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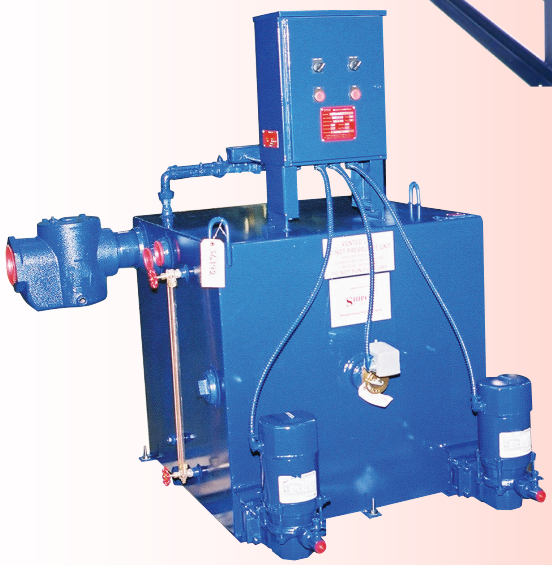
*Pride*

*Quality*

*Craftsmanship*



**BULLETIN 163**
*Revised 11/19*

# TYPE PMS

**PROPELLER MAKEUP STEEL RECEIVER BOILER FEED UNITS**

PMS Units handle condensate to 210˚F

*and*

# TYPE PMES

**PROPELLER MAKEUP ELEVATED STEEL RECEIVER BOILER FEED UNITS**

PMES Units handle condensate to 212˚F

Capacities up to 750 BHP

SHIPCO® PUMPS are equipped with Mechanical Seals rated up to a standard 250°F.
*Higher temperature seals and special faces available upon request.*

# TYPE PMS BOILER FEED UNITS

| BOILER CAP. BHP | PUMP CAP. GPM | PUMP DISCH. PRESS. PSIG | MOTOR HP 3500 RPM ONLY | PHASE | DISCH. SIZE INCHES | CATALOG NO. | REC. CAP. GALS. | INLET SIZE INCHES |
|---|---|---|---|---|---|---|---|---|
| 20 | 3 | 20 | 1/3 | 1 or 3 | 3/4" | 3 PMS-20 | 21 | 2" |
| | | 25 | 1/2 | 1 or 3 | | 3 PMS-25 | | |
| | | 30 | 3/4 | 1 or 3 | | 3 PMS-30 | | |
| | | 40 | 1-1/2 | 1 or 3 | | 3 PMS-40 | | |
| | | 50 | 1-1/2 | 1 or 3 | | 3 PMS-50 | | |
| | | 60 | 3 | 3 | | 3 PMS-60 | | |
| | | 70 | 3 | 3 | | 3 PMS-70 | | |
| | | 75 | 3 | 3 | 1-1/2" | 3 PMS-75 | | |
| | | 80 | 5 | 3 | | 3 PMS-80 | | |
| | | 90 | 5 | 3 | | 3 PMS-90 | | |
| | | 100 | 5 | 3 | | 3 PMS-100 | | |
| 40 | 6 | 20 | 1/3 | 1 or 3 | 3/4" | 6 PMS-20 | 35 | 3" |
| | | 25 | 1/2 | 1 or 3 | | 6 PMS-25 | | |
| | | 30 | 3/4 | 1 or 3 | | 6 PMS-30 | | |
| | | 40 | 1-1/2 | 1 or 3 | | 6 PMS-40 | | |
| | | 50 | 1-1/2 | 1 or 3 | | 6 PMS-50 | | |
| | | 60 | 3 | 3 | | 6 PMS-60 | | |
| | | 70 | 3 | 3 | | 6 PMS-70 | | |
| | | 75 | 3 | 3 | 1-1/2" | 6 PMS-75 | | |
| | | 80 | 5 | 3 | | 6 PMS-80 | | |
| | | 90 | 5 | 3 | | 6 PMS-90 | | |
| | | 100 | 5 | 3 | | 6 PMS-100 | | |
| 55 | 9 | 20 | 1/3 | 1 or 3 | 3/4" | 9 PMS-20 | 45 | 3" |
| | | 25 | 1/2 | 1 or 3 | | 9 PMS-25 | | |
| | | 30 | 3/4 | 1 or 3 | | 9 PMS-30 | | |
| | | 40 | 1-1/2 | 1 or 3 | | 9 PMS-40 | | |
| | | 50 | 1-1/2 | 1 or 3 | | 9 PMS-50 | | |
| | | 60 | 3 | 3 | | 9 PMS-60 | | |
| | | 70 | 3 | 3 | | 9 PMS-70 | | |
| | | 75 | 3 | 3 | 1-1/2" | 9 PMS-75 | | |
| | | 80 | 5 | 3 | | 9 PMS-80 | | |
| | | 90 | 5 | 3 | | 9 PMS-90 | | |
| | | 100 | 5 | 3 | | 9 PMS-100 | | |
| 80 | 12 | 20 | 1/2 | 1 or 3 | 3/4" | 12 PMS-20 | 60 | 3" |
| | | 25 | 3/4 | 1 or 3 | | 12 PMS-25 | | |
| | | 30 | 3/4 | 1 or 3 | | 12 PMS-30 | | |
| | | 40 | 1 1/2 | 1 or 3 | | 12 PMS-40 | | |
| | | 50 | 1-1/2 | 1 or 3 | | 12 PMS-50 | | |
| | | 60 | 3 | 3 | | 12 PMS-60 | | |
| | | 70 | 3 | 3 | | 12 PMS-70 | | |
| | | 75 | 3 | 3 | 1-1/2" | 12 PMS-75 | | |
| | | 80 | 5 | 3 | | 12 PMS-80 | | |
| | | 90 | 5 | 3 | | 12 PMS-90 | | |
| | | 100 | 5 | 3 | | 12 PMS-100 | | |

# TYPE PMS BOILER FEED UNITS

| BOILER CAP. BHP | PUMP CAP. GPM | PUMP DISCH. PRESS. PSIG | MOTOR HP 3500 RPM ONLY | PHASE | DISCH. SIZE INCHES | CATALOG NO. | REC. CAP. GALS. | INLET SIZE INCHES |
|---|---|---|---|---|---|---|---|---|
| 100 | 15 | 20 | 1/2 | 1 or 3 | 3/4" | 15 PMS-20 | 81 | 4" |
| | | 25 | 3/4 | 1 or 3 | | 15 PMS-25 | | |
| | | 30 | 1 | 1 or 3 | | 15 PMS-30 | | |
| | | 40 | 1-1/2 | 1 or 3 | | 15 PMS-40 | | |
| | | 50 | 2 | 1 or 3 | | 15 PMS-50 | | |
| | | 60 | 3 | 3 | | 15 PMS-60 | | |
| | | 70 | 5 | 3 | | 15 PMS-70 | | |
| | | 75 | 5 | 3 | 1-1/2" | 15 PMS-75 | | |
| | | 80 | 5 | 3 | | 15 PMS-80 | | |
| | | 90 | 5 | 3 | | 15 PMS-90 | | |
| | | 100 | 5 | 3 | | 15 PMS-100 | | |
| 125 | 18 | 20 | 1/2 | 1 or 3 | 1-1/2" | 18 PMS-20 | 81 | 4" |
| | | 25 | 3/4 | 1 or 3 | | 18 PMS-25 | | |
| | | 30 | 1 | 1 or 3 | | 18 PMS-30 | | |
| | | 40 | 1-1/2 | 1 or 3 | | 18 PMS-40 | | |
| | | 50 | 2 | 1 or 3 | | 18 PMS-50 | | |
| | | 60 | 3 | 3 | | 18 PMS-60 | | |
| | | 70 | 5 | 3 | | 18 PMS-70 | | |
| | | 75 | 5 | 3 | | 18 PMS-75 | | |
| | | 80 | 5 | 3 | | 18 PMS-80 | | |
| | | 90 | 5 | 3 | | 18 PMS-90 | | |
| | | 100 | 5 | 3 | | 18 PMS-100 | | |
| 150 | 21 | 20 | 3/4 | 1 or 3 | 1-1/2” | 21 PMS-20 | 128 | 4" |
| | | 25 | 3/4 | 1 or 3 | | 21 PMS-25 | | |
| | | 30 | 1 | 1 or 3 | | 21 PMS-30 | | |
| | | 40 | 1-1/2 | 1 or 3 | | 21 PMS-40 | | |
| | | 50 | 2 | 1 or 3 | | 21 PMS-50 | | |
| | | 60 | 3 | 3 | | 21 PMS-60 | | |
| | | 70 | 5 | 3 | | 21 PMS-70 | | |
| | | 75 | 5 | 3 | | 21 PMS-75 | | |
| | | 80 | 5 | 3 | | 21 PMS-80 | | |
| | | 90 | 5 | 3 | | 21 PMS-90 | | |
| | | 100 | 5 | 3 | | 21PMS-100 | | |
| 200 | 30 | 20 | 3/4 | 1 or 3 | 1-1/2" | 30 PMS-20 | 128 | 4" |
| | | 25 | 3/4 | 1 or 3 | | 30 PMS-25 | | |
| | | 30 | 1 | 1 or 3 | | 30 PMS-30 | | |
| | | 40 | 2 | 1 or 3 | | 30 PMS-40 | | |
| | | 50 | 2 | 1 or 3 | | 30 PMS-50 | | |
| | | 60 | 3 | 3 | | 30 PMS-60 | | |
| | | 70 | 5 | 3 | | 30 PMS-70 | | |
| | | 75 | 5 | 3 | | 30 PMS-75 | | |
| | | 80 | 5 | 3 | | 30 PMS-80 | | |
| | | 90 | 7-1/2 | 3 | | 30 PMS-90 | | |
| | | 100 | 7-1/2 | 3 | | 30PMS-100 | | |

# TYPE PMS BOILER FEED UNITS

| BOILER CAP. BHP | PUMP CAP. GPM | PUMP DISCH. PRESS. PSIG | MOTOR HP 3500 RPM ONLY | PHASE | DISCH. SIZE INCHES | CATALOG NO. | REC. CAP. GALS. | INLET SIZE INCHES |
|---|---|---|---|---|---|---|---|---|
| | | 20 | 3/4 | 1 or 3 | | 35 PMS-20 | | |
| | | 25 | 1 | 1 or 3 | | 35 PMS-25 | | |
| | | 30 | 1-1/2 | 1 or 3 | | 35 PMS-30 | | |
| | | 40 | 2 | 1 or 3 | | 35 PMS-40 | | |
| 250 | 35 | 50 | 3 | 3 | 1-1/2" | 35 PMS-50 | 168 | 4" |
| | | 60 | 5 | 3 | | 35 PMS-60 | | |
| | | 70 | 5 | 3 | | 35 PMS-70 | | |
| | | 75 | 5 | 3 | | 35 PMS-75 | | |
| | | 80 | 5 | 3 | | 35 PMS-80 | | |
| | | 90 | 7-1/2 | 3 | | 35 PMS-90 | | |
| | | 100 | 7-1/2 | 3 | | 35 PMS-100 | | |
| | | 20 | 1 | 1 or 3 | | 42 PMS-20 | | |
| | | 25 | 1-1/2 | 1 or 3 | | 42 PMS-25 | | |
| | | 30 | 2 | 1 or 3 | | 42 PMS-30 | | |
| | | 40 | 3 | 3 | | 42 PMS-40 | | |
| 300 | 42 | 50 | 3 | 3 | 1-1/2" | 42 PMS-50 | 235 | 4" |
| | | 60 | 5 | 3 | | 42 PMS-60 | | |
| | | 70 | 5 | 3 | | 42 PMS-70 | | |
| | | 75 | 7-1/5 | 3 | | 42 PMS-75 | | |
| | | 80 | 7-1/2 | 3 | | 42 PMS-80 | | |
| | | 90 | 7-1/2 | 3 | | 42 PMS-90 | | |
| | | 100 | 7-1/2 | 3 | | 42 PMS-100 | | |

Charted units are a representation of the more typical systems and sizes used. Higher pump pressures and larger pump capacities are available.

# ELECTRICAL CONTROL PANELS

SHIPCO® PUMPS has the panel assemblies to make your installation an easy and fast connection. Control panels are available to comply with all NEMA and JIC specifications. The controls are designed for efficient automatic operation of the condensate, vacuum and boiler feed pumps, as required. Panels are clearly identified with nameplates for easy reference to unit serial number and corresponding wiring diagrams.

Panels feature independent pump control circuits. This allows partial operation of duplex units for servicing and repairs. Internal wiring is numbered to match the wiring diagram for identification.

**Magnetic Starters** are usually required for single phase motors 1 horsepower and over, and all 3 phase motors. Overload relays are recommended to protect the wiring and motors, should an unbalanced condition occur.

**Disconnects** are available as an integral part of the panel to meet electrical code and service requirements.

**Selector Switches** are available for pump control. SHIPCO® PUMPS recommends two normal types.

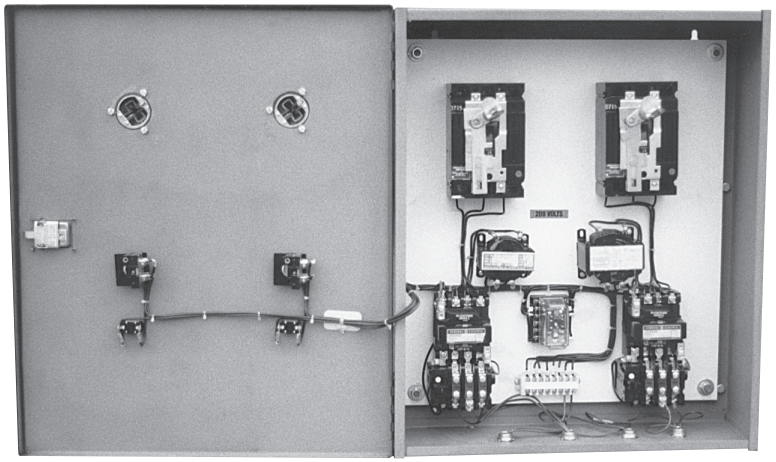
**Lead-off-Lag** selector switches allow manual alternation of the lead pump for even wear.

**Auto-Off** selector switches with **test push buttons** — for use with electrical alternators.

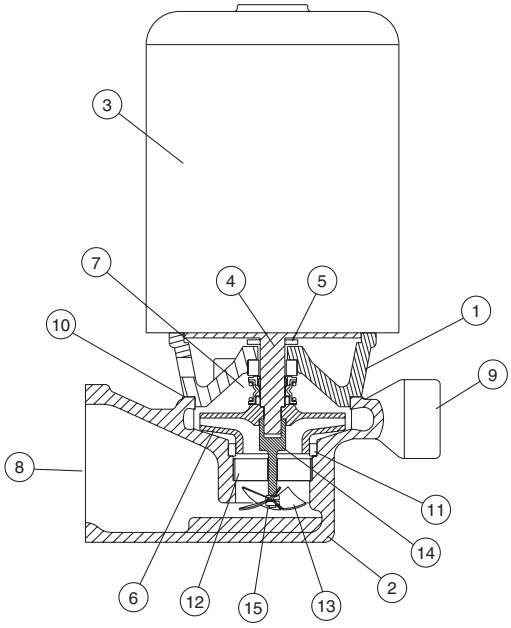
**Electrical Alternators** are available as an integral part of the panel. Two separate boiler level switches must be provided for automatic standby.

**Control Circuit Transformers** provide step down voltage for control circuits. Control circuits are normally recommended to be 115/1/60.

Relays, Pilot Lights, Alarm Lights, Alarm Bells, etc. are available upon request.



Control panels available and can be factory mounted and wired to NEMA and J.I.C. specifications.
(NOTE: Magnetic starters should be provided for all three phase motors.)




## Model P

1. Pump Head
2. Pump Case
3. Motor
4. Motor Shaft
5. Water Slinger
6. Impeller
7. Mechanical Seal
8. Pump Suction
9. Pump Discharge
10. Gasket
11. Case Wearing Ring
12. Straightening Vanes
13. Propeller
14. Propeller Shaft
15. Locking Nut (2)

# TYPE PMES BOILER FEED UNITS

| BOILER CAP. BHP | PUMP CAP. GPM | PUMP DISCH. PRESS. PSIG | MOTOR HP 3500 RPM ONLY | PHASE | DISCH. SIZE INCHES | CATALOG NO. | REC. CAP. GALS. | INLET SIZE INCHES |
|---|---|---|---|---|---|---|---|---|
| 20 | 3 | 20 | 1/3 | 1 or 3 | 3/4" | 3 PMES-20 | 21 | 2" |
| | | 25 | 1/2 | 1 or 3 | | 3 PMES-25 | | |
| | | 30 | 3/4 | 1 or 3 | | 3 PMES-30 | | |
| | | 40 | 1-1/2 | 1 or 3 | | 3 PMES-40 | | |
| | | 50 | 1-1/2 | 1 or 3 | | 3 PMES-50 | | |
| | | 60 | 3 | 3 | | 3 PMES-60 | | |
| | | 70 | 3 | 3 | | 3 PMES-70 | | |
| | | 75 | 3 | 3 | 1-1/2" | 3 PMES-75 | | |
| | | 80 | 5 | 3 | | 3 PMES-80 | | |
| | | 90 | 5 | 3 | | 3 PMES-90 | | |
| | | 100 | 7-1/2 | 3 | | 3 PMES-100 | | |
| 40 | 6 | 20 | 1/3 | 1 or 3 | 3/4" | 6 PMES-20 | 35 | 3" |
| | | 25 | 1/2 | 1 or 3 | | 6 PMES-25 | | |
| | | 30 | 3/4 | 1 or 3 | | 6 PMES-30 | | |
| | | 40 | 1-1/2 | 1 or 3 | | 6 PMES-40 | | |
| | | 50 | 1-1/2 | 1 or 3 | | 6 PMES-50 | | |
| | | 60 | 3 | 3 | | 6 PMES-60 | | |
| | | 70 | 3 | 3 | | 6 PMES-70 | | |
| | | 75 | 3 | 3 | 1-1/2" | 6 PMES-75 | | |
| | | 80 | 5 | 3 | | 6 PMES-80 | | |
| | | 90 | 5 | 3 | | 6 PMES-90 | | |
| | | 100 | 7-1/2 | 3 | | 6 PMES-100 | | |
| 55 | 9 | 20 | 1/3 | 1 or 3 | 3/4" | 9 PMES-20 | 45 | 3" |
| | | 25 | 1/2 | 1 or 3 | | 9 PMES-25 | | |
| | | 30 | 3/4 | 1 or 3 | | 9 PMES-30 | | |
| | | 40 | 1-1/2 | 1 or 3 | | 9 PMES-40 | | |
| | | 50 | 1-1/2 | 1 or 3 | | 9 PMES-50 | | |
| | | 60 | 3 | 3 | | 9 PMES-60 | | |
| | | 70 | 3 | 3 | | 9 PMES-70 | | |
| | | 75 | 3 | 3 | 1-1/2" | 9 PMES-75 | | |
| | | 80 | 5 | 3 | | 9 PMES-80 | | |
| | | 90 | 5 | 3 | | 9 PMES-90 | | |
| | | 100 | 7-1/2 | 3 | | 9 PMES-100 | | |
| 80 | 12 | 20 | 1/2 | 1 or 3 | 3/4" | 12 PMES-20 | 60 | 3" |
| | | 25 | 3/4 | 1 or 3 | | 12 PMES-25 | | |
| | | 30 | 3/4 | 1 or 3 | | 12 PMES-30 | | |
| | | 40 | 1 1/2 | 1 or 3 | | 12 PMES-40 | | |
| | | 50 | 1-1/2 | 1 or 3 | | 12 PMES-50 | | |
| | | 60 | 3 | 3 | | 12 PMES-60 | | |
| | | 70 | 3 | 3 | | 12 PMES-70 | | |
| | | 75 | 3 | 3 | 1-1/2" | 12 PMES-75 | | |
| | | 80 | 5 | 3 | | 12 PMES-80 | | |
| | | 90 | 5 | 3 | | 12 PMES-90 | | |
| | | 100 | 5 | 3 | | 12 PMES-100 | | |

# TYPE PMES BOILER FEED UNITS

| BOILER CAP. BHP | PUMP CAP. GPM | PUMP DISCH. PRESS. PSIG | MOTOR HP 3500 RPM ONLY | PHASE | DISCH. SIZE INCHES | CATALOG NO. | REC. CAP. GALS. | INLET SIZE INCHES |
|---|---|---|---|---|---|---|---|---|
| 100 | 15 | 20 | 1/2 | 1 or 3 | 3/4" | 15 PMES-20 | 81 | 4" |
| | | 25 | 3/4 | 1 or 3 | | 15 PMES-25 | | |
| | | 30 | 1 | 1 or 3 | | 15 PMES-30 | | |
| | | 40 | 1-1/2 | 1 or 3 | | 15 PMES-40 | | |
| | | 50 | 2 | 1 or 3 | | 15 PMES-50 | | |
| | | 60 | 3 | 3 | | 15 PMES-60 | | |
| | | 70 | 5 | 3 | | 15 PMES-70 | | |
| | | 75 | 5 | 3 | 1-1/2" | 15 PMES-75 | | |
| | | 80 | 5 | 3 | | 15 PMES-80 | | |
| | | 90 | 5 | 3 | | 15 PMES-90 | | |
| | | 100 | 5 | 3 | | 15 PMES-100 | | |
| 125 | 18 | 20 | 1/2 | 1 or 3 | 1-1/2" | 18 PMES-20 | 81 | 4" |
| | | 25 | 3/4 | 1 or 3 | | 18 PMES-25 | | |
| | | 30 | 1 | 1 or 3 | | 18 PMES-30 | | |
| | | 40 | 1-1/2 | 1 or 3 | | 18 PMES-40 | | |
| | | 50 | 2 | 1 or 3 | | 18 PMES-50 | | |
| | | 60 | 3 | 3 | | 18 PMES-60 | | |
| | | 70 | 5 | 3 | | 18 PMES-70 | | |
| | | 75 | 5 | 3 | | 18 PMES-75 | | |
| | | 80 | 5 | 3 | | 18 PMES-80 | | |
| | | 90 | 5 | 3 | | 18 PMES-90 | | |
| | | 100 | 5 | 3 | | 18 PMES-100 | | |
| 150 | 21 | 20 | 3/4 | 1 or 3 | 1-1/2" | 21 PMES-20 | 128 | 4" |
| | | 25 | 3/4 | 1 or 3 | | 21 PMES-25 | | |
| | | 30 | 1 | 1 or 3 | | 21 PMES-30 | | |
| | | 40 | 1-1/2 | 1 or 3 | | 21 PMES-40 | | |
| | | 50 | 2 | 1 or 3 | | 21 PMES-50 | | |
| | | 60 | 3 | 3 | | 21 PMES-60 | | |
| | | 70 | 5 | 3 | | 21 PMES-70 | | |
| | | 75 | 5 | 3 | | 21 PMES-75 | | |
| | | 80 | 5 | 3 | | 21 PMES-80 | | |
| | | 90 | 5 | 3 | | 21 PMES-90 | | |
| | | 100 | 5 | 3 | | 21PMES-100 | | |
| 200 | 30 | 20 | 3/4 | 1 or 3 | 1-1/2" | 30 PMES-20 | 128 | 4" |
| | | 25 | 3/4 | 1 or 3 | | 30 PMES-25 | | |
| | | 30 | 1 | 1 or 3 | | 30 PMES-30 | | |
| | | 40 | 2 | 1 or 3 | | 30 PMES-40 | | |
| | | 50 | 2 | 1 or 3 | | 30 PMES-50 | | |
| | | 60 | 3 | 3 | | 30 PMES-60 | | |
| | | 70 | 5 | 3 | | 30 PMES-70 | | |
| | | 75 | 5 | 3 | | 30 PMES-75 | | |
| | | 80 | 5 | 3 | | 30 PMES-80 | | |
| | | 90 | 7-1/2 | 3 | | 30 PMES-90 | | |
| | | 100 | 7-1/2 | 3 | | 30 PMES-100 | | |

# TYPE PMES BOILER FEED UNITS

| BOILER CAP. BHP | PUMP CAP. GPM | PUMP DISCH. PRESS. PSIG | MOTOR HP 3500 RPM ONLY | PHASE | DISCH. SIZE INCHES | CATALOG NO. | REC. CAP. GALS. | INLET SIZE INCHES |
|---|---|---|---|---|---|---|---|---|
| | | 20 | 3/4 | 1 or 3 | | 35 PMES-20 | | |
| | | 25 | 1 | 1 or 3 | | 35 PMES-25 | | |
| | | 30 | 1-1/2 | 1 or 3 | | 35 PMES-30 | | |
| | | 40 | 2 | 1 or 3 | | 35 PMES-40 | | |
| 250 | 35 | 50 | 3 | 3 | 1-1/2" | 35 PMES-50 | 168 | 4" |
| | | 60 | 5 | 3 | | 35 PMES-60 | | |
| | | 70 | 5 | 3 | | 35 PMES-70 | | |
| | | 75 | 5 | 3 | | 35 PMES-75 | | |
| | | 80 | 5 | 3 | | 35 PMES-80 | | |
| | | 90 | 7-1/2 | 3 | | 35 PMES-90 | | |
| | | 100 | 7-1/2 | 3 | | 35 PMES-100 | | |
| | | 20 | 1 | 1 or 3 | | 42 PMES-20 | | |
| | | 25 | 1-1/2 | 1 or 3 | | 42 PMES-25 | | |
| | | 30 | 2 | 1 or 3 | | 42 PMES-30 | | |
| | | 40 | 3 | 3 | | 42 PMES-40 | | |
| 300 | 42 | 50 | 3 | 3 | 1-1/2" | 42 PMES-50 | 235 | 4" |
| | | 60 | 5 | 3 | | 42 PMES-60 | | |
| | | 70 | 5 | 3 | | 42 PMES-70 | | |
| | | 75 | 7-1/2 | 3 | | 42 PMES-75 | | |
| | | 80 | 7-1/2 | 3 | | 42 PMES-80 | | |
| | | 90 | 7-1/2 | 3 | | 42 PMES-90 | | |
| | | 100 | 7-1/2 | 3 | | 42 PMES-100 | | |

**Charted units are a representation of the more typical systems and sizes used. Higher pump pressures and larger pump capacities are available.**

## PMS & PMES UNIT DESCRIPTION

**PMS Pumps are "The Pumps That Pump"** even when traps start to leak and temperatures go to boiling!

**Propeller Boiler Feed Pumps** are designed to handle hot condensate with low NPSH requirements. The type "P" pumps require only 2 feet of NPSH to handle water at its saturation temperature. Floor mounted units can handle condensate at temperatures to 210°F.

**Elevated Units** can handle condensate at temperatures to 212°F.

**Steel Receivers** provide years of service even with the most aggressive waters. Receivers are available from 15 gallon to 235 gallon capacity. The receivers are fully vented and operate at atmospheric pressure. (Receivers are not ASME code stamped.)

**Butterfly Suction Valves** are an integral part of the service features of the PMS units. By closing the butterfly suction valves the PMS pumps are isolated from the receiver for servicing without draining the receiver. PMES units (elevated) have valves in the suction piping.

**Basket Inlet Strainers** are a recommended feature of the PMS units. The large dirt pocket and vertical self cleaning screens help prevent unnecessary wear and problems with the PMS pumps.

**Gauge Glass** provides a quick check of receiver water level.

**Dial Thermometer** provides a quick check of condensate temperature.

**Discharge Pressure Gauges** provide a quick check of pump operation at design conditions.

**The heart of the PMS unit is the Type "P" pump.** The type "P" pump is designed for vertical flange mounting as shown.

**Pump Head and Case** are made of close grained cast iron.

**Impeller** is cast bronze, enclosed vane, precision balanced, and trimmed to design conditions for smooth durable operation.

**Case Wearing Ring** is bronze and easily renewable to keep the type "P" pump at peak performance.

**Motors** are heavy duty ball bearing design.

**Water Safety Slingers** are installed to help prevent water from entering the motor from seal leakage.

**Motor Shaft** is stainless steel on 56J Frame motors. JM motors have a bronze shaft sleeve or optional stainless steel shaft sleeve.

**Straightening Vanes** provide a directed flow into the eye of the centrifugal impeller.

**Axial Flow Impeller** provides low NPSH characteristics and is precision finished for smooth vibration-free operation.

**Discharge Companion Flange** allows the pump to be removed and eliminates the need of additional unions.

**Solenoid Make-up Valve and Float Switch** adds make-up water to receiver when required.

**All units are completely assembled, piped, wired, and individually tested before shipment. Testing includes a complete hydrostatic test for leaks, electrical tests for controls and accessories, and performance test for pumps at design conditions. After testing, the units are packaged for shipment.**

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## ENGINEERING SELECTION DATA

### Receiver Sizing — PMS Units

The receivers in this series of units are sized to allow for approximately a 10-minute system lag time. The lag time of the system is the time from which the steam evaporated at the boiler travels to the radiation device, condenses to water and returns to the boiler. This is adequate for most small systems. (Larger multi-building systems, the receiver is sized for a 15-minute lag time.)

Boiler required make-up water is added to the receiver on PMS Units. This helps, by tempering the make-up water, reduce thermal shock to the boiler.

### Sizing Boiler Feed Pumps — PMS Units

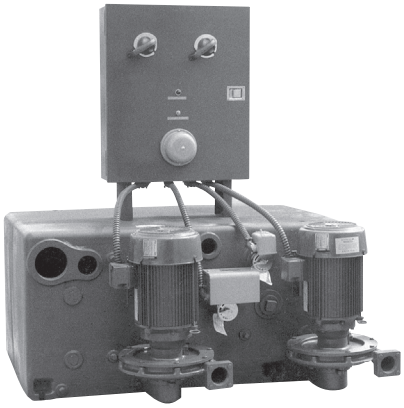
34.5 lbs. per hour of water evaporated at 212°F at sea level equals (1) Boiler Horsepower.

$$\frac{34.5 \text{ lbs.}}{60 \text{ min.}} \times \frac{1 \text{ gallon}}{8.34 \text{ lbs.}} = .069 \text{ gallon per minute}$$

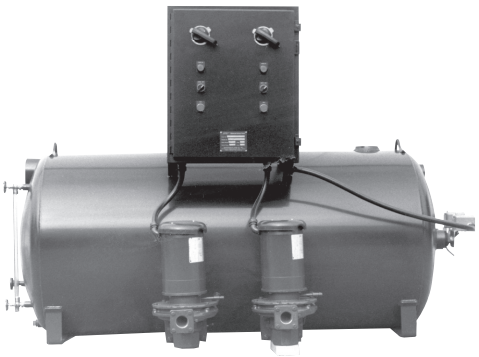
The evaporation rate of 1 boiler horsepower is .069 gallons per minute. The feed pump input rate is sized at a rate of 170% to 200% of the maximum steaming rate of the boiler. This method of sizing helps to balance the boiler conditions and reduce thermal shock to the boiler. Thermal shock is caused by oversizing the feed pumps.

### Table of Values of Heat and Power

| | GPM | BTU | Lbs/Hr | Sq. Ft. EDR |
|---|---|---|---|---|
| 1 Boiler HP | .069 | 33,475 | 34.5 | 139.4 |
| 1,000 sq. ft. EDR | .50 | 240,000 | 247.3 | 1,000 |

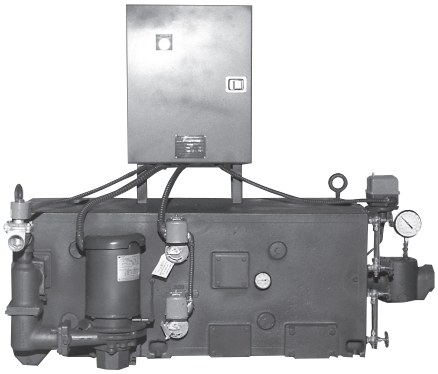


**DC/DMC**

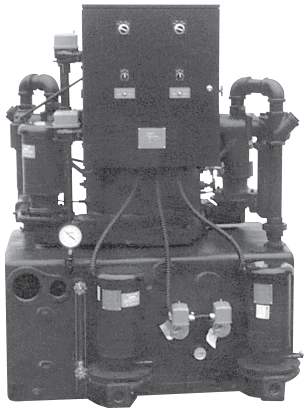


**SHM/SHC**

**DUC/DUMC**



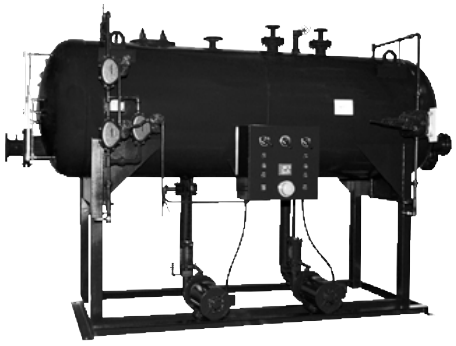
**LRV**



**BVC/BVMC**

**SHEM/SHEC**

**.005 DA-ST**



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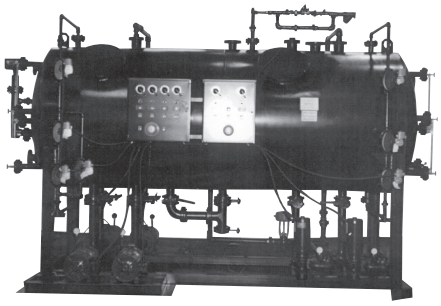

**.005 DA-2C**





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