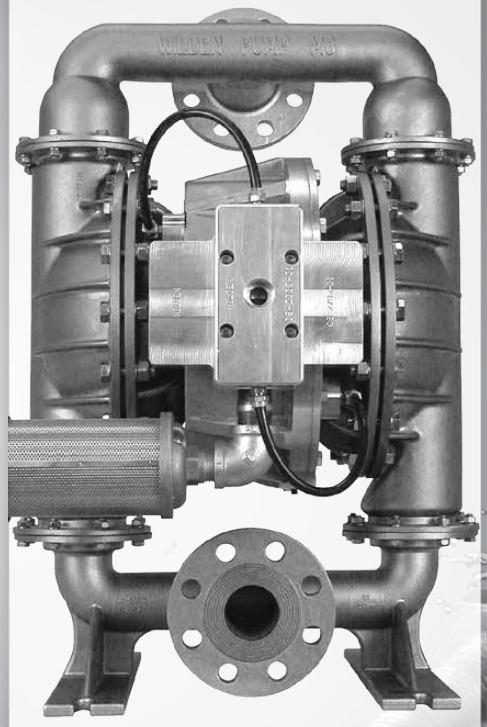
WILDEN®

Part of Pump Solutions Group

A DOVER COMPANY

H800

Advanced™ Series Metal Pump



Where Innovation Flows

www.wilden-pumps.com

H800 HIGH PRESSURE PUMP

Ex CE

WIL-11150-E-10
REPLACES WIL-11150-E-09

TABLE OF CONTENTS

CAUTIONS—READ FIRST!

TEMPERATURE LIMITS:

Neoprene	–17.7°C to 93.3°C	0°F to 200°F
Buna-N	–12.2°C to 82.2°C	10°F to 180°F
Nordel®	–51.1°C to 137.8°C	–60°F to 280°F
Viton®	–40°C to 176.7°C	–40°F to 350°F
Saniflex™	–28.9°C to 104.4°C	–20°F to 220°F
Wil-Flex™	-40°C to 107.2°C	–40°F to 225°F
Polytetrafluoroethylene (PTFE)	4.4°C to 104.4°C	40°F to 220°F
Polyurethane	–12.2°C to 65.6°C	10°F to 150°F

NOTE: Not all materials are available for all models. Refer to Section 2 for material options for your pump.

CAUTION: When choosing pump materials, be sure to check the temperature limits for all wetted components. Example: Viton® has a maximum limit of 177°C (350°F) but polypropylene has a maximum limit of only 79°C (175°F).

CAUTION: Maximum temperature limits are based upon mechanical stress only. Certain chemicals will significantly reduce maximum safe operating temperatures. Consult Chemical Resistance Guide for chemical compatibility and temperature limits.

WARNING: Prevent static sparking — If static sparking occurs, fire or explosion could result. Pump, valve and containers must be grounded to a proper grounding point when handling flammable fluids and whenever discharge of static electricity is a hazard.

CAUTION: Do not exceed 5.9 bar (85 psig) air supply pressure.

CAUTION: All piping, valves, gauges and other components installed on the liquid discharge must have a minimum pressure rating of 20.7 bar (300 psig).

CAUTION: The discharge pressure generated by this pump is 3X the inlet pressure supplied.

CAUTION: The process fluid and cleaning fluids must be chemically compatible with all wetted pump components. Consult Chemical Resistance Guide.

CAUTION: Pumps should be thoroughly flushed before installing into process lines. FDA- and USDA- approved pumps should be cleaned and/or sanitized before being used.

CAUTION: Always wear safety glasses when operating pump. If diaphragm rupture occurs, material being pumped may be forced out air exhaust.

CAUTION: Before any maintenance or repair is attempted, the compressed air line to the pump should be disconnected and all air pressure allowed to bleed from pump. Disconnect all intake, discharge and air lines. Drain the pump by turning it upside down and allowing any fluid to flow into a suitable container.

CAUTION: Blow out air line for 10 to 20 seconds before attaching to pump to make sure all pipeline debris is clear. Use an in-line air filter. A 5µ (micron) air filter is recommended.

NOTE: Before starting disassembly, mark a line from each liquid chamber to its corresponding air chamber. This line will assist in proper alignment during reassembly.

CAUTION: Wilden H800 High Pressure pumps cannot be used in submersible applications.

CAUTION: Tighten all hardware prior to installation.

H800 METAL

51 mm (2") Pump
Maximum Flow Rate:
360 lpm (95 gpm)

LEGEND

H800 / XXXXX / XXX / XX / XXX / *XXXX*

- H800 — MODEL
- XXXXX — WETTED PARTS & OUTER PISTON
- XXXXX — AIR CHAMBERS
- XXXXX — CENTER BLOCK
- XXXXX — AIR VALVE
- XXX — DIAPHRAGMS
- XX — VALVE BALLS
- XXX — VALVE SEAT
- XXX — O-RINGS
- *XXXX* — SPECIALTY CODE (if applicable)

MATERIAL CODES

MODEL
H800 = 51 mm (2") HIGH PRESSURE

WETTED PARTS & OUTER PISTON
SS = STAINLESS STEEL/ STAINLESS STEEL
WW = DUCTILE IRON/ DUCTILE IRON

AIR CHAMBERS
S = STAINLESS STEEL
W = DUCTILE IRON

CENTER BLOCK
A = ALUMINUM

AIR VALVE
A = ALUMINUM

DIAPHRAGMS
FWL = FULL-STROKE SANITARY WIL-FLEX™ IPD[1]
FWS = SANITARY WIL-FLEX™ [1]
TWS = FULL-STROKE PTFE W/WIL-FLEX™ BACKUP

VALVE BALL
TF = PTFE (WHITE)
WF = WIL-FLEX™ [SANTOPRENE® (ORANGE DOT)]

VALVE SEAT
S = STAINLESS STEEL
M = MILD STEEL

VALVE SEAT O-RING
TF = PTFE (WHITE)
WF = WIL-FLEX™ [SANTOPRENE® (ORANGE DOT)]

Notes: [1]Meets Requirements of FDA CFR21.177

SPECIALTY CODES

0504 DIN flange

NOTE: MOST ELASTOMERIC MATERIALS USE COLORED DOTS FOR IDENTIFICATION.

NOTE: Not all models are available with all material options.

HOW IT WORKS—PUMP

The Wilden diaphragm pump is an air-operated, positive displacement, self-priming pump. These drawings show flow pattern through the pump upon its initial stroke. It is assumed the pump has no fluid in it prior to its initial stroke.

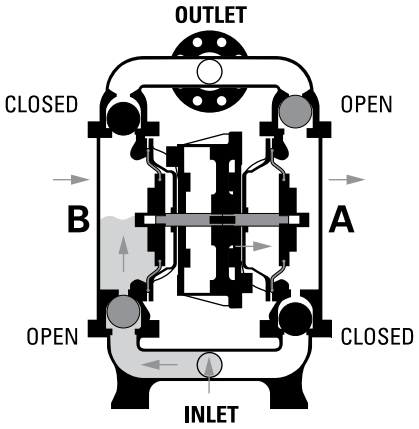


FIGURE 1 When air pressure is supplied to the pump, the air valve directs pressure to the back side of diaphragm A. The compressed air moves the diaphragm away from the center section of the pump. The opposite diaphragm is pulled in by the shaft connected to the pressurized diaphragm. Diaphragm B is on its suction stroke; air behind the diaphragm has been forced out to the atmosphere through the exhaust port. The movement of diaphragm B towards the center section of the pump creates a vacuum within chamber B. Atmospheric pressure forces fluid into the inlet manifold forcing the inlet valve ball off of its seat. Liquid is free to move past the inlet valve ball and fill the liquid chamber (see shaded area).

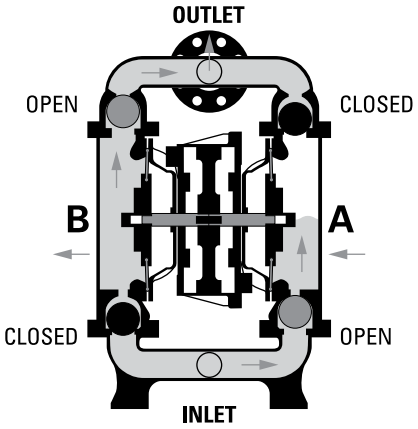


FIGURE 2 Once the shaft has reached the end of its stroke, the air valve redirects pressurized air to the back side of diaphragm B.

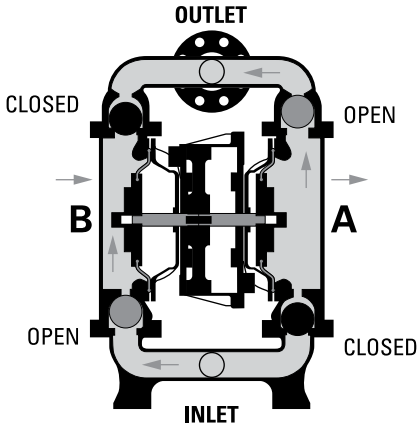


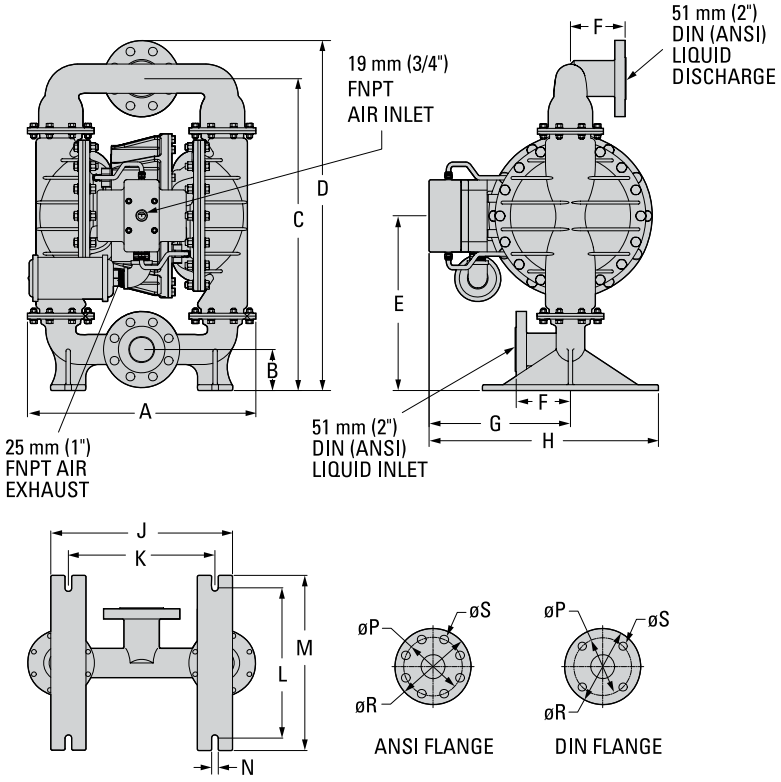
FIGURE 3 At completion of the stroke, the air valve again redirects air to the back side of diaphragm A, which starts diaphragm B on its exhaust stroke. As the pump reaches its original starting point, each diaphragm has gone through one exhaust and one discharge stroke. This constitutes one complete pumping cycle. The pump may take several cycles to completely prime depending on the condition of the application.

HOW IT WORKS—THE POWER PRINCIPLE

The H800 uses an integral power amplifier piston together with two diaphragms to yield a pressure ratio of 3:1 (e.g. 85 psig air inlet will develop pump discharge pressures up to 250 psig). Air is simultaneously directed behind the amplifier piston as well as one of the diaphragms via specialized air manifold porting. The sum of the two surface areas is three times that of the diaphragm. Therefore, the discharge is amplified by a 3:1 pressure output ratio.

DIMENSIONAL DRAWINGS

H800 Metal



DIMENSIONS

ITEM	Metric (mm)	Standard (inch)
A	490	19.3
B	89	3.5
C	677	26.7
D	760	29.9
E	378	14.9
F	120	4.7
G	307	12.1
H	498	19.6
J	394	15.5
K	318	12.5
L	325	12.8
M	379	14.9
N	14	0.6
	DIN FLANGE	
P	125 DIA.	4.9 DIA.
R	165 DIA.	6.5 DIA.
S	18 DIA.	0.7 DIA.
	ANSI FLANGE	
P	125 DIA.	5.0 DIA.
R	165 DIA.	6.5 DIA.
S	19 DIA.	0.8 DIA.

REV B

PERFORMANCE (TPE/FULL STROKE PTFE)

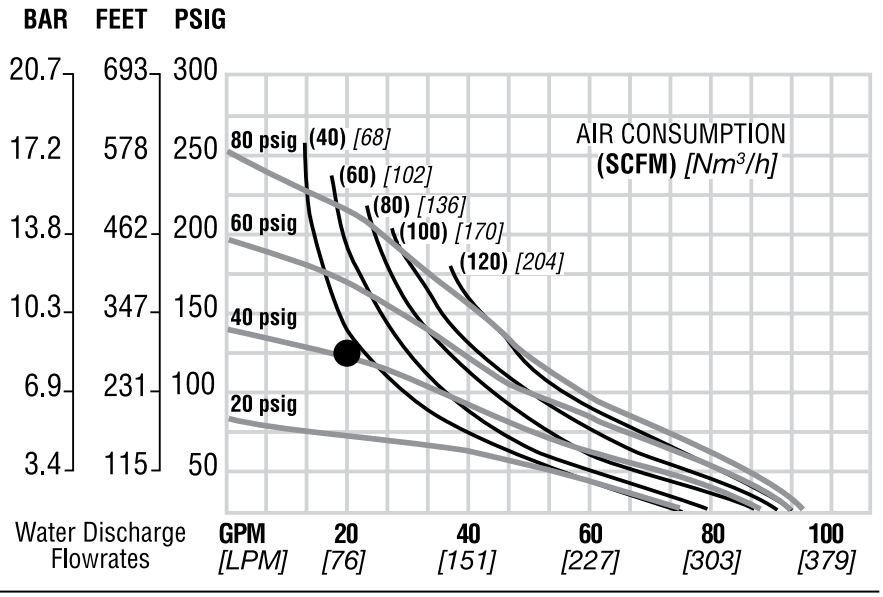
H800 METAL

Height.....759 mm (29.9")
Width .....490 mm (19.3")
Depth .....546 mm (21.5")
Est. Ship Weight.....Stainless Steel 128 kg (283 lb)
Ductile Iron 128 kg (283 lb)
Air Inlet .....19 mm (3/4")
Inlet ..... 51 mm (2")
Outlet ..... 51 mm (2")
Suction Lift ..... 3.7 m Dry (12.0')
9.0 m Wet (29.5')
Displacement Per Stroke...1.67 L (0.44 gal)
Max. Flow Rate ..... 360 lpm (95 gpm)
Max. Size Solids..... 12.7 mm (1/2")

[1]Displacement per stroke was calculated at 4.8 bar (70 psig) air inlet pressure against a 5.1 bar (75 psig) head pressure.

Example: To pump 76 lpm (20 gpm) against a discharge pressure head of 8.6 bar (125 psig) requires 2.9 bar (42 psig) and 65 Nm^3/h (38 scfm) air consumption.

Caution: Do not exceed 5.9 bar (85 psig) air supply pressure.



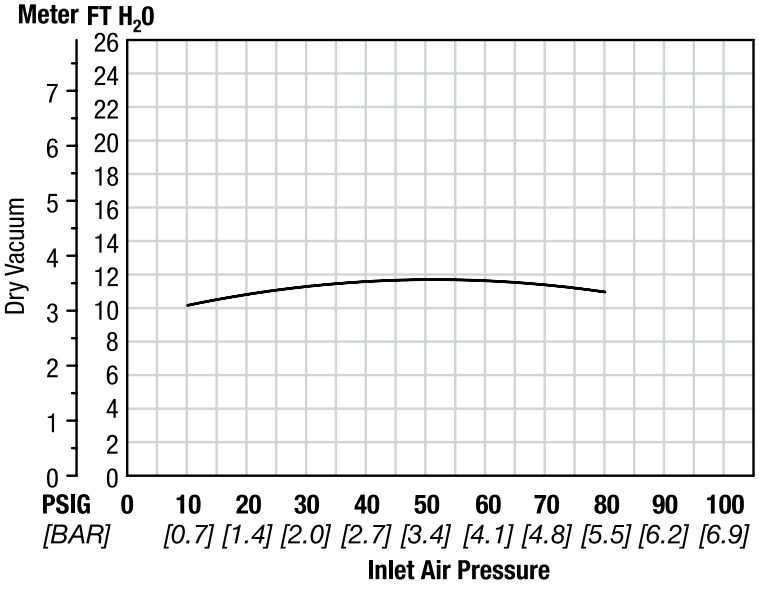
Flow rates indicated on chart were determined by pumping water.

For optimum life and performance, pumps should be specified so that daily operation parameters will fall in the center of the pump's performance curve.

SUCTION-LIFT CURVE

H800 METAL HIGH PRESSURE SUCTION-LIFT CAPABILITIES

Suction lift curves are calibrated for pumps operating at 305 m (1,000') above sea level. This chart is meant to be a guide only. There are many variables that can affect your pump's operating characteristics. The number of intake and discharge elbows, viscosity of pumping fluid, elevation (atmospheric pressure) and pipe friction loss all affect the amount of suction lift your pump will attain.



SUGGESTED INSTALLATION

Wilden pumps are designed to meet the performance requirements of even the most demanding pumping applications. They have been designed and manufactured to the highest standards and are available in a variety of liquid path materials to meet your chemical resistance needs. Refer to the performance section of this manual for an in-depth analysis of the performance characteristics of your pump. Wilden offers the widest variety of elastomer options in the industry to satisfy temperature, chemical compatibility, abrasion resistance and flex concerns.

The suction pipe size should be at least the equivalent or larger than the diameter size of the suction inlet on your Wilden pump. The suction hose must be non-collapsible, reinforced type as these pumps are capable of pulling a high vacuum. Discharge piping should also be the equivalent or larger than the diameter of the pump discharge, which will help reduce friction losses. It is critical that all fittings and connections are airtight or a reduction or loss of pump suction capability will result.

INSTALLATION: Months of careful planning, study and selection efforts can result in unsatisfactory pump performance if installation details are left to chance.

Premature failure and long-term dissatisfaction can be avoided if reasonable care is exercised throughout the installation process.

LOCATION: Noise, safety and other logistical factors usually dictate where equipment will be situated on the production floor. Multiple installations with conflicting requirements can result in congestion of utility areas, leaving few choices for additional pumps.

Within the framework of these and other existing conditions, every pump should be located in such a way that six key factors are balanced against each other to maximum advantage.

ACCESS: First of all, the location should be accessible. If it's easy to reach the pump, maintenance personnel will have an easier time carrying out routine inspections and adjustments. Should major repairs become necessary, ease of access can play a key role in speeding the repair process and reducing total downtime.

AIR SUPPLY: Every pump location should have an air line large enough to supply the volume of air necessary to achieve the desired pumping rate. Use air pressure up to a maximum of 5.9 bar (85 psig) depending on pumping requirements.

For best results, the pumps should use a 5µ (micron) air filter, needle valve and regulator. The use of an air filter before the pump will ensure that the majority of any pipeline contaminants will be eliminated.

SOLENOID OPERATION: When operation is controlled by a solenoid valve in the air line, three-way valves should be used. This valve allows trapped air between the valve and the pump to bleed off, after which improves pump performance. Pumping volume can be estimated by counting the number of strokes per minute and then multiplying the figure by the displacement per stroke.

MUFFLER: Sound levels are reduced below OSHA specifications using the standard Wilden muffler. Other mufflers can be used to further reduce sound levels, but they usually reduce pump performance.

ELEVATION: Selecting a site that is well within the pump's dynamic lift capability will assure that loss-of-prime issues will be eliminated. In addition, pump efficiency can be adversely affected if proper attention is not given to site location.

PIPING: Final determination of the pump site should not be made until the piping challenges of each possible location have been evaluated. The impact of current and future installations should be considered ahead of time to make sure that inadvertent restrictions are not created for any remaining sites.

The best choice possible will be a site involving the shortest and straightest hook-up of suction and discharge piping. Unnecessary elbows, bends and fittings should be avoided. Pipe sizes should be selected to keep friction losses within practical limits. All piping should be supported independently of the pump. In addition, the piping should be aligned to avoid placing stress on the pump fittings.

Flexible hose can be installed to aid in absorbing the forces created by the natural reciprocating action of the pump. If the pump is to be bolted down to a solid location, a mounting pad placed between the pump and the foundation will assist in minimizing pump vibration. Flexible connections between the pump and rigid piping will also assist in minimizing pump vibration. If quick-closing valves are installed at any point in the discharge system, or if pulsation within a system becomes a problem, a surge suppressor (SD Equalizer®) should be installed to protect the pump, piping and gauges from surges and water hammer.

If the pump is to be used in a self-priming application, make sure that all connections are airtight and that the suction lift is within the model's ability. Note: Materials of construction and elastomer material have an effect on suction lift parameters. Please refer to the performance section for specifics.

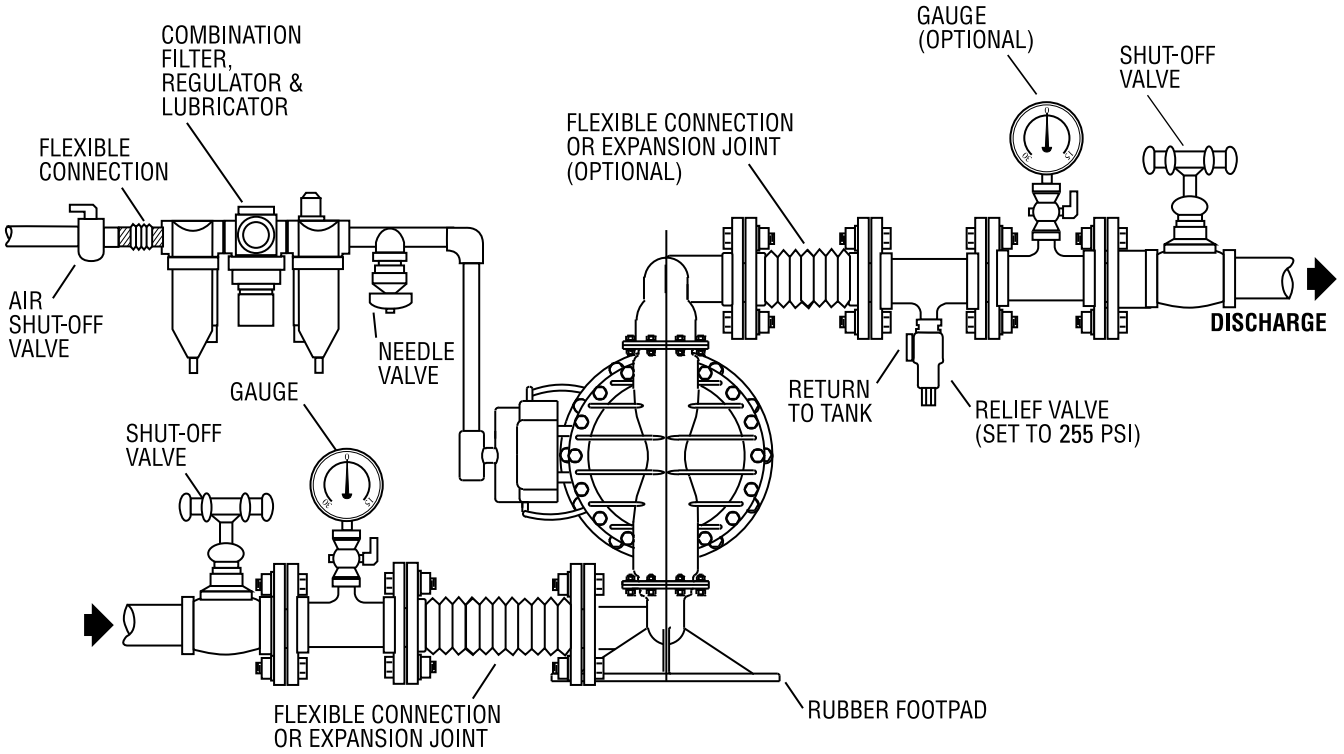
When pumps are installed in applications involving flooded suction or suction head pressures, a gate valve should be installed in the suction line to permit closing of the line for pump service.

Pumps in service with a positive suction head are most efficient when inlet pressure is limited to 0.5–0.7 bar (7–10 psig). Premature diaphragm failure may occur if positive suction is 0.7 bar (10 psig) and higher.

ALL WILDEN PUMPS ARE CAPABLE OF PASSING SOLIDS. A STRAINER SHOULD BE USED ON THE PUMP INTAKE TO ENSURE THAT THE PUMP'S RATED SOLIDS CAPACITY IS NOT EXCEEDED.

CAUTION: DO NOT EXCEED 5.9 BAR (85 PSIG) AIR SUPPLY PRESSURE.

SUGGESTED INSTALLATION



NOTE: In the event of a power failure, the shut-off valve should be closed, if the restarting of the pump is not desirable once power is regained.

AIR-OPERATED PUMPS: To stop the pump from operating in an emergency situation, simply close the shut-off valve (user-supplied) installed in the air supply line. A properly functioning valve will stop the air supply to the pump, therefore stopping output. This shut-off valve should be located far enough away from the pumping equipment such that it can be reached safely in an emergency situation.

SUGGESTED OPERATION & MAINTENANCE

OPERATION: Pump discharge rate can be controlled by limiting the volume and/or pressure of the air supply to the pump. An air regulator is used to regulate air pressure. A needle valve is used to regulate volume. Pump discharge rate can also be controlled by throttling the pump discharge by partially closing a valve in the discharge line of the pump. This action increases friction loss which reduces flow rate. (See Section 5.) This is useful when the need exists to control the pump from a remote location. When the pump discharge pressure equals or exceeds the air supply pressure, the pump will stop; no bypass or pressure relief valve is needed, and pump damage will not occur. The pump has reached a "deadhead" situation and can be restarted by reducing the fluid discharge pressure or increasing the air inlet pressure. The Wilden H800 pump runs solely on compressed air and does not generate heat, therefore your process fluid temperature will not be affected.

MAINTENANCE AND INSPECTIONS: Since each application is unique, maintenance schedules may be different for every pump. Frequency of use, line pressure, viscosity and abrasiveness of process fluid all affect the parts life of a Wilden pump. Periodic inspections have been found to offer the best means for preventing unscheduled pump downtime. Personnel familiar with the pump's construction and service should be informed of any abnormalities that are detected during operation.

RECORDS: When service is required, a record should be made of all necessary repairs and replacements. Over a period of time, such records can become a valuable tool for predicting and preventing future maintenance problems and unscheduled downtime. In addition, accurate records make it possible to identify pumps that are poorly suited to their applications.