



1074 Kenran Industrial Dr.  
St. Louis, MO 63137  
Phone: 1-800-381-9968

# HUMCO ENGINE CONTROLS

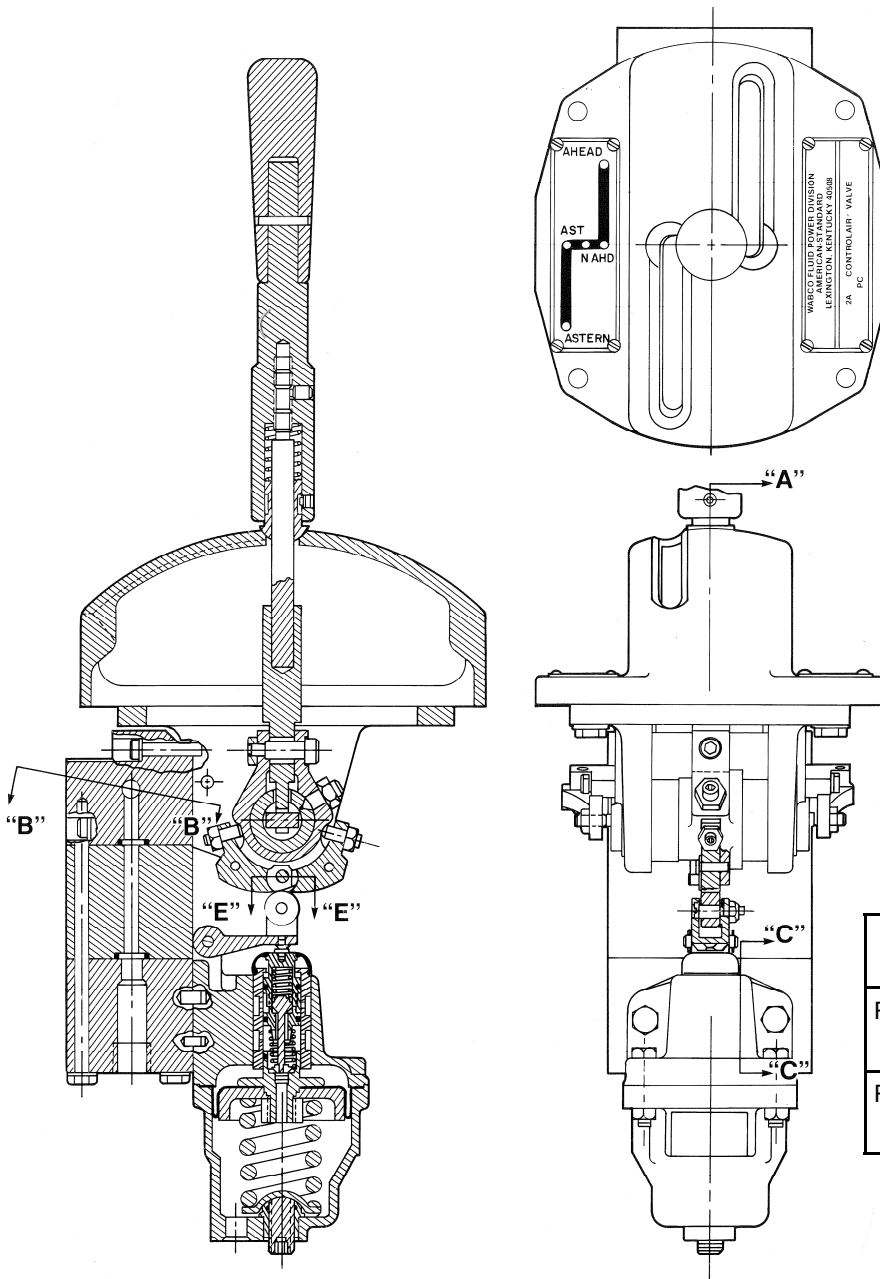
## Rexroth Controlair® Pneumatic Marine Valve

### Back By Popular Demand Model 2A-2A Controlair® Pneumatic Marine Valve

**Rugged and reliable, the 2A-2A remains a favorite**

Rexroth brought back the 2A-2A Controlair due to the valves undying popularity. Captains prefer the 2A-2A Controlair as the clear choice among controls because of its purpose-built design. The "Z" slot cover to guide the handle travel and the ability to lock the handle in position are the main reasons the 2A-2A continues to be a favorite.

6



**Ordering Reference**

Not recommended for exposed weather deck installation due to open cover slot.

2A-2A Controlair Valve

New Part Number	Old Part Number	Pressure Range
R431009268	P -065775-00000	7 - 61 psi (0.5-4.2 bar)
R431009269	P -065775-00001	28 - 71 psi (1.9-4.9 bar)

Installation Drawing DP65775  
Weight - 25 lb. 11.34 kg.

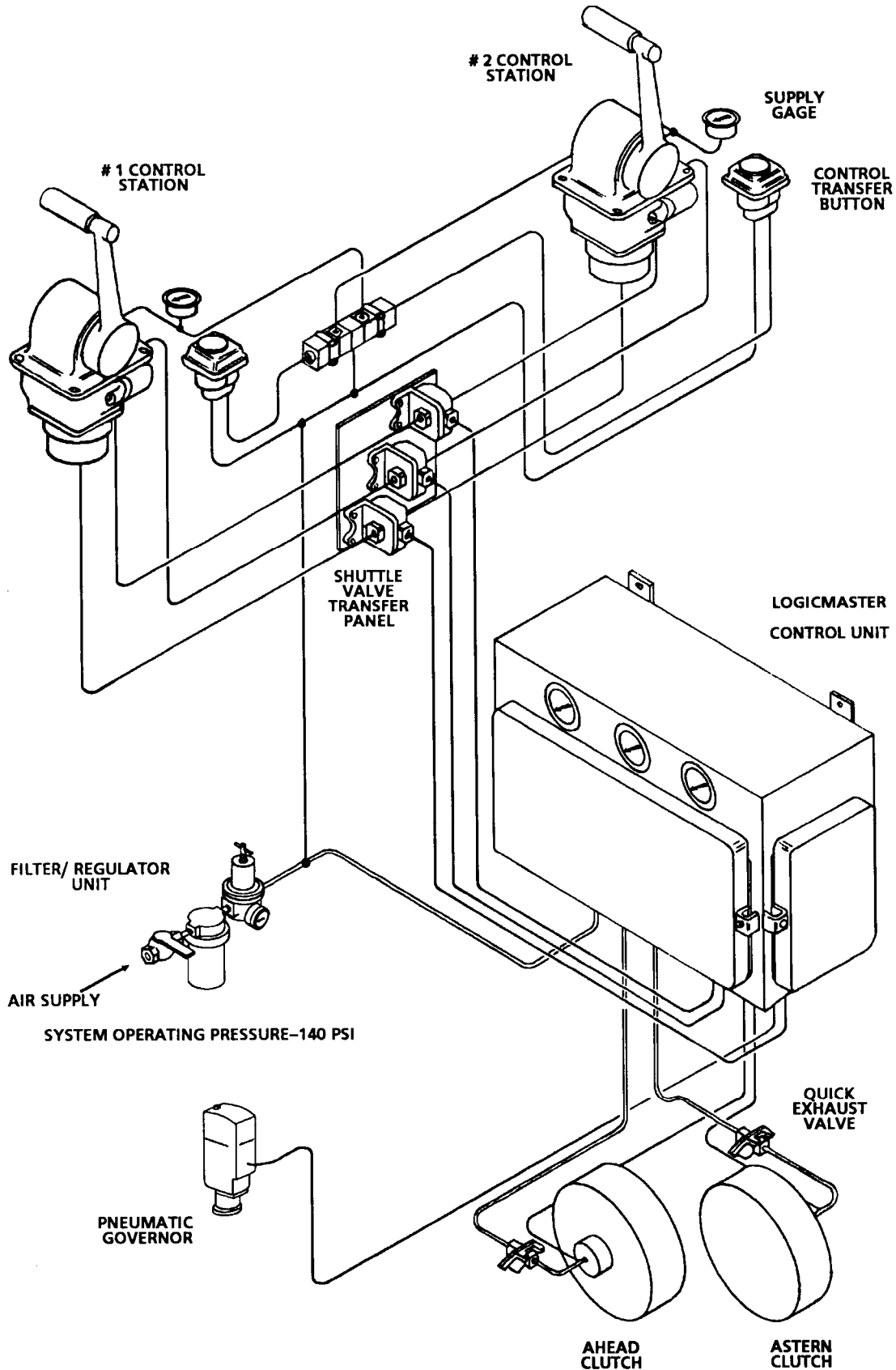


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# HUMCO ENGINE CONTROLS

## Rexroth LogicMaster® Air Clutch Control System

### LOGICMASTER® AIR CLUTCH CONTROL SYSTEM SINGLE ENGINE—TWO CONTROL STATIONS



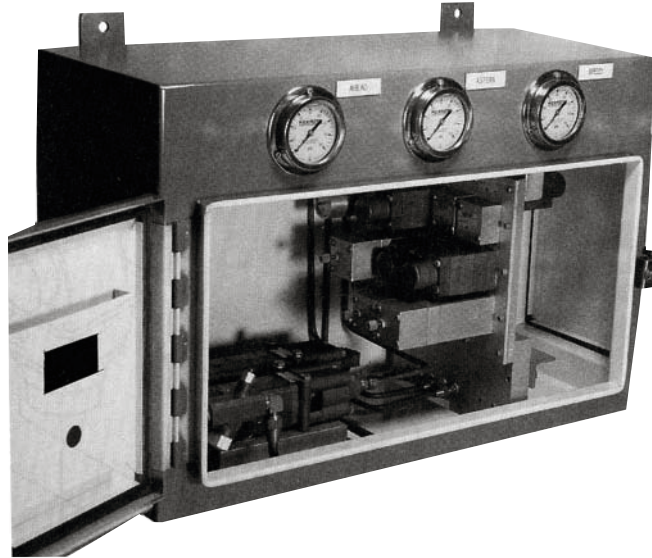


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# HUMCO ENGINE CONTROLS

## Rexroth LogicMaster® Air Clutch Control Units

### LOGICMASTER® AIR CLUTCH CONTROL UNITS



6

- **1,000 TO 4,000 H.P.**
- **TUGS, OFFSHORE SUPPLY BOATS, TOW BOATS, FISHING & GENERAL SERVICE BOATS**

#### FEATURES...

- Fast maneuvering
- Maximum protection for propulsion machinery
- Rugged, service proven control valves
- Compact arrangement simplifies shipboard installations
- Manifolding assembly minimizes piping & potential leakage problems
- Factory tested for 100% operational performance and timing adjustments
- Simplified maintenance and troubleshooting

**L**OGICMASTER Air Clutch Control Units combine proven, high performance pneumatic components into factory assembled, tested and pre-timed units, ready for shipboard installation and operation. All operating valves are subbase mounted for simplified service, maintenance and troubleshooting.

LMAC units incorporate the pneumatic pressure interlocks and protective circuits required for proper engine and reverse gear operation without the necessity to rely on operator judgement to time, sequence or anticipate the propulsion machinery functions. The **built-in control system logic program** provides safe operation of the engine and reverse gear under all maneuvering conditions. The propulsion machinery responds to maneuvering commands without wear or damage from high speed clutch engagement or engine stalling during reversal maneuvers.

#### CONTROL SYSTEM SEQUENCE OF OPERATION...from FULL AHEAD to FULL ASTERN

- Operator moves control handle from FULL AHEAD to FULL ASTERN
- Governor goes to the IDLE position
- AHEAD clutch exhausted
- Shaft Brake applied (if used)
- Timed interlock holds clutches in NEUTRAL (adjustable)
- Propeller speed reduces to acceptable level
- ASTERN clutch inflates at a controlled rate
- Shaft brake releases as clutch inflates
- Governor power boost prevents engine stalling on initial engagement
- Clutch reaches lock-up pressure; governor advances to FULL SPEED.



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# HUMCO ENGINE CONTROLS

## Rexroth LogicMaster® Air Clutch Control Units

### Ordering Information

Model	Part No.	Old Part No.	Description
LMAC-1	R431007550	P-090196-00000	Standard Unit
LMAC-2	R431007552	P-090197-00000	Standard Unit with shaft brake control signal
LMAC-3	R431009156	P-090198-00000	Unit with proportional reversing interlock timing
LMAC-3C	R431009167	P-090393-00000	Unit with proportional reversing interlock timing for 3600 Series Caterpillar® engine

Weight: 87 lbs. (40kg.)

Maintenance kit for the above units is Part Number R431006453 (P-064517-00000).

Caterpillar® engine is a registered trademark of Caterpillar, Inc., Mossville, IL

### LMAC CONTROL UNITS INCORPORATE THE FOLLOWING INTERLOCKS AND OPERATIONAL FEATURES . . .

**GOVERNOR POWER BOOST**—applied at the time of clutch engagement to prevent engine stalling and possible engine reversal—boost is adjustable for magnitude and duration.

#### CROSS-ENGAGEMENT

**INTERLOCKS**—monitor clutch pressure to insure that one clutch fully vents before the opposite clutch can be inflated, i.e. "ahead" clutch must fully disengage before "astern" clutch can engage.

#### TIMED REVERSING INTERLOCK

**CONTROL**—provides an adjustable "neutral" hold time during fast reversals to allow engine and propeller speed to decrease to an acceptable level before opposite clutch can be engaged.

#### CLUTCH PRESSURE/ENGINE SPEED

**INTERLOCK**—insures that selected clutch inflates to lock-up pressure before engine speed can be increased.

**SOFT CLUTCH ENGAGEMENT**—provides smooth engagement to reduce gear shock and engine loading by two-stage rate of clutch fill. Initial fill is at a controlled rate for soft engagement then opens to maximum flow rate for rapid fill.

#### SHAFT BRAKE CONTROL

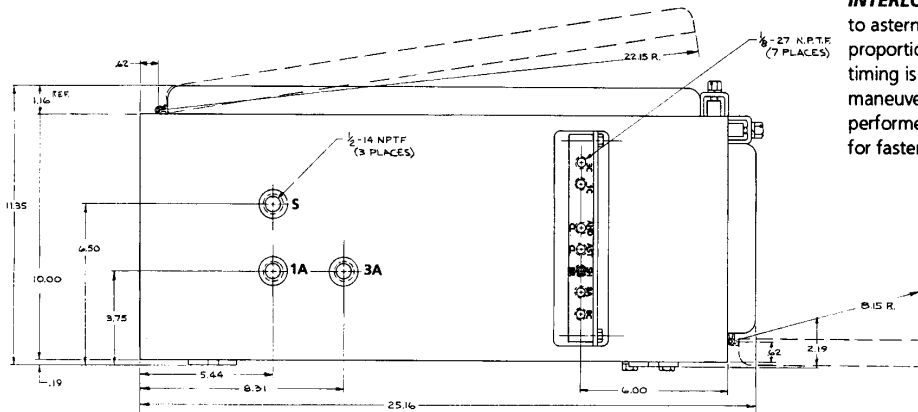
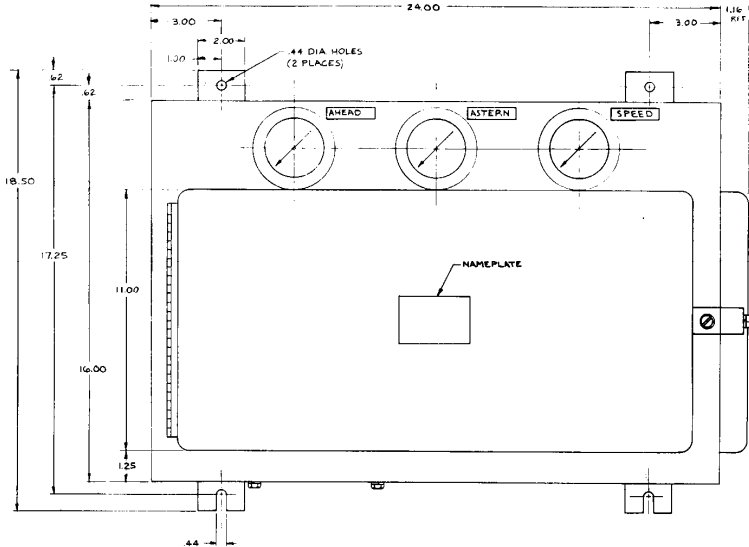
(optional)—activates shaft brake in synchronization with clutches. Brake releases when clutch engagement starts and applies when clutches release. With brake control the "timed reversing interlock" provides neutral hold time to permit the propeller to be stopped.

#### PROPORTIONAL TIMED REVERSING

**INTERLOCK** (optional)—provides an ahead to astern reversing time which is in proportion to vessel speed (adjustable). Since timing is proportional to speed, low speed maneuvers for docking and shifting are performed with minimum interlock timing for faster handling.

#### Port Numbers

- 1A – Ahead Clutch Out
- 1C – Ahead Signal In
- 3A – Astern Clutch Out
- 3C – Astern Signal In
- 8A – Speed Signal Out
- 8C – Speed Signal In
- AHD CL – Ahead Interlock
- AST CL – Astern Interlock
- SH BR – Shaft Brake Signal





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# HUMCO ENGINE CONTROLS

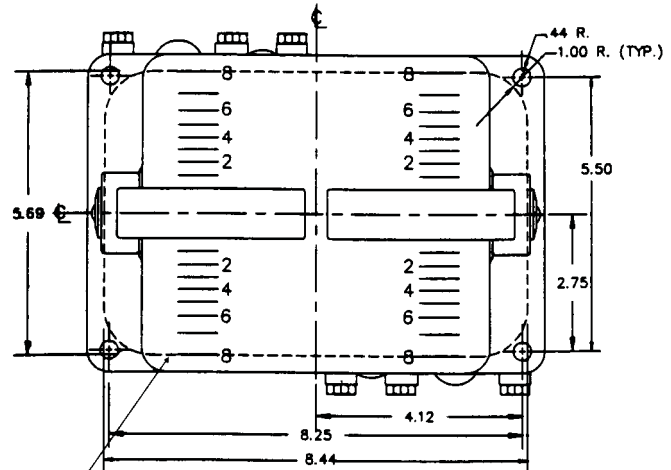
## Rexroth Controlair® Valves Model THD-2-FM

### Twin Engine Marine Control Valve



**T**HD-2-FM Valves provide single handle control for propulsion direction and engine speed for two engines. This top of the line model is ruggedly built from non-ferrous materials and has an attractive chrome plated brass cover with chrome handles. The completely enclosed cover and rugged construction make it ideal for exposed station installations.

Fore or aft movement of either control handle from neutral to the clutch position delivers supply pressure into the appropriate ahead or astern control line to engage the clutch. Further movement increases the pressure signal delivered to the engine governor. The neutral and clutch positions are detented for positive position indication. An adjustable friction brake holds the handles in any selected position.



NOTE:  
(1) PANEL MOUNTING CUTOUT – ONE PIPE BRACKET MUST BE REMOVED FOR INSTALLATION.  
(2) CUTOUT TEMPLATE PACKAGED WITH EACH VALVE.

#### FEATURES...

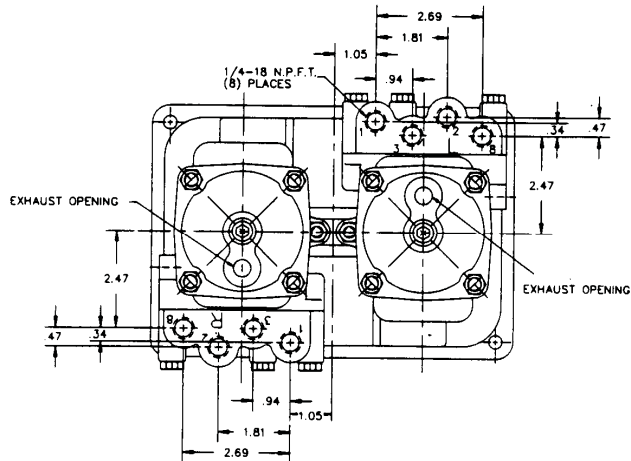
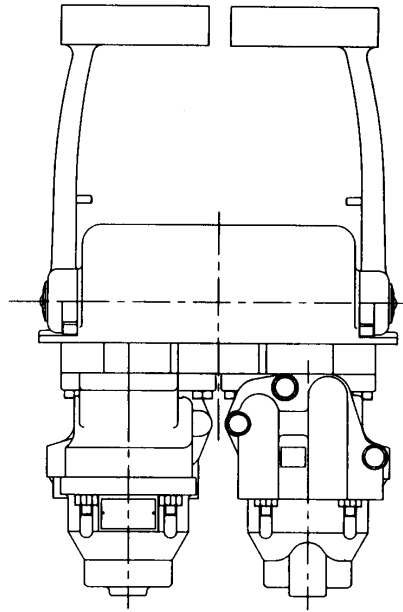
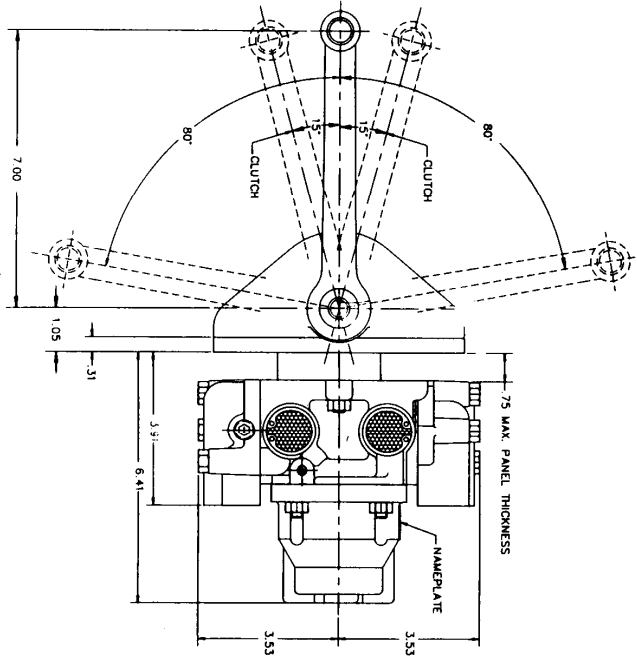
- Modern, Low Profile Design
- Rugged Construction
- Polished Chrome Plated Brass Cover and Handles
- Provides Direction and Speed Control of Two Engines in One Assembly
- Enclosed Upper Cover for Exposed Station Service
- Simplified Console Installation
- Accommodates up to 3/4" Console Thickness



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# HUMCO ENGINE CONTROLS

## Rexroth Controlair® Valves Model THD-2-FM



MAX. INLET AIR  
200 PSI (13.8 BAR)

TEMPERATURE  
-40°F TO 160°F  
(-40°C TO 71°C)

**PORT CONNECTIONS:**

- 2 = SUPPLY
  - 1 = CLUTCH
  - 3 = CLUTCH
  - 8 = SPEED
- WEIGHT: 25 LBS.  
(11.3 KG.)

THD-2-FM Order Information:		
Part No.	Old Part No.	Description
R431000720	P-027121-00101	THD-2-FM (10-65 PSI)
R431000721	P-027121-00109	THD-2-FM (30-70 PSI)

Maintenance kit (2 Required) R431006521  
(Old Part No. P-064894-0002)



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# HUMCO ENGINE CONTROLS

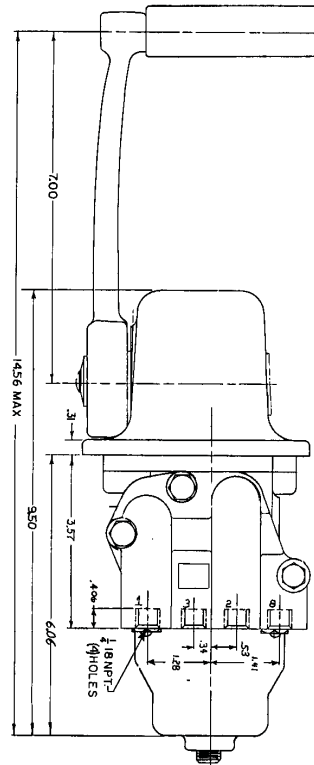
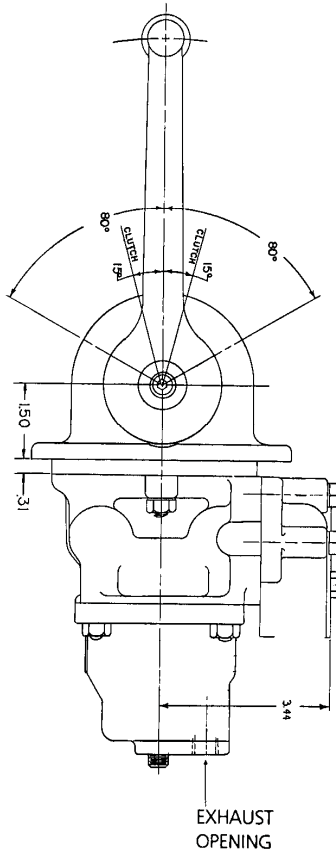
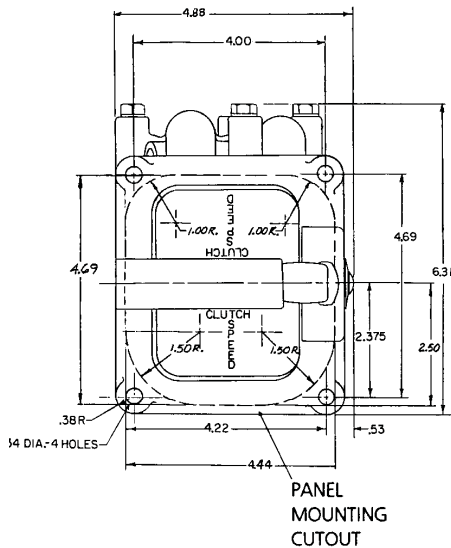
## Rexroth Controlair® Valves Model HD-2-FM



HD-2-FM Valves provide single handle control for propulsion direction and engine speed. This middle of the line model is ruggedly built from non-ferrous materials and has an attractive chrome plated bronze cover with a chrome handle. The completely enclosed cover and rugged construction make it ideal for exposed station installations.

Fore or aft movement of the control handle from neutral to the clutch position delivers supply pressure into the ahead or astern control line to engage the appropriate clutch. Further movement increases the pressure signal delivered to the engine governor. The neutral and clutch positions are detented for positive position indication. The HD-2-FM is designed with an L-shaped handle so that two units can be mounted side by side for operation with one hand. An adjustable friction brake holds the handle in any selected position.

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### HD-2-FM Order Information:

Designation	Part No.	Old Part No.	Setting
HD-2-FM	R431006281	P-063470-00101	10-65 PSI
HD-2-FM	R431006282	P-063470-00109	30-70 PSI
HD-2-FM	R431006283	P-063470-00111	10-70 PSI

Maintenance kit R431006521 (Old Part No. P-064894-00002)

MAX. INLET AIR  
200 PSI (13.8 BAR)

TEMPERATURE  
-40°F TO 160°F  
(-40°C TO 71°C)

PORT CONNECTIONS:  
2 = SUPPLY  
1 = CLUTCH  
3 = CLUTCH  
8 = SPEED  
WEIGHT: 12 LBS.  
(5.44 KG.)



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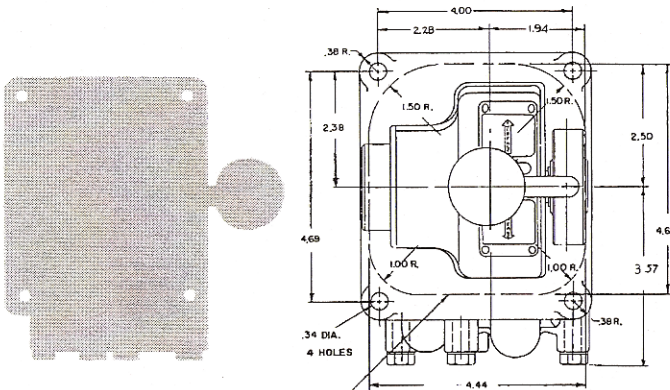
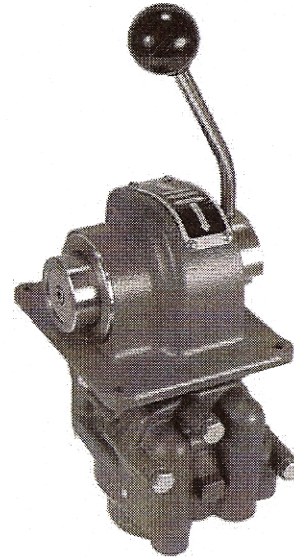
# HUMCO ENGINE CONTROLS

## Rexroth Controlair® Valves Model HD-2-FC

The HD-2-FC CONTROLAIR Valve is a handle operated pressure control and directional flow control valve. It contains two 3-way directional valves and a pressure regulating portion, which are arranged to furnish inlet air pressure to two directional clutch control lines and graduated pressure to one infinite positioning speed control line.

The selection between the two clutch control lines depends upon handle movement to either side of "Neutral" position. The pressure in the speed control line is proportional to the position of the handle in either quadrant.

The cover is die-cast aluminum with grey textured polyester paint, with stainless steel handle, hub and yoke. The angled handle, so designed that when mounted side by side they can be operated by one hand, is equipped with an adjustable friction brake that will hold the handle in any selected position.



PANEL MOUNTING CUTOUT

HD-2-FC Order Information:				
Designation	Part No.	Old Part No.	Setting	Style
HD-2-FC	R431006249	P-063420-00001	0-65 PSI	Right Hand
HD-2-FC	R431006251	P-063421-00001	0-65 PSI	Left Hand

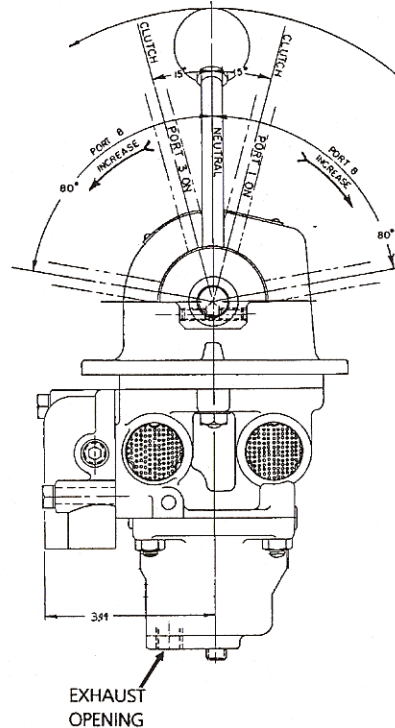
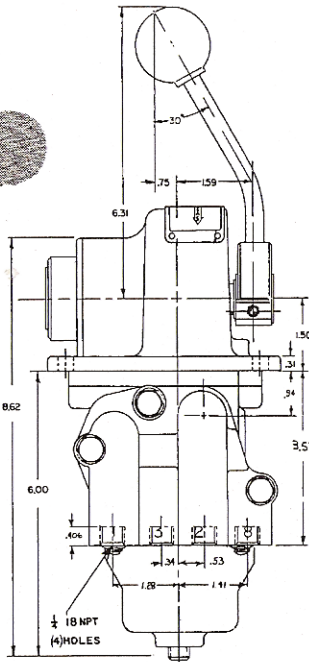
Maintenance kit R431006521 (Old Part No. P-064894-00002)

PORT CONNECTIONS:  
2 = SUPPLY  
1 = CLUTCH  
3 = CLUTCH  
8 = SPEED  
WEIGHT: 8.1 LBS.  
(3.7 KG.)

MAX. INLET AIR  
200 PSI (13.8 BAR)

TEMPERATURE  
-40°F TO 160°F  
(-40°C TO 71°C)

Shaded areas illustrate twin engine applications



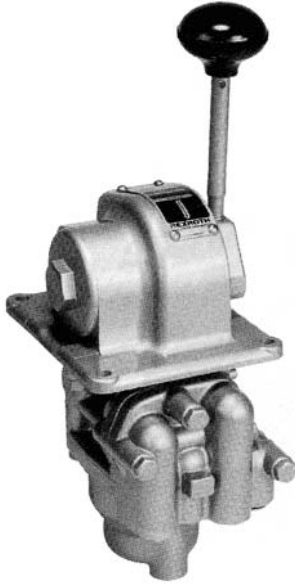




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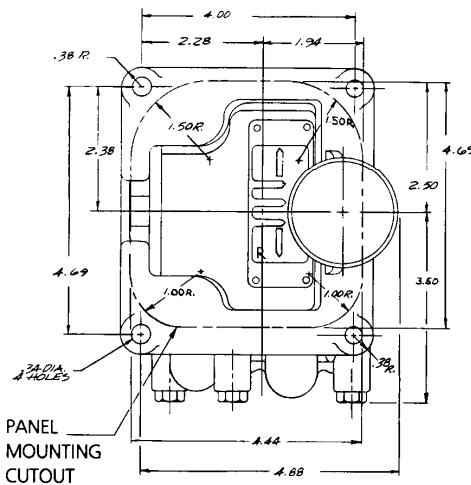
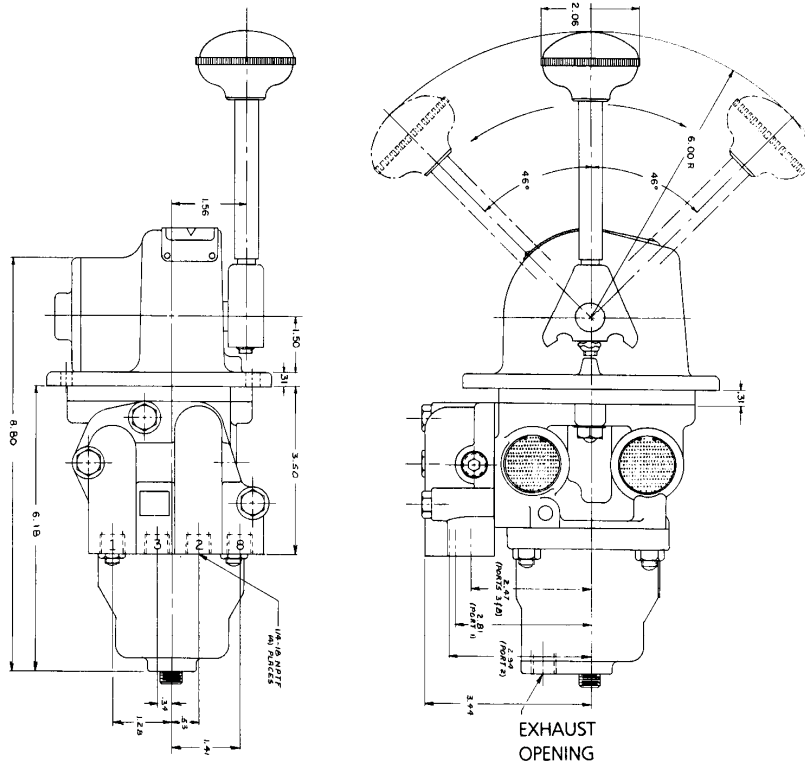
# HUMCO ENGINE CONTROLS

## Rexroth Controlair® Valves Model HD-2-FX



The HD-2-FX valve provides simple and efficient single handle control for propulsion direction and engine speed. It is frequently used as an engine room control, or on smaller craft as a bridge control.

Lightweight and rugged, non-ferrous construction, HD-2-FX valves are made of anodized die-cast aluminum for economy. The lever remains in the position where released. Holding friction is adjustable. Functional operation is the same as HD-2-FM and HD-2-FC CONTROLAIR Valves.



MAX. INLET AIR  
200 PSI (13.8 BAR)

TEMPERATURE  
-40°F TO 160°F  
(-40°C TO 71°C)

PORT CONNECTIONS:  
2 = SUPPLY  
1 = CLUTCH  
3 = CLUTCH  
8 = SPEED  
WEIGHT: 7 LBS.  
(3.17 KG.)

### HD-2-FX Order Information:

Part No.	Old Part No.	Pressure	Cover
R431002823	P-050970-00001	0-65 PSI	Plain
R431002824	P-050970-00002	0-100 PSI	Plain
R431002825	P-050970-00003	0-125 PSI	Plain
R431002826	P-050970-00004	0-150 PSI	Plain
R431001204	P-066514-00001	0-65 PSI	Chrome*
R431001749	P-064924-00017	30-70 PSI	Plain

\*Chrome cover and handle yoke.

Maintenance kit R431006521

(Old Part No. P-064894-00002)



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# HUMCO ENGINE CONTROLS

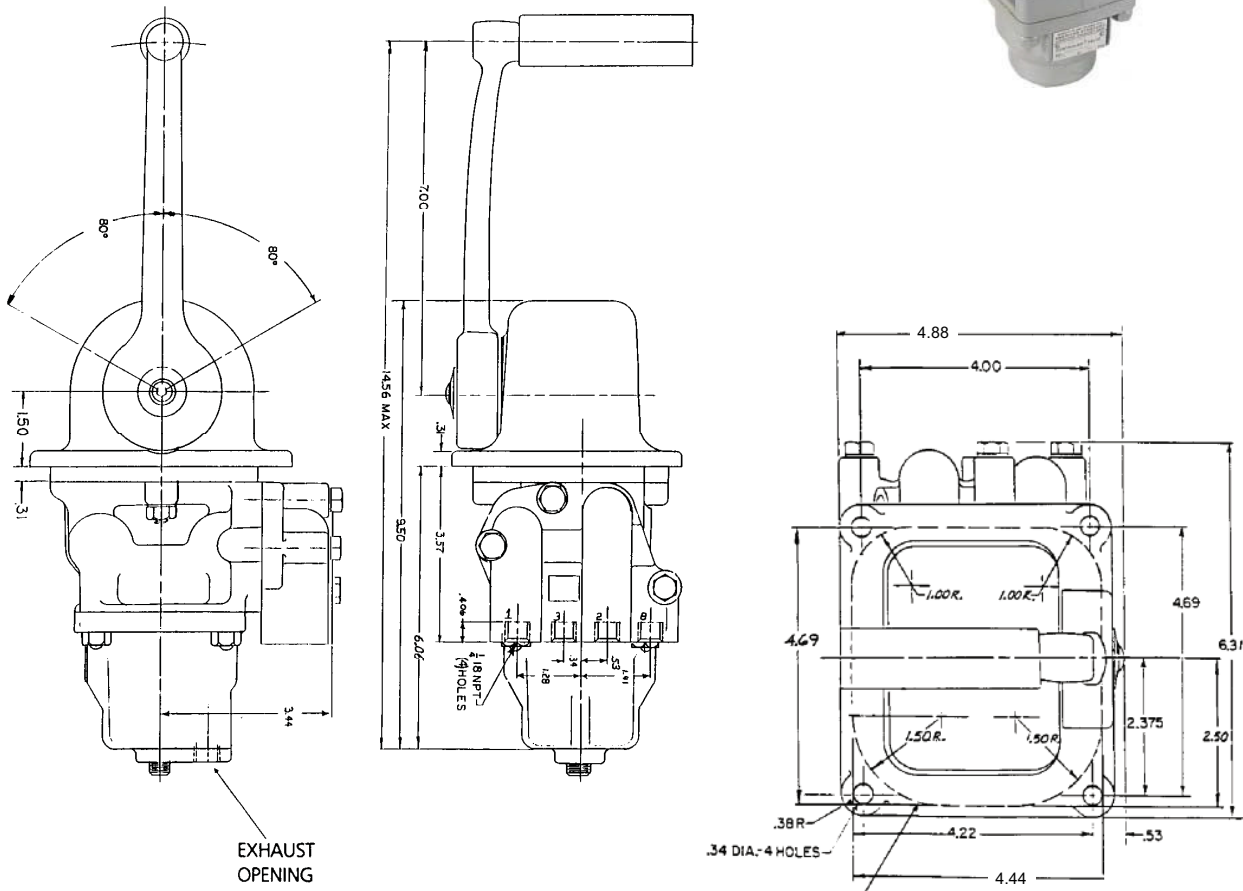
## Rexroth Controlair® Valves Model HC-2-FM

The HC-2-FM valve is designed for open deck marine service and is the same as the HC-2-FX CONTROLAIR valve, except it features longer handle travel, more accurate positioning and a polished chrome plated bronze cover and handle.

The 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 inlet air to the directional valves. Each directional valve has its own outlet port.

Initial lever movement from "mid" position selects the outlet port to be activated. Further lever movement in the same direction controls the outlet pressure at that point. The opposite port remains connected to atmosphere. Lever remains in the position where released. Handle holding friction is adjustable.

Use these valves to control two clutches, a clutch and a brake, two single acting cylinders or a double acting cylinder...wherever you want to selectively control pressure in either of two separate air lines with one lever.



<b>HC-2-FM Order Information:</b>				
Part No.	Old Part No.	Pressure	Style	Handle Travel
R431000809	P-027592-0101	0-65 PSI	Chrome	80°

MAX. INLET AIR  
200 PSI (13.8 BAR)

TEMPERATURE  
-40°F TO 160°F  
(-40°C TO 71°C)

PORT CONNECTIONS:  
2 = SUPPLY  
1 = CONTROL OUT  
3 = CONTROL OUT  
8 = PLUGGED  
WEIGHT: 12 LBS.  
(5.44 KG.)

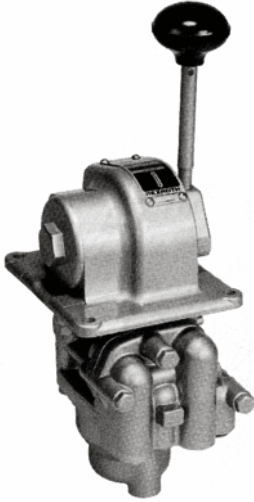
Maintenance kit R431006521 (Old Part No. P-064894-00002)



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# HUMCO ENGINE CONTROLS

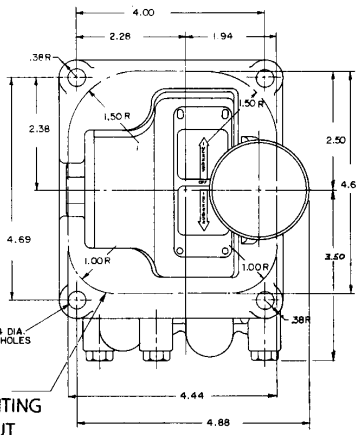
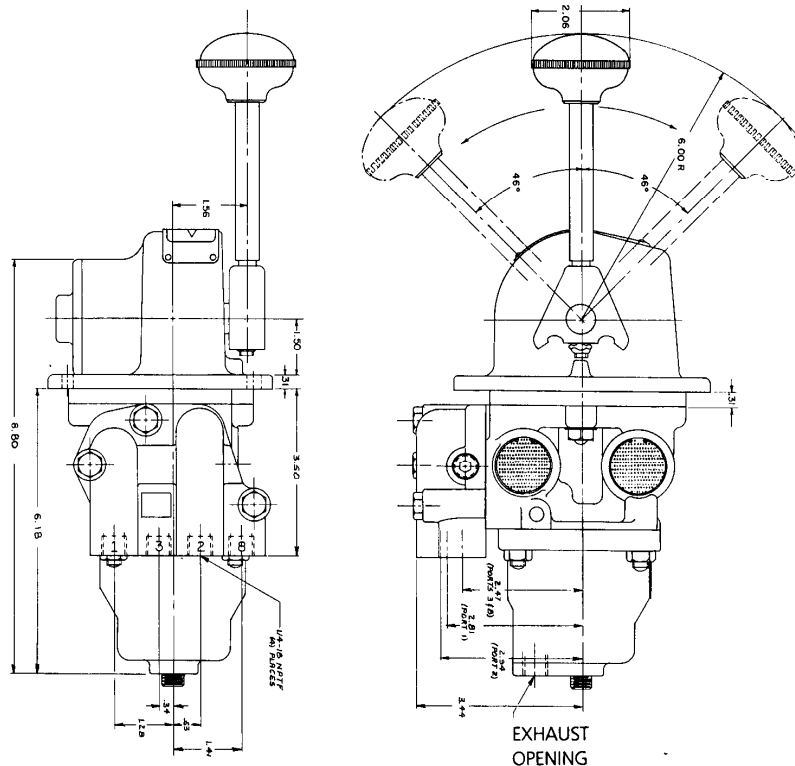
## Rexroth Controlair® Valves Model H-2-FX



The H-2-FX valve is a lever operated, pressure regulation, 4-way directional valve made of anodized die-cast aluminum. It consists of two 3-way directional valves and a 3-way pressure regulating portion. The regulating portion furnishes inlet air to the directional valves. Each directional valve has its own out port.

Initial lever movement from "mid" position selects the out port to be activated. Further lever movement in the same direction controls the outlet pressure at that port. The opposite port remains connected to atmosphere. Lever remains in the position where released. Handle holding friction is adjustable.

Use these valves to control two clutches, a clutch and a brake, two single acting cylinders or a double acting cylinder...wherever you want to selectively control pressure in either of two separate air lines with one lever.



PORT CONNECTIONS:  
2 = SUPPLY  
1 = CONTROL OUT  
3 = CONTROL OUT  
8 = PLUGGED  
WEIGHT: 12 LBS.  
(5.44 KG.)

MAX. INLET AIR  
200 PSI (13.8 BAR)

TEMPERATURE  
-40°F TO 160°F  
(-40°C TO 71°C)

### HC-2-FX Order Information:

Part No.	Old Part No.	Pressure
R431002839	P -050976-00001	0-65 PSI
R431002840	P -050976-00002	0-100 PSI
R431002841	P -050976-00003	0-125 PSI
R431002842	P -050976-00004	0-150 PSI
R431002843	P -050976-00008	0-30 PSI

Maintenance kit R43100652

(Old Part No. P -064894-00002)



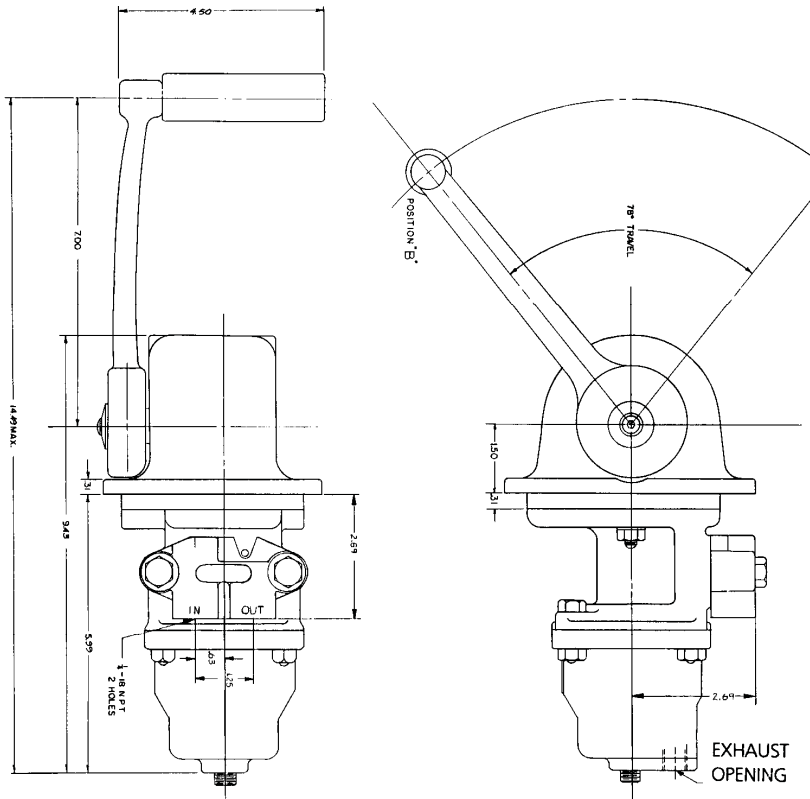
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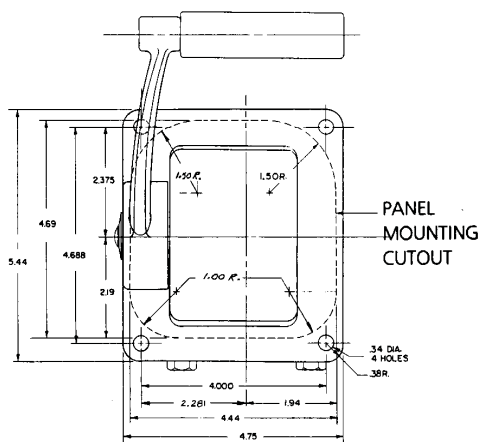
## Rexroth Controlair® Valves Model H-2-FM

The H-2-FM valve is designed for open deck marine service and features handle travel of 78°, plus accurate pressure control and a polished chrome plated bronze cover, handle and grip.

This valve controls engine governor operation permitting the engine to be run at advanced speed for warm-up and check-out without engaging the clutch. After engine warm-up, control is transferred to the bridge.



MAX. INLET AIR PORT CONNECTIONS:  
200 PSI (13.8 BAR) 2 = SUPPLY  
1 = CONTROL OUT  
TEMPERATURE 3 = CONTROL OUT  
-40°F TO 106°F 8 = PLUGGED  
(-40°C TO 71°C) WEIGHT: 12 LBS.  
(5.44 kg.)



### H-2-FM Order Information:

Designation	Part No.	Old Part No.	Delivery Pressure		
			Position A	Position B	Style
H-2-FM	R431006728	P-065914-00111	65 PSI	10 PSI	Right Hand
H-2-FM	R431006729	P-065914-00122	150 PSI	10 PSI	Right Hand
H-2-FM	R431006721	P-065852-00111	10 PSI	65 PSI	Left Hand
H-2-FM	R431006628	P-065468-00118	30 PSI	70 PSI	Left Hand
H-2-FM	R431006627	P-065467-00118	70 PSI	30 PSI	Right Hand

Maintenance kit R431004887 (Old Part No. P-059028-00000)





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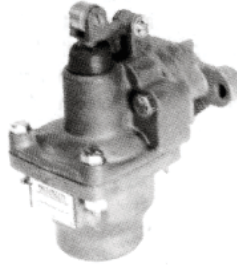
# HUMCO ENGINE CONTROLS

## Rexroth Controlair® Valves Model H-3 and H-3-G

### H-3

The H-3 CONTROLAIR Valve is equipped with a roller for operation by a cam or a similar mechanical device. Graduated pressure which is directly proportional to the amount of downward movement of the roller lever is delivered from the OUT port. Total movement is approximately 5/16" (7.9 mm) with the initial 1/16" (1.6 mm) travel used to close the exhaust valve.

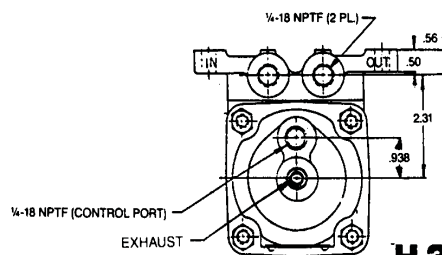
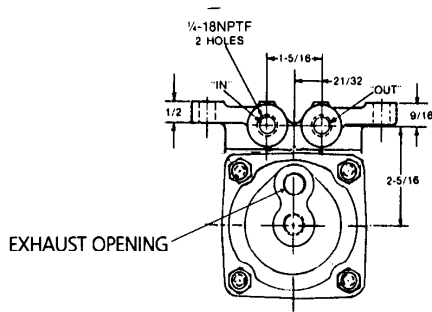
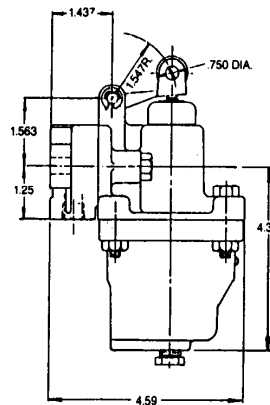
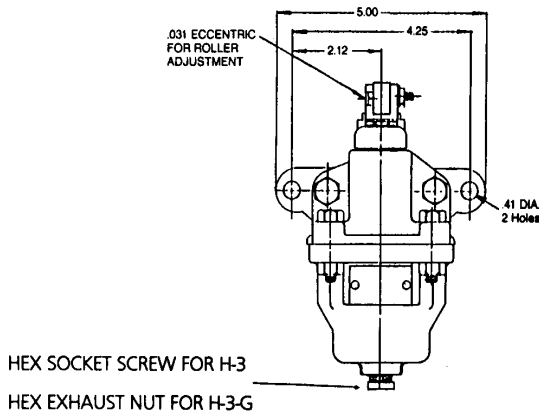
Approximate weight 4.5 lbs. (2.04 Kg)



### H-3-G

This design is similar to the H-3 CONTROLAIR except the spring housing area is sealed and a biasing control pressure can be introduced through the tapped lower housing 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 proportion. This bias signal must be lower than the output signal.

Approximate weight 5 lbs. (2.27 Kg)



### H-3 Order Information:

Part No.	Old Part No.	Pressure
R431002626	P-050382-00001	0-65 PSI
R431002627	P-050382-00002	0-100 PSI
R431002628	P-050382-00003	0-125 PSI
R431002629	P-050382-00004	0-150 PSI
R431002630	P-050382-00006	0-15 PSI
R431002631	P-050382-00008	0-25 PSI
R431002632	P-050382-00009	0-75 PSI

Maintenance kit R431004887 (Old Part No. P-059028-00000)

Maintenance kit (Roller ass'y.) R431006648

(Old Part No. P-065636-00000)

MAX. INLET AIR  
200 PSI (13.8 BAR)

TEMPERATURE  
-40°F TO 160°F  
(-40°C TO 71°C)

### H-3-G Order Information:

Part No.	Old Part No.	Pressure	Ports
R431009131	P-052550-00008	0-30 PSI	1/4-18
R431002981	P-052550-00001	0-65 PSI	1/4-18

Maintenance kit R431003896 (Old Part No. P-055687-00002)

Maintenance kit R431006648 (Old Part No. P-065636-00000)

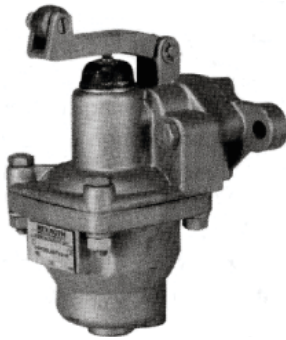
(Roller ass'y)



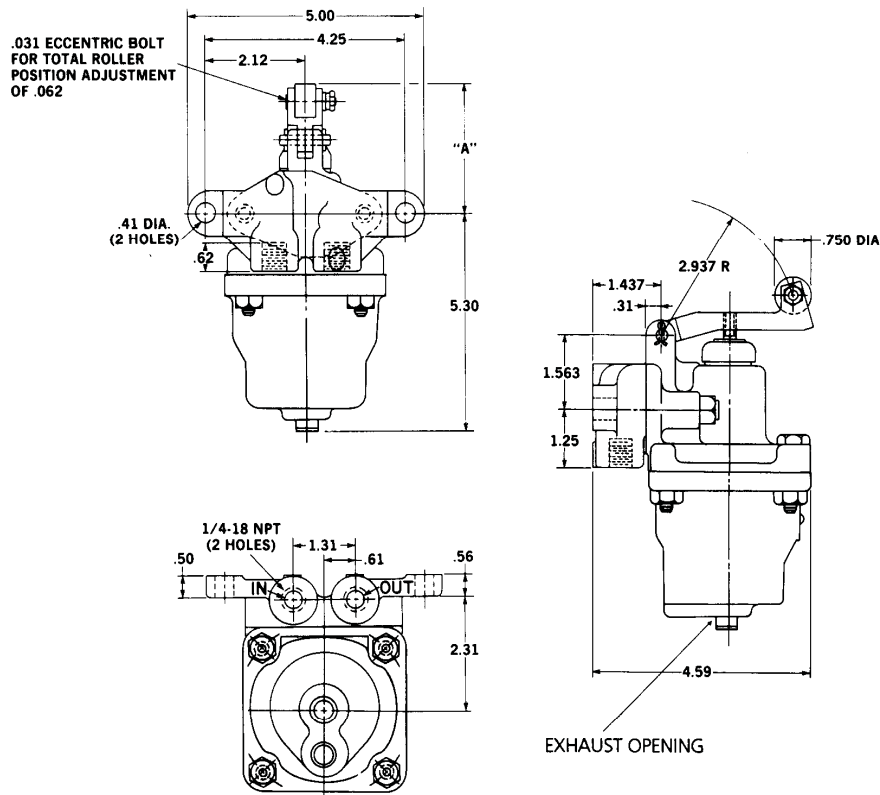
1074 Kenran Industrial Dr.  
St. Louis, MO 63137  
Phone: 1-800-381-9968

# HUMCO ENGINE CONTROLS

## Rexroth Controlair® Valves Model SH-3



The SH-3 CONTROLAIR Valve is a pressure graduating valve similar to the H-3 CONTROLAIR Valve, but with a larger, more sensitive diaphragm for minimum hysteresis and maximum sensitivity of pressure graduation for optimum control of positioning devices such as Servo Positioners and applications where very precise control is required. (Hysteresis =  $\pm \frac{3}{4}$  psi.) Weight: 4 lbs. (1.81 Kg)



6

SH-3 Order Information:			"A" FACTORY SETTING*		
Part No.	Old Part No.	Pressure	2.718	2.531	2.114
R431006528	P-064920-00001	10-60 PSI			+5
			FULL EXH	10 PSI	60 PSI
					-0
R431006529	P-064920-00005	3-15 PSI			+2
			FULL EXH	3 PSI	15 PSI
					-1/2

MAX. INLET AIR  
200 PSI (13.8 BAR)

WEIGHT: 4 LBS.  
(1.81 KG.)

TEMPERATURE  
-40°F TO 160°F  
(-40°C TO 71°C)

\*Travel further than this can damage valve mechanism.

Maintenance kit P-065018-00000



1074 Kenran Industrial Dr.  
St. Louis, MO 63137  
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# HUMCO ENGINE CONTROLS

## Rexroth Controlair® Valves Models H-4 and H-4-G

### H-4

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: 5.5 lbs. (2.5 Kg)

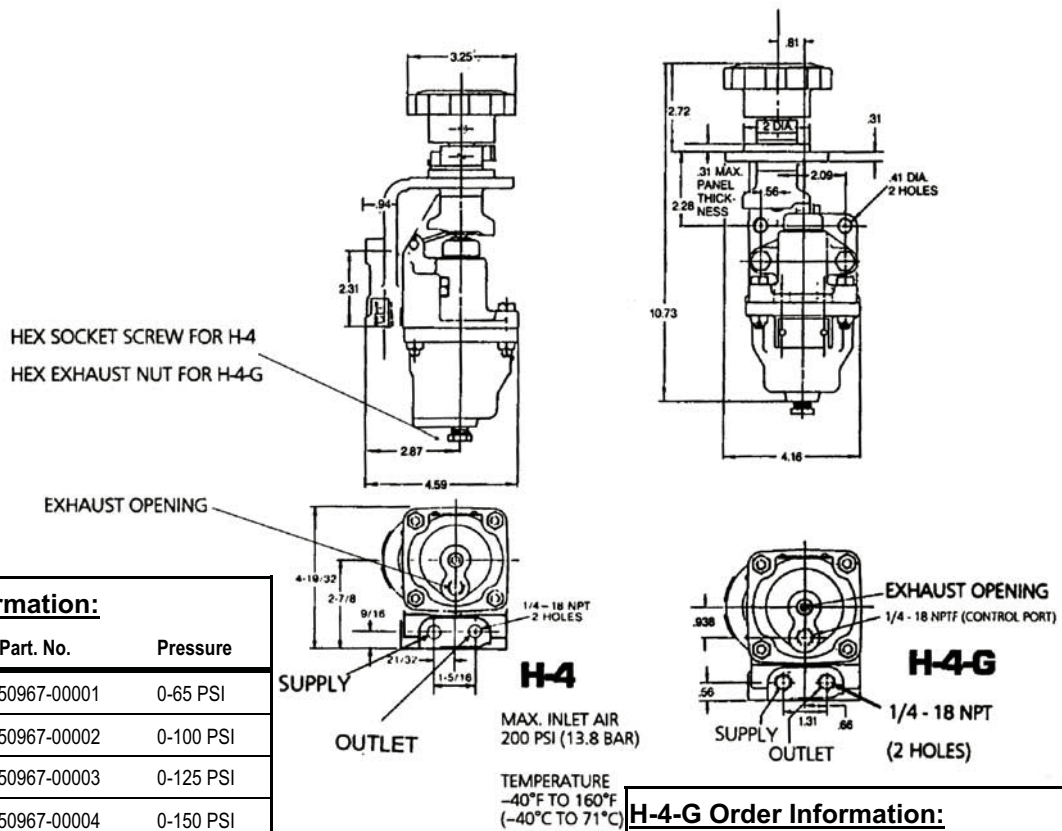


### H-4-G

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 lower housing port.

The delivery pressure is then regulated by the applied control signal and can be biased by operation of the control knob to adjust the output pressure approximately 10 psi (0.7 bar).

Approximate weight: 6 lbs. (2.72 Kg)



H-4 Order Information:		
Part No.	Old Part No.	Pressure
R431002818	P -050967-00001	0-65 PSI
R431002819	P -050967-00002	0-100 PSI
R431002820	P -050967-00003	0-125 PSI
R431002821	P -050967-00004	0-150 PSI
R431002822	P -050967-00008	0-30 PSI
R431002885	P -051173-00001(1)	0-65 PSI
R431002886	P -051173-00002(1)	0-100 PSI

(1) Counterclockwise rotation increases pressure.

Maintenance kit R431004887(Old Part No. P -059028-00000)

Maintenance kit R431006421 (Roller ass'y.) (Old Part No. P -064421-00007)

H-4-G Order Information:			
Part No.	Old Part No.	Bias Range Pressure	Ports
R431002962	P -052035-00001	10 PSI	1/4 - 18
R431002963	P -052035-00002	10 PSI	9/16 - 18

Maintenance kit R431003896

(Old Part No. P -055687-00002)