The RCV/RCR (Remote Controlled Valve / Remote Controlled Regulator) is a remotely controlled oxygen valve & regulator system that allows you the maximum amount of installation flexibility. The RCR/RCV directly mounts to a KF (Kevlar Fiber) series cylinder, or remotely to a cylinder or other supply via a short run of aluminum, copper or stainless steel tubing and through our low-profile HP manifold kit. The main high pressure valve can be remote actuated by electric current or pneumatic means. Optionally, it can be operated mechanically with a customer supplied control cable or an electric servo motor. Operation options are vast. The RCV/RCR is intended for use in aircraft oxygen systems and other related applications. The RCV/RCR does not comply to any TSO nor does it have any current STCs'. It has, however, been installed into a number of type certified aircraft via a 337. Our 337 information reports are available to interested parties as they become available to us.

## Installation Ideas

All regulators and fittings connect to the RCV body by the SAE system. The RCV (Remote Controlled Valve) is the "main hex-body" valve device with 3 valved and 2 direct-to-tank SAE-4-M (7/16-20) straight thread o-ring type outlet ports. The RCV has a dual size inlet port with an SAE-4-F (female) fitting port centered coaxially just inside the SAE-8-M (3/4-16 male) cylinder and hold-down port. Unlike the NPT thread system, the SAE system allows items to be removed and replaced many times over without the worry of leakage or thread adulteration. Once an appliance such as a regulator has been mounted to any of the valved ports of the RCV it becomes an RCR (Remote Controlled Regulator). The RCV/RCR unit can be controlled (operated) remotely by pneumatic, electro-pneumatic or mechanical means. In addition, the RCV/RCR has a dual inlet port system so that it can either be directly mounted to a cylinder or be remotely interconnected by fittings and tubing to a cylinder.

The RCV/RCR system is a versatile multi-purpose remote controlled oxygen valve & regulator assembly. You can mix-n-match our high pressure manifold sets to meet those tight-fitting applications. Below is an application in which the RCV/RCR is remote mounted to the cylinder via tubing. The inlet of the RCV body is a coaxial type with an external SAE-8-M and an internal SAE-4-F thread gas inlet system to accommodate a vast number of installation, mounting and plumbing requirement options.

The design of the RCV/RCR is relatively simple. It operates pneumatically by utilizing a very small amount of the pressurized oxygen supply through a small 'pilot regulator', to provide the necessary (normally static) pressure to open a high-pressure main valve inside the RCV body. An electro-pneumatic valve (operated remotely by 12 or 24 volts DC) controls the pressure to this valve by just 2 wires from the RCV/RCR unit to an electrical control such as a toggle switch. The electro-pneumatic valve and manifold can be removed and replaced by a pneumatic only manifold if pneumatic operation is desired. If so, only two small pneumatic lines are run from the RCV/RCR and pneumatic control device such as a toggle switch. Only low pressure oxygen is plumbed to the outlets. The RCV/RCR system contains all the high pressure oxygen at the cylinder.

### Diagram

The RCV/RCR system is shown without the main regulator.
Remote controlled oxygen regulator system
remotely controlled electrically & pneumatically operated oxygen regulators featured in our best built-in aircraft oxygen systems

The RCV/RCR mounted to a KF-050 cylinder shown with the optional electric cylinder pressure sending unit for use with our electric pressure gauges to eliminate HP pneumatic capillary lines.

ELECTRO-PNEUMATIC: Remote electro-pneumatic (figure right) probably offers the most convenient method of operation. Applying current to a small built-in pilot-valve turns the RCV on. The electro-pneumatic valve can be ordered in two (2) voltage ratings, 12 VDC or 24 VDC. The 12 VDC valve requires about 850 ma to initially turn on the RCV. The sustain current thereafter will be about 1/2 of that. The 24 volt valve is about 1/4 this current. The screw-on pilot regulator, calibrated at 2 bars (30 psig.), is required and is directly plumbed to the actuating manifold. A small vent port releases a very small amount of gas as the electro-pneumatic valve is released to the off state. At the users option, a small 3.2 or 4mm OD polyurethane tube may be connected to this port to provide an overboard vent. The amount of gas released by this vent port (during turn-off phase only) is about 10 cc. for the interface manifold.

PNEUMATIC: The RCV (figures below) unit has a built-in pneumatic actuating piston that allows remote operation of the RCV by two basic pneumatic means. They are: 1: an external pressure supply of about 2 bars (30 psig.) being applied to the actuation port of the actuating manifold on the RCV, 2: the screw-on pilot regulator, calibrated to 2 bars (30 psig.), provides the actuating pressure in which a simple 3-way valve is plumbed and remotely mounted to operate the RCV unit. The pilot regulator taps a small amount of the oxygen supply for static pneumatic actuating needs. It is always active and does not allow gas to flow, except for a very small amount during the state changes from on to off and visa versa. Once the RCV has settled in the on or off state the pilot regulator automatically shuts off holding the interface tubing at the calibrated pressure. A small vent port releases a very small amount of gas as the electro-pneumatic valve is released to the off state. At the users option, a small 3.2 or 4mm OD polyurethane tube may be connected to this port to provide an overboard vent. The amount of gas released by this vent port (during turn-off phase only) is about 10 cc. for the interface manifold. The actual volume vented during the turn-off phase will be a function of the size of the actuating pneumatic interconnecting tubing used for that installation. 2 to 4 mm. (1/16 to 1/8") Dia. recommended.


The in-line HP reducing regulators have found their way into many applications in aircraft oxygen systems.

The in-line regulator has been connected external to the RCV unit to facilitate unique requirements and tight-fitting installations. It is connected to the RCV unit via tubing and Swagelok type compression fittings. Up to three regulators (of many types) can be connected to the three valved outlet ports on the RCV unit.

Remote controlled oxygen regulator system

The main reducing regulator on the RCV/RCR are calibrated like our XCP, XCR and in-line regulators. This allows the freedom to use all our delivery devices as well as almost any others.

The EDS units can be built-in behind the paneling with the plumbing for a customized out-of-the-way installation or carried about and simply plugged in one of the outlets as shown below.

The RCV/RCR system is very configurable

The RCV/RCR system uses the SAE fitting system so that changing the appliance configuration is simple and easy. You can have as many as three redundant-parallel regulators at the same time an RCV body.

The RCV/RCR unit itself can be remote-mounted then plumbed to a cylinder. This is common in applications where the cylinder(s) are mounted in a tight-fitting area to maximize space. Also, because the KF series cylinders are so light, builders are mounting them farther aft in tight areas not possible before with heavier cylinders and unaccommodating regulators and hardware.
Remote controlled oxygen regulator system
remotely controlled electrically & pneumatically operated oxygen regulators featured in our best built-in aircraft oxygen systems

This Lancair ES has the oxygen system as shown on page 28 (bottom left) with the RCV/RCR. It is set up for 4-persons with two (2) EDS units for the front seats and two (2) flowmeters for those occasional rear seat passengers.

The remote-fill station with gauge mounted next to the external electrical connector behind a flush-fitting access door.

The KF series cylinders are light so you can think about using all that space aft the rear seats that otherwise will go unused.

The KF-077 with the RCV/RCR fits nicely into the rear just behind the seats. The CMK-Ω kit allows the cylinder to be periodically removed for service & testing.

Oxygen outlet fittings mounted in a panel that will be placed just below the center console.