



Installation, Operation, and Maintenance Instructions Sewage Transfer/Macerator Close Coupled Rubber Impeller Pumps

FEATURES

- Body: Durable Cast Bronze
- Cam: Machined-in for improved impeller life
- oprene
- Shaft: Stainless Steel
- Wear Plate: Replaceable / Reversible
- Shaft Seal: Mechanical - Carbon/Ceramic/Buna
- Macerator: Replaceable
- Vacuum Switch: Dependable Spring Loaded Rubber Diaphragm (manual re-set)
- Ports: 1 1/2" Male NPT Inlet and OD Barb for 2" ID Hose, 1" Female NPT Outlet with OD Barb for 1 1/2" ID Hose
- Weight: Portable

VARIATIONS AVAILABLE

MODEL NO.	DESCRIPTION
406M-04	Pump Head with Standard Neoprene Impeller
406M-07	Pump Head with Buna Impeller
406M-04N26	Pump with 1725 RPM 1 HP 1 Phase AC ODP Motor
406MK-04N26	Pump with 1725 RPM 1 HP 1 Phase AC ODP Motor, Vacuum Switch and 8' power cord and plug
406M-04N95	Pump with 1725 RPM 1 HP 3 Phase AC ODP Motor
406M-04N75	Pump with 1725 RPM 1 HP 12 VDC TEFC Motor
406M-04N76	Pump with 1725 RPM 1 HP 24 VDC TEFC Motor
406MG-03UGY	Pump with 3000 RPM 3 HP Gas Engine
406MK-04	Pump Head with Vacuum Switch

APPLICATIONS

- MARINE: Sewage Transfer, Dockside Pump-out, Holding Tank Pump-out
- MOBILE: Campers, Campsites, Trailers, Mobile Homes, General Utility, Emergency

INSTALLATION

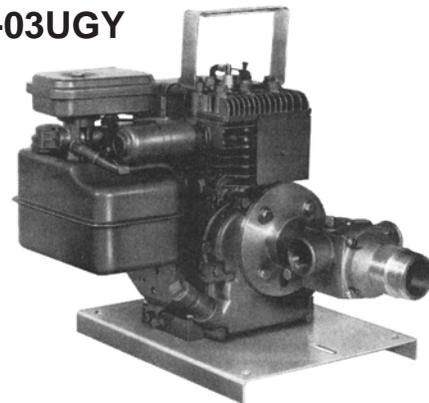
Macerator Pump Model 406M can be configured to run in either rotation. However once the configuration is set, it becomes a uni-directional pump. Given the macerator feature, the pump will not function in both rotating directions during operation. Model 405M can be converted to 406M using macerator conversion kit 10827.

Vacuum Switch Option is intended to be used as a safety device to protect pump and motor from damage caused by dry running conditions. Switch must be mounted on the suction side of the pump in order to sense a break in vacuum. Pump housing has properly positioned convenient connection points for this purpose. When the switch senses vacuum falling below 1 1/2" mercury, it will open/break the power circuit to the single-phase 115V /230V AC motor.

406MK-04N26



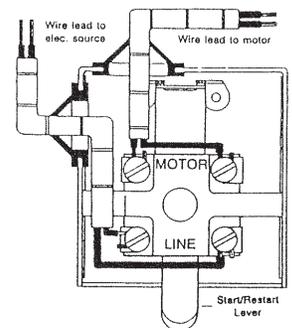
406MG-03UGY



Caution: For DC motor operation, the Vacuum Switch is only rated 32-115-230V up to 1/2 HP. It is not designed for direct use with 1 HP 12VDC or 1 HP 24 VDC motors. For Three Phase motors, the vacuum switch must be wired, using a control circuit to actuate an independent relay. Do not attempt to use the switch to disrupt two of three power legs directly to three phase motors.

Suction Plumbing considerations are important to assure adequate fluid flow to the pump. Avoid collapsed or kinked hose conditions by using pipe or reinforced hose. Avoid unnecessary bends or elbows.

Pump Heads with Vacuum Switch (406MK-04) are Factory supplied with Vacuum Switch mounted in the "Factory Supplied" CCW rotation orientation shown on pg.3. If reverse rotation is desired, follow the diagram to reposition the switch 14 , pipe nipple 15, pipe plug 16, pick screw 27, port plug 17, and plate 20. Note that there is a notch in plate 20 that is always oriented towards discharge. Follow instructions for mounting pump head to motor and the wiring diagram to interface the vacuum switch.



406MK-04N26 is supplied in the "Factory Supplied" CCW rotation orientation shown on pg.3 and with the vacuum switch prewired to the 1 HP motor for 115 V operation. A convenient 8' long power cord and plug is provided.

Motor Mounting: Pump heads are supplied with adapters and coupling hardware to directly attach to Nema 56C frame motors. Attach the adapter 3 to the motor with (4) bolts 4. Place collar 5 loosely over pump shaft 7 aligning the collar setscrew over the keyway slot. Loosen clamp bolt 15.

Setting Mechanical Seal Compression:

Set the motor on its base on the edge of a firm flat surface with the shaft key oriented upwards. While holding the pump head upside down, orient the pump shaft keyway slot to the window and clamp slot for easy viewing and collar access. With the pump still inverted, gradually slide pump head onto the adapter bracket hub and onto the motor shaft taking care to align keyways. Place edge of key 6 into shaft 3 key slot. With the help of a flathead screwdriver held against the rear of key 6, continue to slide pump head onto motor shaft until key drops fully into position, engaging motor shaft to pump shaft. Slide pump head towards adapter -but do not fully shoulder. Rather, leave 0.030" to 0.050" of gap between adapter shoulder and pump body. Slide collar 5 further on shaft 7 and over key 6. Tighten collar set screw directly over key.

Rotate pump head 180 degrees from the inverted position to the standard upright position. Slide pump head further onto adapter bracket until it shoulders fully. Tighten clamp bolt 15.

OPERATING INSTRUCTIONS

PRE START-UP

WARNING: Before attempting disassembly and service, disconnect motor power and release all pressure within the system. Failure to disconnect and lockout electrical power before attempting any maintenance can cause severe personal injury.

- 1) Rubber impellers may stick to inner wall of pump body when units have been in dry storage for extended periods. In this case, remove plug 17 from pump and add lubricant to the inside of the pump body. In rare instances, it may be necessary to remove cover 23 to free the shaft manually by turning the macerator wheel.
- 2) On initial start-up, prime the pump to prevent dry-running the impeller. For units equipped with Vacuum safety switch, push down the start/restart lever and hold until the pump is primed and operating.

START-UP and RUNNING

- 3) On subsequent starts, as long as the impeller remains wet, pump is self-priming with suction lifts of 15 feet possible.

Caution: DO NOT RUN DRY for more than 30 seconds. Lack of liquid will damage impeller.

- 4) Caution: When the pump is operated against a clogged suction strainer in a fluid starved condition, there may still be adequate vacuum present to keep switch contacts closed (for units with optional vacuum switch). Keep suction strainer clean to retain switch protection.

- 5) Freezing temperatures - drain the unit by loosening (4) cover screws 24 and loosening plate 20. Retighten and fill the pump chamber with a methyl alcohol based anti-freeze (compatible with neoprene impeller). Do not use petroleum-based anti-freeze.

SERVICE INSTRUCTIONS

Wet End Repair Kit 10956 contains impeller, seal, and gasket
Vacuum Switch Repair Kit 10798 contains switch, pipe nipple, and power cord

WARNING: Before attempting disassembly and service, disconnect motor power and release all pressure within the system. Failure to disconnect and lockout electrical power before attempting any maintenance can cause severe personal injury.

Disassembly

Impeller changing:

- 1) Remove (4) cover screws 24 and cover 23
- 2) Remove shaft screw 22, macerator wheel 21, plate 20, gaskets 19, and key 9
- 3) Pry impeller 18 out of body 13 using 2 screw drivers

Shaft Seal changing:

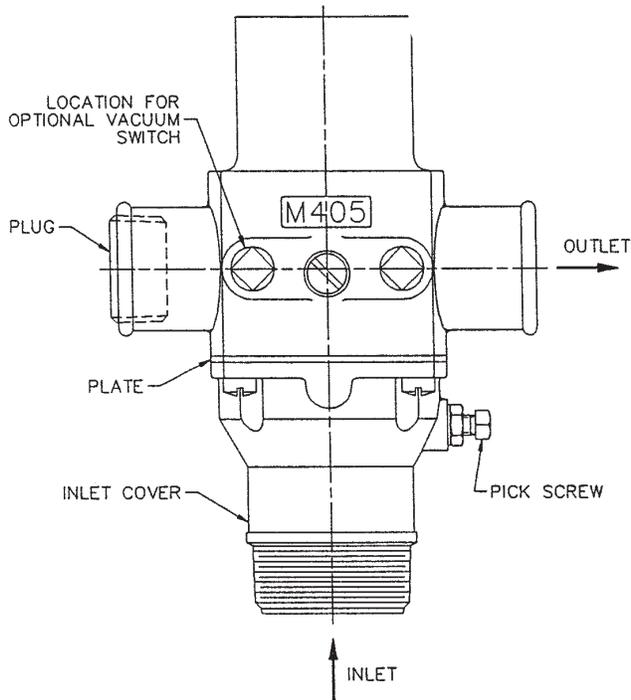
- 4) Remove shaft key 8
- 5) Loosen screw 12 and remove pump body 13 from adapter
- 6) Press seal head 11 out of pump body and slide wear face (with seat) off pump shaft.

Reassembly

- 7) Slide new wear face (with seat) onto pump shaft to shoulder position
- 8) Press new seal head into pump body 1/16" below surface using Loctite, Permatex or similar sealant between seal OD and housing bore.
- 9) Reassemble pump onto adapter. Tighten screw 12
- 10) Install key 8 into pump shaft and push new impeller 18 on shaft 7 into pump body 13
- 11) Install (1) gasket 19 and plate 20 loosely against pump body face 13.
- 12) Install key 9 and macerator wheel 21 onto shaft. Secure with screw 22 using Loctite 222.
- 13) Place second gasket against outer face of plate 20. Carefully position kidney-shaped opening in plate 20 relative to pump body consistent with the desired rotation and outlet direction. See diagram below.
- 14) While holding plate 20 and gaskets 19 (one on each side of plate 4) in position, attach cover 24 with (4) screws 24. Tighten screws securely.
- 15) Check and reset mechanical seal compression following instructions above.

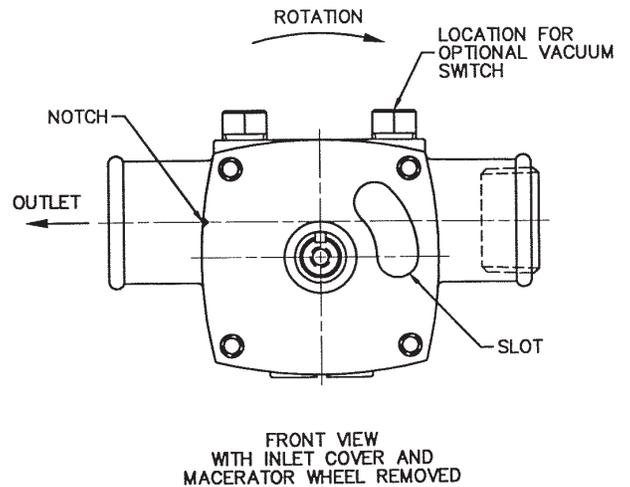
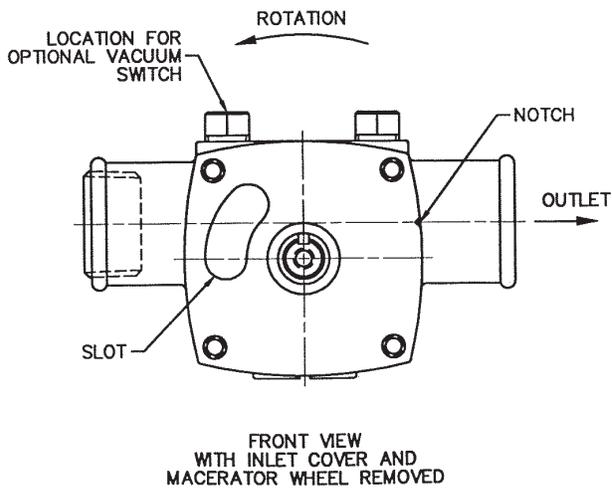
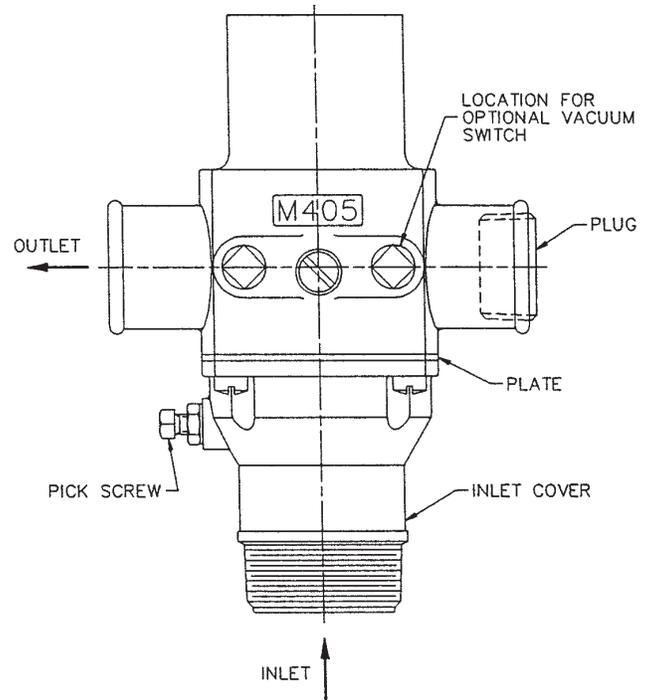
MODEL: 406M

FACTORY SUPPLIED ROTATION
(COUNTERCLOCKWISE)

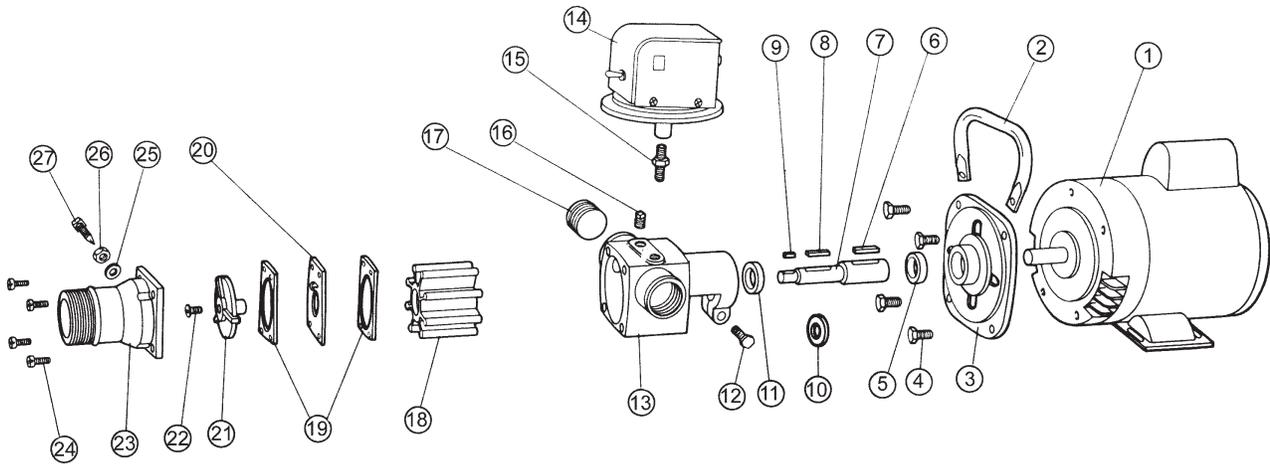


TO REVERSE ROTATION:

1. REMOVE PLUG FROM LEFT PORT AND PUT IT IN RIGHT PORT (SEE DIAGRAM).
2. REMOVE INLET COVER AND MACERATOR WHEEL. REVERSE PLATE SO THAT SLOT POSITION IS AS SHOWN BELOW.
3. REPLACE MACERATOR WHEEL.
4. REPLACE INLET COVER WITH PICK SCREW ON LEFT SIDE (SEE DIAGRAM).



EXPLODED VIEW & PARTS LIST



Part No.	1	2	3	4	5	6	7	8	9	10	11	12	13
	Motor	Handle	Adapter	Screw	Collar	Key	Shaft	Key	Key	Washer	Seal Assy.	Screw	Body
	1 Reqd	1 Reqd	1 Reqd	4 Reqd	1 Reqd	1 Reqd	1 Reqd						
406M-04	---	---	7459	5411	5886	6845	7519	5475	6947	6631	32230	5595	7040
406M-04N26	7055	9773	7459	5411	5886	6845	7519	5475	6947	6631	32230	5595	7040
406MK-04N26	7055	9773	7459	5411	5886	6845	7519	5475	6947	6631	32230	5595	7040

Part No.	14	15	16	17	18	19	20	21	22	23	24	25	26
	Vacuum Switch	Nipple	Pipe Plug	Pipe Plug	Impeller	Gasket	Plate	Wheel	Screw	Cover	Screw	Washer	Jam Nut
	1 Reqd	1 Reqd	2 Reqd	1 Reqd	1 Reqd	2 Reqd	1 Reqd	1 Reqd	1 Reqd	1 Reqd	4 Reqd	1 Reqd	1 Reqd
406M-04	---	---	7043	7189	6603	7188	7101	7075	6437	7100	8229	7255	7256
406M-04N26	---	---	7043	7189	6603	7188	7101	7075	6437	7100	8229	7255	7256
406MK-04N26	7046	7050	7043	7189	6603	7188	7101	7075	6437	7100	8229	7255	7256

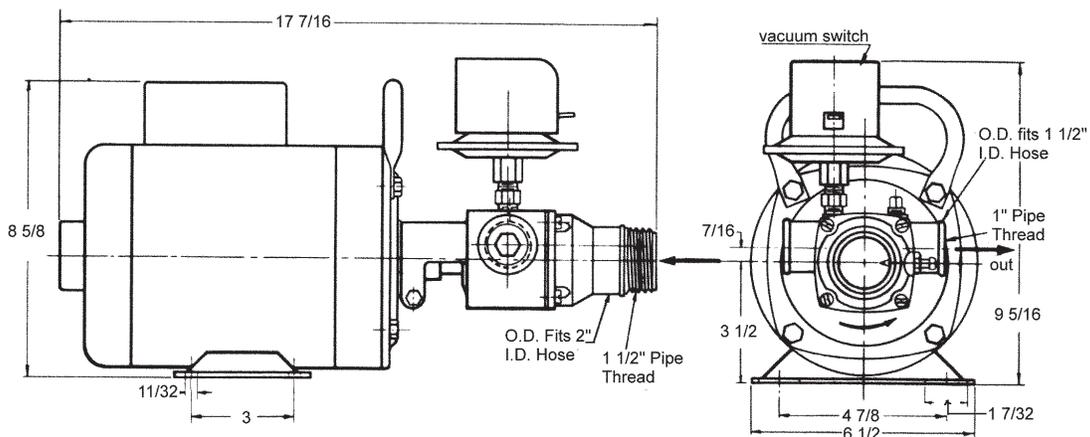
Part No.	27	28	29	30	31	32	33	34	
	Pick Screw	Cord	Terminal Spade	Wire Nut	Wire Nut	Washer (Handle)	Screw (Handle)	Cord	Repair Kits*
	1 Reqd	1 Reqd	1 Reqd	1 Reqd	2 Reqd	2 Reqd	2 Reqd	1 Reqd	
406M-04	7258	---	---	---	---	---	---	---	10956
406M-04N26	7258	7044	7297	9850	9857	6831	5974	---	10956
406MK-04N26	7258	7044	7297 ¹	9850	9857	6831	5974	7047	10956

*Repair Kits contain items 11, 18 & 19.
 Vacuum Switch Repair Kit is p/n 10798. Kit contains items 14, 15, 29 & 34.

¹ Five Required.

Items 28 - 34 are not shown on illustration.

DIMENSIONS



REV. 02/08