- 230/460#190/ 380	3.4- 3.6/1.8&3.4/1. 7	ACROSS THE LINE	CONTINUOU S	F3	1.15/1.15	40	3300

FULL LOAD EFF: 77&77	3/4 LOAD EFF: 77	1/2 LOAD EFF: 73.5	GTD. EFF	ELEC. TYPE	NO LOAD AMPS
FULL LOAD PF: 68.4&65	3/4 LOAD PF: 60	1/2 LOAD PF: 45	74	SQ CAGE IND RUN	2.4 / 1.2

F.L. TORQUE	LOCKED ROTOR AMPS	L.R. TORQUE	B.D. TORQUE	F.L. RISE°C
3 LB-FT	25 / 12.5	10.2 LB-FT 340	12.5 LB-FT 417	55

SOUND PRESSURE @ 3 FT.	SOUND POWER	ROTOR WK^2	MAX. WK^2	SAFE STALL TIME	STARTS /HOUR	APPROX. MOTOR WGT
62 dBA	72 dBA	0.056 LB-FT^2	7 LB-FT^2	12 SEC.	2	26 LBS.

***** SUPPLEMENTAL INFORMATION *****

DE BRACKET TYPE	ODE BRACKET TYPE	MOUNT TYPE	ORIENTATION	SEVERE DUTY	HAZARDOUS LOCATION	DRIP COVER	SCREENS	PAINT
C-FACE	BRAKE	BOLT-ON	HORIZONTAL OR UP OR DOWN	FALSE	NONE	PROVISIONS ONLY	NONE	STANDARD

BEARINGS		GREASE	SHAFT TYPE	SPECIAL DE	SPECIAL ODE	SHAFT MATERIAL	FRAME MATERIAL
DE	OPE						
BALL	BALL	STANDARD	STANDARD 56	NONE	NONE	STANDARD	ROLLED STEEL
6203	6203						

THERMO-PROTECTORS				THERMISTORS	CONTROL	SPACE /n HEATERS
THERMOSTATS	PROTECTORS	WDG RTDs	BRG RTDs			
NONE	NOT	NONE	NONE	NONE	FALSE	NONE VOLTS

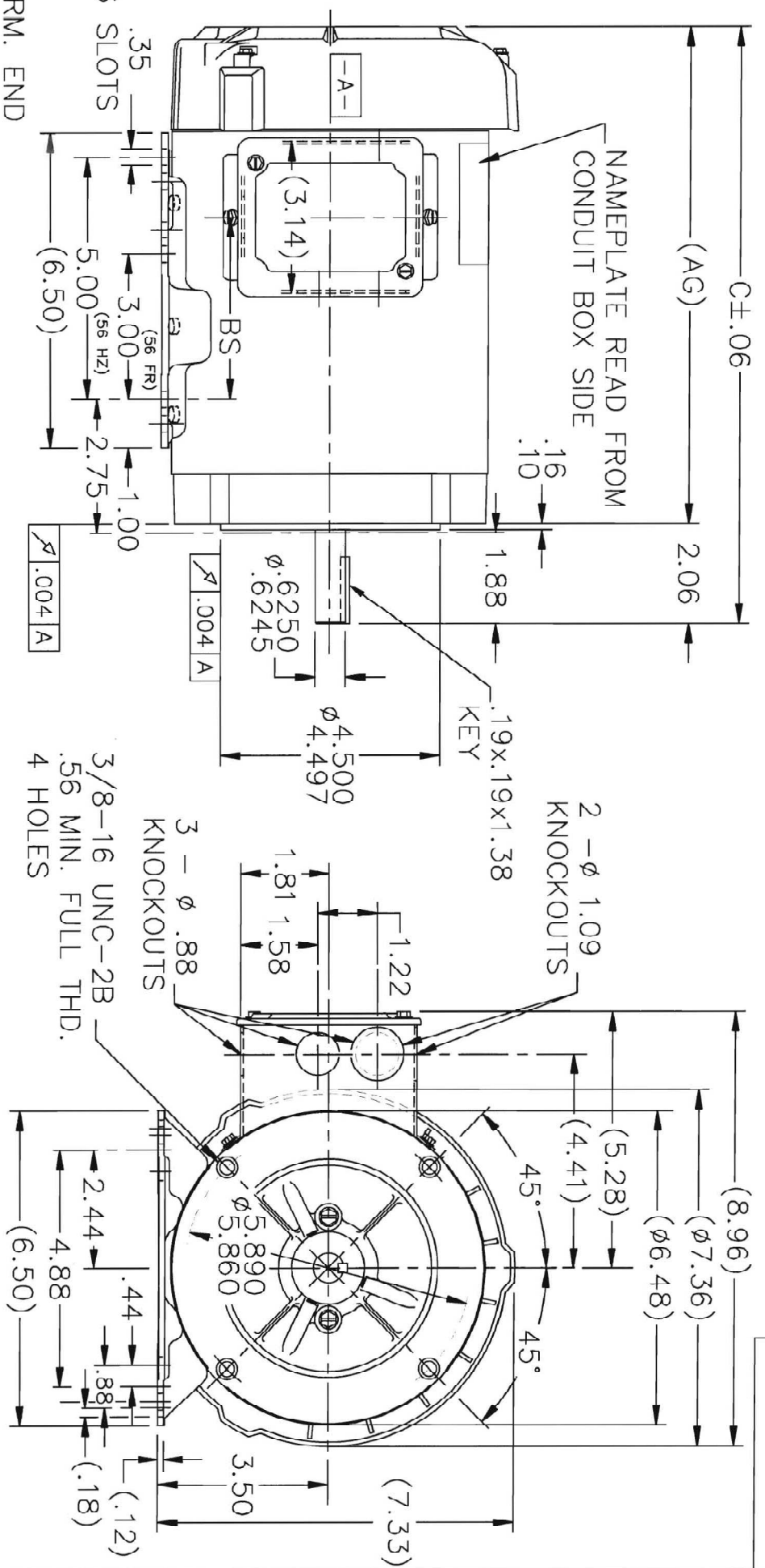
*
N
O
T
E
S
*

INVERTER TORQUE: NONE
INV. HP SPEED RANGE: NONE
ENCODER: NONE
NONE NONE
NONE NONE PPR
BRAKE: PROVISIONS FOR KIT NONE
NONE P/N NONE
NONE NONE
NONE FT-LB NONE V NONE Hz

DATE: 05/18/2015 10:41:00 AM

FORM 3531 REV.3 02/07/99

** Subject to change without notice.



TERM. END

DASH	FRAME	C	AG	BS	DASH	FRAME	C	AG	BS
706	56-70	12.31	10.25	3.75	906		14.31	12.25	5.75
756	"-75	12.81	10.75	4.25	956		14.81	12.75	6.25
806	"-80	13.31	11.25	4.75					
856	"-85	13.81	11.75	5.25					

- NOTES:
1. CONDUIT BOX CAN BE ROTATED 180°
 2. BASE IS REMOVEABLE

MARATHON
ELECTRIC

DRAWN BLR 05-27-1997
CHK WL 05-27-1997
APPD GK 05-27-1997

NO.	REVISION	BY & DATE	C-HK	ANG	FINISH	PREV
5	FIXED TABULATED CHART	TAT 03-21-2005	ML	.XX	$\pm .03$	
4	REDRAWN IN AUTOCAD	TAT 06-29-2004	ML	.XXX	$\pm .035$	
3	REDRAWN ON CAUD	BLR 05-27-1997		.XXXX	$\pm .0305$	

TOLERANCES UNLESS SPECIFIED DEC. INCHES

X $\pm .1$

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CAD FILE 100140

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A	100140			5



Pump Division
Flowserve Pumps
IDP Pumps

August 24, 2015

Mr. Steve Martin
Alsay Inc.

Re: SAWS Brackish Groundwater Pumps

Mr. Martin,

It is Flowserve's recommendation that each pump be pre-lubed for a minimum of 15 minutes before operation.

Kyle Oakeson
Project Manager
Flowserve Corporation