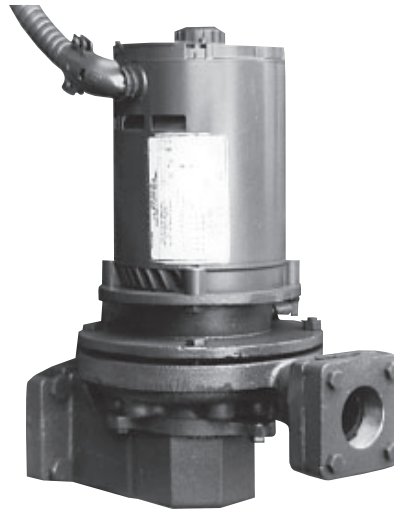


MINUTEMAN VERTICAL PUMPS FOR REPAIR OR REPLACEMENT OF EXISTING PUMPS



MINUTEMAN VERTICAL PUMPS are the workhorse of the NES PUMPS product offering. All MINUTEMAN condensate and boiler feed units are built with the same high quality 1/3 horsepower 3500 RPM bronze fitted vertical centrifugal pumps. These pumps are among the most reliable, efficient, and cost effective in the industry. By building our pumps with high quality industry standard electric motors it is possible to easily replace our motors with standard off the shelf components. The result is significant cost savings over the life of the unit. In addition to offering replacement and service components we also offer an entire portfolio of pumps as bolt on replacements for most manufacturers. By replacing a proprietary pump with one with an industry standard motor you will save time and money every time your pump needs servicing.

Our vertical pumps are designed to operate efficiently up to 200°F. Motors and mechanical seals are rated for temperatures up to 250°F. Higher temperature units are available upon request. Our pumps are designed using centrifugal technology which means they will operate efficiently at high temperatures and have excellent debris and water contamination resistance.

FEATURES

Industry Standard Motor

- Universal availability lowers cost and down time.

Bronze Impeller and Wear Ring

- Superior corrosion and wear resistance increases pump life.

Centrifugal Technology

- Allows pump to operate at low suction head levels.

- Resistant to debris and water contamination; No strainer required.



PUMPTECHNICALOVERVIEW

MINUTEMAN VERTICAL PUMPS provide the best combination of value and performance on the market today. Our vertical pumps are designed to minimize floor space and are built by mating a high quality industry standard electric motor to a centrifugal pump. We are one of only a few manufacturers to offer an industry standard motor. Most manufactures build proprietary pump and motor assemblies which can be expensive and difficult to source. Industry standard motors are sourced locally, making repairs less costly and faster. Our centrifugal pumps are engineered to maximize performance and longevity. We factory tune our impellers to optimize pumping characteristics for a given set of performance points. In fact, each pump is tested under pressure and temperature load prior to shipment to ensure they meet specified performance requirements. Our pumps are constructed using all bronze impellers and wear rings to prolong technology is inherently resistant to contamination and debris. Our pumps are so robust they do not require inlet strainers which only reduce pump efficiency.

TECHNICAL SPECIFICATIONS

- Our centrifugal pumps are engineered to perform efficiently at temperatures up to 200°F which is a function of available Net Positive Suction Head (NPSH). The temperature limit of our pumps is 250°F which is a function of mechanical seal material. Higher temperature pumps are available upon request.
- All pumps are manufactured with industry standard O.D.P. 3500 RPM motors and factory wired for 115V or 230V single phase and 208/230 or 460V three phase. Motors are equipped with built-in thermal overload protection.
- Vertical pumps are available as **TYPE 10** for applications up to 25PSIG and **TYPE 16** for higher pressures.
- Pump drawings, performance curves, and parts

HOW TO SELECT AND ORDER MINUTEMAN PUMPS

- Pumps are selected based on the output gallons per minute (GPM) and pressure (PSIG).
- Select the pump based on the table below based on GPM and PSIG. (see below).
- Determine if an adaptor is needed if replacing non-NES manufacturer (see back cover).

GPM	PSIG	HP	Discharge	Pump	Single Phase*	Three Phase**
0-18	10	1/3	3/4"	TS Type 10	TS33101	TS33103
0-18	15	1/3	3/4"	TS Type 10	TS33101	TS33103
0-18	20	1/3	3/4"	TS Type 10	TS33101	TS33103
0-18	25	1/2	3/4"	TS Type 10	TS12101	TS12103
0-18	30	3/4	1-1/4"	TS Type 16	TS34161	TS34163
0-18	40	1	1-1/4"	TS Type 16	TS10161	TS10163
19-23	10	1/3	1"	TS Type 10	TS33102	TS33104
19-23	15	1/3	1"	TS Type 10	TS33102	TS33104
19-23	20	1/2	1"	TS Type 10	TS12102	TS12104
19-23	25	1/2	1-1/4"	TS Type 16	TS12161	TS12163
19-23	30	3/4	1-1/4"	TS Type 16	TS34161	TS34163
19-23	40	1	1-1/4"	TS Type 16	TS10161	TS10163
24-30	10	1/3	1"	TS Type 10	TS33102	TS33104
24-30	15	1/2	1"	TS Type 10	TS12102	TS12104
24-30	20	3/4	1"	TS Type 10	TS34102	TS34104
24-30	25	1	1-1/4"	TS Type 16	TS10161	TS10163
24-30	30	1	1-1/2"	TS Type 16	TS10161	TS10163
24-30	40	1-1/2	1-1/4"	TS Type 16	N/A	TS15163
31-37	10	3/4	1-1/4"	TS Type 16	TS34161	TS34163
31-37	15	3/4	1-1/4"	TS Type 16	TS34161	TS34163
31-37	20	1	1-1/4"	TS Type 16	TS10161	TS10163
31-37	25	1	1-1/4"	TS Type 16	TS10161	TS10163
31-37	30	1	1-1/4"	TS Type 16	TS10161	TS10163
31-37	35	1-1/2	1-1/4"	TS Type 16	N/A	TS15163

Determining GPM

The evaporation rate of one boiler horsepower is .069 gallons per minute. Boiler feed at a rate of 1.5 to 2 times this evaporation rate. (Conversion Equivalents): One boiler horsepower equals .069 GPM or 33,475 BTU or 34.5 lbs/hr or 139.4 sq. ft. EDR.

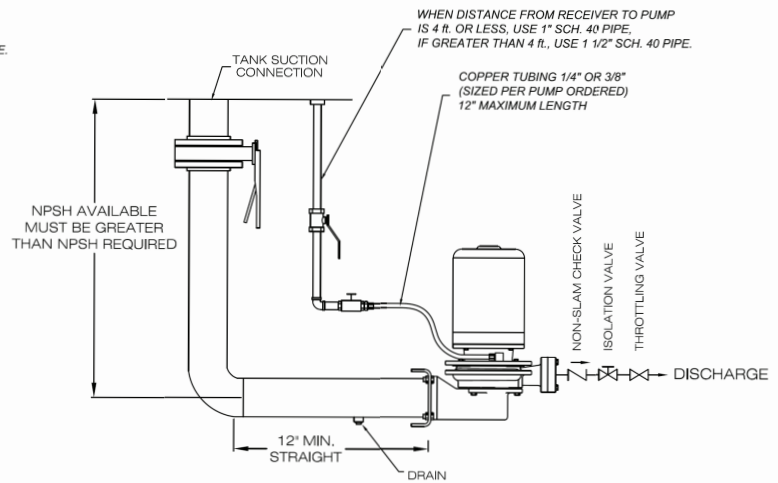
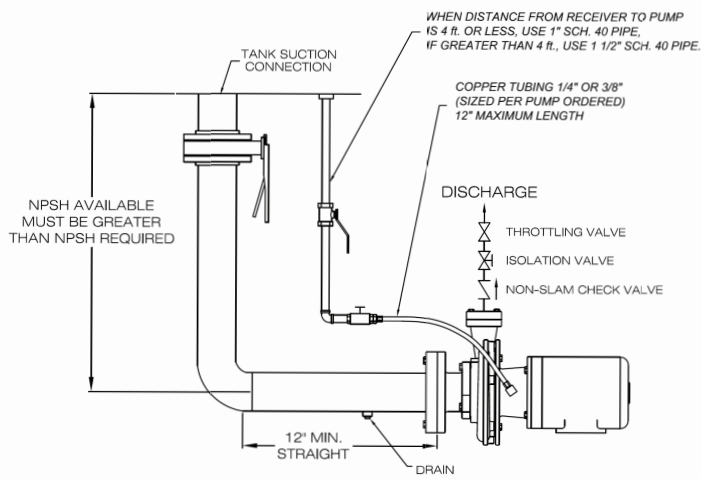
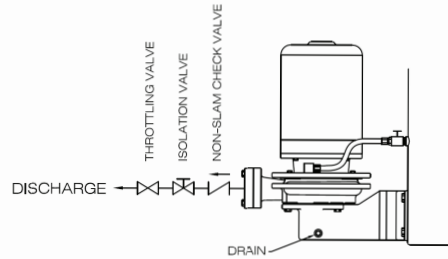
Determining PSIG

Generally low pressure boilers run at .5 to 15 PSIG. Therefore, a discharge pump pressure of 20 PSIG should be adequate. Boiler feed units are usually near the boilers they feed. To be safe you should determine the amount of vertical rise + friction loss in pipe + valve loss + feed valve loss (if any) + back pressure in line (boiler operating pressure) + a safety margin of approximately 5 PSIG. The amount of these values, or together, are normally expressed in feet of head. To convert to pounds per square inch or PSIG, 2.31 feet of head = 1 PSIG.

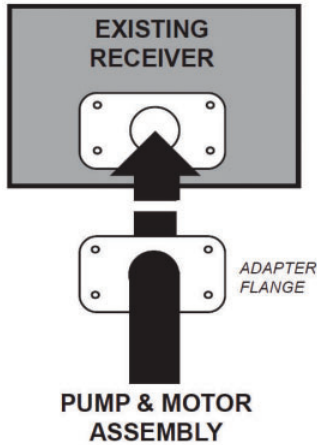
All motors are O.D.P. enclosures; 3500 RPM.

TYPICAL PIPING DIAGRAM

NOTE: The seal flushing (bleed) line must be field installed as detailed in Figure 2 when pumps are field piped. Factory packages include flushing line.



ADAPTOR FLANGES (if required): Standard NES Pumps have a 2-3/4" vertical by 5" horizontal center to center bolt hole pattern.



Manufacturer	Adaptor P/N
AURORA	N-105
DUNHAM BUSH	N-103
ECONOMY	N-101
FEDERAL	N-106
ITT DOMESTIC	None Required
ITT HOFFMAN	None Required
NASH	N-104
MEPCO	N-103
SARCO	N-102
SHIPCO	None Required
SKIDMORE	N-102
STERLING	N-107
WEIMAN	N-108
OTHER	Measure Bolt pattern

COMMON PARTS LIST

Pump Type	Item	Part Number
All Pumps	Mechanical seal kit w/ gaskets 250F Rated	N-211
Type 10	Wear Ring	N-214
Type 16	Wear Ring	N-215
Type 10	Impeller 1/3 HP	N-216
Type 10	Impeller 1/2 HP	N-217
Type 10	Impeller 3/4 HP	N-218
Type 16	Impeller 1/3 HP	N-219
Type 16	Impeller 1/2 HP	N-220
Type 16	Impeller 3/4 HP	N-221
Type 16	Impeller 1-1/2 HP	N-222

All pump and motor assembly parts are available.

Complete parts list and assembly drawings available upon request.

IMPORTANT INSTALLATION NOTES:

Strainers:

Pump suction strainers are NOT ____ to be placed ahead of a centrifugal pump in the suction piping. NPSHA can not be calculated. Strainers will shut off water supply or cause a restriction. This will result in pump and mechanical seal failures. All strainers belong in return lines back to receiver tanks and also in make-up water lines.

Discharge Piping

Install a union immediately beyond the pump discharge. A spring-loaded check valve should be installed in the discharge piping close to the pump to prevent backflow into the unit. A throttling valve (ball valve, globe valve or steam cock) must be installed after the check valve close to the pump. The throttling valve is used to set pump discharge at design conditions to prevent motor overload and cavitation.

Notes on Piping

1. When installing the pump, suction and discharge gauge ports should be installed in the pipeline.
2. The piping should have isolation valves around the pump and have a drain valve in the suction line.
3. When installing the suction and discharge connections to a threaded pump housing a Teflon tape sealer or a high quality thread sealant is recommended.