Definitions & Nomenclature Used In This Manual & Industry

Bubbletight Sealing — zero leakage between the internal sealed ports of a valve in either the energized or de-energized position. Test is based on the air and soap bubble type.

Current Drain — the amount of current expressed in amperes that flows through the coil of a solenoid valve when it is energized.

Compensated Plunger — a plunger designed to compensate for top insert problems that occur on application conditions of high heat when used with water, gasoline, etc. This condition causes standard inserts to swell or shrink, resulting in leakage. The compensated plunger design permits the top insert to move up or down to provide long life and a bubbletight seal at the top of the orifice. **Standard in all valves at no extra cost.**

Continuous Duty — a rating given to a valve that can be energized indefinitely without overheating or failure under normal operating conditions.

C_v factor — The C_v factor of a valve is the quantity of 60° F water expressed in gallons per minute, which will flow through a valve with a one PSI pressure drop. C_v factors for Peter Paul solenoid valves are indicated in the catalog listings in each section.

Cycle — a complete operation of a solenoid valve. For example: opening a normally closed valve and then closing it is one cycle.

Cycle Rate — the number of times a valve is capable of opening and closing its main orifice in a particular time interval.

Cycles per Minute (CPM) — the number of times a valve is capable of opening and closing its main orifice in one minute.

Dead End Gas Service — a condition in which two-way normally open or three-way valve applications require continuous energization or repetitive cycles for over 2 hours.

Drip Proof — see NEMA classifications

Drip Tight — see NEMA classifications

Dust Tight — see NEMA classifications

Duty Cycle — the longest time that a valve is energized, followed by the shortest time that it is de-energized.

Explosion-Proof Construction — a solenoid valve constructed to meet the specifications of the Underwriters' Laboratories, Inc. for operation in hazardous locations. See also NEMA classifications.

Flow — the continuous movement of fluid created by a pressure differential.

Flow Rate (Valve) — the amount of fluid through a valve in reference to pressure drop across the valve to carry magnetic flux from the housing to the sleeve assembly. A flux plate is required only on valves having a non-magnetic body material.

General Purpose Valves — valves suitable for application indoors under normal atmospheric conditions. See also NEMA and U.L. classifications.

Hazardous Locations — as defined by Underwriters' Laboratories, Inc. most Peter Paul explosion-proof valves are listed for use in the following hazardous locations: Class I, Group D, Class II, Group F and G. See also NEMA classifications.

Class I Locations — are those in which flammable gases or vapors are or may be present in the air in sufficient quantities to produce explosive or ignitible mixtures. Group D atmospheres are: gasoline, hexane, naphtha, benzine, butane, benzol, propane, alcohol, acetone, lacquer, solvent vapors, and natural gas.

Class II Locations — are hazardous because of the presence of mixtures of combustible dust. Group F atmospheres contain carbon black, coal or coke dust. Group G atmospheres contain flour, starch or grain dust.

Intermittent Duty Coil — a valve coil not designed for continuous duty but which will perform satisfactorily for a specified duty cycle.

Heat Rise — the difference between the temperature of the solenoid coil when energized and de-energized. As current flows through a coil, heat is generated. The coil temperature rises until the coil and valve construction dissipates additional heat as fast as it is generate, and the temperature stays at a stabilized level.

Insert — a material used in a plunger assembly to seal an orifice.

Definitions & Nomenclature (Continued)

Insert Material - Color coded for easy identification

Buna-N — a soft synthetic rubber used as the standard insert material in Peter Paul valves.

Kel-F — a synthetic plastic material used for many semi-corrosive media.

Neoprene — a soft synthetic rubber used as an insert material on certain types of Freons.

Nordel — a soft synthetic rubber used as an insert material on certain water and steam applications.

Nylon — a synthetic plastic material used for semi-corrosive medial where Kel-F is not suitable.

Teflon — a synthetic plastic material used for semi-corrosive medial where Kel-F or Nylon is not suitable.

Viton — a soft synthetic rubber used for high temperature and with many fluids not handled by Buna-N or Nordel.

Leakage, External — the leakage between the internal part of the valve and the external part of the valve. All Peter Paul valves have no external leakage.

Leakage, Internal — the leakage between the internal sealed ports of a valve in either the energized or de-energized position. All Peter Paul Standard Valves with standard (Buna-N) inserts are bubbletight when applied as rated.

Manual Override — a mechanical device that permits manual opening of normally closed valves or closing of normally open valves.

Metering — a mechanical device that permits manual adjustment of fluid flow through a valve. Sometimes referred to as speed control.

Oxygen Service — valves **specified** for use with oxygen are furnished free of any oil. Special cleaning may be required and should be so specified.

Port — an opening or passageway for the inlet or outlet of fluid in a valve. The terminus of the port is threaded with National Pipe Threads (NPT) to accommodate line connection. A port designated with an NPTF port indicates one with dry seal threads. A port designated with a PTF indicates one with short dry seal threads.

Port, Cylinder — a port which provides a passage to or from an actuator. This port is a common port and in multi-purpose valves is called a common port.

Port, Exhaust — a port which provides a passage to the atmosphere, or the return lines of a system.

Port, IN — a port which provides a passage from the source of fluid.

Port, OUT — the port where the fluid leaves the two-way valve.

Port, normally closed — the port that is closed to fluid flow when the valve is de-energized.

Port, normally opened — the port that is open to fluid flow when the valve is de-energized.

Power Consumption — the number of watts a solenoid valve draws when it is energized.

Pressure — is a potential force used as a propellant of air or fluid. Pressure is induced into a system by means of a pump, compressor, or by gravity. Absolute pressure is measured in pounds per square inch absolute (PSIA). Absolute pressure is the reference of pressure with 0 used as a base. Gauge pressure (or PSIG) is the reference of pressure with 14.7 pounds per square inch at sea level as a base.

Pressure, Burst — is the minimum pressure that would cause the weakest section of the valve to fail and cause external leakage.

Pressure, Differential (Drop) — is the difference in pressure measured between any two given points.

Pressure, Maximum Operating Pressure Differential— the maximum difference in pounds per square inch between the pressure at INlet port and the pressure at OUTlet port at which a solenoid will operate, either to open or to close one or more ports when energized or de-energized.

Pressure, Proof — is that pressure which may cause malfunction of the valve without permanent damage, i.e., the valve will operate properly when the pressure is reduced to normal operating range.

Pressure, Ratings:

Higher than Standard — are pressure ratings which can be made available through minor changes on a solenoid valve. In most cases, this is possible only when UL approval is not a factor.

Standard Catalog — are pressure ratings established to conform to Underwriters' Laboratories, Inc., and to do so under the most adverse conditions of pressure, low or high voltage, maximum heat rise, etc. The standard ratings listed in this catalog should be considered as conservative.

Response Time — the length of time required for the operating mechanism of a valve to move from the fully closed position to the fully open position, or vice versa. Response time will vary according to pressure, media, voltage and system. The response times shown in the catalog are based on average conditions.

U. L. and CSA Terms Nomenclature and Listings

Most standard Peter Paul series 20, 30, and E20 are U.L. and CSA listed. **All** Peter Paul Valves, including those not U.L. and CSA listed, use the high standards of U.L. as the minimum standard for performance. A copy of the U.L. and CSA cards regarding Peter Paul's valve listings is enclosed. The valves are listed under the following U.L. and CSA Guide Numbers and categories:

1. U.L. Guide No. 440 A5 (Valves Electrically Operated) Safety and General Purpose Valves.
2 U.L. Guide No. 440 A5-C (Component-Valves, Electrically Operated) Safety and General Purpose Valves.
3. U.L. Guide No. 440 AO (Valves, Electric, For Use in Hazardous Locations) Safety and General Purpose.
4. U.L. Guide No. 384 OO (Solenoids for Use in Hazardous Locations).
5. CSA Guide NO. 440-A-O, Class 3221 (Solenoid Valves)

Some terms and nomenclature as defined and used by Underwriters' Laboratories, Inc.:

General Purpose Valve — a valve intended to control the flow of a fluid, but not depended upon to act as a safety valve. It may be normally closed or a normally open valve.

Safety Valve — a normally closed valve of the "on" and "off" type intended to be actuated by a safety control or by an emergency device to prevent the unsafe delivery of a fluid. It may also be used as a "general purpose valve."

Hazardous Fluids — gases and liquids which are usually considered to be combustible, highly corrosive, or toxic such as acetylene, strong acids and alkalis, ammonia, anesthetics, liquefied petroleum, manufactured and natural gases, combustible oils, oxygen, etc.

Hazardous Locations — locations in which "hazardous fluids" may be present in the air in sufficient quantities to produce explosive or ignitible mixtures.

Peter Paul Explosionproof Valves and Solenoids are U.L. listed for use in the following hazardous location groups as defined by Underwriters' Laboratories:

Class I, Group A — Atmospheres containing acetylene.

Class I, Group B — Atmospheres containing acrolein, butadiene, ethylene oxide, hydrogen, propylene oxide.

Class I, Group C — Atmospheres containing ethyl-ether vapors, ethylene or cyclopropane.

Class I, Group D — atmosphere containing gasoline, hexan, naphtha, benzine, butane, propane, alcohol, acetone, benzol, lacquer, solve vent vapors, or natural gas.

Class II, Group E — atmospheres containing metal dust, including aluminum, magnesium, and their commercial alloys, and other metals of similarly hazardous characteristics.

Class II, Groups F and G — atmospheres containing carbon black, coal or coke dust, flour, starch or grain dust.

PETER PAUL ENCLOSURES FOR VARIOUS NEMA REQUIREMENTS:

NEMA (National Electrical Manufacturers Association) Standards for Electrical Enclosures are defined as listed below. The specific Peter Paul housing arrangements that meet these requirements are described below.

NEMA 1. GENERAL PURPOSE

To prevent accidental contact, protection from dust, but not dust tight. All Peter Paul standard housings, with **non-molded** or **molded** coils meet this requirement.

NEMA 2. DRIP TIGHT

To prevent accidental contact and to exclude falling moisture or dirt, Peter Paul **J.I.C. housing** with **non-molded** or **molded** coils are suitable.

NEMA 2. DRIP PROOF

To prevent accidental contact and protection against falling moisture or spray from interfering with operation. All Peter Paul standard housings with **molded** coil or Peter Paul **J.I.C. housing** with **non-molded** or **molded** coils meet this requirement.

NEMA 3. WEATHER RESISTANT

To provide suitable protection against falling moisture or spray from interfering with operation. All Peter Paul standard housings with **molded** coil or Peter Paul **J.I.C. housing** with **non-molded** or **molded** coils meet this requirement.

NEMA 4. WATER TIGHT

To provide entrance of water after a specific hose test. Peter Paul **J.I.C. housing with non-molded coil,** molded, or potted coil meets this requirement.

NEMA 5. DUST TIGHT

To prevent entrance of dust by use of gaskets or equivalent. Peter Paul **J.I.C. housing** meets this requirement with **non-molded** or **molded** coil, or potted coil.

U. L. and CSA Terms Nomenclature and Listings (Continued)

NEMA 6. SUBMERSIBLE

Constructed so that it will operate successfully when submerged in water under specific conditions of pressure and time. Liquid potted coils meet this requirement.

NEMA 7. — AND UNDERWRITERS' LAB. CLASS I — GROUP D — EXPLOSION PROOF

Where flammable gases are present, specifically, gasoline, hexane, naphtha, benzine, butane, propane, alcohol, acetone, benzol, lacquer solvent vapors and natural gas. **Non-molded** or **molded** coils in Peter Paul explosion proof valves meet this requirement.

NEMA 8.

As above (NEMA 7) except unit is oil immersed. Peter Paul **explosion proof valves** with **molded coils** meet this requirement. (Class I - Group D and Class II - Group F and G.)

NEMA 9 AND 9A AND UNDERWRITERS' LAB CLASS II— GROUP F AND G

Where combustible dust is present. Specifically, Group F (carbon black, coal or coke dust) and Group G (flour, starch and grain dust). **Non-molded** or **molded** coils in Peter Paul explosion proof valves meet this requirement.

COIL TEMPERATURE CLASS CHART

Class A	105 C / 221 F
Class B	130 C / 226 F
Class F	155 C / 311 F
Class H	180 C / 356 F
Class N	200 C / 392 F
Class C	220 C / 428 F

Valve Types and Function

The basic Peter Paul Valves are electromagnetically actuated, direct operating, solenoid-type valves with resilient inserts that seal upon the orifice.

De-energized - When a valve is de-energized it is said to be in its “normal condition” and no current flows through the electrical coil winding.

Energized - When current is permitted to flow through the coil and the resultant magnetic flux overcomes the fluid pressure and spring force and brings the plunger up against the stop.

Normally Closed Valve - a valve in which the inlet orifice is closed when the coil is de-energized and open when the coil is energized.

Normally Open Valve - a valve in which the inlet orifice is open when the coil is de-energized and closed when the coil is energized.

Multi-Purposed Valve - a valve which has combinations of normally closed, normally open or normally closed and normally open orifices in one valve unit which are opened or closed by energizing or de-energizing the coil.

Directional Control Valve - a valve in which the inlet is open to the normally closed port when the coil is energized.

Two-Way Valve - a valve that has a single orifice which may be normally open or normally closed.

Refer to the cross-sectional drawings on the following pages for the desired valve description.

Two-Way Normally Closed (2 W.N.C) - a valve in which the orifice is closed in the de-energized position and no flow can exist between the inlet and outlet ports.

Two-Way Normally Open - (2 W.N.C.) - a valve in which the orifice is closed in the de-energized position and no flow can exist between the inlet and outlet ports.

Two-Way Dual Purpose Valve - (2 W.D.P.) - a valve that will function properly with rated pressure at either the IN port or OUT port in the energized or de-energized position.

Three-Way Valve - a valve that has two orifices and three ports. One orifice is always open when the other is closed and one port is always open to one of the other two ports. Flow is controlled by opening or closing either of the two orifices.

Three-Way Normally Closed - (3 W.N.C.) - a valve in which inlet orifice is closed and the exhaust orifice is open in the de-energized position. No flow can exist between the inlet cylinder ports. Full flow can exist between the cylinder and exhaust ports.

Three-Way Normally Open (3 W.N.O.) - a valve in which the inlet orifice is open and the exhaust orifice is closed in the de-energized position. Full flow can exist between the cylinder and exhaust ports.

Three-Way Directional Control (3 W.D.C.) - a valve in which the inlet is open to the normally open port when the coil is de-energized and open to the normally closed port when the coil is energized.

Three-Way Multi-purpose (3 W.M.P.) - a valve in which will function as three-way normally open, as three-way normally closed, and three-way directional control, depending on piping hookup.

Direct Action Valve - a valve in which flow is controlled directly by the plunger and the spring in the magnetic circuit and is not dependent on any other factors. There are only two moving parts.

Internal Pilot-Operated Valve - a valve that operates on a minimum and maximum pressure differential and uses a small orifice size “direct acting” valve to open and close a much larger main orifice size valve. The main orifice is operated and closed by pressure differential across a diaphragm, spool or piston built into the main valve body.

External Pilot-Operated Valve - a valve that operates in a similar manner to the internal type except that the pilot valve operated from a separate source of pressure.

Servo-Valve - a valve sometimes referred to as a “proportioning valve.” The extent of orifice opening or flow is controlled by extent or amount or electrical signal inputs.

Synthetic Insert Material for Valves

Color Coded for easy Identification

The information is a general guide and can be changed due to media and type of valve being considered.

Type	General Purpose Buna N	FKM	Neoprene®	EPDM
Code # Durometer	Code. Duro. A (80-90) B (70-80) C (55-65) D (70-80) H (70-80) P (90-100)	Code. Duro. V (70-80) I (80-90) N (90-95)	Code. Duro. G (75-85) R (70-80) L (80-90)	Code. Duro. U (80-90) X (70-80)
Property	Acrylonitrile Rubber	Fluoroelastomer	G. N.	Ethylene-Propylene Elastomer
Oil Resistance	Excellent up to 225 F.	Excellent up to 400 F.	Good up to 225 F.	Fails
Water Resistance	Excellent up to 150 F.	Good up to 180 F.	Good up to 150 F.	Excellent 210 F.
Air Resistance	Excellent up to 180 F.	Excellent up to 350 F.	Excellent up to 180 F.	Good (no oi) up to 180 F.
Abrasion Resistance	Excellent	Excellent	Excellent	Good
Age Resistance	Excellent	Good	Excellent	Excellent
Steam Resistance	Fail	Fail	Fail	Good (to 300 F.)
Low Temp Range	-40 to -65 F.	+10 to -10 F.	-40 to -65 F.	-40 to -60 F.
High Temp. Cont. Duty	+230 to +240 F.	+325 to + 350 F.	+230 to +240 F.	+250 to +300 F.
High Temp. Int. Duty	+25 to +300 F.	+425 to +450 F.	+260 to +280 F.	+350 to +400 F.

COMPENSATED PLUNGERS

Peter Paul supplies compensated plunger in all cases at no extra charge.

WHAT IS A "COMPENSATED PLUNGER"

The "Compensated Plunger" permits the top insert to move up and down thus providing long life and bubble-tight sealing at the top orifice. The design provides a metal-jacketed top insert that is spring loaded. This plunger is offered with various insert materials to suit different applications. It is offered with Standard Buna-N (no charge). FKM, EPDM, Neoprene, Teflon, Kel-F or Nylon insert material are available.

WHY A COMPENSATED PLUNGER IS USED

A general property of rubber products is to dry, shrink and harden with the application of heat. Another property is the change in volume and swelling that takes place in liquids. Various liquids and chemical formulations will affect different insert materials to varying degrees.

The specific advantages of a compensated plunger are when:

1. A liquid media is being used in a Three Way Valve or a Two Way Normally Open Valve.
2. A Three Way Valve or a Two Way Normally Open Valve is continuously energized for two hours or longer.
3. A Three Way Valve or a Two Way Normally Open Valve is operating at a high cycle rate (greater than 200 C.P.M.)
4. A Three Way Valve or a Two Way Normally Open Valve is operating at a long duty cycle (such as "On Time"=1 hour, "Off Time" = 10 minutes)
5. A Three Way Valve or a Two Way Normally Open Valve is "dead ending" (no flow when energized) for repetitive cycles that have an "On Time" greater than 1 1/2 hours.
6. A Three Way Valve or a Two Way Normally Open Valve is being used with media of excessive temperature.
7. A combination of the above-consult factory on any questionable applications.

TYPE OF INSERT MATERIAL TO APPLY

Refer to the above table describing each insert material. Consult factory for any questionable applications and for other Seal Material options.

Metering Options
When a critical or controlled amount of flow is required, a metering device is incorporated in the valve body. This allows adjustment of flow through the valve form nearly zero to fully open for pressures up to 300 PSI. If a metering device is required for higher pressures, consult the factory.

Two basic metering devices are offered. These are the “stem” (option “F”) and the “screw” (options “T” standard) and “A” (fine). Other metering functions offered are “metered by-pass” (option “W”) and “metered sleeve, to atmosphere” (option “U”).

Standard Screw Type Metering (T)
This is a precision tapered screw and is used to adjust the flow of orifice sizes 3/64 to 1/8 inch. It can meter flow down to a degree of extremely low leakage. If bubble-tight leakage is required, consult the factory. This type of metering can be fabricated to meter the flow through the valve body cavity port or the valve body orifice port. Thus, if two 3 Way Valves are used to operate a double acting cylinder, the forward stroke, return stroke, or both strokes of the cylinder may be adjusted to obtain a given required operating speed by desired valve and metering selection. The “Standard” Screw-Type Metering travels from closed to full orifice opening in approximately 2 1/2 turns. Stock valves are fabricated to adjust orifice port flow.

Fine Screw Type Metering (A)
This is a precision tapered screw to give fine adjustment of orifice sizes sizes 3/64 to 1/8 inch. The fine metering screw is 4 xs finer in adjustment than the standard. Thus if the standard metering takes 1/4 of a turn from closed position to obtain desired metering, the fine would take one full turn to adjust to the same point. The full adjustment range of the fine metering is approximately 2 1/2 turns (same as standard). It can adjust flow down to extremely low leakage (bubbles). If bubble-tight leakage is required, consult the factory.

Stem Type Metering (F)
This metering device is for orifice sizes 5/32 to 1/4 inch. Seven full turns are required to fully open a 1/4 inch valve body orifice. This metering device can not be adjusted to bubble-tight leakage and is only offered as an orifice port metering device.

Metered By-Pass (W)
This type of metering device is offered when an adjustable flow is required to pass through the valve regardless of whether the valve is energized or de-energized and whether the orifice being opened or closed. Thus a by-pass with a metering device is fabricated into the valve body. Consult the factory with specific requirements.

Adjustable Sleeve Exhaust (U)
This is a metering device that is placed in the top of the sleeve assembly and exhausts to atmosphere. This is particularly useful in adjusting an air operated cylinder’s return stroke speed.
All metering options are described and listed in that section of the catalog. Metering location is considered standard as listed. Check customer’s location requirement. Apply standard location, if at all possible. The metering can be offered with directly opposite location. If the quantity is large enough there will be no extra charge. If other locations are required consult the factory.

Manual Override (Y)
This is mechanical device that permits a person to operate the valve by either hand or screwdriver. This is useful in case of a power failure or to assist in machine or system set-up or test.
The manual override location is listed in that section of the catalog. These locations are standard and are a stock item. The manual override can be offered with directly opposite location.

GANG FEEDING OPTION
In application where numerous solenoid valves are connected to the same supply line, considerable savings can be achieved by eliminating fittings. This can be done by using a multi-ported valve body where one of the pipe ports is a feed-through supply.
Using this method, the feed-though ports can be connected in a line resulting in a simplified piping. Only one valve requires connection with the main supply line. This feature can be offered in a 2 Way or 3 Way valves.

Application
Vending Machines: Where different valves are connected to the same water line, but the outlet feeds different circuits.
Packaging Machines: Where the air supply is required to actuate different cylinders at different times, but feed from the same source.
Automation: So that more valves can fit in a limited space.

GANG FEEDING (continued)

Specification:

Gang feeding can be applied in both 1/8 or 1/4 NPT pipe ports.
Applicable on series 20 and 30 valve lines.
Gang feeding can be applied on 2 Way or 3 Way valves.

Connecting Pipe: Standard straight pipe 1/8 or 1/4 NPT with a minimum length of 1.0 inch.

2 Way Normally Closed: Two inlet ports and one outlet port. Valve can be fed from either of the inlet ports, while the other inlet port is connected with the inlet port of the next valve in the line.

3 Way Normally Closed: Two inlet ports and one cylinder and exhaust port. One inlet port is connected with the next valve's inlet port. If the two valves are "ganged" it is equivalent to a 4 Way Valve.

Directional Control: Two inlet ports and one N.C. and one N.O. port. One of the inlet ports is connected to the next valve in line and a multi-directional valve is obtained. (More than 2 directions, depending on the number of valves.

Orifice Size: Any valve body with standard orifice can be supplied.

VALVES FOR MANIFOLD MOUNTING

Peter Paul Electronics Co. produced two types of Solenoid Valves which can be mounted on a manifold.

Bottom Mounted Manifold Feed: (Print No. 20-3025) Suitable for applications where the valve's body can be mounted by using two 10-32 holding screws at the bottom of the valve body. The advantage of this method is the economical utilization of space, lower cost and immediate availability.

Flange Mounted Manifold Feed: (Print No 20-3012) Suitable for application where the valve's body has to be mounted form the upper end (Face) of the manifold. Since mounting is accomplished by a flange, the space requirement is greater than the bottom mounted manifold feed. Customer must use the two locating holes to avoid mis-application.

Sleeve Port: Since the sleeve port is not part of the valve body, its connection to the manifold, if necessary, has to be made by using copper tubing or by using flexible hoses.

SOLENOID VALVES . . .

COIL TYPES

Peter Paul manufactures all coil in our own plant to rigid manufacturing and quality standards. This makes for excellent availability and delivery of all types for all voltages.
The only coils presently U.L. listed are types V and M.

Non-Molded (Type V)–Class A rated at 105° C.–IEEE* and 110° C. Continuous & 125° C. Intermittent–U.L.

Molded (Type M)–Class F rated at 155° C.—IEEE* and 110° C. Continuous & 125° C. Intermittent– U.L.** The coils are moisture proof.

High Temperature Molded (Type H)–Class H rated at 180° C.–IEEE* and 160° C. Continuous & 175° C. Intermittent–(Non-Published) U.L.** The coils are moisture resistant.

POTTED (Type P)–Class F rated at 105°–IEEE* and 110° C. Continuous & 125° C. Intermittent–U.L.** Peter Paul Rating*** 125° Continuous. The unit is water proof.

***IEEE*–**The temperatures listed are the limiting temperature definitions by this organization for insulation material categories.

****U.L.–**The temperatures listed are the maximum permissible temperatures for the total of coil resistance temp, rise and ambient temp for the complete coil.

COIL SELECTION FOR SERIES 20, 30, 40, 50 & 70 VALVES

In selecting coils for various “odd voltage” requirements, the following formula should be observed.

If an applied voltage (A.C.) falls between the rated voltage of two coils (rated voltage appears on Coil Charts), take 40% of the difference in voltage between the two coils and add to the lower voltage rating. If the resulting figure is equal to or larger than the applied voltage, the coil with the lower voltage ratting should be used. If the resulting figure is smaller than the applied voltage, the coil with the higher voltage rating should be used.

Example: Field Voltage 130v/60cy.
The 2C-115 Coil has a rated voltage of 138v/60y.
The 2C-114 Coil has a rated voltage of 120v/60y.
18v (difference)
40% of 18 Volts 7v
120v (lower volt. rating)
127 v is the max. 60 cy.
Voltage for 20C-114

Therefore, a 2C-115 coil should be used with a field Voltage of 130 volts 60 cycles.

Coils selected under the above formula will operate successfully at 10% below and 10% above the nominal applied voltage.

This general rule for coil selection should only be used with “Standard Valves” in the Series 20, 30, 40, 50, & 70 operated under “Standard Conditions”. For clarity, definition of what is meant by “Standard Valves” and “Standard Conditions” follows.

Non-Molded

Molded

Potted

Technical Information

General

The following table will assist in determining the suitability of Peter Paul valves for a wide range of common media.

Media Variables

Quite often the exact chemical composition, concentration or application conditions can vary the corrosive effect of some media. In these cases Peter Paul must be consulted and the code note (PP) appears. When requesting recommendations in these cases the following information must be provided.

1. Exact composition of media.
2. Concentration of media.
3. Temperature range.
4. Pressure range.
5. Length of exposure.
6. Allowable Leakage.
7. Valve life expectancy.

Uncommon Media

Often requests are received to recommend valves for media with which we've had no prior experience and which do not appear in tables furnished by the Steel, Rubber and Plastic manufacturers.

In such cases the prospective customer is often in the best position to know what materials are compatible. Thus, there is a table that follows listing Peter Paul Valve materials.

Note

(1.) The following recommendations are limited to Media whose temperature range between 0 F. and 180 F. Consult Peter Paul when either lower or higher temperatures are expected.

(2.) Three-Way normally closed valves that exhaust to atmosphere are usually restricted to air service.