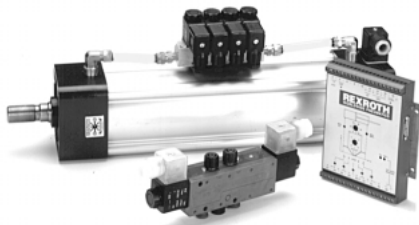


Electro-Pneumatic Pressure Control

Accu-Air™, E-P Positioner, Flowmeter

(Pages from SC-600 Catalog)

The Drive & Control Company



Electro-Pneumatic Pressure Control Valves

Accu-Air™ EP-1



Accu-Air™ EP-1 [NPT Ports]

Type	EP-1 Electro/Pneumatic Converter
Supply Pressure	105 psi max. standard [150 psi max. optional]
Outlet Pressure	various
Temperature Range	0 to 160° F
Media	Air or inert gas, filtered 5 micron
Port Size	1/4" NPT
Material	Aluminum
Mounting	DIN rail [spec. EN50022]

► Applications

Provides electrically controlled graduated (analog) pneumatic outputs for indoor or outdoor applications, such as:

- Positioning (controlling valve actuators or progressive spring rate cylinders - For process industries, etc.)
- Graduated pressure applications (spot welding)
- Tensioning
- Throttling
- Load Balancing
- Braking
- Clutch Control (including "soft" engagement, slipping, and full-pressure lock-up)
- Pilot pressure for volume booster
- or any pneumatic pressure cycle that requires interfacing to electronic equipment (adhesive dispensing, hot stamping, automation or controlling vacuum applications).



► Factory calibrated Base part number P -028339-xx xxx

First two x's	Last three x's	Accessories
Output Pressure [01] 0-65 psi	Signal Inputs [020] 0-20 mA	P -026054-00000 6" DIN Rail P -028927-00006 6 ft. Micro-Change Cable+connector
[02] 0-100 psi	[420] 4-20 mA	
[05] 0-15 psi	[010] 0-10 vdc	
[09] 0-75 psi	[105] 1-5 vdc	
[11] 10-60 psi	[110] 1-10 vdc	
[29] 3-15 psi	Other combinations of output pressure ranges and signal inputs are available.	

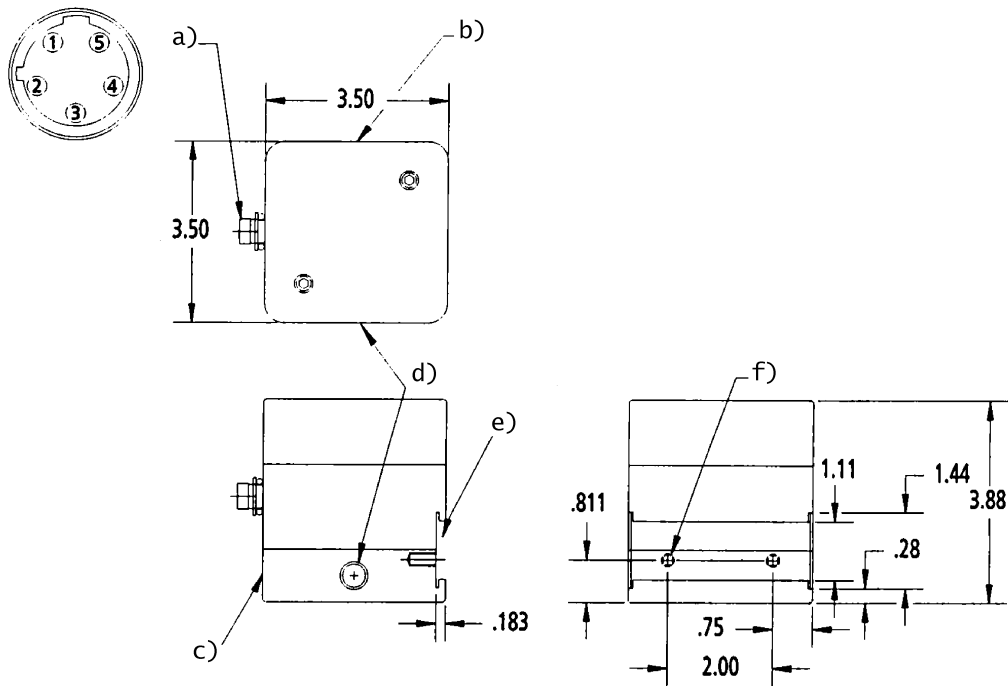
For optional feedback, use base part number P -029360- followed by the appropriate suffix as listed above.

For 150 psi max. version, use base part number P -029250-xx xxx.

Electro-Pneumatic Pressure Control Valves

Accu-Air™ EP-1

Rexroth
Bosch Group



Dimensions in inches.

Note: 5 micron filter required for proper operation.

a) Micro Change 5 pin male receptacle.

b) Supply port 1/4" NPT.

c) Delivery port 1/4" NPT.

d) Exhaust port 1/4" NPT.

e) DIN rail mount.

f) 1/4"-20 NPT holes, 0.50" depth.

Operating Characteristics

Pin number	Description	Connection
1	Red-White	[+] signal input
2	Red	[+] 24 vdc supply
3	Green	[-] signal input
4	Red-Yellow	Feedback (optional)
5	Red-Black	[-] 0 vdc supply

Electro-Pneumatic Pressure Control Valves

Accu-Air™ EP-300 Relay

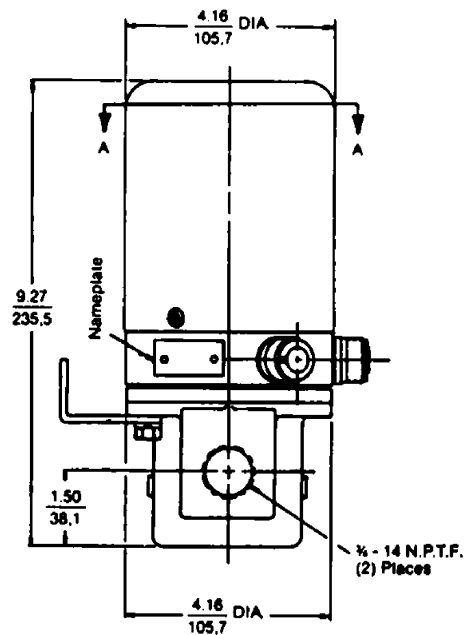
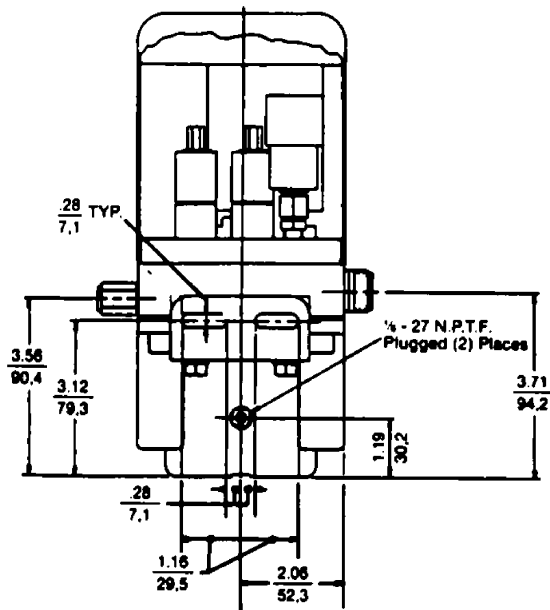
Rexroth
Bosch Group

Accu-Air™ EP-300 Relay [NPT Ports]

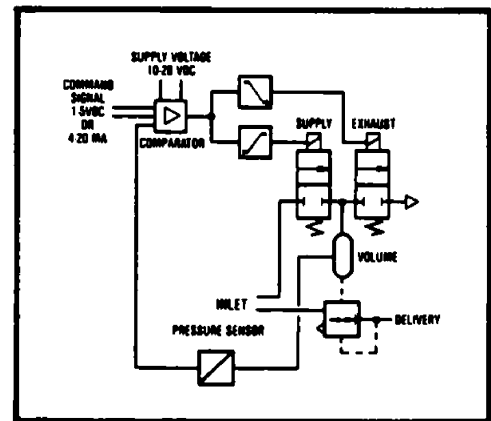
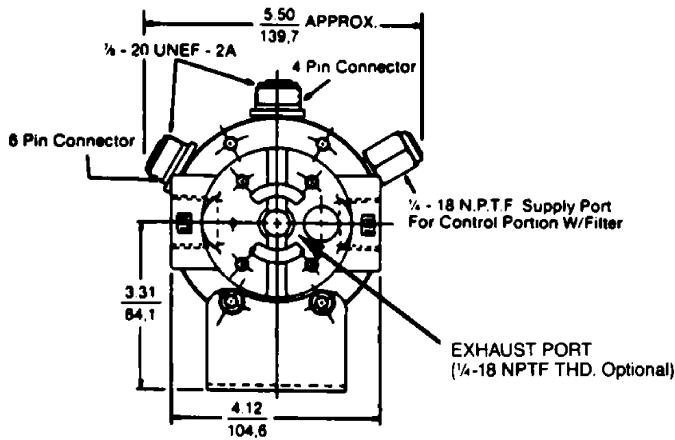
Type	EP-300 Electro/Pneumatic Relay Converter Valves
Supply Pressure	100 psi or 250 psi max.
Flow	300 SCFM max.
Temperature Range	-20°F to 160°F (-29°C to 71°C)
Media	Air or inert gas, filtered 5 micron
Port Size	1/4" NPT supply; 3/4" NPT delivery [1" available]
Supply voltage	10-28 vdc

Applications

Provides electrically controlled graduated (analog) pneumatic outputs for indoor or outdoor applications, such as: Positioning (controlling valve actuators or progressive spring-rate cylinders), Tensioning, Braking, Load Balancing, or Clutch Control (including 'soft' engagement, slipping and full-pressure lockup).
No air consumption at stable state; stable failure mode retains last setting if power is lost.



INCHES
Millimeters



CIRCUIT DIAGRAM

Electro-Pneumatic Pressure Control Valves

Accu-Air™ EP-300 Relay

Rexroth
Bosch Group

➔ **Factory calibrated Base part number [EP-300] P -06x45x-000xx**

[first x] Signal input	[second x] Supply pressure in psi	[last two x's] Output pressure in psi
[7] 1-5 vdc [8] 4-20 mA	[7] 100 max. [8] 250 max.	[01] 0-65 [02] 0-100 [03] 0-125 [04] 0-150 [11] 10-60 [13] 0-200 [14] 0-250

Other combinations of output pressure ranges and signal inputs are available.

Connectors

Part number	Description
P -048345-00000	6 pin male connector, for command signal*
P -048345-00001	4 pin female connector, for power supply*

*Order one of each cable for each EP-300.

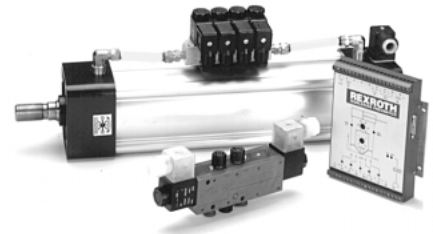
Electro-Pneumatic Positioner

E-P Positioner Assembly

Rexroth
Bosch Group

Electro-Pneumatic Positioner Specifications

Stroke	Any length in 1" increments, to 10" 2" increments between 10" and 16" strokes
Accuracy	+/- .050" or 1 percent full stroke, whichever is greater
Repeatability	+/- .050"
Stroking Speed	Approx.: Fast 2"/sec., slow .5"/sec.
Operating Temp.	41°F to 122°F
Power Requirements	24vdc, 600 ma
Signal Options	0-10vdc, 0-20ma, 5k ohm pot.
Feedback Device	Linear potentiometer, internally mounted
Supply Pressure	100 psi nominal, 125 psi max. at 5 micron filtration recommended
Optional Meter Drive	0-20 ma



Application

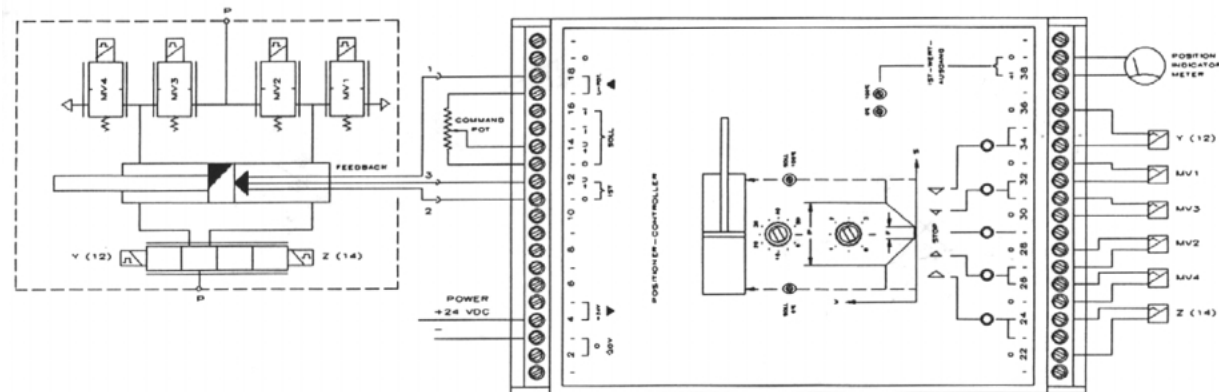
Wherever infinite positioning requirements allow electrical analog control signals. Interfaces with computer, PLC or simple potentiometer. Consists of cylinder with integral sensor, optimized valving, and an electronic controller. Available in bore sizes 1-1/2 thru 4" and strokes up to 16"; single or dual stroking speed control available.

Load Capacities per Bore Size

Bore size (inches)	1.5	2	2.5	3.25	4
Load rating (lbs)	35	63	98	166	250

At 100 psi supply pressure, 1 percent positioning accuracy.

FIGURE 1.



The basic concept involves a cylinder with integral feedback potentiometer in conjunction with a controller and matched solenoid valves. Figure 1 represents the system layout. The figure represents a 2 speed system utilizing (4) 2-way solenoid valves (energized in pairs) for slow speed and a double solenoid, 4-way, closed center for fast speed. The two speed feature offers the fastest response without sacrificing accuracy. The single speed positioners are applied in areas that require accuracy and only slow speed, or fast speeds that do not require 1% accuracy. For single speed applications, only one set of valves is necessary. For the slow retract, (mv1) and (mv3) solenoid valves are energized simultaneously. Valves (mv2) and (mv4) are energized for the slow extend command. The double solenoid valve is energized for either the fast retract or for fast extend. The controller constantly monitors the command signal and compares the feedback signal the position sensor located in the cylinder. If the command signal is greater than the feedback, the controller will energize the solenoid valves associated with extension. The retract solenoid valves are energized when the command signal is less than the feedback signal. If the command equals the feedback signal, all of the solenoid valves are De-energized and position is maintained. The two speed controller consists of a narrow window and a wide window comparator. A large difference between the command and feedback results in energization of both sets of solenoid valves. When the position approaches the set-point command, only the slow speed valves are energized. A unique feature is that each set of solenoids is pulsed before complete shut-off to provide a stepped, gradual deceleration of the load. The width of sensitivity and the width of deceleration is adjustable on the controller to allow tailoring of the positioner for each application.

E-P Positioner Selection

HOW TO SELECT:

1. Determine the amount of force required for the application.
2. Determine the available supply pressure.
3. Note length of stroke required.
4. Check and note accuracy and speed requirements.
5. Determine if meter drive output is desired.
6. Contact sales representative or factory for component selection.

Flowmeter

Electronic volume measurement

Rexroth
Bosch Group

Technical Data

Operating Pressure max. 145 psi (10 bar)
 Flow Range See table.
 Accuracy $< \pm 2\%$ FS (1:10 of Flow Range)
 Response Time < 15 ms
 Temperature Range $+41$ to $+122$ °F ($+5$ to $+50$ °C)
 Medium Condensate and Oil Free Compressed Air, filtered 50 μ m

Supply Voltage 24 VDC $\pm 10\%$
 Current Consumption max. 300 mA
 Protection IP54-IEC 529 (DIN VDE 0470)
 Installation Position Optional / Free

Output (Selectable) Frequency 200-1200 Hz
 Analog Voltage 0-10 VDC
 Analog Current 4-20 mA

Output Signal Flow DIN 1343 or ISO 6358
 Characteristic Specification Selectable



Application Area

The VolumeMeter uses the orifice gauge principle and differential pressure sensors to accurately measure volume flow rate. The output electrical signal is proportional to this flow rate measurement. This robust principle offers special features such as an inherent immunity to overpressure and a high common mode pressure ratio.

An integrated Zero Point adjustment assures accurate readings of the internal pressure sensors, improves long-term stability of the unit and prevents problems associated with temperature drifts. State of the art electronics compensate for the non-linearity effects of the orifice.

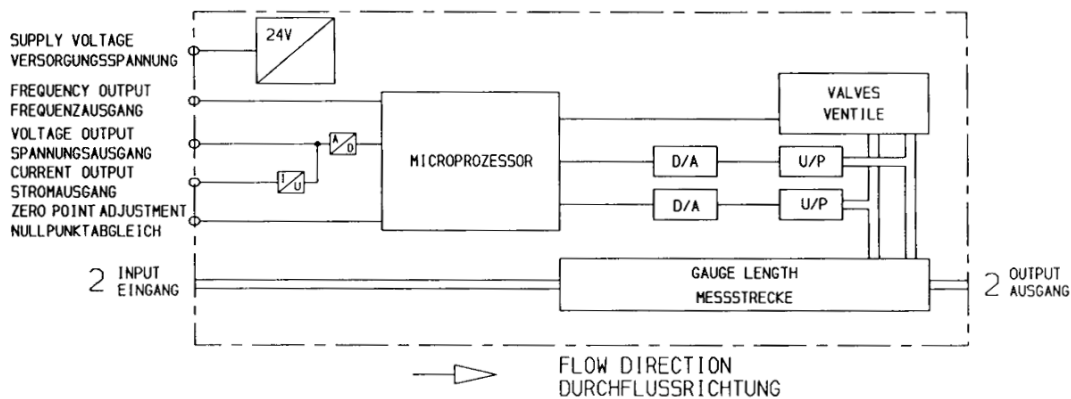
Code No.	Code No.
Flow Range	
0 - .25 Cv (0 - 250 NI/min)	553-001-100-0
0 - .50 Cv (0 - 500 NI/min)	553-001-110-0
0 - 1.0 Cv (0 - 1000 NI/min)	553-001-120-0

Accessories (to be ordered separately)

Type	Code No.
Operating Manual	885-890-355-3

Functional Schematic

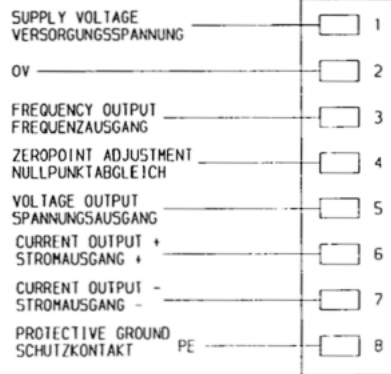
Block Diagram / Funktionsschema



Output Characteristic

Connection / Anschluß

PLUG
STECKER

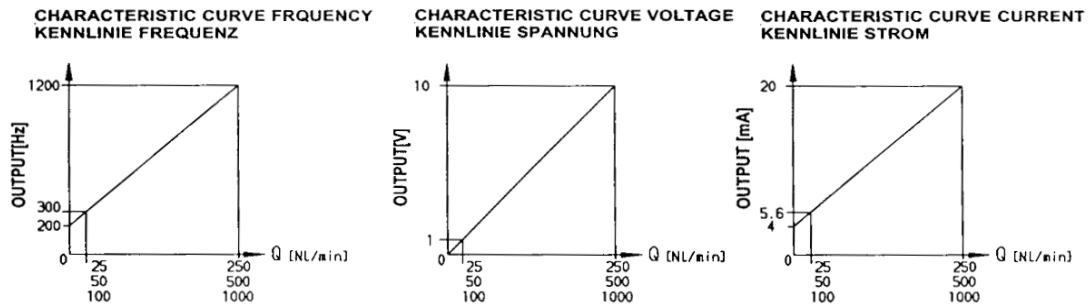


SHIELD IS CONNECTED TO PLUG BODY
SCHIRM LIEGT AUF STECKERGEHÄUSE

Electrical Connection

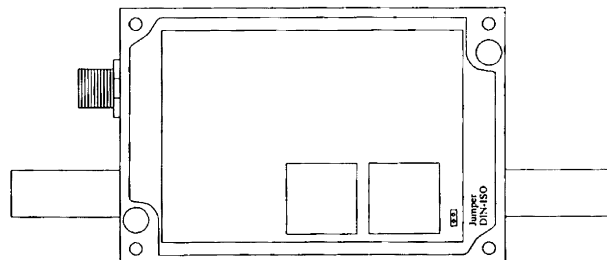
Output Characteristics Curves / Kennlinien

for / für 553 001 100 0, 553 001 110 0, 553 001 120 0



Switching of flow characteristic Umschaltung der Kalibrierung

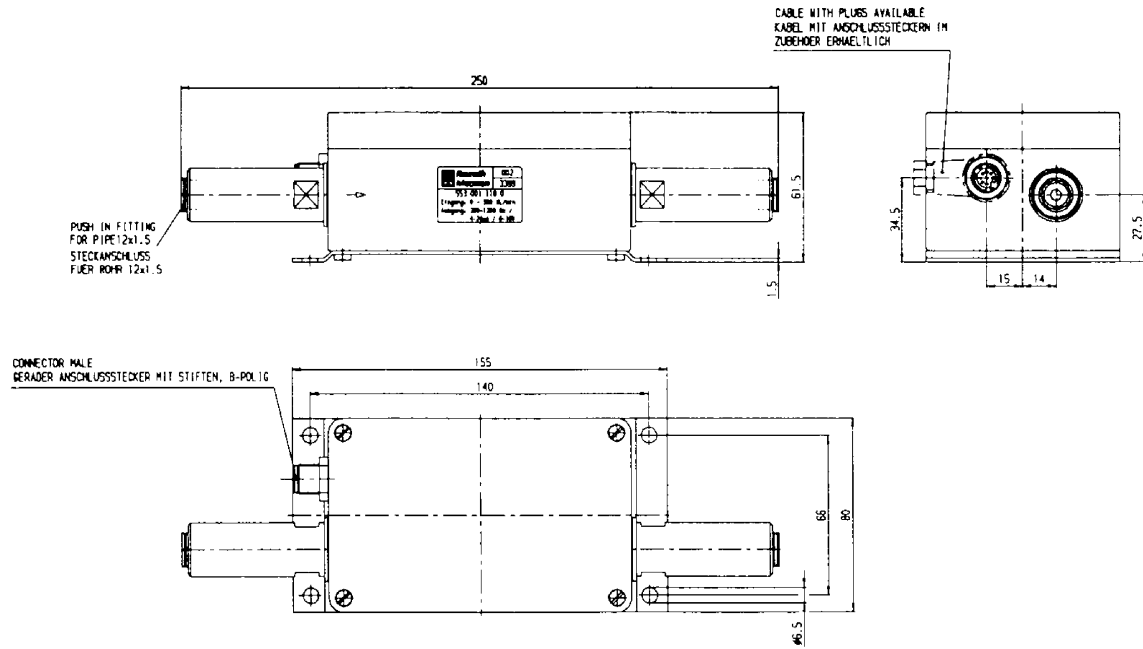
Jumper ON / aufgesteckt calibration to DIN 1343 / Kalibrierung nach DIN 1343
 Jumper OFF / nicht aufgesteckt calibration to ISO 6358 / Kalibrierung nach ISO 6358



Flowmeter

Electronic volume measurement

Dimensions



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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