

“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.

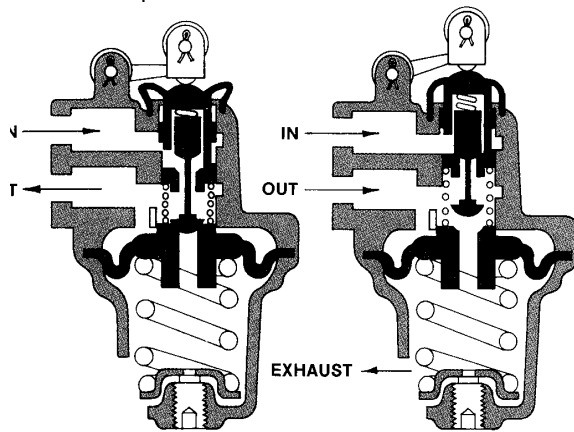
LX - Self returning with latch. The lever returns to the valve’s “Neutral” or “Off” position when manually moved out of the latch position (extreme travel position).

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.

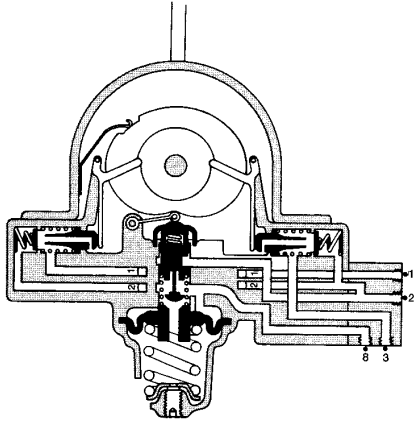
When the outlet pressure reaches the value called for by the amount of operator movement, the air pressure acting on the diaphragm has moved it enough to let the inlet valve spring close the inlet valve and stop further increase in pressure.

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.

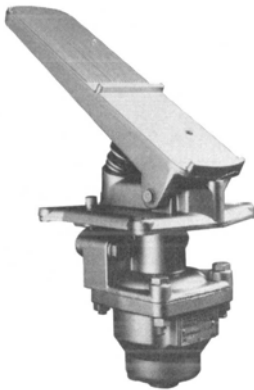
“H” Controlair® Valves

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

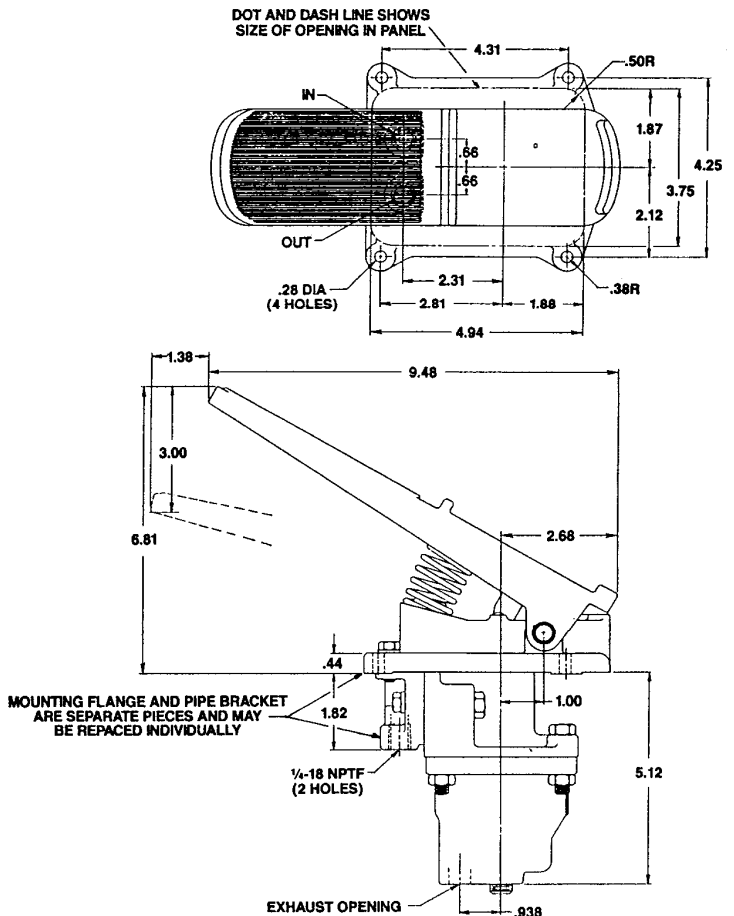
The outlet pressure of a CONTROLAIR Valve for any of its operator positions can be changed by an external adjustment. Changing the pressure for one position, however, changes the pressure for all positions since the pressure differential is fixed for given control spring.

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.



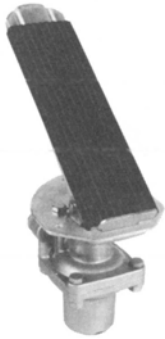
“H” Controlair® Valves

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)



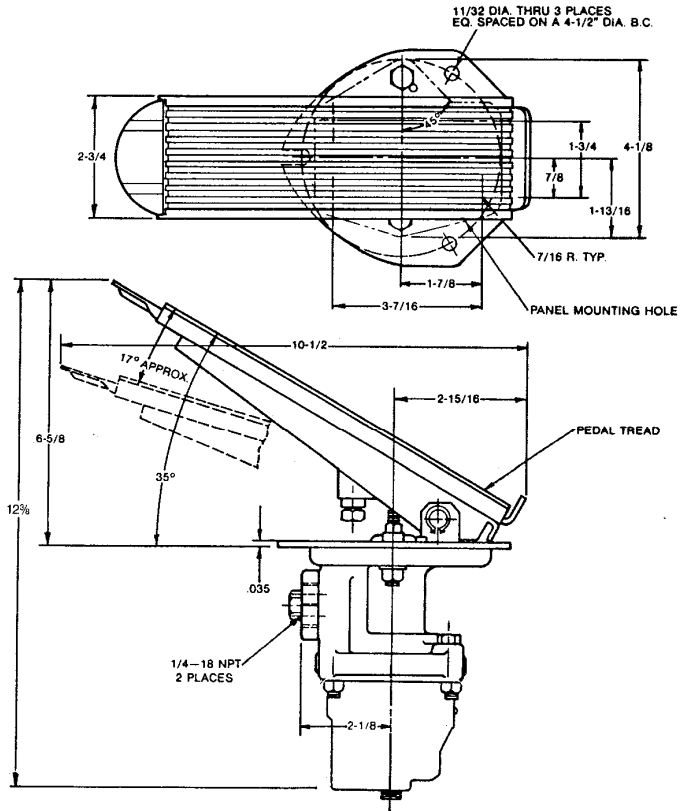
PIPE CONNECTIONS:

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

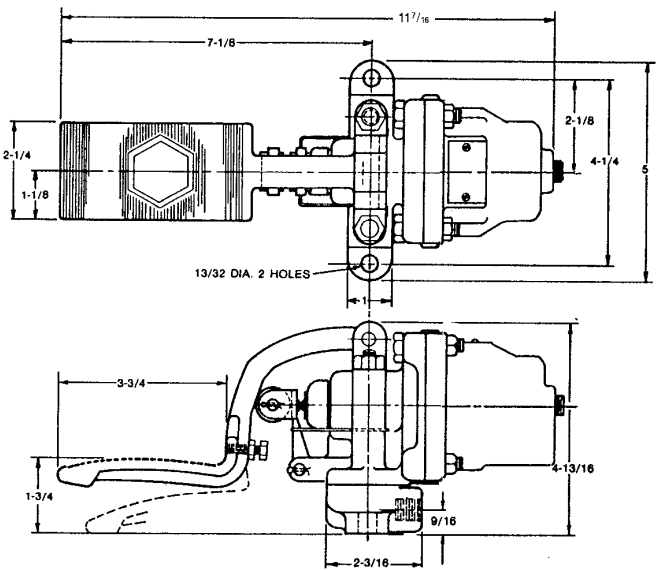
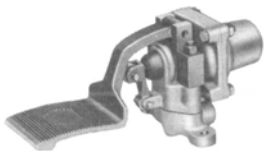
The H-1-A CONTROLAIR Valve is a pedal actuated 3-way pressure regulating valve that is designed for installations in which its operator is standing or in which part of the valve

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)



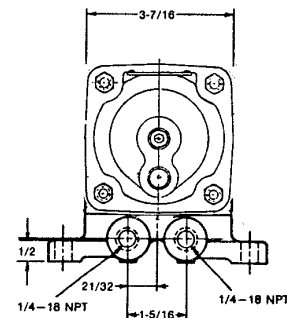
PIPE CONNECTIONS:

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.

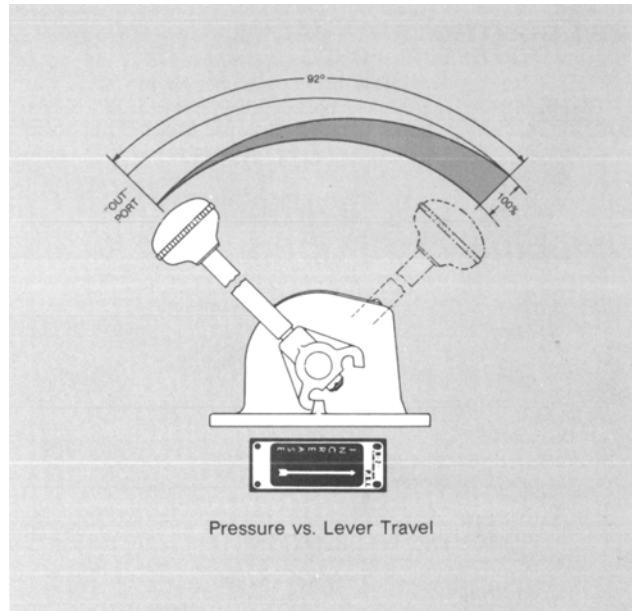
Approximate weight: 6½ lbs. (2.9 Kg)

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.

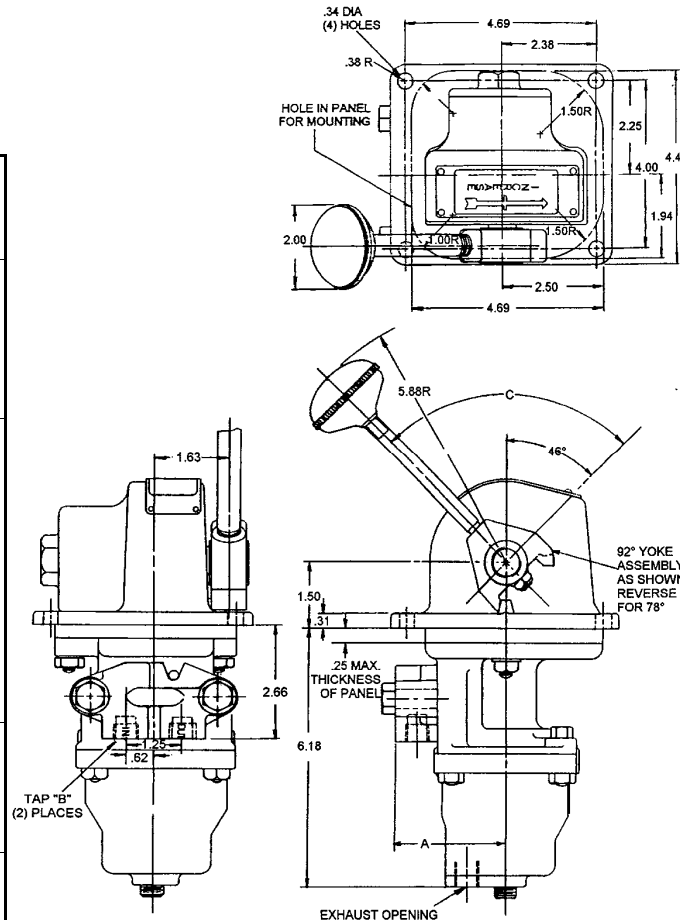
H-2-FX CONTROLAIR Valve - Lever remains in the position where released.

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

ORDERING INFORMATION

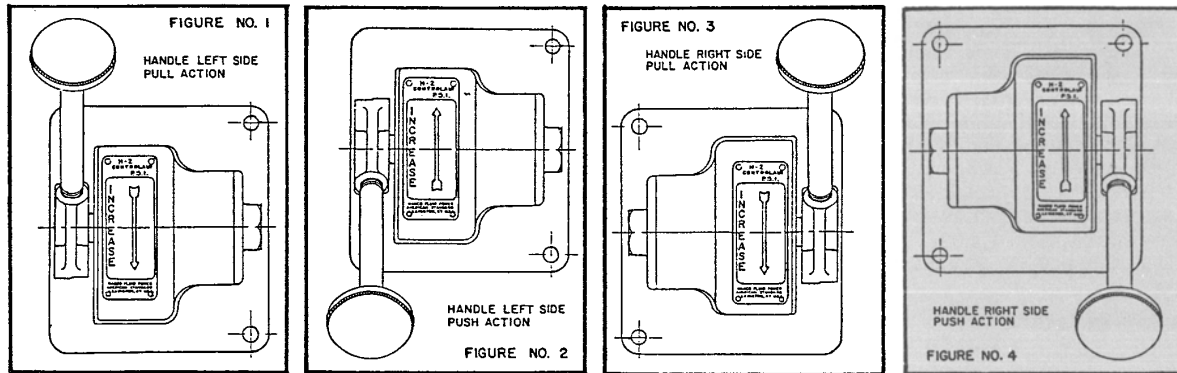
Model	New Part No.	Old Part No.	Pressure Range psi (bar)	“C” Lever Travel
H-2-X	R431002638	P-050493-00001	0-65 (0-4.5)	92°
	R431002639	P-050493-00002	0-100 (0-6.9)	92°
	R431002640	P-050493-00003	0-125 (0-8.6)	92°
	R431002641	P-050493-00004	0-150 (0-10.3)	92°
	R431002642	P-050493-00008	0-30 (0-2.1)	92°
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)

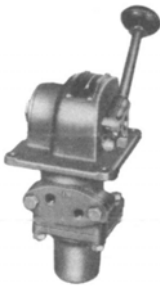
Model	New P/N	Old P/N	Configuration	Model	New P/N	Old P/N	Configuration
H-2-LX	R431007326	P -068546-00003	Figure No. 1 Rev. nameplate Std. cam	H-2-LX	R431007327	P -068547-00003	Figure No. 3 Rev. nameplate Rev. cam
H-2-LX	R431007325	P -068545-00003	Figure No. 2 Std. nameplate Reverse cam	H-2-LX	R431002653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

“H” Controlair® Valves
H-2-E CONTROLAIR® VALVE



The H-2-EX and H-2-EFX CONTROLAIR Valves are 3-way pressure graduating valves which increase outlet pressures from 0 to 40% of maximum value in the first 60° of lever movement from “OFF” position, and then increases outlet pressure from 40% to maximum value in the remaining 32° of lever movement.

H-2-EX and H-2-EFX CONTROLAIR Valves are used in applications that require closer pressure adjustments at the low end of the outlet pressure range than at the high pressure end of the range.

Typical applications for these valves are the operation of clutches on oil drilling rigs, the control of pressure rolls in rolling mills, and the operation of some clamping cylinders.

Approximate weight: 6½ lbs. (2.9 Kg)

PIPE CONNECTIONS

IN Port - Supply

OUT Port - Delivers graduated pressure when lever is moved clockwise from “Off” (facing lever side of valve). A slow build-up of pressure with 40% of the maximum obtained at 60° of lever travel, then rapid build-up of the remaining 60% of pressure range in the remaining 32° of lever travel.

MODELS

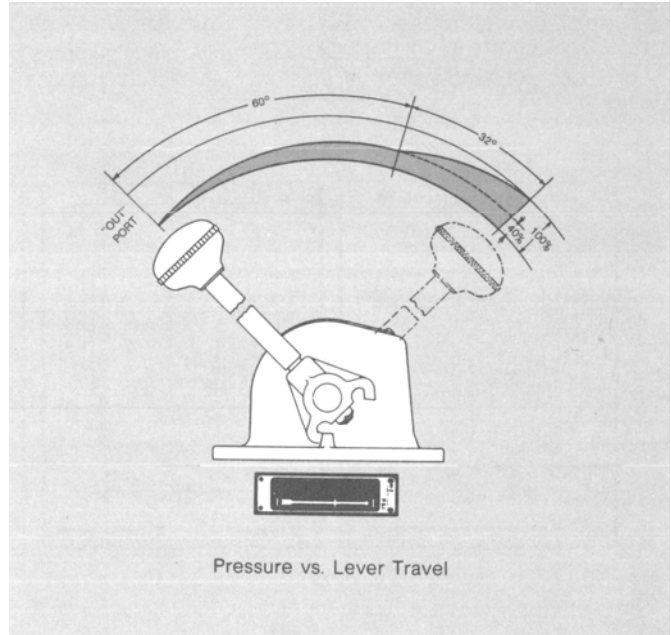
H-2-EX CONTROLAIR Valve - Lever automatically returns to “Off” position when released.

H-2-EFX CONTROLAIR Valve - Lever remains in the position when released.

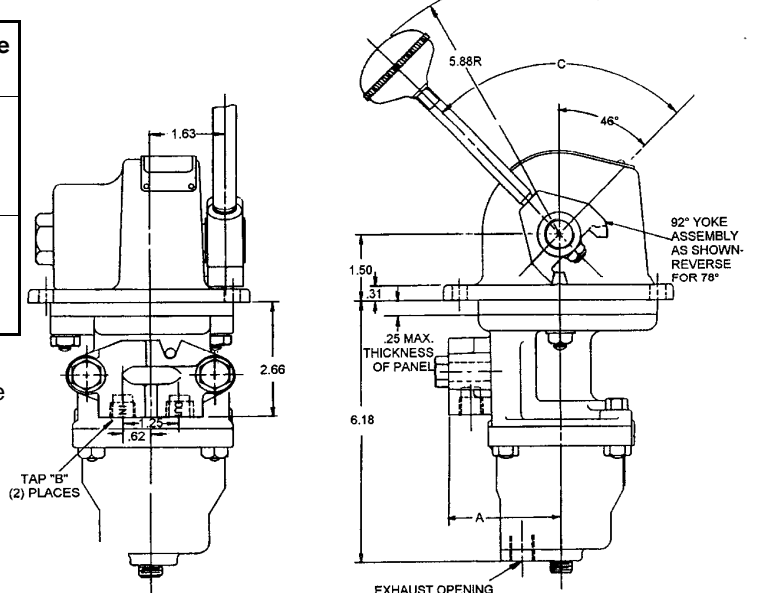
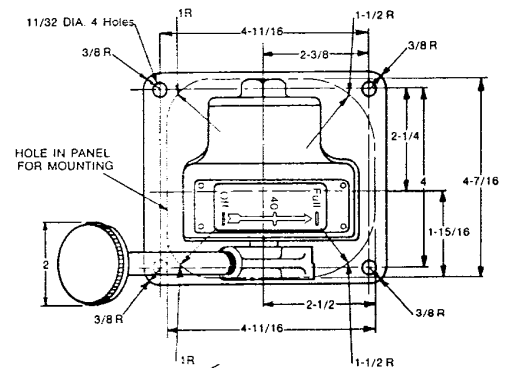
ORDERING INFORMATION

Model	New Part No.	Old Part No.	Pressure Range psi (bar)
H-2-EX	R431002807	P -050925-00001	0-65 (0-4.5)
	R431002808	P -050925-00002	0-100 (0-6.9)
	R431002809	P -050925-00003	0-125 (08.6)
H-2-EFX	R431002946	P -051846-00001	0-65 (04.5)
	R431002947	P -051846-00002	0-100 (06.9)
	R431002948	P -051846-00003	0-125 (0-8.6)

See page 9 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.

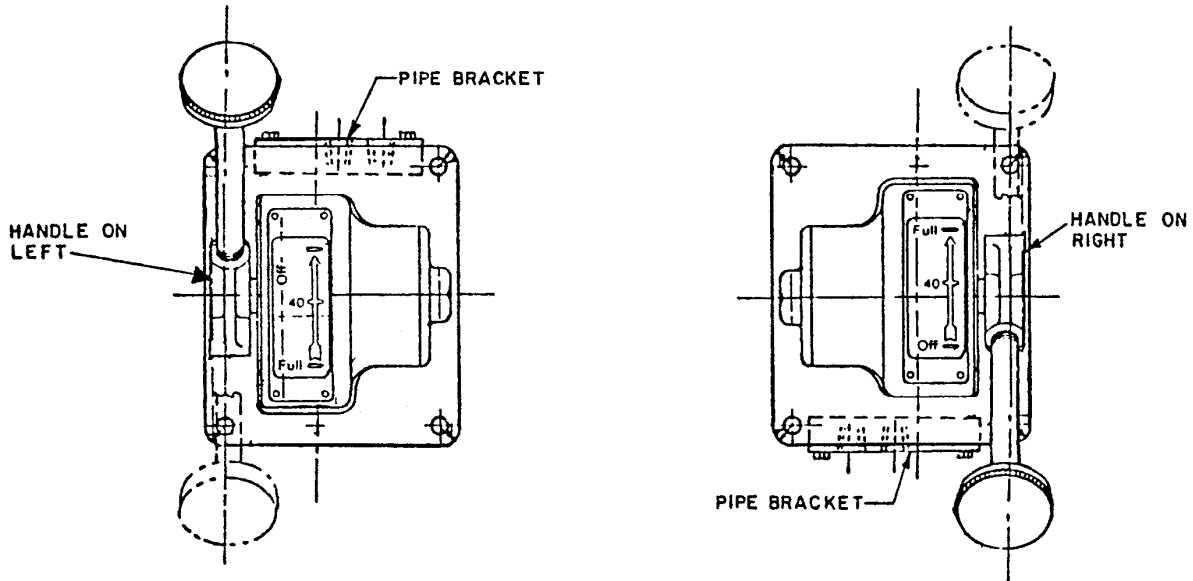


Pressure vs. Lever Travel



“H” Controlair® Valves
H-2-EX CONTROLAIR® VALVES Alternate Models

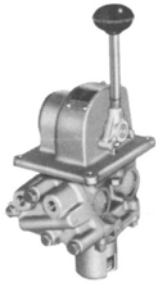
In order to provide maximum flexibility in control panel arrangements, the following alternate models of the H-2-EX CONTROLAIR valve have been established. In general, the four options provide either push or pull action when the valve is mounted so that the handle is on either the left or right. This is particularly attractive with the increased use of vertical control panels where the pull action is easier for the operator.



Model	New Part No.	Old Part No.	Action	Details
H-2-EX	R431007222	P-067577-00002	Pull	Reverse nameplate Standard cam
H-2-EX	R431007221	P-067576-00002	Push	Standard nameplate Reverse cam
H-2-EX	R431007033	P-067224-00002	Pull	Reverse nameplate Reverse cam
H-2-EX	R431002808	P-050925-00002	Push	Standard nameplate and cam

*shaded area is standard valve configuration

“H” Controlair® Valves
HC-2 CONTROLAIR® VALVE



The HC-2 CONTROLAIR Valve is a lever operated, pressure regulating, 4-way directional valve. It consists of two 3-way directional valves, and a 3-way pressure regulating portion. The regulating portion furnishes the inlet air for the directional valves. Each directional valve has its own OUT port.

Initial lever movement from “OFF” position selects the “OUT” port to be activated. Further lever movement in the same direction controls the outlet pressure of the air at that port. The opposite OUT port remains connected to atmosphere. (See diagram)

These valves are used to control two clutches, two brakes, a clutch and a brake, two single acting cylinders or a double acting cylinder. In fact, wherever it is desired to control, with one lever, the flow and pressure in one or the other of two separate air lines.

Approximate weight: 9 lbs. (4.1 Kg)

PIPE CONNECTIONS

Port 1 - OUT, graduated pressure when lever is moved clockwise from “Off” (facing lever side of valve).

Port 2 - IN pressure.

Port 3 - OUT, graduated pressure when lever is moved counterclockwise from “Off”.

MODELS

HC-2-X CONTROLAIR Valve - Lever automatically returns to “Off” position when released.

HC-2-FX CONTROLAIR Valve - Lever remains in the position where released. Holding friction is adjustable.

HC-2-LX CONTROLAIR Valve - Lever automatically returns to “Off” position when released from any position except maximum pressure position.

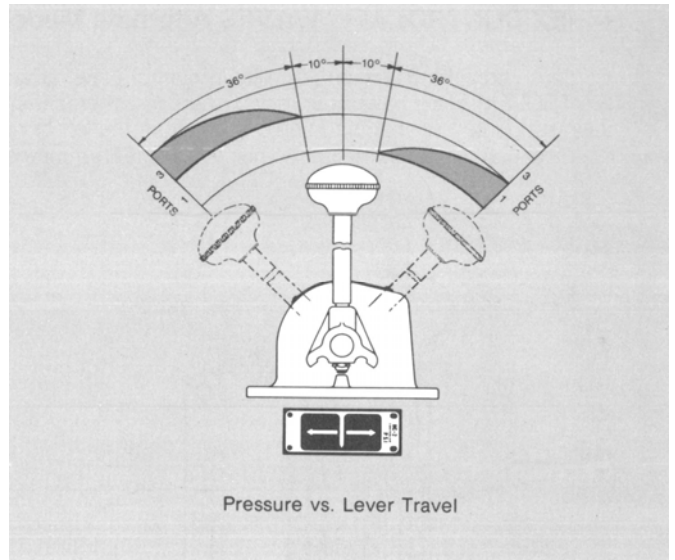
HC-2-SX CONTROLAIR Valve - Detent 10° either side of neutral. Handle latches in one maximum position only. The handle self returns to the NEUTRAL position from the other position in the handle travel arc. Models with latch position in either maximum pressure position are available.

ORDERING INFORMATION

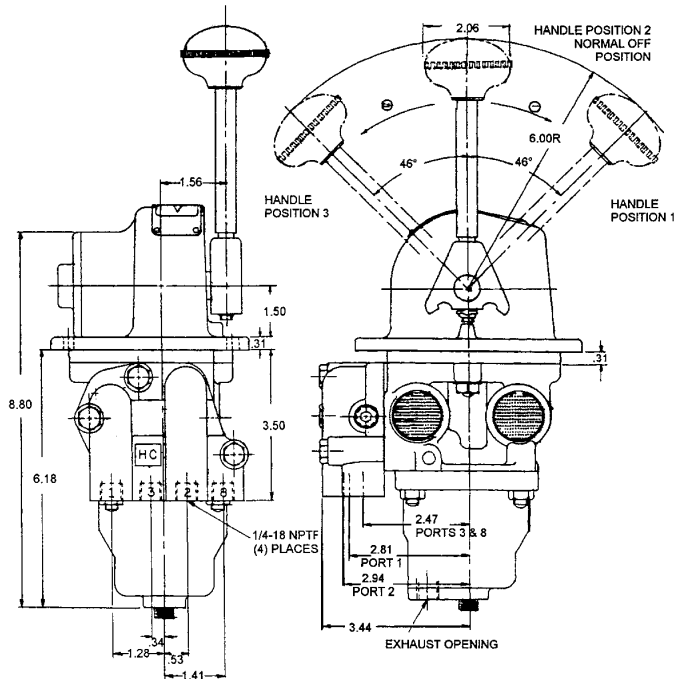
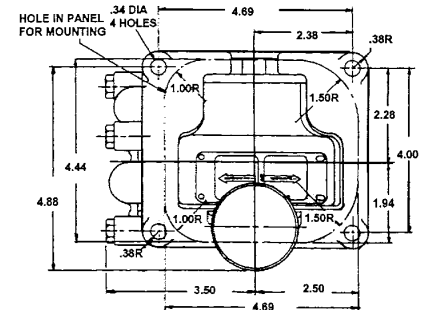
Model	New Part No. (note no.)	Old Part No.	Pressure Range psi (bar)
H-2-X	R431002835	P -050975-00001	0-65 (0-4.5)
	R431002836	P -050975-00002	0-100 (0-6.9)
	R431002837	P -050975-00003	0-125 (08.6)
	R431002838	P -050975-00004	0-150 (0-10.3)
H-2-FX	R431002839	P -050976-00001	0-65 (0-4.5)
	R431002840	P -050976-00002	0-100 (0-6.9)
	R431002841	P -050976-00003	0-125 (0-8.6)
	R431002842	P -050976-00004	0-150 (0-10.3)
HC-2-LX	R431003824	P -055582-00001	0-65 (0-4.2)
	R431003825	P -055582-00002	0-100 (0-6.9)
	R431003826	P -055582-00003	0-125 (0-8.6)
	R431003827	P -055582-00004	0-150 (0-10.3)
HC-2-SX	R431009114 (1)	P -051206-00001	0-60 (0-4.2)
	R431002892 (1)	P -051206-00002	0-100 (0-6.9)
	R431002893 (1)	P -051206-00003	0-125 (0-8.6)
	R431002894 (1)	P -051206-00004	0-150 (0-10.3)
	R431007030 (2)	P -067197-00003	0-125 (0-8.6)

NOTE:

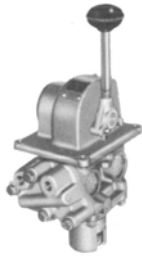
- (1) Handle detent latches in maximum pressure position away from pipe bracket. (Position "A")
- (2) Handle detent latches in maximum pressure position on pipe bracket side (Position "B").
- (3) Full pressure feature, chrome plated cover details, and other special arrangements are available. Consult factory for requirements and part numbers not shown.



Pressure vs. Lever Travel



“H” Controlair® Valves
HD-2 CONTROLAIR® VALVE



The HD-2 CONTROLAIR Valve is a composite lever operated directional valve consisting of two 3-way directional valves and a 3-way pressure regulating portion. Each unit has its own OUT port.

Initial lever movement either side of “Neutral” position activates the OUT port from the pressure regulating portion and one or the other of the ports from the 3-way directional valves. The chosen directional valve port delivers full inlet pressure while the other OUT port remains connected to atmosphere. Further lever movement in the same direction controls the air pressure delivered by the pressure regulating portion. (See diagram)

These valves are used principally to control the forward and reverse clutches and the throttle of an engine. They are also suitable for applications where combined lever-operated direction control and pressure control are desired.

Approximate weight: 9 lbs. (4.1 Kg)

PIPE CONNECTIONS

Port 1 - OUT, full inlet pressure when lever is moved clockwise from “Neutral” (facing lever side of valve).

Port 2 - IN pressure.

Port 3 - OUT, full inlet pressure when lever is moved counterclockwise from “Neutral.”

Port 8 - OUT, graduated pressure when lever is moved in either direction from “Neutral.”

MODELS

HD-2-X CONTROLAIR Valve - The lever returns from the extreme position to the valve’s “Neutral” or “Off” position when the operating force is removed.

HD-2-FX CONTROLAIR Valve - Lever remains in the position where released. Holding friction is adjustable.

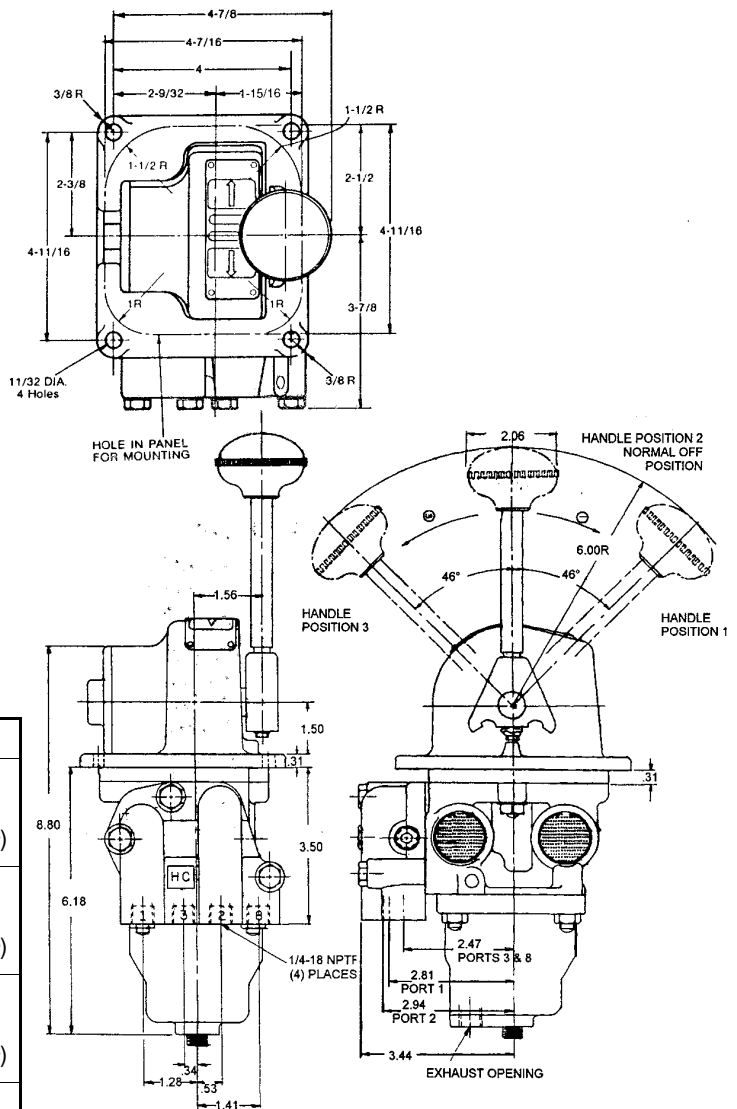
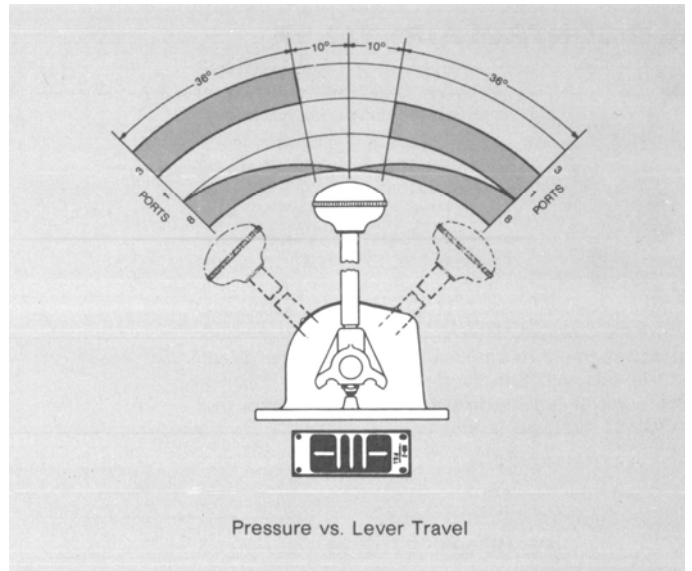
HD-2-LX CONTROLAIR Valve - The lever returns to the valve’s “Neutral” or “Off” position when manually moved out of the latch position (extreme travel position).

HD-2-XS CONTROLAIR Valve - Same as HD-2-X models except no graduated pressure delivery from port 8 when handle is moved away from pipe bracket.

ORDERING INFORMATION

Model	New Part No.	Old Part No.	Pressure Range
HD-2-X	R431002831	P -050973-00001	0-65 psi (0-4.5 bar)
	R431002832	P -050973-00002	0-100 psi (0-6.8 bar)
	R431002833	P -050973-00003	0-125 psi (0-8.6 bar)
	R431002834	P -050973-00004	0-150 psi (0-10.3 bar)
HD-2-FX	R431002823	P -050970-00001	0-65 psi (0-4.5 bar)
	R431002824	P -050970-00002	0-100 psi (0-6.9 bar)
	R431002825	P -050970-00003	0-125 psi (0-8.6 bar)
	R431002826	P -050970-00004	0-150 psi (0-10.3 bar)
HD-2-LX	R431002827	P -050972-00001	0-65 psi (0-4.5 bar)
	R431002828	P -050972-00002	0-100 psi (0-6.9 bar)
	R431002829	P -050972-00003	0-125 psi (0-8.6 bar)
	R431002830	P -050972-00004	0-150 psi (0-10.3 bar)
HD-2-XS	R431009025	P -067556-00001	0-65 psi (0-4.5 bar)

Full pressure feature, chrome plated cover details, and other special operating details are available. Consult factory for requirements and part numbers not shown.



“H” Controlair® Valves
HE-2 CONTROLAIR® VALVE



The HE-2 CONTROLAIR Valve is a composite lever operated directional valve consisting of a 3-way directional valve and a 3-way pressure regulating portion with each unit having its own OUT port.

The first 10° of lever travel from the “Off” position opens the directional valve to provide full inlet pressure for its OUT port. Further lever-travel controls the pressure of the air delivered by the pressure regulating portion. This graduated pressure varies directly with lever travel. (See diagram)

These valves are used principally in the control of a clutch and a throttle of an engine.

Approximate weight: 9 lbs. (4.1 Kg)

PIPE CONNECTIONS

Port 1 - OUT, full inlet pressure when lever is moved 10° clockwise from “Off” (facing lever side of valve).

Port 2 - IN pressure.

Port 8 - OUT, graduated pressure when lever is moved clockwise from “Off”.

MODELS

HE-2-X CONTROLAIR Valve - The lever returns from the extreme position to the valve’s “clutch” or “Off” position when the operating force is removed.

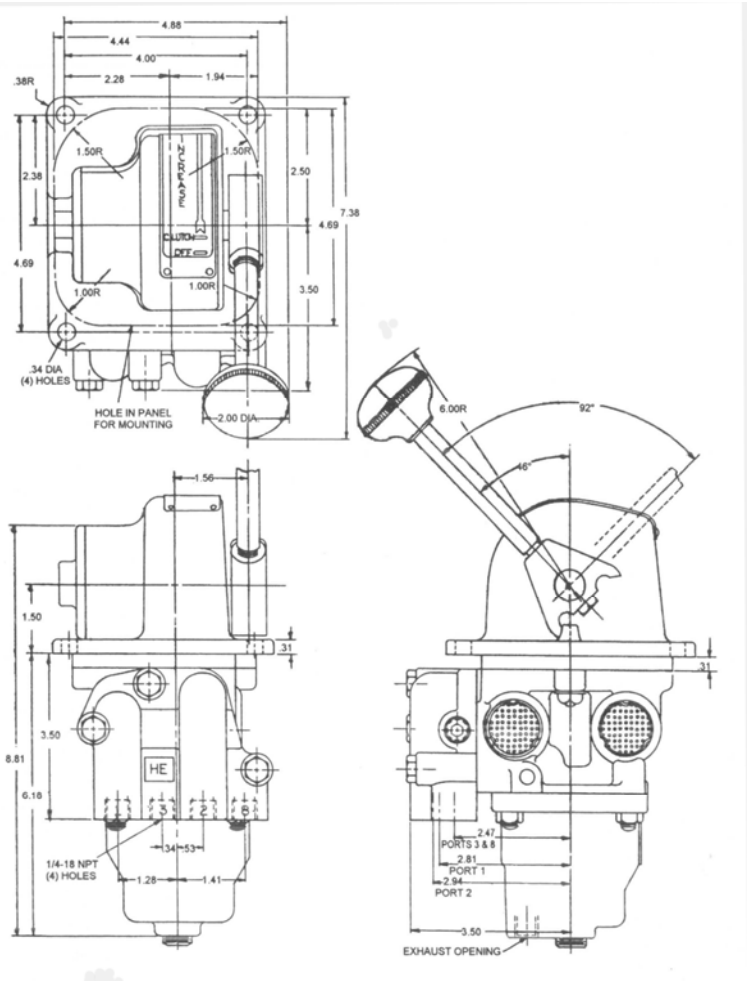
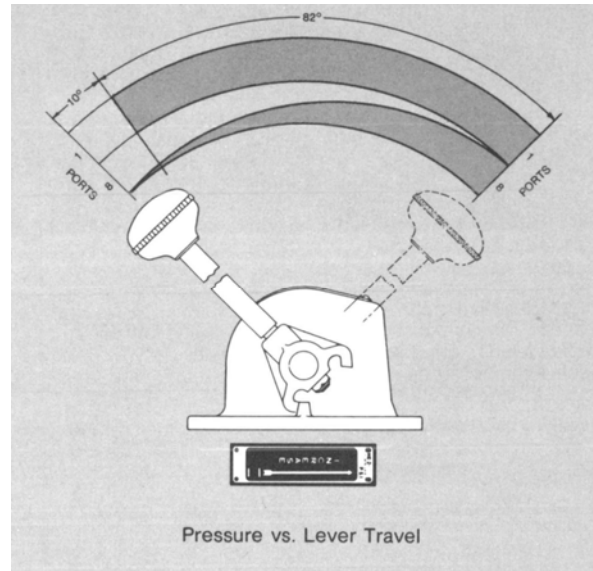
HE-2-FX CONTROLAIR Valve - Lever remains in the position where released. Holding friction is adjustable.

HE-2-LX CONTROLAIR Valve - The lever returns to the valve’s “Neutral” or “Off” position when manually moved out of the latch position (extreme travel position).

ORDERING INFORMATION

Model	New Part No.	Old Part No.	Pressure Range psi (bar)
HE-2-X	R431002937	P-051692-00001	0-65 (0-4.5)
	R431002938	P-051692-00002	0-100 (0-6.9)
	R431002939	P-051692-00003	0-125 (0-8.6)
HE-2-FX	R431002912	P-051612-00001	0-65 (0-4.5)
	R431002913	P-05161200002	0-100 (0-6.9)
	R431002914	P-051612-00003	0-125 (0-8.6)
	R431002915	P-051612-00004	0-150 (0-10.3)
HE-2-LX	R431002916	P-051614-00001	0-65 (0-4.5)
	R431002917	P-051614-00002	0-100 (0-6.9)
	R431002918	P-051614-00003	0-125 (0-8.6)

Full pressure feature, chrome plated cover details, and other special operating details are available. Consult factory for requirements and part number not shown.



“H” Controlair® Valves
H-3 CONTROLAIR® VALVE and H-3-G CONTROLAIR® VALVE

H-3 CONTROLAIR® VALVE



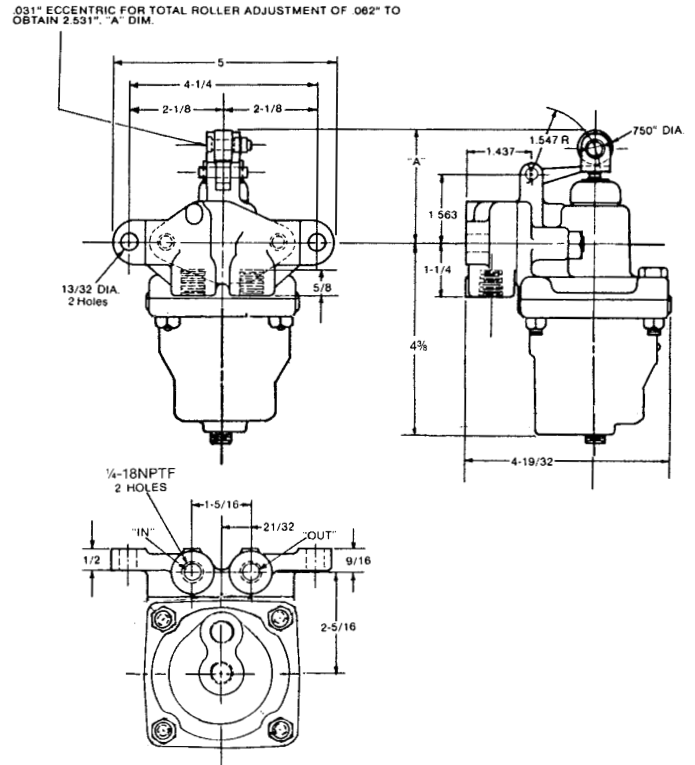
The H-3 CONTROLAIR Valve is equipped with a roller for operation by a cam or a similar mechanical device. Graduated pressure is obtained from the valve's OUT line. Total movement is approximately 5/16" (8mm) with the initial 1/16" (1.6 mm) travel used to close its exhaust valve.

Approximate weight: 4½ lbs. (2.0 Kg)

ORDERING INFORMATION

New Part No.	Old Part No.	Pressure Range psi (bar)
R431002626	P-050382-00001	0-65 (0-4.5)
R431002627	P-050382-00002	0-100 (0-6.9)
R431002628	P-050382-00003	0-125 (0-8.6)
R431002629	P-050382-00004	0-150 (0-10.3)
R431002630	P-050382-00006	0-25 (0-1.7)
R431002631	P-050382-00008	0-30 (0-2.1)
R431002632	P-050382-00009	0-75 (0-5.2)

Some special models are available. Consult factory for requirements and part numbers not shown.

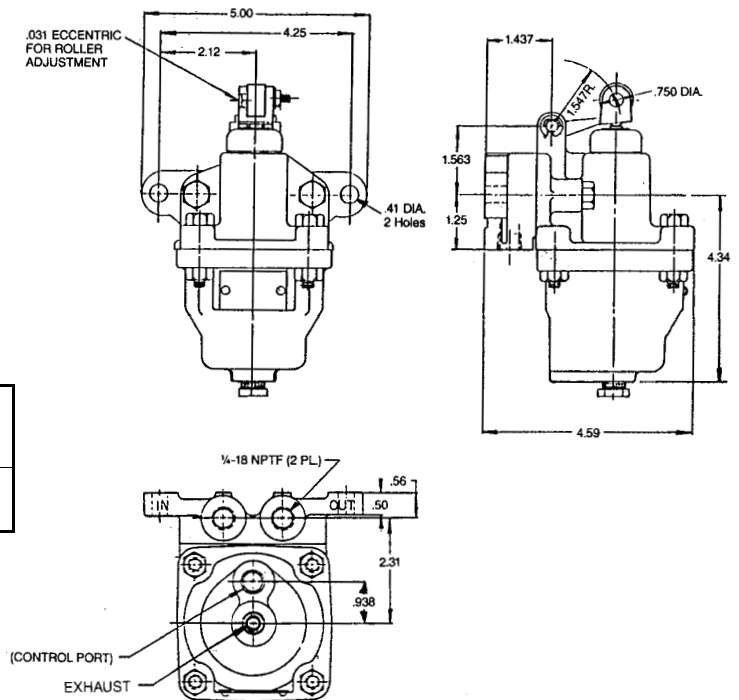


H-3-G CONTROLAIR® VALVE

This design is similar to the H-3 CONTROLAIR except the spring housing area is sealed and control pressure can be introduced through the tapped exhaust port to the underside of the diaphragm. By varying this signal, the output of the H-3-G CONTROLAIR can be biased or adjusted in proportions. This bias signal must be lower than the output signal.

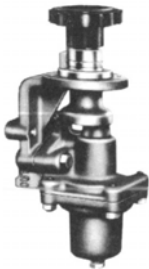
ORDERING INFORMATION

New Part No.	Old Part No.	Pressure Range psi (bar)
R431009131	P-052550-00008	0-30 (0-2.1)



“H” Controlair® Valves
H-4 CONTROLAIR® VALVE and H-4-G CONTROLAIR® VALVE

H-4 CONTROLAIR® VALVE



The H-4 CONTROLAIR Valve is a knob operated, 3-way pressure regulating valve. Arranged for panel mounting, this valve gives fine, vernier type pressure control in one delivery line. The knob holds in all positions and has adjustable stops to limit maximum and minimum travel.

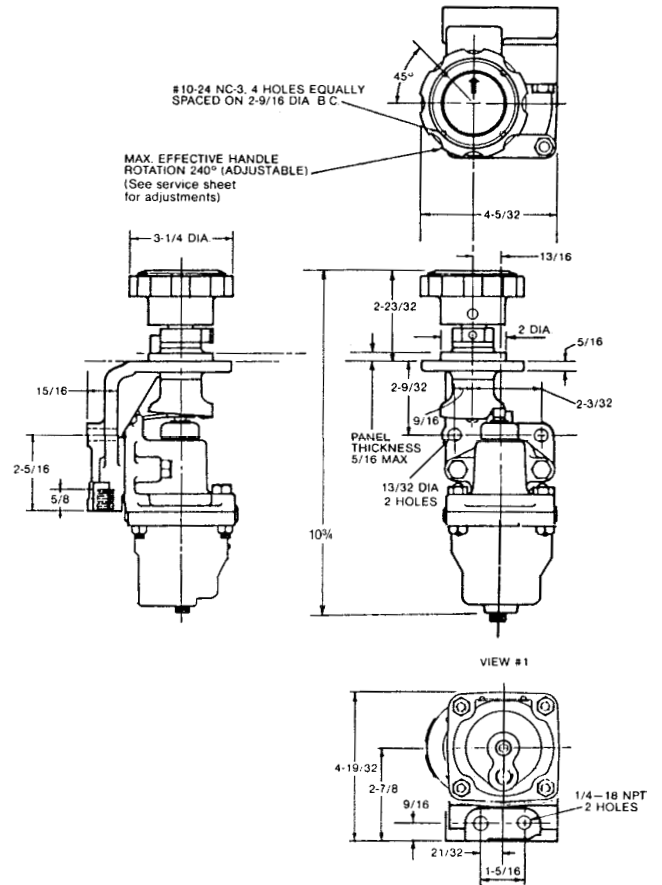
Clockwise rotation of the knob increases pressure in the standard models. Opposite knob action is available.

Approximate weight: 5½ lbs. (2.5 Kg)

ORDERING INFORMATION

New Part No.	Old Part No.	Pressure Range psi (bar)
R431002818	P -050967-00001	0-65 (0-4.5)
R431002819	P -050967-00002	0-100 (0-6.9)
R431002820	P -050967-00003	0-125 (0-8.6)
R431002821	P -050967-00004	0-150 (0-10.3)
R431002822	P -050967-00008	0-30 (0-2.1)
R431002885 (1)	P -051173-00001	0-65 (0-4.5)
R431002886 (1)	P -051173-00002	0-100 (0-6.9)

- (1) Counterclockwise rotation increases pressure.
- (2) Consult factory for requirements and part numbers not shown.



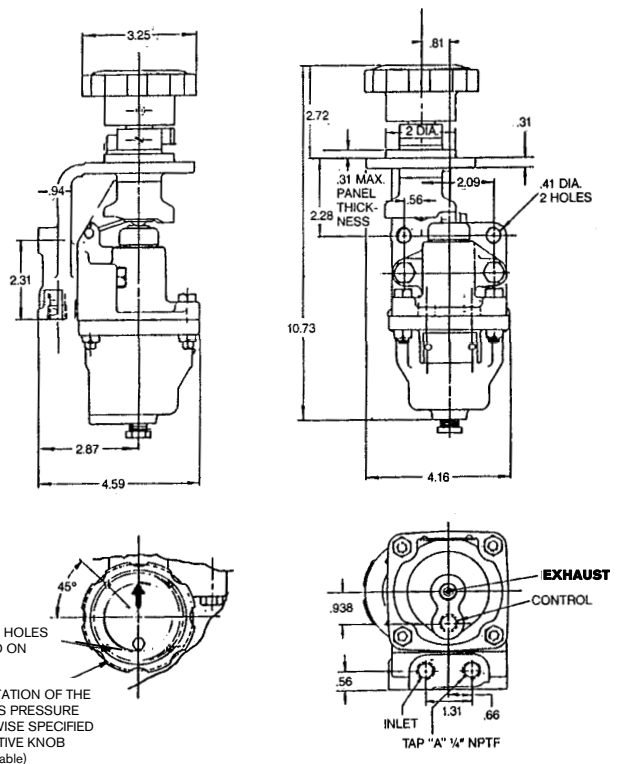
H-4-G CONTROLAIR® VALVE

This design is similar to the H-4 CONTROLAIR except the spring housing area is sealed and a control signal can be introduced under the diaphragm through the tapped exhaust port. The delivery pressure is then biased (decreased) by this signal. The bias signal must always be lower than the output signal called for by the knob travel.

ORDERING INFORMATION

New Part No.	Old Part No.	Bias Range psi (bar)
R431002962	P -052035-00001	0-65 (0-4.5)
R431002963 (1)	P -052035-00002	0-65 (0-4.5)

- (1) 9/16-18 Standard Thread Ports



“H” Controlair® Valves
REPAIR KIT LIST

REPAIR KIT LIST

VALVE PORTION KITS

New Part No.	Old Part No.	Description
R431003895	P -055687-K0000	For All Models: Kit, graduating valve (except H-3-G and H-4-G models) (lapped set of inlet and exhaust valve unit, exhaust valve seat, diaphragm, and O rings)
R431003896	P -055687-K0002	Kit, graduating valve (as above for H-3-G and H-4-G models)
R431004887	P -059028-K0000	For H-1, H-1-A, H-2, H-3, and H-4 Models: (except H-3-G and H-4-G models) Kit, major, valve portion (R431003895 kit, gaskets and strainers, exh. valve spring, dirt protector, O rings, cam dog)
R431003743	P -055474-K0002	For HC-2, HD-2 and HE-2 Models: Kit, minor, side valve (inlet valve assembly and seals)
R431003885	P -057094-00001	Kit, major, side valve (R431003743 kit, gaskets, strainers, exh. valve spring, O rings, cam dog)
R431004005	P -057136-00000	Kit, major, graduating valve (R431003895 kit, gaskets and strainers, exhaust valve spring, O rings, cam dog)
R431006521	P -064894-00002	Kit, major, valve portion, HC-2 and HD-2 models (R431004005 kit and (2) R431003985 kits)
R431006522	P -064894-00003	Kit, major, valve portion, HE-2 models (R431004005 kit and (1) R431003985 kit)

These kits contain some common parts to renew the valve portions only. For severely worn or damaged valve portions, select additional parts from appropriate service bulletins. All kits contain a small tube of recommended lubricant.

MECHANICAL OPERATOR KITS

New Part No.	Old Part No.	Description
R431006425	P -064421-K0000	Kit, knob (H-4) (knob, screw, escutcheon plates)
R431006415	P -064421-00001	Kit, latch springs (-LX, -LS, HD-2-FX models)
R431006418	P -064421-00004	Kit, handle and cam shaft (HC-2-X, HC-2-LX, HD-2-X, HD-2-LX models)
R431006419	P -064421-00005	Kit, handle and cam shaft (HC-2-X, HC-2-LX, HD-2-X, HD-2-LX models)
R431006420	P -064421-00006	Kit, handle and cam shaft (H-2 and HE-2 models except H-2-EX) cam shaft yoke, handle, knob, bearings, cap nut)
R431006421	P -064421-00007	Kit, knob and cam (H-4) (R431006425 kit and new cam details)
R431006422	P -064421-00008	Kit, return spring (H-2 and HE-2 models) (spring and arbor) (except H-2-EX models)
R431006423	P -064421-00009	Kit, return spring (HC-2 and HD-2 models) (spring and arbor)
R431006424	P -064421-00010	Kit, return spring (H-2-EX models) (spring and arbor)
R431006648	P -065636-00000	Kit, roller operator on H-3 model (roller lever assembly, pin and retainers)
R431000597	P -026205-00000	Kit, pedal replacement for H-1 (replaces obsolete pedal 526474)

The above are some common kits for the repair of the mechanical operating portions of the valves. For severely worn or damaged valves, select model and parts from the appropriate service bulletins. Most service bulletins are available on line at: www.boschrexroth-us.com/brp

NOTICES TO PRODUCT USERS

1. WARNING: FLUID MEDIA

Bosch Rexroth pneumatic devices are designed and tested for use with filtered, clean, dry, chemical free air at pressures and temperatures within the specified limits of the device. For use with media other than air or for human life support systems, Bosch Rexroth must be consulted. Hydraulic cylinders are designed for operation with filtered, clean, petroleum based hydraulic fluid; operation using fire-resistant or other special types of fluids may require special packing and seals. Consult the factory.

2. WARNING: MATERIAL COMPATIBILITY

Damage to product seals or other parts caused by the use of non-compatible lubricants, oil additives or synthetic lubricants in the air system compressor or line lubrication devices voids Bosch Rexroth's warranty and can result in product failure or other malfunction. See lubrication recommendations below.

AIR LINE LUBRICANTS! In service higher than 18 cycles per minute or with continuous flow of air through the device, an air line lubricator is recommended. * (Do not use line lubrication with vacuum products.) However, the lubricator must be maintained since the oil will wash out the grease, and lack of lubrication will greatly shorten the life expectancy. The oils used in the lubricator must be compatible with the elastomers in the device. The elastomers are normally BUNA-N, NEOPRENE, VITON, SILICONE and HYTREL. Bosch Rexroth recommends the use of only petroleum-based oils without synthetic additives, and with an aniline point between 180° and 210° F.

COMPRESSOR LUBRICANTS! All compressors (with the exception of special "oil free" units) pass oil mist or vapor from the internal crankcase lubricating system through to the compressed air. Since even small amounts of non-compatible lubricants can cause severe seal deterioration (which could result in component and system failure) special care should be taken in selecting compatible compressor lubricants. It is recommended that users review the National Fluid Power Association "Recommended Guide Lines For Use Of Synthetic Lubricants In Pneumatic Fluid Power Systems" (NFPA T1-1978).

3. WARNING: INSTALLATION AND MOUNTING

The user of these devices must conform to all applicable electrical, mechanical, piping and other codes in the installation, operation or repair of these devices.

INSTALLATION! Do not attempt to install, operate or repair these devices without proper training in the technique of working on pneumatic or hydraulic systems and devices, unless under trained supervision. Compressed air and hydraulic systems contain high levels of stored energy. Do not attempt to connect, disconnect or repair these products when system is under pressure. Always exhaust or drain the pressure from system before performing any service work. Failure to do so can result in serious personal injury.

MOUNTING! Devices should be mounted and positioned in such manner that they cannot be accidentally operated.

4. WARNING: APPLICATION AND USE OF PRODUCTS

The possibility does exist for any device or accessory to fail to operate properly through misuse, wear or malfunction. The user must consider these possibilities and should provide appropriate safe guards in the application or system design to prevent personal injury or property damage in the event of malfunction.

5. WARNING: CONVERSION, MAINTENANCE AND REPAIR

When a device is disassembled for conversion to a different configuration, maintenance or repair, the device must be tested for leakage and proper operation after being reassembled and prior to installation.

MAINTENANCE AND REPAIR! Maintenance periods should be scheduled in accordance with frequency of use and working conditions. All Bosch Rexroth products should provide minimum of 1,000,000 cycles of maintenance free service when used and lubricated as recommended. However, these products should be visually inspected for defects and given an "in system" operating performance and leakage test once a year. Where devices require major repair as result of the one million cycles, one year, or routine inspection, the device must be disassembled, cleaned, inspected, parts replaced as required, rebuilt and tested for leakage and proper operation prior to installation. See individual catalogs for specific cycle life estimates.

6. PRODUCT CHANGES

Product changes including specifications, features, designs and availability are subject to change at any time without notice. For critical dimensions or specifications, contact factory.

*Many Bosch Rexroth pneumatic components can operate with or without air line lubrication; see individual sales catalogs for details.

--Refer to the appropriate service catalog for parts and service information.

LIMITATIONS OF WARRANTIES & REMEDIES

Bosch Rexroth warrants its products sold by it to be free from defects in material and workmanship to the following:

For twelve months after shipment Bosch Rexroth will repair or replace (F.O.B. our works), at its option, any equipment which under normal conditions of use and service proves to be defective in material or workmanship at no charge to the purchaser. No charge will be made for labor with respect to defects covered by this Warranty, provided that the work is done by Bosch Rexroth or any of its authorized service facilities. However, this Warranty does not cover expenses incurred in the removal and reinstallation of any product, nor any downtime incurred, whether or not proved defective.

All repairs and replacement parts provided under this Warranty policy will assume the identity, for warranty purposes, of the part replaced, and the warranty on such replacement parts will expire when the warranty on the original part would have expired. Claims must be submitted within thirty days of the failure or be subject to rejection.

This Warranty is not transferable beyond the first using purchaser. Specifically, excluded from this Warranty are failures caused by misuse, neglect, abuse, improper operation or filtration, extreme temperatures, or unauthorized service or parts. This Warranty also excludes the use of lubricants, fluids or air line additives that are not compatible with seals or diaphragms used in the products. This Warranty sets out the purchaser's exclusive remedies with respect to products covered by it, whether for negligence or otherwise. Neither, Bosch Rexroth nor any of its affiliates will be liable for consequential or incidental damages or other losses or expenses incurred by reason of the use or sale of such products. Our liability (except as to title) arising out of the sale, use or operation of any product or parts, whether on warranty, contract or negligence (including claims for consequential or incidental damage) shall not in any event exceed the cost of replacing the defective products and, upon expiration of the warranted period as herein provided, all such liability is terminated. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, WHETHER FOR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE. No attempt to alter, amend or extend this Warranty shall be effective unless authorized in writing by an officer of Bosch Rexroth Corporation.

Bosch Rexroth reserves the right to discontinue manufacture of any product, or change product materials, design or specifications without notice.

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Further contacts

www.boschrexroth.com/addresses

The data specified above only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.