

# “H” Controlair® Pneumatic Pressure Control Valves



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## “H” Controlair® Valves Features and Specifications

The REXROTH Type “H” CONTROLAIR Valves are a family of pneumatic pressure regulating, directional valves. They are versatile three- and four-way pressure regulating valves or a combination of pressure regulating and non-regulating three-way valves. Hand, foot or mechanically operated, these valves control both pressure and flow of air. Some control these functions in one air circuit. Others selectively control these functions in two separate and independent air circuits or in branches of the same circuit. Still others control these functions either selectively or simultaneously in three separate and independent branches of an air circuit.

With each valve, the position of the operator - lever, pedal, cam or knob - determines the air pressure delivered by the valve. Changing operator positions changes delivery pressure. Once the operator's position is set, a CONTROLAIR Valve maintains the delivery pressure for that position - automatically. It feeds more air into a circuit to compensate for leakage and operations which reduce pressure. It vents air from a circuit to compensate for operations and other conditions which would increase a circuit's pressure.

### APPLICATIONS

Applications for “H” CONTROLAIR® Valves are limitless.

They operate:

Throttles	Rolling Mills	Marine Propulsion Engines
Clutches	Presses	Construction Equipment
Brakes	Shears	Oil Drilling Rigs
Clamps	Conveyors	Production Tools
Gates	Dredges	Cranes, Hoists & Draglines

and many other kinds of equipment and machines. In fact “H” CONTROLAIR Valves are used wherever it is necessary, or preferable, to have instant and convenient control of the flow of air into a pneumatic circuit and of the pressure build-up of air in that circuit.

Besides exceptional versatility, other CONTROLAIR Valve features are:

**EASE OF OPERATION** - as “H” CONTROLAIR Valves need only light operating forces, these valves increase both the efficiency and the out-put of operating personnel by decreasing operator fatigue and concentration required.

**SENSITIVITY** - the outlet pressure of “H” CONTROLAIR Valves having 60 lb. (27 Kg) graduating springs can be changed in increments of approximately 1/4 psi (0.02 bar). The outlet pressure of valves having 100 lb. (45 Kg) graduating springs can be changed in increments of approximately 1/2 psi (0.3 bar), other cataloged pressures are changed proportionately. After setting “H” CONTROLAIR Valves maintain their outlet pressure within a range of approximately 1-1/2 psi (0.10 bar).

**EASE OF MAINTENANCE** - all pipe connections are made to a pipe bracket from which the CONTROLAIR Valve can be removed without disturbing the circuit's piping.

**CORROSION RESISTANCE** - diaphragms and seals are made of oil-resistant synthetic rubber. All steel parts are plated. All other parts are made of anodized aluminum or bronze.

**SIMPLICITY** - CONTROLAIR Valves contain only a few wearing parts and these are easily replaced.

**PARTS INTERCHANGEABILITY** - all similar parts in the various types of CONTROLAIR Valves are interchangeable.

**RUGGED, RELIABLE AND PRECISION BUILT.**

**TEMPERATURE RANGE** -  
-40°F to 160°F (-40°C to 71°C)

**MAXIMUM SUPPLY PRESSURE** -  
200 psi (13.8 bar)

**OUTLET PRESSURE** -  
According to model selected.

## “H” Controlair® Valves

### MODELS

“H” CONTROLAIR Valves are built in the following models:

**H-1 - FOOT PEDAL** operated for one pressure regulated circuit.

**H-2 - HAND LEVER** operated for one pressure regulated circuit

**HC-2 - HAND LEVER** operated for two pressure regulated circuits.

**HD-2 - HAND LEVER** operated for one pressure regulated circuit and two non-regulated circuits.

**HE-2 - HAND LEVER** operated for one pressure regulated circuit and one non-regulated circuit.

**H-3 - CAM** operated for one pressure regulated circuit.

**H-4 - HAND KNOB** operated for one pressure regulated circuit.

The H-2, HC-2, HD-2 and HE-2 CONTROLAIR Valves are available with any one of the following types of lever

return or holding characteristics. These characteristics are indicated by the suffix added to the designation.

**X - Self returning.** The lever return from the extreme position to the valve’s “Neutral” or “Off” position when the operating force is removed.

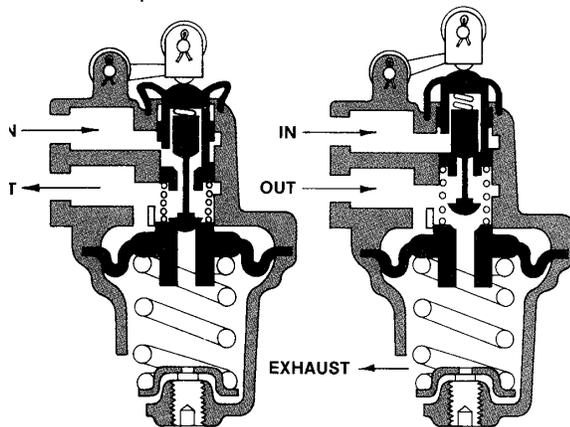
**LX - Self returning with latch.** The lever returns to the valve’s “Neutral” or “Off” position when manually moved out of the latch position (extreme travel position).

**FX- Self holding.** The lever stays in any position in which it is placed. The holding friction is adjustable.

In addition to these models, other CONTROLAIR Valves are available which are not cataloged because they have modifications that limit their application.

### OPERATION

The sensitive, precise pressure control of the “H” CONTROLAIR Valve and its ability to change delivery pressure in small increments are obtained through the use of a large responsive diaphragm. The ease with which an “H” CONTROLAIR Valve is operated is obtained by creating a differential between the counter-balanced air pressure and spring forces within the valve and by using this differential to open or to close valves.



INCREASING PRESSURE      DECREASING PRESSURE

When the CONTROLAIR Valve is in decreasing pressure position, the inlet valve is closed and the exhaust valve is open to vent the OUT pressure to atmosphere, inlet pressure is on top of the closed inlet valve.

Should leakage or a temperature variation occur that would change the outlet pressure called for by the CONTROLAIR Valve’s operator position, this deviation in pressure opens either the CONTROLAIR Valve’s supply valve or its exhaust valve to restore the correct pressure.

In addition to having a pressure graduating valve, the HC-2, HD-2 and HE-2 CONTROLAIR Valves have one or two normally closed, non-graduating, three-way valves. When the lever of one of these CONTROLAIR Valves is moved 10° or more from its “Neutral” position, it opens one of the 3-way valves and hold it open. The exhaust

valves in these three-way valves are closed by initial movement from “Neutral” of the CONTROLAIR Valve lever. Further movement of the lever operates the pressure regulating portion.

A complete description of the operation for each CONTROLAIR Valve is in the Service Information publication for that valve.

Starting from decreasing pressure position, to increase the OUT pressure of an “H” CONTROLAIR Valve, its operator moves the valve assembly in contact with the exhaust valve seat. Initial movement of the valve assembly closed the passage from the CONTROLAIR Valve’s OUT line to atmosphere. Further movement of the assembly opens the passage between the CONTROLAIR Valve’s IN and OUT lines allowing inlet air to flow into the OUT line and to the upper face of the diaphragm.

As the flow of inlet air into the line raises the air pressure in the OUT line, it also increases the air pressure on top of the diaphragm. This pressure compresses the spring beneath the diaphragm and forces the diaphragm downward.

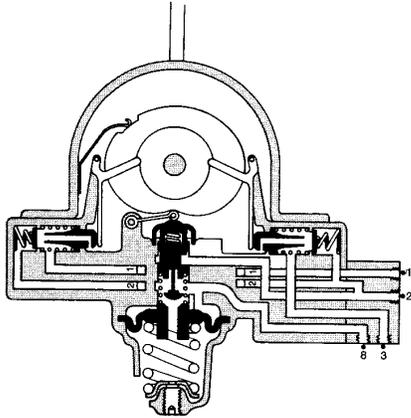
When the outlet pressure reaches the value called for by the amount of operator movement, the air pressure acting on the diaphragm has moved it enough to let the inlet valve spring close the inlet valve and stop further increase in pressure.

Further movement of the CONTROLAIR Valve operator to increase pressure moves the valve assembly and again opens the inlet valve. This allows additional air to flow into the OUT line until air pressure acting on the diaphragm depresses it enough to allow inlet valve to close.

Movement of the CONTROLAIR Valve operator to decrease outlet pressure decreases the force on the valve assembly and lets the spring beneath the valve assembly move it upward. This action lifts the exhaust valve from its seat and allows air in the OUT line to vent to atmosphere, thus decreasing air pressure in that line.

### “H” Controlair® Valves

With less air pressure on top of the diaphragm, the spring beneath it raises the diaphragm, with its exhaust valve seat, toward the exhaust valve until it closes and stops the venting of air from the OUT line.



“HD” TYPE CONTROLAIR VALVE WITH NON-GRADUATING, THREE-WAY VALVES

### H-1 CONTROLAIR® VALVE



The H-1 CONTROLAIR Valve is a pedal actuated, 3-way pressure regulating valve, suitable for applications where the valve portion extends below the floor level. Depressing the pedal increases the outlet pressure. The pedal is self-returning. This valve is suitable for brake and clutch control or any use where foot operation pressure control is desired. Approx. weight: 8½ lbs. (3.9 Kg)

#### PIPE CONNECTIONS:

IN Port - Supply  
 OUT Port - Delivers graduated pressure in direct proportion to pedal depression.

#### ORDERING INFORMATION

New Part No.	Old Part No.	Pressure Range psi (bar)
R431002613	P-050208-00001	0-65 (0-4.5)
R431002614	P-050208-00002	0-100 (0-6.9)
R431002615	P-050208-00003	0-125 (0-8.6)
R431002616	P-050208-00004	0-150 (0-10.3)
R431002617	P-050208-00008	0-30 (0-2.1)
R431002981*	P-052570-00001*	0-65 (0-4.5)
R431002982*	P-052570-00002*	0-100 (0-6.9)

\* light pedal springs

### ADJUSTMENTS

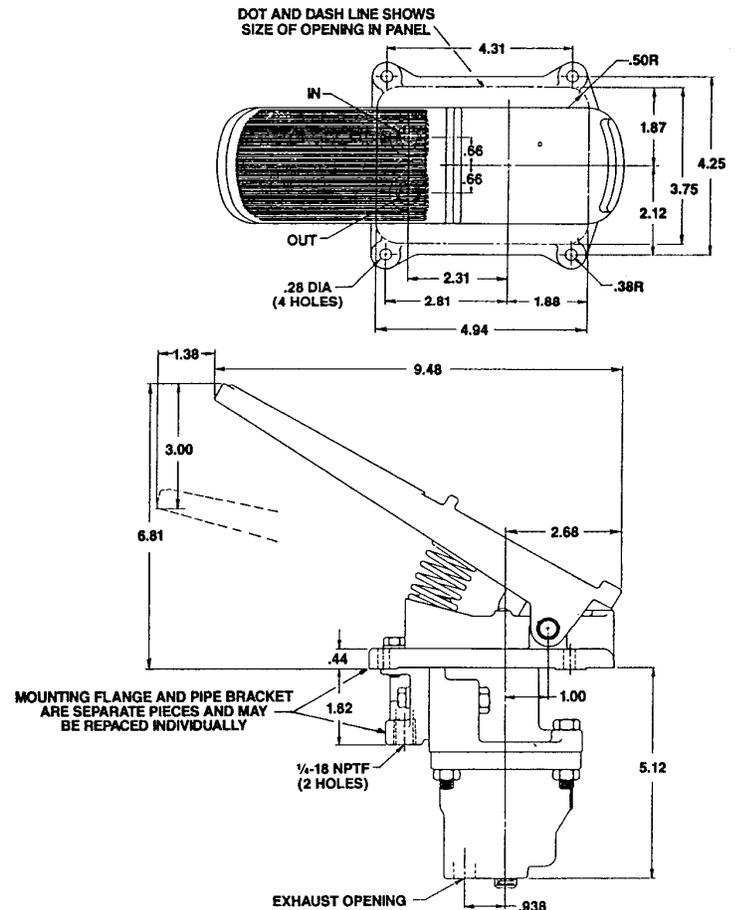
The outlet pressure of a CONTROLAIR Valve for any of its operator positions can be changed by an external adjustment. Changing the pressure for one position, however, changes the pressure for all positions since the pressure differential is fixed for given control spring.

With the operator in minimum pressure position, CONTROLAIR Valves used with brakes, clutches, etc. are adjusted to vent outlet pressure to atmosphere. This adjustment fully vents pressure to atmosphere. This adjustment fully vents pressure from these devices.

With the operator in minimum pressure position, devices are adjusted to maintain a low pressure in the circuit. This adjustment gives instant response at the start of operator movement from that position.

### HOW TO ORDER CONTROLAIR® VALVES

To order a CONTROLAIR Valve, specify it by model, by part number, and by the pressure range desired. Example: HC-2-LX CONTROLAIR Valve, Part Number R431002616 with 0-65 psi (0-4.5 bar) pressure range.



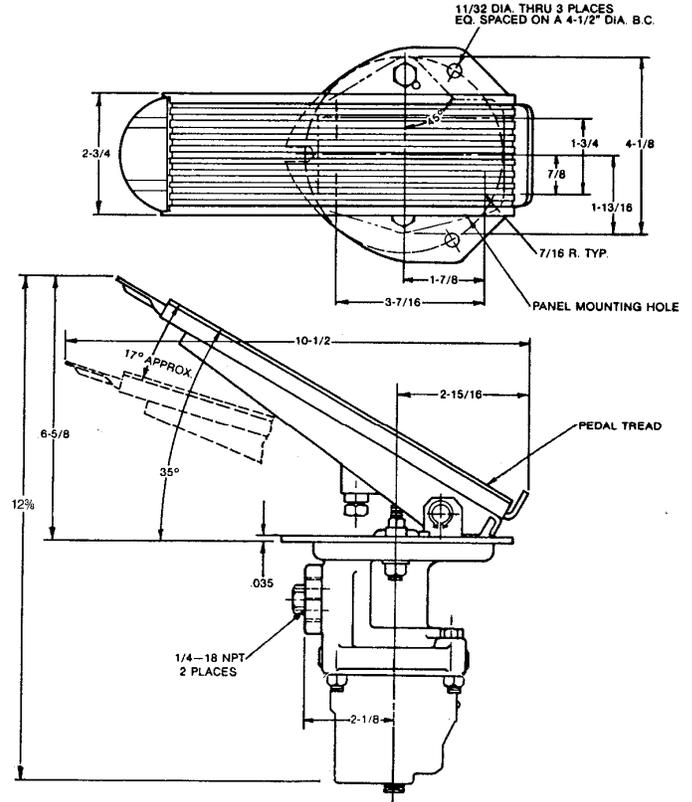
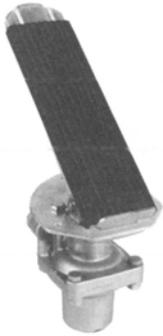
“H” Controlair® Valves

H-1 CONTROLAIR® VALVE

LIGHT PEDAL FORCE

This economical version of the H-1 operates identically to the standard H1, but has considerably lighter pedal force that makes it especially suited for throttle controls. This model also offers an alternative piping arrangement as the valve portion from the H-2 version is utilized. Formed steel pedal with a rubber tread is utilized on this model.

Approximate weight: 6 lbs. (2.7 Kg)



PIPE CONNECTIONS:

IN Port - Supply

OUT Port - Delivers graduated pressure in direct proportion to pedal depression.

ORDERING INFORMATION

New Part No.	Old Part No.	Pressure Range
R431005617	P-060921-00001	0-65 psi (0-4.5 bar)
R431005618	P-060921-00002	0-100 psi (0-6.9 bar)
R431005619	P-060921-00003	0-125 psi (0-8.6 bar)

H-1-A CONTROLAIR® VALVE

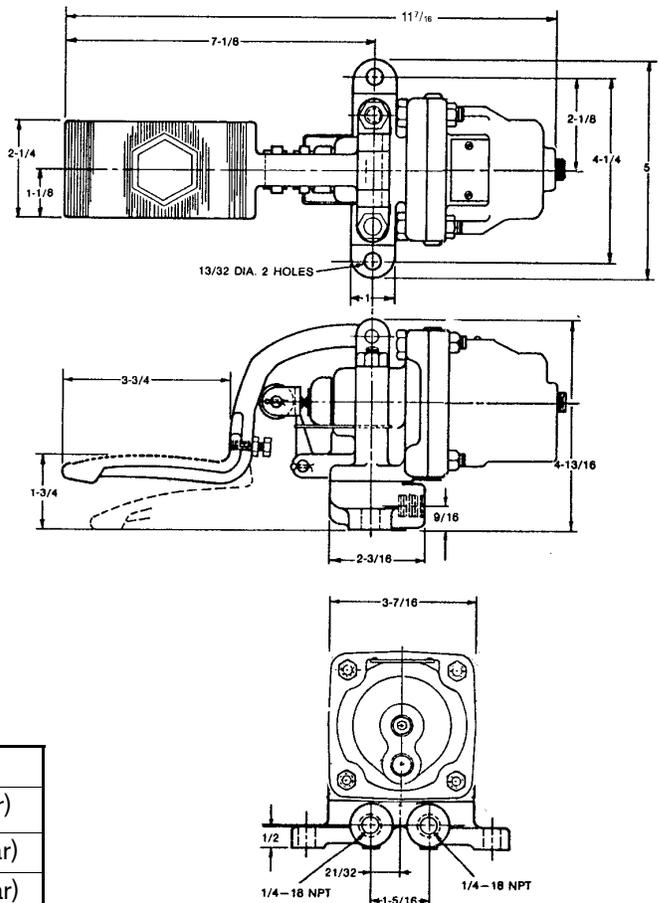
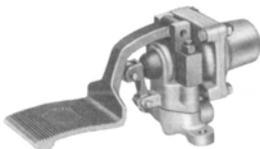
The H-1-A CONTROLAIR Valve is a pedal actuated 3-way pressure regulating valve that is designed for installations in which its operator is standing or in which part of the valve

cannot extend below floor level.

Depressing its pedal increases the outlet pressure. Raising the pedal decreases the outlet pressure. The pedal is self-returning.

This valve is suitable for industrial control and any use where foot operated pressure control is desired.

Approximate weight: 6½ lbs. (2.9 Kg)



PIPE CONNECTIONS:

IN Port - Supply

OUT Port - Delivers graduated pressure in direct proportion to pedal depression.

ORDERING INFORMATION

New Part No.	Old Part No.	Pressure Range
R431003063	P-052971-00001	0-65 psi (0-4.5 bar)
R431003064	P-052971-00002	0-100 psi (0.6.9 bar)
R431003065	P-052971-00003	0-125 psi (0-8.6 bar)
R431003066	P-052971-00004	0-150 psi (0-10.3 bar)

**“H” Controlair® Valves**

**H-2 CONTROLAIR® VALVE**



The H-2 CONTROLAIR Valve is a lever operated, 3-way, pressure regulating valve. Air pressure is increased, decreased or maintained at the OUT port according to lever position. Facing the lever side of the valve, clockwise lever movement increases pressure. (see diagram)

When the lever remains in one position, the CONTROLAIR Valve maintains outlet pressure for that position.

For throttle control applications, the valve is set with a pre-load of 10 psi (0.69 bar) and has a 10-60 psi (0.79-4.1 bar) delivery pressure range.

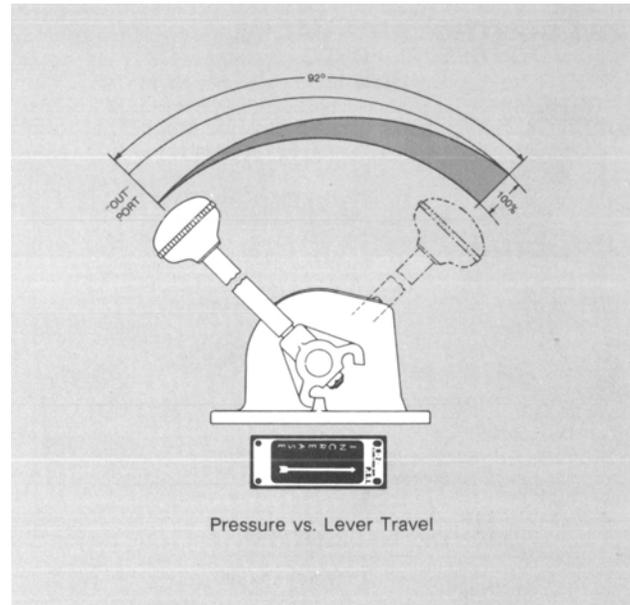
Approximate weight: 6½ lbs. (2.9 Kg)

**PIPE CONNECTIONS:**

**IN Port** - Supply

**OUT Port** - Delivers graduated pressure in direct proportion to clockwise lever travel from minimum pressure position (facing lever side of valve).

Maximum pressure position is detented.



**MODELS**

**H-2-X CONTROLAIR Valve** - Lever returns to minimum pressure position when released.

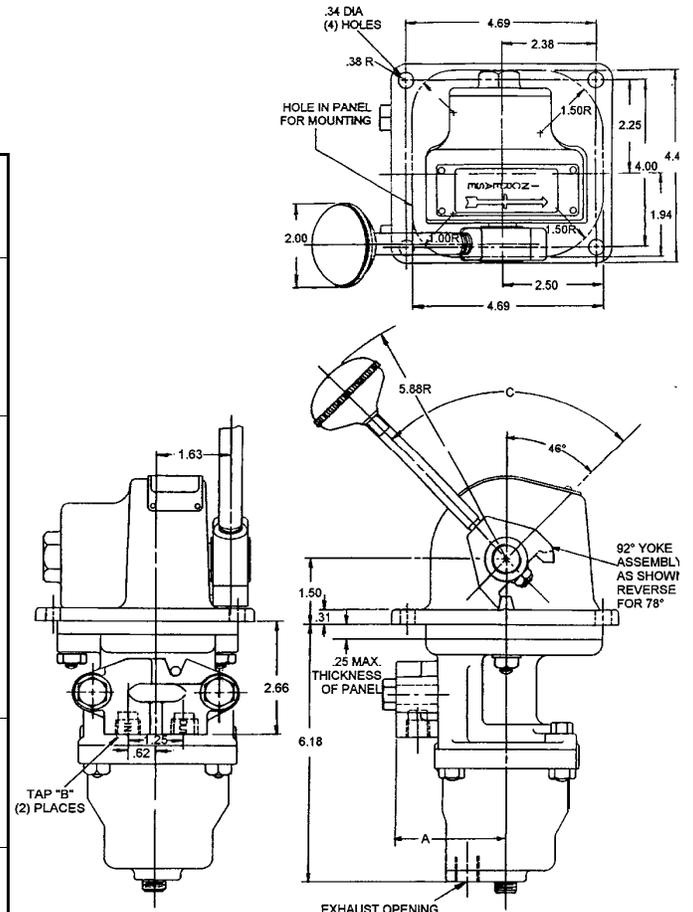
**H-2-FX CONTROLAIR Valve** - Lever remains in the position where released.

**H-2-LX CONTROLAIR Valve** - Lever returns to minimum pressure position when released from any position except maximum pressure position.

**ORDERING INFORMATION**

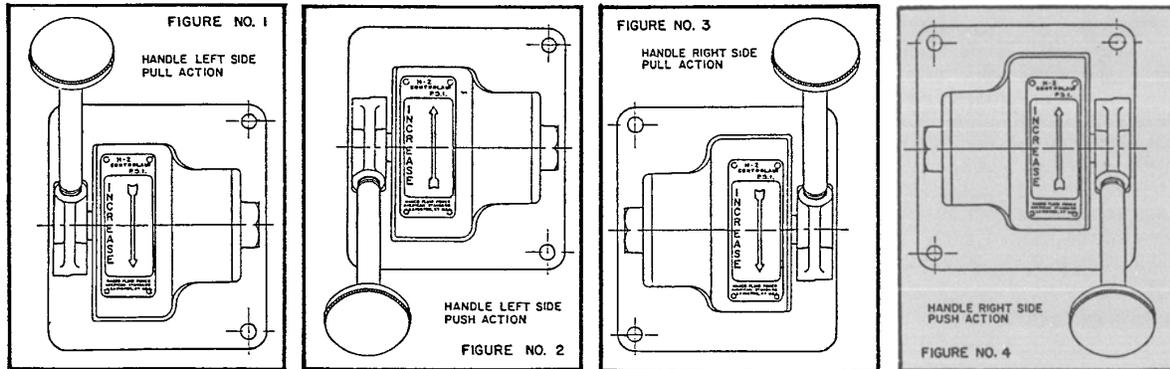
Model	New Part No.	Old Part No.	Pressure Range psi (bar)	“C” Lever Travel
H-2-X	R431002638	P-050493-00001	0-65 (0-4.5)	92°
	R431002639	P-050493-00002	0-100 (0-6.9)	92°
	R431002640	P-050493-00003	0-125 (0-8.6)	92°
	R431002641	P-050493-00004	0-150 (0-10.3)	92°
	R431002642	P-050493-00008	0-30 (0-2.1)	92°
H-2-FX	R431002643	P-050494-00001	0-65 (0-4.5)	92°
	R431002644	P-050494-00002	0-100 (0-6.9)	92°
	R431002645	P-050494-00003	0-125 (0-8.6)	92°
	R431002646	P-050494-00004	0-150 (10.3)	92°
	R431002045	P-050494-00005	0-15 (0-1.1)	92°
	R431002647	P-050494-00008	0-30 (0-2.1)	92°
	R431002648	P-050594-00010	0-80 (0-5.5)	92°
	R431002649	P-050494-00011	10-65 (0.7-4.5)	78°
	R431002650	P-050494-00012	10-90 (0.7-6.2)	78°
R431002651	P-050494-00015	0-175 (0-10.3)	92°	
H-2-LX	R431002652	P-050499-00001	0-65 (0-4.5)	92°
	R431002653	P-050499-00002	0-100 (06.9)	92°
	R431002654	P-050499-00003	0-125 (0-8.6)	92°
	R431002655	P-050499-00004	0-150 (0-10.3)	92°

See page 7 for listing of alternate handle arrangements. Full pressure feature and chrome plated cover details are available on selected models. Consult factory for requirements and part numbers not shown.



**“H” Controlair® Valve Models**  
**Alternate H-2 Controlair® Valve Models**

The following list of H-2 CONTROLAIR® valve part numbers is provided for use in those cases where a handle location or a push/pull handle action is required by special control panel configurations. Use standard catalog whenever possible.



**H-2-X CONTROLAIR® Valves (spring return)**

Model	New P/N	Old P/N	Configuration	Model	New P/N	Old P/N	Configuration
H-2-X	R431007252	P -067694-00003	Figure No. 1 Rev. nameplate Std. cam	H-2-X	R431007234	P -068544-00003	Figure No. 3 Rev. nameplate cam
H-2-X	R431007323	P -068543-00003	Figure No. 2 Std. nameplate Reverse cam	H-2-X	R431002639	P -050493-00002	Figure No. 4 Std. nameplate Std. cam

**H-2-X CONTROLAIR® Valves (spring return with detent)**

Model	New P/N	Old P/N	Configuration	Model	New P/N	Old P/N	Configuration
H-2-LX	R431007326	P -068546-00003	Figure No. 1 Rev. nameplate Std. cam	H-2-LX	R431007327	P -068547-00003	Figure No. 3 Rev. nameplate Rev. cam
H-2-LX	R431007325	P -068545-00003	Figure No. 2 Std. nameplate Reverse cam	H-2-LX	R431002653	P -050499-00002	Figure No. 4 Std. nameplate Std. cam

**H-2-FX CONTROLAIR® Valves (friction holding handle)**

Model	New P/N	Old P/N	Configuration	Model	New P/N	Old P/N	Configuration
H-2-FX	R431007308	P -068521-00002	Figure No. 1 Rev. nameplate Std. cam	H-2-FX	R431007329	P -068549-00003	Figure No. 3 Rev. nameplate Rev. cam
H-2-FX	R431007328	P -068548-00003	Figure No. 2 Std. nameplate Reverse cam	H-2-FX	R431002644	P -050494-00002	Figure No. 4 Std. nameplate Std. cam

Shaded areas (\*) standard catalog combinations see page 6. Others are non-stock items.