WARNING

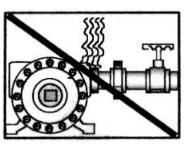
This bulletin is produced to give the end-user some insight into the problems that can occur for which immediate action is necessary to eliminate potentially dangerous conditions. Read this bulletin and all other literature provided with the pump *before* the pump is put into service. This includes literature bulletins "AL-1", "AL-3", "AL-200", "AL-17A", and "AL-99" included with all pumps shipped, as well as specific operation/maintenance bulletins that may also be provided for a specific model pump. If the above referenced literature sheets are missing, please advise us or your nearest Smith distributor, and we will forward these to you immediately.

LEAKS TO ATMOSPHERE

Always pressure test a repaired pump before putting it back in service. Once a leak-tight pump is put into service, we highly recommend that thereafter the pump is checked for leakage on a periodic basis. The casings should be checked periodically, as well as the piping connections to the pump casings. If a leak is detected, do not continue to use the pump. Immediately investigate the cause. Repair or replace the pipe connections or the pump, as required.

The continued use of the pump with a leaking mechanical seal will damage gears, casings, and bearings.

(A) PIPE CONNECTION LEAKS

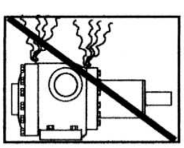


Maximum allowable moment for inlet/outlet connections or welded base blocks, is 250 ft/lbs.

Once a pump has been installed in the piping system, the pipe connections should be carefully tested for leaks, after the pump is pressurized. In situations where the liquid is not dangerously reactive, this can be done visually, checking for bubbles with a soap and water solution, other suitable water-based solutions, or liquids designed specifically for this purpose. With Nitrous Oxide, use an N_2O leak detection instrument. Thereafter, pump pipe connections should be checked for leaks periodically.

(B) CASING LEAKS

Once a pump has been disassembled for repairs, all old sealant must be carefully removed, and new sealant applied sparingly, to the main housing and gear end face of the secondary housing(s) only, in a very thin coat, being careful not to allow excessive sealant into the pump interior, especially around the gears. After reassembly, the pump should be tested for leaks, before being installed in the piping system. Do not install a repaired pump into the piping system before it is properly tested for leaks. Once the leak-tight pump is installed in the piping system, it should be thereafter checked for product leakage periodically.



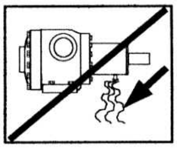
Maximum allowable moment for inlet/outlet connections or welded base blocks, is 250 ft/lbs.

CO_2 vapor is the recommended medium for bench testing the integrity of the sealing casing faces. Once the pump has been installed in the system, it can be tested for product leaks visually, or with an approved leak detection device. The repaired pump should be initially tested at its maximum allowable pressure rating, and thereafter at the prevailing pressure of the system in use at the site.

With LPG, similar petrochemicals, Anhydrous Ammonia, Gasoline, Fuel Oils, Alcohols, and other similar flammables, a visual leak check can be made by pressurizing the pump, and checking casing joints for bubbles, using soap and water, other suitable water-based solutions, or liquids designed specifically for this purpose.

With Nitrous Oxide, use an N_2O leak detection instrument.

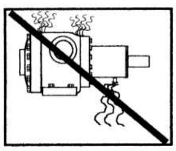
(C) SEAL LEAKS



With the exception of Nitrous Oxide pumps, checking for seal leaks in pumps handling the same flammable or hazardous liquids as described above, follows the same basic visual procedure, this time looking for bubbles at the "leak detection port". In most cases, open the spring loaded cover, wet the area with approved bubble solution and place your finger over the port with light pressure, to observe visual signs of leakage. If there is a small check valve in place of the fitting with the spring loaded cover, wet the pressure exit area with bubble solution, and place your finger over the port with light pressure, to observe visual signs of leakage. All Smith pumps have a "leak detection port" for this purpose. A use-specific leak detection instrument may also be employed.

The visual method is not recommended for Nitrous Oxide. An N_2O leak detection instrument should be used to detect leaks from a Smith Nitrous Oxide pump mechanical seal assembly.

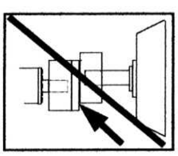
(C) MAJOR LEAK PREVENTION PROCEDURE.



The leak detection action should be accomplished periodically to avoid any product discharge to atmosphere from pipe connections, and casing joints. Mechanical seal assemblies should be checked for leakage, frequently. Note that under normal operating conditions, the shaft seal assembly used for small capacity pumps up to 15 GPM, should be replaced after 8,000 hours of use, and for pumps in the 20 to 250 GPM range, the shaft seal should be replaced after 12,000 hours of use. However, the shaft seal assembly may have to be replaced sooner. It is important to know that the ball bearing that supports the pump drive shaft is one of the components included with the Smith shaft seal assembly. A visual inspection of the shaft seal assembly if required after a pump performance test described in this bulletin, therefore includes the condition of the ball bearing. The grease seal should be removed and the ball bearing checked for grease. If little or no grease is present, the entire shaft seal assembly should be replaced. We recommend a 30% grease pack. The low capacity pumps up to 15 GPM utilize "Beacon 325" grease. The higher capacity pumps up to 250 GPM utilize "DC-33" grease.

SMITH FLEXIBLE DRIVE COUPLING DAMAGE

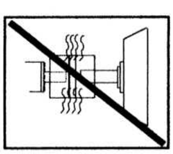
A misaligned coupling, or a coupling which is worn, will cause damage to the ball bearings producing excessive heat generation, and damage to the mechanical seal assembly, leading to product discharge. Make sure that the coupling, which connects the motor shaft with the pump drive shaft, is the type and size recommended by the manufacturer for the application.



(A) COUPLING ALIGNMENT IS CRITICAL.

The pump and motor shafts must be aligned to within .015 thousandths of an inch (0.38 mm). With a Smith coupling, this can be easily checked with a straight edge across the coupling halves, and a set of feeler gauges.

(B) WORN COUPLING SHOULD BE IMMEDIATELY REPLACED.

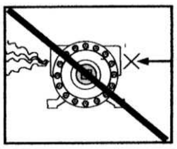


Be aware of unusual noise. If the coupling insert wears out, there will immediately be an audible increase in functional noise when the pump runs, as the hardened steel pins contact each other and produce a loud clattering sound. If this happens, stop the pump immediately and replace the insert, or the complete coupling as required. This is especially important with the MC/GC-series pumps where the coupling is not visible.

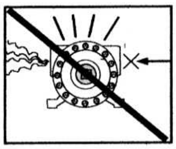
(C) COUPLING PREVENTIVE MAINTENANCE.

To prevent the possibility of coupling damage due to insert wear, we recommend that the coupling insert be inspected periodically, and replaced if damage is noted, or as indicated after a pump performance test as outlined in this bulletin.

INTERNAL FRICTION



Be sure to properly design the piping system. Maintain "flooded suction" on the pump. Keep the pump inlet line short, direct, and mount the pump as close to the supply tank as possible. Do not run the pump with a clogged strainer. Do not run the pump with a blocked inlet line. Do not run the pump dry. Do not cavitate the pump. Do not pump the tank completely empty. Do not allow a flow of liquid to drive the pump ("wind milling"). Any situation, which would cause the pump to continually move more than ten percent vapor displacement in the liquid handled, should be avoided.



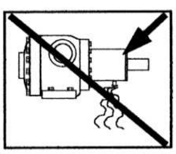
These factors will lead to mechanical shaft seal failure, ball bearing failure, highly accelerated internal wear, unusual noises, and a very noticeable drop in the expected differential pressure built by the pump. If there is a mechanical shaft seal leak, bearing failure, development of unusual noise, if the pump differential pressure drops unexpectedly, or if the pump bogs-down the motor, stop the pump immediately. Investigate the cause of the problem. Repair or replace the pump.

Continually running the pump under any one or more of these conditions will result in accelerated casing wear, gear failure, bearing failure, excessive coupling wear, mechanical seal failure, strange noises, noticeable loss of pump output, and/or pump lock-up.

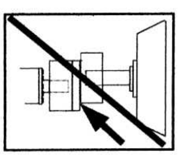
BALL BEARING FAILURE

A failing ball bearing will excessively resist the turning movement of the pump drive shaft, bogging-down the motor. Ball bearing failure may be caused by one or more of the following:

(A) LEAKING MECHANICAL SEAL ASSEMBLY.

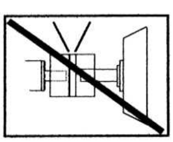


The ball bearing in a leaking Smith mechanical seal assembly is initially protected by the rotary seal, which when activated in this event, forces the leakage through the leak detection port. However, if the leak goes undetected, the rotary seal will eventually wear out, allowing the leakage of product to degrease the ball bearing.



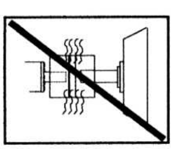
(B) MISALIGNED PUMP AND MOTOR SHAFTS.

(C) EXCESSIVE PRELOADING.



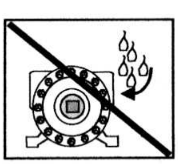
Be sure that when the coupling halves are tightened, there is at least a total .005 - .010" (0.18 – 0.25 mm) gap between the insert and the coupling halves. Do not affix the two coupling halves together tightly against the insert.

(D) WORN COUPLING.



A worn out coupling will eventually cause ball bearing failure.

(E) EXCESSIVE MOISTURE.

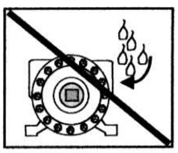


Do not immerse the pump or the shaft-seal assembly in water. Do not hydrostatically test the pump with water, or water-based solutions. Excessive moisture in the immediate area of the mechanical seal assembly will cause it to rust. The rust will result in mechanical seal failure, which can cause degreasing of ball bearings.

(F) EXCESSIVE RPM.
Do not run the pump faster than its maximum design speed. Pumps operated at speeds above their maximum design RPM will make unusual noise, overheat, and cavitate. This will damage the mechanical seal assembly, and can cause ball bearing failure.

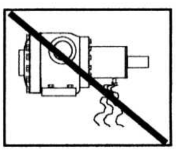
INTERNAL RUSTING

If a Smith pump is hydrostatically tested with water, its interior will rust. The same can occur if the pump or piping is left open to the atmosphere, or if repetitive condensation takes place during storage or prolonged disuse out of the piping system. Situations such as these, lead to rusting of internal parts.



(A) RUST TAKES-UP INTERNAL GEAR CLEARANCES.

When this happens, the pump does not turn freely by hand, and it will tend to bog-down the motor if placed in service in this condition. Should this happen, do not use the pump. Repair or replace it immediately.



(B) RUST DAMAGE TO THE MECHANICAL SEAL ASSEMBLY.

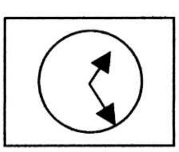
Extensive rusting of the mechanical seal assembly will cause mechanical seal failure. If a badly rusted shaft-seal assembly is used, there will be a discharge of handled product to atmosphere through the leak detection port. This discharge of product can eventually degrease the ball bearing. Should the mechanical seal assembly be rusted, replace it immediately. Should you detect a seal leak, take the pump out of service immediately. Investigate the cause of the leak. Repair or replace the pump.

ELECTRICAL SYSTEM

Follow all approved practices, applicable regulations, codes, and directives in force in the area where the pump is installed. Make sure the wiring is properly designed, sized, and provided with adequate emergency shut-off and overload protection. Be sure there is a specifically sized circuit breaker, which will shut down the electric motor, which drives the pump, in case of pump failure at the site where it is installed.

DUTY CYCLE

Standard Smith pumps are designed for intermittent duty service. The recommended maximum operating time should not be exceeded in accordance with the following table:



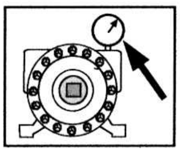
	MAX. TIME "ON"
LOW CAPACITY PUMPS (10-15 GPM)	20 MINUTES
MEDIUM CAPACITY PUMPS (20-50 GPM)	120 MINUTES
HIGH CAPACITY PUMPS (50-250 GPM)	120 MINUTES

Observance of this interval allows the pump to operate in a normal condition, and minimizes damage associated with continuous duty service conditions. Continuous duty applications must utilize available options recommended by the factory. The above recommended intervals are based on pumps operated in accordance with the instructions provided with the pump or pump/motor assemblies, and the pump being operated at the maximum recommended RPM. Allowable maximum "on" time will be greater for pumps operated at slower drive speeds. For the purpose of the above, the nominal motor speed of 3600 RPM is considered the same as 3000 RPM, and 1800 RPM is the same as 1500 RPM.

EXCESSIVE PRESSURE

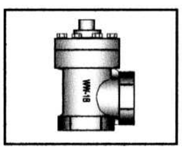
Do not expose the pump to more than the maximum allowable pressure rating, as stamped on the pump tag. Do not allow the pump to build higher than the maximum differential pressure rating as stamped on the pump tag. Do not expose the pump to hydrostatic pressure lock.

(A) MAXIMUM ALLOWABLE PRESSURE RATING.



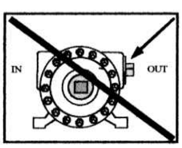
The pump must not be exposed to pressure higher than its maximum allowable pressure rating. If the maximum allowable pressure rating is exceeded, components can be excessively stressed, leading to system failure, pump failure, and/or discharge of handled product to atmosphere.

(B) MAXIMUM DIFFERENTIAL PRESSURE RATING.

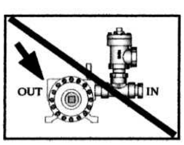


The pump must not be allowed to build more pressure above the inlet pressure, than as stamped on the label plate. The proper use of an approved differential pressure bypass valve will allow excessive pressure discharge back to the system in a safe, secure manner. This valve should be set below the maximum rated differential pressure, taking into account any line loss through the valve or the bypass line (which should return the liquid to the tank being vacated, in such a way that it will not immediately recirculate back to the pump again). Failure to observe this precaution will lead to highly accelerated wear, excessive internal slippage, increased functional noise, mechanical seal leakage, and bearing failure.

(C) HYDROSTATIC PRESSURE LOCK.

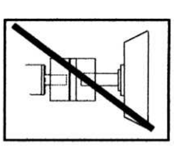


DO NOT DEAD HEAD A SMITH PUMP WHILE RUNNING. The pump must be supplied with at least one hydrostatic pressure relief valve which is always open to the pressure within the pump interior, and open to the outlet pressure when the pump is running. This valve must be properly sized for the projected discharge flow rate, and correctly positioned on the pump, or in the immediate piping, to cover all such contingencies, whether the pump is running, or not.



The pumping system must be used in such a manner that regardless of which direction the pump is run, the handled liquid will never become trapped between two shut valves, or between a functioning pump and a closed valve on the outlet side. **Since Smith pumps will pump liquid in either direction of rotation, the excessive pressure relief mechanism should be designed to continually relieve hydrostatic pressure at a safe level, even if the pump were mistakenly run in reverse.**

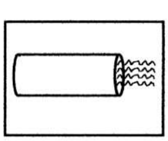
Failure to provide a properly sized relief mechanism for excessive liquid pressure, under any circumstances, can result in casing failure, coupling failure, motor failure, mechanical shaft seal failure, and subsequent discharge of handled product to atmosphere.



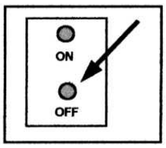
MOVING PARTS

A suitable coupling guard is recommended or other measures to prevent injuries due to moving parts. Never run the pump with a coupling guard removed.

START-UP FOR NEW PUMPS OR AFTER MAINTENANCE.



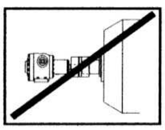
All air must be purged from the pipe work, including the pump, before the pump is operated. An explosive atmosphere in such pipe work may exist if air is not eliminated. Do not operate the pump until all air is purged and the pipe work is full of liquid. A pump operated on an intermittent basis in an atmosphere of air and vapor will generate heat. This may lead to ball bearing failure and mechanical seal failure, in which case product will be discharged to atmosphere. This may lead to a dangerous condition in a potentially explosive atmosphere.

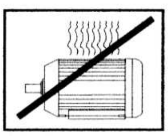


POWER FAILURE

If a pump is operating at the time of a power failure, all control switches must be turned to the "off" position, after such failure, to prevent the pump from coming on when the power is restored. Failure to do this or design an automatic feature into the electrical system that prevents the pump from coming on after power is restored, will allow the pump to immediately begin running again. If this occurs in an unsupervised manner, the pump may stay "on", bypassing its output on a continuous duty basis. This will generate heat and may cause ball bearing failure and/or mechanical seal failure, in which case product will be discharged to atmosphere. This may lead to a dangerous condition in a potentially explosive atmosphere.

ELECTRIC MOTORS



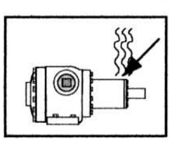


Never use an electric motor that is not recommended for the specific pump model and environment for which it is designed. Never use an electric motor containing more horsepower than is recommended for a specific pump model. External overload devices must be installed if the motor does not contain one. They must limit the motor maximum surface temperature to no higher than the motor rating. Do not use an electric motor that contains thermal overload protection devices designed to trip at temperatures exceeding 400 degrees F. (205 degrees C.). It is important that the thermal overload device in the motor work as intended if there is a malfunction in the pump. This automatically shuts the pump/motor assembly off. Should this occur, shut-off all electric circuits and diagnose/correct the problem before operating the pump/motor again. This may require replacement of specific pump parts that are worn and are causing the motor to draw more current. However, it is important not to ignore a situation in which the motor thermal overload device trips. In some cases, the motor thermal overload device trips because the main wiring is not adequate for the horsepower required from the pump/motor assembly.

GROUND CONNECTIONS

Make certain that the electric motor is appropriately grounded. Instructions from the electric motor manufacturer should be followed. Do not ignore the ground connection. Likewise, any vessel feeding the pump should be appropriately grounded. Stray voltage and static electricity concerns must be addressed either at the installation site or in the assembly stage.

PUMP SURFACE TEMPERATURE



Operating a pump for prolonged periods of time will cause heat generation from the ball bearing. Under normal conditions, the heat generation is not excessive, especially if the pump is operated as per our instructions. The ball bearing supports the pump drive shaft, and is located at the end of the pump where the drive shaft exits the pump. Ball bearing heat generation should be periodically checked. Carefully place your hand over that portion of the pump where the drive shaft exits the pump. Only do this when the pump is not operating. If this area is moderately warm to the touch, and is not so hot that you have to immediately remove your hand, the ball bearing is not generating excessive heat. However, if this area is hot to the touch, there may be a problem with the ball bearing and the mechanical seal should be replaced. Periodically measure the temperature in this area to quantify the heat generation. If the temperature is in excess of 130 degrees F. (55 degrees C.), this indicates there may be a problem with the bearing. It is recommended that the shaft seal assembly be replaced. Do not continue to operate a pump that is generating excessive heat in the ball bearing area.

DO NOT MODIFY THE PUMP ASSEMBLY

Never modify the Smith pump assembly in any way, shape, or form. Use only genuine factory produced parts from Smith Precision Products Company, Inc.. The use of other parts may cause a dangerous situation.

INSTALLATION AND PERIODIC PERFORMANCE TEST

A periodic performance test should be conducted on an annual basis or at a predetermined number of gallons/liters pumped, to determine pump efficiency. See literature sheet "AL-200" for the predetermined number of gallons/liters pumped. The pump performance test will generally determine if internal pump components require replacement. The performance test involves checking the transfer rate of the pump at a predetermined differential pressure or recirculating product back to the supply vessel, and comparing the transfer rate with published transfer rates in our catalogue or other literature, or with the initial transfer rate recorded when the pump was first installed. Best practice is to compare the performance test results with those recorded when the pump is first installed. If the performance test indicates a 25 percent drop in gallons/liters pumped, or the pump is not able to develop maximum differential pressure over the differential pressure setting of either the internal or external bypass relief valve, this may indicate wear of internal components and they should be visually inspected. Sometimes, inadequately designed piping systems will cause the pump transfer rates to decrease due to lower than recommended NPSH on pump suction. Other conditions involving restrictions on the pump inlet or discharge may also cause a decrease in the pumping rate and ability of the pump to develop differential pressure, such as, but not limited to, a clogged strainer. This condition may be more pronounced on either cold or hot days. A noticeable drop in the pump transfer rate as determined by a performance test should not be ignored. In this case, pump internal components should be visually examined for unacceptable wear and replaced if required.

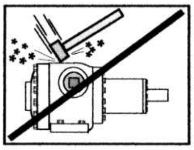
Smith pumps are designed to give very good service over years of field use. Performance testing is a recommended useful tool to insure a pump problem is identified and corrected early to minimize the cost of replacement parts and to insure acceptable and safe operation of the pump. Literature sheet "AL-200" itemizes pump components to be visually inspected should this become necessary.

CAPACITIES/SPEEDS OF LOW CAPACITY SMITH PUMPS, FOR PERFORMANCE RECIRCULATION TEST

PUMP MODEL	RATED SPEED	ACTUAL SPEED	RATED CAPACITY AT "0" PSID
EG-1Z	3600	3600	10 GPM
EG-1Z	3600	3000	8 GPM (30 LPM)
DW-1Z	3600	3600	10 GPM
DW-1Z	3600	3000	8 GPM (30 LPM)
EC-HZ	3600	3600	15 GPM
EC-HZ	3600	3000	12 ½ GPM (47 LPM)
MC-1	3600	3600	10 GPM
MC-1	3600	3000	8½ GPM (32 LPM)
GC-1	3600	3600	10 GPM
GC-1	3600	3000	8½ GPM (32 LPM)
GC-1LZ	3600	3000	10 GPM (37 LPM)
SQ-1	1800	1800	5 GPM
SQ-1	1800	1500	4 GPM (16 LPM)
SQ-H	1800	1800	7 GPM
SQ-H	1800	1500	6 GPM (22 LPM)
SQ-HH	1800	1800	13 GPM
SQ-HH	1800	1500	11 GPM (41 LPM)
SQ-HH8	1200	1200	13 GPM
SQ-HH8	1200	1000	11 GPM (41 LPM)

CAPACITIES/SPEEDS OF MEDIUM AND HIGH CAPACITY SMITH PUMPS, FOR PERFORMANCE RECIRCULATION TEST

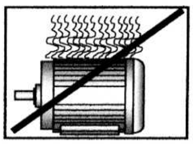
PUMP MODEL	RATED SPEED	ACTUAL SPEED	RATED CAPACITY AT "0" PSID
MC-1044	1800	1800	20 GPM
MC-1044	1800	1500	16½ GPM (62 LPM)
MC-1044H	1800	1800	35 GPM
MC-1044H	1800	1500	29 GPM (110 LPM)
MC-1044Q	1800	1500	27 GPM (101 LPM)
MC-2	1800	1800	50 GPM
MC-2	1800	1500	42 GPM (159 LPM)
MC-2H	1500	1500	50 GPM (189 LPM)
MC-2Q	1800	1800	50 GPM (189 LPM)
MC-2Q	1800	1500	42 GPM (159 LPM)
MC-3	1800	1800	100 GPM
MC-3	1800	1500	83 GPM (314 LPM)
MC-3H	1500	1500	100 GPM (378 LPM)
MC-4	1800	1800	150 GPM
MC-4	1800	1500	125 GPM (473 LPM)
MC-4H	1500	1500	150 GPM (567 LPM)
MC-5	1800	1800	200 GPM
MC-5	1800	1500	167 GPM (632 LPM)
MC-5H	1500	1500	200 GPM (757 LPM)
TC-1044H	900	900	35 GPM (132 LPM)
TC-2	500	500	50 GPM (189 LPM)
TC-3	500	500	100 GPM (378 LPM)
MCAT-2R/L	700	700	42 GPM (159 LPM)
MCAT-3R/L	700	700	85 GPM (323 LPM)



USE OF PROPER TOOLS

Do not use tools made from incendive materials that could possibly cause sparks in a potentially explosive atmosphere.

LIMITING SURFACE TEMPERATURE OF ELECTRIC MOTORS



It is especially important that electric motors used in a potentially explosive atmosphere are approved for the type of vapors that may be present. The maximum surface temperature of the electric motor must not be exceeded. Some electric motors contain internal automatic thermal overload devices that will limit the maximum motor surface temperature. In a case where an electric motor is used that does not contain an internal thermal overload device, one must be installed external to the motor to limit the maximum surface temperature. Make sure that such external thermal overload device does not allow the motor to develop temperatures in excess of the T3 temperature code, which is 200° C. (about 400° F.), and that this temperature is well below the ignition temperature of the vapors present in the area. Some electric motors contain an internal thermal overload device that must be wired externally. Before installation, read the user instructions provided by the electric motor manufacturer to determine if the motor is protected by an internal thermal overload device or if one must be installed externally, and confirm from the information on the electric motor label plate and electric motor user instructions, if it is suitable for the type of vapors present in the area it is to be installed.

ATEX INFORMATION FOR LP-GAS PUMPS

03, 04, 05, etc.	**Year of manufacture (found on pump nameplate)**
CE	**CE Marking**
II2G	**Marking according to Group II, Category 2, gas**
c	**Marking essential for safe use, c = constructional safety**
V1234X	**Tech. File no., X = Special conditions apply – pumps for intermittent duty ***
Serial number	**Found on pump nameplate**
Ambient temperature marking	**Found on pump nameplate**

Maximum Allowable Pressure: 24 bar. Maximum Drive Speed up to 15 GPM pumps: 3600 RPM **
Maximum Discharge Pressure: 24 bar. Maximum Drive Speed for 20 – 250 GPM pumps: 1800 RPM **
Maximum Differential Pressure: 9 bar

*** Maximum Surface Temperature: T6 – not to exceed 85°C.**
****For intermittent duty**

NOTE: FOR PUMP/MOTOR ASSEMBLIES, THE ASSEMBLY IS DESIGNED FOR GROUP II LPG'S AND THE MAXIMUM SURFACE TEMPERATURE OF THE MOTOR, T3, T4, OR T5, IS NOT TO BE EXCEEDED. T3 = 200° C., T4 = 135° C., T5 = 100° C., T6 = 85° C.. MAXIMUM SURFACE TEMPERATURE IS STATED ON THE ELECTRIC MOTOR. PUMP/MOTOR ATEX LABEL INCLUDES II 2G c b II LPG T3, OR T4, OR T5. c = constructional safety, b = control of ignition source by way of thermal overload device, either built into the motor, or wired externally. NOTE: TEMPERATURE OF PUMP NOT TO EXCEED 85° C.. TEMPERATURE OF MOTOR NOT TO EXCEED MAX. SURFACE TEMPERATURE AS STATED ON MOTOR NAMEPLATE IN T3 - T5 RANGE.

LPG IS DEFINED AS PROPANE, BUTANE, AND RELATED HYDROCARBONS.

SMITH PUMPS

SMITH PRECISION PRODUCTS COMPANY
P.O. Box 276, Newbury Park, CA 91319 USA
1299 Lawrence Drive, Newbury Park, CA 91320 USA
Tel.: 805/498-6616 FAX: 805/499-2867
e-mail: SMPUMP1299@aol.com **web: www.smithpumps.com**