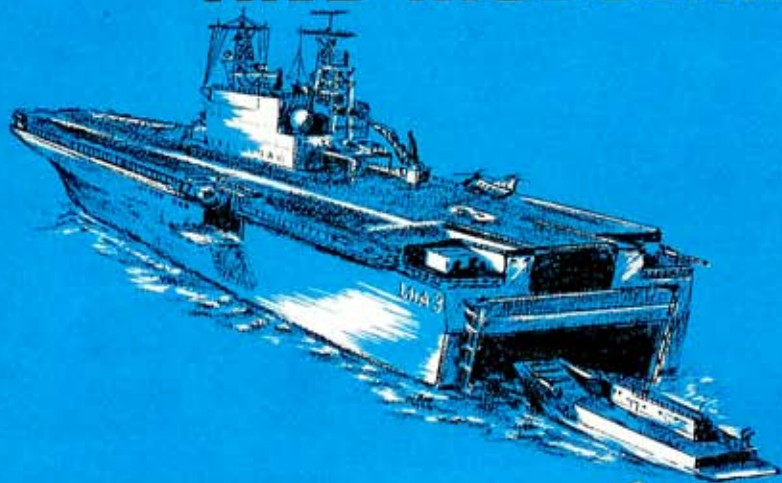


INTEGRATED FLUID CIRCUIT MANIFOLDS AND MODULAR COMPONENTS



CIRCLE SEAL CONTROLS, INC.

A division of CIRCOR International, Inc.

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The products shown in this brochure indicate the capability of Circle Seal Controls to manufacture such products. In order to evaluate your requirements, please furnish complete engineering specifications, including fluids, flow rates, inlet and outlet pressures, temperatures, relief valve flows and reseal, space and mounting limitations (if any), environmental and performance parameters, and any other pertinent data.

WHY INTEGRATED CIRCUITS

The use of an integrated system or manifold system affords the ultimate user many intangibles such as reduced procurement time, single source manufacturer service, reduction of engineering time, improved quality, and reliability. Most of all, manifold systems provide outstanding trouble free performance, minimize usable space, and most important of all the overall cost of the system is greatly reduced.

The parameters outlined in the following paragraphs are presented to assist you in selecting the right manifold system for the right application.

When using the integrated circuit approach, the designer is able to specify the performance of the system rather than the performance of each component part. Operational arrangement, inlet and outlet pressure and flow requirements are more easily defined when the integrated circuit approach is utilized. Other important benefits derived through the use of the integrated circuit approach concept include the elimination of the time and cost of selecting, specifying, evaluating, and qualifying of each individual component.

Manifold systems consolidate many components such as piping and fittings into a compact package that results in a considerable saving of valuable space. In most instances the installation of a manifold system is quick and efficient. During assembly, each individual component is checked for leakage. After assembly the entire unit is once more checked for leakage, thereby ensuring a reliable operating unit when installation is complete.

When manifolds are utilized, costly tube bending, brazing of joints, and constant tightening of fittings are eliminated. A manifold system on the average eliminates fabricated joints in a ratio of 2-1/2 to 3 times the number in a manifold system.

The use of manifolds in a system guarantees a compatible system by utilizing components that have previously been tested as a unit and have been proven to function in a reliable manner. In most assemblies, the arrangement of the manifold controls are generally "human engineered" in order to establish an easier operating procedure, thereby reducing the error factor.

When using a manifold system, a single source for spare parts is more desirable than many individual supply sources. In the event of system malfunction, only the single source vendor can be called for service.

The procurement time involved in the purchasing of a manifold system is greatly reduced, since the necessary documentation covers only a single unit rather than the many components utilized in a conventional system. Since only a single vendor is involved, the buying and expediting is reduced to a minimum, therefore the proper functioning of the system becomes the responsibility of the single source vendor and the danger of conflicting claims in the event of system malfunction is completely eliminated.

Quality Control procedures generally associated with conventional piping systems, such as visual inspection, hydrostatic testing, radiography, ultrasonic testing, and inspection of welded or brazed joints, are eliminated when a manifold system is utilized.

Pre-testing of each manifold component, and then functional testing of the completed manifold unit prior to final shipment increases the overall operational reliability. Manifold components are able to be removed from the unit without suffering system downtime.

ENGINEERING



MANUFACTURING



OPERATION AND SERVICE



PURCHASING



QUALITY CONTROL



INTEGRATED CIRCUIT SYSTEMS

aircraft baggage conveyor system

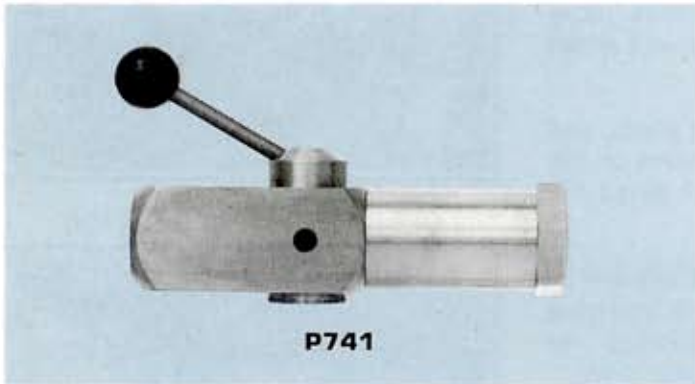


A combination solenoid and regulator valve is used on commercial aircraft to control air supply to a pneumatic brake on the container conveyor system. The system operates off the aircraft turbine bleed air system.

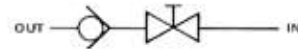


2990-9539

combination check valve



P741



A combination manual shutoff and check valve is utilized as a vacuum system component. The valve operates at a pressure of 0 to 15 psi. The valve body is of commercial brass. The cracking pressure of the check valve is 0.5 to 1.0 psi. Air is used as a fluid media.

diving system manifold

This manifold consists of the following Circle Seal products: Shutoff Valve, Plug Shutoff Valve, and a Check Valve. The body of the valve is chrome plated brass. This unit was specifically designed for hard hat or deep diving applications. The valves use oxygen or mixed gases as fluid media.



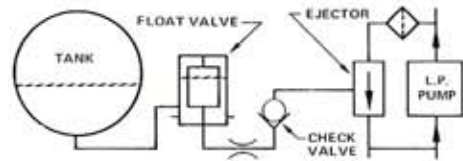
P60-727

INTEGRATED CIRCUIT SYSTEMS

jet fuel recovery manifold

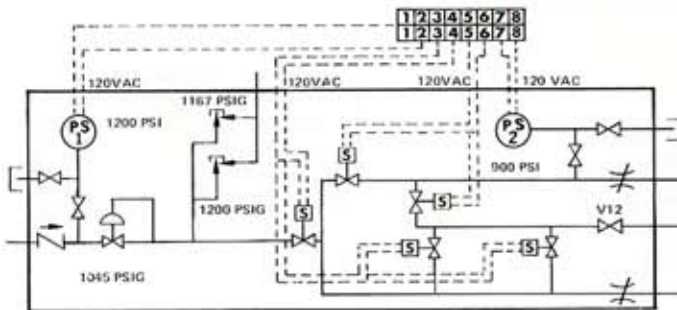


P39-401



This combination float valve contains the following pressure sensitive components designed for use on commercial jet aircraft engines in the anti-pollution jet fuel recovery system: Float Valve, Check Valve, Pressure Ejector, etc. The manifold recycles the fuel rather than venting it to the atmosphere. The operating pressure is 150 psig, and the manifold is compatible with all jet fuels. The valve body is stainless steel.

nuclear power plant sub-system



This complete system controls the operation of a brake system plus controlling the helium pressure supply to an inflatable seal. The manifold contains 17 individual components housed in a carbon steel body. All functional components are of stainless steel. The manifold operates at a pressure of 1400 psi and utilizes helium as a service fluid.

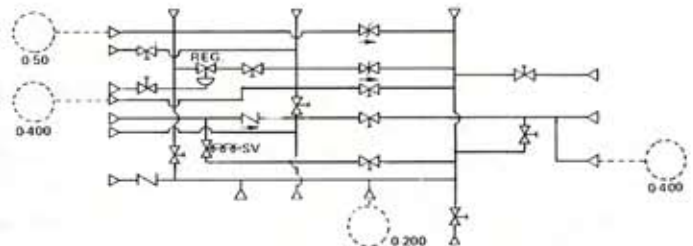


P74-727

electrical circuit breaker switch



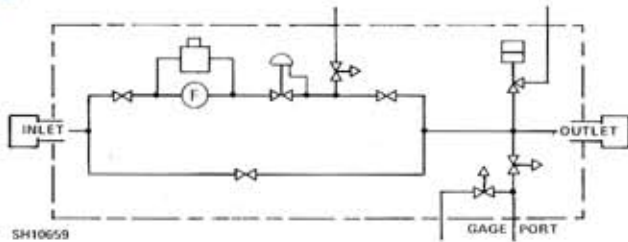
P64-727



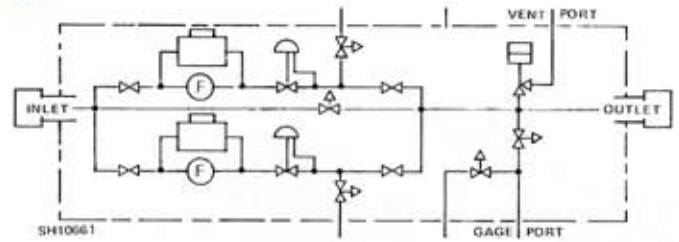
This Sulphur Hexafluoride Insulating Manifold contains 5 different types of valves. A total of 17 components comprise the complete manifold. The system was designed for a manufacturer of heavy duty electrical systems. The manifold controls both the flow and the pressurization of the insulating gas in both the high and low pressure side of the system. The manifold is available in aluminum. The operating pressure of the manifold is 300 psi.

PNEUMATIC MANIFOLDS

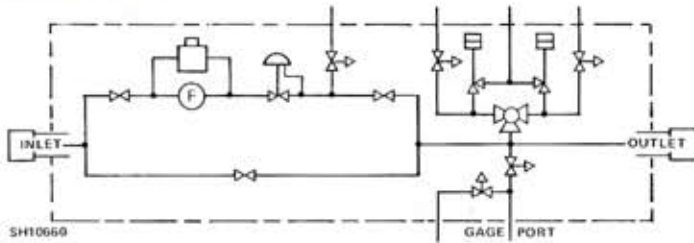
type 1-1



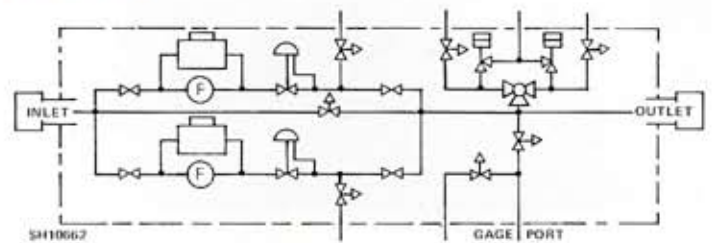
type 2-1



type 1-2



type 2-2



regulators

Regulators incorporated in the manifolds shown on these pages conform to the requirements of Military Specification MIL-V-9261. The regulator designs are the result of over 25 years experience in the production of high pressure pneumatic regulators for all types of applications. Each of the units has been subjected to close monitoring quality assurance procedures.



hand valves

The hand valves utilized in these manifolds, as shown in this brochure were designed and manufactured to conform to the requirements of Military Specification MIL-V-24109. The valves are provided with a soft seat design that delivers tight shutoff immediately. The seat design is a simple configuration that allows for easy replacement when repair is necessary aboard ship.



relief valves

The Circle Seal Relief Valves provide absolute leak proof sealing when closed and virtually maintenance-free operation. The valves are available in either a piloted or direct flow configuration. Circle Seal Relief Valves feature a tamper proof adjustment that permits precise settings for the most exacting system requirements. This adjustment is accessible from only the inlet side of the valve. The relief valves conform to the requirements of MIL-V-22549.



bleed valves

The Block and Bleed Valves are miniature valve assemblies designed to safely vent gage or internal cavities in accordance with the requirements of MIL-V-24272(A). These small assemblies reflect the broad experience that Circle Seal has gained over the years in the field of needle valve manufacturing.

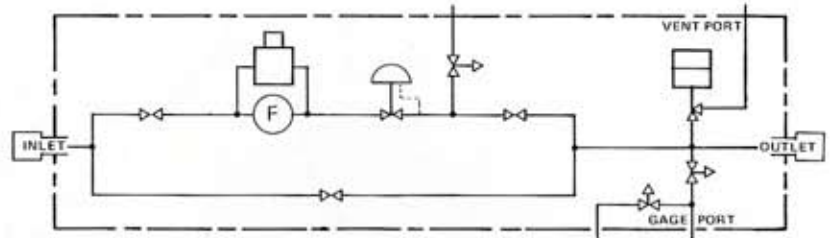


FOR SHIPBOARD APPLICATIONS

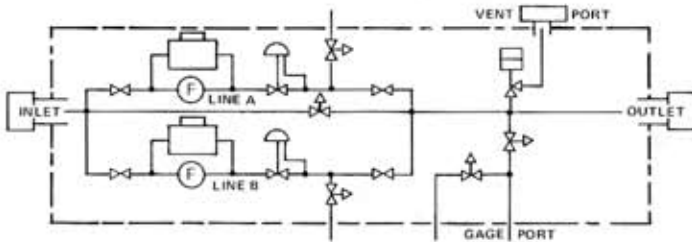
gas pressure reducing manifolds



P40-433



The P40-433 conforms to the requirements of Configuration 1-1. The flow rate of the manifold is 5 to 80 SCFM. The inlet and outlet fittings are 1" and 3/4". The body is naval brass with stainless steel trim. Service is air or gaseous nitrogen.



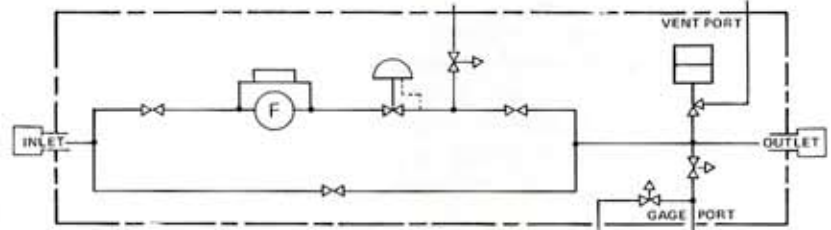
This dual circuit oxygen service manifold was designed to comply to the requirements of Configuration 2-1. The body of the P39-433 is monel with stainless steel trim. The flow rate of the unit is 58 SCFM.



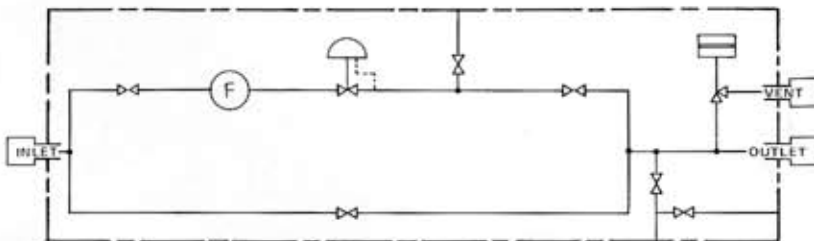
P39-433



P37-433



This high flow, low pressure manifold conforms to the requirements of Configuration Type 1-1. The P37-433 has a brass body with stainless steel trim. Flow rate is 50 to 160 SCFM with inlet pressures of 84 to 135 psi. Service is air or gaseous nitrogen.



The P42-433 is a Type 1-1 Configuration manifold designed for low pressure, high flow system use. Applications include torpedo launching, pneumatic tube systems, pressurization of aircraft, etc. The manifold body is naval brass with stainless steel trim. The operating pressure of the manifold is 135 psi. Service is air.



P42-433

INTEGRATED CIRCUITS

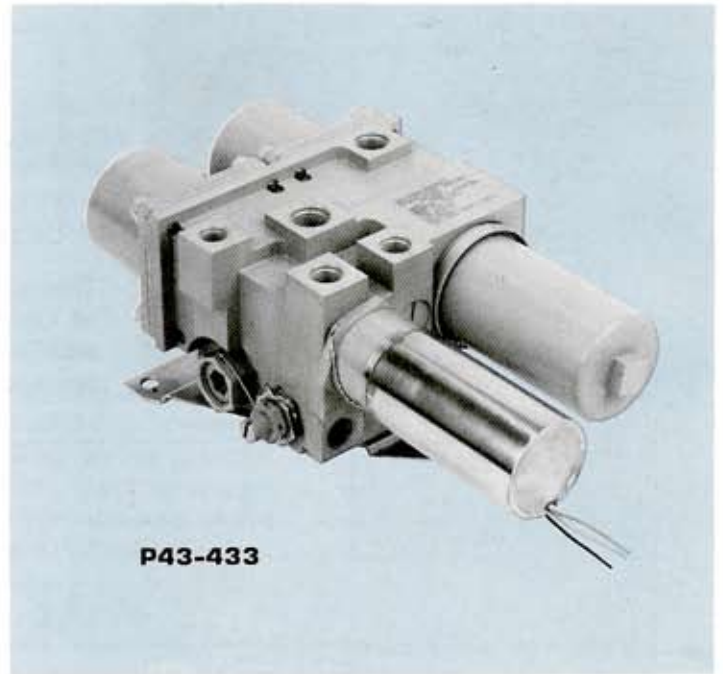
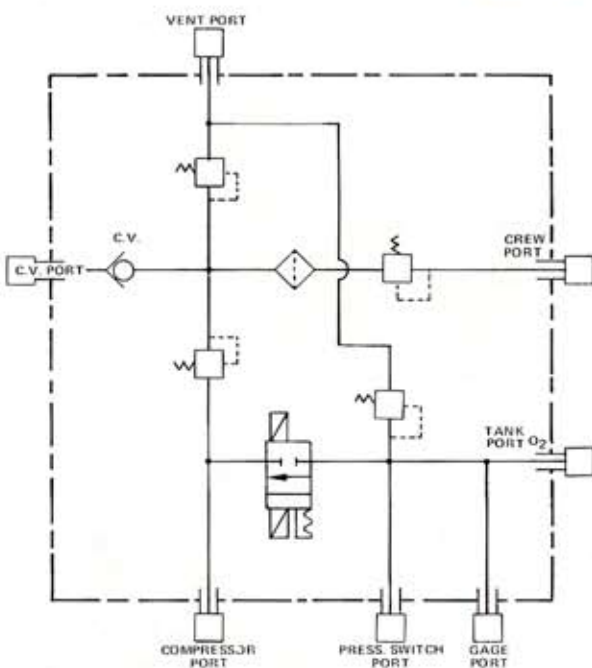
oxygen regulator manifold



P33-727

The P33-727 is an oxygen regulator manifold valve that controls the flow from a single inlet source by means of six plug shutoff valves. The valve was designed for use in experimental deep diving vehicles and inspection of offshore drilling sites. Low pressure (0 to 10 psi) supplies oxygen, helium, and nitrogen. The body of the manifold is made from monel for protection against corrosion.

oxygen pressure manifold

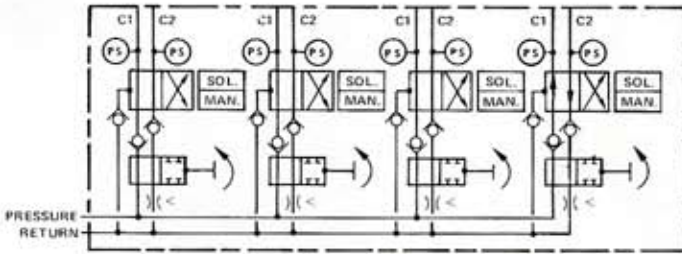


P43-433

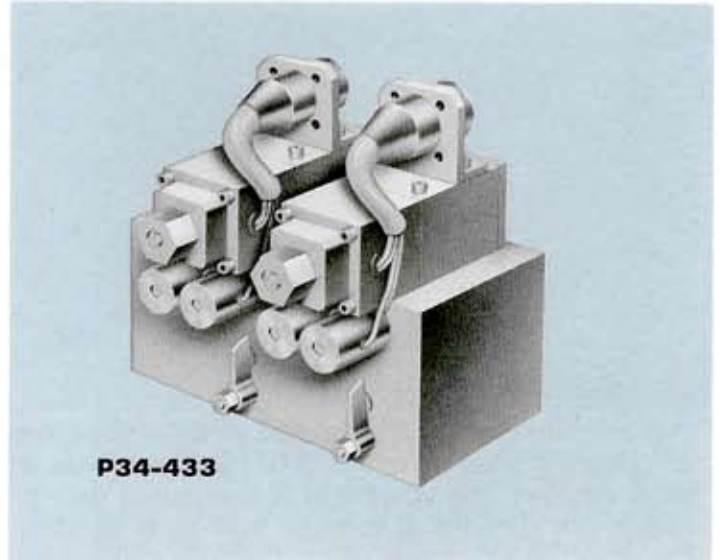
The P43-433 is a solenoid operated manifold designed to function as a control for oxygen breathing systems in military aircraft. The operating pressure of the manifold is 110 to 2250 psi. The manifold contains five separate components: Solenoid Valve, Check Valve, two Relief Valves, and a single Filter assembly. The body of the unit is anodized aluminum.

ORDNANCE – MARINE

remote controlled hydraulic manifold



This hydraulic manifold was designed for use on large naval vessels that required automatic and remote operation of the main ballast valves. Each manifold unit contains 4 to 5 repetitive valve circuits. Each circuit contains check valves and relief valves as system components. The body of the manifold is carbon steel with a black oxide finish. The P34-433 has an operating pressure of 2000 psi and is compatible with MIL-H-19457 Type oil.

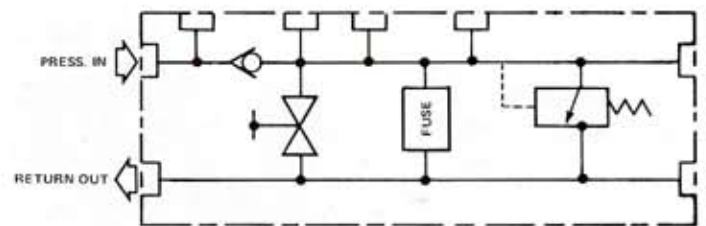


P34-433

hydraulic supply manifold

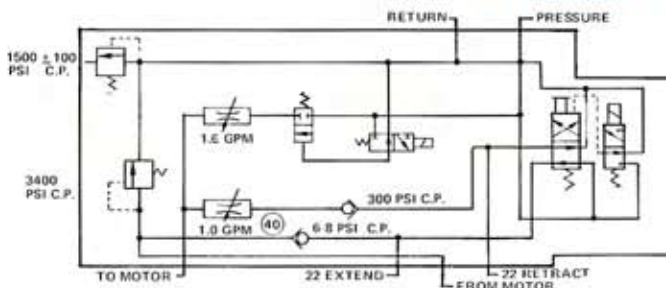


P50-433



The P50-433 was designed as a high pressure hydraulic supply manifold to control pressures to 3000 psi. The unit is used in the gun turret system of an advanced army mobile vehicle. The flow rate of the manifold is 10.0 GPM using MIL-H-8063 Hydraulic oil. The body of the manifold is anodized aluminum.

ordnance system manifold



The P25-433 is a high pressure hydraulic manifold with an operating pressure of 3000 psi. It was designed to function as a component in the fire control system of a missile launching tank program for the U.S. Army. The manifold was an integral part of the magazine indexing system. It was engineered to use both MIL-H-5606 and MIL-H-8063 Hydraulic oils. The manifold body is aluminum.



P25-433

COMPONENTS FOR MODULAR FLUID

solenoid valves



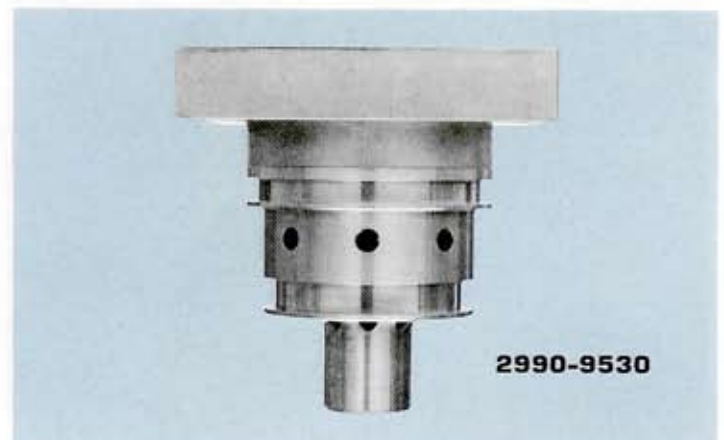
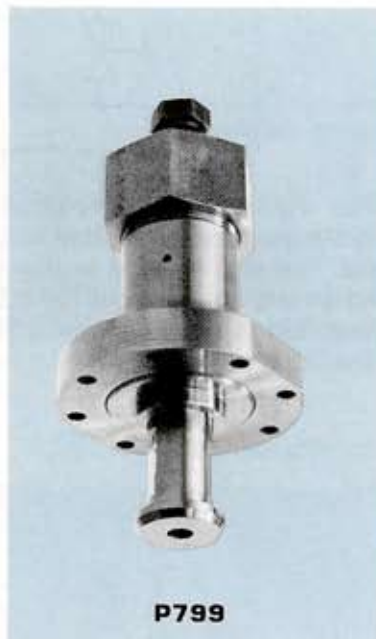
This normally closed cartridge type solenoid valve has an operating pressure of 0 to 2000 psi. The service is air or nitrogen. The VC-4075 is of continuous duty in design and operates at voltages from 18 to 28 VDC. The valve has a C_v factor of 0.5. The body of the valve is anodized aluminum with stainless steel trim.

The P79-326 is a pilot operated, normally closed solenoid valve suitable for use in nuclear applications. The Solenoid operates on 120 VDC. A normally open version of the P79-326 is available for pneumatic applications. Both the body and the trim of the solenoid are of stainless steel.



pressure regulators

This cartridge mounted regulator designed for use as a component in systems that require manifolds. The body of the P799 is stainless steel with stainless trim. The regulator operates at inlet pressures up to 1400 psig and will accommodate all pneumatic fluids.



The 2990-9530 is a cartridge type high pressure breathing gas regulator for Deep Diving systems. The body of the valve is made of 303 Stainless Steel. The inlet pressures of the valve ranges from 850 to 3800 psig with flow rates from 40 to 3000 SCFM. Service is gaseous oxygen and helium.

pilot operated relief valves



This pneumatic relief valve is supplied for use in special breathing systems aboard Salvage and Rescue Ships. The body of the valve is 303 Stainless Steel. The full flow pressure is 2150-SCFM of gaseous nitrogen and oxygen.

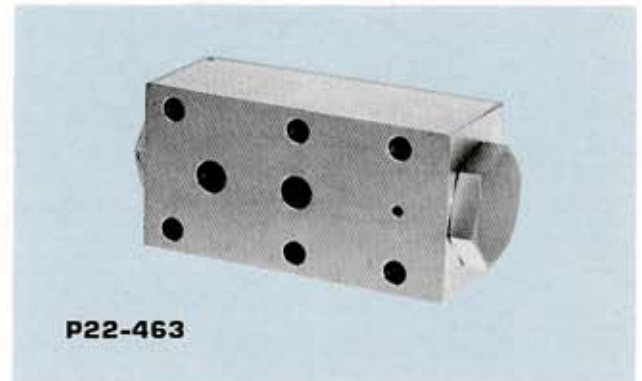
CIRCUIT APPLICATIONS

pilot operated relief valves

This compact high flow, high response cartridge mounted pressure reducing valve is designed for use in industrial modular hydraulic systems. The C5600 is available in aluminum and stainless steel housings. The valve is available in two standard cartridge units that allows for flows up to 110 GPM. This valve is a standard off the shelf item and has cracking pressures up to 4300 psi. The C5600 is adaptable to airborne applications, Military Ground Support Systems, aircraft hydraulic systems, etc.



pilot operated check valves



This double check valve is for line mounting or subplate (sandwich) mounting applications that utilize NFPA porting that match NFPA 4-way valves. The P22-463 is a standard-off-the-shelf item. The valve is available in Aluminum or Ductile Iron. The rated pressure of the valve is 3000 psi with a flow of 8.5 GPM.

cartridge check valves



This cartridge mounted pilot operated check valve is designed for use as a component utilized in critical applications that control cylinder drift. The P38-463 is also used to lock in position variable pitch propellers on large ships. Service is hydraulic fluid.



This spool type valve is designed for use as a component for manifolds that are part of tank hydraulic systems using MIL-H-5606 and MIL-H-6083 hydraulic fluids. The V4284 has an operating pressure of 3000 psig and a flow rate of 10.0 GPM. The exterior of the valve is hard coated aluminum, while the interior is stainless steel.

toggle shutoff valves



The TC900 is a cartridge type shutoff valve. The valve has an operating pressure of 0 to 6000 psi. The valve is fabricated from steel. The stem and seat design of the valve permits rapid actuation of the handle with a minimum of opening and closing shock to the system. The TC900 is a standard catalog item and is compatible with most fluid media.

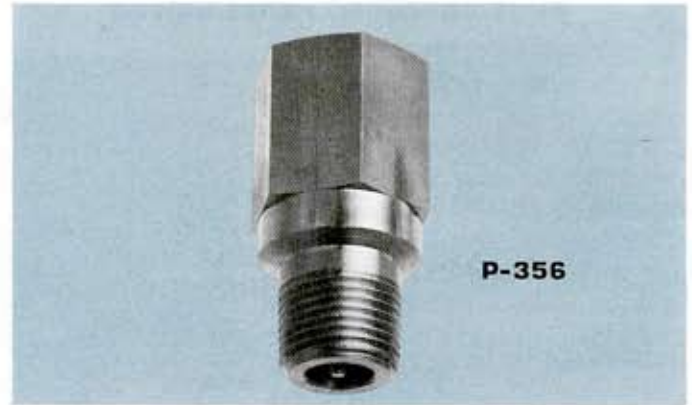
TYPICAL INTEGRATED CIRCUIT COMPONENTS

cartridge check valves



C200

This leakproof cartridge check valve provides a precise, compact, non-leaking valve for use as an integral component in manifolds designed for pneumatic and hydraulic systems. The C200 operates at a pressure of 0 to 6000 psi. It offers positive sealing at any differential pressure. The valve is available in aluminum, steel, and stainless steel. The C200 is compatible with virtually all liquids and gases.



P-356

This brass bodied check valve is designed for use as a vital component in military aircraft fuel systems. The P356 has an operating pressure of 85 psi and a maximum cracking pressure of 5.0 psi. The valve will function in any position in the system. Aircraft fuel with octane ratings of 115 to 145 are compatible with the valve.

flow control valves



V4290

The V4290 is a low flow control valve designed for use in low flow systems. The body is aluminum. The valve has an operating pressure of 3000 psi. The flow of the V4290 can be monitored between 1.0 and 1.9 gallons per minute, and is compatible with both types of hydraulic fluids.

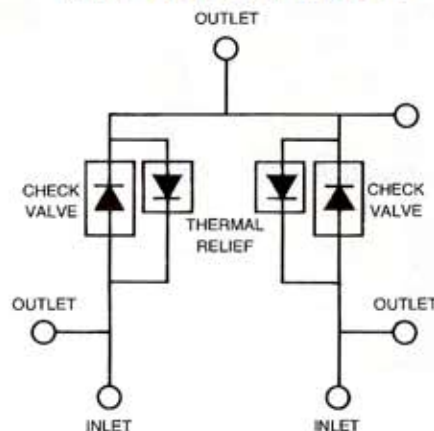


P3-595

Like the V4290, the P3-595 is another of many low flow Regulator Valves manufactured by Circle Seal Controls. The valve has an operating pressure of 3000 psi and a pressure drop of 70 psi minimum. The valve body is of anodized aluminum. The flow of the regulator ranges from 0.5 to 5.0 gallons per minute compatible with either of the hydraulic fluids.

fuel valve manifold

The P67-433 is used in a submerged installation on a turbine powered helicopter fuel tank. This valve manifold provides a dual combination of check and thermal relief valves which provide free flow in one direction, zero leakage in the reverse direction, with an internal thermal relief unit.



P67-433

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