



# Operating & Maintenance Manual

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# 25-40 HP Electric Rotary Screw Compressors

## Owners Manual



**Introduction.** Congratulations on the purchase of your new air compressor. The air compressor is precision built from the finest materials using the finest state of the art design, and high tech engineering available today. Quality, performance and trouble free operation will assure you a dependable supply of air power on demand

Check [www.compressed-air-systems.com](http://www.compressed-air-systems.com) for most up to date manual and compressor service and technical information

**CAUTION** READ THIS MANUAL CAREFULLY before operating or servicing this air compressor, to familiarize yourself with the proper safety, operation, and standard operating procedures of this unit. **FAILURE TO COMPLY WITH INSTRUCTIONS IN THIS MANUAL COULD RESULT IN THE VOIDING OF YOUR WARRANTY, AND PERSONAL INJURY, AND/OR PROPERTY DAMAGE. THE MANUFACTURER OF THIS AIR COMPRESSOR WILL NOT BE LIABLE FOR ANY DAMAGE BECAUSE OF FAILURE TO FOLLOW THE INSTRUCTIONS IN THIS MANUAL.** By following the instructions and recommendations in this manual you will ensure a longer and safer service life of your air compressor.

If you have questions or need clarification about this manual or your compressor call 800-531-9656

***Do not operate compressor outdoors in wet weather***

**Compressed Air Systems**  
Simplicity. It's What We Do.

Compressed Air Systems, LLC 2626 Skyway Drive Grand Prairie, TX, 75052 1-800-531-9656 Fax 972-352-6364

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## **SAFETY PRECAUTIONS AND WARNINGS**

Listed are some, but not all safety precautions that must be observed with compressors and compressed air systems. Failure to follow any of these warnings may result in severe personal injury, death, property damage and/or compressor damage.

**Air from this compressor will cause severe injury or death if used for breathing or food processing. Air used for these processes must meet OSHA 29 CFR 1910 or FDA 21 178.3570 regulations.**

**This compressor is designed for use in the compression of normal atmospheric air only. No other gases, vapors or fumes should be exposed to the compressor intake, nor processed through the compressor.**

**Disconnect all power supplies to the compressor plus any remote controllers prior to servicing the unit.**

**Relieve all pressure internal to the compressor prior to servicing.**

**Do not depend on check valves to hold system pressure.**

**A properly sized safety valve must be installed in the discharge piping ahead (upstream) of any shut-off valve (block valve), heat exchanger, orifice or any potential blockage point. Failure to install a safety relief valve could result in rupturing or explosion of some compressor or safety component.**

**Do not change the pressure setting of the safety relief valve, restrict the function of the safety relief valve, or replace the safety valve with a plug.**

**Over pressurization of some system or compressor component can occur, resulting in severe personal injury, death and property damage.**

**Never use plastic pipe, rubber hose, or soldered joints in any part of the compressed air system. Failure to ensure system compatibility with compressor piping is dangerously unsound.**

**Never use a flammable or toxic solvent for cleaning the air filter or any parts.**

**Do not attempt to service any part while the compressor is operating.**

**Do not operate the compressor at pressures in excess of its rating.**

**Do not remove any guards while the compressor is operating.**

**Observe gauges daily to ensure compressor is operating properly.**

**Follow all maintenance procedures and check all safety devices on schedule.**

**Compressed air is dangerous, do not play with it.**

**Use the correct lubricant at all times.**

**Always wear proper safety equipment when using compressed air.**

**Always install compressor to all local applicable electric codes.**

**WARNING:** Never operate a compressor in a moving vehicle or towable object in motion. Doing so can damage the compressor, compressor drive components, or auxiliary parts on the compressor package. Operating the compressor in a moving vehicle or towable object can cause serious bodily injury or death.

**WARNING:** Check function of safety valves, weekly to insure proper function, replace immediately if faulty or damaged.

**WARNING:** (Compressors Packaged with NEMA 7 Components)

Compressed Air Systems, LLC certifies that the electric motor, electrical enclosure and electrical conduit are rated for NEMA7/hazardous locations. (Only for applicable packages with NEMA7 added components)

Air compressors have multiple moving parts and potential points of contact that could create an ignition source. The compressor pumps are manufactured with ferrous metals and in some cases multiple moving parts can come in contact with one another causing an ignition source. Compressed Air Systems LLC does not guarantee this will not occur. Lack of maintenance or care can result in conditions that could also cause ignition sources. Compressed Air Systems, LLC only guarantees that the electric motor, electrical enclosure and electrical conduit are rated for NEMA7 hazardous location. Compressed Air Systems LLC accept no other responsibility for the rating of the package.

**WARNING:** Compressed Air from this machine is not suitable for breathing and will cause death or server personal injury. CONSULT AN AIR FILTRATION SPECIALIST FOR PROPER TREATMENT FOR BREATHING AIR SYSTEMS

Compressed Air Systems design for the compressors is for indoor installation. Consult the factory for any other areas of installation.

This rotary screw compressor is a constantly running air compressor. **IT DOES NOT START AND STOP.** The compressor will only turn off for, high temperature, high pressure, over amperage of electrical systems, timer limit reached.

## Descriptions

This Compressed Air Systems industrial rotary screw compressor is an electric motor driven single stage helical rotary screw compressor. It is sold as a complete package mounted on a steel base. This unit can come with options of being tank mounted, Enclosure mounted or Enclosure tank mounted. The package includes the compressor air end, electric motor, motor controls, air intake system, cooling system, SMART contact capacity control system, air/oil separator, and instrumentation. Installation requires only electric power and a service line.

This air compressor is a rotating piece of equipment and should not be worked on or serviced while there is power to the unit. You should always turn the power off to the compressor unit before performing any kind of service to the machine. If you have any questions please contact the factory for clarifications before making any changes to the delivered state of the compressor.

**The owner, lesser, or operator of this compressor is hereby notified and forewarned that any failure to observe these safety precautions in this manual may result in injury, damage to the unit or death.**

Compressed Air Systems expressly disclaims responsibility or liability for any injury or damage caused by failure to follow these specified precautions or by failure to exercise that ordinary caution and due care required in operation or handling the compressor even though not expressly specified here. If you have any questions contact the factory immediately at 1-800-531-9656

### COMPRESSOR

The compressor assembly is a positive displacement, oil flood lubricated, helical rotary screw type unit employing a single stage of compression. The components include housing or stator, two rotors or screws, bearings and bearing supports.

In operation two helical grooved rotors mesh to compress air. Inlet air entering the compressor becomes trapped between the lobes of the rotors. As the rotors turn, this trapped volume of air is reduced in volume or compressed and is pushed to the discharge end of the compressor. This process delivers smooth flowing air at full pressure to the receiver.

During the compression cycle, oil is injected into the compressor for the purposes of lubricating, cooling, and sealing. Compressed air laden with oil leaves the compressor through a discharge port designed to provide optimum performance within the desired pressure range.

### AIR/OIL SYSTEM

The air/oil system is almost completely contained within the compressor housing. Within or directly attached to the housing are the air filter, oil filter and the air/oil separator element.

### AIR FILTER

The air filter is a high efficiency ring style located on top of the inlet valve of the compressor. It will provide nearly constant efficiency of filtration at all load conditions. The element has a high dirt holding capacity for a long life.

It is specially treated to be insensitive to heat, cold, water, and oil.

### OIL FILTER

The oil filter is a 10-micron spin-on style. It is sized to maintain system cleanliness and to give good service life. The housing is equipped with a bypass to insure that there is oil flow on startup. The restriction created at the filter will have a direct effect on the operating temperature of the compressor. So you must be sure to maintain it.

### AIR/OIL SEPARATOR

This unit utilizes a spin-on air/oil separator to make maintenance much more convenient than the element in vessel design. This does not diminish its operating efficiency. In fact the separation of the element from the pre-separation tank enhances the performance. The purpose of the separator is to remove aerosols. The vapor pressure of the oil, the operating temperature of the unit, operating pressure of the unit and the operating cycle will affect its performance.

### MINIMUM PRESSURE VALVE

As the compressed air leaves the compressor it goes through a minimum pressure valve. This is set to maintain at least 85 psig (586kPa) in the sump when the compressor is running. This is to insure that there is pressure to force the oil out of the sump and through the oil system so that sufficient oil is injected into the compressor. It is also necessary to provide good air/oil separation. The valve acts as a check valve to prevent back flow into the compressor from the plant system.

## COOLING

The compressor has an air-cooled and after-cooler as standard. The following are the heat loads and cooling airflow rates that must be accommodated.

The compressor is an oil flooded unit. The oil lubricates, seals, and cools the internals of the compressor. In cooling it picks up the heat generated by the compression process and the mechanical friction from the bearings. So the oil must be cooled to within 60 degrees Fahrenheit of the ambient temperature.

The after-cooler has been designed for a minimum approach of 15 degrees F

## HEAT LOAD OF COMPRESSOR

MODEL	TOTAL HEAT LOAD B/Min	REQUIRED FLOW CFM
5-7.5hp	805	1767
10hp	1064	2335
15hp	1587	3483
20hp	2104	4619
25hp	2727	5985
30hp	3250	7134
40hp	4256	9341
50hp	5325	11,700
60hp	6390	14,040
75hp	7988	17,550
100hp	10,650	23,400
125hp	13,313	29,250
150hp	15,975	35,100
200hp	21,300	46,800
250hp	26,625	58,500
300hp	31,950	70,200

## Controls

The RS series of units is equipped with a normally closed inlet valve. This means that when the unit is started, the inlet valve remains closed while the unit builds up pressure by means of a bypass line. After startup the inlet valve is controlled by a simple on/off action of a pressure switch working with a solenoid valve.

For instrumentation the unit has a discharge temperature gauge, air pressure gauge.

## Installation

### GENERAL

The standard RS series was designed for indoor applications. For outdoor applications consult the factory for modifications. Failure to obtain factory approval will void the warranty.

### FOUNDATION


Your Compressed Air Systems LLC rotary screw compressor does not require a special foundation. However, it is necessary that the floor be level and the frame adequately supported. Consult the SPECIFICATIONS section of this manual for the compressor weight and dimensions. We do recommend that the compressor be bolted to the floor. We recommend the compressor be mounted on vibration reduction pads

### ROOM

The room should be of adequate size to provide full access to the machine for routine maintenance. It should have ventilation to keep the room as cool as possible. Operating at elevated temperatures will cause nuisance overload and temperature shutdowns. Room temperature should not exceed 105° F.

### AIR INTAKE

To achieve the longest filter and lubricant life and the least maintenance you need to supply the compressor with the cleanest air possible. It must not contain any flammable or toxic gases. These will be concentrated by the compressor, and could result in personal injury or death and property damage.

	<p><b>Inlet containing reactive gases will cause the failure of the lubricant and compressor.</b></p> <p><b>Insure an air supply that is well clear of any reactive gas source.</b></p>
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If it is necessary to take air from a remote source, the piping should be at least the diameter of the air filter inlet. For distance over twenty feet the diameter needs to be enlarged to reduce the restriction. This pipe should also be corrosion resistant and free from scale and dirt. The inlet should also be covered to prevent rain and small animals from entering.



## Receiving and Uncrating of your Compressor

### BEFORE UNCRATING THE COMPRESSOR THE FOLLOWING STEPS SHOULD BE TAKEN.

1. Immediately upon receipt of the equipment, it should be inspected for damage that may have occurred during shipment. If any damage is found, demand an inspection immediately by an inspector from the carrier. Ask him/her how to file a claim for damages. (Never attempt to move compressor without proper lifting equipment).
2. Insure that adequate lifting equipment is available for moving the machinery.
3. Read the compressor nameplate to be sure the compressor is the model and size ordered.
4. Read the motor nameplate to be sure the motor is compatible with your electrical conditions. (Volts-Phase-Hertz).

**IMPORTANT:** If voltage supplied to the compressor is below 208 volts the unit need a 200 Volt drive motor and 208-230-460 Volt should not be used below 208 volts.

**NOTE:** Standard motors are open drip proof with a maximum ambient temperature rating of 104 degrees F. They are not suitable for salt laden, corrosive, dirty, wet, or explosive environments.



**CAUTION**

Improper lifting can result in component or system damage or personal injury.

Follow good shop practices and safety procedures



**CAUTION**

Under no circumstances should a compressor be placed in an area that may be exposed to a flammable, toxic, volatile or corrosive atmosphere nor should flammable, toxic, volatile or corrosive agents be stored near the compressor.

## Compressor Installation

### LOCATION

Locate the compressor in an indoor area that is clean, dry, well lighted, and well ventilated, with sufficient space for safe and proper inspection and maintenance. Ambient temperatures should not exceed 104 degrees F or fall below 30 degrees unless an electric motor rated for a higher temperature is used. Inspection and maintenance checks are required daily, therefore, ample space is required around the compressor.

The compressor must not be installed closer than 24 inches from a wall or from another compressor to allow ample circulation of air across the compressor cylinders and head, and through the coolers if they are part of the system. Additional safety can be achieved by locating the pulley guard next to the wall.

### MOUNTING

The use of the factory supplied rubber vibration isolation pads, or other factory supplied vibration isolation mounting equipment is required for tank warranty from the original tank manufacturer. The compressor should never be left on original shipping material for installation. If a shim is required to level the unit, place it between the pad and floor. If you bolt the unit to the floor, use the bolts as guide pins and do not tighten the bolts. The rubber pads are used to absorb machine vibration and cannot work effectively if bolted tightly.

### INDUCTION SYSTEM

Do not locate the compressor where it could ingest or ignite toxic, explosive or corrosive vapors, ambient air temperatures exceeding 110 degrees F, water or extremely dirty air. Ingestion of any of the above noted atmospheres by the compressor could jeopardize the performance of the equipment and all personnel exposed to the total compressed air system.

Destructive pulsations can be induced by reciprocating compressors that will damage walls and break windows. Pulsation can be minimized by adding a pulsation dampener on the inlet side of the compressor.

**For compressor tank to have full manufacturer warranty. The tank must be installed properly on manufacturer supplied vibration pads per compressor manual. Failure to do so can void compressor tank warranty and cause tank cracks or failures.**

**On Electric compressors all electrical connections must be wired and installed per NEC (National Electric Code) (See the back of the manual for NEC code) and all local applicable codes for full electric component warranty. Failure to do so can void compressor electrical warranty.**

## Installation Continued

### COOLING AIR DISCHARGE

The cooling air discharge must be restriction free. Any louvers or ducting must not exceed a quarter of an inch static head. Above this a booster fan will be required. Consult a local HVAC contractor for recommendations prior to installation. Excessive restriction to the cooling air discharge will cause the unit to operate at elevated temperatures that could result in high temperature shutdowns.

Ducting of cooling air to the unit is not generally recommended.

### ELECTRICAL

A qualified electrician in compliance with standards and local codes should do all electrical wiring. Be sure to investigate the local requirements before installing the compressor.

The power supply should be adequate and free of parasitic loads that will cause an under voltage condition during the operation of the compressor, otherwise there will be nuisance electrical shutdowns. Always connect the compressor to its power source through a fusible disconnect and insure the unit is properly grounded.

### UNPACKING AND HANDLING

Occasionally damage will occur during shipping. Be sure to carefully inspect the unit before unpacking. After unpacking before you sign the receiver, if anything damage has occurred, document it with the trucking firm immediately. Contact your Compressed Air Systems LLC representative for assistance.

To move your compressor to its installation site we recommend that you leave the unit on its shipping skid as long as possible. The forks should be extended the width of the compressor and padding should be placed between the compressor and the truck boom.

If it is necessary to lift the compressor with a crane, we recommend the use of the spreader bar and chains. The spreader bar should be greater than the width of the compressor and padding is placed on the edges to prevent chain damage. Consult the installation drawing at the end of this section for the center of gravity.

### STORAGE

In some cases it may be necessary to store the compressor for extended periods of several months before placing the unit in operation. When this is required do the following:

Cover and seal all machine openings to prevent the entrance of water and dirt.

Cover all openings in open drip proof motors to prevent the entrance of rodents.

If the storage conditions are below freezing; drain the after cooler, traps, water-cooled heat exchanges and attendant piping. We do not recommend outside storage.

Cover with a waterproof tarpaulin that can easily be removed for in-storage maintenance.

While in storage, every two or three months, rotate the compressor and motor by hand to prevent flat spots on the bearings that will lead to premature failure.

At the end of the storage period, follow the uncrating and start-up procedures. If the unit has been stored for more than eighteen months, you should contact Compressed Air Systems before restarting the compressor.

## Guidelines for Compressed Air Systems

- The air pressure drop between the compressor and the point of use is not recoverable.
- Pipe size should be large enough that the pressure drop does not exceed 10% between the air receiver and the point of use.
- Arrange the air distribution piping to avoid the following types of strain:
  - Strains that are due to dead weight of the pipe itself.
  - Strains that are due to expansion or contraction of the piping due to temperature.
  - Strains due to internal pressure within the pipe.
- Design inlet and discharge piping for smooth airflow.
- Plan for future emergencies and establish an area of the loop to install a temporary compressor.
- Consider a second receiver at the end of the line or opposite side of the loop.
- Use loop-piping systems; if possible, both around the plant and within the loop.
- Consider a second receiver at the end of the line or opposite side of the loop.
- Locate runaways from the main header close to the point of application.
- Take air off the top of the header to prevent carryover of condensed moisture to tools.
- Slope piping so that it drains toward a drop leg or moisture trap away from the compressor.

## Operation

Every Compressed Air Systems LLC compressor has been operated and thoroughly tested at the factory prior to shipment. The test assures that the compressor will deliver its rated capacity and is in good working order. However, there is the possibility that damage may occur in shipping. For this reason, it is recommended that the unit be carefully inspected for evidence of damage or malfunction before installation and during the first hours of operation.

### PREPARATION FOR INITIAL START-UP

1. Pull the main disconnect switch and ensure that there is no power to the unit.
2. Review the installation instructions to see that everything is complete.
3. Inspect for visible signs of damage that could have happened during shipment or installation.
4. Make certain protective coverings required for shipment or painting are removed from the compressor.
5. Fill the sump to the proper oil level. Do not overfill, if it is, drain to proper level. Tighten the fill cap securely.
6. Reconnect the main disconnect.
7. Refer to control section and check out panel components.
8. "Jog" the motor (press start and stop in quick succession) and check for the correct direction of rotation. Reverse LS1 and L2 connections if incorrect.
9. Start the unit and run for several minutes, then shutdown. Check the oil level and add, if necessary, to compensate for filling the system.
10. Begin normal operation



**CAUTION**

**Reverse rotation will cause air end damage. Exchange leads L1 and L2, if reverse rotation.**

## NOISE

Noise is a potential health hazard that must be considered. There are local and federal laws specifying maximum acceptable noise levels that must not be exceeded. Most of the noise from a reciprocating compressor originates from the air inlet point. Excessive noise can be greatly reduced by installing an intake noise silencer. Intake noise silencers are available from the compressor manufacturer.

## PIPING FITUP

Care must be taken to avoid assembling the piping in a strain with the compressor. It should line up without having to spring or twist into position. Adequate expansion loops or bends should be installed to prevent undue stresses at the compressor resulting from the changes between hot and cold conditions. Pipe support should be mounted independently of the compressor and anchored as necessary to limit vibration and prevent expansion strains.



**Safety valves are to protect system integrity in accordance with ASME Codes and ANSI B19.3 safety standards. Failure to use safety valves of the proper capacity and pressure will cause severe personal injury or death.**

**NOTE:** Standard motors are open drip proof with a maximum ambient temperature rating of 104 degrees F. They are not suitable for salt laden, corrosive, dirty, wet, or explosive environments.

**SAFETY VALVES:** Safety valves are pressure relief valves and should be sized and purchased with a pressure setting to protect the weakest link in the system. Never change the pressure setting, only the safety valve manufacturer is qualified to make a change. Safety valves are to be placed ahead of any potential blockage point which included but is not limited to, shutoff valves, heat exchangers, pulsation dampeners, and discharge silencers.

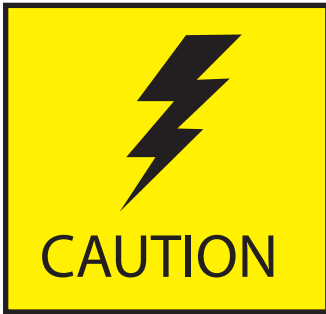
**Failure to properly size, set and install pressure relief valves can be fatal.**



**ASME coded pressure vessels must not be modified, welded, repaired, reworded or subjected to operation conditions outside the nameplate ratings. Such actions will negate code status, affect insurance status and may cause severe personal injury, death, and property damage.**

### **PRESSURE VESSELS**

Air receiver tanks and other pressure containing vessels such as, but not limited to, pulsation bottles, heat exchangers, moisture separators and traps, shall be in accordance with ASME Boiler and Pressure Vessel Code Section VIII and ANSI B19.3 Safety Standards.



**The installation, wiring, and all electrical controls must be in accordance with ANSI C1 National Electric Code, ANSE C2 National Electric Safety Code, state and local codes. All electrical work should be performed by a qualified electrician. Failure to abide by the national, state and local codes may result in physical and/or property damage.**

### **ELECTRICAL**

Before installation, the electrical supply should be checked for adequate wire size, breaker size, transformer and capacity. During installation a suitable fused or circuit breaker disconnect switch should be provided. Where a 3 phase motor is used to drive a compressor, any unreasonable voltage unbalance between the legs must be eliminated and any low voltage corrected to prevent excessive current draw. Compressors must be equipped with a properly wired magnetic motor starter or a pressure switch rated to carry the full motor current load. The coil which engages and disengages the contact points in the motor starter is controlled by the pressure switch. Never attempt to bypass the pressure switch or adjust it past the factory set pressure range. Improper installation of the electrical system can cause the motor to overheat or a short circuit to occur.



## CAUTION

Electric power always exists inside the pressure switch when there is electric power at the compressor package. Either a qualified electrician should make the pressure adjustments or the electric power supply should be disconnected and locked out before making any adjustment.

**NEVER** exceed the designed pressure for the system or overload the motor beyond its service factor.

**FAILURE TO HEED THESE WARNINGS MAY RESULT IN SERIOUS INJURY OR DEATH, PROPERTY DAMAGE AND/OR MECHANICAL FAILURE**

### PRESSURE SWITCH

The pressure switch is automatic in operation and is adjusted to start and stop the unit at the minimum and maximum desired air receiver pressure by cutting in and out the power to the electric motor. On some models, the pressure switch incorporates a release valve, which releases air between the check valve located in the receiver and discharge valve in the head of the compressor.



## CAUTION

Relieve compressor and system air pressure by opening the appropriate manual relief valve prior to servicing.

Failure to relieve all system pressure may result in severe personal injury, death and property damage.

### MANUAL RELIEF AND SHUTOFF VALVES

Install a manual relief valve to vent the compressor to atmosphere. In those instances where the air receiver tank services a single compressor, the manual relief valve can be installed on the receiver. When a manual shut-off valve, and a safety relief valve installed upstream from the manual relief valve. These valves are to be designed and installed as to permit maintenance to be performed in a safe manner. Never substitute a check valve for a manual shut-off valve (block valve) if the purpose is to isolate the compressor from a system for servicing.



Guards must be fastened in place before starting the compressor and never removed before cutting off and locking out the main power supply.

## GUARDS

All mechanical action or motion is hazardous in varying degrees and needs to be guarded. Guarding shall be in compliance with OSHA Safety and Health Standards 29 CFR 1910.219 in OSHA manual 2206 and any state or local



Excessive speed of the compressor or driver can be lethal. Never operate the compressor beyond the manufacturer's recommendation. Bursting of the flywheel may be the greatest threat because the normal guard may not contain all the pieces. Crankshaft and connecting rod breakage is a possibility and compressor efficiency, valve life and bearing life will be abnormally reduced.

## DRIVES

It is important that the compressor and motor pulleys are aligned properly and the V belt is correctly tensioned. Improper pulley alignment and belt tension are causes for motor overloading, excessive vibration, and premature belt and/or bearing failure.

**Removal or painting over safety labels will result in uninformed conditions. This may result in personal injury or property damage. Warnings signs and labels shall be provided with enough light to read, conspicuously located and maintained for legibility. Do not remove any warning, caution, or instructional material attached!**

Provisions should be made to have the instruction manual readily available to the operator and maintenance personnel. If for any reason any part of the manual becomes illegible or if the manual is lost, have it replaced immediately. The instruction manual should be periodically read to refresh one's memory, it may prevent a serious or fatal accident.



## Normal Operation

### START-UP

Drain off condensate from the sump and check the oil level. Refill as necessary.

Check for any oil leaks. Correct as necessary.

On water cooled units, turn on the water.

Press the start button.

### STOPPING

1. Make sure the compressor is fully unloaded before step 2. Unload the compressor by closing the service valve (this is a ball or block valve) placed in the system during compressor installation between the compressor and operating airlines for service and maintenance reasons.
2. After the unit has exhausted its contained pressure (this takes about 30 seconds) push the stop button.

### EMERGENCY STOPPING

1. Push the stop button.
2. Pull the main disconnect, if possible

### AIR FILTER

The air filter is the primary protection of the compressor from harmful dirt being ingested into the oil system. It needs to be looked at periodically for clogging or holes. The period for these inspections is dependent on the environment the machine is in. For optimum life it is recommended that an air filter restriction indicator be used. Service simply based on hours is not recommended.

### ELEMENT INSPECTION AND REPLACEMENT

Switch off the unit and disconnect the power to prevent accidental starting.

Allow one minute after stopping for the system to settle and the pressure to be relieved.

Loosen the nut that secures the cover and remove the cover.

Remove the element.

Place a bright light inside the element to inspect for damage or leak holes.

Inspect all gaskets and gasket contact surfaces of the housing. Correct any faulty conditions immediately.

Clean the housing with a damp cloth. Do not attempt to blow out dirt with compressed air.

Place a new element in the housing.

Replace the cover and tighten the nut.

Reset the filter indicator and the machine will be ready for operation.

If the compressor is turned off before being fully unloaded it can cause the unit to discharge oil into the air filter housing causing it to stop up or become contaminated.

### OIL FILTER

The oil filter in the compressor system is a full flow replaceable canister type. This element protects the compressor bearings from grit and dirt ingress throughout the system. A dirty filter will cause an oil flow restriction that can result in high oil temperature and a unit shutdown.

### OIL FILTER REPLACEMENT

1. Switch off the unit and disconnect the power to prevent accidental starting.
2. Allow one minute after stopping for the system to settle and the pressure to be relieved.
3. Using a strap wrench, remove the old element and gasket.
4. Clean the gasket surface with a clean rag.
5. Apply a light film of oil to the new gasket.
6. Hand tighten the new element until the new gasket is seated in the gasket groove.
7. Continue tightening by hand an additional  $\frac{1}{2}$  to  $\frac{3}{4}$  turn.
8. Reconnect power and restart the machine to check for leaks.



**Hot oil under pressure will cause severe injury, death, or property damage.**

**Be sure the compressor is shutdown and pressure relieved before attempting to remove the oil filter, separator, oil fill, or change the oil.**

### AIR/OIL SEPARATOR

The air/oil separator should be changed every 2000 hours, or when there is excessive oil vapor in the discharge air.

### SEPARATOR ELEMENT REPLACEMENT

1. Switch off the unit and disconnect the power to prevent accidental starting.
2. Allow one minute after stopping for the system to settle and the pressure to be relieved.
3. Using a strap wrench, remove the old element and gasket.
4. Clean the gasket surface with a clean rag.
5. Apply a light film of oil to the new gasket.
6. Hand tighten the new element until the new gasket is seated in the gasket groove.
7. Continue tightening by hand and additional  $\frac{1}{2}$  to  $\frac{3}{4}$  turn.
8. Reconnect power and restart the machine to check for leaks
- 9.
- 10.

### LUBRICANT

Your compressor has been filled and tested with CAS RS8000, a high quality compressor lubricant. It is a PAO with the advantage of extended service life, high temperature operation, easy start-up when cold, reduced sludge and lacquer buildup, and is completely compatible with all seals, gaskets, and other compressor materials.

### LUBRICANT SPECIFICATIONS

If you choose not to use CAS RS8000, for optimum life and warranty service your lubricant must meet the following specification:

Grade ISO	46
Viscosity@100oF,cST	46
Viscosity@210oF,cST	7.93
Viscosity Index	100 or more
Pour Point, F	-20 or less
Flash Point, F	400 or more
Fire Point, F	450 or more
Rust Test ASTM-FG-665 A&B	Pass
Oxidation Test, ASTM0-D943	1500
Emulsion Test, ASTM-D1401	10 Min.
Foam Test, ASTM	Pass

### OIL ANALYSIS

Oil analysis is an excellent tool to add to your compressor maintenance program. At regular intervals you submit lubricant samples to a qualified laboratory. From this you receive a detailed report showing the lubricant condition, wear metals, and contaminants. Changes in this information over time provides the basis for predictive compressor maintenance. Saving you unplanned machine downtime and unnecessary oil changes.

## CHECKING OIL LEVEL AND ADDING COMPRESSOR OIL

1. Switch off the unit and disconnect the power to prevent accidental restarting.
2. Allow one minute after stopping the compressor for settling and the pressure to relieve.
3. Remove any dirt from around the fill cap, then remove the fill cap.
4. Inspect the o-ring in the cap for damage and cleanliness. Replace if necessary.
5. The oil should be between the bottom of the neck and the o-ring groove or 1/2 full in sight glass.
6. Replace the cap securely. Never put the cap on without tightening immediately.

## CHANGING COMPRESSOR LUBRICANT

Regular maintenance of the oil filter and the air filter will help prolong the life of the lubricant.

1. Switch off the unit and disconnect the power to prevent accidental restarting.
2. Allow one minute after stopping the compressor for settling and the pressure to relieve.
3. Remove any dirt from around the fill cap, and then remove the fill cap. If the lubricant appears dirty or has a foul smell, it should be replaced.
4. Drain the lubricant from the bottom of the air/oil receiver. Oil will drain more quickly and completely if is warm from operation.
5. Close all drains and replace with fresh CAS RS8000 to the proper level.
6. Replace the fill cap and run the unit.
7. Switch off the unit and disconnect the power to prevent accidental restarting.
8. Allow one minute after stopping the compressor for settling and the pressure to relieve.
9. Remove the fill cap to see if more lubricant should be added and to insure that there are no leaks.

## OIL RETURN SIGHT GLASS

During loaded operation there should be a visible flow in the sight glass. If there are no droplets visible then the orifice in this line needs to be checked for plugging. Oil not returned ends up in the plant air system.

## MINIMUM PRESSURE VALVE

This minimum pressure valve is a non-adjustable spring biased check valve. It has been designed to maintain a minimum sump pressure of 85 psig. If the pressure is allowed to get too low, the oil carryover rate will increase and the separator could be damaged.

## TO CHECK THE BELTS

1. Switch off the unit and disconnect the power to prevent accidental restarting.
2. Allow one minute after stopping the compressor for settling and the pressure to relieve.
3. Remove the belt guard.
4. Inspect for any fraying or cracking of the belts. If there is any, replace the belts.
5. Check the tension. It should be about 1/64" per inch of span between the sheaves
6. To Change the Belts
7. Switch off the unit and disconnect the power to prevent accidental restarting.
8. Allow one minute after stopping the compressor for settling and the pressure to relieve.
9. Remove the belt guard.
10. Loosen the motor hold down bolts and the puller bolt and slide the motor toward the air end.
11. Remove the belt.
12. Replace with new belt.
13. Set the initial by sliding the motor back to its original position using the puller bolt and tighten the motor hold down bolts.

## FAN

Check the fan for cracking, loose rivets, and bent or loose blades. Make sure that it is securely mounted and tighten the mounting screws if loose. Replace a damaged fan immediately.

## Troubleshooting Chart

NOTE: Troubleshooting problems may have similar causes and solutions

**You should always contact an authorized service center before attempting to fix or repair your air compressor.**

**Always make sure electrical power is off before removing any inspection covers or plates or before servicing compressor.**

Problem	Possible causes	Solutions
Compressor will not start	<ul style="list-style-type: none"> <li>No power</li> <li>Fuse blown in control circuit</li> <li>Motor overloads not tripped or not reset</li> <li>Loose incoming or power connection wires</li> <li>Low voltage to unit</li> <li>Faulty temperature switch</li> <li>Temperature switch tripped</li> <li>High pressure switch tripped</li> </ul>	<ul style="list-style-type: none"> <li>Check power supply for adequate voltage</li> <li>Check fuses</li> <li>Make sure all power wires are tight at connections</li> <li>Check voltage supply to make sure it is high enough to run the electric system</li> <li>Check temperature switch for proper operation</li> <li>Check system pressure</li> </ul>
Unit starts-them immediately stalls	<ul style="list-style-type: none"> <li>Pressure switch out of adjustment</li> <li>Temperature switch activated</li> <li>Loose electrical supply wires</li> <li>Motor overloads tripped</li> <li>Low voltage</li> <li>Incorrect compressor rotation</li> </ul>	<ul style="list-style-type: none"> <li>Check compressor power supply for adequate breaker and wire size</li> <li>Inspect check valve for proper operation</li> <li>Tighten belts</li> <li>Check compressor for proper oil level</li> </ul>
Low discharge pressure	<ul style="list-style-type: none"> <li>Plugged separator</li> <li>Plugged oil cooler</li> <li>Improper pressure switch setting</li> <li>Low incoming power voltage</li> <li>Electrical phase imbalance</li> <li>Possible airend or motor failure</li> </ul>	<ul style="list-style-type: none"> <li>Tighten compressor belts to recommended specifications</li> <li>Check compressor voltage supply</li> </ul>

**Troubleshooting Chart (continued)**

**NOTE:** Troubleshooting problems may have similar causes and solutions

**You should always contact an authorized service center before attempting to fix or repair your air compressor.**

**Always make sure electrical power is off before removing any inspection covers or plates or before servicing compressor.**

<b>Problem</b>	<b>Possible causes</b>	<b>Solutions</b>
Compressor does not build up to pressure	Air leaks in shop Inlet valve malfunction Compressor belts slipping Air demand exceeds compressor output Pressure switch set to low Solenoid valve malfunction Compressor rotors damaged	Find and fix shop air leaks Check inlet valve for proper function Check air usage requirements on machinery and check for shop air leaks Check pressure switch for proper setting Check solenoid for proper function
Compressor will not load to compress air	Pressure switch set to high Inlet valve malfunction Faulty solenoid	Check pressure switch for proper setting Check inlet valve for proper function Check solenoid for proper function
CFM Flow (air flow) seems low	Restricted air intake filter Inlet valve partially closed Air pressure set to high Insufficient oil flow Solenoid valve malfunction	

## Troubleshooting Chart (continued)

NOTE: Troubleshooting problems may have similar causes and solutions

**You should always contact an authorized service center before attempting to fix or repair your air compressor.**

**Always make sure electrical power is off before removing any inspection covers or plates or before servicing compressor.**

Problem	Possible causes	Solutions
Excessive oil consumption	Over filled sump Broken oil line Plugged oil return line Damaged or dirty separator Excessive unloaded compressor run time	Check sump for proper oil level Check all lines for cracks Replace separator Add a timer to the system
High temperature shutdown	High ambient air temperature around compressor Low oil level in compressor Plugged oil filter Restricted air flow over cooler Thermal by pass leaking Faulty temperature switch	Lower ambient temperature around compressor Check unit for proper oil level Replace oil filter Clean oil cooler Check thermal bypass for proper operation Check temperature switch for proper operation.
High amperage draw	Restricted air intake filter Inlet valve partially closed Air pressure set to high Insufficient oil flow Solenoid valve malfunction	Change separator Clean oil cooler Check pressure switch Check incoming voltage Check air end and motor for proper function

**RED** adjustment screw and **RED** needle are for pressure range adjustment & indication.




**GREEN** adjustment screw and **GREEN** needle are for differential pressure adjustment & indication.

Turn **RED** adjustment screw clockwise to increase operating pressure. Turn **RED** adjustment screw counterclockwise to decrease operating pressure.

Turn **GREEN** adjustment screw clockwise to increase differential pressure. Turn **GREEN** adjustment screw counterclockwise to decrease differential pressure.



## Stopping for Maintenance or Service

	<p><b>Never assume the compressor is ready for maintenance or service because it is stopped.</b></p> <p><b>The automatic stop-start control may start the compressor at any time!</b></p>
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The following procedure should be followed to maximize safety when preparing for maintenance or service.

1. Disconnect and lock-out the main power switch and hang a sign at the switch Informing of the unit being serviced.
2. Close shut-off valve (block or ball valve) between compressor and main supply (air tank or air lines). This is the valve installed to isolate the air compressor for maintenance or service. The valve is placed in the system during installation for the purpose of servicing the compressor and to not allow (shop or working) air back into the compressor during service. \*See note for turning compressor off while under a load or compressing air.
3. Lock open manual vent valve and wait for the pressure in the area to be serviced (compressor, receiver, etc.) to be completely relieved before starting service. The Manual vent valve may be the drain valve in the receiver. NEVER remove a plug to relieve the pressure.
4. Open all manual drain valves within the area to be serviced.
5. Wait for the unit to cool before starting service, (temperatures at 125 degrees F can burn the skin), some surface temperatures exceed 400 degrees F when the compressor is working).
6. Clean up all oils spills immediately to prevent slipping (Mark spill area accordingly).

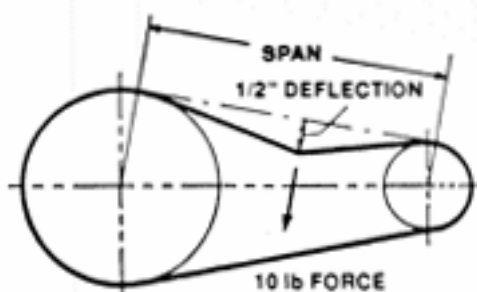
\* Note. If the compressor is turned off before being **FULLY UNLOADED** it can cause the unit to discharge oil into the air filter housing and could cause the air filter element to become contaminated. This may happen when using the emergency shut-off button and/or the on/off switch



## Adjusting Belt Tension

Proper belt tension and pulley alignment must be maintained for maximum drive efficiency and for maximum belt life. The correct tension exists if a deflection of  $\frac{1}{2}$  inch occurs by placing 10lbs of force midway between the motor pulley and the compressor flywheel. This deflection can be adjusted by the following procedure. The pulley should be carefully aligned with the flywheel and set screws should be kept tight.

1. Remove the belt guard
2. Loosen the motor mounting bolts
3. Shift the motor to the point where the correct deflection exists
4. Retighten the motor mounting belts
5. Check to ensure that the tension remain correct after tightening
6. Re-install the belt guard. All moving parts must be guarded

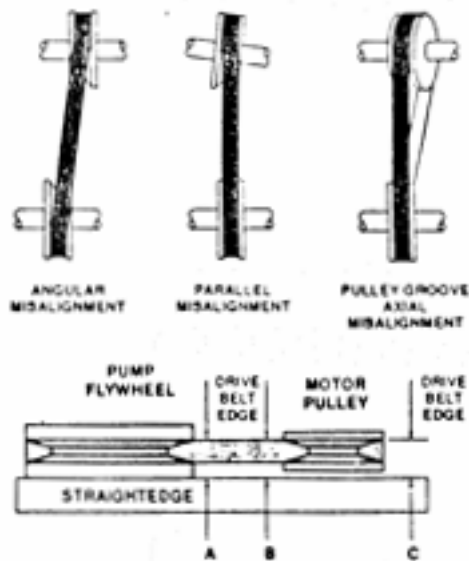


NOTE: Drive belt tension and pulley alignment are done at the same time. They are discussed separately for clarity.

## Pulley Alignment

The figure to the side shows 3 examples of misaligned pulleys. To check pulley alignment, remove the belt guard and place a straightedge against the compressor flywheel, measure and record the distance from the straightedge to the edge of the drive belt. Then measure the distance to the edge of the drive belt on the motor pulley at the same edge. As long as both points measure the same distance the pulleys will be aligned if not you will need to move the pulley until its in alignment this may take a few tries. To re-align the pulley follow the steps below

1. Loosen the motor mounting bolts
2. Remove the belt guard
3. Loosen the set screw on the motor pulley
4. Align the motor pulley with the compressor flywheel
5. Re-tighten the motor pulley set screws
6. Adjust the proper belt tension
7. Re-tighten the motor mounting bolts
8. Re-install the belt guard



## Compressor Maintenance

**WARNING:** To avoid personal injury, always shut OFF the main power supply and disconnects to the compressor, relive all air pressure from the system, and check electrical system with electrical probe before starting any service or maintenance on the compressor.

### Daily:

**Check Airend Oil Level:** remove oil fill cap and check for proper level. Oil should be half way up the at the bottom or half way up the threads on the oil fill

**Drain the Receiver:** condensation will accumulate in the tank daily, and should be drained at least once a day. This is done to reduce corrosions of the tank from the inside. Always wear protective eyewear when draining the tank.

**Check Oil Cooler:** check cooler for proper air flow to keep unit cool clean if necessary

Check unit for any unusual noise or vibrations

### Weekly:

**Clean air filter:** this will ensure that no dirt or heavy particulate makes its way into the compressors valve assemblies

**Clean external parts** of compressor and electric motor: this helps to ensure proper cooling and prevents rust and corrosion on critical parts

**Check safety Valves:** this is don't to ensure they are not stuck in place and operating properly

### Monthly:

**Inspect complete air system** for leaks: this is done to make sure the compressor does not get out of its duty cycle due to air leak in the system

**Inspect Oil** for Contamination: this is done to ensure that harmful deposits do not build up in the oil

**Check belt tension:** this is done to ensure the belt do not fail pre-maturely, tighten them as needed to ensure they do not slip

### Every 3 months (every 500hrs):

**Change oil filter:** this is done to ensure that the compressor has proper oil level and that the oil in the machine does not deteriorate past factory specifications

**Check airend filter** and change as needed.

### Yearly (every 2000 hrs)

**Change oil:** change with only CAS RS 8000

**Clean Oil Cooler:** this is done to ensure adequate cooling for the compressor air end.

### Storage of Compressor:

Before storing the compressor for a prolonged period of time, use a blow gun to clean all debris from compressor. Shut OFF main power and turn OFF disconnect. Drain tank pressure, clean air filter, drain old oil and replace with new oil. Cover the unit to prevent dust and moisture from collecting on the unit.

## Maintenance Procedures Review

### SAFETY PROCEDURES.

Adherence to safe working procedures are important to Service personnel at the time of servicing and to those who may, at a later date be around the compressor and the system it serves. Routine maintenance insures trouble free operation and protects your investment. All warranties are void if maintenance is neglected.

#### Daily:

##### CHECK THE OIL LEVEL.

Oil should be half up, or at the bottom of the threads on the fill spout, or 1/2 full in the sight glass.

##### DRAIN THE TANK.

Turn off the power to the compressor and drain all the moisture from the bottom of the tank.

#### Weekly:

##### CHECK THE OIL.

If the oil appears contaminated by moisture or dirt, change immediately.

##### CHECK THE BELTS.

Turn off the compressor and inspect the belts for damage, excessive wear, and correct tension. Replace if necessary.

##### TEST THE SAFETY VALVE.

Pull the ring on the safety valve. Air should escape and then reset. In the event the compressor ran over pressure, the safety valve would reduce the tank pressure to a safe level. Never run the unit without this safety valve or attempt to adjust it.

##### GENERAL INSPECTION.

Check the overall operation of the unit. Tighten any loosen bolts, inspect for air leaks and inspect for any unusual noises or vibrations.

##### INSPECT COMPRESSOR INTAKE.

NEVER use gasoline, thinners or other flammable solutions to clean valves or related parts. Check to be sure the valves are seated against the sealing surface around each port. If the valves are not sealing, compressor capacity will be severely reduced.

ROTARY SCREW COMPRESSOR CONSUMABLES	AIR FILTER	OIL FILTER	SEPERATOR	OIL CAPACITY (GALLONS)
NK30	NK30AF	NK30OF	NK30SE	1
NK31	NK30AF	NK30OF	NK30SE	1
NK40	NK30AF	NK30OF	NK30SE	1
NK60	NK60AF	NK60OF	NK60SE	1.5
NK100	NK100AF	NK100OF	NK100SE	2.5
NK160	NK160AF	NK160OF	NK160SE	5
NK200	NK160AF	NK200OF	NK100SE (x2)	10
EVO3	EVO3AF	EVO3OF	EVO3SE	1.5
EVO6	EVO6AF	EVO6OF	EVO6SE	2.5
EVO9	EVO9AF	EVO9OF	EVO9SE	5
GCU11	GCU11AF	GCU11OF	GCU11SE	1.25
GCU30	GCU30AF	GCU30OF	GCU30SE	2.5

COMPRESSED AIR SYSTEMS, LLC.

# WARRANTY

## CERTIFICATE OF LIMITED WARRANTY

### Rotary Screw Compressors

All component parts on this compressor installed by the manufacturer are warranted to be free of defects, workmanship and material for a period of one year. Transportation charges are the responsibility of the purchaser. This warranty extends to the original purchaser of the compressor only.

There are NO express warranties except other than those contained in this limited warranty statement

Covered in the one year period of the warranty are defective parts due to defects in the original part only.

The compressor warranty is void in the cases of abuse, lack of proper service, in correct application, in correct installation, and neglect

Standard compressor warranty covers defective parts and labor for the one year period.

Industrial Electric stationary compressors may be repaired on site as long as the compressor is not located further than 50 miles from the service center. The purchaser is responsible for any additional travel expense past 50 miles from the service center.

Gas/Diesel engine driven compressors must be repaired at the closest service center to the compressor. The purchaser is responsible for any travel expense if they do not wish to bring the compressor to the service center.

**ALL "SPECIALTY COMPRESSOR" WARRANTY SERVICE MUST BE PERFORMED AT THE CLOSEST SERVICE CENTER TO THE COMPRESSOR**

Specialty compressor-any compressor package with options other than those that apply to the standard model number in the catalog

The compressor "airend" is covered by a 2 year warranty to be free from defects from manufacturing. This does not cover abuse, neglect, improper service, mis-application, or improper installation. An oil sample must be submitted with any airend warranty claim for verification. The purchaser must use only Compressed Air Systems synthetic rotary screw oil in the compressor for the duration of the warranty.

### **Airend- the rotors and bearings of the compressor**

**BEFORE WARRANTY SERVICE IS PERFORMED CONTACT MANUFACTURER TECH SUPPORT FOR FASTEST SOLUTION**

Warranty labor for the first year is only covered for work performed Monday-Friday 8am-5pm excluding all major US holidays

### **Optional 5 year "airend" warranty**

To be applicable for this option the purchaser must purchase a Full year Rotary Screw compressor service kit at the same time as the compressor and a subsequent kit every year afterwards for a total of 5 kits during the compressor warranty period. The purchaser must use only Compressed Air Systems synthetic rotary screw oil in the compressor for the duration of the warranty.

The warranty covers the "airend" of the compressor for a period of 5 years parts replacement only, from any defect due to manufacturing. The warranty does not cover wear and tear, abuse, neglect, improper service, mis-application, or improper application.

**BEFORE WARRANTY SERVICE IS PERFORMED CONTACT MANUFACTURER TECH SUPPORT FOR FASTEST SOLUTION.**

Rotary Screw Compressor Installation Sheet

Date of Installation \_\_\_\_\_ Compressor Model# \_\_\_\_\_

Installation Company \_\_\_\_\_ Compressor Serial # \_\_\_\_\_

Installation Technician \_\_\_\_\_ Compressor Voltage \_\_\_\_\_

Site Electrical Phase \_\_\_\_\_ Site Voltage L1 \_\_\_\_\_ L2 \_\_\_\_\_ L3 \_\_\_\_\_

Compressor Electrical breaker size \_\_\_\_\_

Incoming Voltage at motor start up L1 \_\_\_\_\_ L2 \_\_\_\_\_ L3 \_\_\_\_\_

Incoming Voltage at max operating pressure L1 \_\_\_\_\_ L2 \_\_\_\_\_ L3 \_\_\_\_\_

Incoming power connected to Magnetic Starter \_\_\_\_\_

Breaker size for the compressor \_\_\_\_\_AMPS Wire size for the compressor \_\_\_\_\_

Distance from main electric panel \_\_\_\_\_ Disconnect installed at the compressors site \_\_\_\_\_

If Duplex compressor separate disconnects for each drive motor:  Yes  No

Compressor Rotation Correct  Yes  No

Motor amps at Max operating Pressure L1 \_\_\_\_\_ L2 \_\_\_\_\_ L3 \_\_\_\_\_

Compressor Max Operating Pressure \_\_\_\_\_ Compressor tank drain functional \_\_\_\_\_

Unit inspected for Air leaks \_\_\_\_\_ Unit inspected for oil leaks \_\_\_\_\_

Unit location:  Indoors  Outdoors

Unit tank fill time 0-125psi \_\_\_\_\_ (Put N/A if pressure not applicable to installed unit)

Unit tank fill time 0-150psi \_\_\_\_\_ (Put N/A if pressure not applicable to installed unit)

Unit tank fill time 0-175psi \_\_\_\_\_ (Put N/A if pressure not applicable to installed unit)

Unit Cooling Fan  Pulls air through cooler  Push's air through cooler)

Compressor Temperature switch reading (Before install) \_\_\_\_\_ (After install) \_\_\_\_\_

Unit unloads at max operating pressure and begins to release sump pressure \_\_\_\_\_ -

Belt tension checked:  Yes  No Vibration Pads properly installed:  Yes  No

All installation steps completed:  Yes  No If no, reason: \_\_\_\_\_

Send copy of completed installation sheet to manufacture to begin warranty

Compressed Air Systems, LLC

2626 Skyway Drive

Grand Prairie, TX, 75052

## 25-40 HP Electric Rotary Screw Compressors

### NEC (National Electric Code) Guide Lines

1 Phase Motor Requirements (Copper wire must be THW, THHN-THWN, XHHW) No solid core wire

**NOTE:** Wire size is based on being within 30ft of main electrical panel installation further would need a qualified electrician to properly size the wire to account for voltage drop

Horse Power	Voltage	Instantaneous Trip Circuit Breaker Rating	Circuit Breaker Trip Rating	Minimum Wire Size
1.5	115	30	40	12
1.5	230	15	20	14
2	115	50	50	10
2	230	30	30	14
3	115	50	70	8
3	230	30	40	12
5	230	50	60	10
7.5	230	70	80	8
10	230	90	100	4

NOTE: Some rotary screw compressors have additional drive motors for the coolings fans these need to be taken into account when sizing the electrical system

3 Phase Motor Requirements (Copper wire must be THW, THHN-THWN, XHHW) No solid core wire

**NOTE:** Wire size is based on being within 30ft of main electrical panel installation further would need a qualified electrician to properly size the wire to account for voltage drop

Horse Power	Voltage	Circuit Breaker Trip Rating	Minimum Wire Size	Horse Power	Voltage	Circuit Breaker Trip Rating	Minimum Wire Size
3	200	20	14	30	200	150	2
3	230	20	14	30	230	125	3
3	460	15	14	30	460	80	8
3	575	15	14	30	575	60	8
5	200	35	12	40	200	200	1/O
5	230	30	14	40	230	175	1
5	460	15	14	40	460	100	6
5	575	15	14	40	575	80	6
7.5	200	50	10	50	200	200	3/O
7.5	230	45	10	50	230	200	2/O
7.5	460	20	14	50	460	125	4
7.5	575	20	14	50	575	100	6
10	200	60	8	60	200	250	4/O
10	230	60	10	60	230	225	3/O
10	460	35	14	60	460	125	3
10	575	25	14	60	575	125	4
15	200	90	6	75	200	300	300
15	230	80	6	75	230	300	250
15	460	45	10	75	460	150	1
15	575	40	12	75	575	125	3
20	200	100	4	100	200	400	500
20	230	90	4	100	230	400	350
20	460	60	10	100	460	200	2/O
20	575	50	10	100	575	175	1
25	200	125	3				
25	230	125	4				
25	460	70	8				
25	575	60	10				

NOTE: Some rotary screw compressors have additional drive motors for the coolings fans these need to be taken into account when sizing the electrical system

## **Additional Information**

For compressor pump information see pump specific manual.

For installation instructions see Install Guide.

For compressor package wiring diagram contact manufacturer.

For compressor parts breakdown see website ([compressed-air-systems.com](http://compressed-air-systems.com)) or contact compressor manufacturer.

On electric driven compressors always follow NEC (National Electric Code) on any local applicable code that exceeds NEC guidelines.

On gas/diesel engine driven packages follow engine manufacturer guide for proper placement and installation of engine driven equipment.





Notes

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**Compressed Air Systems, LLC**

2626 Skyway Drive

Grand Prairie, TX, 75052

**1-800-531-9656**

Fax 972-352-6364

**Simplicity. It's What We Do.**



## Enclosed Electric Rotary Screw Compressor

# Installation Guide

**Notice:** Air compressors should only be installed trained installation personnel call 800-531-9656 to find a local trained air compressor service technician.

**Warning:** Read all installation steps, compressor package operation manual, notices and warnings prior to beginning compressor package installation. Failure to do so can result in personal injury or damage to compressor package.

**Warning:** Always wear proper protective eye wear, hearing protection, and other mandated safety clothing and devices when installing compressor packages

**ATTENTION:** All incoming electrical power connections are to be made on the main motor contactor(s) DO NOT attach incoming power wires to package pressure switch. This will result in electrical component damage not covered under warranty.

**Notice:** Compressor package should not be mounted to a moving piece of equipment that will be moving while the compressor package is in operation. The compressor package should not be mounted to a piece of equipment that adds additional vibration to the compressor package. The compressor package is only designed to handle its own organic vibration during operation. Failure to follow either one of these guidelines may result in pre-mature failure of compressor package, components and/or personal injury.

**NOTICE:** To ensure full compressor tank warranty all tank mounted compressor packages must be mounted on factory supplied vibration isolation pads.

**Warning:** Before beginning steps 6-17 verify power supply is off to compressor disconnect, and compressor package

## Compressed Air Systems

**Simplicity. It's What We Do.**

Compressed Air Systems, LLC 2626 Skyway Drive Grand Prairie, TX, 75052 1-800-531-9656 Fax 972-352-6364

[www.compressed-air-systems.com](http://www.compressed-air-systems.com)

## NEC (National Electric Code) Guide Lines

1 Phase Motor Requirements (Copper wire must be THW, THHN-THWN, XHHW) No solid core wire

**NOTE:** Wire size is based on being within 30ft of main electrical panel installation further would need a qualified electrician to properly size the wire to account for voltage drop

Horse Power	Voltage	Instantaneous Trip	Circuit Breaker Rating	Circuit Breaker Trip Rating	Minimum Wire Size
1.5	115	30		40	12
1.5	230	15		20	14
2	115	50		50	10
2	230	30		30	14
3	115	50		70	8
3	230	30		40	12
5	230	50		60	10
7.5	230	70		80	8
10	230	90		100	4

NOTE: Some rotary screw compressors have additional drive motors for the coolings fans these need to be taken into account when sizing the electrical system

3 Phase Motor Requirements (Copper wire must be THW, THHN-THWN, XHHW) No solid core wire

**NOTE:** Wire size is based on being within 30ft of main electrical panel installation further would need a qualified electrician to properly size the wire to account for voltage drop

Horse Power	Voltage	Circuit Breaker Trip Rating	Minimum Wire Size		Horse Power	Voltage	Circuit Breaker Trip Rating	Minimum Wire Size
3	200	20	14		30	200	150	2
3	230	20	14		30	230	125	3
3	460	15	14		30	460	80	8
3	575	15	14		30	575	60	8
5	200	35	12		40	200	200	1/0
5	230	30	14		40	230	175	1
5	460	15	14		40	460	100	6
5	575	15	14		40	575	80	6
7.5	200	50	10		50	200	200	3/0
7.5	230	45	10		50	230	200	2/0
7.5	460	20	14		50	460	125	4
7.5	575	20	14		50	575	100	6
10	200	60	8		60	200	250	4/0
10	230	60	10		60	230	225	3/0
10	460	35	14		60	460	125	3
10	575	25	14		60	575	125	4
15	200	90	6		75	200	300	300
15	230	80	6		75	230	300	250
15	460	45	10		75	460	150	1
15	575	40	12		75	575	125	3
20	200	100	4		100	200	400	500
20	230	90	4		100	230	400	350
20	460	60	10		100	460	200	2/0
20	575	50	10		100	575	175	1
25	200	125	3					
25	230	125	4					
25	460	70	8					
25	575	60	10					

NOTE: Some rotary screw compressors have additional drive motors for the coolings fans these need to be taken into account when sizing the electrical system

**Warning:** Always wear proper protective eye wear, hearing protection, and other mandated safety clothing and devices when installing compressor packages

**ATTENTION:** All incoming electrical power connections are to be made on the main motor contactor(s) DO NOT attach incoming power wires to package pressure switch. This will result in electrical component damage not covered under warranty.

**NOTICE:** To ensure full compressor tank warranty all tank mounted compressor packages must be mounted on factory supplied vibration isolation pads.

**Notice:** Compressor package should not be mounted to a moving piece of equipment that will be moving while the compressor package is in operation. The compressor package should not be mounted to a piece of equipment that adds additional vibration to the compressor package. The compressor package is only designed to handle its own organic vibration during operation. Failure to follow either one of these guidelines may result in pre-mature failure of compressor package, components and/or personal injury.

## Step 1

Verify compressor package install site can handle weight load of compressor package.

(Note: this should have been done prior to the sale of the compressor package)

Notice: Installing compressors on the roof, mezzanine, 2nd story or higher of a building can result in higher DBA readings for the compressor package as well as additional vibration

## Step 2

Make sure compressor installation site is clear of debris and has adequate space around where the compressor will sit for service (minimum of 24in.) and ventilation (must be able to get clean fresh air through oil/air cooler during operation, without recirculating cooler hot air discharge) If site is excessively dusty or dirty due to grinding, sanding, or due to the nature of the selected application site a new site should be sought out.

## Step 3

Make sure site voltage for compressor installation is correct

(When reading voltage read across the lines to get an exact voltage. On single phase units read across L1 (Line 1) and L2 (Line 2) to get the operational voltage. On 3 phase units read across L1 to L2, then L2 to L3 (Line 3), then from L1 to L3 this gives the most accurate reading of the voltage. It is also recommended to read the voltage at both the main electrical panel and at the compressor disconnect to check for voltage drops prior to installation)

- A. 208-230 volt compressors can operate on voltages from 207-253 volts
- B. 460-480 volt compressor can operate on voltage from 420-505 volts
- C. On either 208-230 or 460-480 volt compressor packages; the lower the site voltage, the more amps the compressor motor will draw. (See electric motor MFG. website for amp draw at 208 volt if applicable)
- D. If voltage is lower than 207 on 208-230 or higher than 505 on 460-480 volt package then, a special low or high voltage motor is required as well as a different motor contactor and controls (this should be confirmed prior to compressor sale)
- E. If compressor package is being powered by a generator verify generator has enough power to start the compressor package. An easy calculation for the amount of power required to start a compressor is below.

Max running amps X operating voltage = running kilowatts (then) Running Kilowatts x 4= Starting Kilowatts required to start the compressors drive motor.

**Notice: Air compressors should only be installed trained installation personnel call 800-531-9656 to find a local trained air compressor service technician**

**Warning:** Always wear proper protective eye wear, hearing protection, and other mandated safety clothing and devices when installing compressor packages

**ATTENTION:** All incoming electrical power connections are to be made on the main motor contactor(s) DO NOT attach incoming power wires to package pressure switch. This will result in electrical component damage not covered under warranty.

**NOTICE:** To ensure full compressor tank warranty all tank mounted compressor packages must be mounted on factory supplied vibration isolation pads.

**Notice:** Compressor package should not be mounted to a moving piece of equipment that will be moving while the compressor package is in operation. The compressor package should not be mounted to a piece of equipment that adds additional vibration to the compressor package. The compressor package is only designed to handle its own organic vibration during operation. Failure to follow either one of these guidelines may result in pre-mature failure of compressor package, components and/or personal injury.

## Step 4

Verify that main power wires leading to compressor disconnect are proper size per National Electric Code (NEC) and local applicable standards. Failure to have properly sized wire can cause damage to the electrical components of the compressor package. Incorrect wire size for the compressor package may also result in the loss of electric component warranty.

## Step 5

Verify that the breaker for the compressor is properly sized for the compressor total full load amps. NEC and local applicable standards should be followed. Failure to do so will result in damage to electrical components. Incorrect breaker size for the compressor package may also result in the loss of electric component warranty.

**STOP**

**Warning:** Before beginning steps 6-17 verify power supply is off to compressor disconnect, and compressor package

## Step 6

Uncrate compressor package (verify package is intact and not missing parts).

## Step 7

Remove compressor shipping pallet.

(Warning: Only use forklift or approved lifting device to remove compressor from shipping pallet)

## Step 8

Set compressor into place on vibration isolation pads.

## Step 9

Drill holes in floor through vibration pads and mounting location on compressor package to set compressor package anchors in place.

## Step 10

Tighten compressor package anchor nuts to set anchors in floor.

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**Notice:** Compressor package should not be mounted to a moving piece of equipment that will be moving while the compressor package is in operation. The compressor package should not be mounted to a piece of equipment that adds additional vibration to the compressor package. The compressor package is only designed to handle its own organic vibration during operation. Failure to follow either one of these guidelines may result in pre-mature failure of compressor package, components and/or personal injury.

**Warning:** Before beginning steps 6-17 verify power supply is off to compressor disconnect, and compressor package

## *Step* **11**

Back anchor nuts off to  $\frac{1}{2}$  to  $\frac{3}{4}$  turn past hand tight.

## *Step* **12**

Connect airline to compressor package air discharge. (Note: It is recommended to use a flexible line between the compressor package and the system piping to avoid damage due to compressor vibration)

## *Step* **13**

Remove knock out on compressor operation panel or drill/cut hole for main electrical power wires for compressor. (No connections are to be made on the pressure switch during standard installation. Pressure switch's are pre-set from the factory)

## *Step* **14**

Attach incoming compressor package wire conduit to compressor operation panel.

## *Step* **15**

Install compressor package incoming power wires to proper terminal on main motor contactor.

- A.** On single phase compressor packages ports L1 (line 1) and L2 (line 2)
- B.** On 3 phase compressor packages ports L1 L2 L3 (line 3)

**Note:** Make sure incoming power wires are properly torqued into place. This is also a good time to verify all electrical power wires are torqued properly.

## *Step* **16**

Install ground wire in compressor panel.

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**ATTENTION:** All incoming electrical power connections are to be made on the main motor contactor(s) DO NOT attach incoming power wires to package pressure switch. This will result in electrical component damage not covered under warranty.

**NOTICE:** To ensure full compressor tank warranty all tank mounted compressor packages must be mounted on factory supplied vibration isolation pads.

**Notice:** Compressor package should not be mounted to a moving piece of equipment that will be moving while the compressor package is in operation. The compressor package should not be mounted to a piece of equipment that adds additional vibration to the compressor package. The compressor package is only designed to handle its own organic vibration during operation. Failure to follow either one of these guidelines may result in pre-mature failure of compressor package, components and/or personal injury.

**Warning:** Before beginning steps 6-17 verify power supply is off to compressor disconnect, and compressor package

## Step 17

Verify all wire terminal connections in compressor package are torqued to proper specs,

## Step 18

Turn power on to the compressor package

## Step 19

Verify voltage of incoming power on the main drive motor starter

## Step 20

Wait for green light on compressor smart contactor to come on.

## Step 21

With green light on smart contactor on, turn compressor package on for 1-3 seconds to verify for proper compressor rotation and cooling fan rotation (When facing the front of the compressor airen opposite the motor shaft, the compressor should turn clockwise on standard belt drive compressors, verify direction on direct drive units with directional arrows)

**Notice:** Do not allow compressor to run for more than 3 seconds on this step, doing so may cause damage to compressor air end

## Step 22

If rotation is incorrect, turn power off to compressor package.

- A.** On 3 phase compressors; once power is confirmed to be off, switch incoming power wire from L1 to L3 position and place L3 incoming power wire in L1 position.
- B.** On single phase compressor packages; if rotation is incorrect, check motor wiring diagram for proper rotation wiring diagram.

**Notice: Air compressors should only be installed trained installation personnel call 800-531-9656 to find a local trained air compressor service technician**

**Warning:** Always wear proper protective eye wear, hearing protection, and other mandated safety clothing and devices when installing compressor packages

**ATTENTION:** All incoming electrical power connections are to be made on the main motor contactor(s) DO NOT attach incoming power wires to package pressure switch. This will result in electrical component damage not covered under warranty.

**NOTICE:** To ensure full compressor tank warranty all tank mounted compressor packages must be mounted on factory supplied vibration isolation pads.

**Notice:** Compressor package should not be mounted to a moving piece of equipment that will be moving while the compressor package is in operation. The compressor package should not be mounted to a piece of equipment that adds additional vibration to the compressor package. The compressor package is only designed to handle its own organic vibration during operation. Failure to follow either one of these guidelines may result in pre-mature failure of compressor package, components and/or personal injury.

**Warning:** Before beginning steps 6-17 verify power supply is off to compressor disconnect, and compressor package

### Step 23

Close ball valve on compressor storage tank discharge.

### Step 24

Turn power back on to compressor package.

### Step 25

(If rotation was incorrect) Turn compressor back on for 1-3 seconds to verify that rotation is now correct if needed.

### Step 26

**(Read 26A, 26B, 26C prior to starting Step 26)**

Turn compressor package on with correct rotation and allow package to build to maximum operating pressure, and unload.

- A.** Check voltage on main motor contactor prior to starting.
- B.** Continue to check voltage on motor contactor as compressor package starts.
- C.** If voltage drops more than 5% or below 207 on 208-230 volt packages or below 420 on 460-480 volt packages; and does not immediately return to original voltage, then check power supply.

(A drop of 5% or more; or below the minimum operating voltage of the electric motor can cause damage to the electrical components of the compressor package resulting in loss of electrical component warranty. If drop occurs, contact electrician and compressor package owner to notify them of power issues that need to be corrected for proper operation.)

### Step 27

Once compressor is running unloaded, wait 10 minutes to verify that compressor package unloaded power save feature is properly functioning. Compressor package should turn off after 10 minute of running unloaded. (Compressor package will unload automatically at maximum operating pressure. Compressor package pressure switch has been pre-set at factory during testing. Do not adjust compressor package pressure switch without consulting factory.)

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**Warning:** Always wear proper protective eye wear, hearing protection, and other mandated safety clothing and devices when installing compressor packages

**ATTENTION:** All incoming electrical power connections are to be made on the main motor contactor(s) DO NOT attach incoming power wires to package pressure switch. This will result in electrical component damage not covered under warranty.

**NOTICE:** To ensure full compressor tank warranty all tank mounted compressor packages must be mounted on factory supplied vibration isolation pads.

**Notice:** Compressor package should not be mounted to a moving piece of equipment that will be moving while the compressor package is in operation. The compressor package should not be mounted to a piece of equipment that adds additional vibration to the compressor package. The compressor package is only designed to handle its own organic vibration during operation. Failure to follow either one of these guidelines may result in pre-mature failure of compressor package, components and/or personal injury.

**Warning:** Before beginning steps 6-17 verify power supply is off to compressor disconnect, and compressor package

## Step 28

Once compressor has shut down after running unloaded for 10 minutes, open compressor storage tank ball valve to pressurize piping system.

## Step 29

Using either the compressor tank safety relief valve or tank discharge drain, release air pressure until compressor package re-starts from unloaded timer stopping package. (Note: In most cases pressurizing the air piping system releases enough air from the system to re-start the compressor) (Warning: When releasing air from compressor safety relief valve or tank drain DO NOT look at valve or drain.)

## Step 30

Perform function test on compressor package operating system. Using STEP 29, allow the compressor package to build up to maximum operating pressure and unload. Once unloaded release air from the system to cause the compressor package to re-load and compress air. Repeat this process a minimum of 6 times.

## Step 31

Check compressor temperature gauge for current operating temperature. (Note on installation sheet)

## Step 32

Check all compressor air and oil lines for leaks, tighten fittings as needed.

## Step 33

Check compressor tank drain for proper function. If drain has a timer feature, set timer to appropriate setting. Timer operated drains have a test button, use this to test for proper function. (Warning: Never look directly at compressor drain when testing or during drain operation)

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**Warning:** Always wear proper protective eye wear, hearing protection, and other mandated safety clothing and devices when installing compressor packages

**ATTENTION:** All incoming electrical power connections are to be made on the main motor contactor(s) DO NOT attach incoming power wires to package pressure switch. This will result in electrical component damage not covered under warranty.

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**Warning:** Before beginning steps 6-17 verify power supply is off to compressor disconnect, and compressor package

## Step 34

Make sure compressor installation sheet is properly & completely filled out to be sent in for warranty registration.

## Step 35

Go over general operation and maintenance instructions of compressor package with owner and other personal that work around the compressor package. Verify if a maintenance agreement has already been set up or if one needs to be established.

## Step 36

Once steps 1-35 have been completed, turn compressor package off. Allow air end sump pressure to bleed off. (Complete sump depressurization takes approximately 5-10 minutes)

## Step 37

Once sump pressure has bled off, pull sump safety relief valve to verify sump pressure is gone.

## Step 38

Remove air end oil fill cap slowly (If hissing or air is coming out around oil cap, tighten back down and verify sump pressure has been relived). Verify proper oil level in compressor package, add oil as needed.

## Step 39

Turn compressor back on, wipe down surfaces and make sure installation sheet is complete. Compressor is now ready for full operation.

**Notice: Air compressors should only be installed trained installation personnel call 800-531-9656 to find a local trained air compressor service technician**

COMPRESSED AIR SYSTEMS, LLC.

# WARRANTY

C E R T I F I C A T E   O F   L I M I T E D   W A R R A N T Y

## Rotary Screw Compressors

All component parts on this compressor installed by the manufacturer are warranted to be free of defects, workmanship and material for a period of one year. Transportation charges are the responsibility of the purchaser. This warranty extends to the original purchaser of the compressor only.

There are NO express warranties except other than those contained in this limited warranty statement

Covered in the one year period of the warranty are defective parts due to defects in the original part only.

The compressor warranty is void in the cases of abuse, lack of proper service, in correct application, in correct installation, and neglect

Standard compressor warranty covers defective parts and labor for the one year period.

Industrial Electric stationary compressors may be repaired on site as long as the compressor is not located further than 50 miles from the service center. The purchaser is responsible for any additional travel expense past 50 miles from the service center.

Gas/Diesel engine driven compressors must be repaired at the closest service center to the compressor. The purchaser is responsible for any travel expense if they do not wish to bring the compressor to the service center.

ALL "SPECIALTY COMPRESSOR" WARRANTY SERVICE MUST BE PERFORMED AT THE CLOSEST SERVICE CENTER TO THE COMPRESSOR

Specialty compressor-any compressor package with options other than those that apply to the standard model number in the catalog

The compressor "airend" is covered by a 2 year warranty to be free from defects from manufacturing. This does not cover abuse, neglect, improper service, misapplication, or improper installation. An oil sample must be submitted with any airend warranty claim for verification. The purchaser must use only Compressed Air Systems synthetic rotary screw oil in the compressor for the duration of the warranty.

### **Airend- the rotors and bearings of the compressor**

BEFORE WARRANTY SERVICE IS PERFORMED CONTACT MANUFACTURER TECH SUPPORT FOR FASTEST SOLUTION

Warranty labor for the first year is only covered for work performed Monday-Friday 8am-5pm excluding all major US holidays

### **Optional 5 year "airend" warranty**

To be applicable for this option the purchaser must purchase a Full year Rotary Screw compressor service kit at the same time as the compressor and a subsequent kit every year afterwards for a total of 5 kits during the compressor warranty period. The purchaser must use only Compressed Air Systems synthetic rotary screw oil in the compressor for the duration of the warranty.

The warranty covers the "airend" of the compressor for a period of 5 years parts replacement only, from any defect due to manufacturing. The warranty does not cover wear and tear, abuse, neglect, improper service, misapplication, or improper application.

BEFORE WARRANTY SERVICE IS PERFORMED CONTACT MANUFACTURER TECH SUPPORT FOR FASTEST SOLUTION.

**Rotary Screw Compressor Installation Sheet**

Date of Installation \_\_\_\_\_ Compressor Model# \_\_\_\_\_

Installation Company \_\_\_\_\_ Compressor Serial # \_\_\_\_\_

Installation Technician \_\_\_\_\_ Compressor Voltage \_\_\_\_\_

Site Electrical Phase \_\_\_\_\_ Site Voltage L1 \_\_\_\_\_ L2 \_\_\_\_\_ L3 \_\_\_\_\_

Compressor Electrical breaker size \_\_\_\_\_

Incoming Voltage at motor start up L1 \_\_\_\_\_ L2 \_\_\_\_\_ L3 \_\_\_\_\_

Incoming Voltage at max operating pressure L1 \_\_\_\_\_ L2 \_\_\_\_\_ L3 \_\_\_\_\_

Incoming power connected to Magnetic Starter \_\_\_\_\_

Breaker size for the compressor \_\_\_\_\_ AMPS Wire size for the compressor \_\_\_\_\_

Distance from main electric panel \_\_\_\_\_ Disconnect installed at the compressors site \_\_\_\_\_

If Duplex compressor separate disconnects for each drive motor:  Yes  No

Compressor Rotation Correct  Yes  No

Motor amps at Max operating Pressure L1 \_\_\_\_\_ L2 \_\_\_\_\_ L3 \_\_\_\_\_

Compressor Max Operating Pressure \_\_\_\_\_ Compressor tank drain functional \_\_\_\_\_

Unit inspected for Air leaks \_\_\_\_\_ Unit inspected for oil leaks \_\_\_\_\_

Unit location:  Indoors  Outdoors

Unit tank fill time 0-125psi \_\_\_\_\_ (Put N/A if pressure not applicable to installed unit)

Unit tank fill time 0-150psi \_\_\_\_\_ (Put N/A if pressure not applicable to installed unit)

Unit tank fill time 0-175psi \_\_\_\_\_ (Put N/A if pressure not applicable to installed unit)

Unit Cooling Fan (Pulls air through cooler) (Push's air through cooler)

Compressor Temperature switch reading (Before install) \_\_\_\_\_ (After install) \_\_\_\_\_

Unit unloads at max operating pressure and begins to release sump pressure \_\_\_\_\_ -

Belt tension checked:  Yes  No Vibration Pads properly installed:  Yes  No

All installation steps completed:  Yes  No If no, reason: \_\_\_\_\_

Send copy of completed installation sheet to manufacture to begin warranty

Compressed Air Systems, LLC

2626 Skyway Drive

Grand Prairie, TX, 75052



**Compressed Air Systems, LLC**

2626 Skyway Drive

Grand Prairie, TX, 75052

**1-800-531-9656**

Fax 972-352-6364

**Simplicity. It's What We Do.**





# Forced Air Heaters Regular Duty - GE

## Application

Caloritech™ GE fan-forced heater is designed for use in regular duty industrial and commercial space heating applications. This heater features CCI Thermal's robust design which surpasses the standards of most competitive models.

If the environment is particularly demanding, the Caloritech™ GX heater is recommended (see pages C23 and C24, Forced Air Heaters Heavy Duty GX).

Also available are specially equipped 5 kW barn heaters which have been approved by Manitoba Hydro for use in buildings housing livestock.

## Designed for Application in Non-Hazardous Environments

- factories
- parking garages
- arenas
- mechanical rooms
- warehouses
- boiler rooms
- grandstands
- mall display areas, stores

## Features

- 2 kW to 40 kW output
- 208V to 600V, 1 or 3 phase
- field convertible from 1 to 3 phase
- tubular heating elements
- adjustable air flow louvres
- permanently lubricated motors
- overheat protection
- phosphate coated
- epoxy painted (ASA61 Grey)
- optional thermostats and controls
- optional wall bracket
- motors mounted outside element bundle
- ceiling mounting bracket supplied



## Motors

- 2 - 10 kW heaters are standard with dual rated motors; 208/240V single phase. Where necessary, transformers are used to provide proper motor voltage.
- 15 - 40 kW heaters are standard with single phase full voltage rated motors.
- standard motors have permanently lubricated bearings and built-in thermal overloads.
- totally enclosed ball bearing motors are standard.
- motor RPM - 1550 unless otherwise stated.
- motor HP
  - 2 to 10 kW - 1/20 HP
  - 15 to 40 kW - 1/10 HP
  - other ratings available, check factory.

## Contactors and Transformers

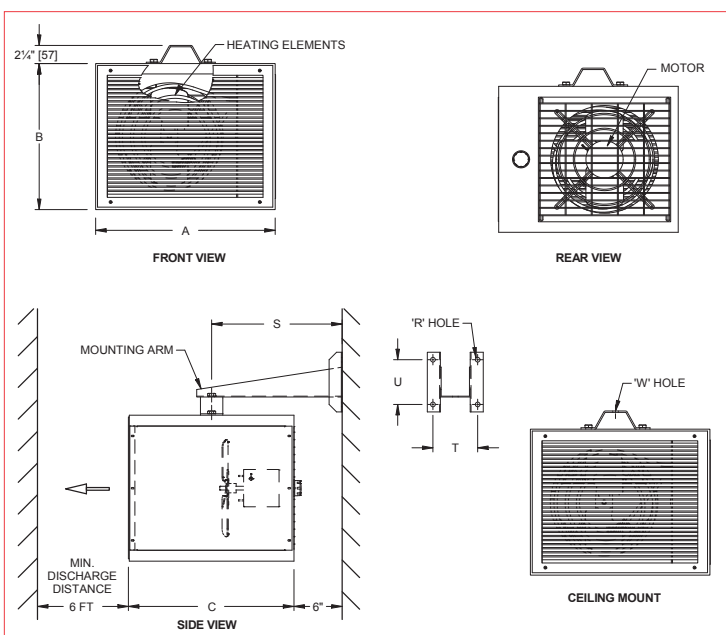
- factory installed contactors are available when required.
- transformers are standard when primary voltage is not suitable for motor operation or contactor coil ratings.
- standard control voltage is 240V.

Table 1 - Heater & Bracket Dimensions

Dim.	2-10 kW		15-40 kW	
	in.	mm	in.	mm
A	17	432	24	610
B	14	356	19 1/2	495
C (Depth)	15 1/2	394	22	559
R (Hole dia.)	1/2	13	5/8	16
S	12 1/2	318	17 1/2	445
T	4 1/2	114	6	152
U	4 1/2	114	6	152
W (Hole dia.)	3/4	19	3/4	19

Table 2 - Installation Height & Heater Weight

kW	Recommended Mounting Height - ft (m)	Heater Weight lbs (kg)
2 - 10	6 - 8 (1.8 - 2.4)	38 (17)
15 - 40	8 - 12 (2.4 - 3.0)	88 (40)



## Specifications

kW (Btu/hr)	Voltage	Phase	CFM	m <sup>3</sup> /min	Temperature Rise		Motor Volts	Catalog Number			
					°F	°C		Basic Unit	Basic Unit with:		
									Contactor	Thermostat (1 phase only)	Contactors & Thermostat
2 (6824)	208	1 or 3	460	13	14	8	208/240	GE022	GE022C	GE022T	GE022CT
	240	1						GE023	GE023C	GE023T	GE023CT
3 (10236)	208	1 or 3	465	13	21	12	208/240	GE032	GE032C	GE032T	GE032CT
	240	1						GE033	GE033C	GE033T	GE033CT
	600	1 or 3						GE038	GE038C	GE038T	GE038CT
4 (13648)	208	1 or 3	475	14	28	16	208/240	GE042	GE042C	GE042T	GE042CT
	240	1						GE043	GE043C	GE043T	GE043CT
	480	1 or 3						GE047	GE047C	GE047T	GE047CT
	600	1 or 3						GE048	GE048C	GE048T	GE048CT
5 (17060)	208	1 or 3	480	14	40	22	208/240	GE052	GE052C	GE052T	GE052CT
	240	1						GE053	GE053C	GE053T	GE053CT
	480	1 or 3						GE057	GE057C	GE057T	GE057CT
	600	1 or 3						GE058	GE058C	GE058T	GE058CT
5 (17060)	208	1	550	16	35	20	208/240	–	–	GE052T/GX*	–
	240	1						–	–	GE053T/GX*	–
7.5 (25590)	208	1 or 3	590	17	43	24	208/240	GE072	GE072C	–	GE072CT
	240							GE073	GE073C	–	GE073CT
	480							GE077	GE077C	–	GE077CT
	600							GE078	GE078C	–	GE078CT
10 (34120)	208	1 or 3	760	22	45	25	208/240	GE102	GE102C	–	GE102CT
	240							GE103	GE103C	–	GE103CT
	480							GE107	GE107C	–	GE107CT
	600							GE108	GE108C	–	GE108CT
15 (51180)	208	1 or 3	1040	29	50	28	208	GE152	GE152C	–	GE152CT
	240						GE153	GE153C	–	GE153CT	
	480						GE157	GE157C	–	GE157CT	
	600						GE158	GE158C	–	GE158CT	
20 (68240)	208	1 or 3	1260	37	55	31	208	GE202	GE202C	–	GE202CT
	240						GE203	GE203C	–	GE203CT	
	480						GE207	GE207C	–	GE207CT	
	600						GE208	GE208C	–	GE208CT	
25 (85300)	208	1 or 3	1500	43	61	34	208	GE252	GE252C	–	GE252CT
	480						GE257	GE257C	–	GE257CT	
	600						GE258	GE258C	–	GE258CT	
	480						GE307	GE307C	–	GE307CT	
30 (102360)	480	1 or 3	1500	43	70	39	480	GE308	GE308C	–	GE308CT
	600						480	GE407	GE407C	–	GE407CT
40 (136480)	480	1 or 3	1500	43	80	44	480	GE407	GE407C	–	GE407CT
	600	1					600	GE408	GE408C	–	GE408CT

**Note:**

\* Barn Heaters: Approved by Manitoba Hydro for use in buildings housing livestock:  
c/w low watt density elements, manual reset high limit, built-in thermostat.

### Optional Factory Installed Features

- built-in thermostat 41°F to 100°F (5°C to 38°C)
- fused control circuit
- manual reset high limit
- “Fan Only” switch
- low voltage relay for remote 24V thermostat
- epoxy painted fan blade and motor
- special wattages and voltages
- special control voltages (standard is 240V)
- available in special finishes

### Accessories For Field Installation

- FAT8 thermostat kit 41°F to 100°F (5°C to 38°C)
- WB210 wall mount bracket (2 to 10 kW)
- WB1540 wall mount bracket (15 to 40 kW)
- line voltage and low voltage thermostats

### To Order Specify

Catalog number, voltage, phase, kilowatts, optional features, and accessories.



**MERCER VALVE CO., INC.**  
AUTO SEAT TECHNOLOGY®

INSTRUMENTS • CONTROLS • VALVES

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## 9100 SERIES Threaded



MERCER VALVE

**THINK...MERCER FIRST™**







## **9100 Series Threaded Product Overview**

The Mercer Valve 9100 Series Pressure Relief Valve is "State of the Art" in soft seat, high flow rate, pressure relieving devices. The 9100 Series is a continuation of the 8100 Series, incorporating our patented **Auto Seat Technology®** into its design. Mercer Valve's **Auto Seat Technology®** has made the 9100 Series an industry leader with its reliable, repeatable set pressures. The patented soft seat design and fully guided disk allow the valve to continually outlast the competition. The soft seat 9100 Series has a field-proven lip seal design, which allows for a tighter seal up to set pressure. This tight seal reduces leaks and limits product loss.



The 9100 Series is manufactured in accordance with the requirements of ASME Boiler and Pressure Vessel Code, Section VIII, Division 1 for Air/Gas and Liquid service. The 9100 Series is well suited for specialty gases, compressors, separators, transmission, gathering lines and other production processes.

### **9100 Series Threaded Features**

- **Designed with Auto Seat Technology®.**
- **Consistent Set Pressures allowing repeatable uses without repair or resetting.**
- **Open, Close, Seat and Seal™.**
- **Fully guided disk keeps the disk properly aligned, opening and closing, helping to reseal the valve.**
- **Mechanical Stop prevents wear on parts and controls valve lift.**
- **Low rated and fully guided spring allows for more consistent set pressures from pop to pop.**
- **Pop Action relief allows valve to go to full lift at set pressure. Helps with DOT regulated applications.**
- **Built in accordance with the requirements of ASME Boiler and Pressure Vessel Code. Sec. VIII Div 1.**
- **Non-rising stems allowing valves to be installed in small areas.**



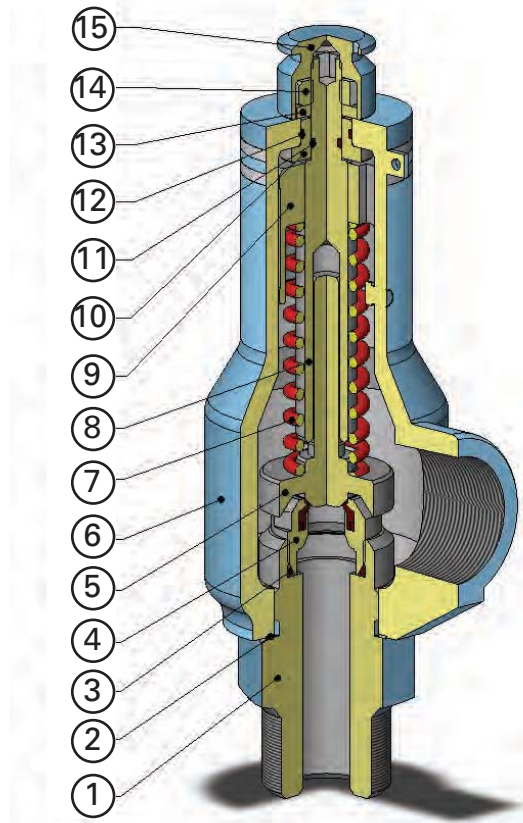
## 9100 Series Threaded Specifications

Orifice Letter	C	D	E	F	G	H	J	K
<b>Standard Inlet Sizes</b>	1/2", 3/4", 1"	3/4", 1"	3/4", 1"	1 1/2", 2"	1 1/2", 2"	1 1/2", 2"	2", 3"	3"
<b>Inlet and Outlet Connection Types Available</b>	Male NPT x Female NPT or Female NPT x Female NPT							
<b>Actual Orifice Diameter (in)</b>	.281	.394	.520	.655	.775	1.050	1.350	1.625
<b>Actual Orifice Area (in<sup>2</sup>)</b>	.062	.122	.212	.337	.472	.865	1.430	2.074
<b>API Orifice Area (in<sup>2</sup>)</b>	---	.110	.196	.307	.503	.785	1.287	1.838
<b>Pressure Ranges (psi)</b>	15 to 2999	15 to 2999	15 to 2400	15 to 2400	15 to 2000	15 to 2000	15 to 800	15 to 750
<b>Standard Temperature Range (°F)</b>	-20 to 400	-20 to 400	-20 to 400	-20 to 400	-20 to 400	-20 to 400	-20 to 400	-20 to 400
<b>ASME Flow Coefficient, K<sub>d</sub> (Gas)</b>	.818	.818	.818	.818	.818	.818	.818	.818
<b>ASME Flow Coefficient, K<sub>d</sub> (Liquid)</b>	.707	.707	.707	.707	.707	.707	.707	.707

**NOTE: Mercer Valve reserves the right to change product designs and specifications without notice.**



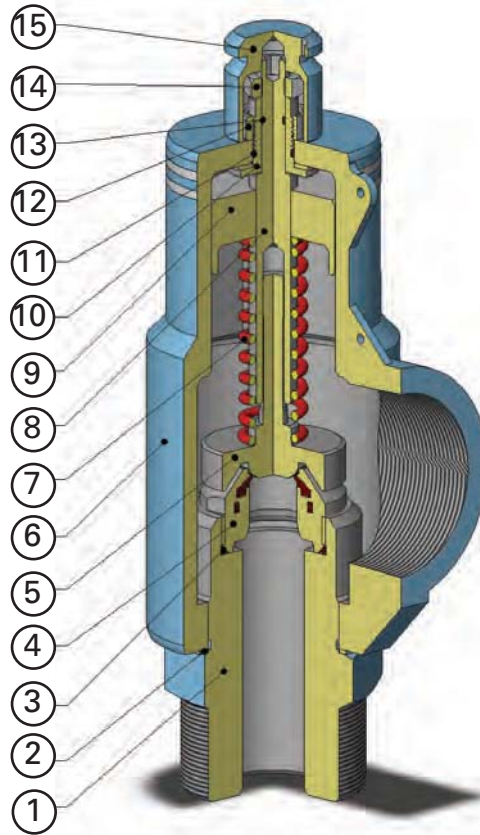
## 9100 Series Threaded Parts and Materials



### 9100 SERIES THREADED C , D , & E ORIFICES

ITEM NO	PART NAME	STANDARD MATERIALS
1	INLET BASE	CARBON STEEL
2	BASE SEAL	SOFT STEEL
3	NOZZLE O-RING	VITON
4	NOZZLE SUBASSEMBLY	STAINLESS STEEL WITH SOFT SEAT
5	DISK SUBASSEMBLY	STAINLESS STEEL
6	BODY SUBASSEMBLY	CARBON STEEL
7	SET SPRING	STAINLESS STEEL
8	ADJUSTMENT SCREW	STAINLESS STEEL
9	ADJUSTMENT BUSHING	STAINLESS STEEL
10	CENTER BUSHING	STAINLESS STEEL
11	ADJUSTMENT SCREW O-RING	BUNA N
12	CENTER BUSHING O-RING	BUNA N
13	WASHER	CARBON STEEL
14	LOCKNUT	CARBON STEEL
15	CLOSED CAP	ALUMINUM ALLOY

*NOTE: Mercer Valve reserves the right to change product designs and specifications without notice.*

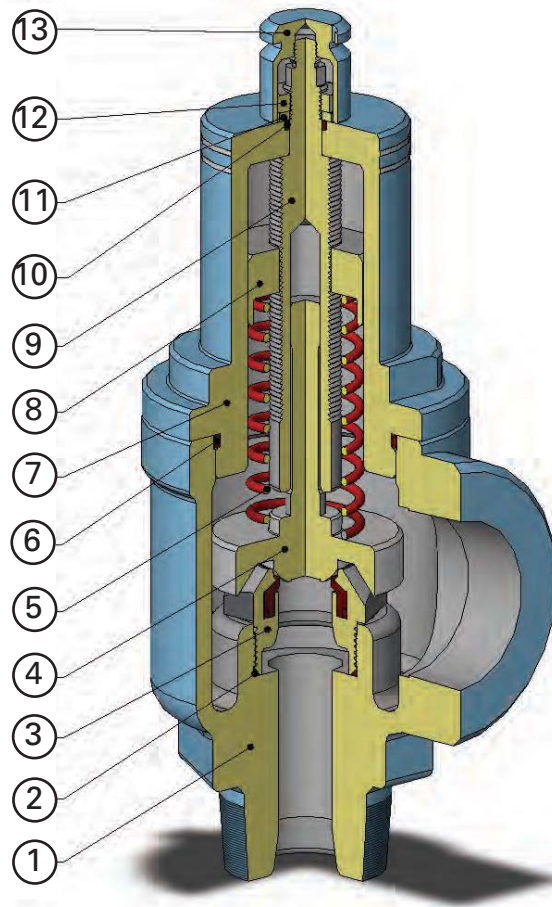


### 9100 SERIES THREADED F & G ORIFICES

ITEM NO	PART NAME	STANDARD MATERIALS
1	INLET BASE	CARBON STEEL
2	BASE SEAL	SOFT STEEL
3	NOZZLE O-RING	VITON
4	NOZZLE SUBASSEMBLY	STAINLESS STEEL WITH SOFT SEAT
5	DISK SUBASSEMBLY	STAINLESS STEEL
6	BODY SUBASSEMBLY	CARBON STEEL
7	SET SPRING	STAINLESS STEEL
8	ADJUSTMENT SCREW	STAINLESS STEEL
9	ADJUSTMENT BUSHING	STAINLESS STEEL
10	CENTER BUSHING	STAINLESS STEEL
11	CENTER BUSHING O-RING	BUNA N
12	CENTER NUT	CARBON STEEL
13	ADJUSTMENT SCREW O-RING	BUNA N
14	LOCKNUT	CARBON STEEL
15	CLOSED CAP	ALUMINUM ALLOY

*NOTE: Mercer Valve reserves the right to change product designs and specifications without notice.*

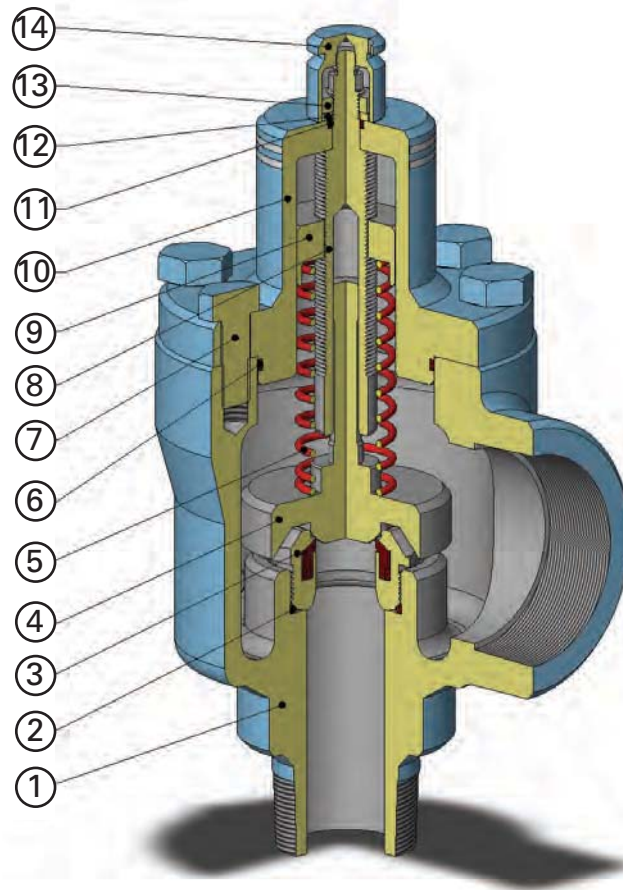




**9100 SERIES THREADED H ORIFICE**

ITEM NO	PART NAME	STANDARD MATERIALS
1	BODY SUBASSEMBLY	CARBON STEEL
2	NOZZLE O-RING	VITON
3	NOZZLE SUBASSEMBLY	STAINLESS STEEL WITH SOFT SEAT
4	DISK SUBASSEMBLY	STAINLESS STEEL
5	SET SPRING	STAINLESS STEEL
6	BONNET O-RING	BUNA N
7	BONNET	CARBON STEEL
8	ADJUSTMENT BUSHING	STAINLESS STEEL
9	ADJUSTMENT SCREW	STAINLESS STEEL
10	ADJUSTMENT SCREW O-RING	BUNA N
11	WASHER	CARBON STEEL
12	LOCKNUT	CARBON STEEL
13	CLOSED CAP	ALUMINUM ALLOY

*NOTE: Mercer Valve reserves the right to change product designs and specifications without notice.*



### 9100 SERIES THREADED J & K ORIFICES

ITEM NO	PART NAME	STANDARD MATERIALS
1	BODY SUBASSEMBLY	CARBON STEEL
2	NOZZLE O-RING	VITON
3	NOZZLE SUBASSEMBLY	STAINLESS STEEL WITH SOFT SEAT
4	DISK SUBASSEMBLY	STAINLESS STEEL
5	SET SPRING	STAINLESS STEEL
6	BONNET O-RING	BUNA N
7	BONNET BOLTS	ALLOY STEEL
8	ADJUSTMENT SCREW	STAINLESS STEEL
9	ADJUSTMENT BUSHING	STAINLESS STEEL
10	BONNET SUBASSEMBLY	CARBON STEEL
11	ADJUSTMENT SCREW O-RING	BUNA N
12	WASHER	CARBON STEEL
13	LOCKNUT	CARBON STEEL
14	CLOSED CAP	ALUMINUM ALLOY

*NOTE: Mercer Valve reserves the right to change product designs and specifications without notice.*



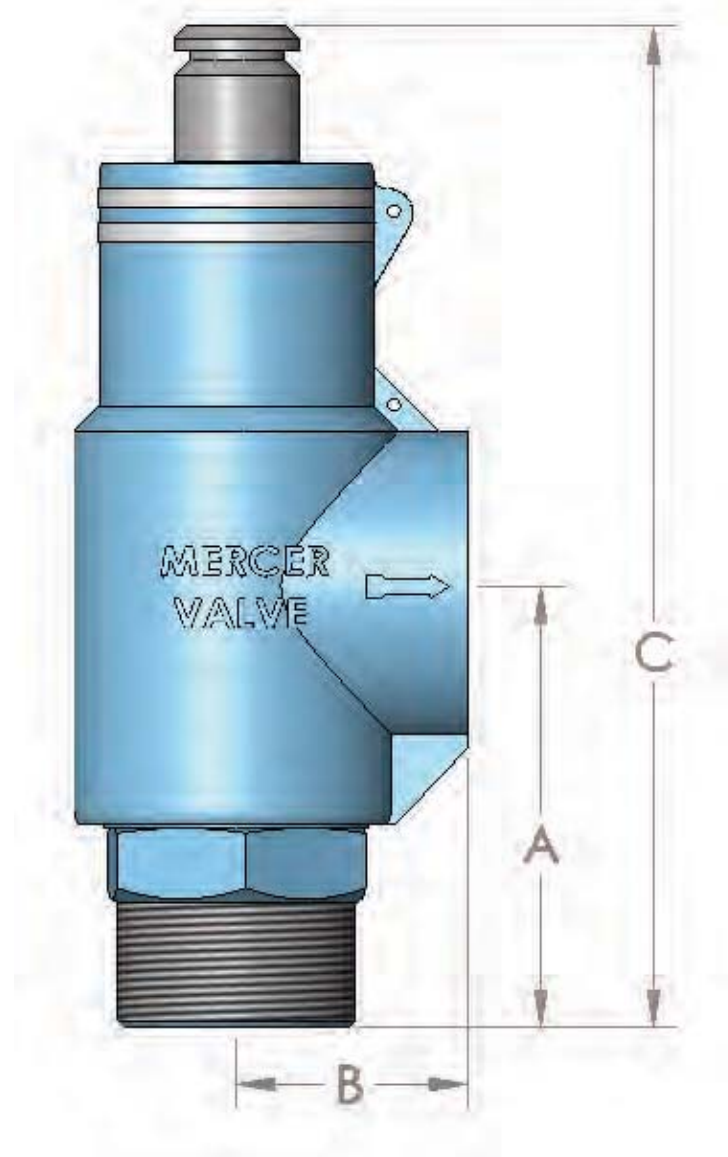
<b>INLET AND OUTLET CODE</b>	<b>INLET AND OUTLET SIZE</b>	<b>ORIFICE AVAILABLE</b>	<b>PRESSURE LIMIT (psi)</b>	<b>DIMENSIONS "A" X "B" X "C" (IN.) + 1/16</b>	<b>APPROX. WEIGHT (lbs.)</b>
05	1/2" FNPT x 1" FNPT	C	15 - 2999	2-1/4 x 1-7/8 x 7-1/16	4.5
06	1/2" MNPT x 1" FNPT	C	15 - 2999	3-1/4 x 1-7/8 x 8	4.5
11	3/4" FNPT x 1" FNPT	C, D	15 - 2999	2-1/4 x 1-7/8 x 7-1/16	4.5
11	3/4" FNPT x 1" FNPT	E	15 - 2400	2-1/4 x 1-7/8 x 7-1/16	4.5
12	3/4" MNPT x 1" FNPT	C, D	15 - 2999	3-1/4 x 1-7/8 x 8	4.5
12	3/4" MNPT x 1" FNPT	E	15 - 2400	3-1/4 x 1-7/8 x 8	4.5
16	1" FNPT x 1" FNPT	C, D	15 - 2999	3-1/4 x 1-7/8 x 8	4.5
16	1" FNPT x 1" FNPT	E	15 - 2400	3-1/4 x 1-7/8 x 8	4.5
17	1" MNPT x 1" FNPT	C, D	15 - 2999	3-1/4 x 1-7/8 x 8	4.5
17	1" MNPT x 1" FNPT	E	15 - 2400	3-1/4 x 1-7/8 x 8	4.5
22	1" FNPT x 1 1/2" FNPT	C, D	15 - 2999	3-3/8 x 2-3/8 x 9	10.5
22	1" FNPT x 1 1/2" FNPT	E	15 - 2400	3-3/8 x 2-3/8 x 9	10.5
23	1" MNPT x 1 1/2" FNPT	C, D	15 - 2999	4-1/2 x 2-3/8 x 9-5/8	11
23	1" MNPT x 1 1/2" FNPT	E	15 - 2400	4-1/2 x 2-3/8 x 9-5/8	11
27	1" FNPT x 2" FNPT	C, D	15 - 2999	3-3/8 x 2-3/8 x 9	10.5
27	1" FNPT x 2" FNPT	E	15 - 2400	3-3/8 x 2-3/8 x 9	10.5
28	1" MNPT x 2" FNPT	C, D	15 - 2999	4-1/2 x 2-3/8 x 9-5/8	11
28	1" MNPT x 2" FNPT	E	15 - 2400	4-1/2 x 2-3/8 x 9-5/8	11
33	1 1/2" FNPT x 2" FNPT	F	15 - 2400	4-5/8 x 2-3/8 x 10-5/16	11.5
33	1 1/2" FNPT x 2" FNPT	G	15 - 2000	4-5/8 x 2-3/8 x 10-5/16	11.5
34	1 1/2" MNPT x 2" FNPT	F	15 - 2400	4-7/16 x 2-3/8 x 10-1/16	11
34	1 1/2" MNPT x 2" FNPT	G	15 - 2000	4-7/16 x 2-3/8 x 10-1/16	11
33	1 1/2" FNPT x 2" FNPT	H	15 - 850	3 x 3 x 10-3/4	22
34	1 1/2" MNPT x 2" FNPT	H	15 - 850	4-1/4 x 3 x 12	22.5
42	2" FNPT x 2" FNPT	F	15 - 2400	4-5/8 x 2-3/8 x 10-5/16	12
42	2" FNPT x 2" FNPT	G	15 - 2000	4-5/8 x 2-3/8 x 10-5/16	12
43	2" MNPT x 2" FNPT	F	15 - 2400	4-7/16 x 2-3/8 x 10-1/16	12
43	2" MNPT x 2" FNPT	G	15 - 2000	4-7/16 x 2-3/8 x 10-1/16	12
42	2" FNPT x 2" FNPT	H	15 - 850	3 x 3 x 10-3/4	22
43	2" MNPT x 2" FNPT	H	15 - 850	4-1/4 x 3 x 12	23
46	2" FNPT x 2 1/2" FNPT	H	15 - 850	3 x 3 x 10-3/4	22
46	2" FNPT x 2 1/2" FNPT	H	851 - 2000	3 x 3 x 13-1/8	28
47	2" MNPT x 2 1/2" FNPT	H	15 - 850	4-1/4 x 3 x 12	23
47	2" MNPT x 2 1/2" FNPT	H	851 - 2000	4-1/4 x 3 x 14-1/2	29



**9100 SERIES THREADED SAFETY RELIEF VALVES**

INLET AND OUTLET CODE	INLET AND OUTLET SIZE	ORIFICE AVAILABLE	PRESSURE LIMIT (psi)	DIMENSIONS "A" X "B" X "C" (IN.) + 1/16	APPROX. WEIGHT (lbs.)
51	2" FNPT x 3" FNPT	J	15 – 450	3-3/4 x 4-1/4 x 11-3/4	41
51	2" FNPT x 3" FNPT	J	451 – 800	3-3/4 x 4-1/4 x 15-5/16	52
52	2" MNPT x 3" FNPT	J	15 – 450	5-1/2 x 4-1/4 x 13-3/8	42
52	2" MNPT x 3" FNPT	J	451 – 800	5-1/2 x 4-1/4 x 17-1/16	53
61	3" MNPT x 3" FNPT	J	15 – 450	5-1/2 x 4-1/4 x 13-1/2	44
61	3" MNPT x 3" FNPT	J	451 – 800	5-1/2 x 4-1/4 x 17-1/4	55
61	3" MNPT x 3" FNPT	K	15 – 285	5-1/2 x 4-1/4 x 13-1/2	46
61	3" MNPT x 3" FNPT	K	286 - 750	5-1/2 x 4-1/4 x 17-1/4	57

**NOTE: Mercer Valve reserves the right to change product designs and specifications without notice.**



**CAPACITY IN SCFM OF AIR AT 60°F AND STD ATMOSPHERIC CONDITIONS**

<b>Set Pressure (psi)</b>	<b>C 0.062</b>	<b>D 0.122</b>	<b>E 0.212</b>	<b>F 0.337</b>	<b>G 0.472</b>	<b>H 0.865</b>	<b>J 1.43</b>	<b>K 2.074</b>
<b>15</b>	30	60	104	165	231	424	701	1017
<b>20</b>	35	69	120	191	267	489	808	1172
<b>25</b>	40	78	136	216	302	554	916	1328
<b>30</b>	44	87	152	241	338	619	1023	1483
<b>50</b>	65	128	222	352	493	904	1495	2168
<b>75</b>	90	178	309	491	688	1261	2084	3023
<b>100</b>	116	228	396	630	883	1617	2674	3878
<b>125</b>	141	278	484	769	1077	1974	3264	4733
<b>150</b>	167	329	571	908	1272	2331	3853	5589
<b>200</b>	218	429	746	1186	1661	3044	5033	7299
<b>300</b>	320	631	1096	1742	2440	4471	7391	10720
<b>400</b>	423	832	1445	2298	3218	5898	9750	14141
<b>500</b>	525	1033	1795	2854	3997	7324	12109	17562
<b>600</b>	627	1234	2145	3409	4775	8751	14467	20983
<b>700</b>	730	1435	2494	3965	5554	10178	16826	24403
<b>800</b>	832	1637	2844	4521	6332	11605	19185	
<b>900</b>	934	1838	3194	5077	7111	13031		
<b>1000</b>	1036	2039	3544	5633	7889	14458		
<b>1100</b>	1139	2240	3893	6189	8668	15885		
<b>1250</b>	1292	2542	4418	7022	9836	18025		
<b>1500</b>	1548	3045	5292	8412	11782	21592		
<b>2000</b>	2059	4051	7040	11191	15675	28726		
<b>2400</b>	2468	4856	8439	13415				
<b>2600</b>	2673	5259						
<b>2800</b>	2877	5661						
<b>2999</b>	3081	6062						



**9100 SERIES THREADED SAFETY RELIEF VALVES**

**CAPACITY IN SCFM OF 0.6 SG NATURAL GAS AT 60°F AND STD ATMOSPHERIC CONDITIONS**

<b>Set Pressure (psi)</b>	<b>C 0.062</b>	<b>D 0.122</b>	<b>E 0.212</b>	<b>F 0.337</b>	<b>G 0.472</b>	<b>H 0.865</b>	<b>J 1.43</b>	<b>K 2.074</b>
<b>15</b>	38	75	130	206	289	529	875	1269
<b>20</b>	44	86	150	238	333	610	1008	1463
<b>25</b>	50	97	169	269	377	691	1142	1657
<b>30</b>	55	109	189	301	421	772	1276	1851
<b>50</b>	81	159	276	439	615	1128	1864	2704
<b>75</b>	113	222	385	613	858	1573	2600	3771
<b>100</b>	145	285	495	786	1101	2018	3336	4838
<b>125</b>	177	347	604	959	1344	2463	4071	5905
<b>150</b>	208	410	713	1133	1587	2908	4807	6972
<b>200</b>	272	536	931	1480	2072	3798	6278	9105
<b>300</b>	400	787	1367	2173	3043	5577	9220	13373
<b>400</b>	527	1038	1803	2866	4015	7357	12163	17640
<b>500</b>	655	1289	2239	3560	4986	9137	15105	21908
<b>600</b>	782	1540	2676	4253	5957	10917	18048	26175
<b>700</b>	910	1791	3112	4947	6928	12697	20990	30443
<b>800</b>	1038	2042	3548	5640	7899	14477	23932	
<b>900</b>	1165	2293	3984	6333	8871	16256		
<b>1000</b>	1293	2544	4420	7027	9842	18036		
<b>1100</b>	1420	2795	4857	7720	10813	19816		
<b>1250</b>	1612	3171	5511	8760	12270	22486		
<b>1500</b>	1931	3799	6602	10494	14698	26935		
<b>2000</b>	2568	5054	8783	13961	19554	35835		
<b>2400</b>	3079	6058	10527	16735				
<b>2600</b>	3334	6560						
<b>2800</b>	3589	7062						
<b>2999</b>	3843	7562						



**CAPACITY IN MMSCFD OF 0.6 SG NATURAL GAS AT 60°F AND STD ATMOSPHERIC CONDITIONS**

<b>Set Pressure (psi)</b>	<b>C 0.062</b>	<b>D 0.122</b>	<b>E 0.212</b>	<b>F 0.337</b>	<b>G 0.472</b>	<b>H 0.865</b>	<b>J 1.43</b>	<b>K 2.074</b>
<b>15</b>	0.05	0.11	0.19	.030	0.42	0.76	1.26	1.83
<b>20</b>	0.06	0.12	0.22	0.34	0.48	0.88	1.45	2.11
<b>25</b>	0.07	0.14	0.24	0.39	0.54	0.99	1.64	2.39
<b>30</b>	0.08	0.16	0.27	0.43	0.61	1.11	1.84	2.66
<b>50</b>	0.12	0.23	0.40	0.63	0.89	1.62	2.68	3.89
<b>75</b>	0.16	0.32	0.56	0.88	1.24	2.26	3.74	5.43
<b>100</b>	0.21	0.41	0.71	1.13	1.59	2.91	4.80	6.97
<b>125</b>	0.25	0.50	0.87	1.38	1.94	3.55	5.86	8.50
<b>150</b>	0.30	0.59	1.03	1.63	2.28	4.19	6.92	10.04
<b>200</b>	0.39	0.77	1.34	2.13	2.98	5.47	9.04	13.11
<b>300</b>	0.58	1.13	1.97	3.13	4.38	8.03	13.28	19.26
<b>400</b>	0.76	1.49	2.60	4.13	5.78	10.59	17.51	25.40
<b>500</b>	0.94	1.86	3.22	5.13	7.18	13.16	21.75	31.55
<b>600</b>	1.13	2.22	3.85	6.12	8.58	15.72	25.99	37.69
<b>700</b>	1.31	2.58	4.48	7.12	9.98	18.28	30.23	43.84
<b>800</b>	1.49	2.94	5.11	8.12	11.38	20.85	34.46	
<b>900</b>	1.68	3.30	5.74	9.12	12.77	23.41		
<b>1000</b>	1.86	3.66	6.37	10.12	14.17	25.97		
<b>1100</b>	2.05	4.02	6.99	11.12	15.57	28.54		
<b>1250</b>	2.32	4.57	7.94	12.62	17.67	32.38		
<b>1500</b>	2.78	5.47	9.51	15.11	21.17	38.79		
<b>2000</b>	3.70	7.28	12.65	20.10	28.16	51.60		
<b>2400</b>	4.43	8.72	15.16	24.10				
<b>2600</b>	4.80	9.45						
<b>2800</b>	5.17	10.17						
<b>2999</b>	5.53	10.89						



**9100 SERIES THREADED SAFETY RELIEF VALVES**

**CAPACITY IN GPM WATER AT 60°F AND STD ATMOSPHERIC CONDITIONS**

Set Pressure (psi)	C 0.062	D 0.122	E 0.212	F 0.337	G 0.472	H 0.865	J 1.43	K 2.074
15	7	14	24	38	54	99	163	236
20	8	16	27	43	61	111	184	267
25	9	17	30	48	67	123	203	295
30	10	19	33	52	73	133	221	320
50	12	24	42	67	94	172	285	413
75	15	30	52	82	115	211	349	506
100	17	34	60	95	133	244	403	584
125	20	38	67	106	149	272	450	653
150	21	42	73	116	163	299	493	716
200	25	49	84	134	188	345	570	826
300	30	60	103	164	230	422	698	1012
400	35	69	119	190	266	487	806	1169
500	39	77	134	212	297	545	901	1307
600	43	84	146	233	326	597	987	1431
700	46	91	158	251	352	645	1066	1546
800	49	97	169	269	376	689	1140	
900	52	103	179	285	399	731		
1000	55	109	189	300	421	771		
1100	58	114	198	315	441	808		
1250	62	122	211	336	470	862		
1500	68	133	231	368	515	944		
2000	78	154	267	425	595	1090		
2400	86	168	293	465				
2600	89	175						
2800	92	182						
2999	96	188						





## 9100 Series Threaded Product Numbering System

**91 - 17 D 5 1**

**VALVE SERIES**

91 – 9100 Series

**INLET & OUTLET COMBINATION**

(See Selection Table on pages 8 & 9)

**ORIFICE SIZE**

C to K

**INLET BASE & BODY MATERIAL**

**5** – CARBON STEEL/WCB  
CARBON STEEL

**6** – 316 STNLS STL/WCB  
CARBON STEEL

**7** – 316 STNLS STL/CF3M  
STAINLESS STEEL

**CAP TYPE**

**1** – CLOSED CAP

**2** – OPEN LIFT LEVER

**3** – CLOSED LIFT LEVER

**4** – CLOSED CAP W/STAINLESS STEEL BONNET (H - K ORIFICE)

**5** – OPEN LIFT LEVER W/STAINLESS STEEL BONNET (H - K ORIFICE)

**6** – CLOSED LIFT LEVER W/STAINLESS STEEL BONNET (H - K ORIFICE)

CONSULT FACTORY FOR  
ADDITIONAL INFORMATION  
AND OPTIONS

**NOTE: Mercer Valve reserves the right to change product designs and specifications without notice.**



**2 - DIGIT "SPECIAL" CODE**  
(IF APPLICABLE ASSIGNED BY MERCER)

**O-RING MATERIAL**

**1** - STANDARD O-RINGS  
(VITON & BUNA-N)

**TRIM CODES**

**U** - 316 S.S. DISK & NOZZLE (STD GAS SERVICE F,G,H,J,&K ORIFICES)\*

**I** - 17-4 S.S. DISK & NOZZLE (STD GAS SERVICE D&E ORIFICES)

**C** - 440C S.S. DISK, 17-4 S.S. NOZZLE (STD GAS SERVICE C ORIFICE AND HIGH PRESSURE F,G,H,)\*

**L** - LIQUID SERVICE 316 S.S. DISK & NOZZLE

**N** - SOUR GAS SERVICE 316 S.S. DISK & NOZZLE

**B** - SOUR LIQUID SERVICE 316 S.S. DISK & NOZZLE

**SPRING CODE**  
(ASSIGNED BY MERCER)

**SEAT MATERIAL**

**V** - VITON 90 DURO

**T** - 15% GLASS FILLED TEFLON

**P** - VIRGIN PEEK

\* = U TRIM CODE CHANGES TO C TRIM CODE AT  
F > 1399psi, G > 1199psi, H > 1049psi



**INSTRUMENTS • CONTROLS • VALVES**

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SINCE 1954  
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3317 Gilmore Industrial Blvd.  
Louisville, KY 40213

Ph: (502) 966-3134  
Fx: (502) 966-3135

## **9100 SERIES CATALOG**

### **CORPORATE HEADQUARTERS**

9609 NW 4th STREET  
OKLAHOMA CITY, OK 73127  
1-800-833-6402  
PHONE: (405) 495-6533, FAX: (405) 495-8728  
[SALES@MERCERVALVE.NET](mailto:SALES@MERCERVALVE.NET)

### **HOUSTON BRANCH OFFICE**

6218 LONG DRIVE  
HOUSTON, TX 77087  
1-866-833-6402  
PHONE: (713) 242-6960, FAX: (713) 242-6963  
[HOUSTON@MERCERVALVE.NET](mailto:HOUSTON@MERCERVALVE.NET)

### **CALGARY BRANCH OFFICE**

#203, 2835 23rd St. NE  
CALGARY, ALBERTA T2E 7A4  
PHONE: (403) 250-5557, FAX: (403) 250-5661  
[CANADA@MERCERVALVE.NET](mailto:CANADA@MERCERVALVE.NET)

### **BRIDGEPORT, TX BRANCH OFFICE**

5758 US Highway 380  
BRIDGEPORT, TX 76426-6421  
1-866-683-9002  
PHONE: (940) 683-9002, FAX: (940) 683-9004  
[BRIDGEPORT@MERCERVALVE.NET](mailto:BRIDGEPORT@MERCERVALVE.NET)

### **CHICAGO BRANCH OFFICE CUSTOMER RELATIONS DEPARTMENT**

P.O. Box 597  
Libertyville, IL 60048  
1-800-833-6402  
[CHICAGO@MERCERVALVE.NET](mailto:CHICAGO@MERCERVALVE.NET)

**WWW.MERCERVALVE.NET**



## Features

- Welded core tube provides higher pressure ratings
- Reliable, proven design with high flows
- Small poppet valves for tight shutoff
- Wide range of elastomers for specialty service applications
- Mountable in any position
- Tapped mounting holes in body standard

## Construction

Valve Parts in Contact with Fluids		
Body	Brass	Cast 304 Stainless Steel
Seals and Discs	NBR or Cast UR	
Core Tube	305 Stainless Steel	
Core and Plugnut	430F Stainless Steel	
Springs	302 Stainless Steel	
Shading Coil	Copper	Silver

## Electrical

Watt Rating and Power Consumption				Spare Coil Part No.			
DC Watts	AC			General Purpose		Explosionproof	
	Watts	VA Holding	VA Inrush	AC	DC	AC	DC
10.6	6.1*	16	30	238210	238510	238214	238514
18.6	9.1*	20	45	238210	238510	238214	238514
11.6	10.1	25	50	238610	238910	238614	238914
22.6	17.1	40	70	238610	238910	238614	238914

**Standard Voltages:** 24, 120, 240, 480 volts AC, 60 Hz (or 110, 220 volts AC, 50 Hz).  
 6, 12, 24, 120, 240 volts DC. Must be specified when ordering.  
 Other voltages available when required.

\*On 50 hertz service, the rating for the 6.1/F solenoid is 8.1 watts, and the rating for the 9.1/F solenoid is 11.1 watts.

## Solenoid Enclosures

**Standard:** Watertight, Types 1, 2, 3, 3S, 4, and 4X.

**Optional:** Explosionproof and Watertight, Types 3, 3S, 4, 4X, 6, 6P, 7, and 9.  
 (To order, add prefix "EF" to catalog number)

See *Optional Features Section* for other available options.

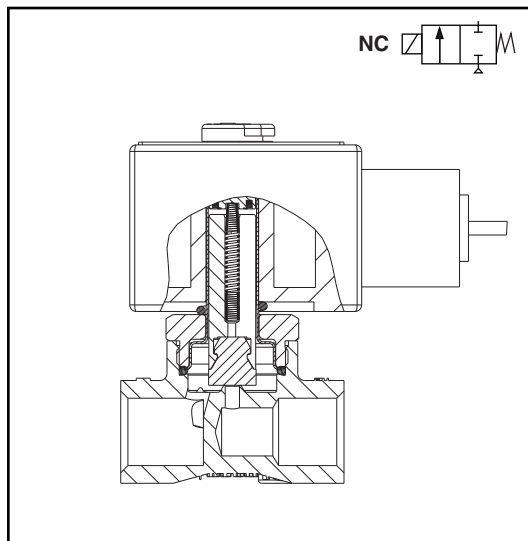
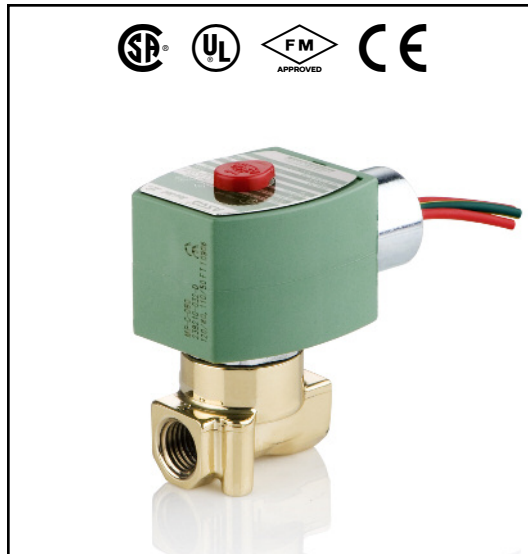
## Options

- Mounting bracket (suffix MB)
- Quarter-turn manual operator with screw slot (suffix MS)
- Panel mount (prefix GP for conduit; *consult ASCO for other electrical connections*)
- Vacuum service (suffix VVM, VVH; *see Vacuum Section for more details.*)
- Oxygen service (suffix N)
- Silicone Free (suffix SF)

**Elastomers:** FKM (suffix V), Ethylene Propylene (suffix E), CR (suffix J), PTFE\* (suffix T), Low Temp NBR\*\* (suffix A)

**Note:** \*PTFE reduces pressure rating by 25% (i.e. 750 psi reduced to 560 psi)  
 \*\* For Low Temp. NBR, fluid temperature range is -40°F to 167°F (only for valves with 10.1, 17.1, 11.6, and 22.6 watt coils).

Refer to *Engineering Section* for fluid and temperature compatibility.



## Nominal Ambient Temp. Ranges

The nominal limitation of 32°F (0°C) is advisable for any valve that might contain moisture (water vapor).

AC: -13°F to 131°F (-25°C to 55°C)

DC: -13°F to 104°F (-25°C to 40°C)

-13°F to 131°F (-25°C to 55°C)

Note: Max ambient for explosionproof (EF) is 125°F (52°C) for AC, 131°F (55°C) for DC.

Optional: For AC, the max. ambient temperature is 140°F (60°C) with Class H coil (with or without prefix EF)

Refer to *Engineering Section* for details.

## Approvals

CSA certified. UL listed, as indicated. Safety Shutoff Valves FM approved. Meets applicable CE directives. Refer to *Engineering Section* for details.

ATEX/IECEx certified with prefix "EV" as listed. Refer to *Optional Features Electrical Section* for details.

Specifications (English units)

Pipe Size (in)	Orifice size (in)	Cv Flow Factor	Operating Pressure Differential (psi)									Max. Fluid Temp. °F		Catalog Number		Const. Ref.	UL Listing	Watt Rating/ Class of Coil Insulation		
			Max. AC@131°F			Max. DC@104°F			Max. DC@131°F					Brass	Stainless Steel			AC	DC	
			Air-Inert Gas	Water ②	Lt. Oil @ 300ssu	Air-Inert Gas	Water ②	Lt. Oil @ 300ssu	Air-Inert Gas	Water ②	Lt. Oil @ 300ssu	AC	DC							
<b>NORMALLY CLOSED (Closed when de-energized), NBR Disc</b>																				
1/8	3/64	0.06	2200	2200	1700	-	-	-	-	-	-	140	-	-	8262H175 ①	1	●	10.1/F	-	
1/8	3/64	0.06	-	-	-	2000	2000	1725	1900	1900	1700	-	140	-	8262H176 ①	1	●	-	22.6/H	
1/8	3/64	0.06	-	-	-	1500	1500	1500	1500	1500	1500	-	140	-	8262H089 ①	-	●	-	22.6/H	
1/8	3/64	0.06	2025	1710	825	965	745	720	920	700	675	140	140	-	8262H079 ①	2	●	9.1/F	18.6/H	
1/8	3/64	0.06	1500	1350	825	750	620	565	700	565	530	140	140	-	8262H096 ①	-	●	6.1/F	10.6/H	
1/8	3/64	0.06	1500	1350	825	-	-	-	-	-	-	-	140	-	8262H173 ①	2	●	6.1/F	-	
1/8	3/64	0.06	1500	1500	1500	1170	1145	945	1000	965	855	140	140	-	8262H099 ①	-	●	10.1/F	11.6/H	
1/8	3/64	0.06	750	750	725	750	640	550	750	600	500	180	180	-	8262H001	8262H012	2	○	6.1/F	10.6/H
1/8	3/32	0.21	720	410	410	610	410	410	600	410	400	180	180	-	8262H277	8262H178	1	○	17.1/F	22.6/H
1/8	3/32	0.21	-	-	-	290	290	270	240	240	255	180	180	-	8262H177 ③	-	1	○	-	11.6/H
1/8	3/32	0.21	500	350	325	295	210	205	285	200	195	180	180	-	8262H011	-	2	○	9.1/F	18.6/H
1/8	3/32	0.21	370	330	190	235	160	160	215	150	145	180	180	-	8262H014	8262H015	2	○	6.1/F	10.6/H
1/8	1/8	0.35	500	380	355	275	275	235	250	250	225	180	180	-	8262H105	8262H174	1	○	17.1/F	22.6/H
1/8	1/8	0.35	340	300	215	-	-	-	-	-	-	-	180	-	8262H179	-	1	○	10.1/F	-
1/8	1/8	0.35	275	260	195	165	130	130	155	120	120	180	180	-	8262H016	-	2	○	9.1/F	18.6/H
1/8	1/8	0.35	185	180	120	130	110	95	120	100	90	180	180	-	8262H002	8262H006	2	○	6.1/F	10.6/H
1/4	3/64	0.06	2200	2200	1700	1170	1145	945	1000	965	855	140	140	-	8262H214 ①	-	3	●	10.1/F	11.6/H
1/4	3/64	0.06	1500	1500	1500	1170	1145	945	1000	965	855	140	140	-	8262H200 ①	-	3	●	10.1/F	11.6/H
1/4	3/64	0.06	1500	1500	1500	1500	1500	1500	1500	1500	1500	140	140	-	8262H107 ②	-	3	●	17.1/F	22.6/H
1/4	3/64	0.06	-	-	-	2000	2000	1725	1900	1900	1700	-	140	-	8262H181 ①	-	3	●	-	22.6/H
1/4	3/64	0.06	1500	1350	825	750	620	530	700	565	495	140	140	-	8262H106 ①	8262H180 ①	4	●	6.1/F	10.6/H
1/4	3/64	0.06	750	750	725	750	640	550	750	600	500	180	180	-	8262H019	8262H080	4	○	6.1/F	10.6/H
1/4	3/32	0.21	720	410	410	610	410	410	600	410	400	180	180	-	8262H109	8262H183 ③	3	○	17.1/F	22.6/H
1/4	3/32	0.21	590	410	410	290	290	270	240	240	225	180	180	-	8262H108	8262H182 ③	3	○	10.1/F	11.6/H
1/4	3/32	0.21	500	350	270	295	210	205	285	200	195	180	180	-	8262H021	-	4	○	9.1/F	18.6/H
1/4	3/32	0.21	370	330	160	235	160	160	215	150	145	180	180	-	8262H020	8262H086	4	○	6.1/F	10.6/H
1/4	1/8	0.35	500	380	355	275	275	235	250	250	225	180	180	-	8262H110	8262H185 ③	3	○	17.1/F	22.6/H
1/4	1/8	0.35	340	300	215	130	125	115	110	105	100	180	180	-	8262H232	-	3	○	10.1/F	11.6/H
1/4	1/8	0.35	340	300	215	-	-	-	-	-	-	180	-	-	8262H184 ③	-	3	○	10.1/F	-
1/4	1/8	0.35	275	260	150	165	130	120	155	120	115	180	180	-	8262H023	-	4	○	9.1/F	18.6/H
1/4	1/8	0.35	185	180	90	130	110	90	120	100	85	180	180	-	8262H022	8262H007	4	○	6.1/F	10.6/H
1/4	5/32	0.52	300	210	210	135	135	135	115	115	115	180	180	-	8262H112	8262H187 ③	3	○	17.1/F	22.6/H
1/4	5/32	0.52	210	200	145	65	63	63	55	54	54	180	180	-	8262H202	-	3	○	10.1/F	11.6/H
1/4	5/32	0.52	210	200	145	-	-	-	-	-	-	180	180	-	8262H220 ③	-	3	○	10.1/F	-
1/4	5/32	0.52	150	140	100	95	75	75	85	72	70	180	180	-	8262H113	-	4	○	9.1/F	18.6/H
1/4	5/32	0.52	100	100	55	72	60	55	67	53	52	180	180	-	8262H111	8262H186	4	○	6.1/F	10.6/H
1/4	7/32	0.73	125	125	125	70	70	70	65	65	65	180	180	-	8262H114	8262H188	3	○	17.1/F	22.6/H
1/4	7/32	0.73	100	100	100	35	35	35	30	30	30	180	180	-	8262H208	-	3	○	10.1/F	11.6/H
1/4	7/32	0.73	100	100	100	-	-	-	-	-	-	180	-	-	8262H226	-	3	○	10.1/F	-
1/4	7/32	0.73	55	54	40	38	33	31	35	30	28	180	180	-	8262H013	8262H036	4	○	6.1/F	10.6/H
1/4	9/32	0.88	90	90	90	53	50	47	48	46	44	180	180	-	8262H212	8262H230	3	○	17.1/F	22.6/H
1/4	9/32	0.88	65	75	60	25	25	22	22	22	20	180	180	-	8262H210	-	3	○	10.1/F	11.6/H
1/4	9/32	0.88	65	75	60	-	-	-	-	-	-	180	-	-	8262H189	-	3	○	10.1/F	-
1/4	9/32	0.88	36	36	33	27	23	21	24	22	20	180	180	-	8262H090	8262H038	4	○	6.1/F	10.6/H
3/8	1/8	0.35	500	380	355	275	275	160	250	250	150	180	180	-	8263H115	8263H191	5	○	17.1/F	22.6/H
3/8	1/8	0.35	340	300	215	130	125	85	110	105	75	180	180	-	8263H232	-	5	○	10.1/F	11.6/H
3/8	1/8	0.35	340	300	215	-	-	-	-	-	-	180	-	-	8263H190	-	5	○	10.1/F	-
3/8	1/8	0.35	275	260	140	165	130	110	155	120	105	180	180	-	8263H003	-	6	○	9.1/F	18.6/H
3/8	1/8	0.35	185	180	90	130	110	80	120	100	75	180	180	-	8263H002	8263H330	6	○	6.1/F	10.6/H
3/8	5/32	0.52	300	210	195	135	135	100	115	115	90	180	180	-	8263H118	8263H193	5	○	17.1/F	22.6/H
3/8	5/32	0.52	210	185	100	65	63	50	55	54	44	180	180	-	8263H200	-	5	○	10.1/F	11.6/H
3/8	5/32	0.52	210	185	100	-	-	-	-	-	-	180	-	-	8263H331 ③	-	5	○	10.1/F	-
3/8	5/32	0.52	150	140	80	95	75	75	85	72	70	180	180	-	8263H117	-	6	○	9.1/F	18.6/H
3/8	5/32	0.52	100	100	50	72	60	55	67	53	52	180	180	-	8263H116	8263H192	6	○	6.1/F	10.6/H
3/8	7/32	0.73	125	100	100	70	70	70	65	65	65	180	180	-	8263H206 ③	8263H332	5	○	17.1/F	22.6/H
3/8	7/32	0.73	100	86	70	35	35	35	30	30	30	180	180	-	8263H124	-	5	○	10.1/F	11.6/H
3/8	7/32	0.73	100	86	70	-	-	-	-	-	-	180	-	-	8263H195	-	5	○	10.1/F	-
3/8	7/32	0.73	55	54	29	38	33	31	35	30	28	180	180	-	8263H119	8263H194	6	○	6.1/F	10.6/H
3/8	9/32	0.88	100	85	70	53	50	47	48	46	44	180	180	-	8263H210	8263H333	5	○	17.1/F	22.6/H
3/8	9/32	0.88	65	63	47	-	-	-	-	-	-	180	180	-	8263H125	8263H197	5	○	10.1/F	-
3/8	9/32	0.88	35	32	21	27	23	21	24	22	20	180	180	-	8263H054	8263H196	6	○	6.1/F	10.6/H

38 ① Only available with UR disc, limits min. ambient temp. to 32°F (0°C). ② Water rating, CSA certified up to 232 psi. ③ ATEX/IECEx certified with prefix "EV".

● = General Purpose Valve, ○ = Safety Shutoff Valve

### Specifications (Metric units)

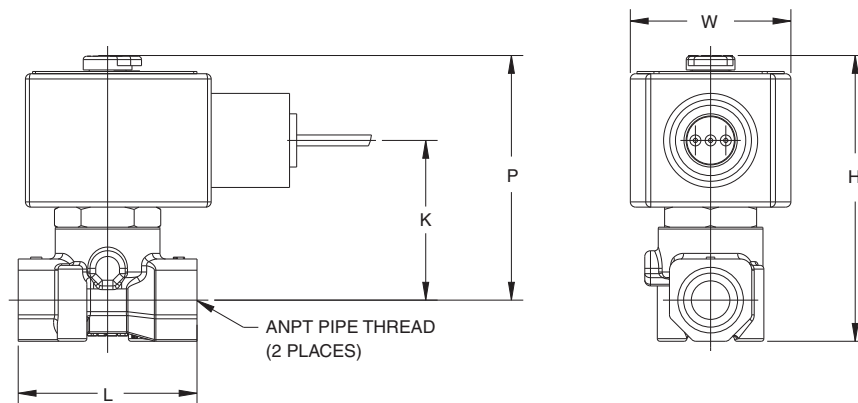
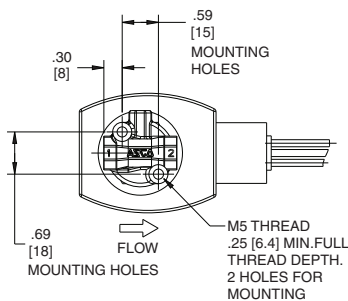
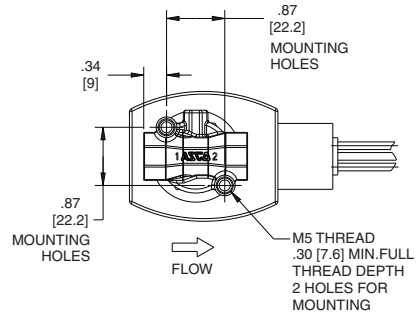
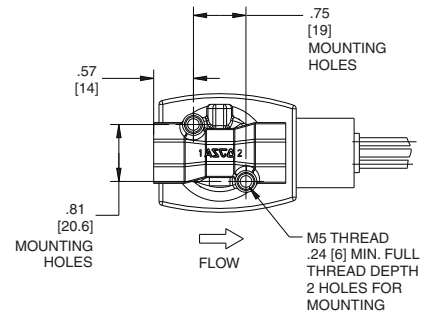
Pipe Size (in)	Orifice size (mm)	Kv Flow Factor (m³/h)	Operating Pressure Differential (bar)									Max. Fluid Temp. °C		Catalog Number		Const. Ref.	UL Listing	Watt Rating/ Class of Coil Insulation	
			Max. AC@55°C			Max. DC@40°C			Max. DC@55°C					Brass	Stainless Steel			AC	DC
			Air-Inert Gas	Water ②	Lt. Oil @ 300ssu	Air-Inert Gas	Water ②	Lt. Oil @ 300ssu	Air-Inert Gas	Water ②	Lt. Oil @ 300ssu	AC	DC						
<b>NORMALLY CLOSED (Closed when de-energized), NBR Disc</b>																			
1/8	1.2	0.05	152	152	117	-	-	-	-	-	-	60	-	-	8262H175 ①	1	●	10.1/F	-
1/8	1.2	0.05	-	-	-	138	138	119	131	131	117	-	60	-	8262H176 ①	1	●	-	22.6/H
1/8	1.2	0.05	-	-	-	103	103	103	103	103	103	-	60	8262H089 ①	-	1	●	-	22.6/H
1/8	1.2	0.05	140	118	57	67	51	50	63	48	47	60	60	-	8262H079 ①	2	●	9.1/F	18.6/H
1/8	1.2	0.05	103	93	57	52	43	39	48	39	37	60	60	8262H096 ①	-	2	●	6.1/F	10.6/H
1/8	1.2	0.05	103	93	57	-	-	-	-	-	-	-	60	-	8262H173 ①	2	●	6.1/F	-
1/8	1.2	0.05	103	103	103	81	79	65	69	67	59	60	60	8262H099 ①	-	1	●	10.1/F	11.6/H
1/8	1.2	0.05	52	52	50	52	44	38	52	41	34	82	82	8262H001	8262H012	2	○	6.1/F	10.6/H
1/8	2.4	0.18	50	28	28	42	28	28	41	28	28	82	82	8262H277	8262H178	1	○	17.1/F	22.6/H
1/8	2.4	0.18	-	-	-	20	20	19	17	17	18	-	82	-	8262H177 ③	1	○	-	11.6/H
1/8	2.4	0.18	34	24	22	20	14	14	20	14	13	82	82	8262H011	-	2	○	9.1/F	18.6/H
1/8	2.4	0.18	26	23	13	16	11	11	15	10	10	82	82	8262H014	8262H015	2	○	6.1/F	10.6/H
1/8	3.2	0.30	34	26	24	19	19	16	17	17	16	82	82	8262H105	8262H174	1	○	17.1/F	22.6/H
1/8	3.2	0.30	23	21	15	-	-	-	-	-	-	82	-	-	8262H179	1	○	10.1/F	-
1/8	3.2	0.30	19	18	13	11	9	9	11	8	8	82	82	8262H016	-	2	○	9.1/F	18.6/H
1/8	3.2	0.30	13	12	8	9	8	7	8	7	6	82	82	8262H002	8262H006	2	○	6.1/F	10.6/H
1/4	1.2	0.05	152	152	117	81	79	65	69	67	59	60	60	-	8262H214 ①	3	●	10.1/F	11.6/H
1/4	1.2	0.05	103	103	103	81	79	65	69	67	59	60	60	8262H200 ①	-	3	●	10.1/F	11.6/H
1/4	1.2	0.05	103	103	103	103	103	103	103	103	103	60	60	8262H107 ①	-	3	●	17.1/F	22.6/H
1/4	1.2	0.05	-	-	-	138	138	119	131	131	117	-	60	-	8262H181 ①	3	●	-	22.6/H
1/4	1.2	0.05	103	93	57	52	43	37	48	39	34	60	60	8262H106 ①	8262H180 ①	4	●	6.1/F	10.6/H
1/4	1.2	0.05	52	52	50	52	44	38	52	41	34	82	82	8262H019	8262H080	4	○	6.1/F	10.6/H
1/4	2.4	0.18	50	28	28	42	28	28	41	28	28	82	82	8262H109	8262H183 ③	3	○	17.1/F	22.6/H
1/4	2.4	0.18	41	28	28	20	20	19	17	17	16	82	82	8262H108	8262H182 ③	3	○	10.1/F	11.6/H
1/4	2.4	0.18	34	24	19	20	14	14	20	14	13	82	82	8262H021	-	4	○	9.1/F	18.6/H
1/4	2.4	0.18	26	23	11	16	11	11	15	10	10	82	82	8262H020	8262H086	4	○	6.1/F	10.6/H
1/4	3.2	0.30	34	26	24	19	19	16	17	17	16	82	82	8262H110	8262H185 ③	3	○	17.1/F	22.6/H
1/4	3.2	0.30	23	21	15	9	9	8	8	7	7	82	82	8262H232	-	3	○	10.1/F	11.6/H
1/4	3.2	0.30	23	21	15	-	-	-	-	-	-	82	-	-	8262H184 ③	3	○	10.1/F	-
1/4	3.2	0.30	19	18	10	11	9	8	11	8	8	82	82	8262H023	-	4	○	9.1/F	18.6/H
1/4	3.2	0.30	13	12	6	9	8	6	8	7	6	82	82	8262H022	8262H007	4	○	6.1/F	10.6/H
1/4	4.0	0.45	21	14	14	9	9	9	8	8	8	82	82	8262H112	8262H187 ③	3	○	17.1/F	22.6/H
1/4	4.0	0.45	14	14	10	4	4	4	4	4	4	82	82	8262H202	-	3	○	10.1/F	11.6/H
1/4	4.0	0.45	14	14	10	-	-	-	-	-	-	82	-	-	8262H220 ③	3	○	10.1/F	-
1/4	4.0	0.45	10	10	7	7	5	5	6	5	5	82	82	8262H113	-	4	○	9.1/F	18.6/H
1/4	4.0	0.45	7	7	4	5	4	4	5	4	4	82	82	8262H111	8262H186	4	○	6.1/F	10.6/H
1/4	5.6	0.63	9	9	9	5	5	5	4	4	4	82	82	8262H114	8262H188	3	○	17.1/F	22.6/H
1/4	5.6	0.63	7	7	7	2	2	2	2	2	2	82	82	8262H208	-	3	○	10.1/F	11.6/H
1/4	5.6	0.63	7	7	7	-	-	-	-	-	-	82	-	-	8262H226	3	○	10.1/F	-
1/4	5.6	0.63	4	4	3	3	2	2	2	2	2	82	82	8262H013	8262H036	4	○	6.1/F	10.6/H
1/4	7.1	0.76	6	6	6	4	3	3	3	3	3	82	82	8262H212	8262H230	3	○	17.1/F	22.6/H
1/4	7.1	0.76	4	5	4	2	2	2	2	2	1	82	82	8262H210	-	3	○	10.1/F	11.6/H
1/4	7.1	0.76	4	5	4	-	-	-	-	-	-	82	-	-	8262H189	3	○	10.1/F	-
1/4	7.1	0.76	2	2	2	2	2	1	2	2	1	82	82	8262H090	8262H038	4	○	6.1/F	10.6/H
3/8	3.2	0.30	34	26	24	19	21	11	17	19	10	82	82	8263H115	8263H191	5	○	17.1/F	22.6/H
3/8	3.2	0.30	23	21	15	9	9	6	8	7	5	82	82	8263H232	-	5	○	10.1/F	11.6/H
3/8	3.2	0.30	23	21	15	-	-	-	-	-	-	82	82	-	8263H190	5	○	10.1/F	-
3/8	3.2	0.30	19	18	10	11	9	8	11	8	7	82	82	8263H003	-	6	○	9.1/F	18.6/H
3/8	3.2	0.30	13	12	6	9	8	6	8	7	5	82	82	8263H002	8263H330	6	○	6.1/F	10.6/H
3/8	4.0	0.45	21	14	13	9	9	7	8	8	6	82	82	8263H118	8263H193	5	○	17.1/F	22.6/H
3/8	4.0	0.45	14	13	7	4	4	3	4	4	3	82	82	8263H200	-	5	○	10.1/F	11.6/H
3/8	4.0	0.45	14	13	7	-	-	-	-	-	-	82	-	-	8263H331 ③	5	○	10.1/F	-
3/8	4.0	0.45	10	10	6	7	5	5	6	5	5	82	82	8263H117	-	6	○	9.1/F	18.6/H
3/8	4.0	0.45	7	7	3	5	4	4	5	4	4	82	82	8263H116	8263H192	6	○	6.1/F	10.6/H
3/8	5.6	0.63	9	7	7	5	5	5	4	4	4	82	82	8263H206 ③	8263H332	5	○	17.1/F	22.6/H
3/8	5.6	0.63	7	6	5	2	2	2	2	2	2	82	82	8263H124	-	5	○	10.1/F	11.6/H
3/8	5.6	0.63	7	6	5	-	-	-	-	-	-	82	-	-	8263H195	5	○	10.1/F	-
3/8	5.6	0.63	4	4	2	3	2	2	2	2	2	82	82	8263H119	8263H194	6	○	6.1/F	10.6/H
3/8	7.1	0.76	7	6	5	4	3	3	3	3	3	82	82	8263H210	8263H333	5	○	17.1/F	22.6/H
3/8	7.1	0.76	4	4	3	-	-	-	-	-	-	82	-	8263H125	8263H197	5	○	10.1/F	-
3/8	7.1	0.76	2	2	1	2	2	1	2	2	1	82	82	8263H054	8263H196	6	○	6.1/F	10.6/H

① Only available with UR disc, limits min. ambient temp. to 32°F (0°C). ② Water rating, CSA certified up to 16 bar. ③ ATEX/IECEx certified with prefix "EV".

● = General Purpose Valve, ○ = Safety Shutoff Valve

**Dimensions: inches (mm)**

Const. Ref.		H	K	L	P	W
1	ins	3.05	1.71	1.19	2.69	1.95
	mm	77	43	30	68	50
2	ins	2.85	1.60	1.19	2.50	1.69
	mm	72	41	30	63	43
3	ins	3.12	1.79	1.56	2.76	1.95
	mm	79	45	40	70	50
4	ins	2.96	1.72	1.56	2.60	1.69
	mm	75	44	40	66	43
5	ins	3.20	1.79	1.88	2.77	1.95
	mm	81	45	48	70	50
6	ins	3.03	1.72	1.88	2.60	1.69
	mm	77	44	48	66	43

**Const. Ref. 1-6**

**Mounting Dimensions**
**Const. Ref. 1, 2**  
**(1/8" Pipe)**

**Const. Ref. 3, 4**  
**(1/4" Pipe)**

**Const. Ref. 5, 6**  
**(3/8" Pipe)**


**Note: Mounting holes will accept a standard #10-32 machine screw.**





### Features

- Solid state electronic timer used to automatically control ASCO solenoid valves.
- Typically used with ASCO Solenoid Valves for automatic draining of condensate in compressed air systems.
- Selectable timing ranges (2-40 seconds “on”; 30 seconds to 45 minutes “off”).
- Manual override for test/reset.
- LED lights to indicate timing phase.



### Technical Specifications

<b>Supply Voltage:</b>	24 – 240V AC/DC 50/60 Hz
<b>Current Consumption:</b>	4 mA max
<b>Operating Temperature:</b>	14°F – 122°F
<b>Environmental Protection:</b>	NEMA 4
<b>Switch Capacity:</b>	1 Amp
<b>Inrush Current Capacity:</b>	10 Amps for 10 mSec
<b>Duty Cycle:</b>	100%
<b>Repeat Accuracy:</b>	± 0.1%
<b>Scale Accuracy:</b>	± 10%
<b>Reset/Test:</b>	Manual Touch Switch
<b>Printed Circuit Board:</b>	UL 94V0
<b>Connection:</b>	DIN 43650 ISO-4400/6952
<b>Indicators:</b>	LEDs to indicate phases
<b>On Time:</b>	Adjustable from 2 to 40 sec
<b>Off Time:</b>	Adjustable from 30 sec to 45 min

### Timer and Accessories Kit Numbers

<b>Timer Catalog Number:</b>	106086-001
<b>Power Cord‡ Kit Number:</b>	106096-001
<b>DIN Connector Kit Number:</b>	106087-001

‡6' Power cord has DIN connector and 3-prong plug for wall outlet

### Approvals:

CSA certified. UL recognized components. Meets applicable CE directives.

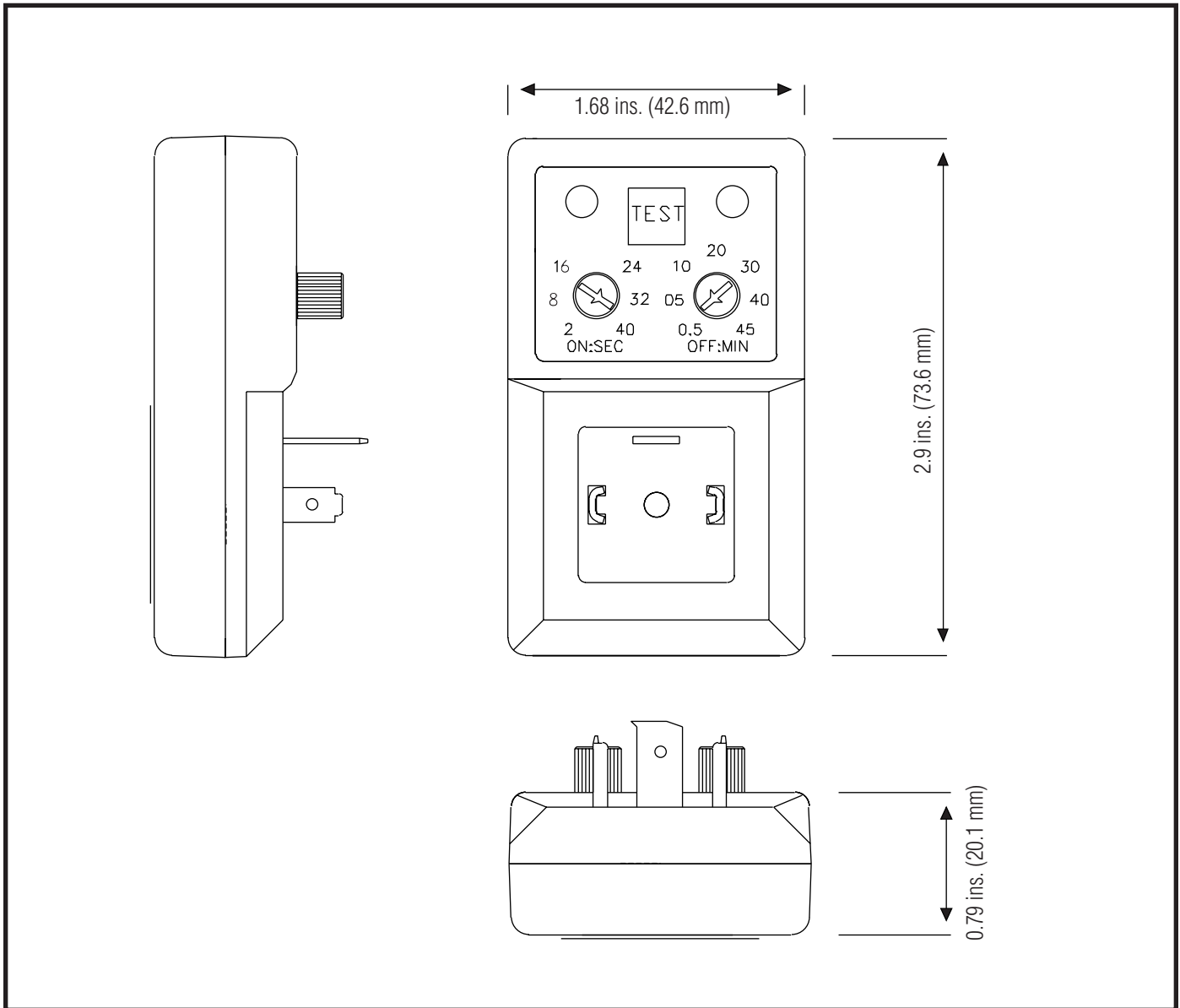
*Refer to Engineering Section for details.*

### Valve Selection:

Timer and valves are available as separate items to be assembled in the field. A Red-Hat II valve with DIN connection coil must be used with the timer. It is important to select a valve whose current draw will not exceed the 1 Amp maximum switch capacity.

*Refer to Engineering Section for calculation of current draw.*

Dimensions inches (mm)

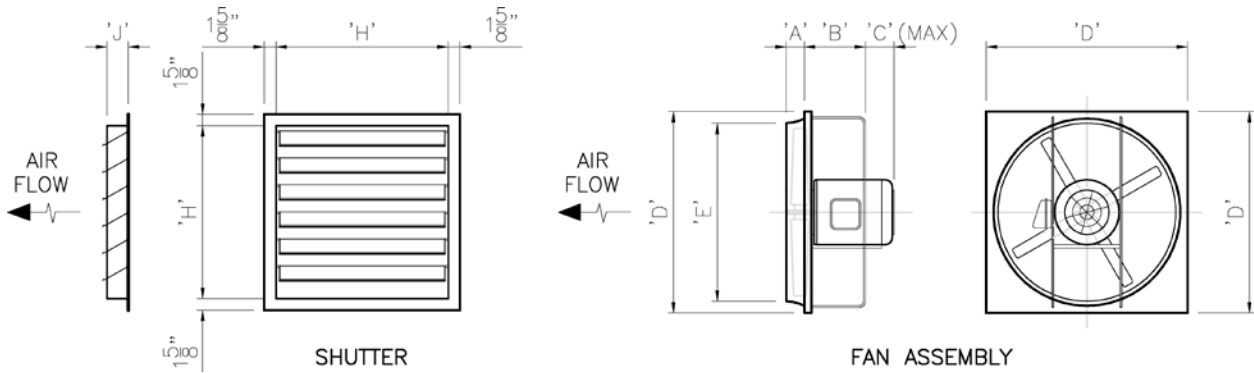




MODEL	A	B	C	D	E	H	J
ET-12	2 1/2"	8 1/2"	4"	16"	12 3/4"	12"	3"
ET-16	2 1/2"	8 1/2"	4"	20"	16 3/4"	16"	3"
ET-20	2 1/2"	8 1/2"	4"	24"	20 3/4"	20"	3"
ET-24	2 1/2"	8 1/2"	4"	28"	24 3/4"	24"	3"

Dimensions given on this sheet are correct within limits suitable for normal installation requirements

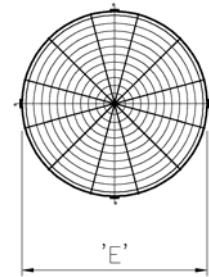
Project:	
Location:	
Architect:	
Engineer:	
Contractor:	
Submitted By:	Ener-Tech Industries
Date:	



### FEATURES

**ET FANS**, designed for heavy-duty ventilation applications. Fans with explosion proof motors designed to exhaust atmospheres containing flammable, explosive vapors or gases. Explosion proof motors are CSA approved for Class I, Group D and Class II, Groups E, F and G hazardous locations. Air deliveries based on AMCA test code for exhaust systems. Heavy-duty venturi panel, fixed position motor base with rigid tubular supports. Fan blades are non-sparking cast or fabricated aluminium. Back guard is heavy gauge steel wire.

**STANDARD SHUTTERS**. For normal applications. Mill finish aluminum vanes with steel pivot pins. 19ga. welded steel frame. Gray enamel finish. Vanes counter-balanced for easy operation, steel reinforced, felted for quiet, weather tight closure. Tie rod attached to vanes on fan side. 9/32" Ø mounting holes.



REAR & FRONT  
FAN GUARD

SPECIFICATIONS		FAN			MOTOR				OPTIONAL ACCESSORIES
Reference	QTY	Size	Model	CFM	SP	HP	Current	Type	
		ET12	ET12-1	500	1/4"	.25	120/1/60		shutter & backguard
			ET12-2	600	1/4"	.25			
			ET12-3	950	1/4"	.25			
			ET12-4	1200	1/4"	.25			
		ET16	ET16-1	1800	1/4"	.25			
		ET20	ET20-1	2100	1/4"	.25			
			ET20-2	2600	1/4"	.5			
			ET20-3	3500	1/4"	.5			
		ET24	ET24-2	4400	1/4"	.5			
			ET24-3	5400	1/4"	.75			

TE - totally enclosed  
WC - wall collar

EX - explosion proof motor  
BA - back (motor side) guard

2S - two speed motor  
FA - front guard



- > **Port size: 1/4" or 3/8" (ISO G/PTF)**
- > **Excelon design allows in-line or modular installation**
- > **Balanced valve design for optimum pressure control**
- > **Push to lock adjusting knob with tamper resistant accessory**


**Technical features**

**Medium:**  
Compressed air only

**Maximum operating pressure:**  
20 bar (300 psi)

**Pressure range:**  
Standard  
0,3 ... 10 bar (4 ... 145 psi)  
0,3 ... 4 bar (4 ... 58 psi) optional,  
0,3 ... 2 bar (4 ... 29 psi) optional

**Port size:**  
G1/4, G3/8, 1/4 or 3/8 NPT

**Gauge port:**  
Rc 1/8 with ISO G main ports  
1/8 PTF with PTF main ports

**Flow:**  
33 dm<sup>3</sup>/s maximum  
At port size: 1/4"  
Inlet pressure 10 bar (145 psi);  
6,3 bar (91 psi) set pressure and a  
 $\Delta p$ : 1 bar (14,5 psi) droop from set.

**Return valve:**  
R72G – without return valve  
R72R – with return valve

**Ambient/Media temperature:**  
-34 ... +65°C (-29 ... +149°F)  
Air supply must be dry enough  
to avoid ice formation at  
temperatures below +2°C (+35°F).

**Materials:**  
Body: Die cast zinc  
Bottom plug: Acetal  
Bonnet: Acetal  
Valve: PP and TPV  
Elastomers: NBR

**Technical data R72G - standard models**

Symbol	Port size	Size	Pressure range (bar)	Adjustment	Weight (kg)	Model
	G1/4	Basic	0,3 ... 10	Knob	0,36	R72G-2GK-RMN
	G3/8	—	0,3 ... 10	Knob	0,36	R72G-3GK-RMN

**Technical data R72R - Reverse flow**

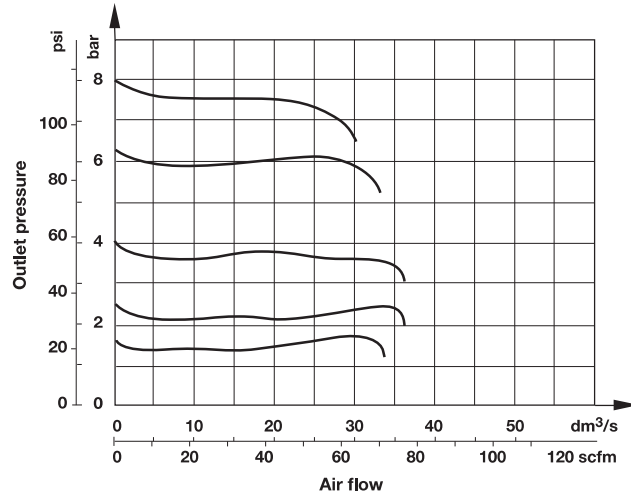
Symbol	Port size	Size	Pressure range (bar)	Adjustment	Weight (kg)	Model
	G1/4	Basic	0,3 ... 10	Knob	0,36	R72R-2GK-RMN
	G3/8	—	0,3 ... 10	Knob	0,36	R72R-3GK-RMN

**Option selector**
**R72★-★★K-★★★**

<b>Return valve</b>	<b>Substitute</b>				<b>Gauge</b>	<b>Substitute</b>
Without (standard)	<b>G</b>				With	<b>G</b>
Integrated	<b>R</b>				Without (standard)	<b>N</b>
<b>Port size</b>	<b>Substitute</b>				<b>Outlet pressure adjustment range *2)</b>	<b>Substitute</b>
1/4"	<b>2</b>				0,3 ... 2 bar	<b>C</b>
3/8"	<b>3</b>				0,3 ... 4 bar	<b>F</b>
<b>Thread form</b>	<b>Substitute</b>				0,3 ... 10 bar (standard)	<b>M</b>
PTF	<b>A</b>				<b>Diaphragm</b>	<b>Substitute</b>
ISO G parallel (standard)	<b>G</b>				Relieving (standard)	<b>R</b>
					Non relieving	<b>N</b>

\*2) Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

**Flow characteristics**  
Inlet pressure: 10 bar (145 psi)  
Port size: 1/4"



**Accessories**

<p><b>Universal mounting bracket</b></p> <p>Page 4 4224-50</p>	<p><b>Quikclamp®</b></p> <p>Page 3 4214-51</p>	<p><b>Quikclamp with wall bracket®</b></p> <p>Page 3 4214-52</p>	<p><b>Neck mounting bracket</b></p> <p>Page 4 74316-50</p>	<p><b>Panel nut</b></p> <p>4248-89</p>
<p><b>Tamper resistant kit</b></p> <p>4255-51</p>	<p><b>Quikmount pipe adaptor *1)</b></p> <p>Page 3 G1/4: 4215-08 G3/8: 4215-09 1/4 PTF: 4215-02 3/8 PTF: 4215-03</p>	<p><b>Porting block with three alternative 1/4" ports</b></p> <p>Page 3 G1/4: 4216-52 1/4 PTF: 4216-50</p>	<p><b>2/2 Shut-off valves (for full technical specification see datasheet 8.160.600)</b></p> <p>Page 4 G1/4: T72B-2GA-P1N G3/8: T72B-3GA-P1N 1/4 PTF: T72B-2AA-P1N 3/8 PTF: T72B-3AA-P1N</p>	<p><b>3/2 Shut-off valves (for full technical specification see datasheet 8.160.600)</b></p> <p>Page 4 G1/4: T72T-2GA-P1N G3/8: T72T-3GA-P1N 1/4 PTF: T72T-2AA-P1N 3/8 PTF: T72T-3AA-P1N</p>

\*1) Please use a Quikmount pipe adaptor if the Quikclamp be mounted at inlet or outlet side.

**Pressure switch**

<p><b>Porting block for pressure switch</b></p> <p>0523109000000000</p>	<p><b>Pressure switch (0,5 ... 8 bar)</b></p> <p>0881300000000000</p>	<p><b>Padlock (brass) with two keys *1)</b></p> <p>0613633000000000</p>
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\*1) for shut-off valves and tamper resistant kit

**Service kit**

<p><b>Service kit</b></p> <p>R72G-KITR</p>
--



### Gauge

Center back connection, white face  
(for full technical specification see datasheet 8.900.900)



Pressure range bar *1	Mpa	psi	Ø	Thread size	Model
0 ... 2,5	—	0 ... 36	40 mm	R1/8	18-013-886
0 ... 4	0 ... 0,4	0 ... 58	40 mm	R1/8	18-013-990
0 ... 10	0 ... 1	0 ... 145	40 mm	R1/8	18-013-989

\*1) primary scale

Center back connection, black face  
for North America  
(for full technical specification see datasheet 8.900.900)  
Pressure range

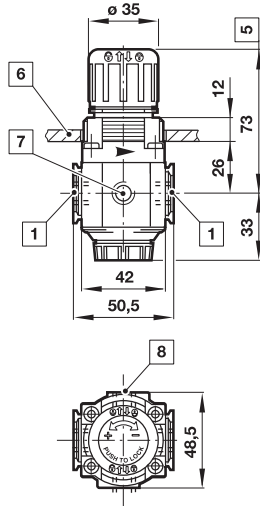


psig *1	bar	Mpa	Ø	Thread size	Model
0 ... 30	0 ... 2	0 ... 0,2	1.5" (40 mm)	1/8 NPT	18-013-214
0 ... 60	0 ... 4	0 ... 0,4	1.5" (40 mm)	1/8 NPT	18-013-211
0 ... 160	0 ... 11	0 ... 1,1	1.5" (40 mm)	1/8 NPT	18-013-212

\*1) primary scale

### Drawings

Dimensions in mm  
Projection/First angle



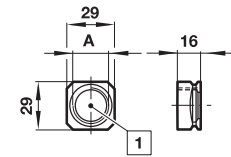
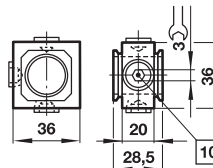
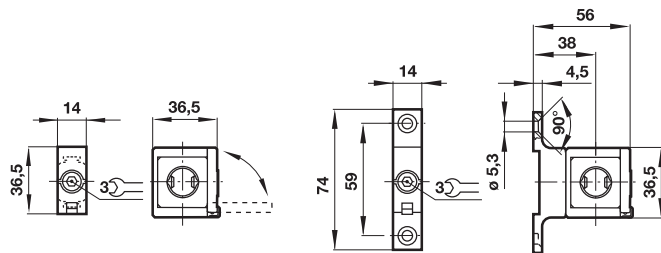
- 1 Main ports 1/4" or 3/8"
- 5 Reduces by 4 mm with knob in locked position
- 6 Panel thickness 0 ... 4 mm
- 7 Gauge port 1/8" plugged
- 8 Alternative gauge port 1/8" plugged

### Accessories Quikclamp®

#### Quikclamp® with wall bracket

#### Porting block

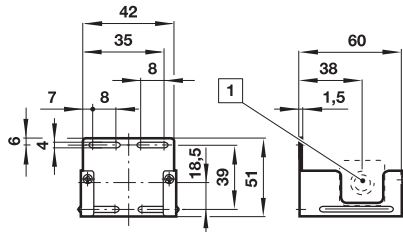
#### Pipe adapter



- 1 Main ports 1/4" or 3/8" ISO G/PTF

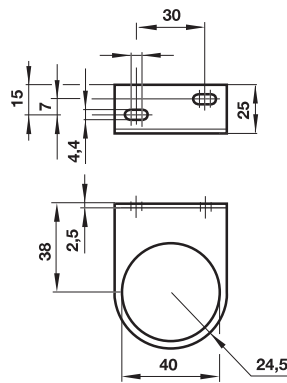
10 Ports (G1/4 or 1/4 NPT) plugged

### Wall mounting bracket

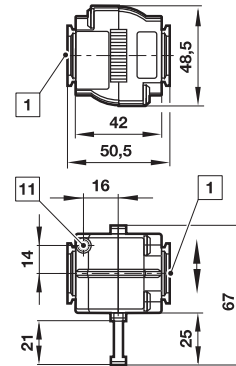


1 Main ports

### Neck mounting bracket



### Shut-off valves

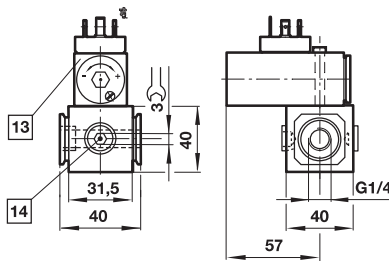


1 Main ports 1/4" or 3/8" ISO G/PTF  
11 Exhaust port M5 at 3/2 valve only

Dimensions in mm  
Projection/First angle



### Porting block for pressure switch



13 Pressure switch is not in scope of delivery  
14 Alternative G1/4 ports plugged

### Warning

These products are intended for use in industrial compressed air systems only. Do not use these products where pressures and temperatures can exceed those listed under

#### »Technical features/data«.

Before using these products with fluids other than those specified, for non-industrial applications, life-support systems or other applications not within published specifications, consult IMI Precision Engineering, Norgren Inc.

Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes.

The system designer is warned to consider the failure modes of all component parts used in fluid power systems and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure.

System designers must provide a warning to end users in the system instructional manual if protection against a failure mode cannot be adequately provided.

System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products.





**PNEUMA SYSTEM CO.,LTD.**

**บริษัท นิวมา ซีสเต็มส์ จำกัด**

## PNEUMATIC ACTUATOR

Pneuma system co.,ltd

. Our products are produced according to the ISO9001:2000 standards. There are more than 10 well educated and experienced technicians in our company to deal with OEM actuator services for our customers. Equipped with advanced facilities and high technology, now we are supplier of some famous enterprises such as the Parker Hannifin in the USA.



RAT series pneumatic actuators-statement of and selection

- Design and Features

Through research, development and design ,RAT series pneumatic actuators incorporate the latest mechanical technology, material, and innovative ideas. The product proudly boasts the following features:

- Full conformance to the latest specification: ISO5211, DIN3337, VD/VDE3845and NAMUR.
- The extruding high intensity aluminum body possess a honed internal surface coated with hone anode oxygenation for long life, low coefficient of friction and swift performance.
- Excellent, compact and modernized construction along with multi-specifications make the selection both economic and beneficial.
- All acting surfaces adopt high quality bearings, resulting in low friction, high cycle life and no noise.
- The two independent external travel stop adjustment bolts can easily and precisely adjust  $\pm 5^\circ$  at both open and close directions.
- Same outline actuator have the functional modes of double acting and spring, and the spring return has the normal-open and normal-close styles.
- Multi-function position indicator with NUMER is convenient for mounting accessories.
- Pre-compressed load spring is convenient for safe mounting and teardown procedures.
- Die-casting aluminum pistons and end caps have high intensity and light weight.
- Different O-rings materials are available for high and low temperature.
- According to different demands we can offer Multi-travel rotations (e.g.  $120^\circ$   $135^\circ$   $180^\circ$ ) and three

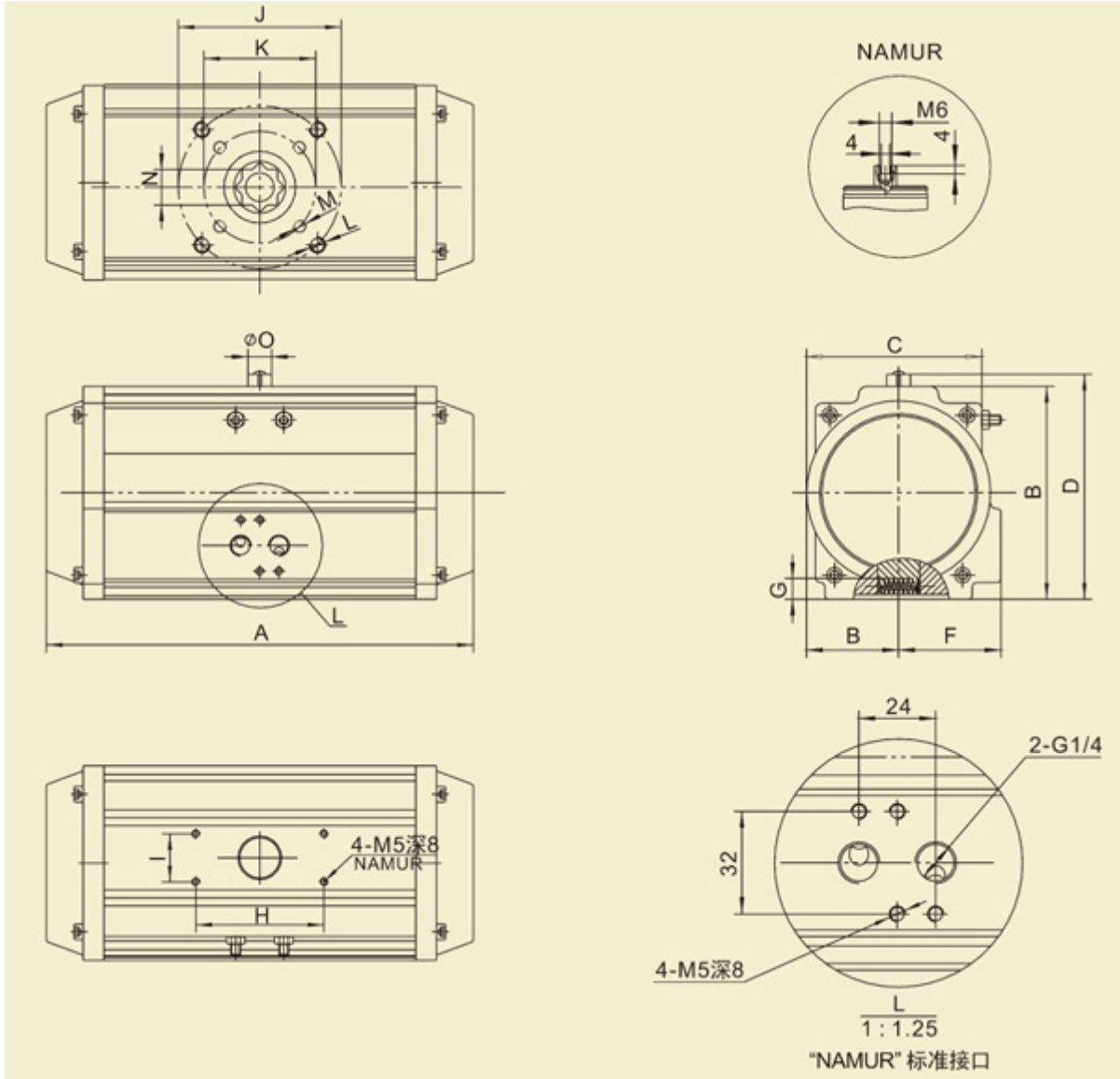
**BK ACTUATOR**



**PNEUMA SYSTEM CO.,LTD.**

**บริษัท นิวมา ซีสเต็มส์ จำกัด**

- position actuators.
- Solenoid valves are easily mounted without any connecting plank.
- Mounting connection and dimension

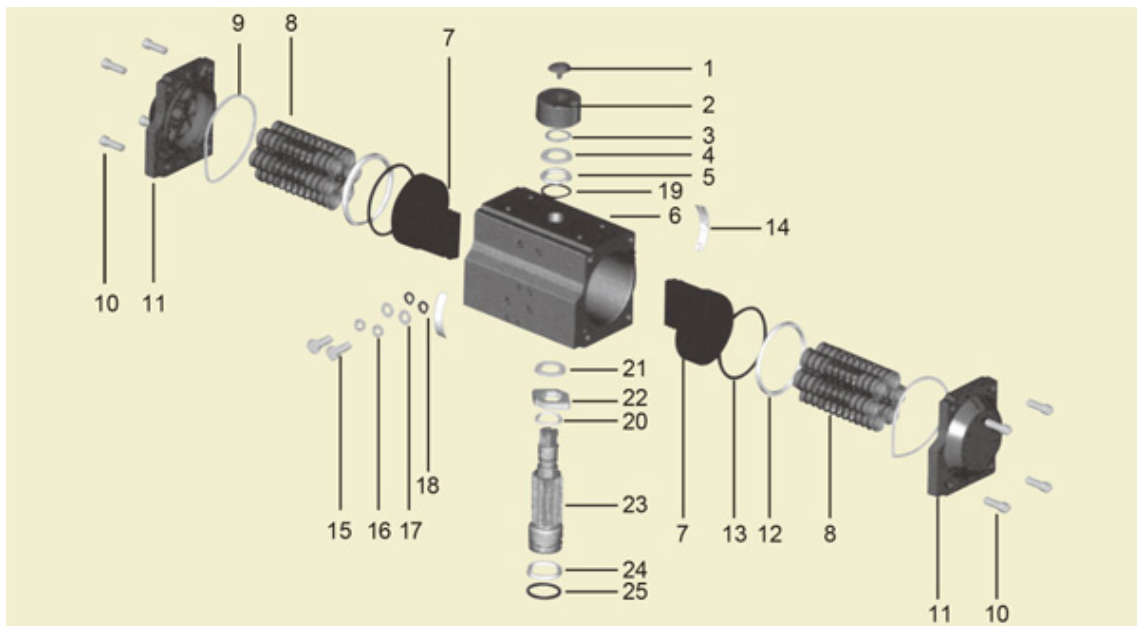


**BK ACTUATOR**

Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	A120	A180	Airconnection
RAT032	110	45	45	65	22.5	23	12	50	25		F03 ø36		M5×5	9				G1/8 "
RAT052	143	72	55	92	30	41	14	80	30	F05 ø50	F03 ø36	M6×8	M5×8	11 ø40	158	200	G1/4 "	
RAT063	190	88	69	108	35	45	18	80	30	F07 ø70	F05 ø50	M8×13	M6×10	14 ø40	184	233	G1/4 "	
RAT075	207	99.5	100.5	119.5	38.5	52.5	20.5	80	30	F07 ø70	F05 ø50	M8×10	M6×8	14 ø40	103	243	G1/4 "	
RAT083	213	109	88	129	46	52.5	21	80	30	F07 ø70	F05 ø50	M8×13	M6×10	17 ø40	221	280	G1/4 "	
RAT092	258	117	98.5	137	50	61	21	80	30	F07 ø70	F05 ø50	M8×12	M6×10	17 ø40	280	274	G1/4 "	
RAT105	267	133	109	153	57	64	26	80	30	F10 ø102	F07 ø70	M10×13	M8×10	22 ø40	304	388	G1/4 "	
RAT125	340	155	120.5	175	67.5	70	27.5	80	30	F10 ø102	F07 ø70	M10×16	M8×13	22 ø65	365	470	G1/4 "	
RAT140	414	171.5	132	191.5	75	76	32	80	30	F12 ø125	F10 ø102	M12×20	M10×15	27 ø65	442	568	G1/4 "	
RAT160	476	197	159.5	217	87.5	87.5	34	80	30	F12 ø125	F10 ø102	M12×20	M10×15	27 ø65	507	654	G1/4 "	
RAT190	515	230	184	260	102	102	40	130	30	F14 ø140		M16×22		36 ø78	575	742	G1/4 "	
RAT210	580	255	205	285	113	113	40	130	30	F14 ø140		M16×24		36 ø78	642	831	G1/4 "	
RAT240	654	290	240	320	130	130	50	130	30	F16 ø165		M20×26		46 ø78	739	965	G3/8(1/4)" "	
RAT270	725	320	269	350	147	147	50	130	30	F16 ø165		M20×26		46 ø78	823	1075	G1/2(1/4)" "	

\* Note: A120 and A180 separately represent the acting length of the 1200 rotation travel and 1800 rotation travel.

• Parts & material



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No.	Description	Qty	Standard Meterial	Anti-corrode treatment	Optional Meterial
1	Indicator screw	1	Plastic		
2	Indicator	1	Plastic		
3	Spring clip	1	Stainless Steel		
4	Washer	1	Stainless Steel		
5	Outside washer	1	PTFE		
6	Body	1	Extruded aluminum alloy	Hard anodized etc	
7	Piston	2	Extruded aluminum alloy	anodized / Zinc galvanized	Stainless Steel
8	Spring-Interated	*	Spring Steel	dip coating	
9	O-ring(End cap)	2	NBR		Viton/Silicone
10	Cap screw	8	Stainless Steel		
11	End cap	2	Aluminum Alloy	powder polyster painted etc	
12	Bearing(Piston)	2	Engineering plastics		
13	O-ring(Piston)	2	NBR		Viton/Silicone
14	Guide(Piston)	2	Engineering plastics		
15	Adjust screw	2	Stainless Steel		
16	Nut(Adjust screw)	2	Stainless Steel		
17	O-ring(Adjust screw)	2	NBR		Viton/Silicone
18	O-ring(pinion top)	1	NBR		Viton/Silicone
19	Bearing(pinion top)	1	Engineering plastics		
20	Inside washer	1	PTFE		
21	Cam	1	Alloy steel		
22	Pinion	1	Alloy steel	Nick Plated	Stainless Steel
23	O-ring(pinion bottom)	1	Engineering plastics		
24	Bearing(pinion bottom)	1	NBR		Viton/Silicone

#### Parts introduction

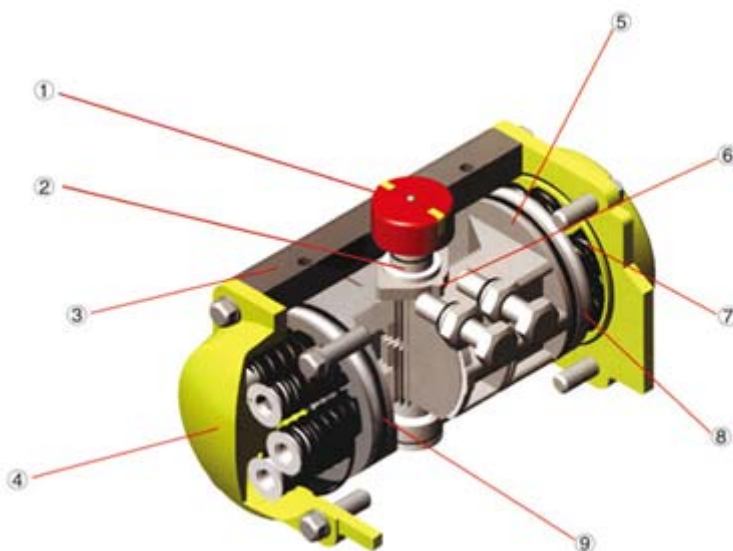
##### 1. Indicator

Position indicator with NAMUR is convenient for mounting accessories such as Limit Switch box, Positioner etc.

##### 2. Pinion

The pinion is high-precision and integrative, made from nickelled-alloy steel, full conform to the lastested standards of ISO5211、DIN3337、NAMUR. The dimensions and the stainless steel matericl can be customized .

**BK ACTUATOR**



### 3. Actuator Body

According to the different requirements, the extruded aluminum alloy ASTM6005 body can be treated with hard anodized, powder polyester painted (different colour is available such as blue, orange, yellow etc.), PTFE or Nickel plated.

### 4. End Caps

Die-casting aluminum powder polyester painted in different colours ,PTFE or Nickel plated.

### 5. Pistons

The twin rack pistons are made from Die-casting aluminum treated with hard anodized or made from Cast steel with galvanization. Symmetric mounting position, long cycle life and fast operation, reversing rotation by simply inverting the pistons.

### 6. Travel Adjustment

The two independent external travel stop adjustment bolts can adjust  $\pm 5^\circ$  at both open and close directions easily and precisely.

### 7. High performance springs

Preloaded coating springs are made from the high quality material for resistant to corrosion and longer service life, which can be demounted safely and conveniently to satisfy different requirements of torque by changing quantity of springs.

### 8. Bearings & Guides

Made from low friction, long-life compound material, to avoid the direct contact between metals. The maintenance and replacement are more easy and convenient.

### 9. O-rings

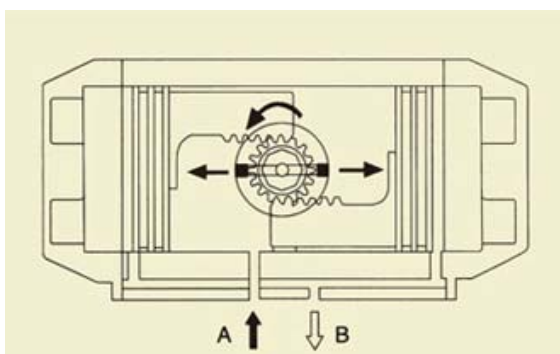
Normal: NBR

High temp. & low temp. :Viton or Silicone

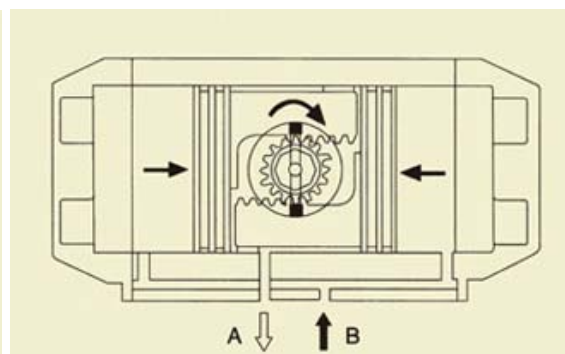


## • Operating Principle ( Standard Rotation )

### 1. Double action (planform)

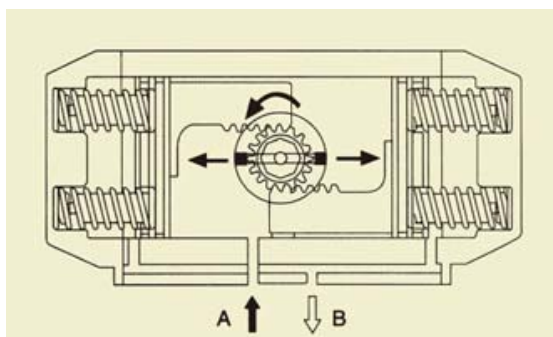


Air into Port A forces the pistons outwards, causing the pinion to turn counterclockwise while the air being exhausted from Port B.

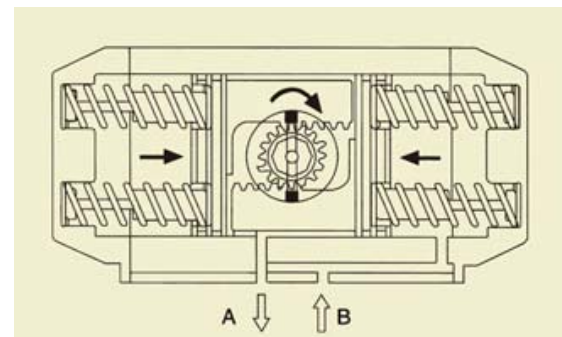


Air into Port B forces the pistons inwards, causing the pinion to turn clockwise while the air is being exhausted from Port A.

### 2. Single action (planform)



Air into Port A forces the pistons outwards, causing the springs to compress, the pinion turns counterclockwise while air is being exhausted from Port B.



In the event of loss air pressure or power, the stored energy in the springs forces the pistons inwards, causing the pinion turns clockwise while air is being exhausted from Port A, and air to Port B can accelerate closing the valve.

\*Note:

1. The standard rotation is clockwise for closing the valve, while counterclockwise for opening.
2. If the assembly direction of the piston is reversed, then the standard rotation is counterclockwise for closing the valve, clockwise for opening.

**BK ACTUATOR**



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- The function and usage of the actuator and the parts
  - Double action actuator : open and close the valve.
  - Single action actuator (Spring return ): when air or power is lost, the actuator either close the valve automatically (normal-closed style ) or opens the valve automatically (normal-open style).
  - Double-control solenoid: power to solenoid opens the valve, power to the other solenoid closes the valve. This kind of solenoid possesses the memorial function (available for anti-exploding).
  - Single-control solenoid: power to the solenoid opens or closes the valve. Loss of power will close or open the valve (available for anti-exploding).
  - Limit switch box (signal feedback): remotely passes the signal of the valve's opened and closed status (available for antiexploding).
  - Pneumatic positioner: according to the air pressure (0.2-1bar) to control the medium fl ux (available for anti-exploding).
  - Electric positioner: according to the electric current (4-20mA) to control the medium fl ux (available for anti-exploding).
  - Electric-pneumatic transfers the current signal to air pressure signal for compatibility with positioner .
  - Tri-unit Air disposal: this includes decompression, fi lter, and oil unit, can clean and lubricate the connection parts.
  - Manual equipment: able to use manual operation in the event of loss of air or power.

#### • Sizing Information

Make sure the torque of the opening or closing valve, under normal conditions is set to a safety factor of 15-20%. For water vapor and non-lubricated liquid medium, raise safety factor setting to 25%. For non-lubricated pasty medium, raise safety factor to 40%; For non-lubricated granule powder, raise safety factor to 80% .Then, according to the air pressure; search for the actuator's type in the output torque table of dual action or single action, In the output torque table of single action, the end line of the output torque of the spring is the torque of the closing the valve.

Sizing: dual action actuators

Example:

- The torque needed by ball valve=280N.m
- Operating medium :water
- Safety factor(20%)=280N.m+20%=336N.m
- Air supply pressure=4Bar
- According to the output torque table of the dual action actuator, we choose RAT140DA. when the air supply pressure at 4Bar, its output torque is 350.96N.m

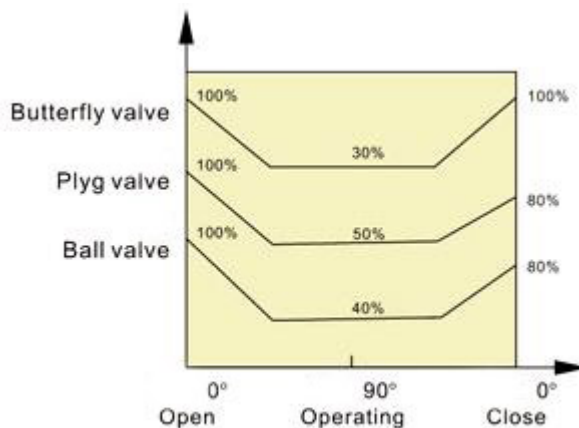
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Economical sizing : single action actuators

During selecting the spring return actuators, we can choose the more reasonable and more economical actuators, if we know the different torque needed by the valve working at opening, operation and closing.



•Example

The torque of the butterfly valve is 80N.m  
 The max torque needed by the butterfly valve  $80 (1 + 30\%) = 104N.m$

The torque after opened (operating)  $104 \times 30\% = 32N.m$

Air supply = 4Bar

We can select the RFS125S K10

Output torque is:

Air stroke  $0^\circ = 114.4N.m > 104N.m$

Air stroke  $90^\circ = 59.4N.m > 32N.m$

Spring stroke  $90^\circ = 173.8N.m > 32N.m$

Spring stroke  $0^\circ = 118.8N.m > 104N.m$

The above datas show the actuator's torque can satisfy the requirement of the butterfly valve.

**Attention**

During the restoration, the spring return actuator's output torque will not be affected by in putting air from the port B On the contrary, it will help restoration of springs.

• Air Consumption

Air volume opening & closing					
Model	(L) Air volume opening	(L) Air volume closing	Model	(L) Air volume opening	(L) Air volume closing
RAT032	0.035	0.045	RAT160	2.6	3.7
RAT052	0.09	0.12	RAT190	4.2	5.9
RAT063	0.14	0.2	RAT210	5.7	8.2
RAT075	0.21	0.3	RAT240	9	12.8
RAT083	0.29	0.41	RAT270	12.6	17.9
RAT092	0.49	0.71	RAT300	21.4	30
RAT105	0.7	0.99	RAT350	31.2	43.7
RAT140	1.7	2.4	RAT400	47.9	67.1

**BK ACTUATOR**

• **Three position Theoborn actuator**

Three position Theoborn actuator provides an operation of 0°, 45°, 90° or the random travel of midway position. The midway position is achieved by a mechanical stoppage of movement on the two (2) auxiliary pistons. (Midway stop position is adjustable).

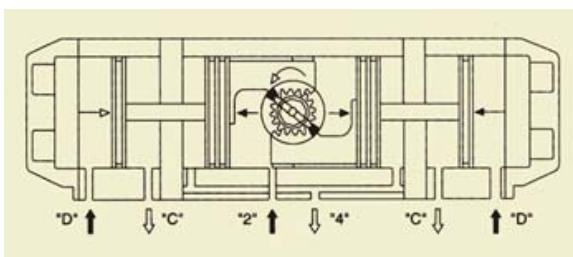


Chart1: midway position from chart 1 we can see that this position is obtained when air is supplied to port 2 and port D. Meantime port 4 and port C are in state of exhaust air. The midway position is achieved by a mechanical stoppage of movement of the two auxiliary pistons.

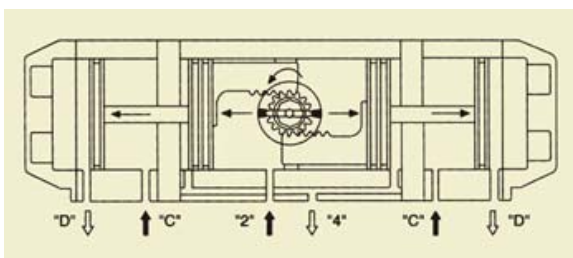


Chart2: fully open position from chart 2 we can see that this position is obtained when air is supplied to port 2 and C (air to port C is optional) ,meantime ,port 4 and D are the state of exhaust air.

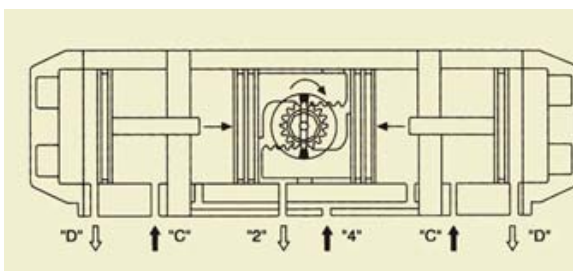


Chart3: fully closed position from chart 3 we can see that this position is obtained when air is supplied to port 4 and port 2 in the state of exhaust air. Port C and D do not need to operate.



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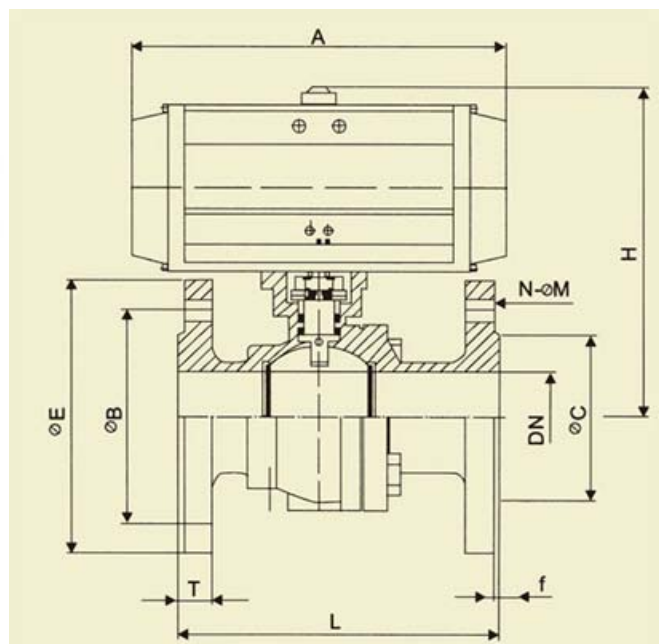
## • How to order

- Pneumatic actuators: double action or single action (normal-close or normal open );
  - The operating pressure of valve, the operating medium, ambient temperature, hard or soft O-rings.
  - Solenoid: valve dual control or single control, operating voltage, Ex-proof or not.
  - Signal feedback: mechanical or approachable, operating voltage, output current and Ex-proof type.
  - Positioner: pneumatic positioner electric positioner, current signal, voltage signal, electric-pneumaticity switch,
  - Ex-proof type.
  - Three-unit of dealing with air supply.
  - Manual equipment.
  - Special customized.
  - National or import should be told.
- High quality products
    - Each product has been tested and checked before it leaves factory.
    - Each product has a Q. C. Passed label.
    - Each product is marked with NUMAR connection size and amounting size.
    - Each product is packaged in a special carton, coated with product carton and specification.

**BK ACTUATOR**

## Pneumatic Flange Type Ball Valve

**flange type ball valve** manufacturer and wholesaler. Our products are produced according to the ISO9001:2000 standards. There are more than 10 well educated and experienced technicians in our company to deal with OEM pneumatic flange type ball valve services for our customers. Equipped with advanced facilities and high technology, now we are supplier of some famous enterprises such as the Parker Hannifin in the USA.



D N	L	T	F	E	B	C	H	A	N-M	Actuator
15	130	14	2	95	65	46	147	143	4-14	RAT052DA
20	130	16	2	105	75	56	152	143	4-14	RAT052DA
25	140	16	2	115	85	65	163	143	4-14	RAT052DA
32	165	18	2	140	100	76	184	173	4-18	RAT083DA
40	165	18	2	150	110	84	201	190	4-18	RAT075DA
50	203	20	2	265	125	99	219	196.5	4-18	RAT083DA
65	222	20	2	185	145	118	249	241	4-18	RAT092DA
80	241	20	2	200	160	132	272	263.5	4-18	RAT105DA
100	305	22	2	220	180	156	321	319	8-18	RAT125DA
125	356	22	2	250	210	184	381	390	8-18	RAT140DA
150	394	24	2	285	240	211	458	515	8-22	RAT190DA
200	457	24	2	340	295	266	534	560	12-22	RAT210DA

**BK ACTUATOR**



**PNEUMA SYSTEM CO.,LTD.**

**บริษัท นิวมา ซีสเต็มส์ จำกัด**

## Pneumatic Flange Type Ball Valve

- Standard

Design: BS 5351

Structure Length: ANSI B 16.10/JIS

B2002/DIN PN 16320F4/F5

Flange Dimensions: ANSI

B16.5/JIS B2210/DIN 2633PN16

Testing: API598

### APPLICATION

For General Chemical and Industrial Services

Pressure and Temp. Range:

ANSI B16.31/JIS B2201

### SPECIFICATION

Fire-safe design

Body material: CF8M,CF8,CF3M

Additive: PTFE PPL flexible graphite



- FEATURES

1. Unique design and beautiful appearance

2. High platform structure and connection to ISO5211, making installation of electric/pneumatic actuator

more professional.

3. Valve body is overlaid with reinforced bar, it can be permanently used in caustic media ,keep itself from

cracking and avoid the failure of parts of valve during installtion.

4. Grinding process of valve stem to reduce the moment of electric/pneumatic valve during assembly and

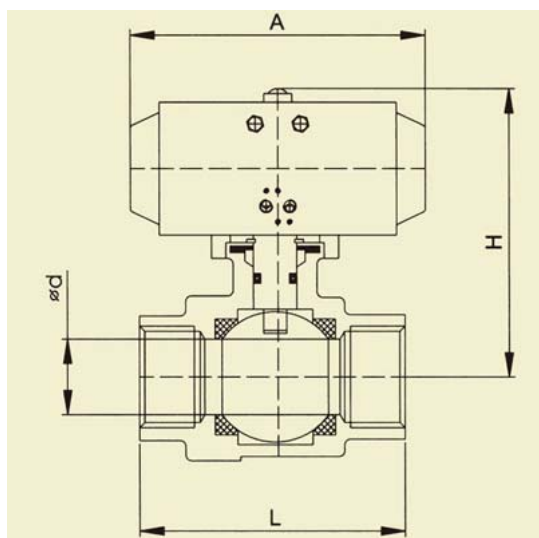
make it runmore flexible.

5. The body of carbon steel ball valve is phosphate coated, no fade ,rustless , durable and beautiful

**BK ACTUATOR**

## Pneumatic Inner Thread 2-pcs Ball Valve

**Inner thread 2-pcs ball valve** manufacturer and wholesaler. Our products are produced according to the ISO9001:2000 standards. There are more than 10 well educated and experienced technicians in our company to deal with OEM pneumatic Inner thread 2-pcs ball valve services for our customers. Equipped with advanced facilities and high technology, now we are supplier of some famous enterprises such as the Parker Hannifin in the USA.



- Standard

Design: ANSI B 16.34

Testing: AP1598

#### APPLICATION

For General Chemical and Industrial Services

Steam Working Pressure: 150PSI WSP

Temperature Range: -20°C ~ +150°C

#### SPECIFICATION

Investment Cast Body & End Cap

End Type: Threaded BSP or NPT, Buttweld

Socket Weld 2PC

Design For Fast Installation & Simple

Maintenance Bottom-loaded, Blow-out-proof Stem



### Pneumatic Inner Thread 2-pcs



Model	ød	L	A	H	Actuator
1/4 "	11.2	75	110	107.5	RAT032DA
3/8 "	12.7	75	110	110.5	RAT032DA
1/2 "	16	75	143	135.5	RAT052DA
3/4 "	20	80	143	138.5	RAT052DA
1 "	25	90	143	146.5	RAT052DA
1-1/4 "	32	110	173	166	RAT063DA
1-1/2 "	38.1	120	190	186.5	RAT075DA
2 "	50.8	140	190.5	204.5	RAT083DA
2-1/2 "	63.5	173	241	241	RAT092DA
3 "	76.2	186	268	264	RAT105DA

NO.	PARTNAME	SPECIFICATION
1	BODY	ASTMA351-CF8M
2	END CAP	ASTMA351-CF8M
3	BALL	ASTMA351-CF8M
4	STEM	ASTMA276-316
5	SEATS	PTFE
6	GASKET	PTFE
7	STEM	PTFE+15%GF
8	O-RING	VITON
9	DISC SPRING	SUS301JI
10	RETAININGRING	S. S.304
11	BOLTS	S. S.304
12	BOLTNUITS	S. S.304
13	WASHER	S. S.304

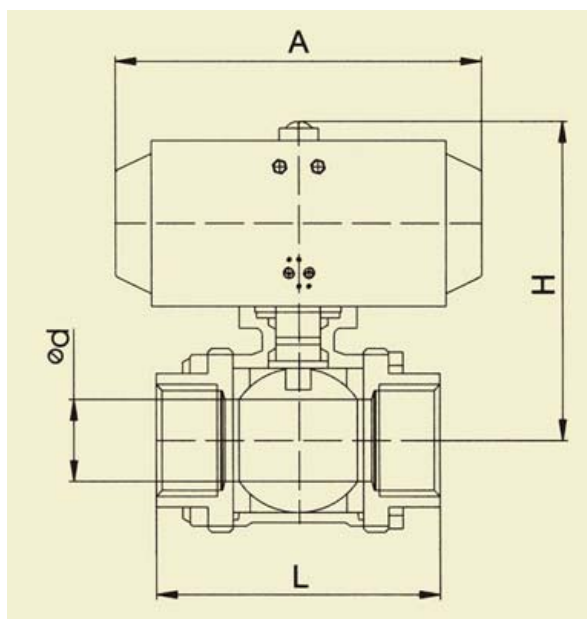


**PNEUMA SYSTEM CO.,LTD.**

**บริษัท นิวมา ซีสเต็มส์ จำกัด**

## Pneumatic Inner Thread 3-pcs Ball Valve

**Inner thread 3-pcs ball valve** manufacturer and wholesaler. Our products are produced according to the ISO9001:2000 standards. There are more than 10 well educated and experienced technicians in our company to deal with OEM pneumatic Inner thread 3-pcs ball valve services for our customers. Equipped with advanced facilities and high technology, now we are supplier of some famous enterprises such as the Parker Hannifin in the USA.



- Standard

Design: ANSI B 16.34

Testing: AP1598

APPLICATION

For General Chemical and Industrial Services

Steam Working Pressure: 150PSIWSP

Temp. Range: -20°C ~ +150°C

SPECIFICATION

Investment Cast Body & End Cap

End Type: Threaded BSP or NPT, Buttweld

Socket Weld 2PC

Design For Fast Installation & Simple

Maintenance Bottom-loaded, Blow-out-proof

Stem

**BK ACTUATOR**

### Pneumatic Inner Thread 3-pcs



Model	ød	L	A	H	Actuator
1/4 "	11.2	75	110	107.5	RAT032DA
3/8 "	12.7	75	110	110.5	RAT032DA
1/2 "	16	75	143	135.5	RAT052DA
3/4 "	20	80	143	138.5	RAT052DA
1 "	25	90	143	146.5	RAT052DA
1-1/4 "	32	110	173	166	RAT063DA
1-1/2 "	38.1	120	190	186.5	RAT075DA
2 "	50.8	140	190.5	204.5	RAT083DA
2-1/2 "	63.5	173	241	241	RAT092DA
3 "	76.2	186	268	264	RAT105DA
4 "	100	225	319	315	RAT125DA

NO.	PARTNAME	SPECIFICATION
1	BODY	ASTMA351-CF8M
2	END CAP	ASTMA351-CF8M
3	BALL	ASTMA351-CF8M
4	STEM	ASTMA276-316
5	SEATS	PTFE
6	GASKET	PTFE
7	STEM	PTFE + 15%GF
8	O-RING	VITON
9	DISC SPRING	SUS301JI
10	RETAININGRING	S. S.304
11	BOLTS	S. S.304
12	BOLTNUITS	S. S.304
13	WASHER	S. S.304

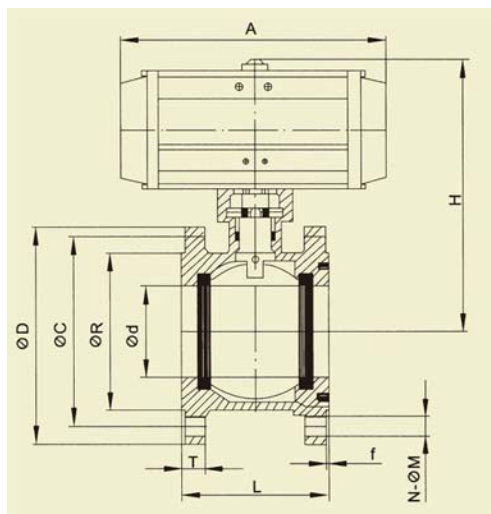
**BK ACTUATOR**



**PNEUMA SYSTEM CO.,LTD.**  
บริษัท นิวมา ซีสเต็มส์ จำกัด

## Pneumatic Thin Type Ball Valve

**Thin type ball valve** manufacturer and wholesaler. Our products are produced according to the ISO9001:2000 standards. There are more than 10 well educated and experienced technicians in our company to deal with OEM pneumatic thin type ball valve services for our customers. Equipped with advanced facilities and high technology, now we are supplier of some famous enterprises such as the Parker Hannifin in the USA.



• SPECIFICATIONS

Working pressure: 1.6~4.0Mpa  
 Temperature range: -20~232°C~350°C  
 Suitable medium:  
 Water,Oil,Air,and some corrosive Liquid

Design Standard: GB/T12237/1989  
 End Flange: JB79  
 Fire Safe: API607 4th 1993  
 Inspection & Testing: GB/T13927-1992

Specification	ød	øR	øc	øD	L	H	A	T	f	N-øM	Actuator	
DN15	1/2"	15	45	65	95	42	145	143	14	2	12	RAT052DA
DN20	3/4"	20	55	75	100	44	150	143	14	2	12	RAT052DA
DN25	1"	25	65	85	110	50	161	143	14	2	12	RAT052DA
DN32	1 1/4"	32	78	100	110	60	185	173	16	2	16	RAT063DA
DN40	1 1/2"	38	85	110	110	65	203	190	16	3	16	RAT075DA
DN50	2"	50	100	125	125	80	220	196.5	16	3	16	RAT083DA
DN65	2 1/2"	63.5	120	145	145	110	253	241	18	3	16	RAT092DA
DN80	3"	76	135	160	160	120	274	263.5	20	3	16	RAT105DA
DN100	4"	95	155	180	180	150	320	319	20	3	16	RAT125DA
DN125	5"	118	185	210	210	180	374	390	22	3	16	RAT140DA
DN150	6"	142	210	240	240	225	415	449	24	3	20	RAT160DA

**BK ACTUATOR**

## Pneumatic Thin Type Ball Valve



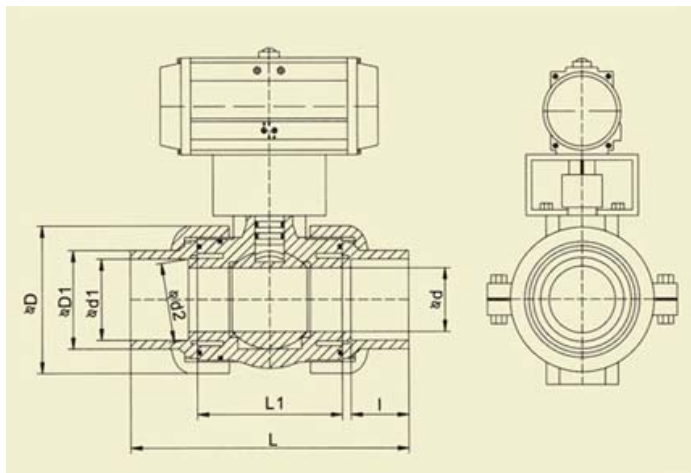
NO.	PART	MATERIAL		
1	Body	CF8M	CF8	WCB
2	Endcap	CF8M	CF8	WCB
3	Ball	316	304	
4	Ball Seat	PTFE	PPL	
5	Stem	316	304	2Cr13
6	Anti-Static equipment	304		
7	Cap gasket	PTFE		
8	Thrust spacer	PTFE		
9	Filling	PTFE		
10	Transitionspacer	Enhanced PTFE, flexible graphite		
11	Filling clamping	304		
12	Butterfl y spring	304		
13	Nut	304		
14	Loose resistantcove	304		
15	Handle Nutr	304		
16	Lock Device	304		
17	Handle	304		
18	Handle sleeve	Plastic		
19	Stop Bol	304		
20	Set Screwedt	304		
21	Handle	304		
22	Handle Adapter	304		



**PNEUMA SYSTEM CO.,LTD.**  
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## Pneumatic Plastic Ball Valve

**Plastic ball valve** manufacturer and wholesaler. Our products are produced according to the ISO9001:2000 standards. There are more than 10 well educated and experienced technicians in our company to deal with OEM pneumatic plastic ball valve services for our customers.



Nom		15mm (1/2" )	20mm (3/4" )	25mm (1" )	32mm (1-1/4" )	40mm (1-1/2" )	50mm (2" )	65mm (2-1/2" )	80mm (3" )	100mm (4" )
JIS	d1	22.3	26.3	32.33	38.43	48.46	60.56	76.6	89.6	114.7
	d2	21.7	25.7	31.67	37.57	47.54	59.44	75.87	88.83	113.98
	I	22.22	25.4	28.6	31.8	34.9	38.1	44.45	63	69
ANSI	d1	21.54	26.87	33.65	42.42	48.56	60.63	73.38	89.31	114.76
	d2	21.23	26.57	32.27	42.04	48.11	60.17	72.85	88.7	114.07
	I	22.22	25.4	28.58	31.75	34.93	38.1	44.45	47.63	57.15
DIN	d1	20.3	25.3	32.3	40.3	50.3	63	75.3	90.3	110.4
	d2	20.1	25.1	32.1	40.1	50.1	63.1	75.1	90.1	110.1
	I	16	19	22	26	31	38	44	51	61
BS	d1	21.5	26.9	33.7	42.4	48.4	60.5	-	-	-
	d2	21.3	26.7	33.5	42.2	42.8	60.3	-	-	-
	I	16.5	19.5	22.5	27	30	36	-	-	-
THD./IN	NPT	14	14	11.5	11.5	11.5	11.5	8	8	8
	PT	14	14	11	11	11	11	11	11	11
D		45	55	66	82	98	120	140	160	225
D1		31	37	44	54	65	79	92	108	146
d		13	18	23	30	38	48	61	69	99
L		112	132	144	165	171	200	273	303	326
L1		60	73	78	87	92	112	136	158	176
Actuator		RAT032DA	RAT052DA	RAT052DA	RAT063DA	RAT075DA	RAT083DA	RAT092DA	RAT105DA	RAT140DA

**BK ACTUATOR**

## Pneumatic Plastic Ball Valve



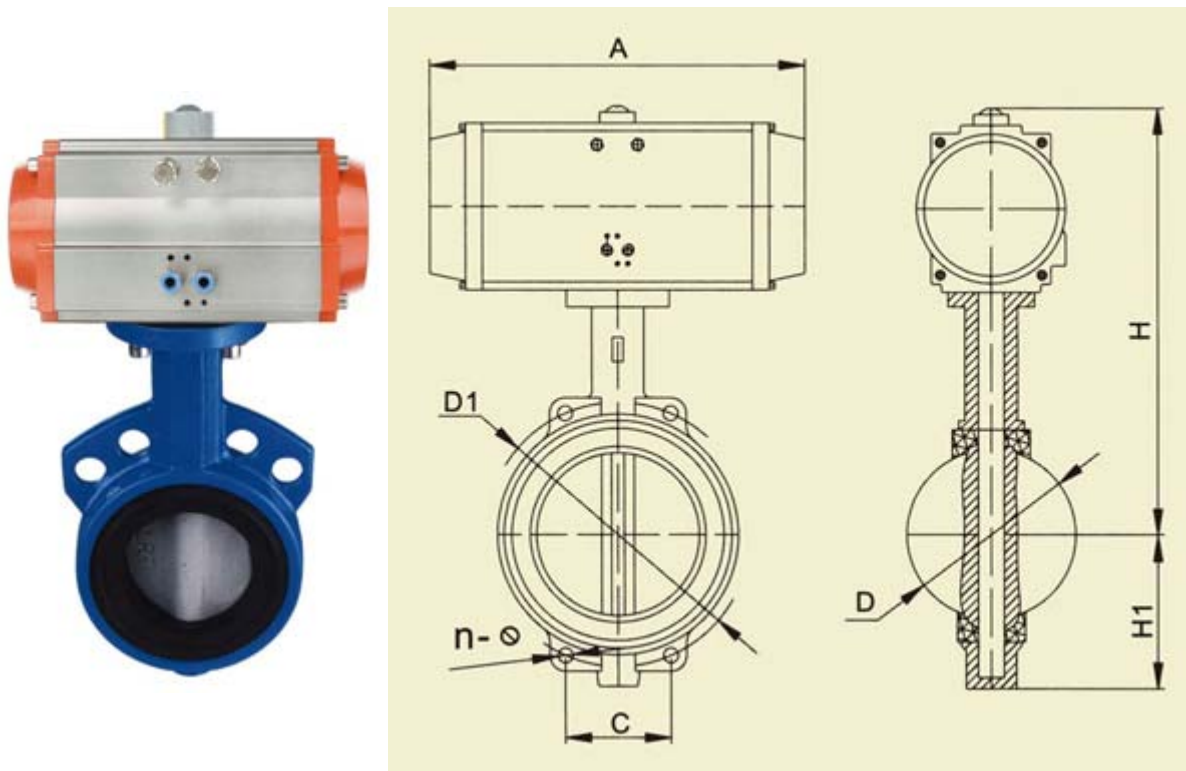
- Characteristic Pneumatic Plastic Ball Valve
  - Pressure rating: 150 psi , Working pressure: 73.4°f (23°C)
  - Standard flow rate
  - Adjustable seat tightness
  - Easy to disassemble by handle
  - Less on-line down time for replacement / maintenance
  - Actuator could be installed with inserted nut
  - Standard product without nut

Type	Size	Standard	Material	Seat	O-ring	Port
VP-640	1/2" ~ 4"	ANSI, JIS, DIN, BS	PVC	PTFE	EPDM, FPM	Socket, Threaded, Flanged
VP-641	1/2" ~ 4"	ANSI, JIS, DIN, BS	CPVC	PTFE	EPDM, FPM	Socket, Threaded, Flanged
VP-643	1/2" ~ 4"	ANSI, JIS, DIN, BS	PVDF	PTFE	EPDM, FPM	Socket, Threaded, Flanged
VP-644	1/2" ~ 4"	ANSI, JIS, DIN, BS	PP	PTFE	EPDM, FPM	Socket, Threaded, Flanged
VP-645	1/2" ~ 4"	ANSI, JIS, DIN, BS	ABS	PTFE	EPDM, FPM	Socket, Threaded, Flanged

NO.	PART	MATERIAL
1	BODY	UPVC, CPVC, PP, PVDF, ABS
2	STEM O-RING	EPDM, FPM
3	STEM	UPVC, CPVC, PP, PVDF, ABS
4	BALL	UPVC, CPVC, PP, PVDF, ABS
5	SEAT SEAL	PTFE
6	CARRIER O-RING	EPDM, FPM
7	SEAT CARRIER	UPVC, CPVC, PP, PVDF, ABS
8	UNION O-RING	EPDM, FPM
9	SET RING	UPVC, CPVC, PP, PVDF, ABS
10	UNION NUT	UPVC, CPVC, PP, PVDF, ABS
11	HANDLE	ABS, PP
12	INSERTED NUT	C3604
13	FLANGE	UPVC, CPVC, PP, PVDF, ABS

## Pneumatic Soft-sealing Butterfly Valve

**Soft-sealing butterfly** valve manufacturer and wholesaler. Our products are produced according to the ISO9001:2000 standards. There are more than 10 well educated and experienced technicians in our company to deal with OEM pneumatic soft-sealing butterfly valve services for our customers. Equipped with advanced facilities and high technology, now we are supplier of some famous enterprises such as the Parker Hannifin in the USA.



**BK ACTUATOR**





## Pneumatic Soft-sealing Butterfly Valve

Specification		D	D1	H	H1	A	C	n-d	Actuator
(mm)	(Inch)								
50	2	52.9	120	274	80	173	42	4-23	RAT063DA
65	2.5	64.5	136.2	300	89	190	44.7	4-26.5	RAT075DA
80	3	78.8	160	315	95	196.5	45.2	8-18	RAT083DA
100	4	104	185	345	114	241	52.1	4-24.5	RAT092DA
125	5	123.3	215	371	127	263.5	54.4	4-23	RAT105DA
150	6	155.6	238	407	139	319	55.8	4-25	RAT125DA
200	8	202.5	295	441	175	319	60.8	4-25 4-23	RAT125DA
250	10	250.5	357	490	203	390	65.6	4-29	RAT140DA
300	12	301.6	407	560	242	449	76.9	4-29	RAT160DA
350	14	333.3	467	591	267	449	76.5	4-30	RAT160DA
400	16	389.6	515 /525	656	309	515	86.5	4-26 4-30	RAT190DA
450	18	440.51	565 /585	703	328	560	105.6	4-26 4-30	RAT210DA
500	20	491.5	620 /650	786	361	654	131.8	4-26 4-33	RAT240DA
600	24	592.5	725 /770	908	459	725	152	20-30 20-33	RAT270DA
700	28	695	840	970	520	725	163	24-30 20-36	RAT270DA
800	32	794.7	950	1046	591	742	188	24-33 24-39	RAT300DA
900	36	864.7	1050	1148	656	860	203	24-33	RAT350DA
1000	40	965	1160	1310	721	918	213	24-36	RAT400DA

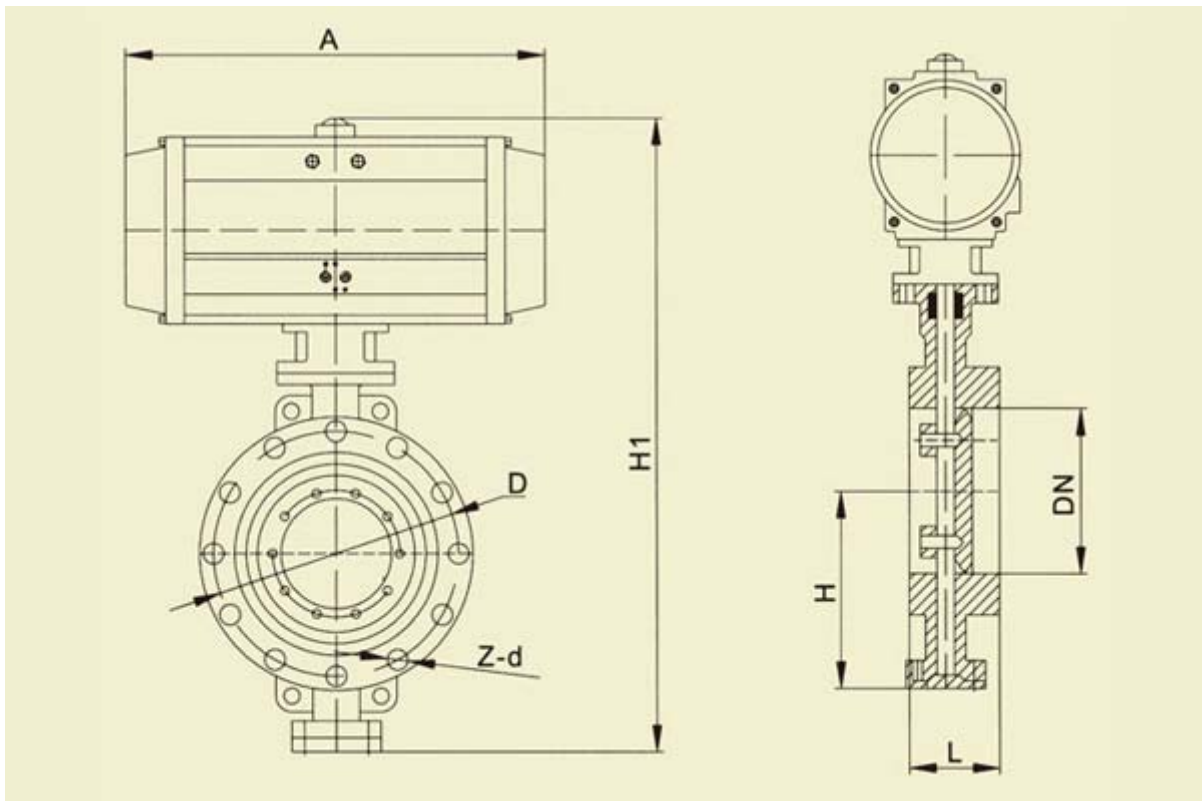
### • FEATURES

1. Small and light, easy for installation and repair, and can be installation on any position.
2. Simple structure, well-organized, prompt 90°turn round, open and close.
3. Small operating torque, simple and light.
4. Flow rate characteristic tend to straight, well regulate.
5. Open and close test over 10,000 times, long life.
6. Complete seal, no leakage during air testing.
7. Choose different material as parts, fit for kinds of medium.

**BK ACTUATOR**

## Pneumatic Hard-sealing Butterfly Valve

**Hard-sealing butterfly valve** manufacturer and wholesaler. Our products are produced according to the ISO9001:2000 standards. There are more than 10 well educated and experienced technicians in our company to deal with OEM pneumatic hard-sealing butterfly valve services for our customers. Equipped with advanced facilities and high technology, now we are supplier of some famous enterprises such as the Parker Hannifin in the USA.



**BK ACTUATOR**



**PNEUMA SYSTEM CO.,LTD.**

**บริษัท นิวมา ซีสเต็มส์ จำกัด**

## Pneumatic Hard-sealing Butterfly Valve

DN		L		D	D1	H	H1	H2	A	Z-d	Actuator
mm	inch	Short	Long								
50	2	108	150	165	125	112		134	196.5	4-18	RAT083DA
65	2 <sup>1</sup> / <sub>2</sub>	112	170	185	145	115		145	241	4-18	RAT092DA
80	3	114	180	200	160	120		158	263.5	8-18	RAT105DA
100	4	127	190	220	180	138	548	181	319	8-18	RAT125DA
125	5	140	200	250	210	164	605	198	390	8-18	RAT140DA
150	6	140	210	285	240	175	653	223	449	8-22	RAT160DA
200	8	152	230	340	295	200	772	223	449	8-22	RAT160DA
250	10	165	250	395	350	243	866	256	515	12-22	RAT190DA
300	12	178	270	445	400	250	964	281	560	12-22	RAT210DA
350	14	190	290	505	460	280	1068	281	560	16-22	RAT210DA
400	16	216	310	565	515	305	1108	281	560	16-26	RAT210DA
450	18	222	330	615	565	350	1177	306	654	20-26	RAT240DA
500	20	291	350	670	620	380	1289	346	725	20-26	RAT270DA
600	24	267	390	780	725	445	1439	374	745	20-30	RAT300DA
700	28	292	430	892	840	480	1494	374	745	24-30	RAT300DA
800	32	318	470	1015	950	530	1718	428	860	24-33	RAT350DA
900	36	330	510	1115	1050	580	1818	428	860	28-33	RAT350DA
1000	40	410	550	1230	1160	650	2041	506	918	28-36	RAT400DA
1200	48	470	630	1455	1380	760	1176	506	918	32-39	RAT400DA

- Characteristic

Because this butterfly valve adopt three-dimensional eccentric to design, make the movement track on facing space reach to idealization, and there are no attrition and on intervene between hermetical components, furthermore, the hermetical material has been selected reasonably, there by it ensure hermetic, 10 antisepsis, wearable capability of valve. The main characteristic as below:

1. Tiny moment for starting, flexible and convenient, save labor and energy.
2. Three-dimensional eccentric configuration forces disc close tighter, and reach to reliable hermetic capability and with no leakage.
3. High temperature resistant, high pressure resistant, long service life etc.

**BK ACTUATOR**

## Pneumatic Hard-sealing Butterfly Valve

- Main technology parameter

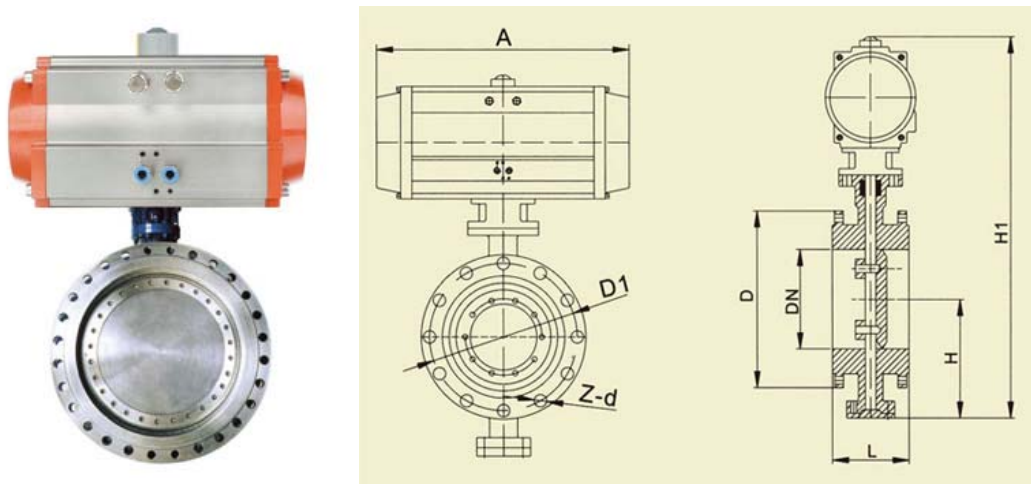
Nominal diameter	DN (mm)	50~200				50~500
Nominal pressure	PN (MPa)	0.6	1	1.6	2.5	4
PS(MPa) Test Pressure	Shell test	0.9	1.5	2.4	3.75	6
	Seal test	0.66	1.1	1.76	2.75	4.4
	Gas seal test	0.6	0.6	0.6	0.6	0.6
Leakage	<0.1xDNmm <sup>3</sup> /s (GB/T13927-92 standard)					
Appropriate temperature	Carbon steel : -29°C~425°C Stainless steel : -40°C~600°C					
Appropriate medium	Air, water, steam, coalgas, oil and acid, alkali, salt corrosive medium and so on					
Drive modality	Worm wheel drive, gas drive, electric drive					

- Material for main parts

Parts name	Material
Body	Cast iron, Stainless steel, Cr.MO.Steel, Alloy steel
Disc	Cast steel, Alloy steel, Stainless steel, Cr.MO.Steel
Seal	Stainless steel and high temperature resistant asbestos composed of multiple layers
Stem	2Cr13, 1Cr13 Stainless steel, Cr.MO.Steel
Bearing	Austenitic stainless steel, 304 nitride ZG00Cr18Ni10, 304nitrication
Additive	Flexible graphite

## Pneumatic Flange Type Butterfly Valve

**flange type butterfly valve** manufacturer and wholesaler. Our products are produced according to the ISO9001:2000 standards. There are more than 10 well educated and experienced technicians in our company to deal with OEM pneumatic flange type butterfly valve services for our customers. Equipped with advanced facilities and high technology,



DN		L	D	H	H1	A	Z-d	Actuator
mm	inch							
50	2	43	125	112		196.5	4-18	RAT083DA
65	2 1/2	46	145	115		241	4-18	RAT092DA
80	3	64	160	120		263.5	8-18	RAT105DA
100	4	64	180	138	548	319	8-18	RAT125DA
125	5	70	210	164	605	390	8-18	RAT140DA
150	6	76	240	175	653	449	8-22	RAT160DA
200	8	89	295	215	772	449	8-22	RAT160DA
250	10	114	350	243	866	515	12-22	RAT190DA
300	12	114	400	285	964	560	12-22	RAT210DA
350	14	127	460	320	1068	560	16-22	RAT210DA
400	16	140	515	350	1108	560	16-26	RAT210DA
450	18	152	565	350	1176	654	20-26	RAT240DA
500	20	152	620	380	1289	725	20-26	RAT270DA
600	24	154	725	435	1439	745	20-30	RAT300DA
700	28	165	840	480	1494	745	24-30	RAT300DA
800	32	190	950	530	1718	860	24-33	RAT350DA
900	36	203	1050	595	1818	860	28-33	RAT350DA
1000	40	216	1160	650	2041	918	28-36	RAT400DA
1200	48	254	1380	775	2276	918	32-39	RAT400DA

**BK ACTUATOR**

## Pneumatic Flange Type Butterfly Valve

- Characteristic

Because this butterfly valve adopt three-dimensional eccentric to design, make the movement track on facing space reach to idealization, and there are no attrition and on intervene between hermetical components, furthermore, the hermetical material has been selected reasonably, there by it ensure hermetic, 10 antisepsis, wearable capability of valve. The main characteristic as below:

1. Tiny moment for starting, flexible and convenient, save labor and energy.
2. Three-dimensional eccentric configuration forces disc close tighter, and reach to reliable hermetic capability and with no leakage.
3. High temperature resistant, high pressure resistant, long service life etc.

- Main technology parameter

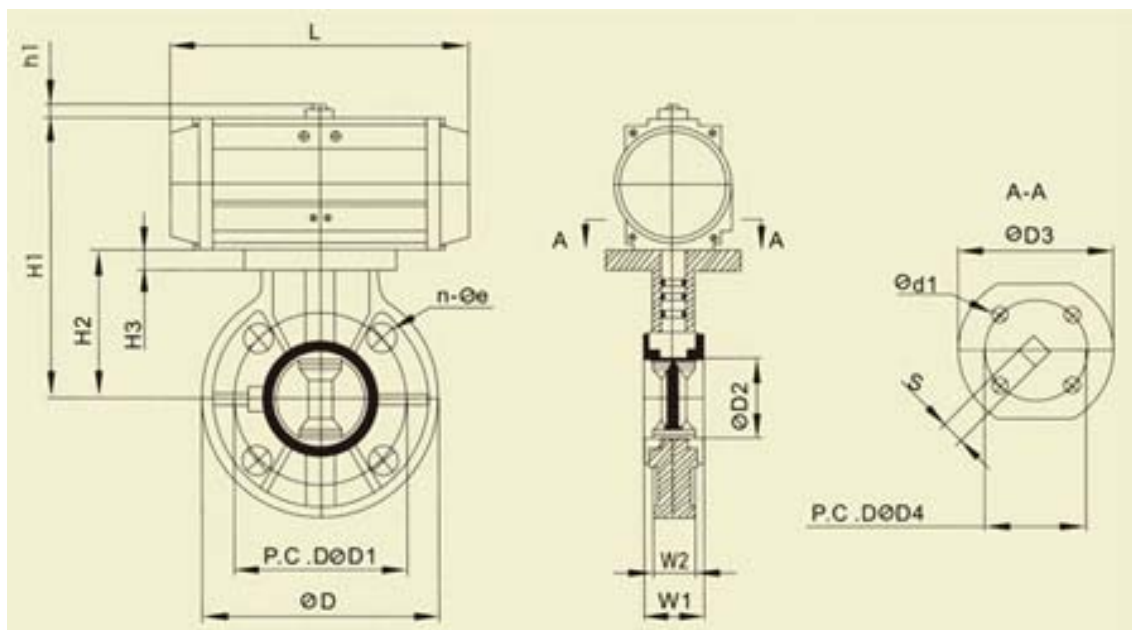
Nominal diameter	DN(mm)	50~200				50~500
Nominal pressure	PN(MPa)	0.6	1	1.6	2.5	4
PS(MPa) Test Pressure	Shell test	0.9	1.5	2.4	3.75	6
	Seal test	0.66	1.1	1.76	2.75	4.4
	Gas seal test	0.6	0.6	0.6	0.6	0.6
Leakage	<0.1xDNmm <sup>3</sup> /s(GB/T13927-92 standard)					
Appropriate temperature	Carbon steel : -29°C~425°C Stainless steel : -40°C~600°C					
Appropriate medium	Air, water, steam, coalgas, oil and acid, alkali, salt corrosive medium and so on					
Drive modality	Worm wheel drive, gas drive, electric drive					

- Material for main parts

Parts name	Material
Body	Cast iron, Stainless steel, Cr.MO.Steel, Alloy steel
Disc	Cast steel, Alloy steel, Stainless steel, Cr.MO.Steel
Seal	Stainless steel and high temperature resistant asbestos composed of multiple layers
Stem	2Cr13, 1Cr13 Stainless steel, Cr.MO.Steel
Bearing	Austenitic stainless steel, 304 nitride ZG00Cr18Ni10, 304nitrication
Additive	Flexible graphite

## Pneumatic Plastic Butterfly Valve

**Plastic butterfly** valve manufacturer and wholesaler. Our products are produced according to the ISO9001:2000 standards. There are more than 10 well educated and experienced technicians in our company to deal with OEM pneumatic plastic butterfly valve services for our customers. Equipped with advanced facilities and high technology



**BK ACTUATOR**

## Pneumatic Plastic Butterfly Valve

Nom		50mm (2) "	65mm (2-1/2) "	80mm (3) "	100m (4) "	125m (5) "	150mm (6) "	200mm (8) "	250mm (10) "	300mm (12) "	350mm (14) "	400mm (16) "	450mm (18) "	500m (20) "	600m (24) "
JIS	D1	120	140	150	175	210	240	290	355	400	445	510	565	620	730
	n-øe	4-19	4-19	8-19	8-19	8-23	8-23	8-23	12-25	16-25	16-25	16-27	20-27	20-27	24-35
ANSI	D1	120.3 9	139.4 4	152.4	190.5	216	241.55	298.5	362	432	476	540	578	635	749
	n-øe	4-19	4-19	4-19	8-19	8-22	8-22	8-22	12-25	12-25	12-29	16-29	16-32	20-32	20-30
DIN	D1	125	145	160	180	210	240	295	350	400	460	515	565	620	725
	n-øe	4-18	4-18	4-18	8-18	8-18	8-18	8-23	8-23	12-23	12-23	16-23	16-27	20-27	24-30
D		165	185	200	229	257	285	343	411	490	533	597	635	699	813
D2		56.5	69.5	79.5	102.5	130	152	203	255	309.5	365	406	452	502	603
D3		105	120	123	135	164	169	201	205	237	236	300	335	335	335
H2		103	113	115	135.5	165	177	210	242	302	300	350	370	400	465
H3		13	13	13	13	15	19	21	22	26	25	32	35	40	46
W1		43	46	46	56	69	705	85	109	133	127	168	189.5	189	209
W2		29	31	31	40	50	54	69	88	103.5	113	153	163	171	191
T-DIN259 85P		1/4 "	1/4 "	1/4 "	1/4 "	1/4 "	1/4 "	1/4 "	1/4 "	1/4 "	1/4 "	1/4 "	1/2 "	1/2 "	1/2 "
DOUBLE ACTION	ød1	6.5	6.5	8.5	8.5	8.5	8.5	10.5	10.5	10.5	12.5				
	øD4	50	50	70	70	70	70	102	102	102	125				
	h1	20	20	20	20	20	20	20	30	30	30				
	H1	188	188	217	237.5	280	304	367	399	498					
	L	158.5	158.5	210.5	210.5	247.5	268.5	345	345	437.5					
	S	14	14	17	17	17	22	27	27	27					
SINGLE ACTION	ød1	6.5	6.5	8.5	8.5	10.5	10.5	12.5	12.5						
	øD4	50	50	70	70	102	102	125	125						
	h1	20	20	20	20	20	20	30	30	30					
	H1	205	205	230	250.5	292	334	406	438						
	L	210.5	210.5	247.5	247.5	268.5	345	437.5	437.5						
	S	17	17	17	17	22	27	27	27						

- Low flow loss

- The opening angle of the disc could be seen clearly throumy the position indicator
- Fast/efficiemt operation for automatic control system in a limited piping space
- Pneumatic actuator specification meets with ISO 5211, VDI/VDE 3845, DIN 3337
- NAMUR, easy to assemble solenoid valve, limit swishes and accessories
- Pneumatic actuator max. air supply pressure 0.8MPa, min. air pressure 0.5MPa.

Pressure rating: 2" ~ 10" 150 psi, 12" 100 psi, 14" 16" 86 psi, 18" 72 psi, 20" ~ 24" 51 psi

**BK ACTUATOR**





## Pneumatic Plastic Butterfly Valve

Type	Size	Standard	Material	Seat	O-ring	Disc	Port
VP-830	2" ~ 24"	ANSI, JIS, DIN	PVC	EPDM, FPM	EPDM, FPM	PP	Flanged
VP-831	2" ~ 24"	ANSI, JIS, DIN	CPVC	EPDM, FPM	EPDM, FPM	CPVC	Flanged
VP-833	2" ~ 24"	ANSI, JIS, DIN	PVDF	EPDM, FPM	EPDM, FPM	PVDF	Flanged
VP-834	2" ~ 24"	ANSI, JIS, DIN	PP	EPDM, FPM	EPDM, FPM	PP	Flanged

NO.	PART	MATERIAL
1	BODY	UPVC, PP, CPVC, PVDF
2	DISC	UPVC, PP, PVDF
3	SEAT SEAL	EPDM, FPM
4	STEM	SUS410
5	O-RING	EPDM, FPM
6	O-RING	EPDM, FPM
7	PNEUMATIC ACTUATORS ALUMINIUM ALLOY	EXTRUDED
8	BOLT & WASHER	SUS
9	PIN	SUS



**BK ACTUATOR**



# Solenoid Valve/Air Control Valve

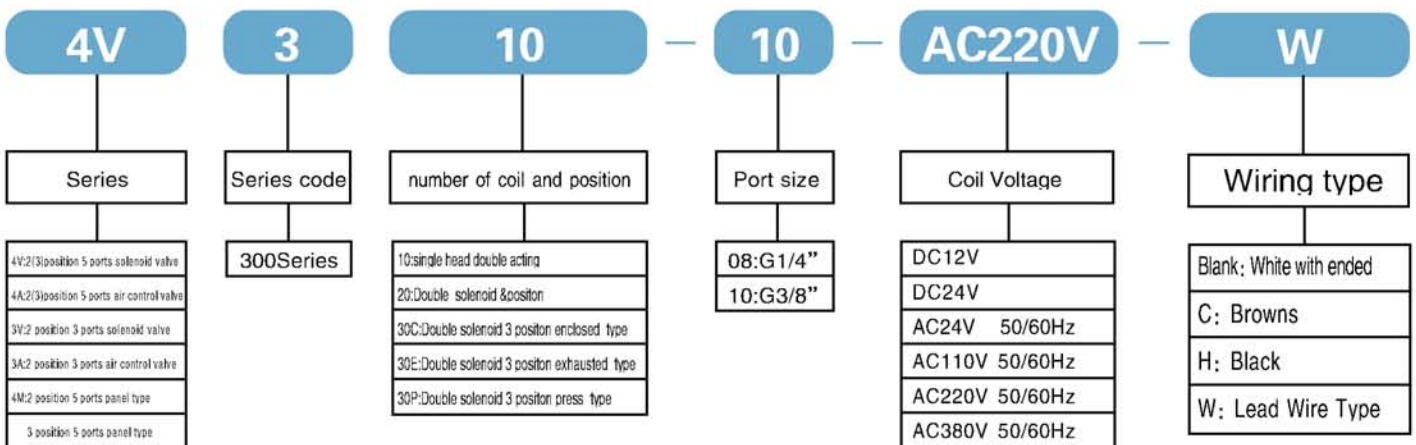
## Characteristic:

- Service life:10million cycle times.
- The bodies are mirror finished and hardening treated.
- Equipped with imported oil seals with smaller friction and longer service life.
- With imported coils,low power consumption, speedy response.
- Capable of long service time without being damaged.

## Specification:

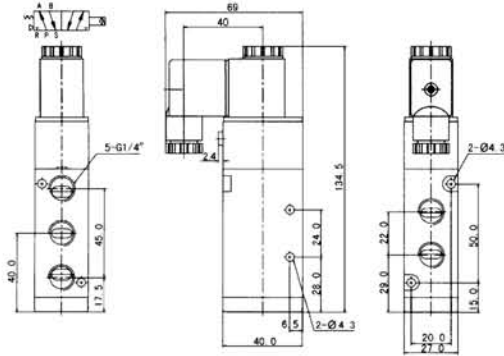
Type	4V310-08	4V320-08	4V330C-08	4V330E-08	4V330P-08	4V310-10	4V320-10	4V330C-10	4V330E-10	4V330P-10
Type	4A310-08	4A320-08	4A330C-08	4A330E-08	4A330P-08	4A310-10	4A320-10	4A330C-10	4A330E-10	4A330P-10
Position number	2 Positon 5 Way		3 Position 5 Way			2 Positon 5 Way		3 Position 5 Way		
Effective sectional area	25mm <sup>2</sup> (CV=1.40)		18mm <sup>2</sup> (CV=1.00)			30mm <sup>2</sup> (CV=1.68)		18mm <sup>2</sup> (CV=1.00)		
Type	3V310-08	3V320-08	3A310-08	3A320-08		3V310-10	3V320-10	3A310-10	3A320-10	
Position number	Two Positon Three Way					Two Positon Three Way				
Effective sectional area	25mm <sup>2</sup> (CV=1.40)					30mm <sup>2</sup> (CV=1.68)				
Port size	input=output=exhausted=G1/4"					input=output=G3/8" output=G1/4"				
Fluid	Air									
Acting type	Internally pilot-actuated									
Working pressure MPa	0.2~0.8									
Ambient temperature °C	-5~50									
Voltage range	± 10%									

## How to order:

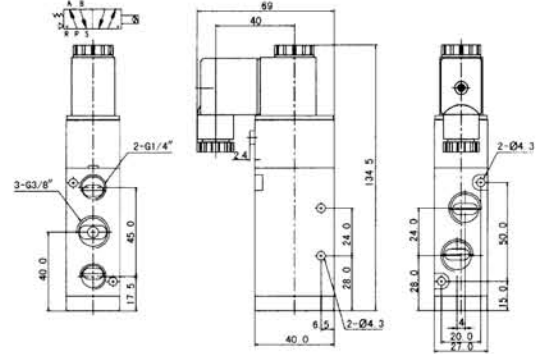


Dimension(mm):

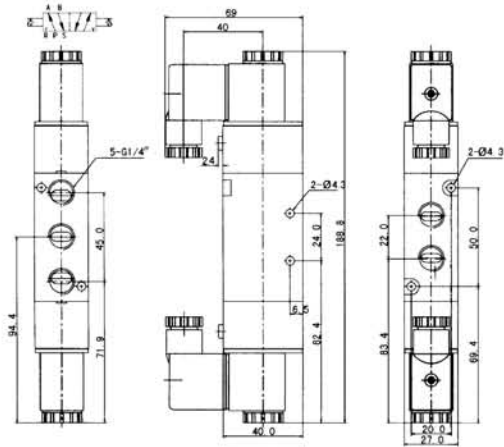
4V310-08



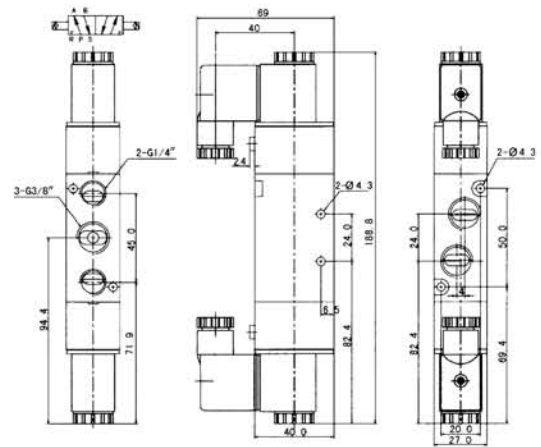
4V310-10



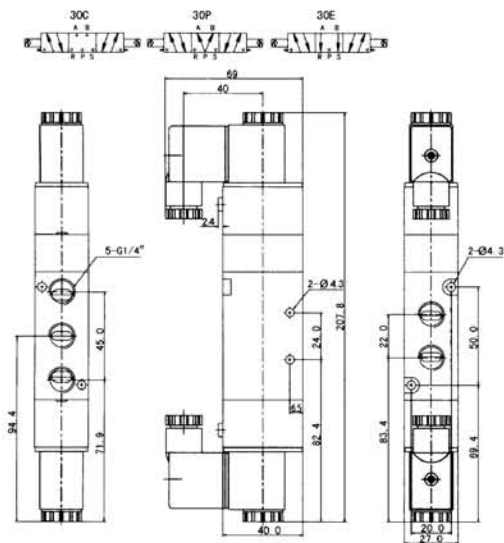
4V320-08



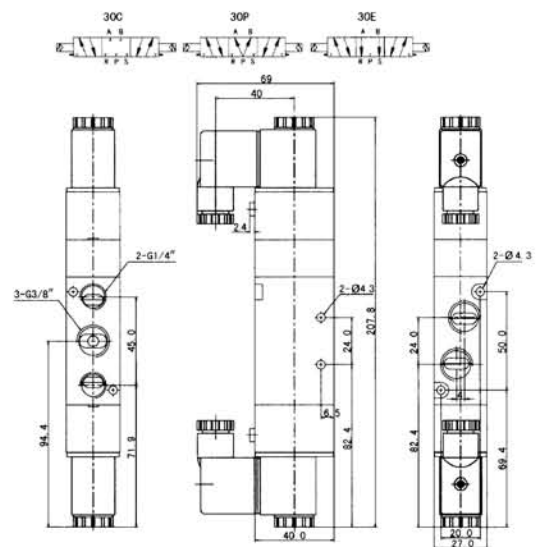
4V320-10



4V330-08

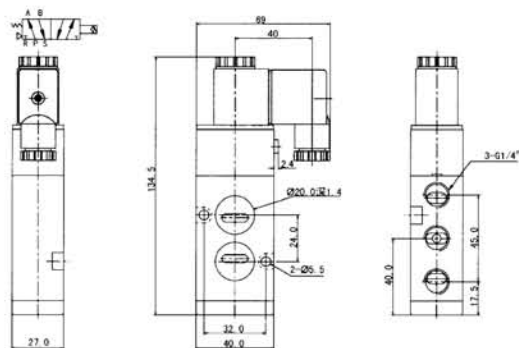


4V330-10

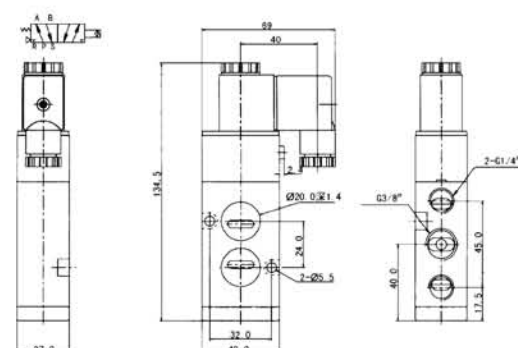


Dimension(mm):

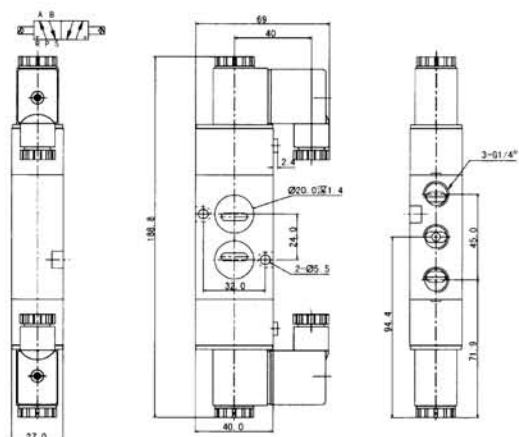
4M310-08



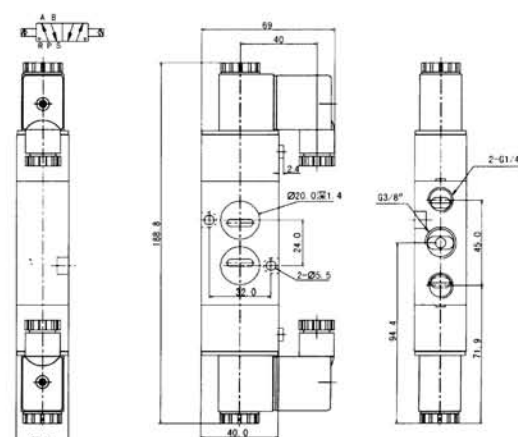
4M310-10



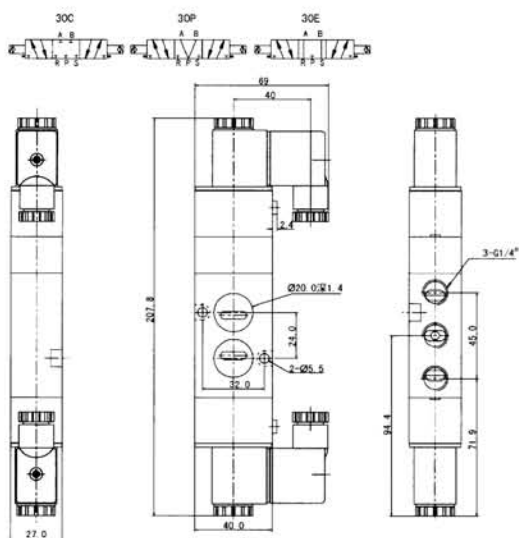
4M320-08



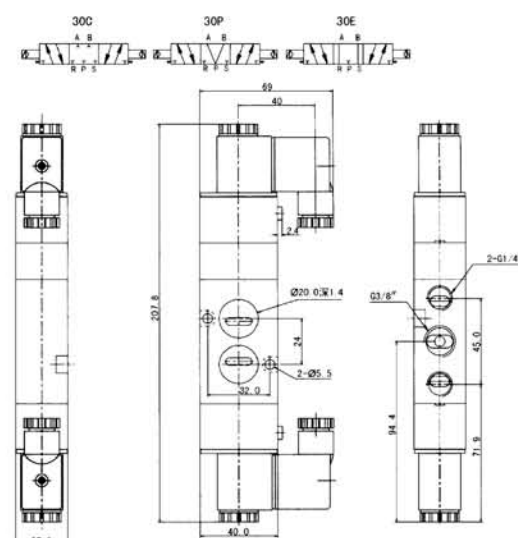
4M320-10



4M330-08

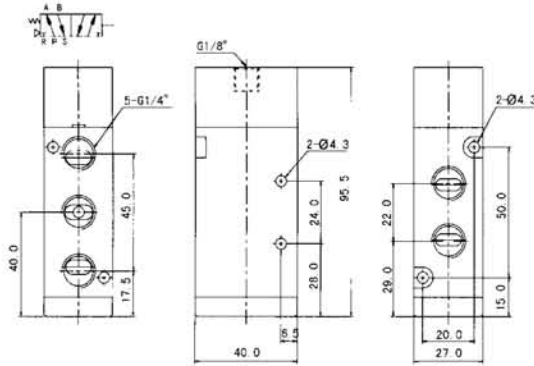


4M330-10

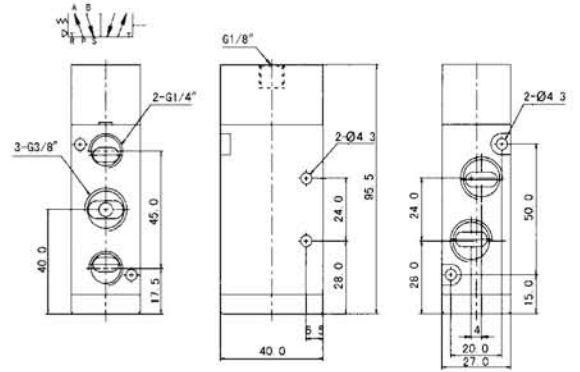


Dimension(mm):

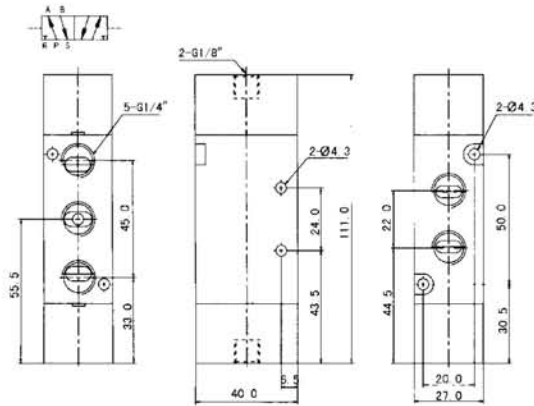
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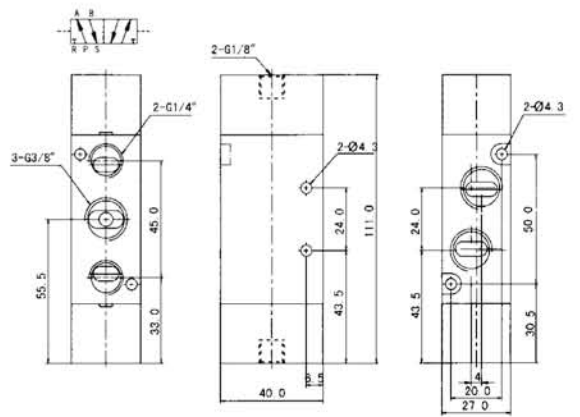
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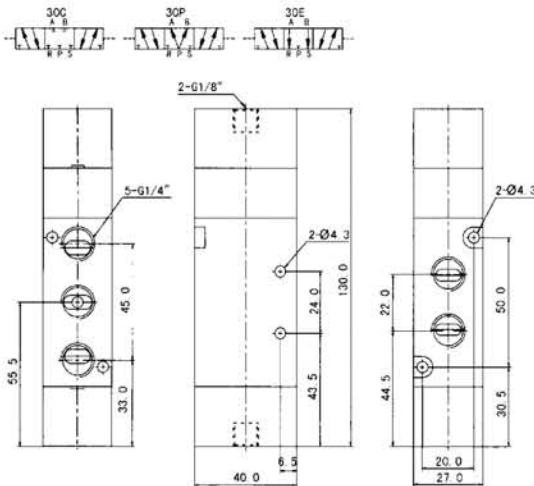
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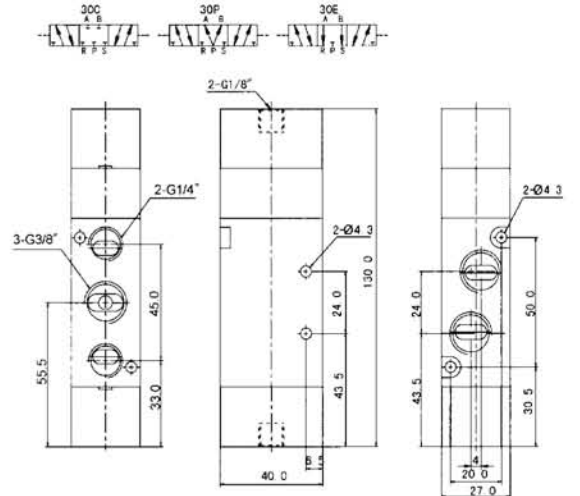
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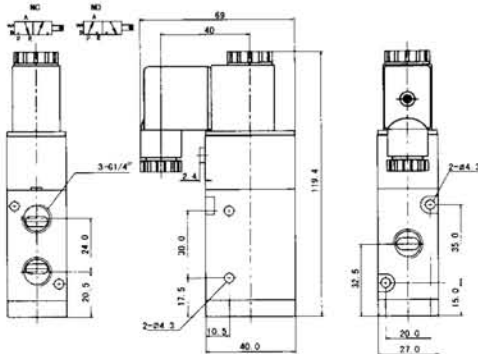


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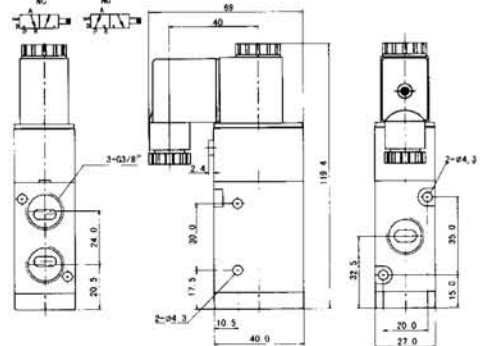


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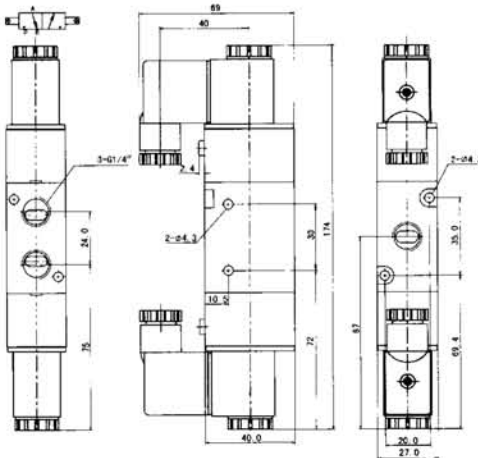
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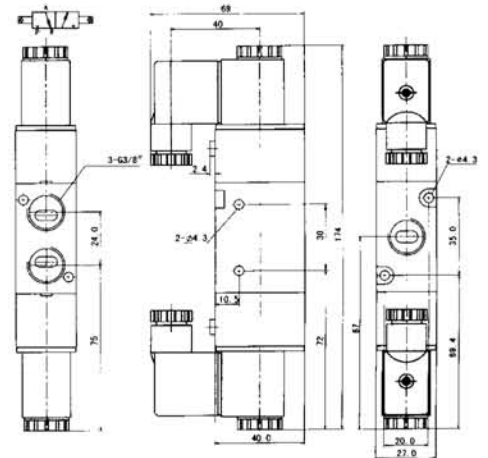
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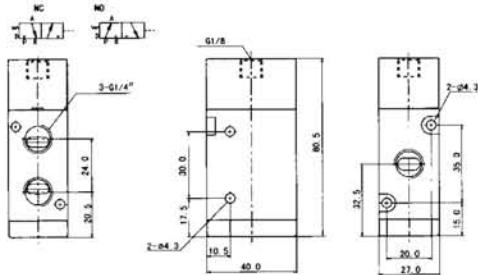
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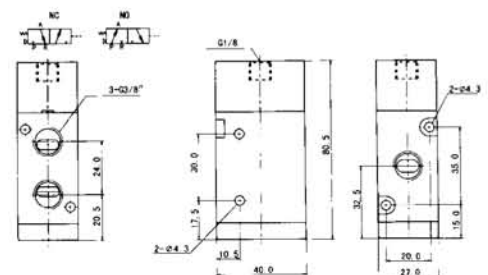
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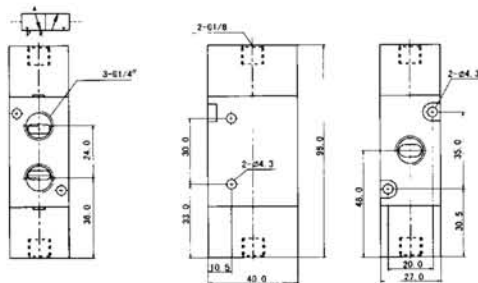
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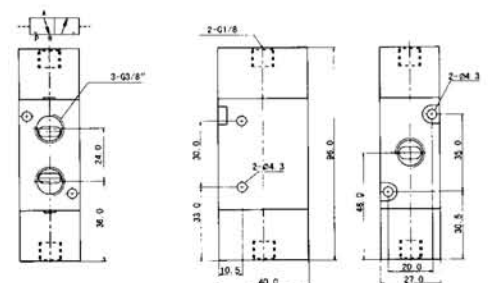
3A310-10



3A320-08



3A320-10







# Bourdon Tube Pressure Gauges

## Industrial Stainless Steel Gauge

### Type 232.54 - Dry Case

### Type 233.54 - Liquid-filled Case

WIKA Datasheet 23X.54

#### Applications

- Intended for adverse service conditions where pulsating or vibration exists
- Process industry: chemical/petrochemical, power stations, mining, on and offshore, environmental technology, mechanical engineering and plant construction
- Suitable for gaseous or liquid media that will not obstruct the pressure system

#### Product features

- Vibration and shock resistant (with liquid filling)
- All stainless steel construction
- Pressure ranges up to 15,000 psi

#### Specifications

##### Design

ASME B40.100 & EN 837-1

##### Sizes

2½" & 4" (63 & 100 mm)

##### Accuracy class

2½": ± 2/1.2% of span (ASME B40.100 Grade A)

4": ± 1% of span (ASME B40.100 Grade 1A)

##### Ranges

Vacuum / Compound to 200 psi (16 bar)

Pressure from 15 psi (1 bar) to 15,000 psi (1000 bar)

or other equivalent units of pressure or vacuum

##### Working pressure

2½":      Steady:      3/4 scale value  
              Fluctuating: 2/3 full scale value  
              Short time: full scale value

4":        Steady:      full scale value  
              Fluctuating: 0.9 x full scale value  
              Short time: 1.3 x full scale value

##### Operating temperature

Ambient: -40°F to +140°F (-40°C to +60°C) - dry

             -4°F to +140°F (-20°C to +60°C) - glycerine filled

             -40°F to +140°F (-40°C to +60°C) - silicone filled

Medium: +212°F (+100°C) maximum



Bourdon Tube Pressure Gauge Model 232.54

##### Temperature error

Additional error when temperature changes from reference temperature of 68°F (20°C) ±0.4% of span for every 18°F (10°K) rising or falling.

##### Weather protection

Weather tight (NEMA 4X / IP 65)

##### Pressure connection

Material: 316L stainless steel

Lower mount (LM) or center back mount (CBM) - 2½"

Lower mount (LM) or lower back mount (LBM) - 4"

1/4" NPT or 1/2" NPT limited to wrench flat area

##### Bourdon tube

Material: 316 stainless steel

< 1,500 psi (100 bar): C-shape,

≥ 1,500 psi (100 bar): Helical type

##### Movement

300-series stainless steel

##### Dial

White aluminum with black lettering; 2½" size with stop pin

**Pointer**

Black aluminum, friction adjustable

**Case**

304 stainless steel with vent plug and polished stainless steel bayonet ring. Suitable for liquid filling. Welded case/socket connection

**Window**

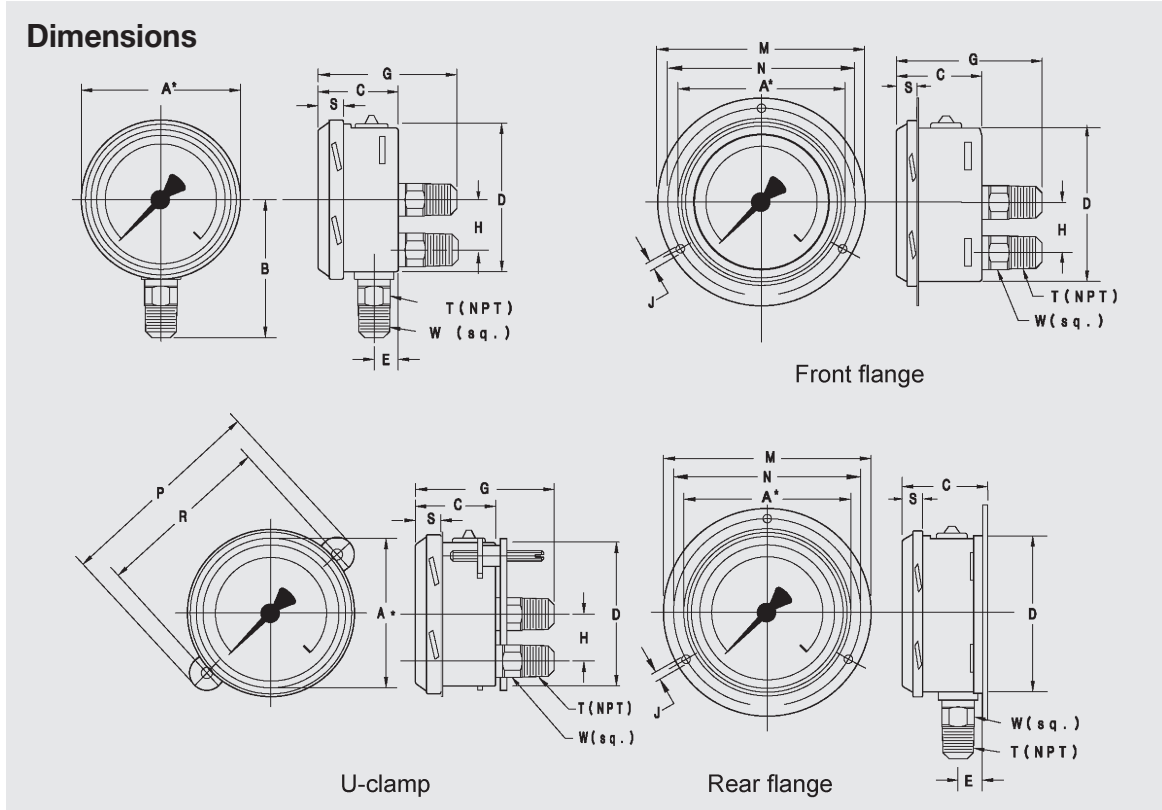
Laminated safety glass with Buna-N gasket

**Case fill**

Glycerine 99.7% - Type 233.54

**Optional extras**

- 316SS restrictor
- Accuracy  $\pm 1.0\%$  of full scale (2 1/2" size)
- Stainless steel front or rear flange
- Zinc-plated steel or SS u-clamp bracket (field installable)
- Red drag pointer or mark pointer
- Silicone or Halocarbon oil case filling
- Special connections limited to wrench flat area
- Custom dial layout
- Other pressure scales available  
bar, kPa, MPa, kg/cm<sup>2</sup> and dual scales



Size		A	B	C	D	E	G	H	J	M	N	P	R	S	T	W	Weight
2.5"	mm	70	54	33.5	62	13	55.5	-	3.6	85	75	87	72	12		14	0.36 lb. dry
	in	2.75	2.13	1.32	2.44	0.51	2.19	-	0.14	3.35	2.95	3.43	2.83	0.47	1/4"	0.55	0.44 lb. filled
4"	mm	110	87	49.5	100	15.5	81	30	4.8	132	116	125	110	15		22	1.10 lb. dry
	in	4.30	3.43	1.95	3.94	0.61	3.19	1.18	0.19	5.20	4.57	4.92	4.33	0.59	1/2"	0.87	1.76 lb. filled

**Recommended panel cutout is dimension D + 3 mm**

**Ordering information**

Pressure gauge model / Nominal size / Scale range / Size of connection / Optional extras required  
 Specifications and dimensions given in this leaflet represent the state of engineering at the time of printing.  
 Modifications may take place and materials specified may be replaced by others without prior notice.



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