

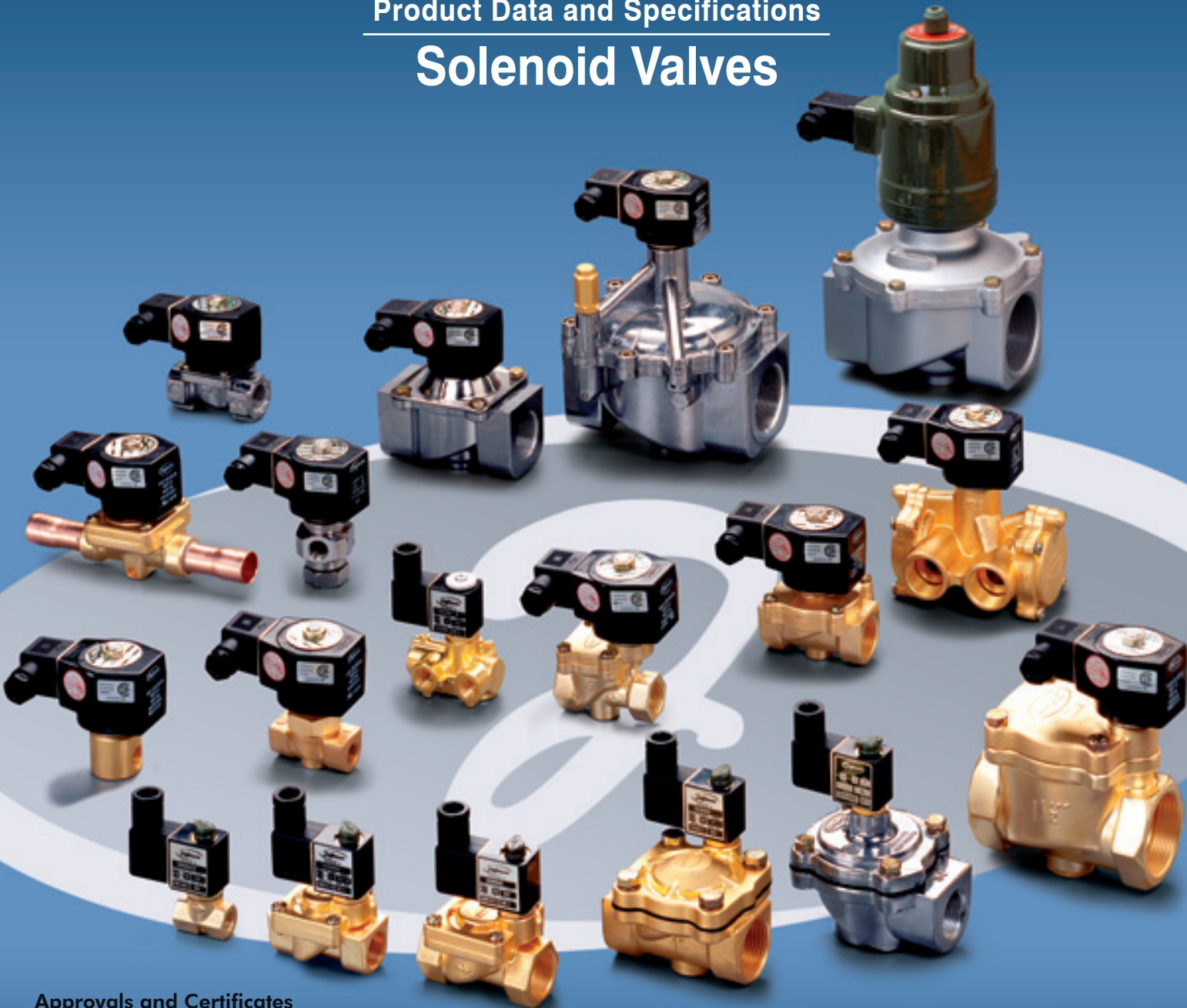


LUPATECH

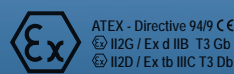
# General Catalog / 3b

Product Data and Specifications

## Solenoid Valves



### Approvals and Certificates



Engineering for Industrial Automation

ISO 9001 Certified



# Jefferson

## A Leader in Industrial Automation

**J**efferson Lupatech is a group of companies that serve 3 business lines - Energy Products, Flow Control and Metallurgy. **JEFFERSON SUDAMERICANA S.A.** is part of the Flow Control group.

The company has been manufacturing solenoid valves, magnetic level switches and other industrial automation equipment for over 45 years. Since its birth it has dedicated itself to serve and respond to the needs of its customers, continuously incorporating new features. Constantly perfecting its products, using state of the art machinery, it is now a redesigned organization to comply to the **ISO 9001** standards, with a product engineering and market-designed orientation controlled by engineers and technical specialists that check all the manufacturing stages that have made **JEFFERSON**, not only a pioneer in Latin Argentina, but a leader in the control of fluids.

Currently, its catalog of standard products includes over 3.000 models between solenoid valves and magnetic level switches which satisfy different needs and industrial requirements to control the most diverse liquids and gases such as water, air, steam, oils, refrigerants, oxygen, liquid nitrogen (-200°C), corrosive fluids and many others.

Its principal customers cover a wide spectre of world-wide industry: petroleum; engineering; laboratories; construction; food and beverage; heating; automobiles; metallurgical; textile; chemical & petrochemical; etc.

**JEFFERSON's** head offices and principal manufacturing plant is situated in Buenos Aires, Argentina only twenty minutes away

from Ezeiza International Airport and the banking district in downtown. Equipped with the latest designed CNC machinery all assisted by computers it produces high quality products for its local and export markets.

Its products have international recognition as attested by the approvals of **UNDERWRITERS LABORATORIES (UL)** in the USA, **CANADIAN STANDARDS ASSOCIATION (CSA)** in Canada, amongst other, which has permitted Jefferson to introduce its products range -in direct competition with other market leaders- in more than 22 countries covering the Five Continents in such competitive markets as the USA, Canada, Mexico, Brazil, Australia, Japan, Taiwan, Greece and recently, in closed countries such as Japan, Taiwan and Singapore, with special models.

Jefferson's international insertion is reflected with the establishment in Brazil through **JEFFERSON SOLENOIDBRAS LTDA.**, in Mexico through **VALJEFF S.A. de C.V.**, in the U.S.A. through **JEFFERSON SOLENOID VALVES U.S.A. INC.** with seat in Miami and sales offices in New York, from which they are taken care of U.S.A. market and Canada. In addition a network of distributors in the rest of the countries of America and the rest of the world, fulfill the objective to cover with sales and services in all the orb.

**JEFFERSON** is continuously visiting sites, assisting industrial projects to understand the markets' needs and offer solutions -which may require new designs- thinking and planning for the future ■

 **LUPATECH** is a group of companies that serve 3 business lines:

**Energy Products, Flow Control and Metallurgy. Jefferson is part of the Flow Control group.**



# General Catalog / 3b

## Product Data and Specifications

### Solenoid Valves



# Jefferson

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**New products**

**NEW SOLENOID VALVE MODELS**

- **Intrinsically Safe.**
- **Low Power.**
- **For Vacuum Systems.**
- **Slow-Opening for Gas - 1/2" & 3/4".**
- **Hydraulic, Water Hammer-Proof.**
- **ATEX Explosion-Proof Coils.**
- **For CNG Compressors.**
- **For CNG Automotive Use.**

To request a technical bulletin for models that are not included in this catalog, please contact **JEFFERSON** at:

**info@jeffersonvalves.com**



# Solenoid valves

## Engineering Information

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## Introduction

Solenoid valves are always present in every current industrial process operating with fluids such as liquids, steam or gases, serving as an automation or safety device.

Selecting them properly allows to save money and guarantees the best performance and long useful life for the system.

This manual aims at that objective and it provides the design or maintenance engineer with all the necessary information to choose the best valve for projects or replacements.

## Definition and scope

Solenoid valves are a combination of two functional units:

**The electromagnetic package**, which comprises a solenoid with its plunger, and the **valve body** including the passage/s and port/s.

Needle type metal guillotine plugs, or elastomer or PTFE disks, close the passage orifice/s. Some models have a sliding closure with seal rings.

Having selected the correct model, it can be applied to a great variety of fluids, whether corrosive or not, provided they are free from suspended solids and have a viscosity below 60 cst, unless they belong to some specific models which exceed that value.

Generally, pressure ranges from vacuum to a maximum of 0.1 to 17 bar for most models, except one model that goes up to 100 bar and another one to 250 bar. However, these values are exceeded in some special constructions. Temperature ranges from -200°C to 180°C at most.

## Solenoid valve types

### Ways - Positions - Resting Position

According to the number of ports, solenoid valves are classified as: 2-Way, 3-Way, 4-Way and 5-Way valves.

According to their operation, they may be monostable or bistable. When de-energized, the monostable valve's solenoid reverts to a stable position. On the other hand, bistable ones include one coil at each position and may work with current pulse.

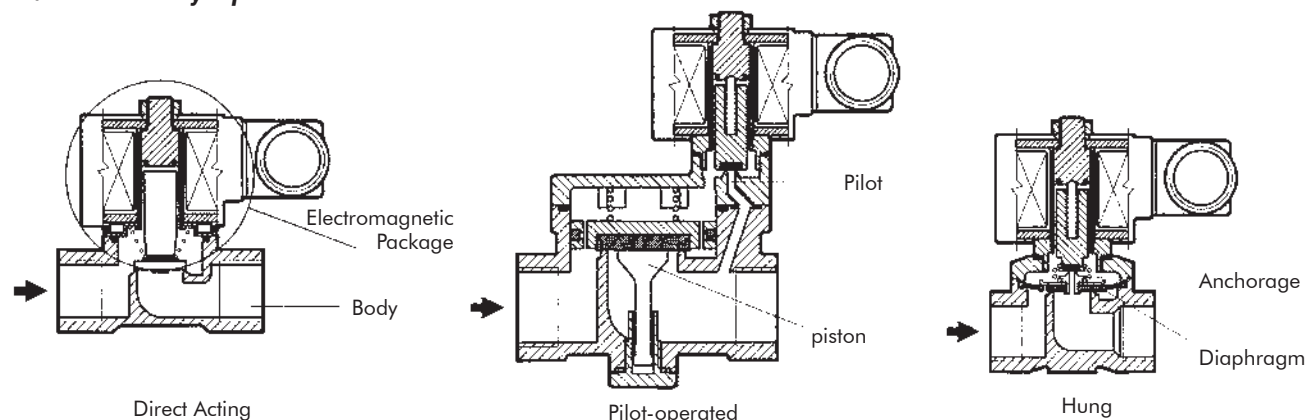
Monostable 2-way valves which close when de-energized are called **Normally Closed Valves**. On the contrary, those which remain open are called **Normally Open Valves**.

Monostable 3-way valves have different denominations depending on how they work, i.e. **Normally Closed, Normally Open, Convergent, Divergent**. The ones that may be operated in any way are called **Universal**.

3, 4 or 5-way valves may have 2 or 3 positions; the last having one stable position and two unstable, with one coil each.

### Direct Acting - Pilot operated - Combined

According to their operation mode, valves may be direct acting, pilot operated or a combination of both: hung valves.



## Manual Reset

Many safety systems require manual reset solenoid valves.

Automatic operation (due to the absence or presence of electric signal) takes place only to adopt one position, which may be open or closed, but it does not return to the previous one unless the operator in charge manually activates a lever ad hoc. **1332** and **1369** Series are examples of these devices.

## Valves operated with air, water or any other auxiliary fluid.

These are not solenoid valves, though they may be considered as such when a pilot solenoid valve integrated to the equipment carries the auxiliary fluid signal.



manufactures two kinds of devices:

• **Pneumatic Operators:** These substitute the electric operator (solenoid) and are actuated by an auxiliary pneumatic signal to change the valve position. They may be applied to most of the solenoid valve series. For more details, see **1372** Series: Pneumatic Devices.

• **Pneumatic or Hydraulic Cylinders:** These are applied to globe or diaphragm type valves, and large valves that are operated by means of an auxiliary fluid such as air, water or others. Cylinder sizing is related to the main fluid pressure, the auxiliary fluid pressure and the valve size. The system is completed with a pilot solenoid valve integrated to the equipment.

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## Application: uses

This manual groups the different valve series into families according to their standard use or by specific industrial area with special requirements and parameters. However, they shall not be restricted only to these applications.

### These families are:

#### General purpose valves

These are used in a great variety of systems and different industrial areas that handle water, air, steam, light oils, neutral gases and cryogenic fluids, from vacuum to high pressure and high temperature.

Some application examples are: automatic petrol and beverage pumps, sector-programmed park irrigation, sown land, dancing water fountains, oxyacetylene welding equipments, electric welding under inert atmosphere, fire-extinguisher systems, liquid or gas dosing, liquid level regulation, packing machines, water treatment systems, pneumatic expellers, car washing machines, building exterior cleaning machines, nickel-plating process, galvanization, coffee machines, car systems against theft or gas selection systems, air heating systems, hot water, steam, hot oils, laboratory or industrial cryogenic systems, low and high vacuum regulation, ink drying systems, etc.

#### Refrigeration Valves

These are used for refrigerating fluids in their different aggregation degrees. So the connections and construction materials are specific for commercial or industrial refrigeration systems. You shall find information about this kind of valves in the **Refrigeration Manual**.

#### Fuel Valves

These are used for automation, for the security of combustion equipments for boilers, furnaces, etc., and for the oil and petrochemical industries.

#### Directional Valves for Pneumatic and / or Hydraulic Systems

These are 3, 4 and 5-way valves used to direct the flow needed to operate single or double acting cylinders.

They are also used when two fluids are to enter the same circuit (convergence), or one fluid into two circuits (divergence).

#### Valves for corrosive or contaminated products

These valves use plastic materials which are compatible with the fluid, isolating the internal materials that are not compatible, such as the fixed core and the plunger, so as to avoid corrosion or fluid contamination.

#### Pneumatically and / or Hydraulically Operated Valves

These are used when there are no solenoid valves available due to size, pressure, working temperature, type of fluid or special service conditions (explosive areas, corrosive fluids, etc.).

#### Dust collector Valves

Due to their special design, response time and flow, these are used for shaking dust collector sleeves by means of periodical pressurized air pulses.

#### Manual Reset Valves

These are used in shut-off security systems for temperature limit, pressure, lack of flame, level, etc. They are widely used in the oil industry and combustion.

## Necessary data for selecting and / or purchasing solenoid valves.

Solenoid Valves provide an easy, safe and economical solution for a great variety of security and control systems, though they are limited in respect to pressure, temperature, viscosity, flow and fluid corrosion and dirtiness.

### Fluid characteristics

The liquid or gaseous product to be handled must be clean and free from suspended foreign particles. Therefore, in order to guarantee continuous faultless service it is **essential** to place a strainer before the valve and very close to it, with a **particle retention** capacity of 100 microns or less.

Generally, viscosity shall not exceed 60 cSt (SAE 10 at 30°C). However, some direct acting models may work with greater viscosity.

Another important aspect is the fluid compatibility with the valve materials that are in contact with it. For this reason, different materials are used to manufacture the body, seal, seat, diaphragm, piston, shading coil, etc, for a single valve. Each valve series provides complete information.

### Size and Type of connection

Connection size is indicated in inches and its fractions. Connection type depends on the specific use and application area. For General Use, Combustion or Pneumatics: Threaded **BSP** or **NPT**. Flanged upon request. Refrigeration: SAE flare threads, flanged or welding ends.

### Installation

The best valve position is over horizontal pipeline with the coil upright. For some models this is the only position acceptable.

### Pressure Differential

Pressure differential, or pressure drop or charge loss, is the static pressure difference between the valve's inlet and outlet.

[Its symbol is  $\Delta p$ .]

### Maximum Operating Pressure Differential

It is established with the valve closed. When pressure exceeds the maximum value shown for each valve model, the valve cannot operate.

### Minimum Operating Pressure Differential

The minimum operating pressure differential is the minimum difference in pressure required to open a pilot operated valve and keep it open (Not required for direct acting or hung type valves).

### Maximum Line Pressure

It is usually equal to maximum differential pressure, except in cases of residual pressure or vacuum from the outlet.

### Hydraulic Test Pressure

It is the pressure at which the valve's design is tested, and equals 5 times the maximum line pressure. This safety factor securely prevents strain or breakage of the external components in case of accidental overpressure in the line.

### Counterpressure

Two-way solenoid valves do not allow output pressure or counterpressure to be greater than the input pressure. In this case, it is necessary to use retention valves to prevent counterpressure from entering the circuit before the valve.

### Operating Temperature

Each model indicates the maximum fluid temperature allowed for that specific valve.

There are two aspects related to this temperature: Construction materials and the coil thermal class. Ambient temperature is also relevant, since the sum of the fluid's heat absorbed by the coil when it exceeds 80°C. and the heat generated by itself when energized, must be dissipated into the environment.

In these cases, it is advisable to place the valve in a ventilated area which shall not exceed 40°C.

If these conditions are not complied with, as a hard and fast rule, the following correction shall be used:

Maximum temperature indicated in the valve + 30°C =  
= fluid temperature + ambient temperature.

### Ambient Conditions

Besides temperature, there are other factors to be considered, such as internal or external use, humidity, rain, water showers, corrosive, explosive or prone to flood environments. "M" and "G" size coils are often encapsulated, with DIN connections and IP65 protection (water and weather proof).


For explosive ambients Jefferson manufactures encapsulated explosion and weather proof coils, according to **IEC79-18 m.**, **ZC** type.

[Non capsulated coils are used in valves that have a weather proof housing, "Y" type, weather and explosion proof, "Z" type, or internal use, "C" type.]


### Response Time

It is the period of time from the commutation of the electric signal to the moment the valve has arrived to 90% of its change of position. Solenoid valves are fast operating. Direct acting models open or close with air at 6 bar at a rate that ranges from 8 to 50 milliseconds (ms). Pilot operated valves are slower and range from 50 a 800 ms according to the model and size.

In some models, response time with liquids may double the response time with air, especially when closing.


 can correct them according to service conditions upon request, by slightly modifying the standard valves.



For this reason, when response time is critical for the system where the valve is to be installed, we advise to consult  's Technical Department.

### Electric Power Supply

Since there is a special coil for each type of current and voltage with the exact power to operate upon a specific service condition, valves shall only be used with their technically appropriate coil.

 produces coils with a wide range of power, sizes, housings and connections for voltages from 12 to 440 V, alternating current of 50 Hz, 60 Hz and direct current.  
See Coils and Housings.

### Power Control:

Device placed between electric power supply and coil.

It offers 2 main functions:

- Higher magnetic force at opening.
- Lower power during hold-in.

PC allows nominal voltage to enter the coil directly for 100 milliseconds, and later goes down to 20% (minimizing its power to 4%).

### Flow and Flow Factor

There are formulas, diagrams and charts which are based on the valve's flow factor, in order to determine the flow of a fluid that goes through a valve in certain conditions such as pressure differential, fluid temperature, state, density, viscosity, etc.

The value is set experimentally, and it is known as the flow factor "**Kv**" for the Metric system and "**Cv**" for the English system: pounds, feet, inches, gallons (USA). Calculations are valid only under fully open valve condition.

The flow factor Kv is the estimated flow of water in m<sup>3</sup>/h that goes through a valve with a pressure drop of 1 Bar, at ambient temperature.

So:

For  $\Delta p = 1 \text{ bar}$

$Q_n = 1 \text{ m}^3/\text{h} \quad K_v = 1$

Generally

$Q_n = n \text{ m}^3/\text{h} \quad K_v = n$

The flow factor Cv is the estimated flow of water in GPM that goes through a valve with a pressure drop of 1 psi.

So:

For  $\Delta p = 1 \text{ psi}$

$Q_n = 1 \text{ Gall/Min} \quad C_v = 1$

Generally

$Q_n = n \text{ Gall/Min} \quad C_v = n$

### Equivalences

$C_v = 1 \quad K_v = 0.85$

$K_v = 1 \quad C_v = 1.17$

### Kv calculation for two valves or more.

2 equal valves in series  
 $K_{v_t} = K_v \times 0.7$

2 or more, equal or different size valves in series  
 $(1/K_{v_t})^2 = (1/K_{v_1})^2 + (1/K_{v_2})^2 + \dots + (1/K_{v_n})^2$

2 or more, equal or different size valves in parallel  
 $K_{v_t} = K_{v_1} + K_{v_2} + \dots + K_{v_n}$

**Kv<sub>t</sub>**: Kv equivalent to one solenoid valve that replaces them.

### Example:

Two Kv = 1 valves **in series**, are equivalent to 1 valve with Kv = 0.7

Two Kv = 1 valves **in parallel**, are equivalent to 1 valve with Kv = 2

**Kv<sub>t</sub>** simplifies the calculation using the formulas and graphics all at once, with no need to repeat the procedure for each particular valve.

### Formulas for flow calculation. Metric units.

Fluids	Flow Calculation: $Q_v = \text{liquids};$ $Q_n = \text{gases}; Q_m = \text{steam}$	Calculation of flow coefficient Kv ( $\text{m}^3/\text{h}$ )	Pressure drop calculation (bar)
<b>Liquids</b>	$Q_v = K_v \sqrt{\frac{\Delta p}{\gamma}}$	$K_v = Q_v \sqrt{\frac{\gamma}{\Delta p}}$	$\Delta p = \gamma \left[ \frac{Q_v}{K_v} \right]^2$
<b>Gases</b>	$P_2 > \Delta p$ $Q_n = 500 \cdot K_v \sqrt{\frac{P_2 \cdot \Delta p}{\delta_n (273+t)}}$	$K_v = \frac{Q_n}{500} \sqrt{\frac{\delta_n (273+t)}{P_2 \cdot \Delta p}}$	$\Delta p = \frac{P_1}{2} - \sqrt{\frac{P_1^2}{4} - C}$ $C = \delta_n T \left[ \frac{Q_n}{500 K_v} \right]^2$
	$P_2 \leq \Delta p$ $Q_n = \frac{250 \cdot K_v \cdot P_1}{\sqrt{\delta_n (273+t)}}$	$K_v = \frac{Q_n \sqrt{\delta_n (273+t)}}{250 \cdot P_1}$	
<b>Dry saturated steam</b>	$P_2 > \Delta p$ $Q_m = K_v \cdot 31.7 \sqrt{\frac{\Delta p}{v_2}}$	$K_v = \frac{Q_m}{31.7} \sqrt{\frac{v_2}{\Delta p}}$	$\Delta p = \left[ \frac{Q_m}{K_v 31.7} \right]^2 \cdot v_2$
	$P_2 \leq \Delta p$ $Q_m = K_v \cdot 22.5 \sqrt{\frac{P_1}{v_1}}$	$K_v = \frac{Q_m}{22.5} \sqrt{\frac{v_1}{P_1}}$	

Symbol	Unit	Magnitude
$K_v$	$\text{m}^3/\text{h}$	Valve flow factor at full open position
$Q_v$	$\text{m}^3/\text{h}$	Liquid volumetric flow
$Q_n$	$\text{Nm}^3/\text{h}$	Gas volumetric flow under normal conditions (atmospheric pressure = 760 mm Hg. and temperature 20°C).
$Q_m$	$\text{kg}/\text{h}$	Mass flow in dry saturated steam state.
$\gamma$	$\text{g}/\text{cm}^3$	Liquid specific weight at operating temperature.
$\delta_n$	—	Air related density under normal pressure and temperature conditions.
$t_1$	$^{\circ}\text{C}$	Fluid temperature upstream the valve.
$T_1$	$^{\circ}\text{K}$	Absolute fluid temperature upstream the valve ( $273 + t_1$ ).
$v_2$	$\text{m}^3/\text{kg}$	Steam specific volume at the valve outlet and $t_1$ condition.
$v_1$	$\text{m}^3/\text{kg}$	Steam specific volume at $P_1$   2 pressure and $t_1$ temperature (overheat).
$P_1$	bar	Absolute pressure at the valve inlet (gauge pressure + atmospheric pressure).
$\Delta p$	bar	Pressure drop across the valve.
$P_2$	bar	Absolute pressure at the valve outlet ( $P_2 = P_1 - \Delta p$ ).
$C$	—	Constant.

**Relative density of some gases and liquids.**

Gases		Liquids		
At 20 °C and 760 mm Hg	Air related density ( $\delta_n$ )	At operating temperature	Temp. in °C	S.W. g/cm <sup>3</sup> ( $\gamma$ )
Acetone	1.06	Acetone	15	0.79
Acetylene	0.90	Alcohol ethil	20	0.79
Air	1.00	Alcohol methyl	20	0.81
Ammonia	0.72	Ammonia	15	0.65
Argon	1.38	Benzene	15	0.85
Butane	2.07	Diesel oil	20	0.90
Carbon dioxide	1.53	Freon 12	20	1.33
Chlorine	1.27	Freon 22	20	1.21
Ethane	2.49	Fuel oil N° 1	20	0.83
Ethane	1.05	Fuel oil N° 2	20	0.84
Ethylene	0.97	Fuel oil N° 3	20	0.89
Ethylene propane	1.45	Fuel oil N° 4	20	0.90
Helium	0.14	Gasoil	20	0.90
Hydrogen	0.07	Gasoline	20	0.75
Hydrogen sulfide	1.19	Kerosene	20	0.81
LPG grade 1	1.50	Light crude oil	20	0.91
LPG grade 2	1.90	Liquid carbon dioxide	-50	1.15
Methane	0.55	Liquid nitrogen	-160	0.80
Natural gas (*)	0.65*	Liquid oxygen	-160	1.20
Nitric oxide	1.04	LPG grade 1	20	0.51
Nitrogen	0.97	LPG grade 2	20	0.57
Nitrous oxide	1.53	Naphta	20	0.76
Oxygen	1.10	Olive oil	20	0.92
Ozone	1.66	Phenol	20	1.02
Propane	1.56	SAE 10 (oil)	20	0.88
Sulphur dioxide	2.26	Tupertine	20	0.87
Sulphur oxide	2.26	Water	15	1.00

**Some properties of dry saturated water steam.**

Gage pressure bar	Temperature °C	Specific Volume m <sup>3</sup> /kg
0	93.5	2.09
0	99.6	1.69
0.1	102.3	1.69
0.2	104.8	1.43
0.3	107.1	1.33
0.5	111.4	1.16
0.7	115.2	1.03
1	120.2	0.89
1.3	124.7	0.78
1.6	128.7	0.69
2	133.5	0.61
2.5	138.9	0.52
3	143.6	0.46
3.5	147.9	0.43
4	151.8	0.38
4.5	156	0.34
5	159	0.32
5.5	161	0.28
6	165	0.27
6.5	168	0.26
7	170	0.24
7.5	173	0.23
8	175	0.22
8.5	177	0.20
9	180	0.19
9.5	182	0.19
10	184	0.18

(\*) This is a representative value. According to its composition, it varies from 0.60 to 0.70.

### Formulas for flow calculation. English units.

Fluids	Flow Calculation; $Q_v = \text{liquids};$ $Q_n = \text{gases}; Q_m = \text{steam}$	Calculation of flow coefficient Cv (GPM)	Pressure drop calculation (psi)
<b>Liquids</b>	$Q_v = K_v \sqrt{\frac{\Delta p}{\gamma}}$	$C_v = Q_v \sqrt{\frac{\gamma}{\Delta p}}$	$\Delta p = \gamma \left[ \frac{Q_v}{K_v} \right]^2$
<b>Gases</b>	$P_2 > \Delta p$ $Q_n = 1412 \cdot C_v \sqrt{\frac{P_2 \cdot \Delta p}{\delta_n (460+t)}}$	$C_v = \frac{Q_n}{1412} \sqrt{\frac{\delta_n (460+t)}{P_2 \cdot \Delta p}}$	$\Delta p = \frac{P_1}{2} - \sqrt{\frac{P_1^2}{4} - C}$ $C = \delta_n T \left[ \frac{Q_n}{1412 C_v} \right]^2$
	$P_2 \leq \Delta p$ $Q_n = \frac{706 \cdot C_v \cdot P_1}{\sqrt{\delta_n (460+t)}}$	$C_v = \frac{Q_n \sqrt{\delta_n (460+t)}}{706 \cdot P_1}$	
<b>Dry saturated steam</b>	$P_2 > \Delta p$ $Q_m = C_v \cdot 64.2 \sqrt{\frac{\Delta p}{V_2}}$	$C_v = \frac{Q_m}{64.2} \sqrt{\frac{V_2}{\Delta p}}$	$\Delta p = \left[ \frac{Q_m}{C_v \cdot 64.2} \right]^2 \cdot V_2$
	$P_2 \leq \Delta p$ $Q_m = C_v \cdot 45.4 \sqrt{\frac{P_1}{V_1}}$	$C_v = \frac{Q_m}{45.4} \sqrt{\frac{V_1}{P_1}}$	

Symbol	Unit	Magnitude
$C_v$	GPM	Valve flow factor at full open position
$Q_v$	GPM	Liquid volumetric flow
$Q_n$	SCFH	Gas volumetric flow under normal conditions (atmospheric pressure = 760 mm Hg. and temperature 68°F).
$Q_m$	lb/h	Mass flow in dry saturated steam state.
$\gamma$	—	Specific gravity at operating temperature.
$\delta_n$	—	Specific gravity under normal pressure and temperature conditions.
$t_1$	°F	Fluid temperature upstream the valve.
$T_1$	°R	Absolute fluid temperature upstream the valve (460 + $t_1$ ).
$V_2$	ft <sup>3</sup> /lb	Steam specific volume at the valve outlet and $t_1$ condition.
$V_1$	ft <sup>3</sup> /lb	Steam specific volume at $P_1/2$ pressure and $t_1$ temperature.
$P_1$	psia	Absolute pressure at the valve inlet (gauge pressure + atmospheric pressure).
$\Delta p$	psi	Pressure drop across the valve.
$P_2$	psia	Absolute pressure at the valve outlet ( $P_2 = P_1 - \Delta p$ ).
C	—	Constant.

Specific gravity of some gases and liquids.

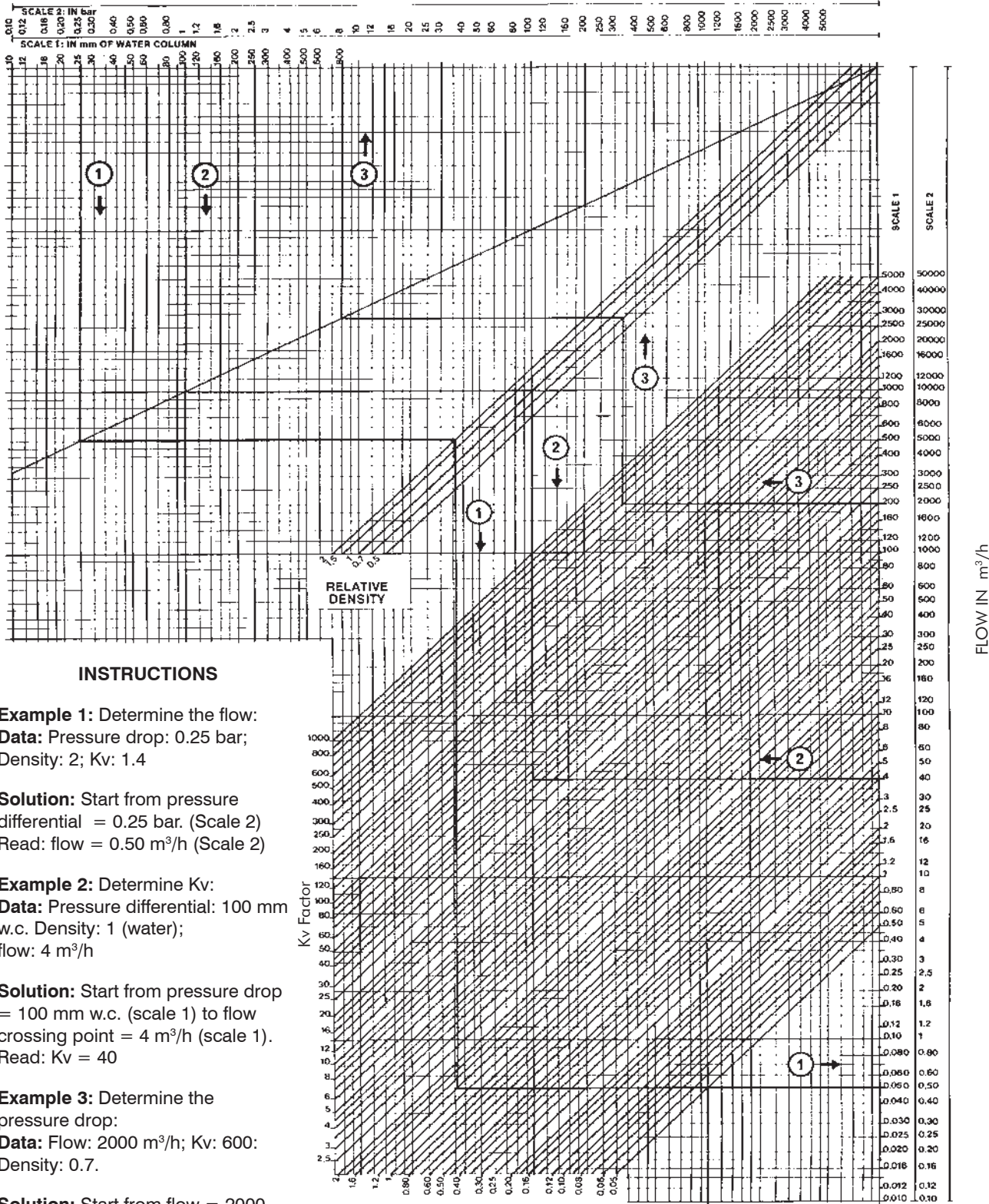
Gases		Liquids		
At 68 °F and 760 mm Hg	Specific gravity ( $\delta_n$ )	At operating temperature	Temp. in °F	Specific gravity ( $\gamma$ )
Acetone	1.06	Acetone	59	0.79
Acetylene	0.90	Acohol ethyl	68	0.79
Air	1.00	Acohol methyl	68	0.81
Ammonia	0.72	Ammonia	59	0.65
Argon	1.38	Benzene	59	0.85
Butane	2.07	Diesel oil	68	0.90
Carbon dioxide	1.53	Freon 12	68	1.33
Chlorine	1.27	Freon 22	68	1.21
Ethane	2.49	Fuel oil N° 1	68	0.83
Ethane	1.05	Fuel oil N° 2	68	0.84
Ethylene	0.97	Fuel oil N° 3	68	0.89
Ethylene propane	1.45	Fuel oil N° 4	68	0.90
Helium	0.14	Gasoil	68	0.90
Hydrogen	0.07	Gasoline	68	0.75
Hydrogen sulfide	1.19	Kerosene	68	0.81
LPG grade 1	1.50	Light crude oil	68	0.91
LPG grade 2	1.90	Liquid carbon dioxide	-58	1.15
Methane	0.55	Liquid nitrogen	-256	0.80
Natural gas (*)	0.65*	Liquid oxygen	-256	1.20
Nitric oxide	1.04	LPG grade 1	68	0.51
Nitrogen	0.97	LPG grade 2	68	0.57
Nitrous oxide	1.53	Naphta	68	0.76
Oxygen	1.10	Olive oil	68	0.92
Ozone	1.66	Phenol	68	1.02
Propane	1.56	SAE 0 (oil)	68	0.88
Sulphur dioxide	2.26	Tupertine	68	0.87
Sulphur oxide	2.26	Water	59	1.00

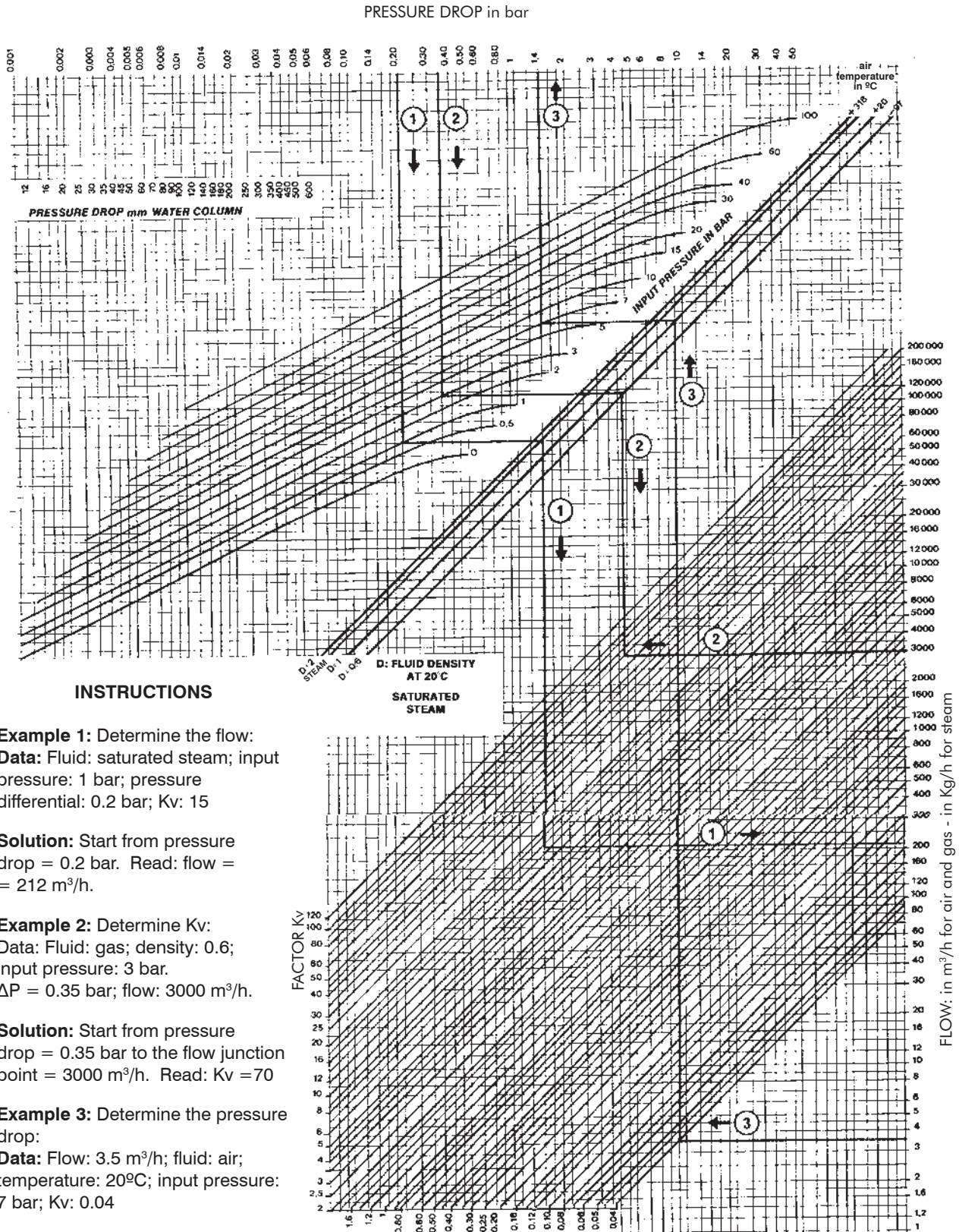
Some properties of the dry saturated water steam.

Gage pressure psig	Temperature °F	Specific Volume ft <sup>3</sup> /lb
-3	200.7	33.2
0	212	26.8
2	218.7	23.6
4	224.4	21.4
6	230	19.4
7	232	18.6
10	240	16.4
15	250	13.9
20	259	12
25	267	10.6
30	274	9.16
35	281	8.57
40	287	7.83
45	292	7.21
50	298	6.68
55	302	6.23
60	307	5.38
65	311	5.49
70	316	5.19
80	324	4.67
90	331	4.24
100	338	3.89
110	344	3.59
120	350	3.34
130	356	3.12
140	361	2.93
145	363	2.84

(\*) This is a representative value. According to its composition, it varies from 0.60 to 0.70.

### PRESSURE DROP





### INSTRUCTIONS

**Example 1:** Determine the flow:  
**Data:** Fluid: saturated steam; input pressure: 1 bar; pressure differential: 0.2 bar; Kv: 15

**Solution:** Start from pressure drop = 0.2 bar. Read: flow = 212 m<sup>3</sup>/h.

**Example 2:** Determine Kv:  
**Data:** Fluid: gas; density: 0.6; input pressure: 3 bar.  
 $\Delta P = 0.35$  bar; flow: 3000 m<sup>3</sup>/h.

**Solution:** Start from pressure drop = 0.35 bar to the flow junction point = 3000 m<sup>3</sup>/h. Read: Kv = 70

**Example 3:** Determine the pressure drop:  
**Data:** Flow: 3.5 m<sup>3</sup>/h; fluid: air; temperature: 20°C; input pressure: 7 bar; Kv: 0.04

**Solution:** Start from flow = 3.5 m<sup>3</sup>/h.  
 Read: pressure drop = 1.4 bar



Current	DIN 43650 Connection - IP65 Integrated weather and humidity proof coil and housing. Plug-in connection with strain-relief or thread for 1/2"NPT conduit.			NEMA 4x. Integrated weather, water and saline corrosion proof coil and housing.		IEC 79-18 m. Integrated explosion, weather and saline corrosion proof coil and housing.	
	Size G	Size M		Size M		Size M	
Hz	Shape B	Shape A		1/2"NPT Connection		1/2"NPT Connection	
	Class F 155°C	Class F 155°C	Class H 180°C	Class F 155°C	Class H 180°C	Class F 155°C	Class H 180°C
D/C	GF06C	MF19C	MH19C	MF19Y	MH19Y	MF19Z	MH19Z
A/C 50 Hz	GF06C	MF11C	MH11C	MF11Y	MH11Y	MF11Z	MH11Z
		MF16C	MH16C	MF16Y	MH16Y	MF16Z	MH16Z
		MF20C	MH20C	MF20Y	MH20Y	MF20Z	MH20Z
A/C 60 Hz	GF06C	MF13C	MH13C	MF13Y	MH13Y	MF13Z	MH13Z
		MF16C	MH16C	MF16Y	MH16Y	MF16Z	MH16Z
		MF20C	MH20C	MF20Y	MH20Y	MF20Z	MH20Z

\* Shape B stands for Shape B DIN 43650 Connections - \* Shape A stands for Shape A DIN 43650 Connections.

### Available tensions

Volts	12	24	48	110	120	220	240
D / C	Yes	Yes	Yes	Yes	No	Yes	No
50 Hz	Yes	Yes	Yes	Yes	No	Yes	Yes
60 Hz	Yes	Yes	Yes	Yes	Yes	Yes	Yes

### DIN Connector types

Strain-relief Pg9			Strain-relief Pg11			1/2"NPT Connection		
Common	Luminous gasket	Luminous connector	Common	Luminous gasket	Luminous connector	Common	Luminous gasket	Luminous connector
1	4	7	2	5	8	3	6	9

### Encapsulated coil catalog numer creation keys:

M	F	11	Y	220	50	1
(1)	(2)	(3)	(4)	(5)	(6)	(7)

Thermal Class:

Class F up to 155 °C

Class H up to 180 °C

(1, 2, 3, and 4) See the available encapsulated coils chart.

1 - Size; 2 - Thermal Class; 3 - Power in Watts;

4 - Coil Type:

- C DIN Connection

- Y threaded connection with 3 output leads (one for ground).

- Z explosion proof, threaded connection with 3 output leads (one for ground).

(5 and 6) See Available tension

5 - Tension;

6 - Type of current

(7) Type of connectors (only for DIN connection. See chart).



Coated with glass fibre and insulating impregnation.  
Terminal cables for splicing.

Current	Size M		Size S		Size B
	Class F 155°C	Class H 180°C	Class F 155°C	Class H 180°C	Class H 180°C
D/C		M19H		S48H S60H (1)	B113H (1)
A/C 50 Hz	M11F M16F	M11H M16H	S28F	S28H S46H S46P (3) S60H (2)	B113H (2)
A/C 60 Hz	M13F M16F	M13H M16H		S30H S46H S46P S60H (2)	B113H (2)

(1) Without rectifier bridge. (2) With rectifier bridge, only 110, 120, 220 and 240 V available. (3) Class H + polyester coating.

### Available Tensions - Size M and S

Volts	12	24	48	110	120	220	240	380	440
D / C	Yes	Yes	Yes	Yes	No	Yes	No	No	No
50 Hz	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No
60 Hz	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes

### Catalog number information:

<b>S</b>   <b>20</b>   <b>H</b>   <b>220</b>   <b>50</b> (1)   (2)   (3)   (4)   (5)
---

(1, 2 and 3) See fibre coated coils chart.

1 - Coil size; 2 - Power in Watts;

3 - Thermal class. **P** = class **H** + polyester coating.

(4 and 5) See available tensions chart.

4 - Tension.

5 - Current.

Thermal Class:

Class F up to 155°C

Class H up to 180°C

### Non capsulated coil housings



Classification	Coil size			
	M	S	S (for 2088)	B
<b>General internal use</b>	Plate hole for Ø19 mm electric connection. Ground terminal (Suffix C)	Cast Iron 3/4" NF Connector	Painted cast iron 1/2" BSP or NPT Connector	Painted cast iron 1/2" BSP or NPT Connector
<b>Weather and water proof (Prefix Y)</b>	Aluminium epoxy paint 1/2" BSP or NPT connection NEMA 4x and IP65	Cast iron epoxy paint 1/2" BSP or NPT connection NEMA 4x and IP65	Cast iron epoxy paint 1/2" BSP or NPT connection NEMA 4x and IP65	Cast iron epoxy paint 1/2" BSP or NPT connection NEMA 4x and IP65
<b>Explosion and weather proof (Prefix Z)</b>	Aluminium epoxy paint 1/2" BSP or NPT connection ATEX - Directive 94 / 9 CE II 2G Ex d IIB T3	Iron epoxy paint 1/2" BSP or NPT connection According to IEC 79 1 "d"	Iron epoxy paint 1/2" BSP or NPT connection According to IEC 79 1 "d"	Iron epoxy paint 1/2" BSP or NPT connection According to IEC 79 1 "d"

### General Purpose

Series	Page	Connection (ins.)											Maximum Temp. °C			Δp bar		Δp psi		Fluids or typical applications							
		1/8	1/4	3/8	1/2	3/4	1	1 1/2	2	2 1/2	3	80	150	180	Minimum	Maximum	Minimum	Maximum	Air and inert gases	Water and light liquids	Thermal oils	Steam	Oxygen	Gasoline	Vacuum		
1314	B-2													○	○	○	0	15	0	225	A	A	T	T	N	V	A-V
1327	B-4													○	○	○	0	100	0	1500	A	A	T	T	N	V	A-V
1335	B-6													○	○		0	10	0	150	A	A	V	E	N	V	A-V
1342	B-8													○	○	○	0.2	17	3	255	A	A	T	T	N	V	-
1390	B-10													○	○	○	0.1	15	1.5	225	A	A	T	T	N	V	-
1393	B-12															○	0	4	0	60	T	T	T	T	-	-	-
2026	B-14													○	○		0	50	0	750	A	A	-	E	N	V	A-V
2036	B-16													○			0.2	15	3	225	A	A	-	-	-	-	-
2036V	B-16														○		0.3	10	4.5	150	-	-	-	T	-	-	-

**Note: 1327, 1335, 1342, 1390, y 1393 NC and NO.**

### Combustion Use

Series	Page	Connection (ins.)											N. Closed	N. Open	Δp bar		Δp psi		Manual Reset	Slow opening	Position ind.	Fluids						
		1/8	1/4	3/8	1/2	3/4	1	1 1/2	2	2 1/2	3	Minimum			Maximum	Minimum	Maximum	Gasoil				Fueloil	Natural V	LPG	Combustion Air			
1312	C-8													○	○	0	21	0	315	-	-	-	S	S	-	A	A	
1330	C-10													○	○	0	0.2	0	3	-	-	-	-	-	A	A	A	
2030	C-10													○	○	0.001	2	0.015	30	-	○	○	-	-	A	A	A	
1332	C-12													○	-	0	3	0	45	○	-	○	-	-	A	A	A	
1356	C-14													○	-	0	20	0	300	-	-	-	T	T	T	T	-	
1388	C-16													○	-	0	5	0	75	-	○	○	-	-	A	A	A	
1327	B-4													○	○	0	20	0	300	-	-	-	V	T	A	A	A	
2026	B-14													○	-	0	10	0	150	-	-	-	V	-	A	A	A	
1335	B-6													○	○	0	10	0	150	-	-	-	V	-	A	A	A	
1390	B-10													○	○	0.1	15	0.1	225	-	-	-	V	-	A	A	A	
2088	C-20													○	-	0	3	0	45	-	○	○	-	-	A	A	A	
V171	C-23													○	-	0	1.5	0	22.5	Thermoelectric safety valve	-	-	-	-	-	A	A	-

#### Nomenclature:

The letters indicated in Typical Applications refer to the seat, seal and diaphragm materials (if any), as follows:  
**A** = Buna N; **N** = Neoprene; **E** = EPDM; **V** = FKM; **T** = PTFE; **S** = AISI 304.

### Pneumatic and hydraulic use.

Series	Page	Connection (ins.)					3 Ways						4 & 5 Ways				Positions	Monostable	Bistable	Fluids							
		1/8	1/4	3/8	1/2	3/4	Minimum		Maximum						Minimum					Maximum		Lubricated Air	Dry Air	Gas	Water	Hydraulic Oil	
							bar	psi	NC		NO		U		bar	psi				bar	psi						
									bar	psi	bar	psi	bar	psi													
1323	D-2						0	0	12	180	12	180	8	120	-	-	-	-	2	○	-	A	A	A	A	A	
1325	D-4						0.5	7.5	10	150	10	150	-	-	-	-	-	-	2	○	-	A	A	A	A	A	
1339	D-6						-	-	-	-	-	-	-	-	0.5	10	10	150	3	○	-	A	A	A	A	A	
1350	D-8						-	-	-	-	-	-	-	-	0.5	10	10	150	2	○	○	A	A	A	A	A	
1351	D-10						0.5	7.5	10	150	10	150	-	-	-	-	-	-	2	○	○	A	A	A	A	A	
1365	D-12						0	0	15	225	15.5	232	9	135	-	-	-	-	2	○	-	A	A	A	A	A	
1375	D-14	NAMUR					-	-	-	-	-	-	-	-	0.5	10	10	150	2	○	-	A	A	-	-	-	
1387	D-15	NAMUR					0	0	10	150	-	-	-	-	-	-	-	-	-	2	○	-	A	A	-	-	-
1387	D-15	NAMUR					0.5	7.5	10	150	-	-	-	-	-	-	-	-	-	2	○	-	A	A	-	-	-
2050	D-16						-	-	-	-	-	-	-	-	0.5	10	10	150	2	○	○	A	A	A	A	A	
2051	D-18						0.5	7.5	10	150	10	150	-	-	-	-	-	-	2	○	○	A	A	A	A	A	
2095	D-20	NAMUR					0.8	12	8	120	-	-	-	-	0.8	12	8	120	2	○	-	A	A	-	-	-	
2024	D-24						-	-	-	-	-	-	-	-	0.8	12	10	150	2	○	-	A	A	-	-	-	

\* Hot Air or Gas: FKM Seats or Seals - NC: Normally Closed. NO: Normally Open. Div: Divergent. Con: Convergent.

### Valves and devices for special service.

Series	Page	Connection (ins.)													Maximum Temperature		Maximum pressure		Auxiliary Fluids	Fluids or typical applications						
		1/8	1/4	3/8	1/2	3/4	1	1 1/2	2	2 1/2	3	4	6	8	°C	°F	bar	psi		Acids	Alkalis	Distillate water	Oil Products	Dirty Fluids	Neutral Gases and Air	Thermal Oils
<b>Solenoid Valves for Dust Collector Systems</b>																										
2073	E-10													80	176	10	150	no	-	-	-	-	-	○	-	
<b>Solenoid Valves for Corrosives Fluids</b>																										
1360	E-6													60	140	4	60	no	○	○	○	○	-	○	○	
<b>Solenoid Valves with Manual Reset Device</b>																										
1369	E-8													80	176	20	300	no	-	-	○	○	-	○	-	
<b>Valves with Pneumatic or Hydraulic Operators</b>																										
1372	E-11													80	176	10	150	yes	○	○	○	○	-	○	-	
<b>Pneumatically or Hydraulically Operated Valves</b>																										
1310	E-2													300	572	20	300	yes	-	-	○	○	-	○	○	
1311	E-4													150	302	7	105	yes	○	○	○	○	○	○	-	

Note: 1310, special construction for higher temperature and pressure.

Continues in next page

### Valves and devices for special service (continued)

Series	Page	Connection (ins.)											Minimum Temperature		Maximum Temperature		Maximum pressure		Fluid applications								
		1/8	1/4	3/8	1/2	3/4	1	1 1/2	2	2 1/2	3	°C	°F	°C	°F	bar	psi	Liquid				CNG (VNG)	Air	Water	Steam	Light oil	
																		Oxygen	Argon	Nitrogen	CO <sub>2</sub>						
<b>Solenoid Valves for CNG (VNG)</b>																											
2094	E-12												80	176	250	3700	-	-	-	-	○	○	-	-	-	-	-
<b>Pulse operated solenoid unit</b>																											
1370	E-14												80	176	10	150	-	-	-	-	-	○	○	-	-	○	
<b>Digital condensation removal timer</b>																											
1398	E-15												80	176	15	225	-	-	-	-	-	○	○	-	-	○	
<b>Solenoid valves for cryogenic fluids</b>																											
UC	E-16												-200	-328	50	122	15*	225*	○	○	○	○	-	-	-	-	-
<b>Power control **</b>																											
CP	E-18												-200	-328	180	356	250	3700	○	○	○	○	○	○	○	○	○

\* CO<sub>2</sub> maximum pressure: 70 bar - 1050 PSI

\*\* The power control is available for any solenoid valve using a DIN type Size A coil (12 & 24 VDC only).

## Recommendations:

**Establish the necessary data** for the correct selection of the solenoid valve or the pneumatically operated valve.

**Do neither oversize, nor undersize** the valve. Use the formulas and graphics shown in this manual, which will make your calculations easier.

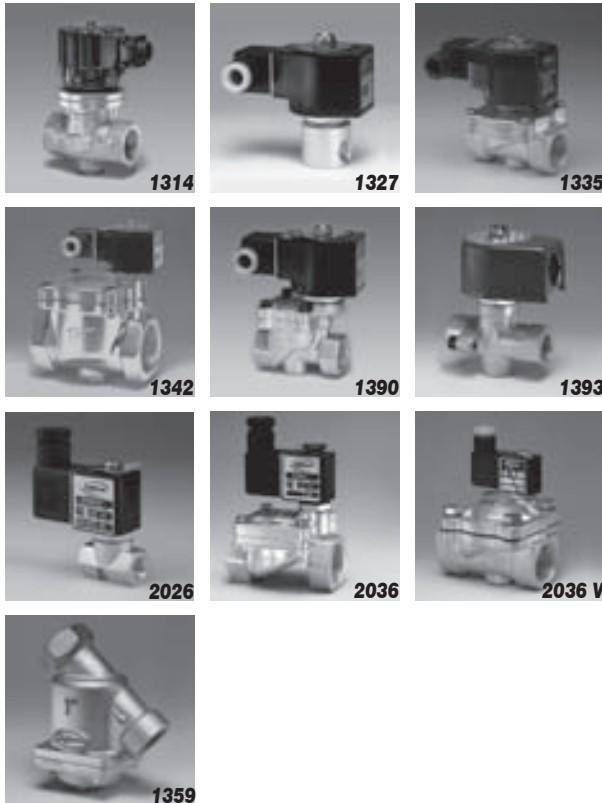
**Check** that there is a strainer with a mesh size smaller than 100 microns immediately upstream the valve.

**Make sure** that the installer follows the mounting instructions indicated by , specially regarding the coil connector airtightness when exposed to water, condensation or ambient humidity, and to the thorough cleaning of pipelines before operation.

**Find out beforehand** which are the recommended repair kits for each valve. They are inexpensive and the product design contemplates an easy and quick replacement. If the valves have been correctly selected, there will be no need to shut down the system in order to perform those replacements.

At the **Repair Kits** chapter we indicate the component numbers corresponding to the standard models.

**Contact** if you have any trouble reading this catalog or if you need to handle an unusual or special application.



## 2 Way Solenoid Valves for General Purpose.

		<b>Pages</b>		<b>Pages</b>
<b>1314 Series</b>	Normally closed Pilot operated.	<b>B-2 / B-3</b>	<b>2036V Series</b>	Normally closed, for steam. <span style="float: right;"><b>B-16 / B-17</b></span>
<b>1327 Series</b>	Normally closed and Normally open. Direct acting.	<b>B-4 / B-5</b>	<b>1359 Series</b>	"Y" strainer for general purpose. <span style="float: right;"><b>B-18</b></span>
<b>1335 Series</b>	Normally closed and Normally open. Direct acting or pilot operated.	<b>B-6 / B-7</b>		
<b>1342 Series</b>	Normally closed and Normally open. Pilot operated.	<b>B-8 / B-9</b>		
<b>1390 Series</b>	Normally closed and Normally open. Pilot operated.	<b>B-10 / B-11</b>		
<b>1393 Series</b>	Normally closed and Normally open Direct acting.	<b>B-12 / B-13</b>		
<b>2026 Series</b>	Normally closed Microvalve Direct acting.	<b>B-14 / B-15</b>		
<b>2036 Series</b>	Normally closed. Pilot operated.	<b>B-16 / B-17</b>		

**New products** 

**NEW SOLENOID VALVE MODELS**

- **Intrinsically Safe.**
- **Vacuum Systems.**
- **Hydraulic, Water Hammer-Proof.**
- **ATEX Explosion-Proof Coils.**

To request a technical bulletin for models that are not included  
in this catalog, please contact **JEFFERSON** at:

**[info@jeffersonvalves.com](mailto:info@jeffersonvalves.com)**



**1314 Series**

**Applications:**

- Pumps of re-circulation for cold or hot water.
- Heating with low or high pressure steam.
- Laundry equipments.
- Spraying. Irrigation. Dishwashers.
- Air dryers. water treatment. Vacuum systems

**Main characteristics**

Normally closed.  
Pilot operated.  
Bronze, stainless steel body.  
BSP or NPT threaded connection.  
Brass, stainless steel piston, among others.  
Coil: Encapsulated up to 150 °C (302 °F) and coated with glass fibre and insulating impregnation up to 180 °C

(356 °F), (for steam).  
Interconnection cables. Internal general use housing.  
3/4 " NF electric connection.  
Core: 430 F s.s.

**Options:**

- Explosion and / or weather proof housing.
- Manual operator on the main orifice.
- Flanged connections.

**Operating pressure differential**

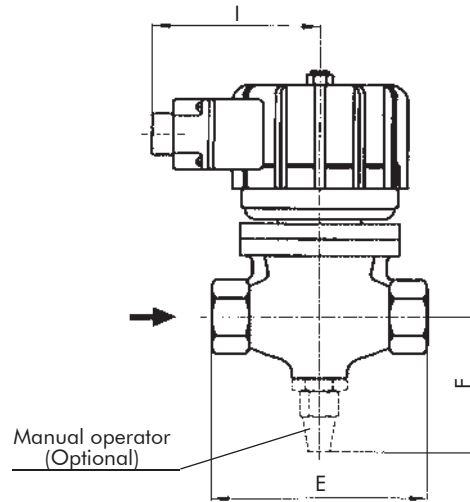
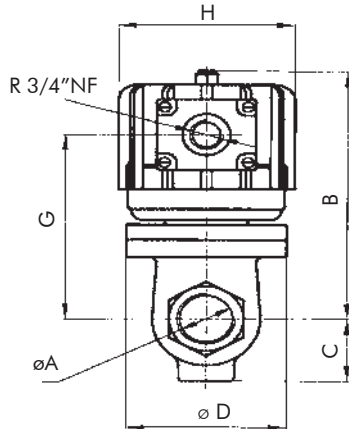
Type	Minimum		Maximum steam				Maximum other fluids			
			PTFE seat		EPDM seat		CA		CC	
	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi
Hung piston	0	0	7	105	3	45	7	105	7	105
Floating piston	0.1	1.5	10	150	3	45	15	225	10	150

**Technical specifications - Bronze body**

Ø Pipe ins	Ø Orifice		Flow factor		Weight		Maximum temp. and catalog N° according to seat material				
	mm	ins.	Kv	Cv	kg	Lb	Buna "N"	Neoprene	EPDM	FKM	PTFE
							80 °C / 176 °F	80 °C / 176 °F	145 °C / 293 °F	150 °C / 302 °F	180 °C / 356 °F
<b>Hung piston</b>											
3/4"	19	0.75	6	7	4	8,9	1314BA06A	1314BN06A	1314BE06A	1314BV06A	1314BST06A
1"	26	1.02	10	12	4,9	10,9	1314BA08A	1314BN08A	1314BE08A	1314BV08A	1314BST08A
1,1/2"	32	1.26	15	18	6,5	14,4	1314BA12A	1314BN12A	1314BE12A	1314BV12A	1314BST12A
2"	38	1.50	23	27	7,3	16,2	1314BA16A	1314BN16A	1314BE16A	1314BV16A	1314BST16A
<b>Floating piston</b>											
3/4"	19	0.75	6	7	4	8,9	1314BA06	1314BN06	1314BE06	1314BV06	1314BST06
1"	26	1.02	10	12	4,9	10,9	1314BA08	1314BN08	1314BE08	1314BV08	1314BST08
1,1/2"	32	1.26	15	18	6,5	14,4	1314BA12	1314BN12	1314BE12	1314BV12	1314BST12
2"	38	1.50	23	27	7,3	16,2	1314BA16	1314BN16	1314BE16	1314BV16	1314BST16

Note: In PTFE seat constructions, the piston is made of stainless steel AISI316.

**General dimensions 1314**



øA	B	C	øD	E	F	G	øH	I
R 3/4"	150	32	76	100	80	113	99	95
R 1"	157	41	90	120	89	120		
R 1.1/2"	180	49	100	149	97	143		
R 2"	180	51	100	149	100	147		

Measurements: mm

øA	B	C	øD	E	F	G	øH	I
R 3/4"	5.91	1.26	2.99	3.94	3.15	4.45	3.90	3.74
R 1"	6.18	1.61	3.54	4.72	3.50	4.72		
R 1.1/2"	7.09	1.93	3.94	5.87	3.82	5.63		
R 2"	7.09	2.01	3.94	5.87	3.94	5.79		

Measurements: ins.

**Special constructions**

Stainless steel body:

- AISI304: change letter **B** or **BS** for **S** in the catalog N<sup>o</sup>.  
Example: 1314SA08, 1314ST08.
- AISI316: change letter **B** or **BS** for **I** in the catalog N<sup>o</sup>.  
Example: 1314IA08, 1314IT08.

Options	Prefix	Suffix	Examples
Weather proof housing	<b>Y</b>		Y1314BST08A
Explosion and weather proof housing	<b>Z</b>		Z1314BST08A
Manual operator: on the main orifice		<b>-M</b>	1314BST08A-M
NPT connections		<b>T</b>	1314BST08AT
Flanged connections		<b>B</b>	1314BST08AB

**Coil characteristics**

Electric power supply	Coil type	Power W	VA (volt-ampere)		Maximum temperature		Available tensions
			Inrush	Holding	°C	°F	
CA 50 Hz	SH28C	28	241	69	155	311	1
	S28H (*)	28	252	73	180	356	1
CA 60 Hz	SH30C	30	267	80	155	311	2
	S30H (*)	30	237	78	180	356	2
CC	SH48	48	48	48	155	311	3
	S48H (*)	48	48	48	180	356	3

(\*) For steam  
1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

**Recommendations for installation**

Place a strainer with a porosity ≤ 100µ upstream the valve.

Mount the valve **only** over horizontal pipeline with the coil upright.

The valve input pressure must always be equal or greater than the output pressure.

**Application according to seat material**

Seat material	Buna "N"	Neoprene	EPDM	FKM	PTFE
<b>Maximum temperature</b>	+80 °C / 176 °F	+80 °C / 176 °F	+145 °C / 293 °F	+150 °C / 302 °F	+180 °C / 356 °F
<b>Uses</b>	Water, air, light oils. Neutral gases. Kerosene, low and medium vacuum	Oxygen, alcohol, argon, other non-corrosive light gases and liquids, Freon 12.	Water steam, hot water, acetone.	Benzene, naphta, aromatics, etc. hot gases, high vacuum, diesel oil.	Steam, hot oils, corrosive fluids.



**Applications:**

- Instrumentation. Laboratory.
- Burner pilot for combustible gases and liquids.
- Welding equipment. Humidifiers.
- Dental equipment. Vacuum systems.
- Laundry and dry cleaning machines.
- Heating with low or high pressure steam

**Main characteristics**

Normally closed and normally open.  
 Direct action. No minimum differential pressure to operate.  
 1/4" BSP or NPT threaded connections.  
 Brass, iron, stainless steel body.  
 Core tube AISI 304 and 316.  
 Plunger and fixed core AISI 430 F.  
 Shading coil: copper, silver or aluminium  
 Shape A DIN 43650 connection encapsulated coils.  
 IP65 and NEMA 4 protection.  
 Approximate weight: 0.5 kg. (1.1Lb)

**Options:**

- Energized coil indicator light.
- Explosion and / or weather proof coils and housings.
- Manual operator.

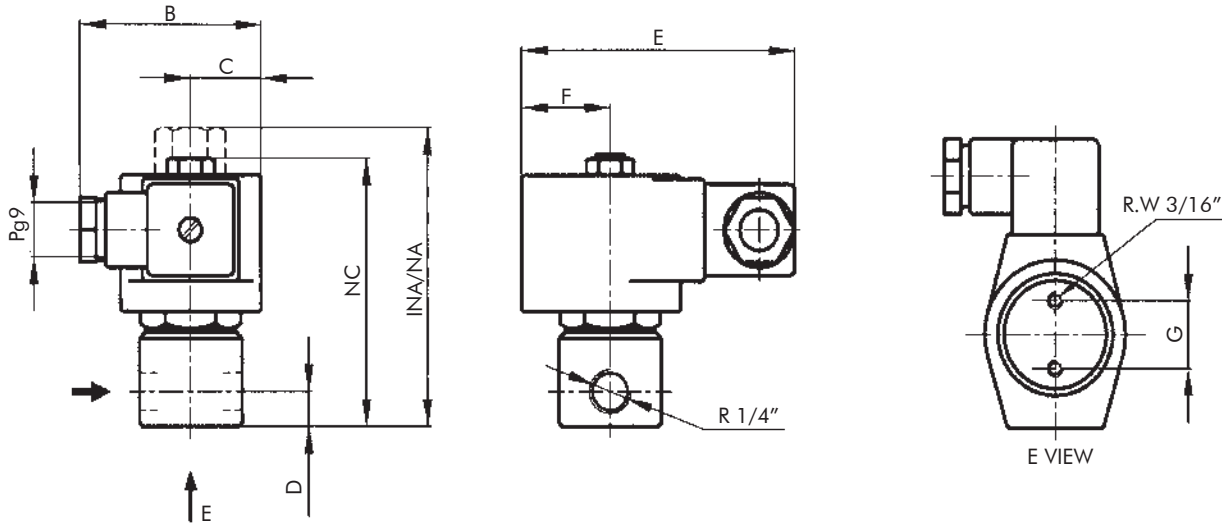
**Technical specifications - Brass body**

Orifice Ø		Flow factor		Δp (a) maximum		Maximum temp. and catalog N° according to seat material				
mm	ins.	Kv	Cv	bar	psi	Buna "N"	Neoprene	EPDM	FKM	PTFE
						80 °C / 176 °F	80 °C / 176 °F	145 °C / 293 °F	150 °C / 302 °F	180 °C / 356 °F
<b>Normally closed</b>										
1.25	.049	0.05	0.06	*	*	1327BA122	1327BN122	1327BE122	1327BV122	1327BT122
1.75	.068	0.09	0.11	35	525	1327BA172	1327BN172	1327BE172	1327BV172	1327BT172
2.25	.088	0.13	0.15	20	300	1327BA222	1327BN222	1327BE222	1327BV222	1327BT222
3.00	.118	0.26	0.30	10	150	1327BA302	1327BN302	1327BE302	1327BV302	1327BT302
4.00	.157	0.43	0.50	5	75	1327BA402	1327BN402	1327BE402	1327BV402	1327BT402
5.00	.197	0.60	0.70	3	45	1327BA502	1327BN502	1327BE502	1327BV502	-
5.25	.206	0.65	0.76	2.2	33	1327BA522	1327BN522	1327BE522	1327BV522	-
<b>(a) Advise:</b> when using direct current (DC), a 25% reduction on the maximum operating pressure differential is expected.						<b>* With PTFE seat 100 bar/1500 psi. Other seats 70 bar/1500 psi.</b>				
<b>Normally open</b>										
1.25	.049	0.05	0.06	50**	750**	1327BA122NA	1327BN122NA	1327BE122NA	1327BV122NA	1327BT122INA
1.75	.068	0.09	0.11	20**	300**	1327BA172NA	1327BN172NA	1327BE172NA	1327BV172NA	1327BT172INA
2.25	.088	0.13	0.15	12**	180**	1327BA222NA	1327BN222NA	1327BE222NA	1327BV222NA	1327BT222INA
2.50	.098	0.17	0.20	10	150	1327BA252NA	1327BN252NA	1327BE252NA	1327BV252NA	-
3.00	.118	0.26	0.30	10	150	1327BA302INA	1327BN302INA	1327BE302INA	1327BV302INA	1327BT302INA
4.00	.157	0.43	0.50	5	75	1327BA402INA	1327BN402INA	1327BE402INA	1327BV402INA	1327BT402INA

**\*\* With PTFE seat, maximum pressure 10bar / 150psi.**



**General dimensions 1327**



NC	NA	INA	B	C	D	E	F	G
80	89	102	57	22	10	85	27	20

Measurements: mm

NC	NA	INA	B	C	D	E	F	G
3.15	3.50	4	2.24	0.87	0.39	3.35	1.06	0.79

Measurements: ins.

**Special constructions**

Stainless steel body.

- AISI 304: change letter **B** for **S** in the catalog N<sup>o</sup>.  
Example: 1327ST302
- AISI 316: change letter **B** for **I** in the catalog N<sup>o</sup>.  
Example: 1327IT302.

Options	Prefix	Suffix	Examples
Water, weather and saline corrosion proof coils.	<b>YC</b>		YC1327BA302
Explosion and weather proof coils.	<b>ZC</b>		ZC1327BA302
Weather proof housing.	<b>Y</b>		Y1327BA302
Explosion and weather proof housing.	<b>Z</b>		Z1327BA302
Manual operator: on the main orifice	<b>(*)</b>	<b>- M</b>	1327BA302-M
NPT connections		<b>T</b>	1327BA122T
Energized coil indicator light		See coils.	

**Coil characteristics**

Electric power supply	Coil type	Power W	VA (volt-amp)		Maximum temperature		Available tensions
			Inrush	Holding	° C	° F	
AC 50 Hz	MF11C	11	40	22	155	311	1
	MH11C	11	40	22	180	356	1
AC 60 Hz	MF13C	13	45	27	155	311	2
	MH13C	13	45	27	180	356	2
DC	MH19C	19	19	19	180	356	3

1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

(\*) Up to 20 bar - 300 psi. PTFE seat not available. Only NC versions.

**Recommendations for installation**

Place a strainer upstream the valve with a porosity ≤ 100µ. Any mounting position. The valve allows > output pressure than input pressure, but in these cases watertightness is not guaranteed when it is closed.

**Application according to seat material**

Seat material	Buna "N"	Neoprene	EPDM	FKM	PTFE
<b>Maximum temperature</b>	+80 °C / 176 °F	+80 °C / 176 °F	+145 °C / 293 °F	+150 °C / 302 °F	+180 °C / 356 °F
<b>Uses</b>	Water, air, light oils. Neutral gases. Kerosene, low and medium vacuum	Oxygen, alcohol, argon, other non-corrosive light gases and liquids, Freon 12.	Water steam, hot water, acetone.	Benzene, naphta, aromatics, etc. hot gases, high vacuum, diesel oil.	Steam, hot oils, corrosive fluids.



**1335 Series**

**Applications:**

- Washing machines.
- Lubricated air, hot air, dry air, etc.
- Oxygen and acetylene equipments.
- Fuel oil and gas burners.
- Vacuum systems.

**Main characteristics**

Normally closed and normally open.  
BSP or NPT threaded connections.  
Forged brass, stainless steel body.  
Plastic or metal core diaphragm.  
Core tube SS. 304 and 316.  
Plunger and fixed core: SS. 430 F.  
Shading coil: copper, silver or aluminium.

Encapsulated plug-in coils. Shape A DIN 43650 connection.  
IP65 and NEMA4 Protection.

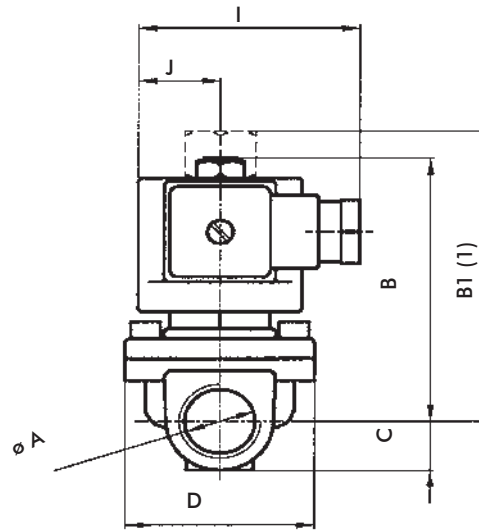
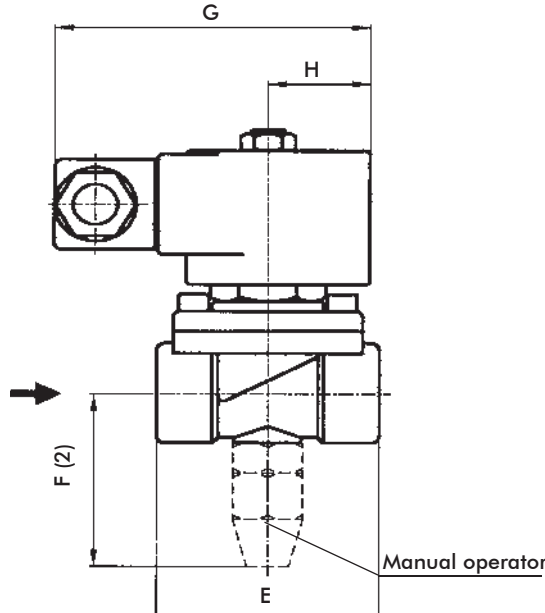
**Options:**

- Energized coil indicator light.
- Explosion and / or weather coils and housings.
- Manual operator.

**Technical specifications - Brass body**

Pipe size ins.	Orifice size		Flow factor		Weight		Pressure minimum		Pressure maximum AC		Pressure maximum DC		Maximum temp. and catalog N° according to seat material.			
	mm	ins	Kv	Cv	Kg	Lb	bar	psi	bar	psi	bar	psi	Buna "N"	Neoprene	EPDM	FKM
													80 °C / 176 °F	80 °C / 176 °F	+145 °C / 293 °F	+150 °C / 302 °F
<b>Direct acting-Normally closed</b>																
3/8"	14	0.55	2.35	2.75	0.8	1.75	0	0	0.2	3	0.1	1.5	1335BA3D	1335BN3D	1335BE3D	1335BV3D
1/2"	14	0.55	2.65	3.1	0.8	1.75	0	0	0.2	3	0.1	1.5	1335BA4D	1335BN4D	1335BE4D	1335BV4D
3/4"	18	0.71	4.3	5.03	0.9	2.0	0	0	0.2	3	0.1	1.5	1335BA6D	1335BN6D	1335BE6D	1335BV6D
3/8"	8	0.31	1.7	2	0.8	1.75	0	0	1	15	0.7	10	1335BA083D	1335BN083D	1335BE083D	1335BV083D
1/2"	8	0.31	1.7	2	0.8	1.75	0	0	1	15	0.7	10	1335BA084D	1335BN084D	1335BE084D	1335BV084D
3/4"	8	0.31	1.7	2	0.9	2	0	0	1	15	0.7	10	1335BA086D	1335BN086D	1335BE086D	1335BV086D
<b>Floating diaphragm-Normally closed</b>																
3/8"	14	0.55	2.35	2.75	0.8	1.75	0.1	1.5	10	150	6	90	1335BA3	1335BN3	1335BE3	1335BV3
1/2"	14	0.55	2.65	3.1	0.8	1.75	0.1	1.5	10	150	6	90	1335BA4	1335BN4	1335BE4	1335BV4
3/4"	18	0.71	4.3	5.03	0.9	2	0.1	1.5	10	150	6	90	1335BA6	1335BN6	1335BE6	1335BV6
<b>Hung diaphragm-Normally closed</b>																
3/8"	14	0.55	2.35	2.75	0.8	1.75	0	0	7	105	6	90	1335BA3A	1335BN3A	1335BE3A	1335BV3A
1/2"	14	0.55	2.65	3.1	0.8	1.75	0	0	7	105	6	90	1335BA4A	1335BN4A	1335BE4A	1335BV4A
3/4"	18	0.71	4.3	5.03	0.8	2	0	0	7	105	6	90	1335BA6A	1335BN6A	1335BE6A	1335BV6A
<b>Floating diaphragm-Normally open</b>																
3/8"	14	0.55	2.35	2.75	0.8	1.75	0.1	1.5	10	150	10	150	1335BA3INA	1335BN3INA	1335BE3INA	1335BV3INA
1/2"	14	0.55	2.65	3.1	0.8	1.75	0.1	1.5	10	150	10	150	1335BA4INA	1335BN4INA	1335BE4INA	1335BV4INA
3/4"	18	0.71	4.3	5.03	0.9	2	0.1	1.5	10	150	10	150	1335BA6INA	1335BN6INA	1335BE6INA	1335BV6INA
<b>Direct acting-Normally open</b>																
3/8"	8	0.31	1.7	2	0.8	1.75	0	0	1	15	1	15	1335BA083DINA	1335BN083DINA	1335BE083DINA	1335BV083DINA
1/2"	8	0.31	1.7	2	0.8	1.75	0	0	1	15	1	15	1335BA084DINA	1335BN084DINA	1335BE084DINA	1335BV084DINA
3/4"	8	0.31	1.7	2	0.9	2	0	0	1	15	1	15	1335BA086DINA	1335BN086DINA	1335BE086DINA	1335BV086DINA
3/8"	14	0.55	2.35	2.75	0.8	1.75	0	0	0.2	3	0.1	1.5	1335BA3DINA	1335BN3DINA	1335BE3DINA	1335BV3DINA
1/2"	14	0.55	2.65	3.1	0.8	1.75	0	0	0.2	3	0.1	1.5	1335BA4DINA	1335BN4DINA	1335BE4DINA	1335BV4DINA
3/4"	18	0.71	4.3	5.03	0.9	2	0	0	0.2	3	0.1	1.5	1335BA6DINA	1335BN6DINA	1335BE6DINA	1335BV6DINA

**General dimensions 1335** (1) Normally open version - (2) Manual operator (optional)



Brass	øA	B	B1	C	D	E	F	G	H	I	J
	R 3/8"	80	88	15	51	60	53	85	26	57	22
	R 1/2"										
R 3/4"											
AISI 304	R 1/2"	82	90	17	58	72	55				
	R 3/4"										

Measurements: mm

Brass	øA	B	B1	C	D	E	F	G	H	I	J
	R 3/8"	3.15	3.46	0.59	2.01	2.36	2.09	3.35	1.02	2.24	0.87
	R 1/2"										
R 3/4"											
AISI 304	R 1/2"	3.23	3.54	0.67	2.28	2.83	2.17				
	R 3/4"										

Measurements: ins.

**Special constructions**

- Investment cast AISI316 Body (only 1/2" and 3/4").  
Change letter **B** for **I** to Catalog N<sup>o</sup>.  
Example: 1335IV4; 1335IV6.
- Vacuum systems: consult **JEFFERSON**.

**Coil characteristics**

Electric power supply	Coil type	Power W	VA (volt-amp)		Maximum temperature		Available tensions
			Inrush	Holding	° C	° F	
AC 50 Hz	MF11C	11	47	18	155	311	1
	MH11C	11	47	18	180	356	1
AC 60 Hz	MF13C	13	57	23	155	311	2
	MH13C	13	57	23	180	356	2
DC	MH19C	19	19	19	180	356	3

1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

Options	Prefix	Suffix	Examples
Water, weather and saline corrosion proof coils.	<b>YC</b>		<b>YC1335BN4A</b>
Explosion and weather proof coils.	<b>ZC</b>		<b>ZC1335BA4A</b>
Weather proof housing.	<b>Y</b>		<b>Y1335BA4A</b>
Explosion and weather proof housing.	<b>Z</b>		<b>Z1335BA4A</b>
Manual operator: on the main orifice	<b>(*)</b>	<b>- M</b>	<b>1335BA4A-M</b>
NPT connections		<b>T</b>	<b>1335BA4AT</b>
Oxygen		<b>-O</b>	<b>1335BN43-O</b>
Energized coil indicator light		See coils.	

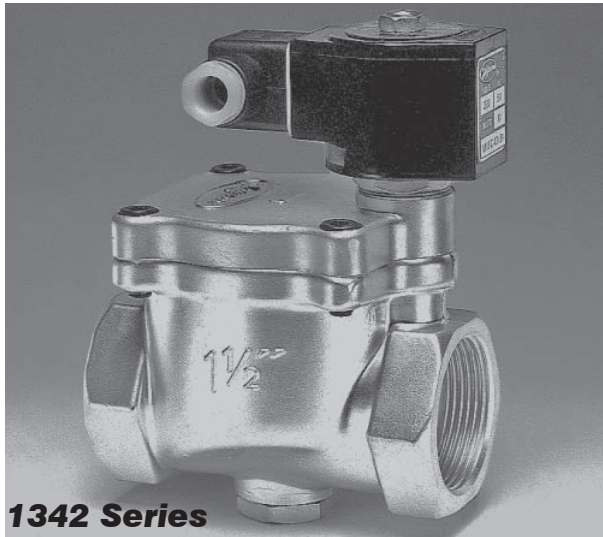
(\*) Only NC versions

**Recommendations for installation**

Place a strainer upstream the valve with a porosity ≤ 100µ. Install the valve in any position, preferably over horizontal pipeline with the coil upright.

**Application according to seat material.**

Seat material	Buna "N"	Neoprene	EPDM	FKM
Maximum temperature	+80 °C / 176 °F	+80 °C / 176 °F	+145 °C / 293 °F	+150 °C / 302 °F
Uses	Water, air, light oils. Neutral gases. Kerosene. Low and medium vacuum	Oxygen, alcohol, argon, other non-corrosive light gases and liquids. Freon 12.	Water steam, hot water, acetone.	Benzene, naphta, aromatics, benzene, etc. Hot gases. High vacuum. Diesel oil.



**1342 Series**

**New products**

**Hydraulic, Water  
Hammer-Proof Solenoid Valve**

To request a technical bulletin for models that are not included in this catalog, please contact **JEFFERSON** at:

**jsventas@jefferson.com.ar**

ISO 9001  
BUREAU VERITAS  
Certification

**CERTIFIED QUALITY SYSTEM**

Underwriters Laboratories Inc.®

Association canadienne de normalisation  
Canadian Standards Association

Contact our manufacturing plant for information on available models

**Applications:**

- Pumps. Laundry equipments.
- Irrigation. Compressors. Pollution controls.
- Heating with medium or high pressure steam.
- Autoclaves. Industrial laundry equipments.
- Spraying. Irrigation.
- Air dryers. water treatment.

**Main characteristics.**

Normally closed or normally open.  
Servo-operated action.  
3/4" to 3" BSP or NPT threaded connections.  
Body: Forged brass or stainless steel.  
Core tube SS. 304 and 316.  
Plunger and fixed core: SS. 430 F.  
Shading coil: copper, silver or aluminium

Shape A DIN 43650 Connection encapsulated coils.  
IP65 and NEMA4 Protection.

**Options:**

- Energized coil indicator light.
- Explosion and / or weather proof coils and housings.
- Manual operator on main passage.
- Manual operator on pilot orifice.

**Operating pressure differential**

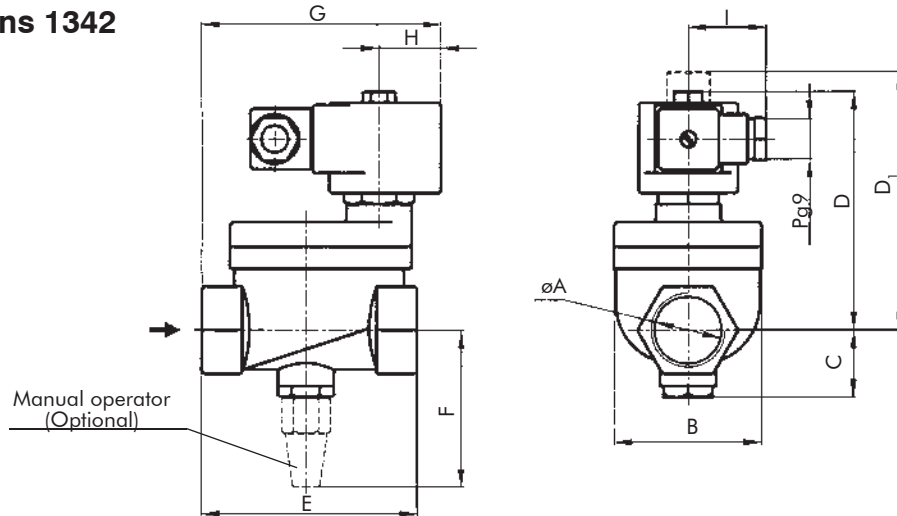
**\*Advise:** when using direct current (DC), a 25% reduction on the maximum operating pressure differential is expected

Type	Minimum				Maximum steam		Maximum other fluids			
	Others seats		Buna "N" seat		PTFE seat		PTFE seat		Other seats	
	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi
NC	0.5	7.5	0.2	3	10	150	17 *	255 *	15 *	225 *
NO	0.5	7.5	0.2	3	10	150	10	150	10	150

**Technical specifications - Brass body**

Ø Pipe ins	Ø Orifice		Flow factor		Weight		Maximum temp. and catalog N° according to seat material				
	mm	ins.	Kv	Cv	kg	Lb	Buna "N"	Neoprene	EPDM	FKM	PTFE
							80 °C / 176 °F	80 °C / 176 °F	145 °C / 293 °F	150 °C / 302 °F	180 °C / 356 °F
<b>Normally closed</b>											
3/4"	20	0.79	5	5.9	1.2	2.6	1342BA06	1342BN06	1342BE06	1342BV06	1342BT06
1"	26	1.02	11	13	1.7	3.8	1342BA08	1342BN08	1342BE08	1342BV08	1342BT08
1.1/2"	38	1.50	25	29	3.1	6.8	1342BA12	1342BN12	1342BE12	1342BV12	1342BT12
2"	50	1.97	40	47	4.1	9.0	1342BA16	1342BN16	1342BE16	1342BV16	1342BT16
2.1/2"	76	3.00	66	77	19	42	1342BA20	1342BN20	1342BE20	1342BV20	1342BT20
3	76	3.00	85	99	18	40	1342BA24	1342BN24	1342BE24	1342BV24	1342BT24
<b>Normally open</b>											
3/4"	20	0.79	5	5.9	1.2	2.6	1342BA06INA	1342BN06INA	1342BE06INA	1342BV06INA	1342BT06INA
1"	26	1.02	11	13	1.7	3.8	1342BA08INA	1342BN08INA	1342BE08INA	1342BV08INA	1342BT08INA
1.1/2"	38	1.50	25	29	3.1	6.8	1342BA12INA	1342BN12INA	1342BE12INA	1342BV12INA	1342BT12INA
2"	50	1.97	40	47	4.1	9.0	1342BA16INA	1342BN16INA	1342BE16INA	1342BV16INA	1342BT16INA
2.1/2"	76	3.00	66	77	19	42	1342BA20INA	1342BN20INA	1342BE20INA	1342BV20INA	1342BT20INA
3	76	3.00	85	99	18	40	1342BA24INA	1342BN24INA	1342BE24INA	1342BV24INA	1342BT24INA

**General dimensions 1342**



øA	B	C	D	D <sub>1</sub>	E	F	G	H	I
R 3/4"	52	26	104	114	71	68	84	27	35
R 1"	67	30	108	118	96	72	104		
R 1,1/2"	81	36	119	129	114	79	122		
R 2"	97	44	125	135	128	85	138		
R 2,1/2"-3"	163	89	214	224	224	170	-		

Measurements: mm

øA	B	C	D	D <sub>1</sub>	E	F	G	H	I
R 3/4"	2.05	1.02	4.09	4.49	2.80	2.68	3.31	1.06	1.38
R 1"	2.64	1.18	4.25	4.65	3.78	2.83	4.09		
R 1,1/2"	3.19	1.42	4.69	5.08	4.49	3.11	4.80		
R 2"	3.82	1.73	4.92	5.31	5.04	3.35	5.43		
R 2,1/2"-3"	6.42	3.50	8.43	8.82	8.82	6.69	-		

Measurements: ins.

**Special constructions**

Stainless steel body:

- AISI304: change letter **B** for **S** in the catalog N<sup>o</sup>.  
Example: 1342ST08.
- AISI316: change letter **B** for **I** in the catalog N<sup>o</sup>.  
Example: 1342IT08.

**Coil characteristics**

Electric power supply	Coil type	Power W	VA (volt-amper)		Maximum temperature		Available tensions
			Inrush	Holding	° C	° F	
AC 50 Hz	MF11C	11	40	22	155	311	1
	MH11C	11	40	22	180	356	1
AC 60 Hz	MF13C	13	45	27	155	311	2
	MH13C	13	45	27	180	356	2
DC	MH19C	19	19	19	180	356	3

1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

Options	Prefix	Suffix	Examples
Water, weather and saline corrosion proof coils.	<b>YC</b>		<b>YC1342BA08</b>
Explosion and weather proof coils.	<b>ZC</b>		<b>ZC1342BA08</b>
Weather proof housing.	<b>Y</b>		<b>Y1342BA08</b>
Explosion and weather proof housing.	<b>Z</b>		<b>Z1342BA08</b>
Manual operator: on main orifice. (**)		<b>- M</b>	<b>1342BA08-M</b>
Manual operator on pilot orifice. (*)(**)		<b>-MP</b>	<b>1342BA08-MP</b>
NPT connections		<b>T</b>	<b>1342BA08T</b>
Energized coil indicator light	See coils.		

(\*) PTFE seat not available

(\*\*) Only NC versions.

**Recommendations for installation.**

Place a strainer upstream the valve with a porosity ≤ 100µ. Mount the valve preferably over horizontal pipeline with the coil upright. The valve input pressure must always be > than the output pressure. In order to allow the normally closed or normally open valve to open, the minimum pressure indicated for each model must be respected.

**Application according to seat material**

Seat material	Buna "N"	Neoprene	EPDM	FKM	PTFE
Maximum temperature	+80 °C / 176 °F	+80 °C / 176 °F	+145 °C / 293 °F	+150 °C / 302 °F	+180 °C / 356 °F
Uses	Water, air, light oils. Neutral gases. Kerosene, low and medium vacuum	Oxygen, alcohol, argon, other non-corrosive light gases and liquids, Freon 12.	Water steam, hot water, acetone.	Benzene, naphta, aromatics, etc. hot gases, diesel oil.	Steam, hot oils, corrosive fluids.



**Applications:**

- Pumps, laundry equipments.
- Irrigation. Compressors. Pollution control.
- Heating with medium or high pressure steam.
- Spraying. Irrigation.
- Air dryers. Water treatment.
- Autoclaves. Industrial laundry equipments.

**Main characteristics**

Normally closed and normally open.  
Piston servo-operated action.  
Brass, stainless steel body.  
BSP or NPT threaded connections.  
Buna N seats for neutral fluids up to 80 °C and PTFE up to 180 °C.  
Encapsulated coils. Shape A DIN 43650 Connection.  
IP65 and NEMA4 Protection.

**Options:**

- Energized coil indicator light.
- Explosion and / or weather proof coils and housings.
- Manual operator.

**Operating pressure differential**

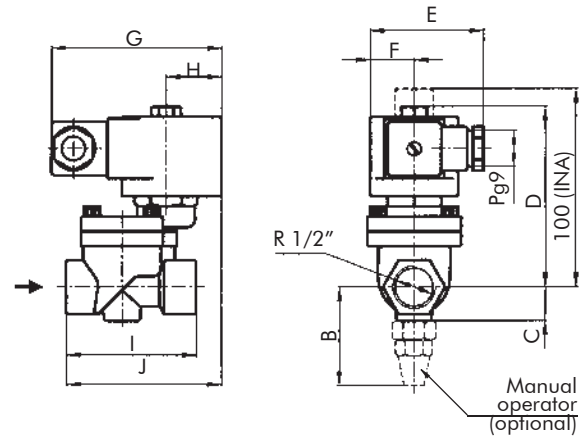
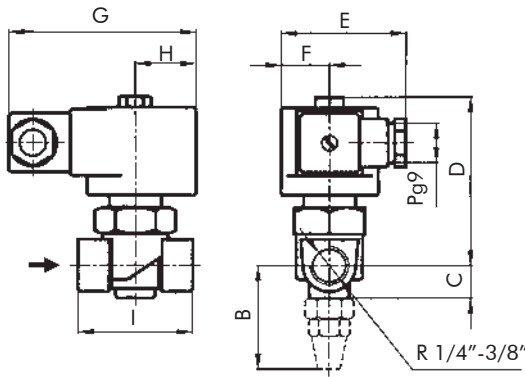
**\*Advise:** when using direct current (DC), a 25% reduction on the maximum operating pressure differential is expected

Type	Minimum		Maximum steam				Maximum other fluids	
			PTFE seat		EPDM seat			
	bar	psi	bar	psi	bar	psi	bar	psi
NC	0.1	1.5	10	150	3	45	15 *	225 *
NO	0.1	1.5	10	150	3	45	10	150

**Technical specifications - Brass body**

Ø Pipe ins	Ø Orifice		Flow factor		Weight		Maximum temp. and catalog N° according to seat material				
	mm	ins.	Kv	Cv	kg	Lb	Buna "N"	Neoprene	EPDM	FKM	PTFE
							80 °C / 176 °F	80 °C / 176 °F	145 °C / 293 °F	150 °C / 302 °F	180 °C / 356 °F
<b>Normally closed</b>											
1/4"	6	0.24	0.80	0.94	0.70	1.6	1390BA2	1390BN2	1390BE2	1390BV2	1390BT2
3/8"	9	0.35	1.60	1.87	0.65	1.4	1390BA3	1390BN3	1390BE3	1390BV3	1390BT3
1/2"	12	.47	2.35	2.75	0.90	2.00	1390BA4	1390BN4	1390BE4	1390BV4	1390BT4
<b>Normally open</b>											
1/4"	6	0.24	0.80	0.94	0.70	1.6	1390BA2INA	1390BN2INA	1390BE2INA	1390BV2INA	1390BT2INA
3/8"	9	0.35	1.60	1.87	0.65	1.4	1390BA3INA	1390BN3INA	1390BE3INA	1390BV3INA	1390BT3INA
1/2"	12	.47	2.35	2.75	0.90	2.00	1390BA4INA	1390BN4INA	1390BE4INA	1390BV4INA	1390BT4INA

**General dimensions 1390**



øA	B	C	D	E	F	G	H	I	J
R 1/4"	48	15	77	57	22	85	27	52	-
R 3/8"									-
R 1/2"	50	17	91	57	22	85	27	65	78

Measurements: mm

øA	B	C	D	E	F	G	H	I	J
R 1/4"	1.89	0.59	3.03	2.24	0.87	3.35	1.06	2.05	-
R 3/8"									-
R 1/2"	1.97	0.67	3.58	2.24	0.87	3.35	1.06	2.56	3.07

Measurements: ins.

**Special constructions**

Stainless steel body:

- AISI304: change letter **B** for **S** in the catalog N<sup>o</sup>.  
Example: 1390ST4.
- AISI316: change letter **B** for **I** in the catalog N<sup>o</sup>.  
Example: 1390IT4.

Options	Prefix	Suffix	Examples
Water, weather and saline corrosion proof coils.	<b>YC</b>		<b>YC1390BA4</b>
Explosion and weather proof coils.	<b>ZC</b>		<b>ZC1390BA4</b>
Weather proof housing.	<b>Y</b>		<b>Y1390BA4</b>
Explosion and weather proof housing.	<b>Z</b>		<b>Z1390BA4</b>
Manual operator: on the main orifice	<b>(*)</b>	<b>- M</b>	<b>1390BA4-M</b>
NPT connections		<b>T</b>	<b>1390BA4T</b>
Energized coil indicator light	See coils.		

(\*) Only NC versions.

**Coil characteristics**

Electric power supply	Coil type	Power W	VA (volt-ampere)		Maximum temperature		Available tensions
			Inrush	Holding	°C	°F	
AC 50 Hz	MF11C	11	40	22	155	311	1
	MH11C	11	40	22	180	356	1
AC 60 Hz	MF13C	13	45	27	155	311	2
	MH13C	13	45	27	180	356	2
DC	MH19C	19	19	19	180	356	3

1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

**Recommendations for installation**

Place a strainer upstream the valve with a porosity ≤ 100µm. Mount the valve in any position, preferably over horizontal pipeline with the coil upright. The valve input pressure must always be > than the pressure downstream from the valve. For the normally closed or normally open valve to open, the minimum pressure indicated in each model must be observed.

**Application according to seat material**

Seat material	Buna "N"	Neoprene	EPDM	FKM	PTFE
Maximum temperature	+80 °C / 176 °F	+80 °C / 176 °F	+145 °C / 293 °F	+150 °C / 302 °F	+180 °C / 356 °F
Uses	Water, air, light oils. Neutral gases. Kerosene, low and medium vacuum	Oxygen, alcohol, argon, other non-corrosive light gases and liquids, Freon 12.	Water steam, hot water, acetone.	Benzene, naphta, aromatics, etc., hot gases, diesel oil.	Steam, hot oils, corrosive fluids.



**Applications:**

- Autoclaves. Steam irons.
- Condensation purge in air systems.
- Coffee machines. Fryers.

**Main characteristics**

Normally closed and normally open.  
Direct action. No minimum differential pressure to operate.  
Forged brass, nickel-plated forged brass body.  
BSP or NPT threaded connections.  
Stainless steel blade type closure PTFE seats.  
The straight passage prevents pressure drops and turbulence caused by the fluid's changing direction as it is the case with conventional valves.

**Options:**

- Explosion and weather proof housings.

**Important:**

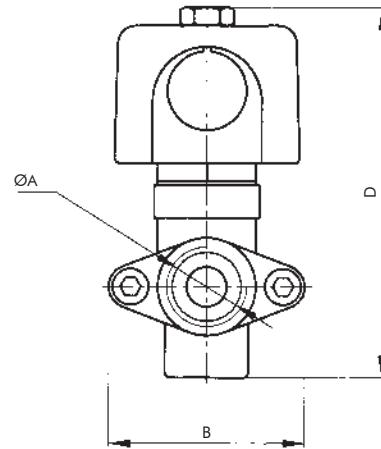
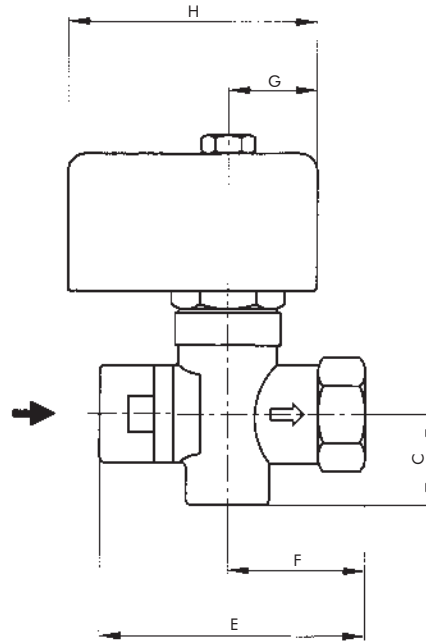
**This series is not available for DC**

**Technical specifications**

Ø Pipe ins	Ø Orifice		Flow factor		Δp maximum		Weight		Maximum temperature		Catalog N°.	
	mm	ins.	Kv	Cv	bar	psi	kg	Lb	°C	°F	Brass	Nickel plated
<b>Normally closed</b>												
1/4"	8	0.31	1.80	2.1	4	60	0.83	1.8	180	356	1393BS082	1393NS082
3/8"			2.80	3.28			0.75	1.7			1393BS083	1393NS083
1/2"			2.80	3.28			0.77	1.7			1393BS084	1393NS084
<b>Normally open</b>												
1/4"	8	0.31	1.80	2.1	4	60	0.83	1.8	180	356	1393BS082NA	1393NS082NA
3/8"			2.80	3.28			0.75	1.7			1393BS083NA	1393NS083NA
1/2"			2.80	3.28			0.77	1.7			1393BS084NA	1393NS084NA



**General dimensions 1393**



øA	B	C	D	E	F	G	H
R 1/4"	54	25	104	73	38	25	68
R 3/8"							
R 1/2"							

Measurements: mm

øA	B	C	D	E	F	G	H
R 1/4"	2.13	0.98	4.09	2.87	1.50	0.98	2.68
R 3/8"							
R 1/2"							

Measurements: ins.

**Coil characteristics**

Electric power supply	Coil type	Power W	VA (volt-ampere)		Maximum temperature		Available tensions
			Inrush	Holding	° C	° F	
AC 50 Hz	M20H	20	66	33	180	356	1
AC 60 Hz	M20H	20	66	33	180	356	2

1 - (12, 24, 110, 220, 240) V    2 - (12, 24, 110, 120, 220, 240) V

Options	Prefix	Suffix	Examples
Weather proof housing	<b>Y</b>		Y1393BS802
Explosion and weather proof housing	<b>Z</b>		Z1393BS802
NPT connections		<b>T</b>	1393BS802T

**Recommendations for installation**

Place a strainer upstream the valve with a porosity ≤ 100µ.

Mount **only** over horizontal pipeline with the coil upright.



**Applications:**

- Instrumentation. Laboratories.
- Burner pilot for gas and oil.
- Welding equipment. Humidifiers.
- Dental equipment. Vacuum systems.
- Dry air-gas. Light liquids.

**Main characteristics**

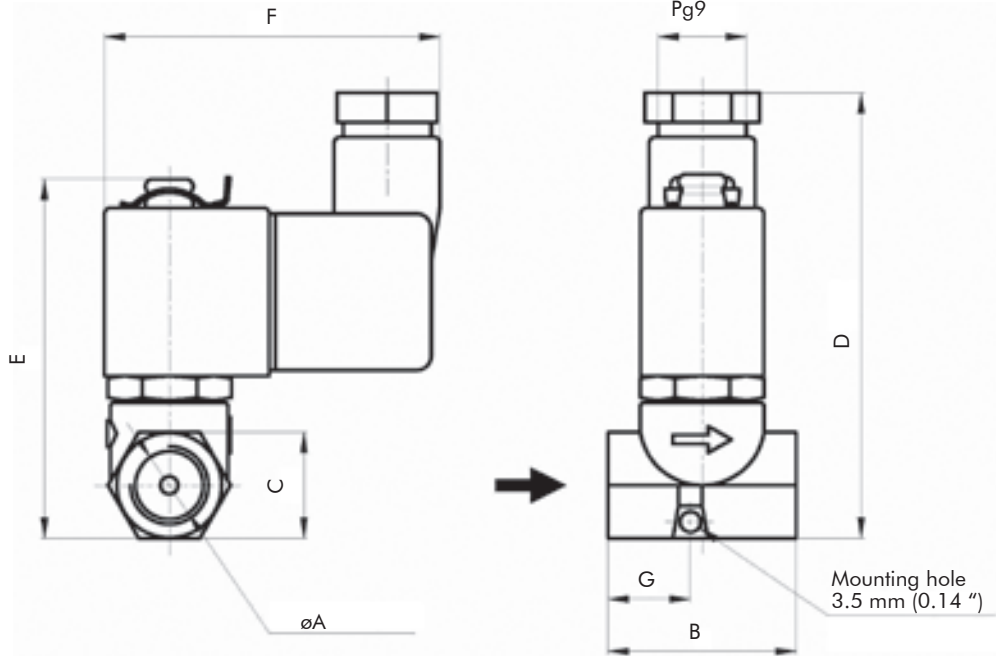
Normally closed.  
 Direct action. No minimum differential pressure to operate.  
 Forged brass compact body.  
 BSP or NPT threaded connections.  
 Buna "N" seat for neutral fluids up to 80 °C.

Neoprene, ethylene-propylene and FKM for other applications.  
 Encapsulated minicoils.  
 Shape B DIN 43650 connection.  
 IP65 and NEMA4 Protection.  
 Response time with air at 6 bar (10 milliseconds)  
 Approximate weight: 170 g. (0.38 Lb)

**Technical specifications**

Ø Pipe ins	Ø Orifice		Flow factor		Maximum Δp				Maximum temp. and catalog N° according to seat material			
					AC		DC		Buna "N"	Neoprene	EPDM	FKM
	mm	ins.	Kv	Cv	bar	psi	bar	psi	80 °C / 176 °F	80 °C / 176 °F	145 °C / 293 °F	150 °C / 302 °F
<b>Normally closed - Minimum Δp: 0</b>												
1/8"	1,25	,049	0,05	0,06	37	536	31	450	2026BA121	2026BN121	2026BE121	2026BV121
	1,75	,068	0,09	0,11	15	217	15	217	2026BA171	2026BN171	2026BE171	2026BV171
	2,25	,088	0,13	0,15	7.5	108	7.5	108	2026BA221	2026BN221	2026BE221	2026BV221
	3,00	,118	0,26	0,30	3	43	3	43	2026BA301	2026BN301	2026BE301	2026BV301
1/4"	1,25	,049	0,05	0,06	37	536	31	450	2026BA122	2026BN122	2026BE122	2026BV122
	1,75	,068	0,09	0,11	15	217	15	217	2026BA172	2026BN172	2026BE172	2026BV172
	2,25	,088	0,13	0,15	7.5	108	7,5	108	2026BA222	2026BN222	2026BE222	2026BV222
	3,00	,118	0,26	0,30	3	43	3	43	2026BA302	2026BN302	2026BE302	2026BV302
	4,00	,157	0,35	0,41	3	43	2,6	39	2026BA402	2026BN402	2026BE402	2026BV402

**General dimensions 2026**



øA	B	C	D	E	F	G
R 1/8"	32	18	76	61	57	14
R 1/4"						

Measurements: mm

øA	B	C	D	E	F	G
R 1/8"	1.26	0.71	2.99	2.40	2.24	0.55
R 1/4"						

Measurements: ins.

**Coil characteristics**

Electric power supply	Coil type	Power W	VA (volt-amper)		Maximum temperature		Available tensions
			Inrush	Holding	°C	°F	
AC 50 Hz	GF06C	6	10.8	7.5	155	311	1
AC 60 Hz	GF06C	6	12.9	8.0	155	311	2
DC	GF06C	6	6	6	155	311	3

1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

Options	Prefix	Suffix	Examples
NPT connections		T	2026BA121T

**Application according to seat material**

Seat material	Buna "N"	Neoprene	EPDM	FKM
Maximum temperature	+80 °C / 176 °F	+80 °C / 176 °F	+145 °C / 293 °F	+150 °C / 302 °F
Uses	Water, air, light oils, kerosene, low and medium vacuum, neutral gases.	Oxygen, alcohol, argon, other non-corrosive light gases and liquids, Freon 12.	Water steam, hot water, acetone.	Benzene, naphta, aromatics, etc. hot gases, high vacuum, diesel oil, benzine.

**Recommendations for installation**

Place a strainer upstream the valve with a porosity ≤ 100µ.  
Any position.  
Preferably over horizontal pipeline with the coil upright.



**2036 Main features:**

- Normally closed.
- Piston or diaphragm servo-operated action.
- Forged brass body.
- BSP or NPT threaded connections.
- Buna N or neoprene diaphragm with plastic core, EPDM or FKM with metal core, or brass piston with PTFE.
- Shape B DIN 43650 connection encapsulated minicoils.
- IP65 and NEMA4 Protection.

**2036V Applications:**

**Steam valve up to 10 bar  
Laundry, dry-cleaning, etc.**

**2036 Applications:**

- Washing machines.
- Lubricated air, hot air, dry air, etc.
- Oxygen and acetylene equipments.
- Spraying. Irrigation.
- Air dryers. Water treatment.

**Operating pressure differential**

Size	Minimum*		Maximum		Maximum steam			
					EPDM		PTFE	
	bar	psi	bar	psi	bar	psi	bar	psi
3/8"	0.2	3	15	218	3	45	10	150
1/2"								
3/4"								
1"	0.3	4.5	10	145	3	45	-	-

\* With PTFE rings minimum: 0.3 bar (4 psi)

**Technical specifications**

Ø Connect.	Ø Orifice		Flow factor		Weight		Maximum temp. and catalog N° according to seat material				
	mm	ins	Kv	Cv	kg	Lb	Buna "N"	Neoprene	EPDM	FKM	PTFE
							80°C / 176°F	80°C / 176°F	150°C / 302°F	145°C / 293°F	180°C / 356°F
3/8"	13	0.50	2.60	2.90	0.320	0.7	2036BA03	2036BN03	2036BE03	2036BV03	2036BT03
1/2"	13	0.50	3.60	4.20	0.320	0.7	2036BA04	2036BN04	2036BE04	2036BV04	2036BT04
3/4"	16	0.63	5.50	6.40	0.225	1.4	2036BA06	2036BN06	2036BE06	2036BV06	2036BT06
1"	25	1	9	10.50	0.980	2.2	2036BA08	2036BN08	2036BE08	2036BV08	-

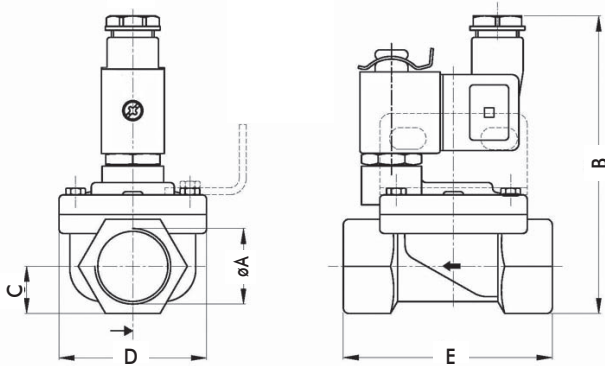
**Note:** Buna N, Neoprene, EPDM y FKM: diaphragm.  
PTFE: piston. Only for steam.



CERTIFIED QUALITY SYSTEM

Contact our manufacturing plant for information on available models

**General dimensions 2036**



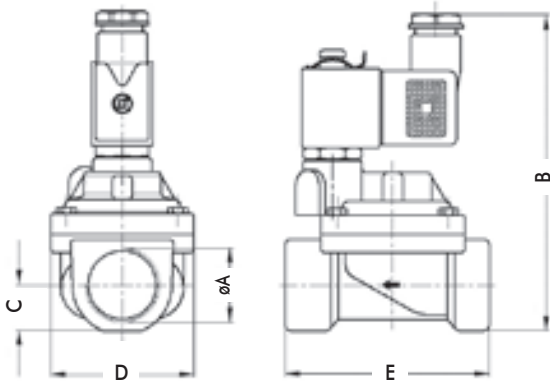
øA	B	C	D	E
R 3/8"	95	13	45	64
R 1/2"				
R 3/4"	103	17	52	73
R 1"	115	21	72	99

Measurements: mm

øA	B	C	D	E
R 3/8"	3.74	0.51	1.77	2.52
R 1/2"				
R 3/4"	4.06	0.67	2.05	2.86
R 1"	4.53	0.83	2.83	3.90

Measurements: ins.

**General dimensions 2036V**



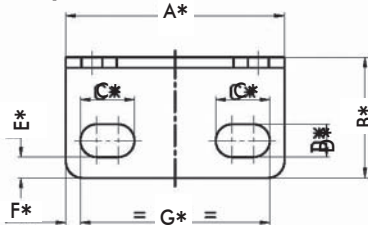
øA	B	C	D	E
R 3/8"	100,5	13	45	64
R 1/2"				
R 3/4"	115	17	52	73

Measurements: mm

øA	B	C	D	E
R 3/8"	3.96	0.51	1.77	2.52
R 1/2"				
R 3/4"	4.53	0.67	2.05	2.86

Measurements: ins.

**Fixing plate (optional)**



A*	B*	C*	D*	E*	F*	G*
52.5	29	13	7.9	5	3.5	45.5

Measurements: mm

A*	B*	C*	D*	E*	F*	G*
2.07	1.14	0.51	0.31	0.20	0.14	1.79

Measurements: ins.

**Coil characteristics**

Electric power supply	Coil type	Power W	VA (volt-ampere)		Maximum temperature		Available tensions
			Inrush	Holding	°C	°F	
AC 50 Hz	GF06C	6	10.8	7.5	155	311	1
AC 60 Hz	GF06C	6	12.9	8.0	155	311	2
DC	GF06C	6	6	6	155	311	3

1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

Options	Prefix	Suffix	Examples
Mounting bracket		-MB	2036BA03-MB
NPT connections		T	2036BA06T
Energized coil indicator light	See coils.		

**Application according to seat material**

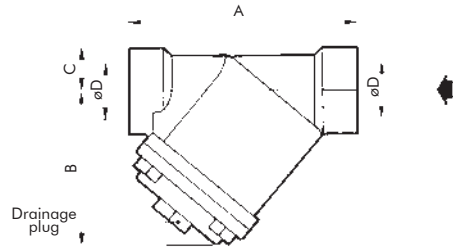
Seat material	Buna "N"	Neoprene	EPDM	FKM	PTFE
Maximum temperature	+80 °C / 176 °F	+80 °C / 176 °F	+145 °C / 293 °F	+150 °C / 302 °F	+180 °C / 356 °F
Uses	Water, air, light oils. Neutral gases. Kerosene, low and medium vacuum	Oxygen, alcohol, argon, other non-corrosive light gases and liquids, Freon 12.	Water steam, hot water, acetone.	Benzene, naphta, aromatics, etc. hot gases, high vacuum, diesel oil.	Water steam.

**Recommendations for installation**

Place a strainer upstream the valve with a porosity ≤ 100µ. Preferably over horizontal pipeline with the coil upright.



**General dimensions 1359**



A	B	C	D(ø)
80	60	16	1/2"
100	78	18	3/4"
120	95	21	1"
150	121	32	1.1/2"
180	165	39	2"

Measurements: mm

A	B	C	D(ø)
3.15	2.36	0.63	1/2"
3.93	3.07	0.70	3/4"
4.72	3.74	0.82	1"
5.90	4.76	1.26	1.1/2"
7.08	6.49	1.53	2"

Measurements: ins.

**Applications:**

- Strainers must be used wherever it is essential that the fluid flowing through pipe lines be maintained free of foreign solid matter, to assure the correct operation of the solenoid valve.

**Main characteristics**

Gray cast body.  
 Basket type filtering element with stainless steel double mesh.  
 Particle retention capacity from 100 microns.  
 Its design features guarantee 100% filtration of the product.  
 Flanged cover with drainage connection.

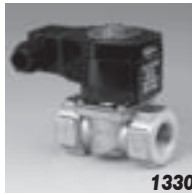
Options	Suffix	Example
NPT connections	<b>T</b>	1359BS4T

**Technical specifications**

ø Pipe ins.	Flow factor		Δp Maximum		Weight		Maximum temp.		Catalog N°.
	Kv	Cv	bar	psi	kg	Lb	°C	°F	
<b>Iron body (1)</b>									
1/2	6	7	10	150	0.5	1.1	180	356	1359FS04
3/4	12	14			1	2.2			1359FS06
1	19	22			1.6	3.5			1359FS08
1.1/2	40	47			3	6.6			1359FS12
2	65	76			5.2	11.5			1359FS16



1312 - 2012



1330



2030



1332



1356



1388



2088



V171

## 2 Way Solenoid Valves for Combustion Use

		<b>Pages</b>
<b>Combustion</b>	Solenoid valves. For liquid fuel and combustible gases.	<b>C-2 / C-3 C-4 / C-5 C-6 / C-7</b>
<b>1312 - 2012 Series</b>	2 way solenoid valves. For fuel oil.	<b>C-8 / C-9</b>
<b>1330 - 2030 Series</b>	2 way valves. For fuel gas and other gases.	<b>C-10 / C-11</b>
<b>1332 Series</b>	Free handle manual reset safety valve.	<b>C-12 / C-13</b>
<b>1356 Series</b>	2 way solenoid valves for fuel oil, gas-oil and mixtures thereof.	<b>C-14 / C-15</b>
<b>1388 Series</b>	Solenoid valves with slow opening and quick shutoff for natural gas and other gases.	<b>C-16 / C-17 C-18 / C-19</b>
<b>2088 Series</b>	Solenoid valves with slow opening and quick shutoff for natural gas and other gases.	<b>C-20 / C-21 C-22</b>
<b>V171 Series</b>	Thermoelectric safety valves.	<b>C-23 / C-24</b>

### New products



#### NEW SOLENOID VALVE MODELS

- **Intrinsically Safe.**
- **Low Power.**
- **Slow-Opening for Gas - 1/2" & 3/4".**
- **ATEX Explosion-Proof Coils.**

To request a technical bulletin for models that are not included in this catalog, please contact **JEFFERSON** at:

**info@jeffersonvalves.com**

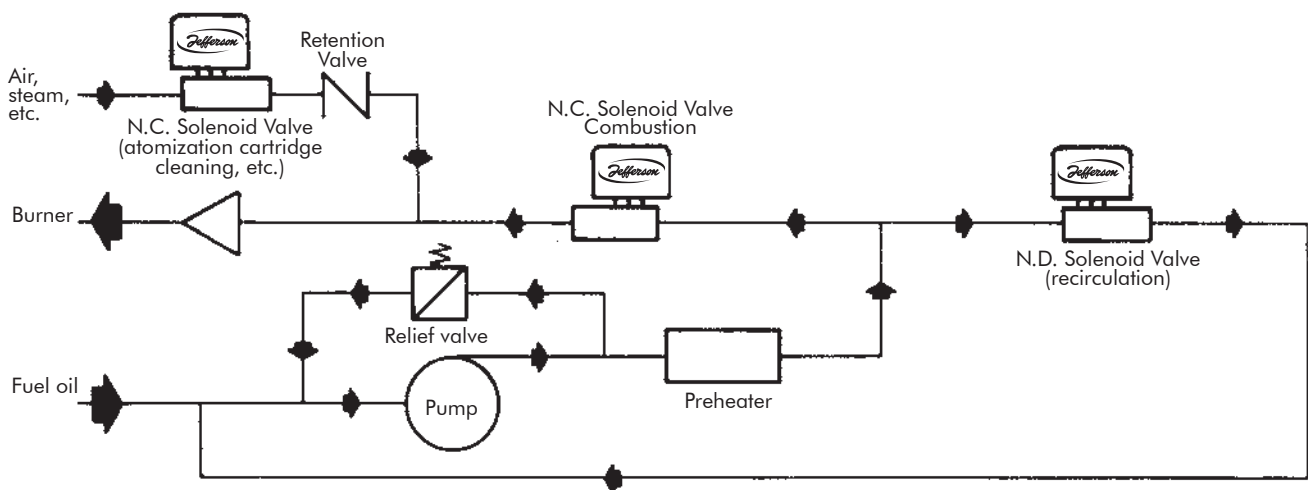
**Jefferson provides solenoid valves specially designed for combustion, for both liquid and gaseous fuels.**

**Solenoid valves for liquid fuels**

**1312 - 2012** and **1356** Series are direct acting and are applied particularly for the control of all fuel oil grades, both light and heavy, for temperatures up to 180 °C (356 °F) and pressure up to 21 bar (300 psi).

They may also be used for LPG; heavy oil, gas or steam. Series **2026** and **1327** described in General Purpose section, are also applied to light liquid fuel burners, such as gas-oil or LPG.

**Typical circuit of a fuel oil burner with mechanical pressure atomizer, preheated up to more than 100 °C, with a recirculation valve and an atomization cartridge cleaning valve.**





## Flow charts

For Fuel oil (100 °C) in kg/hour  
 For Gas-oil (20 °C) in liters/hour

$\Delta p$ bar	1356 Series				1312 - 2012 Series							
	Flow factor Kv				Flow factor Kv							
	0.13		0.6		0.39		0.6		1.4		2.5	
	Fuel oil	Gas-oil	Fuel oil	Gas-oil	Fuel oil	Gas-oil	Fuel oil	Gas-oil	Fuel oil	Gas-oil	Fuel oil	Gas-oil
0.1	41	45	189	207	123	135	189	207	440	483	787	863
0.2	58	63	267	293	174	190	267	293	623	683	1112	1220
0.3	71	78	327	359	213	233	327	359	763	837	1362	1494
0.4	82	90	378	414	245	269	378	414	881	966	1573	1725
0.5	91	100	422	463	274	301	422	463	985	1080	1759	1929
0.7	108	119	499	548	325	356	499	548	1165	1278	2081	2282
1	129	142	597	655	388	426	597	655	1393	1528	2487	2728
2	183	201	844	926	549	602	844	926	1970	2160	3518	3858
3	224	246	1034	1134	672	737	1034	1134	2413	2646	4308	4725
5	289	317	1335	1464	868	952	1335	1464	3115	3416	5562	6099
10	409	449	1888	2070	1227	1346	1888	2070	4405	4830	7866	8626

For Fuel oil N° 6 (212 °F) in Lb/hour  
 For Fuel oil N° 2 (68 °C) in gal/min

$\Delta p$ psi	1356 Series				1312 / 2012 Series							
	Flow factor Cv				Flow factor Cv							
	0.15		0.7		0.46		0.7		1.6		2.9	
	N° 6	N° 2	N° 6	N° 2	N° 6	N° 2	N° 6	N° 2	N° 6	N° 2	N° 6	N° 2
1	77	10	354	46	230	30	354	46	825	107	1474	191
2	108	14	500	65	325	42	500	65	1167	152	2084	271
3	133	17	613	80	398	52	613	80	1429	186	2553	332
4	153	20	707	92	460	60	707	92	1651	214	2948	383
5	171	22	791	103	514	67	791	103	1845	240	3295	428
10	242	31	1119	145	727	94	1119	145	2610	339	4660	606
20	343	45	1582	206	1028	134	1582	206	3691	480	6591	856
25	383	50	1769	230	1150	149	1769	230	4127	536	7369	957
50	542	70	2501	325	1626	211	2501	325	5836	758	10421	1354
100	766	100	3537	460	2299	299	3537	460	8253	1072	14738	1915
150	939	122	4332	563	2816	366	4332	563	10108	1313	18050	2345

## Solenoid valves for combustible gases

**1330 / 2030, 1332, 1388** and **2088** Series valves are especially designed to comply with the Resolutions, Regulations and Recommendations for the use of Natural Gas in Industrial Installations. They may be used with other gases, such as GLP, propane, manufactured gas, etc., as well as with air or any other noncombustible neutral gas.

Maximum operating pressure for **normally closed**

**1330/2030** series diaphragm valves, when applied as safety valves in natural gas burners, is 0.160 kg/cm<sup>2</sup>.

For normally open valves, it's 0.5 kg/cm<sup>2</sup> with regular diaphragm and 2 kg/cm<sup>2</sup> with reinforced diaphragm.

**1330 / 2030** Series Normally Closed diaphragm valves are optionally provided with adjustable slow openings up to 10 sec.

**1388** series valves include a system that allows them to open in two stages, the first of which is quick and with adjustable opening percentage, and the second is time adjustable up to > 20 seconds.

**1330 / 2030, 1332, 1388** and **2088** Series are optionally provided with microcontacts for proof of closed valve.

**2088** Series is provided with a power-rectifier-controller that makes it possible for the valve to open at max. coil power, and after 90 sec. to come down to 16% of nominal value, that is, starting at 50 W and down to 8 W after 90 sec. The benefits over conventional systems are, safe opening, low power consumption, low working temperature and longer coil life.

### Automatic shutoff valve train for Natural Gas boiler burners according to current Resolutions for industrial installations

Diagrams	Requirements	Boiler maximum thermal charge	
		Automatic	Semiautomatic and manual
	One automatic shutoff valve. Tc < 5 sec.	CT < 360 kwh = = 309,600 kcal./h = = 1,228,320 btu/h	CT < 600 kwh = = 516,000 kcal./h = = 2,047,200 btu/h
	Two automatic shutoff valves or one automatic shutoff valve with microcontact for closed valve verification (MCVV) Tc: < 1 sec.	CT < 720 kwh = = 619,200 kcal./h = = 2,456,640 btu/h <b>without pilot</b> CT < 600 kwh = = 516,000 kcal./h = = 2,047,200 btu/h	CT < 1,200 kwh = = 1,032,000 kcal./h = = 4,094,400 btu/h
	Two automatic shutoff valves, one with MCVV. Valve upstream of the train: Mot = 10 sec. Both Tc: < 1 sec.	CT < 1,800 kwh = = 1,548,000 kcal./h <b>pilot burners</b> CT < 60 kwh = = 51,600 kcal./h = = 204,720 btu/h (no need for Mot)	CT < 3,600 kwh = = 3,096,000 kcal./h = = 12,283,200 btu/h <b>pilot burners</b> CT < 60 kwh = = 51,600 kcal./h = = 204,720 btu/h (no need for Mot)
	Two automatic shutoff valves with a venting N.O. valve in between. Mot: 10 sec. Tc < 1 sec.	CT < 12,000 kwh = = 10,320,000 kcal./h = = 40,944,000 btu/h	CT < 12,000 kwh = = 10,320,000 kcal./h = = 40,944,000 btu/h
	Two automatic shutoff valves, one with MCVV and one venting N.O. valve in between. Mot: 20 sec. Tc < 1 sec.	CT > 12,000 kwh = = 10,320,000 kcal./h = = 40,944,000 btu/h	CT > 12,000 kwh = = 10,320,000 kcal./h = = 40,944,000 btu/h

For equipment with a thermal charge greater than 30,000 kwh and multiple burners, an automatic shutoff valve independent from the burner system shall be provided. (See manual reset valves).

TC: Thermal Charge; 1 kwh = 860 kcal./h = 3,412 btu/h; Ct: Maximum Closing Time in seconds; Mot: Minimum opening time in seconds; MCVV: microcontact for closed valve verification.

## Stove Burner Requirements:

They are similar to those indicated for boilers. If there are no flame control devices available, an automatic shutoff and manual reset valve shall be installed.

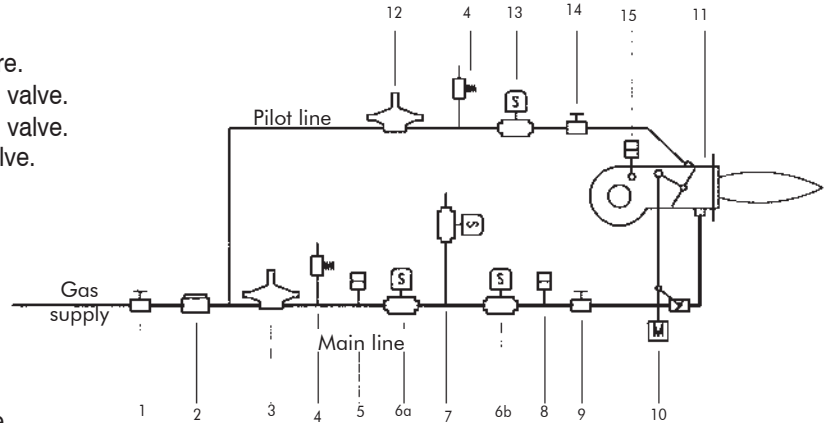
**Manual systems:** The combustion equipment includes at least two automatic shutoff valves, one of which is a manual reset valve.

## Strainers

Appliances which are not for domestic use must have strainers or dust separators immediately after the (manual) blocking valve. Said strainers shall retain 100% of the solid particles from 50 $\mu$ .

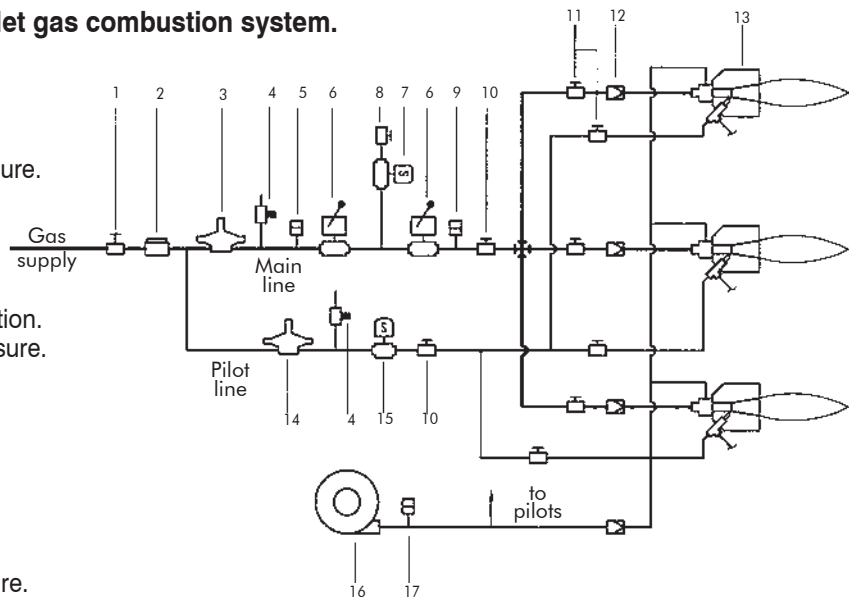
## Applications. Tandem valves for an automatic gas burner up to 12,000 kw.

- 1 Main manual shutoff valve.
- 2 Gas strainer.
- 3 Main gas pressure regulator.
- 4 Venting safety valve.
- 5 Pressure switch for minimum gas pressure.
- 6a 1<sup>o</sup> Series standard closed solenoid valve.
- 6b 2<sup>o</sup> Series standard closed solenoid valve.
- 7 Venting standard open solenoid valve.
- 8 Pressure switch for maximum gas pressure.
- 9 Loss testing manual valve.
- 10 Firepower regulation device.
- 11 Burner.
- 12 Pilot gas pressure regulator.
- 13 pilot solenoid valve.
- 14 Manual valve for leakage.
- 15 Pressure switch for minimum air pressure.



## Tandem valves for a multiple fire-outlet gas combustion system.

- 1 Main manual shutoff valve.
- 2 Gas strainer.
- 3 Main gas pressure regulator.
- 4 Venting safety valve.
- 5 Pressure switch for minimum gas pressure.
- 6 Series standard closed manual reset valve.
- 7 Venting standard open solenoid valve.
- 8 Manual valve with microcontact verification.
- 9 Pressure switch for maximum gas pressure.
- 10 Manual shutoff valve for leakage test.
- 11 Manual shutoff valve.
- 12 Firepower regulation device.
- 13 Burner.
- 14 Pilot gas pressure regulator.
- 15 Pilot solenoid valve.
- 16 Ventilator.
- 17 Pressure switch for minimum air pressure.



### Kv calculation for two valves or more

- 2 equal valves in series.  $Kv_t = Kv_1 \times 0.7$

- 2 or more, equal valves or with different sizes in series.  
 $(1/Kv_t)^2 = (1/Kv_1)^2 + (1/Kv_2)^2 + \dots + (1/Kv_n)^2$

- 2 or more equal valves or with different sizes  
 in parallel.

$$Kv_t = Kv_1 + Kv_2 + \dots + Kv_n$$

$Kv_t$ : Kv equivalent to a solenoid valve that replaces them.

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## Flow chart for Natural Gas or other gases. Nm<sup>3</sup>/h

P <sub>1</sub>	Pressure drop through the valve in mm w.c.										
	20	40	60	100	150	200	300	500	700	1000	1500
100	1.61	2.27	2.78	3.58							
200	1.62	2.28	2.79	3.60	4.40	5.06					
300	1.62	2.29	2.81	3.62	4.42	5.09	6.20				
500	1.64	2.32	2.83	3.65	4.46	5.14	6.26	8.00			
700	1.65	2.34	2.86	3.69	4.50	5.19	6.32	8.08	9.47		
1000	1.68	2.37	2.90	3.74	4.57	5.26	6.41	8.20	9.61	11.32	
1300	1.70	2.40	2.94	3.79	4.63	5.33	6.50	8.32	9.75	11.49	
1600	1.72	2.43	2.98	3.84	4.69	5.41	6.59	8.43	9.89	11.65	13.93
2000	1.75	2.48	3.03	3.90	4.77	5.50	6.71	8.58	10.07	11.87	14.21
3000	1.82	2.58	3.15	4.07	4.97	5.73	6.99	8.95	10.50	12.40	14.87
4000	1.89	2.67	3.27	4.22	5.16	5.95	7.26	9.30	10.92	12.91	15.50
5000	1.96	2.77	3.39	4.37	5.34	6.16	7.52	9.64	11.33	13.39	16.11
7000	2.09	2.95	3.61	4.65	5.69	6.56	8.01	10.28	12.09	14.32	17.26
10000	2.26	3.20	3.92	5.05	6.18	7.12	8.70	11.18	13.16	15.60	18.86
15000	2.53	3.58	4.38	5.65	6.91	7.97	9.74	12.53	14.76	17.54	21.25
20000	2.77	3.92	4.80	6.19	7.57	8.74	10.69	13.75	16.21	19.28	23.41

P<sub>1</sub> = Gauge pressure at the valve inlet in mm w.c.

Calculation base:  
 Relative density 0.65  
 Fluid temperature: 25 °C  
 Kv=1

### Correction factor for density

Relative density	0.60	0.62	0.65	1.00	1.20	1.50
Correction factor	1.04	1.02	1.00	0.81	0.74	0.66

### Application examples

#### Data

Fluid: Natural Gas density 0.60  
 Flow: 120 Nm<sup>3</sup>/h  
 Input pressure: 500 mm w.c.  
 Admissible pressure drop through the valve: 15%  
 Unknown: Kv.

#### Procedure

- Flow / correction factor = 120 / 1.04 = 115
  - Search for value at intersection P<sub>1</sub> = 500 mm w.c. and Δp = 60 mm w.c. in the flow chart: value found: 2.83
  - Corrected flow / value found = Kv: 115 / 2.83 = 40.6
- For **2030** Series the most approximate value is: 2030LA16 Kv = 43.  
 For **1388** Series the most approximate value is: 1388LA16D Kv = 45

#### Pressure drop for kv = 45

- Corrected flow / Kv: 115 / 45 = 2.55
- Search for the closest value for P<sub>1</sub> = 500 mm w.c. in the table, value found: in Δp 40 value: 2.32
- Δp calculation: (2.55 / 2.32)<sup>2</sup> x 40 = 48 mm w.c.

#### Pressure drop for Kv = 43

- Corrected flow / Kv: 115 / 43 = 2.67

- Search for the closest value for P<sub>1</sub> = 500 mm w.c. in the table value found: in Δp 60 value: 2.83
- Δp calculation: (2.67 / 2.83)<sup>2</sup> x 60 = 53 mm w.c.

#### Calculation for two valves in series with the same data:

- Corrected flow: 120 / 1.04 = 115
- Search for a value for p 60 or Δp 100.  
We chose Δp 100 = 3.65.
- Kv = 115 / 3.65 = 31.5 (2 valves Kv)  
Kv for one valve: 31.5 / 0.7 = 45.
- We must look for a valve with Kv greater than 45 to bring Δp 100 down to < 75 mm w.c. (according to data shown)

**2030** Series has no valve greater than 43, so it can only be possible in the **1388** Series: we choose catalog number 1388LA20: Kv = 65  
 Corrected Kv: 65 x 0.707 = 46

#### Pressure drop for corrected Kv = 46

- Corrected flow / Kv: 115 / 46 = 2.5
- Search for P<sub>1</sub> = 500 mm w.c. line in the table the Δp with the closest value: 2.83 for Δp = 60.
- Δp calculation: (2.5 / 2.83)<sup>2</sup> x 60 = 47 mm w.c.

This 47 mm w.c. value belongs to the pressure drop through both valves

**flow chart for natural gas or other gases scfh**

P <sub>1</sub>	pressure drop through the valve in inches w.c.										
	1	2	3	4	6	8	12	20	30	40	60
2	55.2	78.0									
4	55.3	78.2	95.6	110.3							
5	55.4	78.2	95.7	110.4							
10	55.7	78.7	96.3	111.1	135.7	156.3					
20	56.4	79.7	97.5	112.4	137.3	158.2	192.8	246.5			
30	57.1	80.6	98.6	113.7	139.0	160.1	195.1	249.5	301.9		
40	57.7	81.5	99.7	115.0	140.6	161.9	197.4	252.5	305.6	348.7	416.4
50	58.4	82.4	100.8	116.3	142.1	163.8	199.7	255.5	309.3	352.9	421.7
75	59.9	84.7	103.6	119.5	146.0	168.3	205.2	262.7	318.2	363.3	434.8
100	61.5	86.8	106.3	122.6	149.8	172.6	210.6	269.7	326.9	373.5	447.5
125	63.0	89.0	108.9	125.6	153.5	176.9	215.9	276.5	335.3	383.3	459.8
150	64.4	91.0	111.4	128.5	157.1	181.1	221.0	283.2	343.6	393.0	471.9
200	67.3	95.1	116.3	134.2	164.1	189.2	230.9	296.1	359.5	411.5	495.0
250	70.0	98.9	121.0	139.7	170.8	196.9	240.4	308.4	374.8	429.3	517.2
400	77.6	109.6	134.2	154.9	189.4	218.5	266.9	342.8	417.2	478.6	578.5
600	86.7	122.5	150.0	173.1	211.8	244.3	298.6	383.9	467.8	537.4	651.3

P<sub>1</sub> = gauge pressure at the valve inlet in inches w.c.

1 psi = 27.68 i.w.c.

calculation base:  
 relative density 0.65  
 fluid temperature: 77 °f  
 Cv = 1

**correction factor for density**

relative density	0.60	0.62	0.65	1.00	1.20	1.50
correction factor	1.04	1.02	1.00	0.81	0.74	0.66

**application examples**

**Data**

Fluid: Natural Gas density 0.60  
 Flow: 4,300 SCFH  
 Input pressure: 20" w.c.  
 Admissible pressure drop through the valve: 15%  
 Unknown: Cv.

**Procedure**

- 1<sup>o</sup>) Flow / correction factor = 4,300 / 1.04 = 4,135
- 2<sup>o</sup>) Search for value at intersection P<sub>1</sub> = 20" w.c. and Δp = 3" w.c. in the flow chart: value found: 97.5.
- 3<sup>o</sup>) Corrected flow / value found = Cv: 4,135 / 97.5 = 42.4

For **2030** Series the most approximate value is: 2030LA16 Cv = 50.

For **1388** Series the most approximate value is: 1388LA16D Cv = 57.

**Pressure drop for Cv = 50**

- 1) Corrected flow / Cv: 4,135 / 50 = 82.7
- 2) Search for the closest value for P<sub>1</sub> = 20" w.c. in the table value found: in Δp 2" value: 79.7
- 3) Δp calculation: (82.7 / 79.7)<sup>2</sup> x 2 = 2.15" w.c.

**Pressure drop for Cv = 57**

- 1) Corrected flow / Cv: 4,135 / 57 = 72.54

- 2) Search for the closest value for P<sub>1</sub> = 20" w.c. in the table, value found: in Δp 2" value: 79.7
- 3) Δp calculation: (72.54 / 79.7)<sup>2</sup> x 2 = 1.66" w.c.

**Calculation for two valves in series with the same data:**

- 1) Corrected flow: 4,300 / 1.04 = 4,135
- 2) Search for a value for Δp 2" or Δp 3". We chose Δp 3" = 97.5.
- 3) Cv = 4,135 / 97.5 = 42.4 (2 valves Cv)  
Cv for one valve: 42.4 / 0.707 = 60.
- 4) We must look for a valve with Cv greater than 60 to bring Δp 3" down to < 2" w.c. (according to data shown).

**2030** Series has no valve greater than 50, so it can only be possible in the **1388** Series:

we choose catalog number 1388LA20: Cv = 76  
 Corrected Cv: 76 x 0.707 = 54

**Pressure drop for corrected Cv = 54**

- 1) Corrected flow / Cv: 4,135 / 54 = 76.6
- 2) Search for P<sub>1</sub> = 20" w.c. line in the table the Δp with the closest value: 79.7 for Δp = 2".
- 3) Δp calculation: (79.7 / 76.6)<sup>2</sup> x 2 = 2.19" w.c.

This 2.19" w.c. value belongs to the pressure drop through both valves



**1312 / 2012 Series**

**Applications:**

- Burners for fuel oil (preheated or not) and its mixtures, gas-oil, etc., with mechanical pressure atomizer, rotating cup, compressed air, steam, etc.
- It may be used with heavy fluids, steam and corrosive fluids.

**Main characteristics**

Normally closed and normally open.  
Lever activated direct acting. No minimum differential pressure to operate.  
Body: bronze, stainless steel, etc.  
Stainless steel needle type seats.  
Class H coils coated with glass fibre and insulating impregnation.  
Output cables for splicing.  
Interior use housing with an outlet for electrical connector.

**Options:**

- Explosion and / or weather proof housings.
- Suitable for heavy fluids, such as fuel-oil, heavy oils, steam and corrosive fluids.

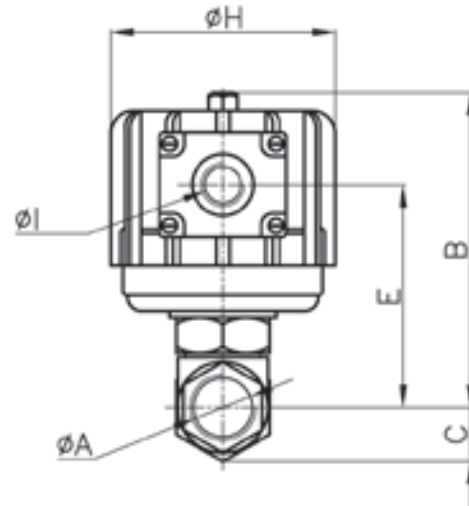
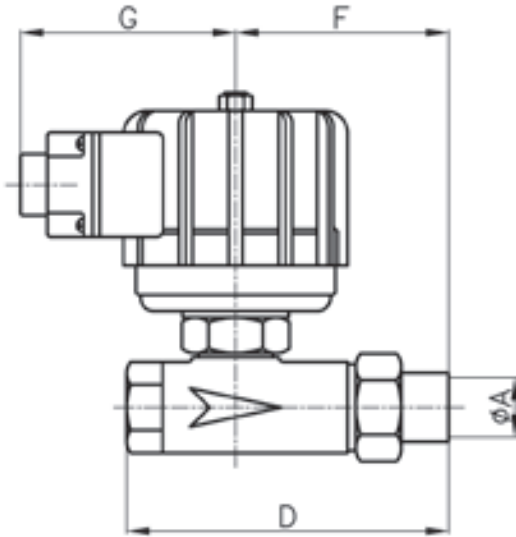
**Technical specifications**

**\*Advise:** when using direct current (DC), a 25% reduction on the maximum operating pressure differential is expected

Ø Piper ins.	Ø orifice		Flow factor		Δp * maximum		Maximum Temp.		Weight		Catalog Nº.	
	mm	ins.	Kv	Cv	bar	psi	°C	°F	kg	Lb	Brass	AISI 304
<b>Normally closed</b>												
1/2"	5	0.20	0.60	0.7	21	300	155	311	3.4	7.5	2012BS504	1312SS504
3/4"	8	0.31	1.40	1.6	12	180			3.6	7.9	2012BS506	1312SS506
											2012BS806	1312SS806
1"	11	0.43	2.50	2.9	6	90			3.8	8.4	1312BS808	1312SS808
									1312BSB08	1312SSB08		
<b>Normally open</b>												
1/2"	4	0.16	0.39	0.46	15	225	155	311	3.4	7.5	2012BS404NA	1312SS404NA
3/4"	5	0.20	0.60	0.7	12	180			3.6	7.9	2012BS406NA	1312SS406NA
											2012BS506NA	1312SS506NA
1"	4	0.16	0.39	0.46	15	225			3.8	8.4	2012BS408NA	1312SS408NA
									2012BS508NA	1312SS508NA		

(\*) For steam at 10 bar

**General dimensions 1312 - 2012**



øA	B	C	D	E	F	G	øH	øI
R 1/2"	139	22	140	98	95	95	99	3/4"NF
R 3/4"								
R 1"	147	30	147	106	96			

Measurements: mm

øA	B	C	D	E	F	G	øH	øI
R 1/2"	5.47	0.87	5.51	3.86	3.74	3.74	3.90	3/4"NF
R 3/4"								
R 1"								

Measurements: ins.

**Coil characteristics**

Electric power supply	Coil type	Power W	VA (volt-amper)		Maximum temperature		Available tensions
			Inrush	Holding	° C	° F	
AC 50 Hz	SH46C	46	277	104	155	311	1
	S46H(*)	46	277	104	180	356	1
AC 60 Hz	SH46C	46	286	103	155	311	2
	S46H(*)	46	286	103	180	356	2
D/C	SH48C	48	48	48	155	311	3
	S48H(*)	48	48	48	180	356	3

1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

(\*) For steam at 10 bar

Options	Prefix	Suffix	Examples
Weather proof housing	Y		Y2012BS504
Explosion and weather proof housing	Z		Z2012BS506
NPT connections		T	2012BS504T

**Recommendations for installation**

Mount the valve **only** over horizontal pipeline with the coil upright.



**1330 Series**

**Main characteristics**

Normally closed and normally open. Direct acting or pilot operated versions. Injected aluminium body. Stainless steel or aluminium die-cast bonnet.

**Technical specifications**



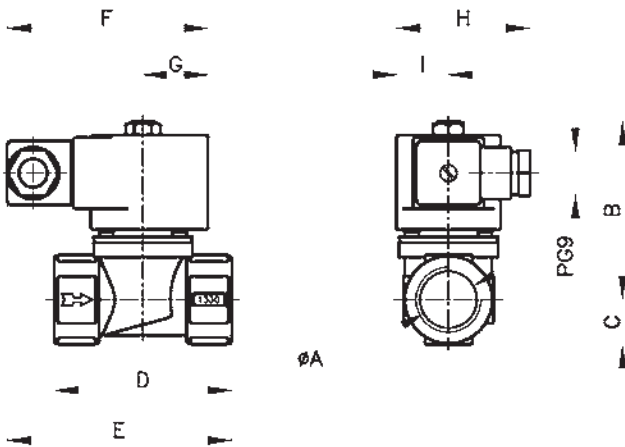
**2030 Series**

BSP or NPT threaded connections. Buna "N" seats and diaphragm. Encapsulated coil. DIN 43650 Connection. IP65 and NEMA 4 Protection. Quick or slow opening adjustable up to 10 sec. Closure in less than 1 second. Optional: microcontact for closed valve verification.

Ø Piper ins.	Ø orifice		Flow factor		Pressure differential				Weight		Catalog N°
	mm	ins.	Kv	Cv	Minimum bar	Minimum psi	Maximum bar	Maximum psi	kg	Lb	
Normally closed - Direct acting											
1/2	8	0.315	1.7	2	0	0	1	15	0.5	1.1	1330LA0
1/2	18	0.71	3.4	4.0			0.2	3	0.5	1.1	1330LA04
3/4	18	0.71	4.2	4.9			0.2	3	0.5	1.2	1330LA06
1	32	1.26	10	12			0.05	0.75	1	2.2	2030LA08
1 1/4	32	1.26	12	14			0.05	0.75	0.9	1.9	2030LA10
Normally closed - Pilot operated - Quick open											
1	26	1.02	12	14	0.001	0.015	0.2	3	1	2.2	1330LA08
1 1/2	48	1.89	35	41					1.8	4.0	2030LA12
2	51	2.00	43	50					1.6	3.5	2030LA16
Normally closed - Pilot operated - Slow opening											
1	26	1.02	12	14	0.001	0.015	0.2	3	1.09	2.4	1330LA08L
1 1/2	48	1.89	35	41					1.88	4.2	2030LA12L
2	51	2.00	43	50					1.66	3.7	2030LA16L
Normally closed - Pilot operated - Reinforced diaphragm											
1	26	1.02	12	14	0.01	0.15	2	30	1	2.2	1330LAR08
1 1/2	45	1.89	34	40					1.8	4.0	2030LAR12
2	45	2.00	41	48					1.6	3.5	2030LAR16
Normally open - Direct acting											
1/2	8	0.315	1.7	2	0	0	1	15	0.6	1.3	1330LA0INA
1/2	18	0.71	3.4	4.0	0	0	0.2	3	0.6	1.3	1330LA04INA
3/4	18	0.71	4.2	4.9					0.6	1.3	1330LA06INA
Normally open - Pilot operated											
1	26	1.02	12	14	0.001	0.015	0.2	3	1	2.2	1330LA08NA
1 1/2	48	1.89	35	41					1.8	4.0	2030LA12NA
2	51	2.00	43	50					1.6	3.5	2030LA16NA
Normally open - Pilot operated - Reinforced diaphragm											
1	26	1.02	12	14	0.01	0.15	2	30	1	2.2	1330LAR08NA
1 1/2	45	1.89	34	40					1.8	4.0	2030LAR12NA
2	45	2.00	40	48					1.6	3.5	2030LAR16NA



### General dimensions 1330 - 2030



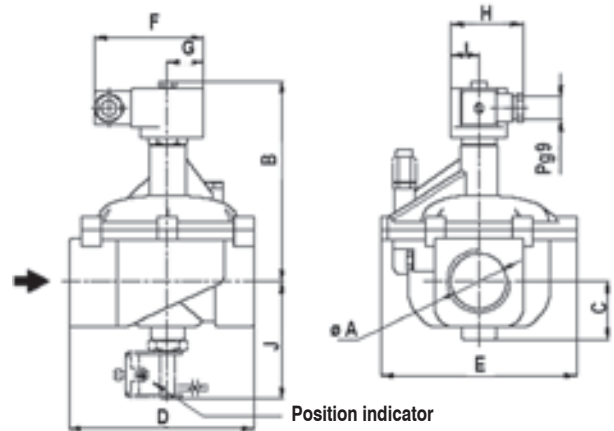
**DIRECT ACTING**

øA	B	C	D	E	F	G	H	I
1/2"	75	19	75	95	85	27	57	22
3/4"								
1"	90	29	105	111	85	27	57	22
1,1/4"								

Measurements: mm

øA	B	C	D	E	F	G	H	I
1/2"	2.95	0.75	2.95	3.74	3.35	1.06	2.24	0.87
3/4"								
1"	3.54	1.14	4.13	4.37	3.35	1.06	2.24	0.87
1,1/4"								

Measurements: ins.



**PILOT OPERATED**

øA	B	C	D	E	F	G	H	I	J
1"	131	22	157	124	85	27	57	22	74
1 1/2"	158	46	148	154	85	27	57	22	98
2"									

Measurements: mm

øA	B	C	D	E	F	G	H	I	J
1"	5.16	0.87	6.18	4.88	3.35	1.06	2.24	0.87	2.91
1 1/2"	6.22	1.81	5.83	6.06	3.35	1.06	2.24	0.87	3.86
2"									

Measurements: ins.

### Coil characteristics

Electric power supply	Coil type	Power W	VA (volt-ampere)		Maximum temperature		Available tensions
			Inrush	Holding	° C	° F	
AC 50 Hz	MF11C	11	40	22	155	311	1
	MH11C	11	40	22	180	356	1
AC 60 Hz	MF13C	13	45	27	155	311	2
	MH13C	13	45	27	180	356	2
D/C	MH19C	19	19	19	180	356	3

1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

### Applications

- Low and medium pressure gas combustion equipment.
- Low and medium pressure air or any other neutral gas.
- They comply with the resolutions, regulations and recommendations for the use of natural gas in industrial installations in Argentina.

## New products



### NEW SOLENOID VALVE MODELS

- Direct Action Slow Opening Valves - 1/2" & 3/4".

To request a technical bulletin for models that are not included in this catalog, please contact JEFFERSON at:

[info@jeffersonvalves.com](mailto:info@jeffersonvalves.com)

Options	Prefix	Suffix	Examples
Water, weather and saline corrosion proof coils.	<b>YC</b>		YC2030LA12
Explosion and weather proof coils.	<b>ZC</b>		ZC2030LA12
Weather proof housing (**)	<b>Y</b>		Y2030LA12
Explosion and weather proof housing. (**)	<b>Z</b>		Z2030LA12
NPT connections		<b>T</b>	2030LA12T
Closed valve verification (*)		<b>-I2</b>	2030LA12-I2
Energized coil indicator light	See coils.		

(\*) Minimum dp 0.005 bar - 0.075 psi

(\*\*) Only for 1", 1 1/2" and 2"

### Recommendations for installation

Place a strainer upstream the valve with a porosity ≤ 50µ.

Any position, preferably over horizontal pipeline with the coil upright.



**1332 Series**

**Applications**

- Shutoff security systems that work with temperature limits, pressure, lack of flame, level, etc., in boiler combustion systems.
- Combustion equipment with charges over 30,000 Kw/h and multiple burners.
- Burners for automatic and semiautomatic furnaces.

**Main characteristics**

Normally closed.  
 Direct acting. No minimum differential pressure to operate.  
 “Free handle” system, i.e., it closes automatically when current is cut off and opens manually when the electric signal is on.  
 Injected or cast aluminium body.  
 DIN 43650 Connection encapsulated coils.  
 Acryl-nitril seat.  
 IP65 and NEMA 4 Protection.  
 Closed or open valve viewer.

360° Rotating housing.  
 Response time < 50 milliseconds.

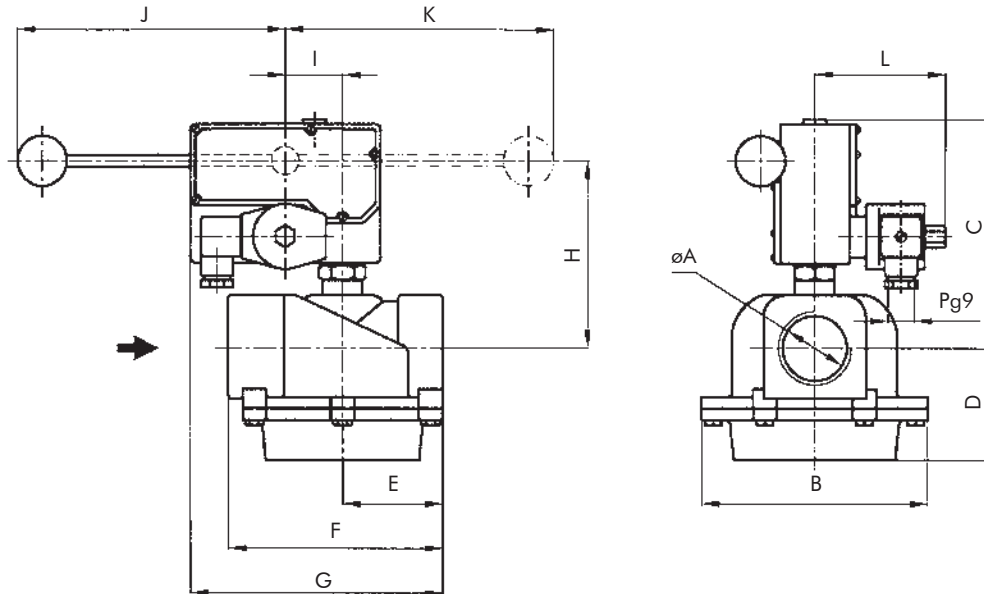
**Options:**

- Energized coil indicator light.
- Weather proof coils and housings.
- Explosion and / or weather proof coils and housings.
- Closed valve verification

**Technical specifications**

Ø Pipe ins.	Ø Orifice		Flow factor		Δp Maximum		Weight		Maximum Temp.		Catalog Nº.
	mm	ins.	Kv	Cv	Bar	Psi	Kg	Lb	°C	°F	
1"	26	1.02	13	15	3	45	2.3	5.1	80	176	1332LA08
1.1/4"	32	1.26	22	26			3.3	7.3			1332LA10
1.1/2"	48	1.89	30	35	2	30	3.1	6.8			1332LA12
2"	51	2.00	55	64			6.2	13.7			1332LA16
2 1/2"	76	3.00	60	70	1	15	6.0	13.2			1332LA20
3"	76	3.00	76	89							1332LA24

**General dimensions 1332**



øA	B	C	D	E	F	G	H	I	J	K	L
1"	124	133	87	79	157	183	104	39	190	190	90
1.1/2"	154	157	76	68	146	173	128	39	190	190	90
2"											
2.1/2"	163	190	135	112	224	-	162	39	190	190	90
3"											

Measurements: mm.

øA	B	C	D	E	F	G	H	I	J	K	L
1"	4.88	5.24	3.43	3.11	6.18	7.20	4.09	1.54	7.48	7.48	3.54
1.1/2"	6.6	6.18	2.99	2.68	0.23	6.81	5.04	1.54	7.48	7.48	3.54
2"											
2.1/2"	6.42	7.48	5.31	4.41	8.82	-	6.38	1.54	7.48	7.48	3.54
3"											

Measurements: ins.

**Coil characteristics**

Electric power supply	Coil type	Power W	VA (volt-ampere)		Maximum temperature		Available tensions
			Inrush	Holding	°C	°F	
AC 50 Hz	MF11C	11	40	22	155	311	1
	MH11C	11	40	22	180	356	1
AC 60 Hz	MF13C	13	45	27	155	311	2
	MH13C	13	45	27	180	356	2
D/C	MH19C	19	19	19	180	356	3

1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

**Special constructions**

- It closes automatically as soon as it receives the electric signal. It opens manually and it is reset only when the electric signal is off.
- Normally open.

Options	Prefix	Suffix	Examples
Water, weather and saline corrosion proof coils.	<b>YC</b>		<b>YC1332LA12</b>
Explosion and weather proof coils.	<b>ZC</b>		<b>ZC1332LA12</b>
Weather proof housing.	<b>Y</b>		<b>Y1332LA12</b>
Explosion and weather proof housing.	<b>Z</b>		<b>Z1332LA12</b>
NPT connections		<b>T</b>	<b>1332LA12T</b>
Closed valve verification		<b>-I</b>	<b>1332LA12-I</b>
Energized coil indicator light	See coils.		

**Recommendations for installation**

Place a strainer upstream the valve with aporosity ≤ 50 μ. Preferably over horizontal pipeline with the coil upright.



**Applications**

- Burners for fuel oil (preheated or not) and its mixtures, gas-oil, etc., with mechanical pressure atomizer, rotating cup, compressed air, steam, etc.
- Heavy fluids, steam, corrosive fluids

**Main characteristics**

Normally closed.  
Direct acting. No minimum differential pressure to operate.  
Body: bronze, stainless steel, etc..  
BSP or NPT threaded connections.  
Stainless steel type closure (s).

PTFE seat closure (t).

Class H coil coated with glass fibre and isolating impregnation. Output cables for splicing (s version). Encapsulated coil. Shape A DIN 43650 connection (t version).  
Internal use housing with an outlet for electric connector (s version).

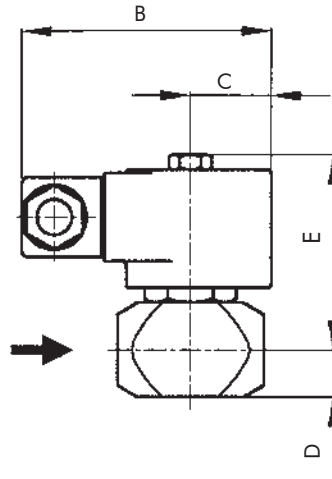
**Options:**

- Explosion and weather proof coils and housings.
- It may be used for heavy fluids such as fuel oil, heavy oils, steam and corrosive fluids.

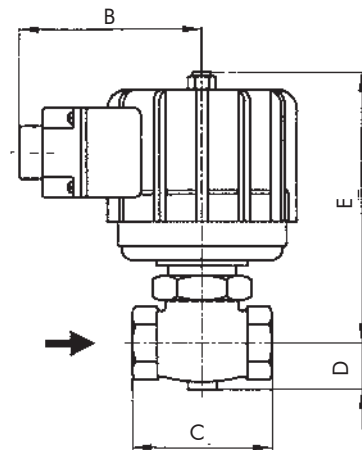
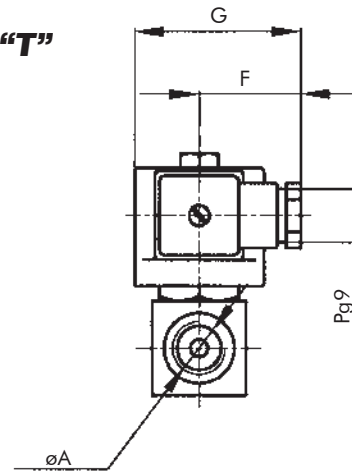
**Technical specifications**

Ø Pipe ins.	Ø Orifice		Flow factor		Operating pressure differential				Power W		Weight		Version	Catalog N°
	mm	ins.	Kv	Cv	Minimum		Maximum		50 Hz	60 Hz	kg	Lb		
					bar	psi	bar	psi						
3/8"	2.5	0.088	0.17	0.20	0	20	300	18	16	0.72	1.6	T	1356BT3	
1/2"	2.5	0.088	0.17	0.20		20	300	46		0.68	1.5	T	1356BT4	
1/2"	5	0.197	0.60	0.70		10	150			3.10	6.8	S	1356BS4-48	

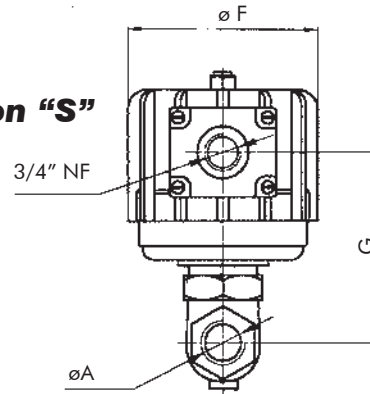
**General dimensions 1356 (t) - 1356 (s)**



**Version "T"**



**Version "S"**



**1356 "T"**

Version	øA	B	C	D	E	F	G
T	R3/8"	85	27	16	67	35	57
T	R1/2"						

Measurements: mm

**1356 "T"**

Version	øA	B	C	D	E	F	G
T	R3/8"	3.35	1.06	0.63	2.64	1.38	2.24
T	R1/2"						

Measurements: ins.

**1356 "S"**

Version	øA	B	C	D	E	F	G
S	R1/2"	95	73	24	142	99	98

Measurements: mm

**1356 "S"**

Version	øA	B	C	D	E	F	G
S	R1/2"	3.74	2.87	0.94	5.59	3.90	3.86

Measurements: ins.

**Coil characteristics**

Electric power supply	Version	Coil type	Power W	VA (volt-amp)		Maximum temperature		Available tensions
				Inrush	Holding	° C	° F	
AC 50 Hz	T	MH18C	18	61	39	155	311	1
		M18H(*)	18	61	39	180	356	1
		MH16C	16	48	29	155	311	2
		M16H(*)	16	48	29	180	356	2
AC 50 Hz	S	SH46C	46	277	104	155	311	1
		S46H(*)	46	277	104	180	356	1
		SH46C	46	286	103	155	311	2
		S46H(*)	46	286	103	180	356	2

(\*) For Steam. 1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V

Options	Prefix	Suffix	Examples
Weather proof housing	Y		Y1356BT3
Explosion and weather proof housing	Z		Z1356BT3
NPT connections		T	1356BT3T

**Recommendations for installation**

- Place a strainer upstream the valve.
- "T" version: Installation: any position. Preferably over horizontal pipeline with the coil upright.
- "S" version: Installation: **only** over horizontal pipeline with the coil upright.



**1388 A Series**



**1388 D Series**

**Application**

- Low and high pressure gas combustion equipment.
- Low and medium pressure air or other neutral gases.
- They comply with the resolutions, regulations and recommendations for the use of natural gas in industrial installations in Argentina.

**Main characteristics**

Normally closed.  
Direct acting. No minimum differential pressure to operate.  
Low and high pressure versions.  
Injected or cast aluminium body.  
BSP or NPT threaded connections.  
Buna "N" seats.

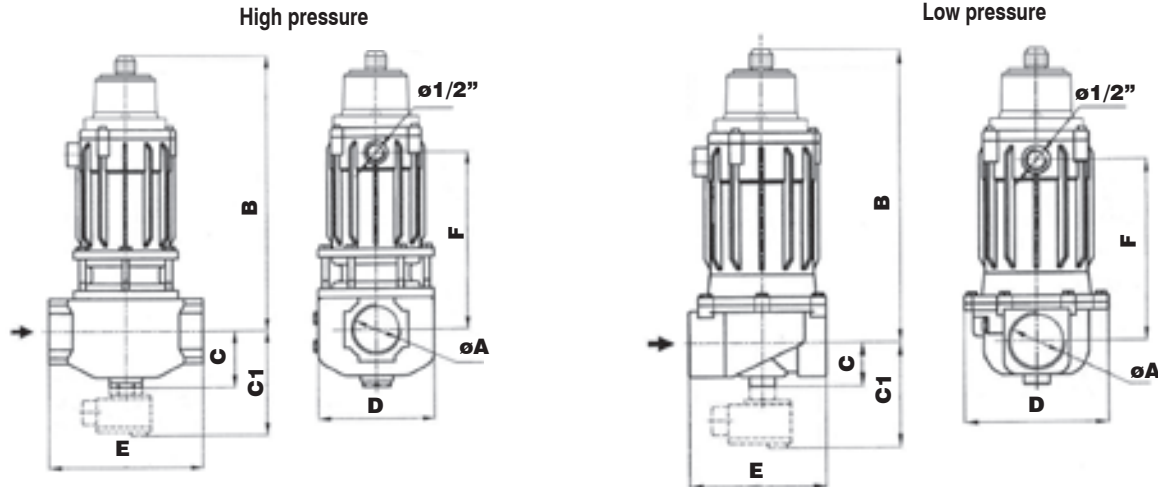
Class H coils with internal use housings.  
It includes the terminals for the electrical connection.  
Connection for 1/2" BSP pipeline.  
For 240V and 110V: current rectifier and transient reactive overvoltage supressor.  
Quick or two-stage opening.  
Both are adjustable.  
**1<sup>o</sup> stage:** Quick opening from 0 to 80% of the total adjustable stroke.  
**2<sup>o</sup> stage:** Adjustable slow opening up to 20 seconds, from the end of stage 1, up to full stroke.  
Shutoff in less than one second.

**Optional:** microcontact for closed valve verification.

**Technical specifications**

Ø Pipe ins.	Ø Orifice		Flow factor		Δp Maximum		Weight		Maximum Temp.		Catalog N°.	
	mm	ins.	Kv	Cv	Bar	Psi	Kg	Lb	°C	°F	Slow opening	Quick opening
<i>Low pressure</i>												
2 1/2"	76	3	65	76	0.1	1.5	13.8	30.5	80	176	1388LA20D	1388LA20DS
3"			80	94			13.5	29.8			1388LA24D	1388LA24DS
<i>High pressure</i>												
3/4"	24	0.95	6	7	5	75	4.5	9.9	80	176	1388LA06A	1388LA06AR
1"	24	0.95	12	14			4.2	9.3			1388LA08A	1388LA08AR
1 1/2"	51	2.00	36	42			12.7	28			1388LA12A	1388LA12AR
2"	51	2.00	49	57			12.3	27			1388LA16A	1388LA16AR
2 1/2"	76	3.00	65	76			16.1	36			1388LA20A	1388LA20AR
3"	76	3.00	80	94			15.8	35			1388LA24A	1388LA24AR

**General dimensions 1388**



**High pressure**

øA	B	C	C <sub>1</sub>	D	E	F
3/4"	228	44	92	88	117	111
1"						
1.1/2"	323	72	121	147	192	221
2"						
2.1/2"	350	82	129	129	220	248
3"						

**Low pressure**

øA	B	C	C <sub>1</sub>	D	E	F
3/4"	8.97	1.73	3.62	3.46	4.60	4.37
1"						
1.1/2"	12.71	2.83	4.76	5.78	7.55	8.70
2"						
2.1/2"	13.78	3.22	5.10	6.77	8.66	9.76
3"						

**Low pressure**

øA	B	C	C <sub>1</sub>	D	E	F
2.1/2"	302	82	129	172	220	200
3"						

**Low pressure**

øA	B	C	C <sub>1</sub>	D	E	F
2.1/2"	11.89	3.22	5.10	6.77	8.66	7.87
3"						

Measurements: mm

Measurements: ins.

**Coil Characteristics for 3/4 and 1"**

Electric Power Supply	Coil Type	Power W	VA (volt-amp)		Maximum Temperature		Available Tensions
			Inrush	Holding	°C	°F	
AC 50 Hz	S60HR	60	60	60	180	356	1
AC 60 Hz	S60HR						1
D/C	S60H						2

1-(110,120,220 y 240)V 2-(24,110,120,220)V

**Coil Characteristics for 1.1/2" to 3"**

Electric Power Supply	Coil Type	Power W	VA (volt-amp)		Maximum Temperature		Available Tensions
			Inrush	Holding	°C	°F	
AC 50 Hz	113HR	113	113	113	180	356	1
AC 60 Hz	113HR						1
D/C	113H						2

1-(110,120,220 y 240)V 2-(24,110,120,220)V

Options	Prefix	Suffix	Examples
Weather proof housing	Y		Y1388LA8A
Explosion and weather proof housing.	Z		Z1388LA8A
Microcontact for closed valve verification (position indicator)		-I2	1388LA8A-I2
Microcontact for closed valve verification (position indicator)*		-I4	1388LA8A-I4
NPT connections		T	1388LA8AT
Energized coil indicator light	See coils.		

\* With Led - Voltage 5-240 V. - Minimum current 5 mA  
Maximum power 50 W. - Voltage drop 3V.

**Recommendations for installation**

See next page.

## General instructions for installation and maintenance.

### Technical characteristics

The instructions shown on the valve nameplate must be followed. They indicate:

Working pressure differential and range.  
Maximum working pressure.  
Valve identification.

Pipe size.  
Power consumption in W.  
Voltage and current type.

### Electrical installation.

All valves are provided for different tensions and current types as follows. When the valve has a different coil voltage from the one required, a new coil with the right voltage can be placed without replacing the valve.

1388 valves are supplied with the following coils:

#### Size 3/4" to 1.1/4"

24V D.C.	60W.	Part N° S76HZ93
110V 50/60 Hz or D.C.	60W.	Part N° S35H195
220V 50/60 Hz or D.C.	60W.	Part N° S25H800

#### Size 1.1/2" to 3"

24V D.C.	113W.	Part N° BB3HZ56
110V 50/60 Hz or D.C.	113W.	Part N° B55H098
220V 50/60 Hz or D.C.	113W.	Part N° B40H385

The use of the voltage and current type specified on the nameplate is compulsory. Permitted tolerance: -15% or +10% of the nominal value.

All the coils, except for some special cases, are for continuous use or high operation frequency. When the coil is on for a long time, the housing heats up to the point that contact with hands will only be possible for a short time. Nonetheless, this temperature is normal and safe.

### Starting up

2088 slow opening and quick shutoff solenoid valves comprise two regulation elements: quick stroke regulator and opening time regulator.

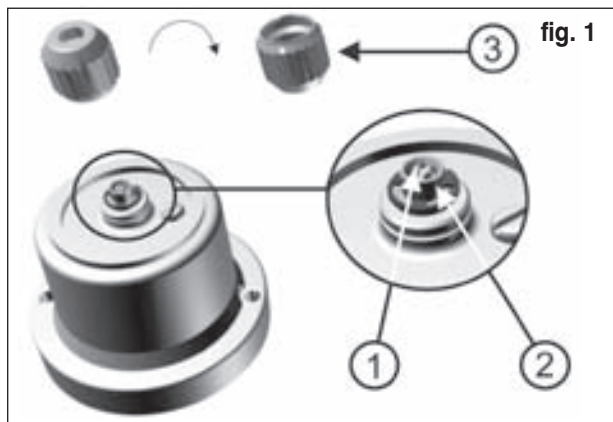
#### Quick stroke regulator adjustment (2 and 3, figure 1)

It must be adjusted from 0 to 80% of the total stroke.

Remove the cap from the valve (3) turn it as shown to adjust it to the knodo. Percentage decreases when turning the knob clockwise and increases when turning it counterclockwise.

#### Slow opening time regulator adjustment (1, figure 1)

It must be adjusted from 0 to 25 seconds. Time increases when turning the knob clockwise (1) and decreases when turning it counterclockwise.



### Mechanical installation.

Check that the service conditions are within the range of differential pressure and temperature indicated on the nameplate.

Place a strainer upstream from the valve with an adequate capacity and porosity below 50 microns.

The mounting position is only over horizontal pipeline with the coil upright.

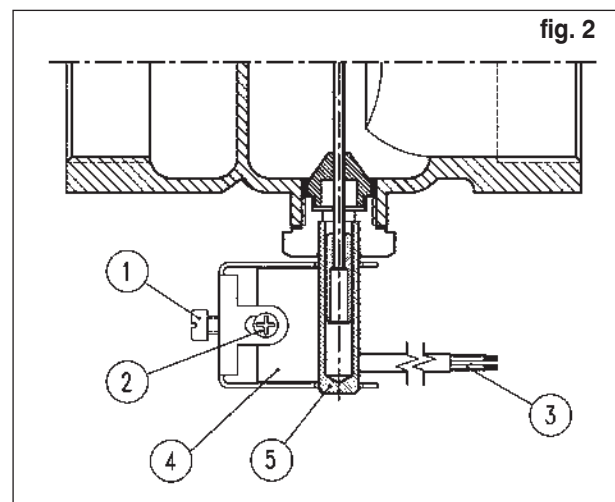
The pipe must be carefully and exhaustively cleaned upstream from the valve and before the strainer by means of compressed air purges or any other system that guarantees the disposal of solid elements such as welding or packaging remains, mud, etc.; this must be done especially in new pipelines.

The flow direction indicated with an arrow on the valve body must be observed. So, the input pressure must always be equal or greater than the output pressure.

### Calibration of the position indicator

When present in the valve, the position indicator is already calibrated. If it is to be installed or recalibrated, proceed as follows (see fig. 2)

- Connect a tester between cables (3) and check for continuity.
- Insert indicator (3) and slide it along column (4) until the tester shows continuity.
- Tighten screw (1) and then screw (2) until assembly is secure.
- Energize the valve and check that continuity is interrupted.
- De-energize the coil and check if continuity resumes.
- Otherwise, unscrew (1) and (2) and re-calibrate.





**Sequence for 1388 series coil replacement**

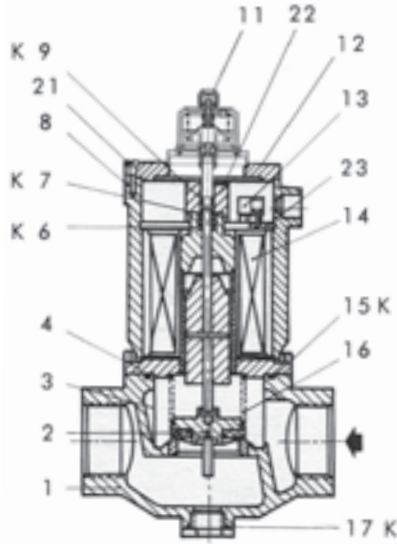
1388LA12-24 (1 1/2" to 3") See figure 1.

- 1 - Cut off electric supply.
- 2 - Remove the 3 screws which fasten the bonnet cover (Pos.21).  
Remove the bonnet cover.
- 3 - Disconnect the coil terminal cables.
- 4 - Unscrew the fixing nut (Pos.22) and remove it together with the bumper (Pos. 9).
- 5 - Remove the washer (Pos.23).
- 6 - Remove the coil (Pos. 14).
- 7 - Place the new coil and assemble the device following the instructions in the opposite direction.

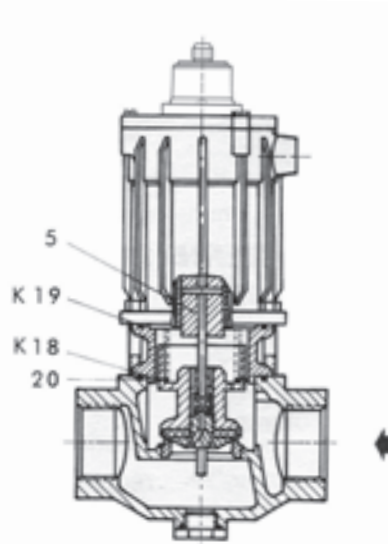
1388LA06-10 (3/4" to 1 1/4") See figure 2.

- 1 - Cut off electric supply.
- 2 - Remove both screws (Pos.20) and the connection box cover (Pos.21) and disconnect both coil cable ends from the terminal.
- 3 - Remove both screws (Pos. 22) from the cap end, which is taken out together with the restraint.
- 4 - Remove seeger ring (Pos. 23).
- 5 - Remove retention washer (Pos. 24), then the cap washer (Pos. 25) and finally the coil (Pos. 6).
- 6 - Place the new coil and assemble the device following the instructions in the opposite direction.

Figure 1.



LOW PRESSURE 1388LA12-24D

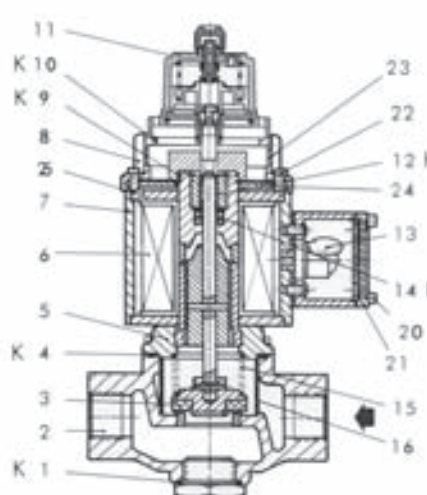


HIGH PRESSURE 1388LA12-24A

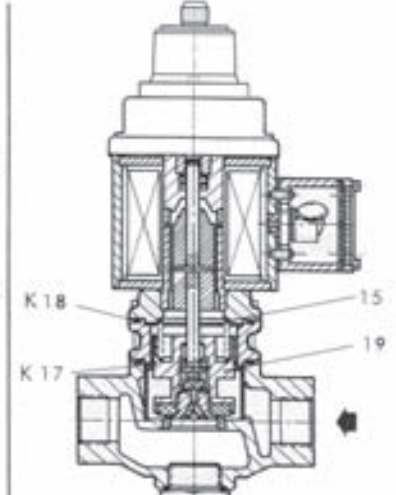
POS	DESCRIPTION	NUMBER	KIT
1	BODY	1	
2	SEAT ASSEMBLY - PLUNGER	1	
3	STRAINER	1	
4	BONNET ASSEMBLY	1	
5	PISTON ASSEMBLY - PLUNGER	1	
6	RETAINER	2	K
7	SEEGER RING D.17 DIN 472	1	K
8	HOUSING COVER	1	
9	BUMPER	1	K
10	O-RING	1	K
11	BRAKE ASSEMBLY	2	
12	BONNET COVER	1	
13	RECTIFYING CIRCUIT	1	
14	COIL	1	
15	O-RING	1	K
16	SPRING	1	
17	O-RING	1	K
18	O-RING	1	K
19	O-RING	1	K
20	SPRING	1	
21	CYLINDR. C. SCREW W. 3/16"X 5/8"	3	
22	FLXING NUT	1	
23	IRON WASHER	1	

POS	DESCRIPTION	NUMBER	KIT
1	O-RING	1	K
2	BODY	1	
3	SEAT ASSEMBLY - PLUNGER	1	
4	O-RING	1	K
5	BONNET ASSEMBLY	1	
6	COIL	1	
7	HOUSING ASSEMBLY	1	
8	HOUSING BONNET	1	
9	SEEGER RING D.17 DIN 472	1	K
10	O-RING	1	K
11	BRAKE ASSEMBLY	1	
12	BUMPER	1	K
13	RECTIFYING CIRCUIT	1	
14	RETAINER	2	K
15	PLUG SPRING	1	
16	STRAINER	1	
17	O-RING	1	K
18	O-RING	1	K
19	PISTON ASSEMBLY - PLUNGER	1	
20	ROUND HEAD SCREW W 1/8" x 3/8"	2	
21	CONNECTION BOX BONNET	1	
22	CYL. HEAD SCREW W 5/32" x 3/8"	2	
23	SEEGER RING D. 30 DIN 471	1	
24	RETENTION GASKET	1	
25	HOUSING GASKET	1	

Figure 2.



LOW PRESSURE 1388LA06-10D



HIGH PRESSURE 1388LA06-10A



**2088 Series**

**Application:**

- Low and high pressure gas combustion equipment.
- Low and medium pressure air or other neutral gases.
- They comply with the resolutions, regulations and recommendations for the use of natural gas in industrial installations in Argentina.

**Main characteristics**

No minimum differential pressure to operate.  
 Low and high pressure versions.  
 Injected or cast aluminium body.  
 BSP or NPT threaded connections.  
 Buna N interior and seals.  
 Class H coils with internal use housings.  
 Electric connector for shielded cable with strain relief  
 or threaded connection for 1/2" NPT pipeline.

Quick or two-stage slow opening.

- 1º Stage:** Quick opening from 0 to 80% of the total adjustable stroke.
  - 2º Stage:** Adjustable slow opening up to 25 seconds from the end of stage 1, up to full stroke.
- Shutoff in less than one second.

**Optional:**

Microcontact for closed valve verification.  
 Weatherproof housing.  
 Explosion-proof and weatherproof housing.

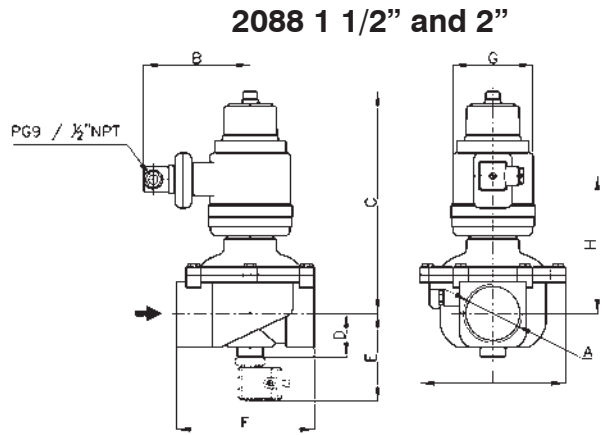
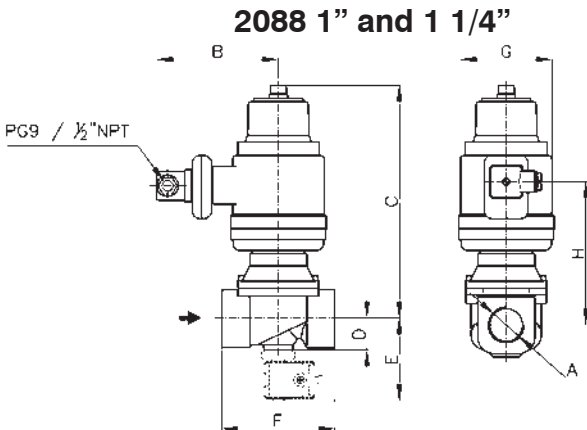
**2088 series for 110 V to 240 V** is provided with a rectifier-controller that makes it possible for the valve to open at max. coil power, and after 90 sec. to come down to 16% of

nominal value. The benefits over conventional systems are, safe opening, low power consumption, low working temperature and longer coil life.

**Technical specifications**

Ø Pipe ins.	Ø Orifice		Flow factor		Δp Maximum		Maximum Temp.		Weight		Catalog Nº.	
	mm	ins.	Kv	Cv	Bar	Psi	°C	°F	Kg	Lb	Slow opening	Quick opening
1"	32	1.26	12	14	3	45	80	176	2.8	6.2	RC 2088LA08L	RC 2088LA08R
1,1/4"	32	1.26	15	17.5							RC 2088LA10L	RC 2088LA10R
1,1/2"	48	1.89	36	42					3.3	7.3	RC 2088LA12L	RC 2088LA12R
2"	51	2.00	49	57							RC 2088LA16L	RC 2088LA16R

**General dimensions 2088**



Measurements: mm

øA	B	C	D	E	F	G	H
R 1"	110	217	29	77	105	99	120
R 1 1/4"	110	217	29	77	105	99	120

Measurements: mm

øA	B	C	D	E	F	G	H
R 1 1/2"	110	236	46	95	146	99	139
R 2"	110	236	46	95	146	99	139

Measurements: ins.

øA	B	C	D	E	F	G	H
R 1"	4.33	8.54	1.14	3.03	4.13	3.89	4.72
R 1 1/4"	4.33	8.54	1.14	3.03	4.13	3.89	4.72

Measurements: ins.

øA	B	C	D	E	F	G	H
R 1 1/2"	4.33	9.29	1.81	3.74	5.74	3.89	5.47
R 2"	4.33	9.29	1.81	3.74	5.74	3.89	5.47

**Coil Characteristics**

Electric Power Supply	Coil Type	Power W	VA (volt-ampere)		Maximum Temperature		Available Tensions
			Inrush	Holding	°C	°F	
AC 50 Hz	S50HR	50	50	8(*)	155	311	1
AC 60 Hz	S50HR						1
DC	S50HR						2

1-(110,120,220, 240)V 2-(24,110,120,220)V - (\*) with RC

**Recommendations for installation**

- Place a strainer with a porosity below 50 microns upstream the valve.
- Mount the valve only over horizontal pipeline with the coil upright.

Options	Prefix	Suffix	Examples
Weather proof housing	<b>Y</b>		YRC2088LA08L
Explosion and weather proof housing.	<b>Z</b>		ZRC2088LA08L
Microcontact for closed valve verification (position indicator)		<b>-I2</b>	RC2088LA08L-I2
Microcontact for closed valve verification (position indicator)*		<b>-I4</b>	RC2088LA08L-I4
NPT connections		<b>T</b>	RC2088LA08LT
Energized coil indicator light	See coils.		

\* With Led - Voltage 5-240 V. - Minimum current 5 mA  
Maximum power 50 W. - Voltage drop 3V.

**Technical characteristics:**

The instructions shown on the valve nameplate must be followed. They indicate:

- Working pressure differential and range: 0 to 3 bar (45 psi)
- Maximum working temperature: 80 °C (176 °F)
- Valve identification: RC2088LA (1) (2) (3) (4)
- (1) Pipe size: 1" (08); 1,1/4" (10); 1, 1/2" (12); 2" (16)
- (2) Slow opening: (L); Quick opening: (R)
- Example: RC2088LA08L: 1" Slow opening**
- (3) NPT connection (T), (BSP not shown)
- Example: RC2088LA08LT**
- (4) Additional position indicator.
- Example: RC2088LA08L-I4**
- Coil power: 50 W.
- Coil voltage

**Electrical installation**

All the coils are for continuous use or high operation frequency. When the coil is on for a long time, the housing heats up to the point that contact with hands will only be possible for a short time. Nonetheless, this temperature is normal and safe. Check that the coil provided with the valve is adequate for the required voltage. When the valve has a different coil voltage from the one required, a new coil with the right voltage can be placed without replacing the valve.

The use of the voltage and current type specified on the nameplate is compulsory.

Permitted tolerance: -15% + 10% if the nominal value.

Electrical connection is DIN D43650 (ISO 4400) SHAPE A with strain-relief or thread for 1/2" NPT conduit.

**Mechanical installation**

Check that the service conditions are within the range of pressure differential and temperature indicated on the nameplate. Place a strainer upstream from the valve with an adequate capacity and porosity below 50 microns.

The mounting position must be only over horizontal pipeline with the coil upright. The pipe must be carefully and exhaustively cleaned upstream from the valve and before the strainer by means of compressed air purges or any other system that guarantees the disposal of solid elements such as welding or packaging remains, mud, etc.; this must be done especially in new pipelines.

The flow direction indicated with an arrow on the valve body must be observed. So, the input pressure must always be equal or greater than the output pressure.

**Starting up**

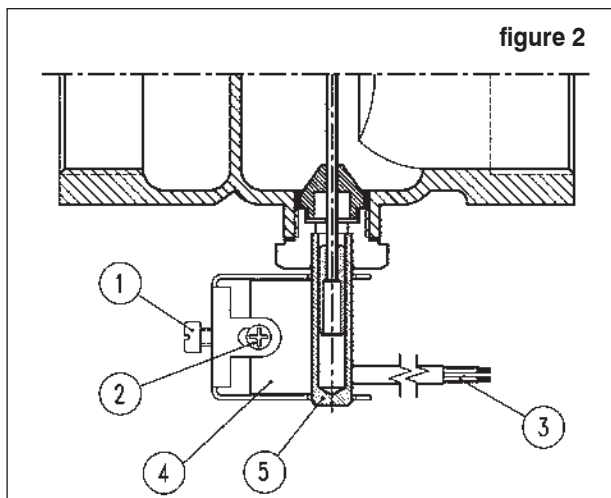
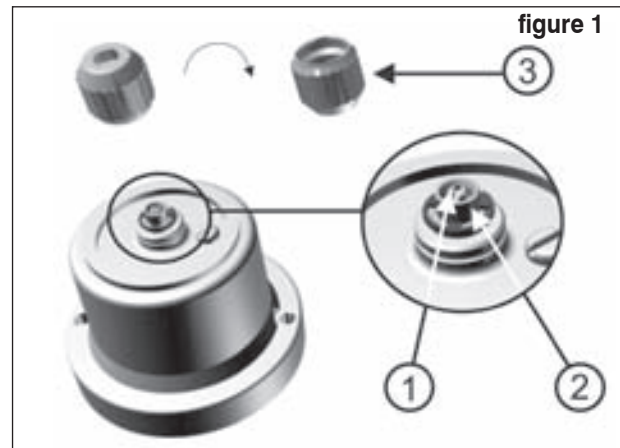
2088 slow opening and quick shutoff solenoid valves comprise two regulation elements: quick stroke regulator and slow opening time regulator.

**Quick stroke regulator adjustment (2 and 3, figure 1)**

It must be adjusted from 0 to 80% of the total stroke. Remove the cap (3) by turning it as shown. Tighten it (2). Percentage decreases when turning the knob clockwise and increases when turning it counter-clockwise.

**Slow opening time regulator adjustment (1, figure 1)**

It must be adjusted from 0 to 25 seconds. Time increases when turning the knob clockwise (1) and decreases when turning it counterclockwise.



**Calibration of the position indicator**

When present in the valve, the position indicator is already calibrated. If it is to be installed or recalibrated, proceed as follows (see fig. 2):

- Connect a tester between cables (3) and check for continuity.
- Place indicator (4) and slide it along column (5) until continuity is set.
- Turn screw (1) and after that turn the second screw (2) until assembly is tight.
- Energize the valve and verify that there is no continuity.
- If so, de-energize the coil and check for continuity.
- If there is no continuity, unscrew (1) and (2) and re-calibrate.



**Applications:**

- Security systems for natural gas and LPG burners.

**Construction characteristics**

Injected aluminum body.  
 Seats: Buna N.  
 Interior: brass, stainless steel.  
 BSP or NPT 3/4" connections.  
 BSP or NPT 1/8" pilot connection.  
 Maximum torque: 30 Nm ( 22 lb.ft ).  
 Thermocouple connection: M9 x 1.  
 Maximum torque: 4 Nm (3 lb.ft)

**Technical characteristics**

No minimum pressure to operate.  
 Opening time: 5 seconds.  
 Cut off time due to lack of flame: < 1 second.

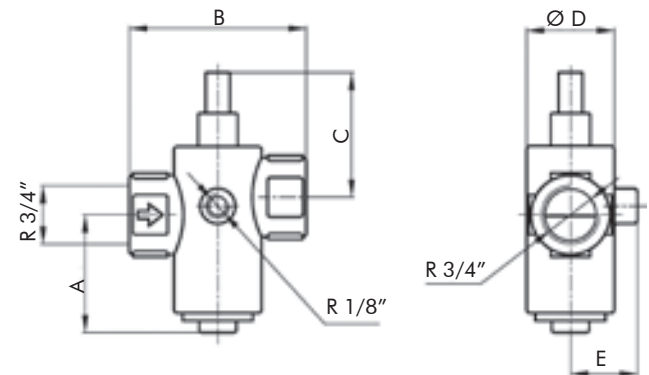
**Observations:**

Cut off time due to lack of flame depends on valve + thermocouple assembly, which should be: < 45 sec.

**Additional features**

Standard thermocouples: 16", 24" and 47" (400, 600, 800, 1200 and 2000 mm).

**V171 General dimensions**



A	B	C	Ø D	E
54	81	57	41	31

Measurements: mm

A	B	C	Ø D	E
2.12	3.18	2.24	1.61	1.22

Measurements: ins.

**Technical specifications**

Ø Orifice		Flow factor		Pilot	Maximum pressure		Minimum temperature		Maximum temperature		Weight		Catalog N°
mm	ins.	Kv	Cv		bar	psi	°C	°F	°C	°F	Kg	Lb	
19	0.75	4.2	4.9	si	0.2	3	-10	14	80	176	0.44	0.97	V171 P06
19	0.75	4.2	4.9	no	1.5	22					0.43	0.95	V171-2
9	0.35	1.9	2.2	si	1.5	22					0.44	0.97	V171-3

## Installation Recommendations

The cutting time of a thermocouple safety valve depends on the sensitivity of different thermocouples available locally and facilities, so you should consider these factors to establish the response time, which should not exceed 45 seconds according to “NAG 201” standard.

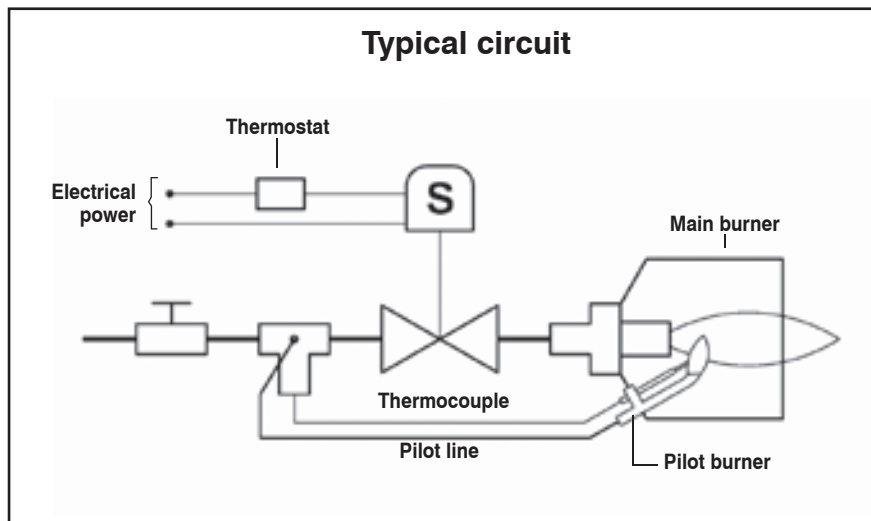
The installation of the thermocouple is important for proper closure. If it is placed in a position close to a source of radiation, it can be sufficiently high to prevent the temperature drops or lengthen the time required for closing the valve.

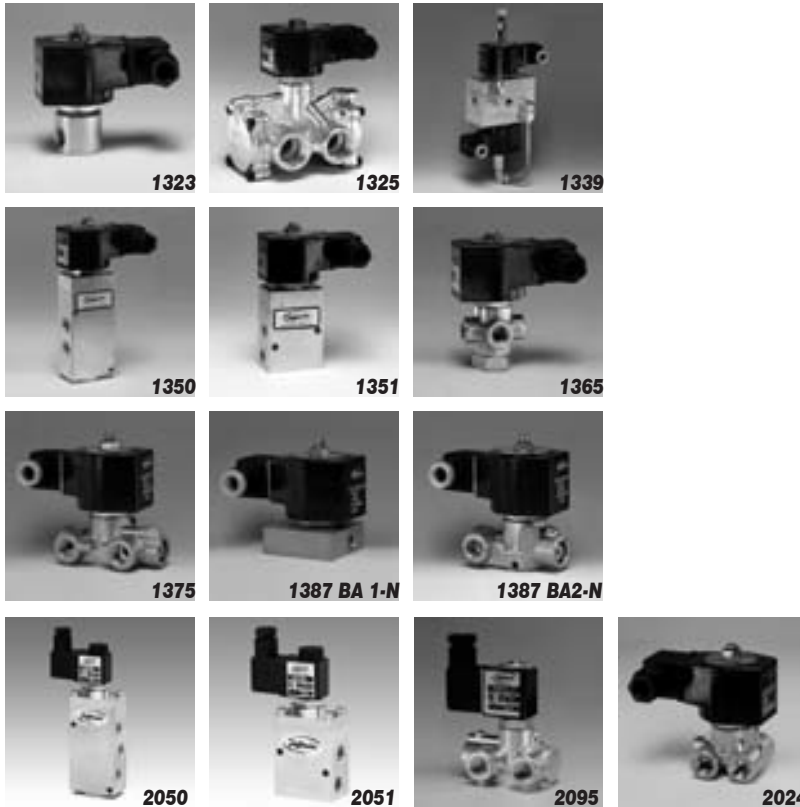
To extend the life of the thermocouple, it must be installed to avoid overheat.

That is the reason why it must be placed in a position to generate only the enough power to maintain the valve open.

This is a benefit in the absence of flame, because you will get a quick drop in temperature and consequently a proper cut response.

The pilot flame should ensure a positive main burner ignition.





## 3, 4 and 5 Way Solenoid Valves for Pneumatic and Hydraulic Use

		Pages			Pages
<b>1323 Series</b>	3 ways. N.closed and N.open or universal. Direct acting.	<b>D-2 / D-3</b>	<b>2050 Series</b>	5 ways. Monostable and bistable. Pilot operated.	<b>D-16 / D-17</b>
<b>1325 Series</b>	3 ways. N.closed and N.open. Pilot operated.	<b>D-4 / D-5</b>	<b>2051 Series</b>	3 ways. N. closed, N. open Monostable or bistable. Pilot operated.	<b>D-18 / D-19</b>
<b>1339 Series</b>	4/3 ways. Closed center. Pilot operated.	<b>D-6 / D-7</b>	<b>2095 Series</b>	3 ways and 5 ways. Direct NAMUR mount. Pilot operated.	<b>D-20 / D-21</b>
<b>1350 Series</b>	5 ways. Monostable and bistable. Pilot operated.	<b>D-8 / D-9</b>	<b>SI Series</b>	Additional information	<b>D-22 / D-23</b>
<b>1351 Series</b>	3 ways. N. closed, N. open Monostable or bistable. Pilot operated.	<b>D-10 / D-11</b>	<b>2024 Series</b>	5 ways. Pilot operated.	<b>D-24</b>
<b>1365 Series</b>	3 ways N. closed, N. open or universal. Direct acting.	<b>D-12 / D-13</b>	<div style="text-align: center;"> <h3 style="color: red; margin: 0;">New products</h3>  <p><b>NEW SOLENOID VALVE MODELS</b></p> <ul style="list-style-type: none"> <li>• Intrinsically Safe.</li> <li>• Low Power.</li> <li>• ATEX Explosion-Proof Coils.</li> </ul> <p style="color: red; font-size: small;">To request a technical bulletin for models that are not included in this catalog, please contact <b>JEFFERSON</b> at:</p> <p style="color: red; font-weight: bold; font-size: small;"><a href="mailto:info@jeffersonvalves.com">info@jeffersonvalves.com</a></p> </div>		
<b>1375 Series</b>	5 ways. Direct NAMUR mount. Pilot operated.	<b>D-14</b>			
<b>1387 Series</b>	3 ways. N. closed. Direct NAMUR mount. Direct acting or pilot operated.	<b>D-15</b>			



**Applications:**

- Single acting pneumatic or hydraulic cylinders.
- Divergence of one fluid into two circuits.
- Alternative convergence of two fluids into one circuit.

**Main characteristics**

3 Ways, 2 positions, normally closed, normally open or universal.  
 Direct action. No minimum differential pressure to operate.  
 Body: brass, iron, stainless steel, etc.  
 BSP or NPT 1/4" Connection.  
 Buna N seal.  
 Core tube SS. 304 and 316.  
 Plunger and fixed core: SS. 430 F.  
 Shading coil: copper, silver or aluminum.

Encapsulated coils.  
 Shape A DIN 43650 connection.  
 IP65 and NEMA4 Protection.

**Options:**

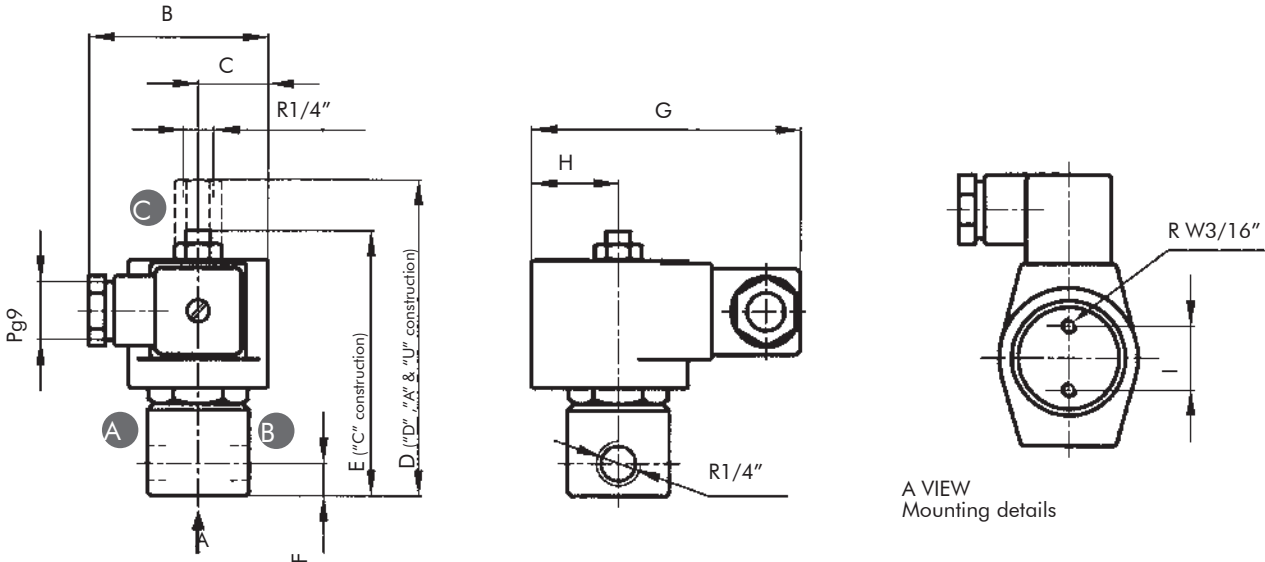
- Energized coil indicator light.
- Explosion and / or weather proof coils and housings.
- Manual operator.

**Technical specifications**

Ø Orifice		Flow factor		Δp maximum								Maximum temp. and catalog N° according to seat material			
				NC		NO		DIV		CONV		Buna "N"	Neoprene	EPDM	FKM
mm	ins.	Kv	Cv	bar	psi	bar	psi	bar	psi	bar	psi	80 °C / 176 °F	80 °C / 176 °F	145 °C / 293 °F	150 °C / 302 °F
<b>"C" Construction - no connector at "C" port</b>															
1.75	.069	0.09	0.11	12	180	-	-	-	-	-	-	1323BA17C	1323BN17C	1323BE17C	1323BV17C
2.00	.079	0.10	0.12	8	120	-	-	-	-	-	-	1323BA20C	1323BN20C	1323BE20C	1323BV20C
2.50	.098	0.14	0.16	3	45	-	-	-	-	-	-	1323BA25C	1323BN25C	1323BE25C	1323BV25C
<b>"D" Construction</b>															
1.75	.069	0.09	0.11	12	180	-	-	20	300	-	-	1323BA17D	1323BN17D	1323BE17D	1323BV17D
2.00	.079	0.10	0.12	8	120	-	-	15	225	-	-	1323BA20D	1323BN20D	1323BE20D	1323BV20D
2.50	.098	0.14	0.16	3	45	-	-	10	150	-	-	1323BA25D	1323BN25D	1323BE25D	1323BV25D
<b>"A" Construction</b>															
1.75	.069	0.09	0.11	4	60	12	180	5	75	4	60	1323BA17A	1323BN17A	1323BE17A	1323BV17A
2.00	.079	0.10	0.12	3	45	8	120	3	45	3	45	1323BA20A	1323BN20A	1323BE20A	1323BV20A
2.50	.098	0.14	0.16	-	-	3	45	-	-	-	-	1323BA25A	1323BN25A	1323BE25A	1323BV25A
<b>"U" Construction</b>															
1.75	.069	0.09	0.11	9	135	9	135	20	300	9	135	1323BA17U	1323BN17U	1323BE17U	1323BV17U
2.00	.079	0.10	0.12	7	105	7	105	15	225	7	105	1323BA20U	1323BN20U	1323BE20U	1323BV20U
2.50	.098	0.14	0.16	3	45	3	45	10	150	3	45	1323BA25U	1323BN25U	1323BE25U	1323BV25U



**General dimensions**



B	C	D	E	F	G	H	I
57	22	100	85	10	85	27	20

Measurements: mm

B	C	D	E	F	G	H	I
2.24	0.87	3.93	3.35	0.39	3.35	1.06	0.79

Measurements: ins.

**Special constructions**

Stainless steel body.

- AISI 304: change letter **B** for **S** in the catalog N<sup>o</sup>.  
Example: 1323SA17C
- AISI 316: change letter **B** for **I** in the catalog N<sup>o</sup>.  
Example: 1323IA17C

**Coil characteristics**

Electric power supply	Coil type	Power W	VA (volt-amp)		Maximum temperature		Available tensions
			Inrush	Holding	°C	°F	
AC 50 Hz	MF11C	11	40	22	155	311	1
	MH11C	11	40	22	180	356	1
AC 60 Hz	MF13C	13	45	27	155	311	2
	MH13C	13	45	27	180	356	2
DC	MH19C	19	19	19	180	356	3

1-(24,110,220)V 2-(24,110,120,240)V 3-(12,24,110,220)V

Options	Prefix	Suffix	Examples
Water, weather and saline corrosion proof coils.	<b>YC</b>		<b>YC1323BA17C</b>
Explosion and weather proof coils.	<b>ZC</b>		<b>ZC1323BA17C</b>
Weather proof housing.	<b>Y</b>		<b>Y1323BA17D</b>
Explosion and weather proof housing.	<b>Z</b>		<b>Z1323BA17D</b>
Manual operator: on the main orifice		<b>- M</b>	<b>1323BA17C-M</b>
NPT connections		<b>T</b>	<b>1323BA17CT</b>
Energized coil indicator light		See coils.	

**Flow diagrams**

Construc.	C or D	A	D	U	U
De-Energized					
Energized					
Operation	NC	NO	Divergent	Convergent	Universal

**Recommendations for installation**

Place a strainer upstream the valve with a porosity ≤ 100 μ.  
Installation: in any position, preferably over horizontal pipeline with the coil upright. Except "C", all the constructions may be used for any operation manner, but it is advisable to choose the valve according to its use in order to obtain the best performance.



Contact our manufacturing plant for information on available models

**Applications:**

- Large single acting cylinders or actuators, compressors, turbines, etc.
- Ideal for instrument air or dry gas.
- It can also operate with lubricated air, water, light oils, etc.

**Main characteristics**

3 ways, 2 positions, normally closed, normally open.  
 Diaphragm servo-operated action with metal core.  
 Seat shutoff. No need for lubrication to operate.  
 Body: brass, stainless steel, etc.  
 BSP or NPT threaded connections.  
 Buna N diaphragm and seats for neutral fluids up to 80 °C (176 °F).  
 FKM diaphragm and seats for other uses.  
 Core tube SS. 304 and 316.  
 Plunger and fixed core: SS. 430 F.  
 Shading coil: copper, silver or aluminum.  
 Weight: 2 kg (4.42 lb).

Encapsulated coils.  
 Shape A DIN 43650 connection.  
 IP65 and NEMA4 Protection.  
 Pilot orifice with internal discharge. It may be used with fluids which cannot be discharged into the atmosphere.  
 Greater flow capacity and lower response time than any other spool valve of the same size.

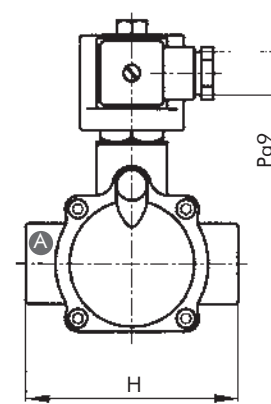
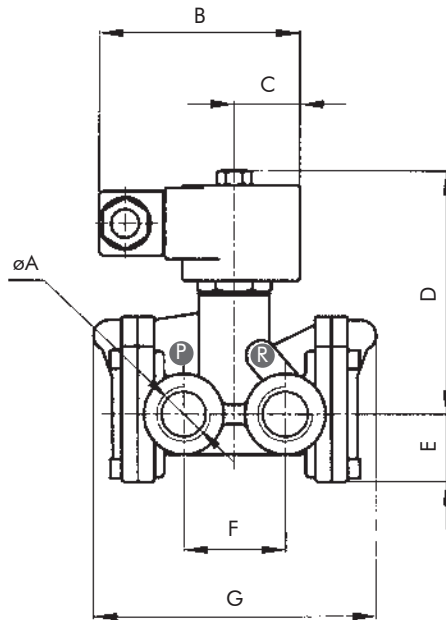
**Options:**

- Energized coil indicator light.
- Explosion and / or weather proof coils and housings.

**Technical specifications**

Ø Pipe ins.	Ø Orifice		Flow factor		Δp				Maximum temp. and catalog N° according to seat material	
					Minimum		Maximum		Buna "N"	FKM
	mm	ins.	Kv	Cv	bar	psi	bar	psi	80 °C / 176 °F	150 °C / 302 °F
<b>Forged Brass Body - Normally closed</b>										
3/8"	16	0.63	2.7	3.2	0.5	7.5	10	150	1325BA3C	1325BV3C
1/2"			3.4	4.0					1325BA4C	1325BV4C
3/4"			4.7	4.7					1325BA6C	1325BV6C
<b>Forged brass body - Normally open</b>										
3/8"	16	0.63	2.7	3.2	0.5	7.5	10	150	1325BA3A	1325BV3A
1/2"			3.4	4.0					1325BA4A	1325BV4A
3/4"			4.7	5.5					1325BA6A	1325BV6A
<b>Stainless steel body AISI 304 - Normally closed</b>										
3/8"	16	0.63	2.7	3.2	0.5	7.5	10	150	1325SA3C	1325SV3C
1/2"			3.4	4.0					1325SA4C	1325SV4C
3/4"			4.7	5.5					1325SA6C	1325SV6C
<b>Stainless steel body AISI 304 - Normally open</b>										
3/8"	16	0.63	2.7	3.2	0.5	7.5	10	150	1325SA3A	1325SV3A
1/2"			3.4	4.0					1325SA4A	1325SV4A
3/4"			4.7	5.5					1325SA6A	1325SV6A

**General dimensions**



øA	B	C	D	E	F	G	H
3/8"	85	27	103	29	43	121	90
1/2"							
3/4"							

Measurements: mm

øA	B	C	D	E	F	G	H
3/8"	3.34	1.06	4.05	1.14	1.69	4.76	3.54
1/2"							
3/4"							

Measurements: ins.

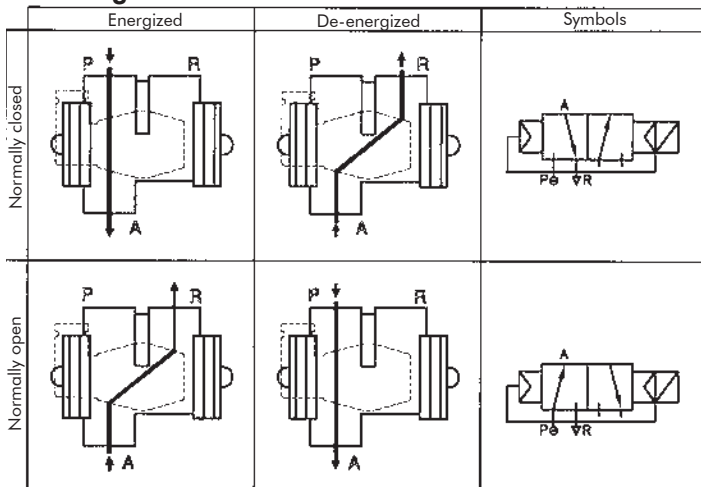
**Coil characteristics**

Electric power supply	Coil type	Power W	VA (volt-ampere)		Maximum temperature		Available tensions
			Inrush	Holding	°C	°F	
AC 50 Hz	MF11C	11	40	22	155	311	1
AC 60 Hz	MF13C	13	45	17	155	311	2
DC	MH19	19	19	19	180	356	3

1-(24,110,220)V 2-(24,110,120,240)V 3-(12,24,110,220)V

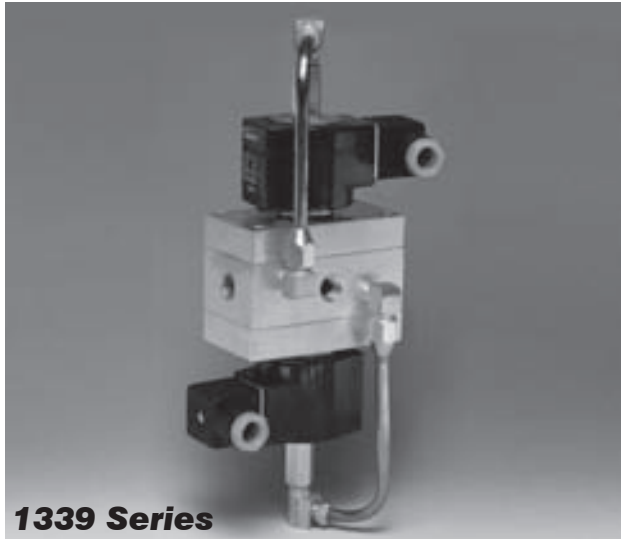
Options	Prefix	Suffix	Examples
Water, weather and saline corrosion proof coils.	<b>YC</b>		YC1325BA4C
Explosion and weather proof coils.	<b>ZC</b>		ZC1325BA4C
Weather proof housing.	<b>Y</b>		Y1325BA4C
Explosion and weather proof housing.	<b>Z</b>		Z1325BA4C
NPT connections		<b>T</b>	1325BA4CT
Energized coil indicator light			See coils.

**Flow diagrams**



**Recommendations for installation**

Place a strainer upstream of the valve with a porosity  $\leq 100 \mu$ .  
Installation: in any position. Preferably on a horizontal pipeline with the coil upright.



**1339 Series**

**Applications:**

- Ideal for application where graduated or full stroke of piston is required.
- High flow; exceptionally long life; heavy-duty operation.
- Dry air, gas, water, light oil and others gases and liquids.

**Main characteristics**

4 ways, 3 positions, closed center.  
It allows to operate double acting cylinders or actuators.  
Aluminium, brass and stainless steel body.  
BSP or NPT 1/4", 3/8", 1/2" threaded connections.  
Seat shutoff, 4 diaphragms which plug up the respective ways.  
High capacity and operation speed.  
No need for lubrication to operate, ideal for instrument air.  
Pilot orifices with internal discharge, it may operate dangerous fluids or those which do not allow spills,

such as gas, fuel, water, light oils and other similar fluids.  
Buna N seals.  
Core tube SS. 304 and 316.  
Plunger and fixed core: SS. 430 F.  
Shading coil: copper, silver or aluminium  
Shape A DIN 43650 connection encapsulated coils.  
IP65 and NEMA 4 protection.

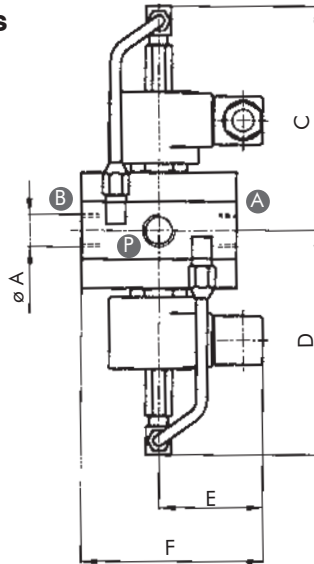
**Options:**

- Energized coil indicator light.
- Explosion and / or weather proof coils and housings.

**Technical specifications**

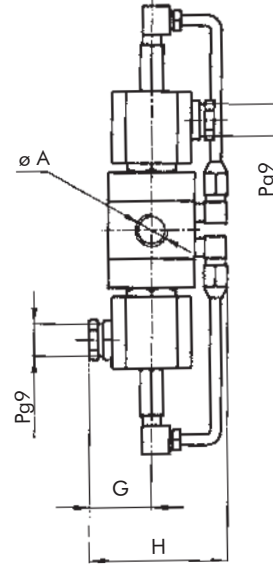
Ø Pipe ins.	Ø Orifice		Flow factor		Pressure differential				Weight				Maximum temp. and catalog N° according to seat material			
					Δp minimum		Δp maximum		kg		Lb		Aluminium	Brass	AISI.304	
	mm	ins.	Kv	Cv	bar	psi	bar	psi	Alum	Br/ss	Alum	Br/ss				
<b>Buna "N" diaphragm</b>																
1/4"	8	0.23	0.34	0.4	0.5	7.5	10	150	1.3	2.2	2.9	4.9	1339LA1	1339BA1	1339SA1	
3/8"	8	0.31	0.68	0.8									1339LA2	1339BA2	1339SA2	
1/2"	8	0.39	1.27	1.5									1339LA3	1339BA3	1339SA3	
<b>FKM diaphragm</b>																
1/4"	8	0.23	0.34	0.4	0.5	7.5	10	150	1.3	2.2	2.9	4.9	1339LV1	1339BV1	1339SV1	
3/8"	8	0.31	0.68	0.8									1339LV2	1339BV2	1339SV2	
1/2"	8	0.39	1.27	1.5									1339LV3	1339BV3	1339SV3	

**General dimensions**



øA	C	D	E	F	G	H
R 1/4"	125	125	58	102	35	76
R 3/8"						
R 1/2"						

Measurements: mm



øA	C	D	E	F	G	H
R 1/4"	81.7	81.7	2.3	4.0	1.4	3.0
R 3/8"						
R 1/2"						

Measurements: ins.

**Coil characteristics**

Electric power supply	Coil type	Power W	VA (volt-ampere)		Maximum temperature		Available tensions
			Inrush	Holding	°C	°F	
AC 50 Hz	MF11C	11	40	22	155	311	1
	MH11C	11	40	22	180	356	1
AC 60 Hz	MF13C	13	45	27	155	311	2
	MH13C	13	45	27	180	356	2
DC	MH19C	19	19	19	180	356	3

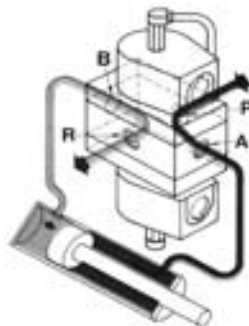
1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

Options	Prefix	Suffix	Examples
Water, weather and saline corrosion proof coils.	<b>YC</b>		<b>YC1339BA2</b>
Explosion and weather proof coils.	<b>ZC</b>		<b>ZC1339BA2</b>
Weather proof housing.	<b>Y</b>		<b>Y1339BA2</b>
Explosion and weather proof housing.	<b>Z</b>		<b>Z1339BA2</b>
Manual operator: on the main orifice		<b>- M</b>	<b>1339BA2-M</b>
NPT connections		<b>T</b>	<b>1339LA1T</b>
Energized coil indicator light		See coils.	

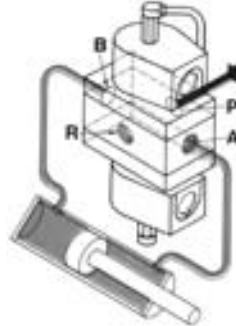
**Recomemendations for installation**

Place a strainer upstream the valve with a porosity ≤ 100 μ.  
Installation: in any position.

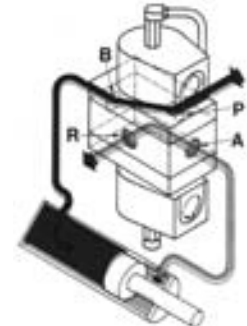
**Flow diagrams**



**POSITION 1**  
Nº1 Solenoid energized.  
Pressure through A and exhaust through B.



**POSITION 2**  
Both solenoids de-energized.  
4 ways closed, the cylinder stops in a balanced position with pressure at both sides.



**POSITION 3**  
Nº2 Solenoid energized.  
Pressure through B and exhaust through A.

**Note:** The solenoids cannot be energized both at the same time because all 4 ways would open and pressure would be in direct contact with the exhaust.



**1350 Series**

**New products**

- Intrinsically Safe.
- Low Power.
- ATEX Explosion-Proof Coils.

To request a technical bulletin for models that are not included in this catalog, please contact **JEFFERSON** at:  
**info@jeffersonvalves.com**

**CERTIFIED QUALITY SYSTEM**

Contact our manufacturing plant for information on available models

**Applications:**

- Double acting cylinders or diaphragms valves.
- Lubricated or dry air-gas, water, light oil.
- Heavy-duty operation.

**Main characteristics**

5 ways, 2 positions, monostable or bistable.  
 Slide servo-operated action.  
 Internal or external pilot:  
 electropneumatic or pneumatic.  
 BSP or NPT threaded connections.  
 Aluminium, brass, stainless steel body.  
 Buna N seals for neutral fluids up to 80 °C (176 °F).  
 FKM seals for other uses.  
 PTFE sleeve for instrument air and dry gases.  
 Core tube SS. 304 and 316.  
 Plunger and fixed core: SS. 430 F.  
 Shading coil: copper, silver or aluminium  
 Shape A DIN 43650 connection encapsulated coils.  
 IP65 and NEMA 4 protection.

**Options:**

- Energized coil indicator light.
- Explosion and / or weather proof coils and housings.
- Manual operator.

Suffix	Main line supply press.				Operation manner
	Min		Max		
	bar	psi	bar	psi	
<b>Electric operator with internal pilot</b>					
A	1	15	10	150	Spring return
B	0.5	7.5			Pneumatic return
C	0.5	7.5			Bistable
<b>Electric operator with independent pilot</b>					
G	0	0	10	150	Spring return
I					Bistable
<b>Pneumatic operator</b>					
D	0	0	10	150	Spring return
F					Bistable

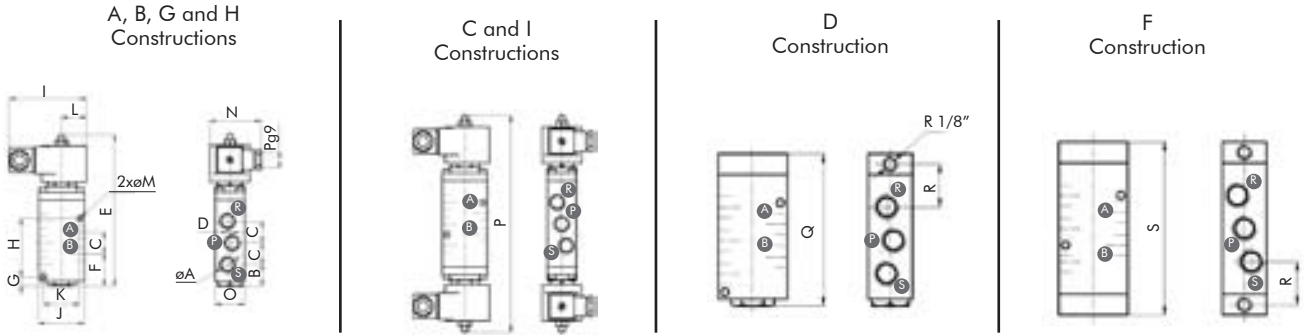
**Note:** The pilot signal with independent pilots or pneumatic operators must be 1 bar and equal or greater than the valve working pressure.

**Technical specifications**

Ø Pipe ins.	Ø Orifice		Flow factor		Buna "N" seals		FKM seals	
	mm	ins.	Kv	Cv	No sleeve	with sleeve	No sleeve	with sleeve
<b>Aluminium body</b>								
1/4"	7	0.27	0.80	0.94	1350LA1*	1350LTA1*	1350LV1*	1350LTV1*
3/8"	7	0.27	0.96	1.12	1350LA2*	1350LTA2*	1350LV2*	1350LTV2*
<b>Brass body</b>								
1/4"	7	0.27	0.80	0.94	1350BA1*	1350BTA1*	1350BV1*	1350BTV1*
3/8"	7	0.27	0.96	1.12	1350BA2*	1350BTA2*	1350BV2*	1350BTV2*
1/2"	10	0.39	1.90	2.22	1350BA3*	1350BTA3*	1350BV3*	1350BTV3*
<b>Stainless steel body AISI 304</b>								
1/4"	7	0.27	0.80	0.94	NO	1350SA1*	NO	1350SV1*
3/8"	7	0.27	0.96	1.12		1350SA2*		1350SV2*
1/2"	10	0.39	1.90	2.22		1350SA3*		1350SV3*

(\*) The suffix corresponding to the operation manner must be added to the catalog number according to the table Example: 1350LA1A.

**General dimensions**



ø A	Unit	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
R1/4"	mm	24	24	5	168	36	10	64.5	85	50	40	27	5.5	57	32	240	110	31	126
R3/8"		23	33		192	39	39	56								259	134	39	144
R1/2"	ins.	0.944	0.944	1.196	6.614	1.417	0.393	2.539	3.346	1.968	1.574	1.062	0.216	2.244	1.259	9.448	4.330	1.220	4.960
R1/4"		0.905	1.299		7.559	1.535	1.535	2.204								10.196	5.275	1.535	5.669

		Weight							
ø A	Units	Figure 1		Figure 2		Figure 3		Figure 4	
		Aluminium	Brass	Aluminium	Brass	Aluminium	Brass	Aluminium	Brass
R1/4"	Kg	0.820	1.650	1.300	2.700	0.400	1.250	0.460	1.470
R3/8"		0.900	1.820	1.380	2.400	0.480	1.400	0.540	1.570
R1/2"		1.610	3.642	2.869	4.856	0.883	2.759	1.015	3.134
R1/4"	Lb	1.610	3.642	2.869	4.856	0.883	2.759	1.015	3.134
R3/8"		1.986	4.017	3.046	5.298	1.059	3.090	1.192	3.465
R1/2"		1.986	4.017	3.046	5.298	1.059	3.090	1.192	3.465

Options	Prefix	Suffix	Examples
Water, weather and saline corrosion proof coils.	YC		YC1350BA2B
Explosion and weather proof coils.	ZC		ZC1350BA2B
Weather proof housing.	Y		Y1350BA2B
Explosion and weather proof housing.	Z		Z1350BA2B
Manual operator		- M	1350BA2B-M
NPT connections		T	1350BA2BT
Energized coil indicator light		See coils.	

**Coil characteristics**

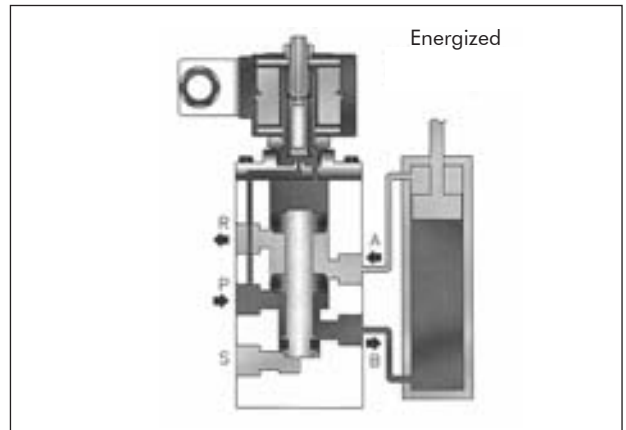
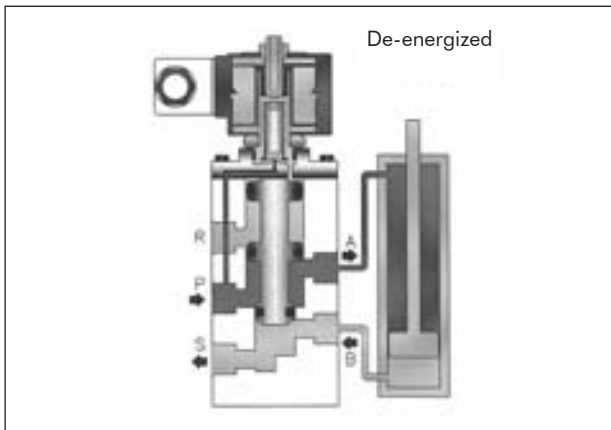
Electric power supply	Coil type	Power W	VA (volt-ampere)		Maximum temperature		Available tensions
			Inrush	Holding	°C	°F	
AC 50 Hz	MF11C	11	40	22	155	311	1
	MH11C	11	40	22	180	356	1
AC 60 Hz	MF13C	13	45	27	155	311	2
	MH13C	13	45	27	180	356	2
DC	MH19C	19	19	19	180	356	3

1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

**Recommendations for installation**

Place a strainer upstream the valve with a porosity ≤ 100 μ.  
 Installation: in any position. It is advisable to use lubrication with valves which do not have a PTFE sleeve.

**Flow diagrams**





**New products**

- Intrinsically Safe.
- Low Power.
- ATEX Explosion-Proof Coils.

To request a technical bulletin for models that are not included in this catalog, please contact **JEFFERSON** at:

**info@jeffersonvalves.com**

CERTIFIED QUALITY SYSTEM

Contact our manufacturing plant for information on available models

**Applications:**

- Single acting cylinders or diaphragms valves.
- Lubricated or dry air-gas, water, light oil
- Heavy-duty operation.

**Main characteristics**

3 ways, 2 positions, normally open or normally closed. Slide servo-operated action. Internal or external pilot: electropneumatic or pneumatic. BSP or NPT threaded connections. Aluminium, brass, stainless steel body. Buna N seals for neutral fluids up to 80 °C (176 °F). FKM seals for other uses. PTFE sleeve for instrument air and dry gases. Shape A DIN 43650 connection encapsulated coils. IP65 and NEMA 4 protection.

**Options:**

- Energized coil indicator light.
- Explosion and/or weather proof coils and housings.
- Manual operator.

Suffix	Main line supply press.				Operation manner
	Min		Max		
	bar	psi	bar	psi	
<b>Electric operator with internal pilot</b>					
A	1	15	10	150	N. closed. Spring return
B	0.5	7.5			N. closed. Pneumatic return
C	0.5	7.5			Bistable
G	1	15			N. open. Spring return
H	0.5	7.5			N. open. Pneumatic return
<b>Electric operator with independent pilot</b>					
K	0	0	10	150	N. closed. Spring return
N					N. open. Spring return
M					Bistable
<b>Pneumatic operator</b>					
D	0	0	10	150	N. closed. Spring return
J					N. open. Spring return
F					Bistable

**Note:** The pressure at the pilot signal with and independent pilot or a pneumatic operator must be 1 bar and equal or greater than the valve's working pressure.

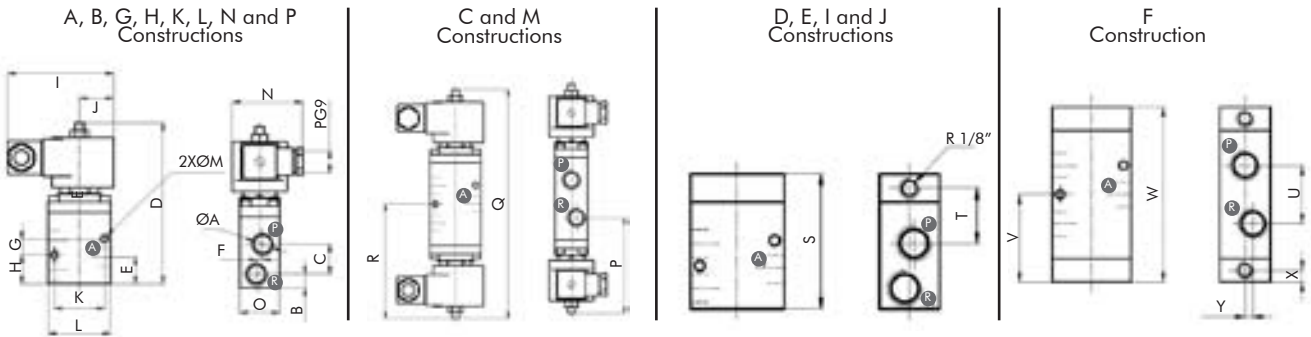
**Technical specifications**

Ø Pipe ins.	Ø Orificio		Flow factor		Buna "N" seals		FKM seals	
	mm	ins.	Kv	Cv	No sleeve	with sleeve	No sleeve	with sleeve
<b>Aluminium body</b>								
1/4"	7	0.27	0.80	0.94	1351LA1*	1351LTA1*	1351LV1*	1351LTV1*
3/8"	7	0.27	0.96	1.12	1351LA2*	1351LTA2*	1351LV2*	1351LTV2*
1/2"	10	0.39	1.90	2.22	1351LA3*	1351LTA3*	1351LV3*	1351LTV3*
<b>Brass body</b>								
1/4"	7	0.27	0.80	0.94	1351BA1*	1351BTA1*	1351BV1*	1351BTV1*
3/8"	7	0.27	0.96	1.12	1351BA2*	1351BTA2*	1351BV2*	1351BTV2*
1/2"	10	0.39	1.90	2.22	1351BA3*	1351BTA3*	1351BV3*	1351BTV3*
<b>Stainless steel body AISI 304</b>								
1/4"	7	0.27	0.80	0.94	NO	1351SA1*	NO	1351SV1*
3/8"	7	0.27	0.96	1.12		1351SA2*		1351SV2*
1/2"	10	0.39	1.90	2.22		1351SA3*		1351SV3*

(\*) The suffix corresponding to the operation must be added to the catalog number according to the table Example: 1351LA1A.



**General dimensions 1351**



ø A	Unit	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
R1/4"	mm	11	24	130	22	5	13	23	85	27	40	50	5.5	57	32	95	226	113	72	30	37	56	112	7.5	5
R3/8"		15	31	149	31	-	21.5	31								102	252	126	91	38	47	68	137	-	3
R1/4"	ins.	0.433	0.944	5.118	0.866	0.196	0.511	0.905	3.346	1.062	1.574	1.968	0.216	2.244	1.259	3.740	8.897	4.448	2.834	1.181	1.456	2.204	4049	0.295	0.196
R3/8"		0.590	1.220	5.866	1.220	-	0.846	1.220								4.015	9.921	4.960	3.582	1.496	1.850	2.677	5.393	-	0.118
R1/2"																									

		Weight							
ø A	Units	Figure 1		Figure 2		Figure 3		Figure 4	
		Aluminium	Brass	Aluminium	Brass	Aluminium	Brass	Aluminium	Brass
R1/4"	Kg	0.680	1.250	0.680	1.800	0.280	0.800	0.350	0.970
R3/8"		-	-	1.20	1.950	0.300	0.920	0.370	1.100
R1/2"	Lb	1.501	2.759	1.501	3.973	0.618	1.766	0.772	2.141
R1/4"		-	-	2.649	4.304	0.662	2.030	0.816	2.428

Options	Prefix	Suffix	Examples
Water, weather and saline corrosion proof coils.	YC		YC1351BA2B
Explosion and weather proof coils.	ZC		ZC1351BA2B
Weather proof housing.	Y		Y1351BA2B
Explosion and weather proof housing.	Z		Z1351BA2B
Manual operator: on the main orifice		- M	1351BA2B-M
NPT connections		T	1351BA2BT
Energized coil indicator light		See coils.	

**Coil characteristics**

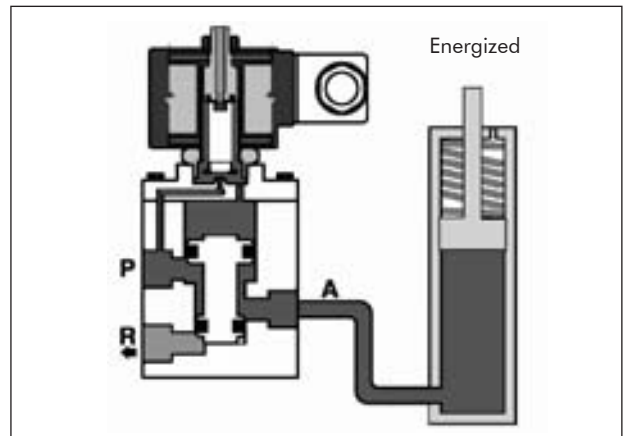
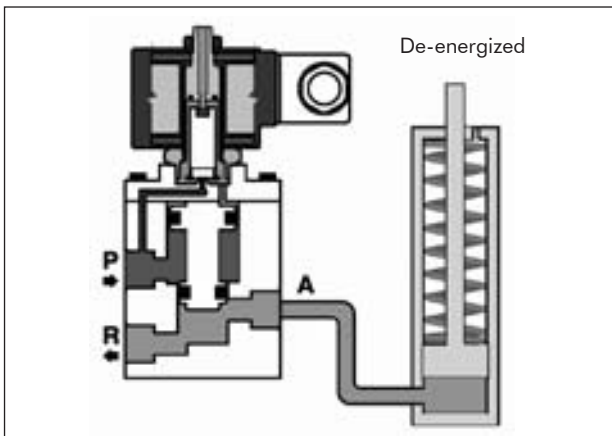
Electric power supply	Coil type	Power W	VA (volt-amp)		Maximum temperature		Available tensions
			Inrush	Holding	° C	° F	
AC 50 Hz	MF11C	11	40	22	155	311	1
	MH11C	11	40	22	180	356	1
AC 60 Hz	MF13C	13	45	27	155	311	2
	MH13C	13	45	27	180	356	2
DC	MH19C	19	19	19	180	356	3

1-(12, 24, 110, 220, 240)V 2-(12, 24, 110, 120, 220, 240)V 3-(12, 24, 110, 220)V

**Recommendations for installation**

Place a strainer upstream the valve with a porosity ≤ 100 µ.  
 Installation: in any position.  
 It is advisable to use lubricated air when valves have no PTFE sleeve.

**Flow diagram (NC)**





**Applications:**

- For the control of single acting cylinders and diaphragms.
- Also suitable for fluids selection and diversion systems.
- Dry air, gas, water, light oils.
- Instrumentation, lubrication devices, robots, pilot operators.

**Main characteristics**

3 Ways, 2 positions, normally closed, normally open or universal.

Direct action. No minimum differential pressure to operate.

Body: brass, iron, stainless steel, etc.

BSP or NPT 1/4" 3 way connections in body.

Seals: Buna N, FKM and EPDM.

Core tube SS. 304 and 316.

Plunger and fixed core: SS. 430 F.

Shading coil: copper, silver or aluminium

Shape A DIN 43650 connection encapsulated coils.

IP65 and NEMA 4 protection

Approximate weight: 0.6 kg / 1.3 Lb.

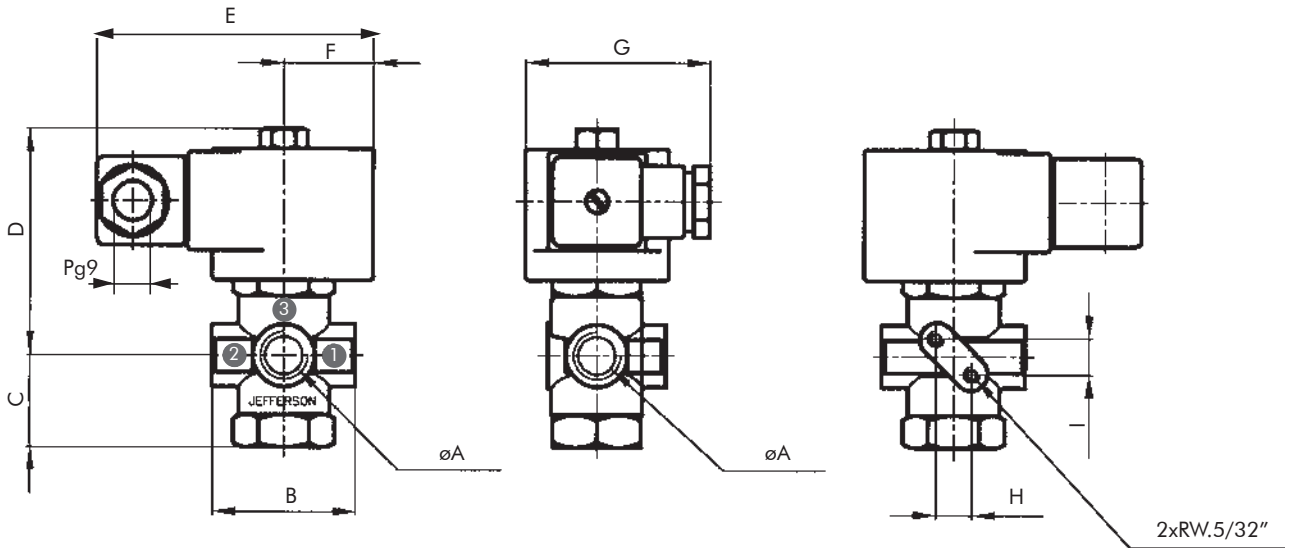
**Options:**

- Energized coil indicator light.
- Explosion and/or weather proof coils and housings.
- Manual operator.

**Technical specifications**

Ø Orifice		Flow factor		Δp maximum								Maximum temp. and catalog N° according to seat material			
mm	ins.	Kv	Cv	NC		NA		DIV		CONV		Buna "N"	Neoprene	EPDM	FKM
				bar	psi	bar	psi	bar	psi	bar	psi				
				80 °C / 176 °F	80 °C / 176 °F	145 °C / 293 °F	150 °C / 302 °F								
<b>"C" Construction</b>															
1.75	0.07	0.08	0.09	15	225	3	45	20	300	3	45	1365BA17C	1365BN17C	1365BE17C	1365BV17C
2.25	0.09	0.12	0.14	11	165	1.5	22	15	225	1.5	22	1365BA22C	1365BN22C	1365BE22C	1365BV22C
3.00	0.12	0.21	0.25	6	90	0.5	7.5	10	150	0.5	7.5	1365BA30C	1365BN30C	1365BE30C	1365BV30C
4.00	0.16	0.30	0.35	3	45	-	-	5	75	-	-	1365BA40C	1365BN40C	1365BE40C	1365BV40C
<b>"A" Construction</b>															
1.75	0.07	0.08	0.09	1.5	22	14	210	10	150	1.5	22	1365BA17A	1365BN17A	1365BE17A	1365BV17A
2.25	0.09	0.12	0.14	1.2	18	10.5	157	5	75	1.2	18	1365BA22A	1365BN22A	1365BE22A	1365BV22A
3.00	0.12	0.21	0.25	1	15	5	75	3	45	1	15	1365BA30A	1365BN30A	1365BE30A	1365BV30A
4.00	0.16	0.30	0.35	-	-	3	45	1	15	-	-	1365BA40A	1365BN40A	1365BE40A	1365BV40A
<b>"U" Construction</b>															
1.75	0.07	0.08	0.09	9	135	8	120	15	225	8	120	1365BA17U	1365BN17U	1365BE17U	1365BV17U
2.25	0.09	0.12	0.14	7	105	7	105	8	120	7	105	1365BA22U	1365BN22U	1365BE22U	1365BV22U
3.00	0.12	0.21	0.25	4	60	3.5	52	6	90	3.5	52	1365BA30U	1365BN30U	1365BE30U	1365BV30U
4.00	0.16	0.30	0.35	1.5	22	1.5	22	4	60	1.5	22	1365BA40U	1365BN40U	1365BE40U	1365BV40U

**General dimensions 1365**



øA	B	C	D	E	F	G	H	I
R1/4"	44	29	70	85	27	57	11	10

Measurements: mm

øA	B	C	D	E	F	G	H	I
R1/4"	0.94	1.14	1.76	3.35	1.06	2.24	0.43	0.39

Measurements: ins.

**Special constructions**

- AISI 304: change letter **B** for **S** in the catalog N<sup>o</sup>.  
Example: 1365SA302C
- AISI 316: change letter **B** for **I** in the catalog N<sup>o</sup>.  
Example: 1365IA302C.

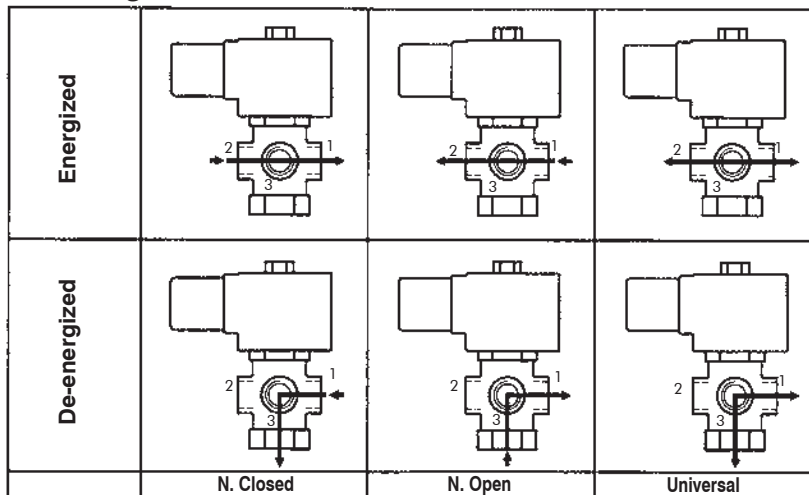
**Coil characteristics**

Electric power supply	Coil type	Power W	VA (volt-amper)		Maximum temperature		Available tensions
			Inrush	Holding	°C	°F	
AC 50 Hz	MF11C	11	40	22	155	311	1
	MH11C	11	40	22	180	356	1
AC 60 Hz	MF13C	13	45	27	155	311	2
	MH13C	13	45	27	180	356	2
DC	MH19C	19	19	19	180	356	3

1-(24, 110, 220)V    2-(24, 110, 120, 240)V    3-(12, 24, 110, 220)V

Options	Prefix	Suffix	Examples
Water, weather and saline corrosion proof coils.	<b>YC</b>		<b>YC1365BA17C</b>
Explosion and weather proof coils.	<b>ZC</b>		<b>ZC1365BA17C</b>
Weather proof housing.	<b>Y</b>		<b>Y1365BA17C</b>
Explosion and weather proof housing.	<b>Z</b>		<b>Z1365BA17C</b>
Manual operator: on the main orifice		<b>- M</b>	<b>1365BA17C-M</b>
NPT connections		<b>T</b>	<b>1365BA17CT</b>
Energized coil indicator light		See coils.	

**Flow diagrams**



**Recommendations for installation**

Place a strainer upstream the valve with a porosity ≤ 100 μ.  
Installation: in any position, preferably over horizontal pipeline with the coil upright.



**1375 Series**

**Main characteristics**

5/2-way compact valve.  
Servo-operated action.  
NAMUR mount.  
1/4" input and exhaust threaded connections.  
BSP or NPT.  
Forged brass body.  
Buna "N" seals.

**Applications:**

• Ideally suited as pilot valves for double acting cylinders and actuators with NAMUR mount.

Core tube SS. 304 and 316.  
Plunger and fixed core: SS. 430 F.  
Shading coil: copper.  
DIN connection encapsulated coil.  
IP65 and NEMA 4 protection.

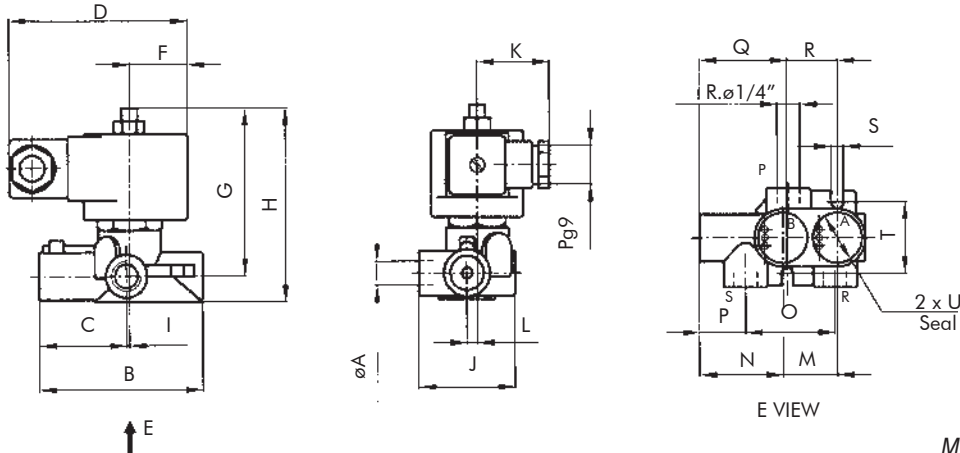
**Options:**

• Energized coil indicator light.  
• Explosion and weather proof coils and housings.

**Technical specifications**

Ø Orifice		Flow factor		Δp				Weight		Catalog Nº
mm	ins.	Kv	Cv	Minimum bar	Minimum psi	Maximum bar	Maximum psi	kg	Lb	
5.5	0.21	0.59	0.69	0.5	7.5	10	150	0.8	1.76	1375BA2N

**General dimensions 1375**



Measurements: mm

øA	B	C	D	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
R1/4	78	42	85	27	78	90	1.5	46	35	5	25	38	42.5	21	41	24	6	32	23.5

Measurements: ins.

øA	B	C	D	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
R1/4	3.07	1.65	3.35	1.06	3.07	3.54	0.06	1.81	1.38	0.2	0.98	1.5	1.67	0.83	1.61	0.94	0.24	1.26	0.93



**Main characteristics**

NC 3/2 ways compact valve.  
Direct or servo-operated action.  
NAMUR mount.  
1/4" input and exhaust threaded connections.  
BSP or NPT.  
Forged brass body.  
Buna "N" seals.

Core tube SS. 304 and 316.  
Plunger and fixed core: SS. 430 F.  
Shading coil: copper.  
Shape A DIN 43650 connection encapsulated coil.  
IP65 and NEMA 4 protection.

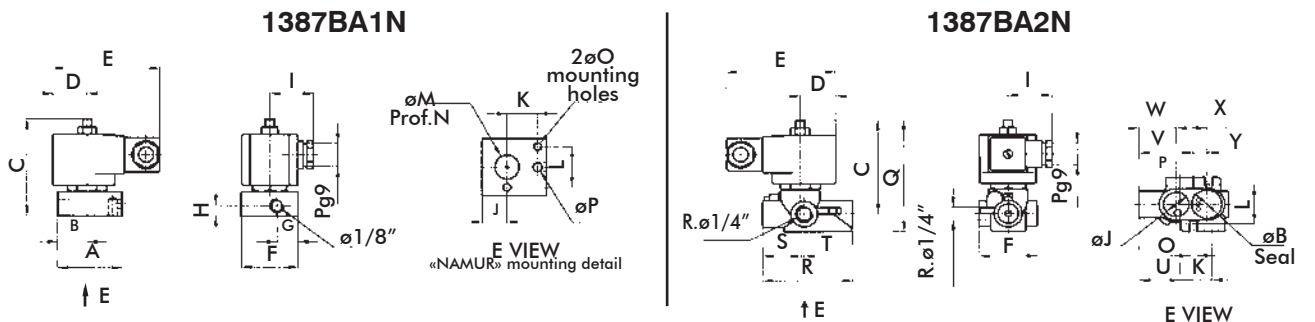
**Options:**

- Energized coil indicator light.
- Explosion and weather proof coils and housings.

**Technical specifications**

Ø Orifice		Flow factor		Δp				Weight		Catalog N°
				Minimum		Maximum				
mm	ins.	Kv	Cv	bar	psi	bar	psi	kg	Lb	
1.75	0.06	0.09	0.11	0	0	10	150	0.71	1.56	1387BA1N
5.50	0.21	0.59	0.69	0.5	7.5					0.8

**General dimensions**



Measurements: mm

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
51	23.5	77	27	85	45	17	8	35	20	24	32	19	1.2	6	7	92	70	30	3	31	42	29	23	12

Measurements: ins.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
2	0.93	3.03	1.06	3.35	1.77	0.67	0.31	1.38	0.79	0.94	1.26	0.75	0.05	0.24	0.28	3.62	2.76	1.18	0.12	1.22	1.65	1.14	0.91	0.47



**2050 Series**



LP - Low Power



SI - Intrinsically Safe Pilot.



ZC - Explosion Proof



M - Manual Operator

**Applications:**

Double acting cylinders or diaphragms valves.  
Lubricated or dry air-gas, water, light oil.  
Heavy-duty operation.

**Main characteristics**

5 ways, 2 positions, monostable or bistable.  
Slide servo-operated action.  
Internal or external pilot.  
BSP or NPT threaded connections.  
Aluminium, brass, stainless steel body.  
Buna N seals for neutral fluids up to 80 °C (176 °F).  
FKM seals for other uses.  
PTFE sleeve for instrument air and dry gases.  
Core tube SS. 304.  
Plunger and fixed core: SS. 430 F.  
Shape A DIN 43650 connection encapsulated coils.  
IP65 and NEMA 4 protection.

**Options:**

Low power pilot with manual operator.  
Intrinsically Safe Pilot.

ATEX 6122X EEx ia IIC T6 - IP65.

Explosion and / or weather proof coils and housings.

CA: ATEX II 2GD Ex mbII T5 - IP66.

CC: ATEX II 2GD Ex mbII T4 - IP66.

Suffix	Main line supply pressure				Forms of work
	Minimum		Maximum		
	bar	psi	bar	psi	
Electric operator with internal pilot					
A	1	15	8	116	Spring return
B	0.5	7.5			Pneumatic return
C	0.5	7.5			Bistable
Electric operator with independent pilot					
G	0	0	8	116	Spring return
I					Bistable

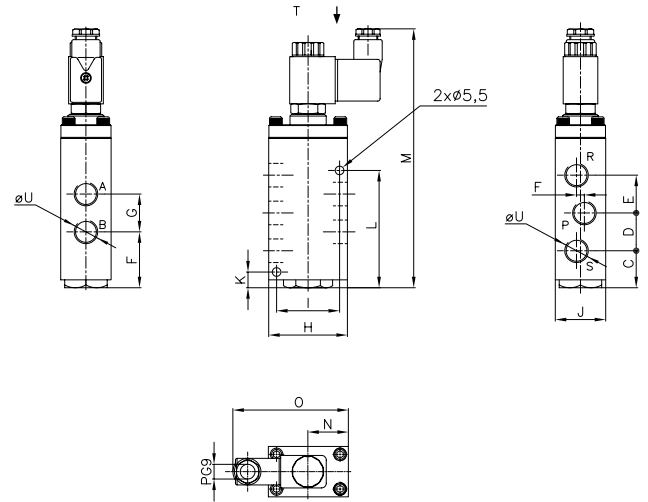
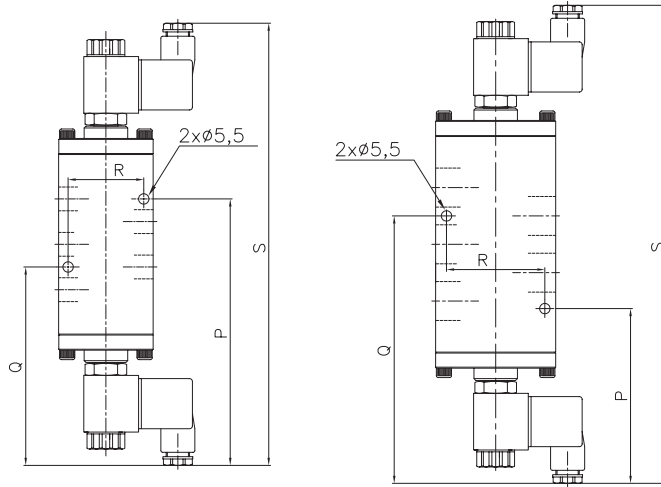
**Technical specifications**

ø Pipe ins.	ø Orifice		Flow Factor		Buna "N" Seals		FKM Seals	
	mm	ins.	Kv	Cv	No sleeve	With sleeve	No sleeve	With sleeve
<b>Aluminium body</b>								
1/4"	7	0.27	0.80	0.94	2050LA02*	2050LTA02*	2050LV02*	2050LTV02*
3/8"	7	0.27	0.96	1.12	2050LA03*	2050LTA03*	2050LV03*	2050LTV03*
1/2"	10	0.39	1.90	2.22	2050LA04*	2050LTA04*	2050LV04*	2050LTV04*
<b>Brass body</b>								
1/4"	7	0.27	0.80	0.94	2050BA02*	2050BTA02*	2050BV02*	2050BTV02*
3/8"	7	0.27	0.96	1.12	2050BA03*	2050BTA03*	2050BV03*	2050BTV03*
1/2"	10	0.39	1.90	2.22	2050BA04*	2050BTA04*	2050BV04*	2050BTV04*
<b>Stainless Steel Body **</b>					<b>AISI 304</b>	<b>AISI 316</b>	<b>AISI 304</b>	<b>AISI 316</b>
1/4"	7	0.27	0.80	0.94	2050SA02*	2050IA02*	2050SV02*	2050IV02*
3/8"	7	0.27	0.96	1.12	2050SA03*	2050IA03*	2050SV03*	2050IV03*
1/2"	10	0.39	1.90	2.22	2050SA04*	2050IA04*	2050SV04*	2050IV04*

(\*) The suffix corresponding to the operation manner must be added to the catalog number according to the table, Example: 2050LA02A (Spring return).

(\*\*) Stainless steel bodies only build PTFE sleeve.

**General dimensions 2050**



T View

**Bistable - Double solenoid**

Connection U	P	Q	R	S
R.1/4"	141	105	40	234
R.3/8"				
R.1/2"	92	141	52	253

Measurements mm.

Connection U	P	Q	R	S
R.1/4"	5.55	4.13	1.57	9.21
R.3/8"				
R.1/2"	3.62	5.55	2.04	9.96

Measurements ins.

**Monostable - Simple solenoid**

Connection U	C	D	E	F	G	H	I	J	K	L	M	N	O
R.1/4"	23.5	24	24	35.5	24	50	40	32	10	75	166	25	73
R.3/8"													
R.1/2"	22.5	33	33	38	34	63.5	40	35	39	95	194	32	81

Measurements mm.

Connection U	C	D	E	F	G	H	I	J	K	L	M	N	O
R.1/4"	0.92	0.94	0.94	1.39	0.94	1.96	1.57	1.25	0.39	2.95	6.53	0.98	2.87
R.3/8"													
R.1/2"	0.88	1.29	1.29	1.49	1.33	2.5	1.57	1.37	1.53	3.74	7.63	1.25	3.18

Measurements ins.

**Coil characteristics**

Electric power supply	Coil Type	Power W	VA (volt-ampere)		Maximum Temp.		Available tensions
			Inrush	Holding.	°C	°F	
CA 50 Hz	GF06C	6	10.8	7.5	155	311	Ver 1
CA 60 Hz	GF06C	6	12.9	8.0	155	311	Ver 2
	CC	6	6	6	155	311	Ver 3
CA 50 Hz	G2ZC	2	4.8	3.2	80	176	Ver 1
CA 60 Hz	G2ZC	1.7	4	2.7	80	176	Ver 2
	CC	3.8	3.8	3.8	80	176	Ver 3
12VCC	LP12	1	80 mA		80	176	12V
24VCC	LP24	1	42 mA		80	176	24V

1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

For the electrical characteristics of the pilot valve Intrinsically Safe (SI) see page D-22/D-23.

Options	Prefix	Suffix	Examples
Manual operator		- M	2050BA02A-M
Low power Pilot. Pulse manual operator. (*)	LP		LP2050BA02A
Explosion and weather proof coils.	ZC		ZC2050BA02A
Explosion proof housing and weather and pulse manual operator.	ZC	- M	ZC2050BA02A-M
Intrinsically Safe Pilot. Pulse manual operator. (*) (**)	SI		SI2050BA02A
NPT connections		T	2050BA02AT

(\*) Only for valves with aluminum bodies and brass.

(\*\*) See additional information for SI, D-22 / D-23 page.

**Recommendations for installation**

Place a strainer upstream the valve with a porosity ≤ 100 μ. Installation: in any position. It is advisable to use lubrication with valves which do not have a PTFE sleeve.



**2051 Series**

**New!!  
iNew!**



**LP - Low Power**



**SI - Intrinsically Safe Pilot.**



**ZC - Explosion Proof**



**M - Manual Operator**

**Applications:**

Single acting cylinders or diaphragms valves.  
Lubricated or dry air-gas, water, light oil.  
Heavy-duty operation.

**Main characteristics**

3 way, 2 position, normally open, or normally closed.  
Slide servo-operated action.  
Internal or external pilot: pneumatic or electropneumatic.  
BSP or NPT threaded connections.  
Aluminium, brass, stainless steel body.  
Buna N seals for neutral fluids up to 80 °C (176 °F).  
FKM seals for other uses.  
PTFE sleeve for instrument air and dry gases.  
Shape A DIN 43650 connection encapsulated coils.  
IP65 and NEMA 4 protection.

**Options:**

Low power pilot with manual operator.  
Intrinsically Safe Pilot.

**Ex** ATEX 6122X EEx ia IIC T6 - IP65.

Explosion and / or weather proof coils and housings.

**CA:** **Ex** ATEX II 2GD Ex mbII T5 - IP66.

**CC:** **Ex** ATEX II 2GD Ex mbII T4 - IP66.

Suffix	Main line supply pressure				Forms of work
	Minimum		Maximum		
	bar	psi	bar	psi	
<b>Electric operator with internal pilot</b>					
A	1	15	10	150	N.C. Spring return
B	0.5	7.5			N.C. Pneumatic return
C	0.5	7.5			Bistable
G	1	15			N.O. Spring return
H	0.5	7.5			N.O. Pneumatic return
<b>Electric operator with independent pilot</b>					
K	0	0	10	150	N.O. Spring return
N					N.O. Spring return
M					Bistable

**Technical specifications**

Ø Connection	Ø Orifice		Flow Factor		Buna "N" Seals		FKM Seals	
	mm	ins.	Kv	Cv	No sleeve	With sleeve	No sleeve	With sleeve
<b>Aluminium body</b>								
1/4"	7	0.27	0.80	0.94	2051LA02*	2051LTA02*	2051LV02*	2051LTV02*
3/8"	7	0.27	0.96	1.12	2051LA03*	2051LTA03*	2051LV03*	2051LTV03*
1/2"	10	0.39	1.90	2.22	2051LA04*	2051LTA04*	2051LV04*	2051LTV04*
<b>Brass body</b>								
1/4"	7	0.27	0.80	0.94	2051BA02*	2051BTA02*	2051BV02*	2051BTV02*
3/8"	7	0.27	0.96	1.12	2051BA03*	2051BTA03*	2051BV03*	2051BTV03*
1/2"	10	0.39	1.90	2.22	2051BA04*	2051BTA04*	2051BV04*	2051BTV04*

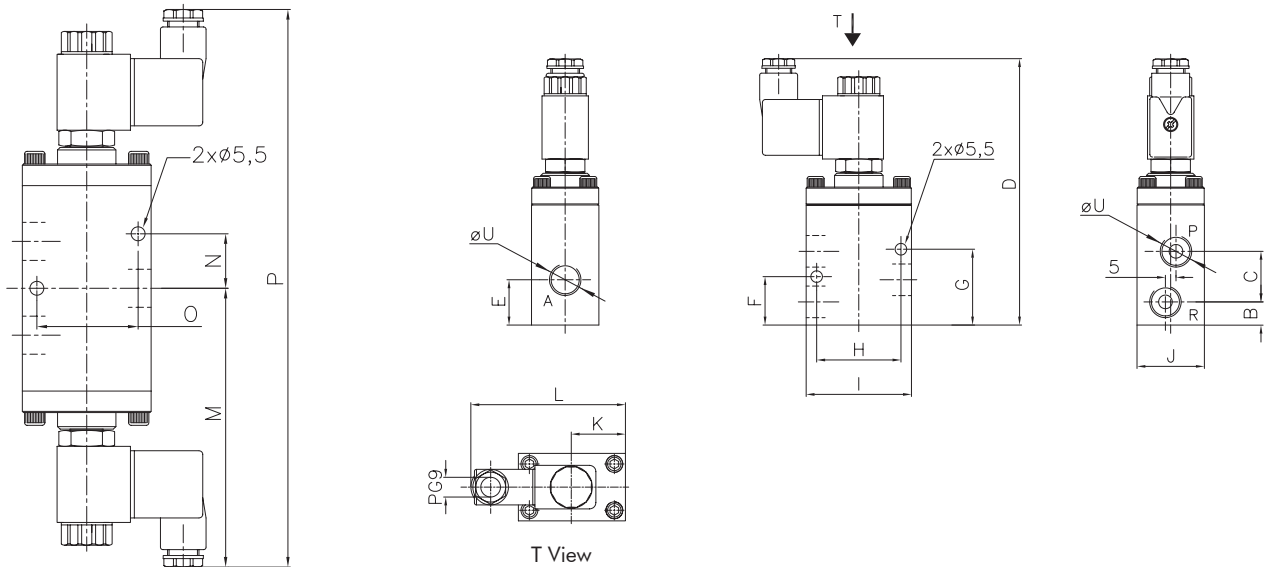
<b>Stainless Steel Body **</b>					<b>AISI 304</b>	<b>AISI 316</b>	<b>AISI 304</b>	<b>AISI 316</b>
1/4"	7	0.27	0.80	0.94	2051SA02*	2051IA02*	2051SV02*	2051IV02*
3/8"	7	0.27	0.96	1.12	2051SA03*	2051IA03*	2051SV03*	2051IV03*
1/2"	10	0.39	1.90	2.22	2051SA04*	2051IA04*	2051SV04*	2051IV04*

(\*) The suffix corresponding to the operation manner must be added to the catalog number according to the table, Example: 2051LA02A (NC Spring return).

(\*\*) Stainless steel bodies only build PTFE sleeve.



**General dimensions 2051**



**Bistable - Double solenoid**

Connection U	M	N	O	P
R.1/4"	110	22	40	220
R.3/8"				
R.1/2"	123	30	52	246

Measurements mm.

Connection U	M	N	O	P
R.1/4"	4.33	0.86	1.57	8.66
R.3/8"				
R.1/2"	4.84	1.18	2.04	9.68

Measurements ins.

**Monostable - Simple solenoid**

Connection U	B	C	D	E	F	G	H	I	J	K	L
R.1/4"	11	24	126	22	23	36	40	50	32	25	73
R.3/8"											
R.1/2"	15	31	145	31	31	9	52	63.5	35	32	79

Measurements mm.

Connection U	B	C	D	E	F	G	H	I	J	K	L
R.1/4"	0.43	0.94	4.96	0.86	0.90	1.41	1.57	1.96	1.25	0.98	2.87
R.3/8"											
R.1/2"	0.59	1.22	5.70	1.22	1.22	0.35	2.04	2.5	1.37	1.25	3.11

Measurements ins.

**Coil characteristics**

Electric power supply	Coil Type	Power W	VA (volt-ampere)		Maximum Temp.		Available tensions
			Inrush	Holding.	°C	°F	
CA 50 Hz	GF06C	6	10.8	7.5	155	311	Ver 1
CA 60 Hz	GF06C	6	12.9	8.0	155	311	Ver 2
CC	GF06C	6	6	6	155	311	Ver 3
CA 50 Hz	G2ZC	2	4.8	3.2	80	176	Ver 1
CA 60 Hz	G2ZC	1.7	4	2.7	80	176	Ver 2
CC	G4ZC	3.8	3.8	3.8	80	176	Ver 3
12VCC	LP12	1	80 mA		80	176	12V
24VCC	LP24	1	42 mA		80	176	24V

1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

For the electrical characteristics of the pilot valve Intrinsicly Safe (SI) see page D-22/D-23.

**Recommendations for installation**

Place a strainer upstream the valve with a porosity ≤ 100 μ. Installation: in any position. It is advisable to use lubrication with valves which do not have a PTFE sleeve.

Opciones	Prefijo	Sufijo	Ejemplos
Manual operator bistable.		- M	2051BA02A-M
Low power Pilot. Pulse manual operator. (*)	LP		LP2051BA02A
Explosion and weather proof coils.	ZC		ZC2051BA02A
Explosion proof housing and weather and pulse manual operator.	ZC	- M	ZC2051BA02A-M
Intrinsicly Safe Pilot. Pulse manual operator. (*)(**)	SI		SI2051BA02A
NPT connections.		T	2051BA02AT

(\*) Only for valves with aluminum bodies and brass.

(\*\*) See additional information for SI, D-22 / D-23 page.



**2095 Series**



**LP - Low Power**



**SI - Intrinsically Safe Pilot.**



**ZC - Explosion Proof**



**(-B) Mounting base.**

**Applications:**

Ideally suited to command cylinders and actuators single and double acting with NAMUR mounting. Optional with threaded base.

**Main characteristics**

Compact Valves::  
 Versions 5/2 way.  
 Versions 3/2 way NC.  
 Servo-operated.  
 NAMUR mounting.  
 Threaded base 1/4" BSP or NPT (optional).  
 Input and threaded download to 1/4" BSP or NPT.  
 Forged brass body.  
 Buna N seals.  
 Admissible Fluids: Air or neutral gas.  
 Capsulated coil connection DIN 43650 form B.

**Optional**

Low power pilot with manual operator.  
 Intrinsically Safe Pilot.

**ATEX 6122X EEx ia IIC T6 - IP65.**

Explosion and / or weather proof coils and housings.

**CA:** **ATEX II 2GD Ex mbII T5 - IP66.**

**CC:** **ATEX II 2GD Ex mbII T4 - IP66.**

**Technical specifications**

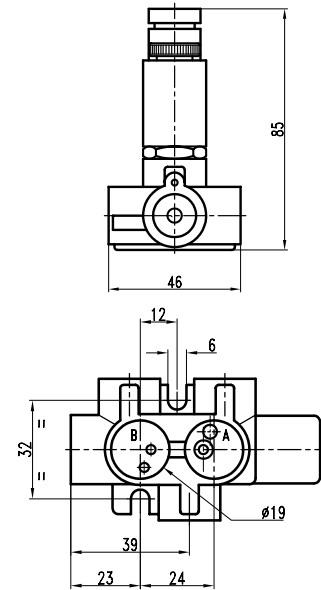
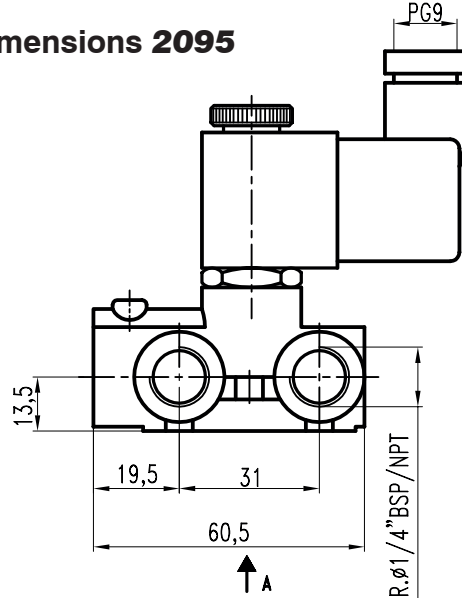
**3/2 ways**

Connection	Ø Orifice		Flow Factor		ΔP				Maximum Temperature		Weight		Catalog N°
					Minimum		Maximum		°C	°F	Kg	Lb	
	mm	ins.	Kv	Cv	bar	psi	bar	psi					
1/4" BSP	3	0.12	0.18	0.21	0.8	12	8	116	80	176	0.4	0.9	2095BA2N3
1/4" NPT													2095BA2N3T
With mounting base with threaded side connections 1/4"- BSP: <b>2095BA2N3-B</b> / NPT: <b>2095BA2N3-BT</b>													

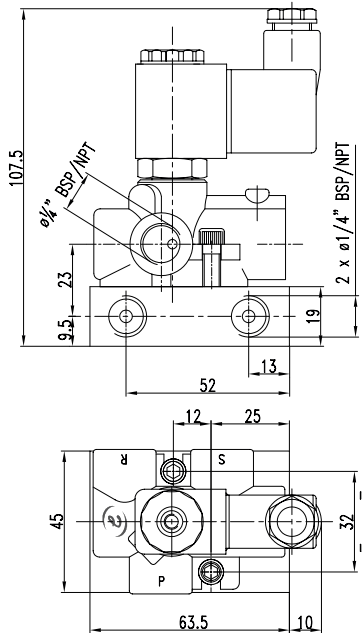
**5/2 ways**

Connection	Ø Orifice		Flow Factor		ΔP				Maximum Temperature		Weight		Catalog N°
					Minimum		Maximum		°C	°F	Kg	Lb	
	mm	ins.	Kv	Cv	bar	psi	bar	psi					
1/4" BSP	3	0.12	0.18	0.21	0.8	12	8	116	80	176	0.4	0.9	2095BA2N5
1/4" NPT													2095BA2N5T
With mounting base with threaded side connections 1/4"- BSP: <b>2095BA2N5-B</b> / NPT: <b>2095BA2N5-BT</b>													

**General dimensions 2095**



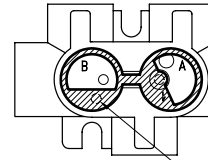
**With threaded base dimensions 2095**



**2095 SERIES SOLENOID VALVE**

Joint position

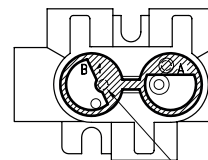
**Version 2095BA2N5 (5 ways):**  
Put side 1 of joint in cavity A.



BOTTOM VIEW

Sealed hole

**Version 2095BA2N3 (3 ways):**  
Put side 1 of joint in cavity B.



BOTTOM VIEW

Sealed hole

**Coil characteristics**

Electric power supply	Coil Type	Power W	VA (volt-ampere)		Maximum Temp.		Available tensions
			Inrush	Holding.	°C	°F	
CA 50 Hz	GF06C	6	10.8	7.5	155	311	Ver 1
CA 60 Hz	GF06C	6	12.9	8.0	155	311	Ver 2
	CC	6	6	6	155	311	Ver 3
CA 50 Hz	G2ZC	2	4.8	3.2	80	176	Ver 1
CA 60 Hz	G2ZC	1.7	4	2.7	80	176	Ver 2
	CC	3.8	3.8	3.8	80	176	Ver 3
12VCC	LP12	1	80 mA		80	176	12V
24VCC	LP24	1	42 mA		80	176	24V

1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

For the electrical characteristics of the pilot valve Intrinsically Safe (SI) see page D-22/D-23.

Options	Prefix	Examples
Low power pilot. Pulse manual operator.	LP	LP2095BA2N3
Explosion and weather proof coils.	ZC	ZC2095BA2N3
Intrinsically Safe Pilot. (*) Pulse manual operator.	SI	SI2095BA2N3

(\*) See additional information for SI, D-22 / D-23 page.

**Recommendations for installation:**

Place a strainer upstream the valve with a porosity  $\leq 100 \mu$ .  
Installation: in any position, preferably over horizontal pipeline with the coil upright.

A minimum amount of energy is needed to produce the ignition of a combustible and oxidizing blend. The Intrinsically safe is a preventive method applied to feeding energy of a certain device, in this case a solenoid valve, preventing to reach this value, both in normal conditions and fail situations. The usage of intrinsically safe solenoid valves, results in many considerable advantages towards systems in which other explosion containing methods are applied, therefore using the intrinsically safe option will not produce spark as standard explosion proof contained methods.

The intrinsically safe valve is not enough to accomplish all the safety requirements, it also has to be fed from a electrical source delivered from an associated device, located **outside the danger area**, this assures that **inside the explosive area** even in presence of a shortcut the energy values will maintain below the deflagration level.

For a better understanding we should introduce some concepts of the standard ANSI/ISA-RP12.06.01-2003.

**Intrinsically safe device:** Is any device in which all its circuits are intrinsically safe. They can be active devices that generate electrical energy restricted to a 1.5 V, current of 100mA and a power smaller than 25mW or passives that do not dissipate energy beyond 1.3W.

**Associated device:** Any device in which their circuits aren't necessarily intrinsically safe and are used to maintain intrinsically safe within the area classified as explosive.

**Intrinsically safe system:** it consist of a device associated installed within a **Secure area** (or inside an area classified as Division 2 / zone 2), wherein connects by wire to an intrinsically safe device installed within an area classified as **Division 1 (zone 1 or zone 0)**.

**Intrinsically safe barriers:** These are the most commonly used associated devices, Connected between the intrinsically safe instrument and its controller. The main propose is restricting the energy sent towards the area under normal operation condition or under failure.

There are two types:

**Passive Intrinsically safe barriers:** employing Zener diodes to limit the tension near the classified area, in addition of resistors and fuses to restrict the flow of electricity. In order to use this kind of barrier it must exists a common equipotential ground system separated from the factory one. Besides the installed device in the danger area must be isolated from other kinds of grounds.

### Galvanic barriers

it's the best option, when there is **no** available equipotential ground system or the field devices don't gather to it, because these provides a floating supply and the same signal to the transmitter, thanks to an isolating transformer.

This kind of barrier provides a full electrical isolation between the inputs, the outputs, supply and immunity to the problems associated to ground connections of Zener barriers and their ability to realize any additional conditioning to the signal, making it more versatile and their application as a protection method easier and more reliable.

There are other kinds of devices associated that are not necessarily barriers of intrinsically safe, but they have energy limiting circuits similar to these barriers. For example a PLC that is not intrinsically safe by itself, has to be installed in a **secure area**, but has certain modules for inlet and outlet signals of intrinsically safe instruments.

When they are evaluated separately the I.S. instrument or device (instrument or electro valve) and the element associated of I.S. (security barrier), the electrical values called identity parameters, must be compatible, depending on it the correct combination when they are assembled.

The criteria employed that takes place in such combinations is that voltage and electricity that could be absorbed from a I.S. valve, considering failure conditions, must be equal or bigger to the voltage and electricity provided from the IS barrier.

In addition the capacity and maximum inductance including wiring that the I.S. instrument is capable to store without protection, must be equal or smaller to the capacity and inductance connected to the IS device associated.

### Summary:

**$V_i \max \geq V_{suministrated}$**

**$I_i \max \geq I_{suministrated}$**

**$L_i + L_{wire} \leq L_a$  (associated device)**

**$C_i + C_{wire} \leq C_a$  (associated device)**

Achieving these criteria, then these could be combined, the I.S. instrument or equipment with their associated I.S. device.

## Electrical characteristics of intrinsically safety pilot valve

### For 24 V

**U nominal voltage** 24 VDC

**U min** 18 VDC

**P maximum power:** 0,70 W.

**I deflagration:** 55,5 mA

**Maximum current:**

**I max:** 37 mA

(maximum current which may flow through the coil).

**C internal capacity:** 0

**Resistance at room temperature:**  $+20\text{ }^{\circ}\text{C} = 580\ \Omega \pm 7\%$ .

**Resistance at room temperature:**  $-10\text{ }^{\circ}\text{C} \leq 476\ \Omega$

**Resistance at room temperature:**  $+50\text{ }^{\circ}\text{C} \leq 690\ \Omega$ .

**Max. U** (EEx source) at the circuit terminals: 28 V

### For 12 V

**U nominal voltage** 12 VDC

**U min** 9 VDC

**P maximum power:** 0,70 W.

**I deflagration:** 111 mA

**Maximum current:**

**I max:** 74 mA

(maximum current which may flow through the coil).

**C internal capacity:** 0

**Resistance at room temperature:**  $+20\text{ }^{\circ}\text{C} = 146\ \Omega \pm 7\%$ .

**Resistance at room temperature:**  $-10\text{ }^{\circ}\text{C} \leq 119\ \Omega$ .

**Resistance at room temperature:**  $+50\text{ }^{\circ}\text{C} \leq 174\ \Omega$ .

**Max. U** (EEx source) at the circuit terminals: 18 V

## Operating Conditions

- Maximum operating pressure: 7 bar.
- Ambient temperature  $-10\text{ }^{\circ}\text{C}$  to  $+50\text{ }^{\circ}\text{C}$
- Compressed air Maximum temperature:  $+50\text{ }^{\circ}\text{C}$
- Authorized Fluid: dry air, class 4, according to ISO 8573-1 (or inert gas)

- Maximum operating frequency: 2 Hz
- Duty cycle 100% ED
- Strictly observe polarities electrical connection.
- Channel leaks outside the ATEX.
- Other features: see catalog.



**2024 Series**

**Applications:**

- These valves control small double acting cylinder not larger than 4" in diameter.

**Main characteristics**

For compressed air and other neutral gases.  
 Forged brass body.  
 Buna "N" seals and seats.  
 BSP or NPT 1/4" threaded connections.  
 Servo operated action.  
 Shape A DIN 43650 connection encapsulated coil  
 IP65 NEMA 4 protection.  
 Maximum temperature: 80 °C.

**Options:**

- Energized coil indicator light.
- Explosion and weather proof coils and housings.

**Technical specifications**

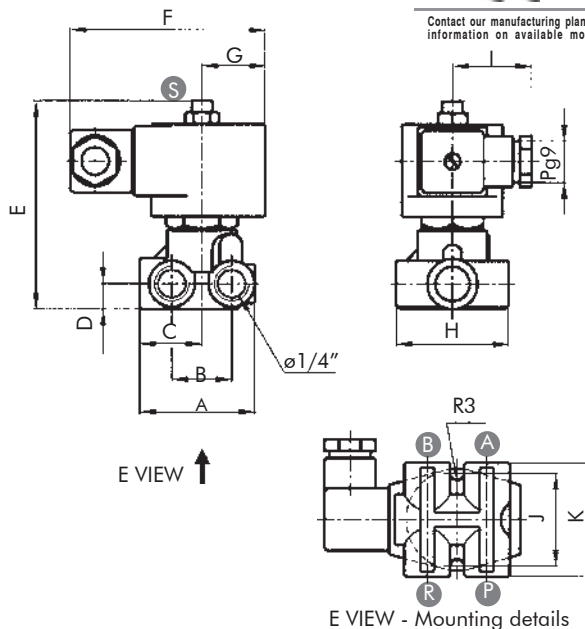
Ø Pipe ins.	Ø Orifice		Flow factor		Δp				Manual Operator	Weight		Catalog N°	
					Minimum		Maximum			kg	Lb	BSP	NPT
					bar	psi	bar	psi					
1/4"	1.75	0.07	0.08	0.09	0.8	12	10	150	No Yes	0.7	1.55	2024BA2 2024BA2-M	2024BA2T 2024BA2T-M

Options	Prefix	Suffix	Examples
Water, weather and saline corrosion proof coils.	<b>YC</b>		<b>YC2024BA2</b>
Explosion and weather proof coils.	<b>ZC</b>		<b>ZC2024BA2</b>
Weatherproof housing	<b>Y</b>		<b>Y2024BA2</b>
Explosion and weather proof housing.	<b>Z</b>		<b>Z2024BA2</b>
NPT connections		<b>T</b>	<b>2024BA2T</b>
Energized coil indicator light	See coils.		

**General dimensions 2024**



Contact our manufacturing plant for information on available models



øA	A	B	C	D	E	F	G	H	I	J	K
R 1/4"	49	26	27	11	91	85	27	49	35	40	49

Measurements: mm

øA	A	B	C	D	E	F	G	H	I	J	K
R 1/4"	1.92	1.02	1.06	0.43	3.58	3.34	1.06	1.92	1.37	1.57	1.92

Measurements: ins.

**Coil characteristics**

Electric power supply	Coil type	Power W	VA (volt-amper)		Maximum temperature		Available tensions
			Inrush	Holding	°C	°F	
AC 50 Hz	MF11C	11	40	22	155	311	1
	MH11C	11	40	22	180	356	1
AC 60 Hz	MF13C	13	45	27	155	311	2
	MH13C	13	45	27	180	356	2
DC	MH19C	19	19	19	180	356	3

1-(24,110,220)V    2-(24,110,120,240)V    3-(12,24,110,220)V

**Recommendations for installation**

Place a strainer upstream the valve with a porosity ≤ 100µ. It is advisable to use lubrication with compressed air. Installation: in any position. Preferably over horizontal pipeline with the coil upright.



## Valves and Devices for Special Service

		<b>Pages</b>
<b>1310 Series</b>	Pneumatically operated globe valves.	<b>E-2 / E-3</b>
<b>1311 Series</b>	Pneumatically operated diaphragm valves.	<b>E-4 / E-5</b>
<b>1360 Series</b>	Solenoid valves for corrosive fluids.	<b>E-6 / E-7</b>
<b>1369 Series</b>	Manual reset device for solenoid valves	<b>E-8 / E-9</b>
<b>2073 Series</b>	Solenoid valves for dust collector systems.	<b>E-10</b>
<b>1372 Series</b>	Pneumatic operator.	<b>E-11</b>
<b>2094 Series</b>	Solenoid valves for CNG (VNG).	<b>E-12 / E-13</b>
<b>1370 Series</b>	Pulse operated solenoid unit.	<b>E-14</b>
<b>1398 Series</b>	Digital condensation removal timer.	<b>E-15</b>
<b>"UC" Series</b>	Solenoid valves for cryogenic fluids.	<b>E-16 / E-17</b>
<b>"CP" Series</b>	Power control.	<b>E-18</b>

**New products** 

**NEW SOLENOID VALVE MODELS**  
1397Series

- For Natural Gas Compressors at CNG gas stations.
- For CNG Automotive Use.

To request a technical bulletin for models that are not included in this catalog, please contact **JEFFERSON** at:  
**info@jeffersonvalves.com**



**1310 Series**

**Applications:**

These are used when there are no solenoid valves available due to size, pressure, working temperature, type of fluid or special service conditions (explosive areas, corrosive fluids, etc.)

**Main characteristics**

Normally closed or normally open.  
 Direct acting. Operated by double acting pneumatic or hydraulic cylinder (air, water, light oils).  
 Body: bronze, carbon steel, stainless steel, etc.  
 BSP or NPT threaded or flanged connections.  
 Buna "N", PTFE, stainless steel seats.

Minimum auxiliary pressure: 1.5 bar.  
 5-Way, 2 or 3 position pilot valve.  
 DIN 43650 connection encapsulated coil.  
 IP65 and NEMA 4 protection.  
 Standard constructions to be used with water, air, light oils, other neutral liquids or steam up to 200 °C.

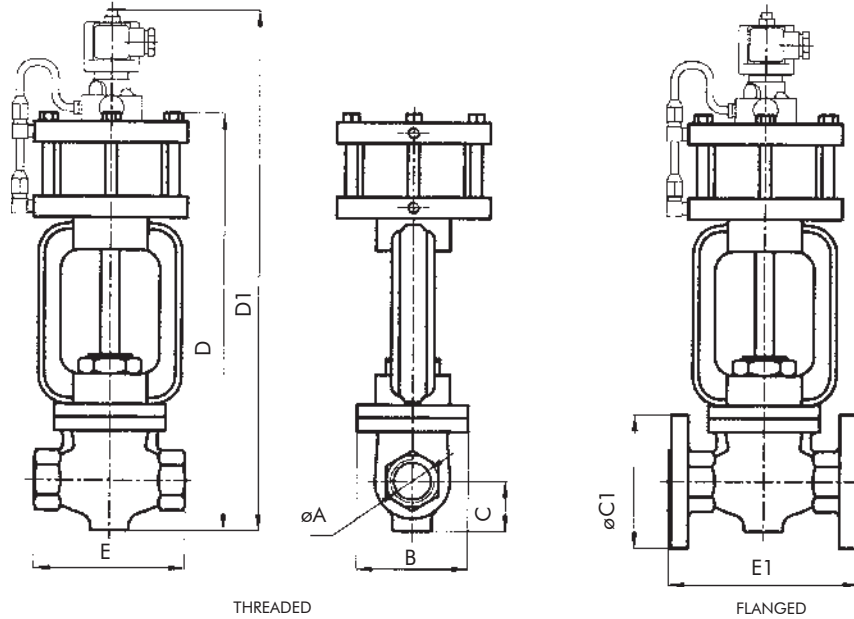
**Technical specifications**

Ø Pipe ins.	Ø Orifice		Flow Factor		Δp maximum		Ø Cylinder		Catalog N° according to body and seat material.		
									Body material		
	Bronze	Carbon Steel	AISI304								
									Seat material		
mm	ins.	Kv	Cv	bar	psi	mm	ins.	Buna N (*)	S.S.	AISI304	
3/4"	19	0.75	6	7	20	300	76.2	3"	1310BA06D3	1310AS06D3	1310SS06D3
1"	26	1.02	11	13	20	300			1310BA08D3	1310AS08D3	1310SS08D3
1.1/2"	32	1.26	15	18	10	150			1310BA12D3	1310AS12D3	1310SS12D3
2"	38	1.5	23	27	10	150	101.6	4"	1310BA16D4	1310AS16D4	1310SS16D4
2.1/2"	76	2.99	66	77	2	30			1310BA20D4	1310AS20D4	1310SS20D4
3"	76	2.99	85	99	10	150	152.4	6"	1310BA24D6	1310AS24D6	1310SS24D6
4"	100	3.94	150	176	2	30			--	1310AS32BD6	1310SS32BD6
6"	150	5.91	320	374	4	60	203.2	8"	--	1310AS48BD8	1310SS48BD8
8"	200	7.87	600	702	3.5	53			254	10"	--

(\*) For PTFE seats change **A** for **T**. Example: 1310BT06D3  
**Note:** Maximum temp.: with PTFE or stainless steel seat 200 °C - with Acrylo-nitrile N seat 80 °C.  
 Maximum pressure: Maximum pressures are determined considering an auxiliary pressure of 5 bar.



**General dimensions**



ø A	B	C	ø C1	D	D1	E	E1
3/4"	150	32	99	317	408	100	117
1"	157	41	108	335	426	122	127
1.1/2"	173	49	127	358	449	139	165
2"	180	51	152	394	485	149	203
2.1/2"	163	89	178	466	557	224	216
3"	163	89	191	466	557	224	241
4"	--	--	229	570	661	--	292
6"	--	--	279	673	764	--	406
8"	--	--	343	770	861	--	495

Measurements: mm

ø A	B	C	ø C1	D	D1	E	E1
3/4"	5.90	1.26	3.89	12.48	16.06	3.93	4.60
1"	6.18	1.61	4.25	13.18	16.77	4.80	5.00
1.1/2"	6.81	1.92	5.00	14.04	17.67	5.47	6.49
2"	7.08	2.00	5.98	15.51	19.09	5.86	7.99
2.1/2"	6.41	3.50	7.00	18.34	21.92	8.81	8.50
3"	6.41	3.50	7.52	18.34	21.92	8.81	9.48
4"	--	--	9.01	22.44	26.02	--	11.49
6"	--	--	10.98	26.49	30.07	--	15.98
8"	--	--	13.50	30.31	33.89	--	19.48

Measurements: ins.

**Coil characteristics**

Electric power supply	Coil type	Power W	VA (volt-amp)		Maximum temperature		Available tensions
			Inrush	Holding	° C	° F	
AC 50 Hz	MF11C	11	40	22	155	311	1
	MH11C	11	40	22	180	356	1
AC 60 Hz	MF13C	13	45	27	155	311	2
	MH13C	13	45	27	180	356	2
DC	MH19C	19	19	19	180	356	3

1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

**Special constructions:**  
Consult **Jefferson**.

**Pilot solenoid valves (supplied)**

For 3, 4, 6" cylinders: 2024BA2 (2 positions)  
1339BA2 (3 positions)  
For 6, 8, 10" cylinders: 1350BA2 (2 positions)  
1339BA2 (3 positions)

Options	Prefix	Suffix	Examples
Water, weather and saline corrosion proof coils.	<b>YC</b>		YC1310BT12D3
Explosion and weather proof coils.	<b>ZC</b>		ZC1310BT12D3
Weather proof housing	<b>Y</b>		Y1310BT12D3
Explosion and weather proof housing.	<b>Z</b>		Z1310BT12D3
NPT connections		<b>T</b>	1310BT12TD3
Flanged connections		<b>B</b>	1310BT12BD3
Energized coil indicator light	See coils		

**Recommendations for installation**

Place a strainer upstream the **pilot valve** with a porosity  $\leq 50\mu$  if the fluid is gas, or not greater than  $100\mu$  if the fluid is water. It is advisable that the air or other gas employed is lubricated. It is also recommended to place an adequate strainer on the main line to prevent suspended solid elements from settling on the valve seats, thus hindering a complete shutoff. Mounting: Preferably over horizontal pipeline with the operator upright.



**1311 Series**

**Applications:**

Fluids with suspended solids, corrosive chemical products, vacuum systems, food products, large flows of liquids and gases, etc.

**Main characteristics**

Normally closed or normally open.  
Direct acting. Operated by double acting pneumatic or hydraulic cylinder (air, water, light oils).  
Body: cast iron, carbon steel, stainless steel, plastic coated, etc.  
BSP or NPT threaded or flanged connections.  
Diaphragm: rubber, FKM, neoprene, PTFE, etc.  
5-way, 2 or 3 position pilot valve.

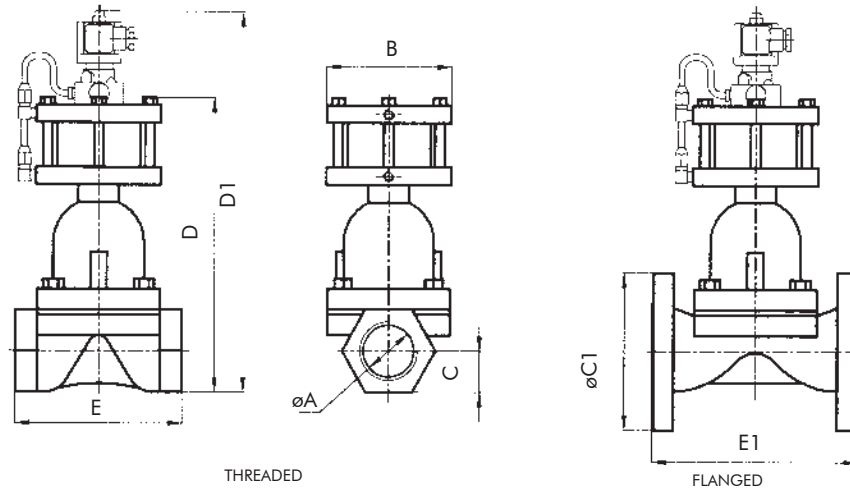
DIN 43650 connection encapsulated coil. IP65 and NEMA 4 protection.  
Minimum auxiliary pressure: 1.5 bar.  
No pressure differential required to operate.  
Standard constructions to handle water, air, light and heavy oils and other liquids or steam.  
Fluids: corrosive, viscose with suspended solids, etc.

**Technical specifications**

Ø Pipe	Coef. Kv. m <sup>3</sup> /h	Δp maximum bar	Ø Cylinder in inches	Catalog N° according to body material		
				Iron	AISI 316	Ebonite coated
3/4"	8	7	3	1311FA06D3	1311IT06D3	1311EV06D3
1"	12	5		1311FA08D3	1311IT08D3	1311EV08D3
1,1/2"	31	5	4	1311FA12D4	1311IT12D4	1311EV12D4
2"	60	3		1311FA16D4	1311IT16D4	1311EV16D4
2,1/2"	89	5	6	1311FA20D6	1311IT20D6	1311EV20D6
3"	127	2		1311FA24D6	1311IT24D6	1311EV24D6
4"	226	3	8	1311FA32D8	1311IT32D8	1311EV32D8
5"	299	2		1311FA40D8	1311IT40D8	1311EV40D8
6"	425	2	10	1311FA48D10	1311IT48D10	1311ET48D10

**Note:** Diaphragms are made of natural rubber, PTFE or FKM for iron, stainless steel and ebonite coated bodies respectively.  
Valves can be provided with other types of diaphragms or body materials upon request.  
Maximum pressures are established with an auxiliary pressure of 5 bar.

**General dimensions**



ø A	B	C	ø C1	D	D1	E	E1
3/4"	125	19	99	195	275	100	117
1"	125	21	108	215	295	122	127
1.1/2"	125	29	127	265	345	139	160
2"	145	37	152	315	395	149	190
2.1/2"	145	43	178	340	420	224	216
3"	200	48	191	390	470	224	254
4"	200	--	229	500	580	--	305
6"	270	--	279	660	740	--	406
8"	330	--	343	880	960	--	521
10"	330	--	406	1000	1080	--	635

Measurements: mm

ø A	B	C	ø C1	D	D1	E	E1
3/4"	4.92	0.74	3.89	7.67	10.82	3.93	4.60
1"	4.92	0.82	4.25	8.46	11.61	4.80	5
1.1/2"	4.92	1.14	5	10.43	13.58	5.47	6.29
2"	5.70	1.45	5.98	12.40	15.55	5.86	7.48
2.1/2"	5.70	1.69	7.00	13.38	16.53	8.81	8.50
3"	7.87	1.89	7.52	15.35	18.50	8.81	10
4"	7.87	--	9.01	19.68	22.83	--	12.00
6"	7.87	--	10.98	25.98	29.13	--	15.98
8"	12.99	--	13.50	34.64	37.79	--	20.51
10"	12.99	--	15.98	39.37	42.52	--	25

Measurements: ins.

**Coil characteristics**

Electric power supply	Coil type	Power W	VA (volt-ampere)		Maximum temperature		Available tensions
			Inrush	Holding	°C	°F	
AC 50 Hz	MF11C	11	40	22	155	311	1
	MH11C	11	40	22	180	356	1
AC 60 Hz	MF13C	13	45	27	155	311	2
	MH13C	13	45	27	180	356	2
DC	MH19C	19	19	19	180	356	3

1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

**Pilot solenoid valves**

- With 3, 4, 6" cylinders: 2024BA2 (2 positions)  
1339BA2 (3 positions)
- With 6, 8, 10" cylinders: 1350BA2 (2 positions)  
1339BA2 (3 positions)

Options	Prefix	Suffix	Examples
Water, weather and saline corrosion proof coils.	<b>YC</b>		YC1311FA12D3
Explosion and weather proof coils.	<b>ZC</b>		ZC1311FA12D3
Weather proof housing	<b>Y</b>		Y1311FA12D3
Explosion and weather proof housing.	<b>Z</b>		Z1311FA12D3
NPT connections		<b>T</b>	1311FA12TD3
Flanged connections		<b>B</b>	1311FA12BD3
Energized coil indicator light	See coils		

**Recommendations for installation**

Place a strainer upstream the **pilot valve** with a porosity ≤ 50µ if the fluid is gas and not greater than 100µ if the fluid is water. It is advisable that air or other gas employed is lubricated. It is advisable to place the valve over horizontal pipeline with the operator upright.



**Main characteristics**

Acrylic, PVC, PTFE bodies.  
 FKM seals and diaphragms.  
 Shielded core. Solenoid parts totally isolated from the fluid.  
 Shape A DIN 43650 connection encapsulated coil.  
 IP65 and NEMA 4 protection.  
 Absence of galvanic electrolysis.  
 No contamination of the fluid handled.

**Options:**

- Energized coil indicator light.
- Explosion and weather proof coils and housings.

**Technical specifications**

Ø Pipe	Ø Orifice		Flow factor		Max. pressure				Maximum temperature		Figure Nº	Weight		Catalog Nº	
					Input		Output		°C	°F		kg	Lb		
	mm	ins.	Kv	Cv	bar	psi	bar	psi							
<b>Acrylic body</b>															
1/4"	2.25	0.09	0.13	0.15	1	15	0.5	7.5	60	140	1	0.4	0.88	1360AV2	
<b>PVC body</b>															
3/8"	7	0.28	1	1.17	4	60	2	30	60	140	2	0.8	1.75	1360PV3	
1/2"														1360PV4	
<b>PTFE body</b>															
1/4"	2.25	0.09	0.13	0.15	1	15	0.5	7.5	60	140	1	0.4	0.88	1360TV2	
3/8"	7	0.28	1	1.17	4	60	2	30	150	302	2	0.8	1.75	1360TV3	
1/2"														1360TV4	

**Note:** For Buna N diaphragms and seals, change letter "V" for "A" in the valve catalog number.  
 Example: 1360TV4 turns into 1360TA4.



Contact our manufacturing plant for information on available models





**Main characteristics**

Manual reset and automatic release.  
Reset with energized coil or without electric signal.  
The “free-handle” system sets the lever out of operation when the coil is de-energized (1369 version) or energized (1369B version).  
It is adaptable to most of our valve series.

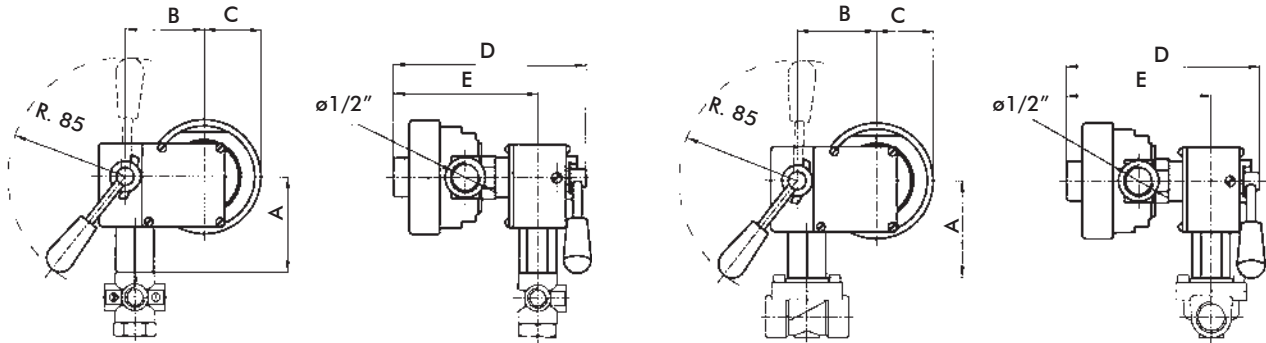


**Technical specifications**

Ø Pipe ins.	1327	1335	1390 1342	1351	1365 1325	1350
<b>1369 version - Reset with electrical signal</b>						
1/4"	1327BA402-69	--	--	1351LA1A-69	1365BA40U-69	1350LA1A-69
3/8"	--	1335BA3-69	--	1351LA2A-69	1325BA3-69	1350LA2A-69
1/2"	--	1335BA4-69	1390BA4-69	1351LA3A-69	1325BA4-69	1350LA3A-69
3/4"	--	1335BA6-69	1342BA06-69	--	1325BA6-69	--
1"	--	--	1342BA08-69	--	--	--
1.1/2"	--	--	1342BA12-69	--	--	--
2"	--	--	1342BA16-69	--	--	--
<b>1369B version - Reset without electrical signal</b>						
1/4"	1327BA402-69B	--	--	1351LA1A-69B	1365BA402-69B	1350LA1A-69B
3/8"	--	1335BA3-69B	--	1351LA2A-69B	1325BA3-69B	1350LA2A-69B
1/2"	--	1335BA4-69B	1390BA4-69B	1351LA3A-69B	1325BA4-69B	1350LA3A-69B
3/4"	--	1335BA6-69B	1342BA06-69B	--	1325BA6-69B	--
1"	--	--	1342BA08-69B	--	--	--
1.1/2"	--	--	1342BA12-69B	--	--	--
2"	--	--	1342BA16-69B	--	--	--

**Note:** 1365 is also provided for normally open operation.

**General dimensions**



A	B	C	D	E
70	57	41	140	104

Measurements: mm

A	B	C	D	E
2.76	2.24	1.61	5.51	4.09

Measurements: ins.

**Coil characteristics**

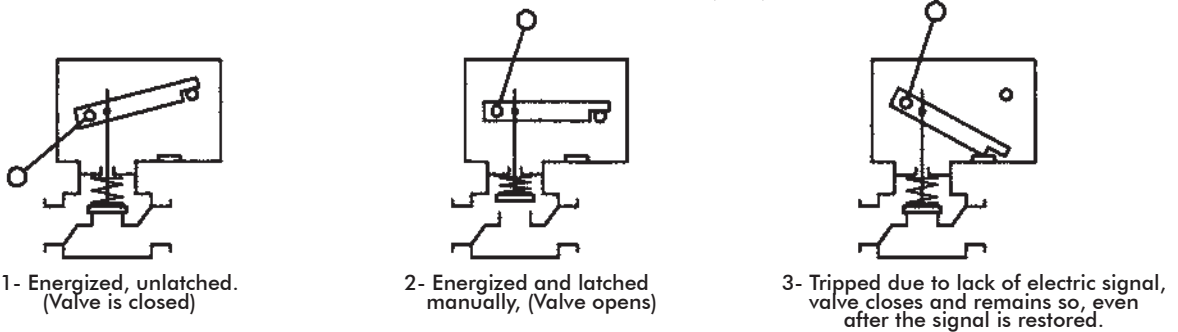
Electric power supply	Coil type	Power W	VA (volt-ampere)		Maximum temperature		Available tensions
			Inrush	Holding	°C	°F	
AC 50 Hz	MF11C	11	47	18	155	311	1
	MH11C	11	47	18	180	356	1
AC 60 Hz	MF13C	13	57	23	155	311	2
	MH13C	13	57	23	180	356	2
DC	MH19C	19	19	19	180	356	3

1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

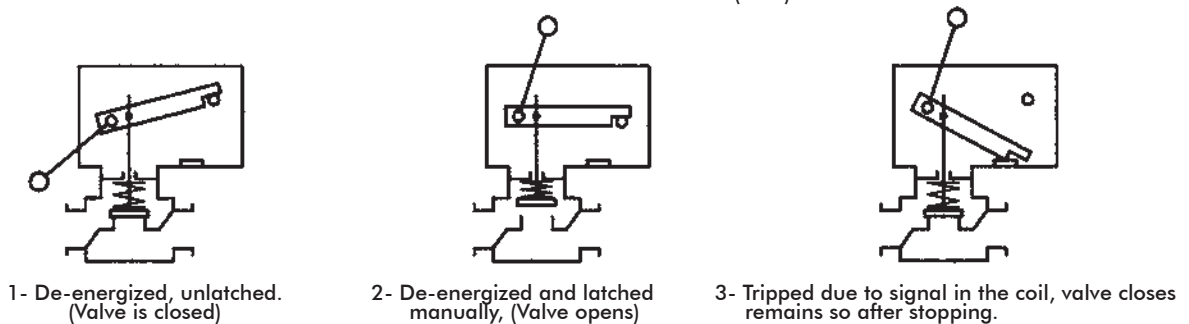
Options	Prefix	Suffix	Examples
Water, weather and saline corrosion proof coils.	<b>YC</b>		<b>YC1335BA3-69</b>
Explosion and weather proof coils.	<b>ZC</b>		<b>ZC1335BA3-69</b>
Weather proof housing.	<b>Y</b>		<b>Y1335BA3-69</b>
Explosion and weather proof housing.	<b>Z</b>		<b>Z1335BA3-69</b>
NPT connections		<b>T</b>	<b>1335BA3T-69</b>
Energized coil indicator light	See coils.		

**Operation**

**1369 FOR NORMALLY CLOSED VALVES (N.C.)**



**1369B FOR NORMALLY CLOSED VALVES (N.C.)**

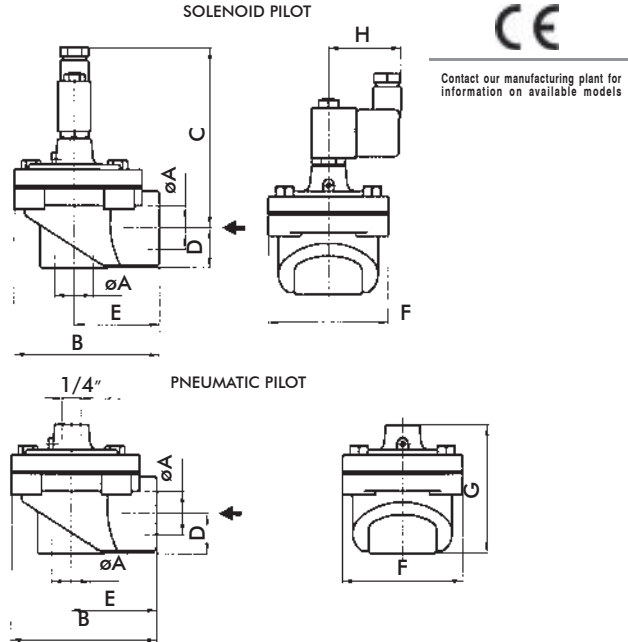




**2073 Series**

**Main characteristics**

- High flow and quick response.
- Injected or cast aluminum body.
- BSP or NPT threaded angle connections.
- Hytrel diaphragms.
- Electric or pneumatic operated versions.
- Encapsulated coils.
- DIN 43650 connection. IP65 and NEMA4 protection.



**CE**  
Contact our manufacturing plant for information on available models

$\phi A$	B	C	D	E	F	G	H
3/4" - 1"	92	104	23	54	76	73	45
1.1/2"	135	119	31	80	126	97	58

Measurements: mm

$\phi A$	B	C	D	E	F	G	H
3/4" - 1"	3.62	4.1	0.91	1.13	2.99	2.87	1.77
1.1/2"	5.31	4.69	1.22	3.15	4.96	3.82	2.28

Measurements: ins.

**Coil characteristics**

Electric power supply	$\phi$ Pipe ins.	Coil type	Power W	VA (volt-ampere)		Maximum temperature		Available tensions
				Inrush	Holding	$^{\circ}C$	$^{\circ}F$	
AC 50 Hz	$\phi$ 3/4" - $\phi$ 1"	GF06C	6	10.8	7.5	155	311	1
AC 60 Hz		GF06C	6	12.9	8.0	155	311	2
DC		GF06C	6	6	6	155	311	3
AC 50 Hz	$\phi$ 1 1/2"	MF11C	11	40	22	155	311	1
AC 60 Hz		MF13C	13	45	17	155	311	2
DC		MH19	19	19	19	180	356	3

1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

**Recommendations for installation**

Place a strainer upstream the valve with a porosity  $\leq 100 \mu$ .  
Installation: in any position, preferably over horizontal pipeline with the coil upright.

Options	Suffix	Example
NPT connections	<b>T</b>	2073LH06ST
For C/C	<b>C</b>	2073LH06SC

**Technical specifications**

$\phi$ Pipe ins.	$\phi$ Orifice		Flow factor		$\Delta p$				Power W	Max temp.		Weight		Maximum temp. and catalog N° according to seat material
	mm	ins.	Kv	Cv	Minimum		Maximum			$^{\circ}C$	$^{\circ}F$	kg	Lb	
					bar	psi	bar	psi						
<b>Integrated solenoid pilot</b>														
3/4"	29	1.14	8.7	10.2	0.5	7.5	10	150	6	60	140	0.55	1.21	2073LH06S
1"	29	1.14	16	18.7										2073LH08S
1,1/2"	40	1.57	29	34										2073LH12S
<b>External pneumatic pilot (*)</b>														
3/4"	29	1.14	8.7	10.2	0.5	7.5	10	150	-	60	140	0.45	1	2073LH06
1"	29	1.14	16	18.7										2073LH08
1,1/2"	40	1.57	29	34										80

(\*) In this case the auxiliary pneumatic signal must be equal or greater than the main input pressure.





**1342-72 Series**



**1335-72 Series**

**Main characteristics**

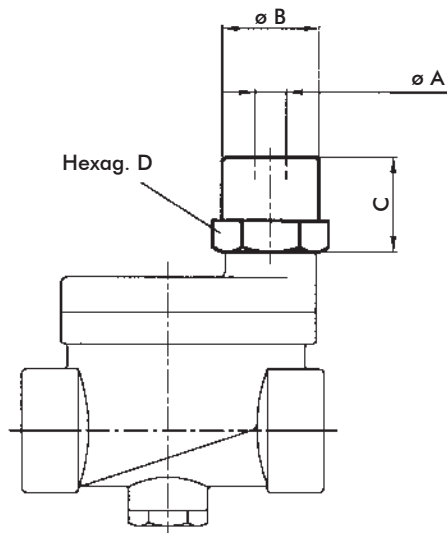
Operates with pneumatic signal.  
 Replaces the solenoid operator and  
 can be adapted to some of the size **M** solenoid  
 valve models.  
 Normally closed and normally open.  
 Seats: Buna N, FKM, etc.  
 Minimum operating pressure: 1 bar.  
 Maximum operating pressure: 10 bar.

**Series that match with this device**

Direct acting: **1327 Series**  
 Pilot operated: **1335 - 1342 - 1390 Series.**

For N.C. models, the auxiliar minimum pressure is 1 bar.  
 For N.O. models, the auxiliar minimum pressure equals the  
 maximum pressure of the fluid to be controlled plus  
 1 bar.

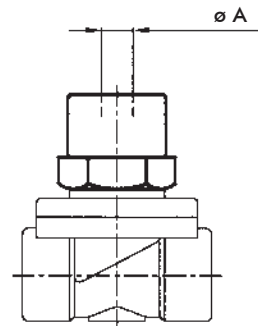
**General dimensions**



**1342-72**

ø A	ø B	C	Hexag. D
R 1/8"	31	30	32

Measurements: mm



**1335-72**

ø A	ø B	C	Hexag. D
R 1/8"	1.22	1.18	1.26

Measurements: ins.



**2094 Series**

**Applications:**

Automatic safety shutoff for Compressed Natural Gas Systems, like CNG Dispensers, etc.

**General description**

2094 series valves have been designed to handle high pressure fluids such as gaseous fuels and offer the customer the ultimate in performance, resistance and efficiency under hard working conditions. In addition, the piston system allows perfect opening and shutoff through an 8 mm passage, by means of a pilot orifice suited for high pressure.

**Main characteristics**

- Normally closed.
- Servo-operated action.
- Brass body.
- Inoxidable piston and Delrin seats.
- NPT threaded connection.
- Core tube SS. 304 and 316.
- Plunger and fixed core: SS. 430 F.
- Shading coil: copper, silver or aluminum.
- Housing: Integrated explosion and weather proof according to IEC 79-1 "d".

**Technical specifications**

ø Pipe ins.	ø Orifice		Flow factor		Operating pressure differential				Power W		Working temperature				Weight		Catalog N°
					Minimum		Maximum		50 Hz	60 Hz	Minimum		Maximum		kg	Lb	
	mm	ins.	Kv	Cv	bar	psi	bar	psi			°C	°F	°C	°F			
1/4"	8	0.31	1.1	1.29	1	15	250	3750	11	13	-20	-4	80	176	2.3	5	Z2094RBD2
3/8"			1.5	1.76													Z2094RBD3
1/2"			1.5	1.76													Z2094RBD4

**New products**



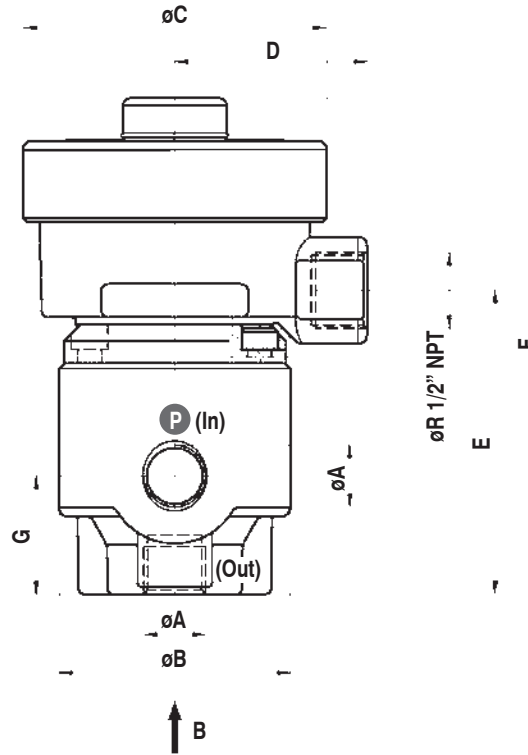
**NEW SOLENOID VALVE MODELS**

- For Natural Gas Compressors at NGC gas stations. 1397 Series
- For CNG Automotive Use. 2099 Series

To request a technical bulletin for models that are not included in this catalog, please contact **JEFFERSON** at

**info@jeffersonvalves.com**

**General dimensions 2094**



øA	øB	øC	D	E	F	G
R 1/4" NPT	62.5	82	52	80	133	32
R 3/8" NPT						
R 1/2" NPT	75	82	52	80	133	32

Measurements: mm

øA	øB	øC	D	E	F	G
R 1/4" NPT	2.46	3.23	2.05	3.15	5.24	1.26
R 3/8" NPT						
R 1/2" NPT	2.95	3.23	2.05	3.15	5.24	1.26

Measurements: ins.

**Coil characteristics**

Electric power supply	Coil type	Power W	VA (volt-ampere)		Maximum temperature		Available tensions
			Inrush	Holding	°C	°F	
AC 50 Hz	M11F	11	40	22	155	311	1
	M11H	11	40	22	180	356	1
AC 60 Hz	M13F	13	45	27	155	311	2
	M13H	13	45	27	180	356	2

1 - (12, 24, 110, 220, 240) V    2 - (12, 24, 110, 120, 220, 240) V

**Recommendations for installation**

Place a strainer upstream the valve with a porosity ≤ 50 µ.

Mounting: In any position, preferably over horizontal pipeline with the coil upright.



**Description**

This device is designed to turn monostable 2-position solenoid valves into bistable 2-position solenoid valves, to operate them through electric pulses.

Although it uses the same coil as a standard valve, its solenoid assembly has certain specific characteristics. When the coil is energized with a direct current pulse polarized as shown in the picture, the core goes up to contact the plugnut and stays in that position (P1) by the influence of a magnet placed on top of the core-tube.

To return to the initial position (P2), a new electric pulse with reversed polarity must be applied.

This device can be adapted to direct acting / pilot-operated using M or G size coils. Suitable for neutral liquids or gaseous fluids.

**Technical specifications**

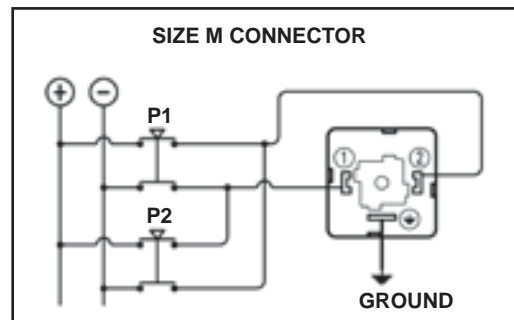
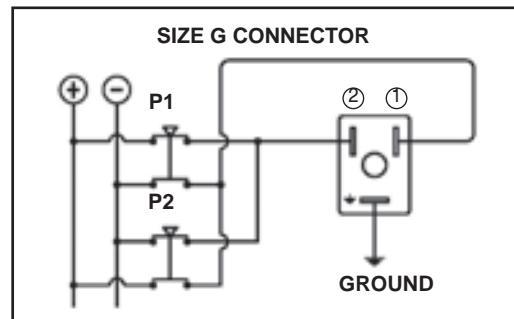
Maximum temperature: 60 °C / 140 °F  
 Pressures up to 10 bar - (150 psi). For higher pressures, please contact Jefferson.  
 Available tensions: 12, 24, 110 and 220 V DC.  
 Length of pulse: 0.1 - 1 sec.  
 Power consumption during electric pulse:

Size M coil: 19 VA.  
 Size G coil: 6 VA.

**Compatible series**

Ø Pipe ins.	1327	1330	1335	1390 1342	2026	2036
1/8"	-	-	-	-	2026BA..1-70	-
1/4"	1327BA..2-70	--	--	--	2026BA..2-70	-
3/8"	--	-	1335BA3-70	--	-	2036BA03-70
1/2"	--	1330LA04-70	1335BA4-70	1390BA4-70	-	2036BA04-70
3/4"	--	1330LA06-70	1335BA6-70	1342BA06-70	-	2036BA06-70
1"	--	--	--	1342BA08-70	-	2036BA08-70
1.1/2"	--	--	--	1342BA12-70	-	-
2"	--	--	--	1342BA16-70	-	-
2 1/2"	-	-	-	1342BA20-70	-	-
3"	-	-	-	1342BA24-70	-	-

**Basic circuit**



P1: To open.  
 P2: To close.  
 Do not pulsate at the same time.

**Applications:**

Automatic draining of filters, liquid separators, dryers, receivers, pipes and other compressed air system components.

**General description**

- The Digital Condensation Removal Timer is a compact electronic device specially designed for pipe air condensation removal when matched with a solenoid valve.
- This digital timer is adaptable to any valve using a DIN type, 43650 – shape A coil.
- This device can be easily programmed by two press-keys and an LCD display.

**Technical Specifications**

Supply voltage: 12 - 115 VDC.  
24 - 240 VAC.

Maximum current: 1 A.

Poles: 2 + Ground.

Time ranges:  
Off 0-99.59 min.  
On 0-59 sec

Ambient temperature:  
-10 °C to +50 °C; (+14 °F to +122 °F).

Weight: 64 g; (2.3 oz.).

Protection:  
IP65 when plugged to a coil with a connector.

Insulation group: VDE 0110 1/89 - Class C.

**Time adjustment**

- 1 - Press SET for 2 seconds.
- 2 - Press ADJ to adjust ON time (sec.)
- 3 - Press SET
- 4 - Press ADJ to adjust OFF time (min.)
- 5 - Press SET

Reset press protected switch located above SET & ADJ keys.

**Series that may be adapted to this device**

Direct acting: **1327**

Servo operated action: **1335 - 1342 - 1390.**



**Main characteristics**

1314, 1327 and 1390 Series with the suffix “UC” solenoid valves are specially designed to control cryogenic flow. Cryogenic fluids include liquid oxygen, liquid argon, liquid nitrogen and liquid CO<sub>2</sub>. All valves showing a UC suffix are clean, and free from oil and moist.

**Temperature ranges:**

Cryogenic fluids -200 °C to 50 °C (-328 °F to 122 °F).  
Liquid CO<sub>2</sub> : -60 °C to 50 °C (-76 °F to 122 °F).

**Technical specifications**

**Construction Materials**

**Body:** Brass or bronze.  
**Seals and seats:** PTFE.  
**Piston:** 1314 Series: SS304 / 1390 Series: Brass.  
**Core assembly and magnetic stop:** AISI 430.  
**Springs:** 302.  
**Shading coil:** copper.

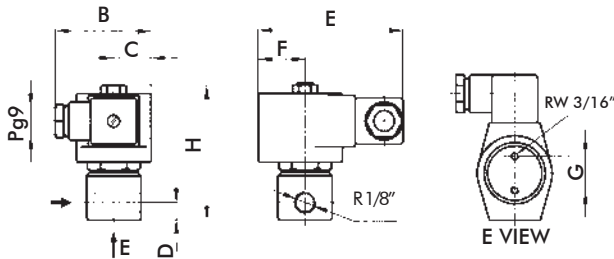
**\*Advise:** when using direct current (DC), a 25% reduction on the maximum operating pressure differential is expected

Normally Closed																			
Ø Pipe ins.	Ø Orifice		Flow factor		Δp minimum		Δp * maximum		Minimum Temp.		Maximum Temp.		Weight		Catalog No				
	mm	ins.	Kv	Cv	bar	psi	bar	psi	C°	F°	C°	F°	kg	Lb					
1/4"	3	0.12	0.26	0.30	0	0	10	150	-200	-328	50	122	0.5	1.1	1327BT302UC				
	4	0.16	0.43	0.50			5	75					0.5	1.1	1327BT402UC				
	6	0.24	0.8	0.94			0.75	1.7					1390BBT2UC						
3/8"	9	0.35	1.6	1.87	0.1	1.5	15	225					0.70	1.5	1390BBT3UC				
	12	0.47	2.35	2.75			0.96	2.1					1390BBT4UC						
1/2"	19	0.75	4.5	5.27	0	0	7	105					4	8.9	1314BST04UC				
	3/4"	19	0.75	6									7.02	4	8.9	1314BST06UC			
1"	26	1.02	10	11.7									4.9	10.9	1314BST08UC				
1 1/2"	32	1.26	15	17.6									6.5	14.4	1314BST12UC				
2"	38	1.5	23	26.9									7.3	16.2	1314BST16UC				
Normally Open																			
1/4"	3	0.12	0.26	0.30	0	0	10	150	-200	-238	50	122	0.5	1.1	1327BT302INAUC				
	4	0.16	0.43	0.50			5	75					0.5	1.1	1327BT402INAUC				
	6	0.24	0.8	0.94			0.75	1.7					1390BBT2INAUC						
3/8"	9	0.35	1.6	1.87	0.1	1.5	15	225					0.70	1.5	1390BBT3INAUC				
1/2"	12	0.47	2.35	2.75			0.96	2.1					1390BBT4INAUC						
Liquid CO <sub>2</sub> service (1) Normally Closed																			
1/8"	1.25	0.5	0.05	0.06	0	0	100	1500					-60	-76	50	122	0.5	1.1	1327BT121UC
	1.75	0.07	0.09	0.11			35	525									0.5	1.1	1327BT171UC
	2.25	0.09	0.13	0.15			20	300									0.5	1.1	1327BT221UC
	3.00	0.12	0.26	0.30			10	150									0.5	1.1	1327BT301UC
Liquid CO <sub>2</sub> service (1) Normally Open																			
1/8"	1.25	0.5	0.05	0.06	0	0	50	750					-60	-76	50	122	0.5	1.1	1327BT121INAUC
	1.75	0.07	0.09	0.11			20	300	0.5	1.1	1327BT171INAUC								
	2.25	0.09	0.13	0.15			12	180	0.5	1.1	1327BT221INAUC								
	3.00	0.12	0.26	0.30			10	150	0.5	1.1	1327BT301INAUC								

(1) Connection pipe: Inside diam. cannot be larger than valve’s passage. The expansion will occur downstream, far away from valve. It prevents CO<sub>2</sub> from freezing.

**General dimensions**

**1327 UC**



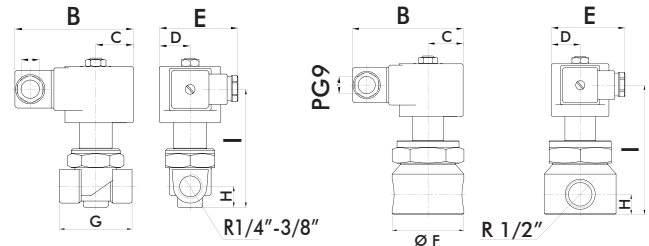
B	C	D	E	F	G	H
57	22	10	85	27	20	80

Measurements: mm

B	C	D	E	F	G	H
2.24	0.87	0.39	3.35	1.06	0.79	3.15

Measurements: ins.

**1390 UC**



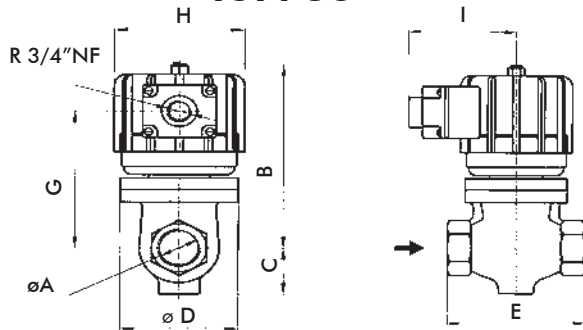
Ø A	B	C	D	E	Ø F	G	H	I
1/4" - 3/8"	85	26	22	57	-	52	15	97
1/2"	85	26	22	57	55	-	15.5	99

Measurements: mm

Ø A	B	C	D	E	Ø F	G	H	I
1/4" - 3/8"	3.35	1.06	0.87	2.24	-	2.05	0.59	3.82
1/2"	3.35	1.02	0.87	2.24	2.17	-	0.61	3.89

Measurements: ins.

**1314 UC**



Ø A	B	C	Ø D	E	F	G	Ø H	I
R 3/4"	150	32	76	100	80	113	99	95
R 1"	157	41	90	120	89	120		
R 1.1/2"	180	49	100	149	97	143		
R 2"	180	51	100	149	100	147		

Measurements: mm

Ø A	B	C	Ø D	E	F	G	Ø H	I
R 3/4"	5.91	1.26	2.99	3.94	3.15	4.45	3.90	3.74
R 1"	6.18	1.61	3.54	4.72	3.50	4.72		
R 1.1/2"	7.09	1.93	3.94	5.87	3.82	5.63		
R 2"	7.09	2.01	3.94	5.87	3.94	5.79		

Measurements: ins.

**Coil characteristics**

Electric power supply	Version	Coil type	Power W	VA (volt-amp)		Maximum temperature		Available tensions
				Inrush	Holding	°C	°F	
AC 50 Hz	1327UC	MF11C	11	40	22	155	311	1
AC 60 Hz	1390UC	MF13C	13	45	27	155	311	2
DC	1390UC	MH19C	19	19	19	155	311	3
AC 50 Hz	1327UC (CO <sub>2</sub> )	MH18C	18	61	39	180	356	1
AC 60 Hz		MH16C	16	48	29	180	356	2
DC		MH19C	19	19	19	180	356	3
AC 50 Hz	1314UC	SH28C	28	241	69	155	311	1
AC 60 Hz		SH30C	30	267	80	155	311	2
DC		SH48C	48	48	48	155	311	3

1-(12,24,110,220,240)V 2-(12,24,110,120,220,240)V 3-(12,24,110,220)V

**Recommendations for installation**

Place a strainer with a porosity ≤ 100 μ upstream the valve. The valve input pressure must always be equal or greater than the output pressure.

**1327UC**

Mount the valve in any position, preferably over horizontal pipeline with the coil upright.

**1314UC- 1390UC**

Mount the valve only over horizontal pipeline with the coil upright.

**General Description**

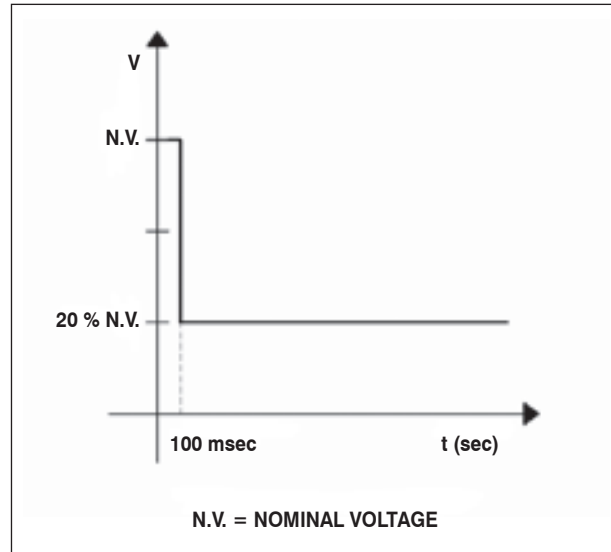
The CP is a solid state device placed on DIN –connection solenoid valves’ coil connectors to control valve power. The CP has two main functions: one is to induce a stronger than usual response at solenoid pull-in. The second is to reduce the solenoid power consumption during hold-in. The CP allows the input voltage directly to the coil for a fixed single shot of 100 milliseconds. After that period the CP automatically decreases to 20 % of the input nominal voltage, and the power is decreased to 4 %.



- The CP is available in DIN 43650 / ISO 4400 shape “A” connectors.
- High-frequency operating cycles.
- Saves energy by reducing overall consumption to nominal power.
- Reduces temperature in long runs of energized coil.
- Increases coil life considerably.
- It is provided with a LED indicator light.
- 3 m (9 ft) standard cable length.

**Electrical Data**

- Input Voltage: 12 to 24 VDC
- Maximum input voltage tolerance 10 %
- Ambient temperature range: -20° to 50 °C (4° to 122 °F)
- Maximum output current:
  - Inrush (50 milliseconds): 8A
  - Holding: 1 A





## Technical information

	<b>Pages</b>
Fluids and materials compatibility table.	<b>F-2 / F-3</b>
Recommendations for installation.	<b>F-4</b>
Problems and solutions.	<b>F-5</b>
Repair Kits.	<b>F-6 / F-7 / F-8</b>

# Fluids and materials compatibility Table



	Buna N	EPDM	Neprene	FKM	Delrin	Nylon	PVC	PTFE	Carbon steel	AISI 430	AISI 304	AISI 316	Silver	Grey cast	Copper	Bronze	Brass	Aluminium
Animal oil	B	C	B	A	A	A		A	A	A	A	A		A	A	A	A	A
Break oil	C	B	C	A		A		A	A	A	A	A	B		A	A	A	A
Linseed oil (pure)	C						A	A	B	B	B		A	B	C	C	C	B
Chinese wood oil	A	C	B	A	B	A	A	A	A		A	A		A	B		B	A
Corn oil	A	C	B	A	B	A	A	A	A		A	A	A	A	A	A	B	A
Olive oil	A		A	A				A		A	A	A		A			A	A
Pine oil	A	C	C	A		A				A	A			A			A	A
Silicone oil	A	A	A	A	A					A	A	A	A		A	A	A	
Hydraulic oil	A	C		A	A			A	A	A	A	A	A	A	A	A	A	A
Mineral oil	A	C	B	A		A	A	A	A	A	A	A	A	A	A			A
Motor oil	A	C		A			A		A	A	A	A	A		A	A	A	A
Petroleum oil	A	C		A					A	A			A	A	A	A	A	A
Acetylene	A	A	B	A	A	A	A	A	A	A	A	A	C	A	C	C		A
Acetaldehyde	C	B	C	C		A	C	A	A	B	B	B	A	A	C	C	C	A
Potassium acetate	A	A	B					B	A	B	B	B	A	A	B	B	B	C
Acetone	C	A	C	C	B	A	C	A	A	B	B	B	A	A	A	A	A	B
Aqueous acetic acid	B	C	B	A					A	A	A	A		A	A	A	A	A
Boric acid	A	A		A		A	A	A	C	B			A	C				
Butyric acid	A	B	C	C				A		C	C	C	A	C			C	
Carbonic acid	C	A	A					A		B	B	B	B	C			B	A
Citric Acid	A	A	A	A		A	A	A	C				B	C	C	B	C	
Hydrochloric acid		B				C	C	A	B	C	C	C	C		C	C	C	C
Stearic acid	A	B	A			A	A	A					A	C	C	C	C	B
Hydrofluoric acid			C	A	C	C		A	C	C			B	C		C	C	C
Formic acid	A	B	A	C	C	C		A	C	C			C					C
Phosphoric acid		B		A	C	C	A	A	C	C			B	C				A
Lactic acid				B				A	C				B	C		C	C	C
Nitric acid	C		C	C	C	C		A	C		A	A	C	C	C	C	C	C
Oleic acid	B			B		A	A	A	B	B	A	A	A	B				
Oxalic acid	A	A	B	C		A		A	C				B	C		B		
Salicylic acid	A		A	A		A	A	A	C	B	B	B	A	C	B	B	B	
Sulfuric acid (10%)	C		C	A	C	C		A					C	C	C	C	C	B
Sulfuric acid (20%)	B				C	C	A	A	C	C	C		B	C	C		B	
Tannic acid		A				A	A	A		B	B		A	B				
Tartaric acid		B				A	A	A	C				A	C			C	
Hot water	A	A	A	A	A	A	A	A	A	A	A	A	A			A	A	A
Carbonated water	A	A	A	A	A	A	A	A	A	A	A	A	A			A	A	A
Chlorinated water	A	A	A	A	A	A	A	A	A	A	A	A	A			A	A	A
Seawater	A	A	A	A	A	A	A	A	A	A	A	A	A			A	A	A
Deminerlized water		A		A	A	A	A	A	C	A	A	A	A	C				A
Distilled/deionized water		A		A	A	A	A	A	C	A	A	A	A	C				A
Drinking water	A	A			A	A	A	A		A	A	A	A	C	A	A	B	B
Hot air				A				A	A	A	A	A	A			A	A	A
Air	A	A	A	A	A	A	A	A	A	A	A	A	A			A	A	A
Aniline	B	A	B	C		A	C	A		B	B		A	A				C
Antioxidants	A		A					A										
Argon	B		A						B	A	A	A	A					
Benzene	C	C	C		A	C	A	A	A	A	A	A	A	A	A	A	A	A
Baking ammonium	A	B	A	A		A	A	A	B	B	B			B	C	C	C	B
Baking soda	A	A	A		C	A	A	A		B	B				B	B	B	C
Carbon bisulfite	C	C	C	A	A	A	C	A	A	A	A	A	B		B	B	B	A
Soda bisulfite	A		A			A	A	A	C				A	C	B	B	C	

# Fluids and materials compatibility Table

	Buna N	EPDM	Neoprene	FKM	Delrin	Nylon	PVC	PTFE	Carbon steel	AISI 430	AISI 304	AISI 316	Silver	Grey cast	Copper	Bronze	Brass	Aluminium
Butane	B	C	B	A	A	A		A	A	A	A	A		A	A	A	A	A
Butanol	A	B	B			A		A	A	A	A	A	B		A	A	A	A
Carbon ammonium	C		A				A	A	B	B	B		A	B	C	C	C	B
Beer					A	A	A	A	A	B	A	A			A	B	B	A
Dry chlorine	C	C	C	B	C	C	C	B		C	C		B					C
Chloroform	C	C	C		B	A	C	A		B	A	A	A			B		C
Carbon dioxide						C	A	A	A	A	A	A	A	A	A	A	A	A
Ethane	A	C	A		A	A	C	A	A	A	A	A	A	A	A	A	A	A
Ethanol	B	A	B	B	A	A	A	A	A	B	B		A	B	B	B	B	
Freon 12			A	C		A		A	C	A	A	A	A	C	A	A	A	A
Freon 22	C			C		A	C	A	C	A	A	A	A	C	A	A	A	A
Fuel oil		C	B	A	A	A	A	A		A	A	A	A			A	A	A
Coke gas		C		B	A		A	A	A	A	A	A	A	A	A		C	A
Bottled gas (LPG)	B	C	B	A						A	A	A	A		A	A	A	A
Natural gas	A	C	A	A		A	A	A	A	A	A	A	A	A	B	A	A	A
Gasoil	B	C	B	A	A	A		A	A	A	A	A	A	A	A	A	A	A
Gelatin	A	A	A	A	A	A	A	A	C	A	C			C	A	A	B	A
Glycerin	A	A	A		A	A	A	A	A	A	A	A	A	B	B	A	A	A
Glycols	A	A	A							A	A	A	A		A	A	A	
Edible, glucose	A	A	A	A	A	A	A	A	A	A	A	A		A	A	A	B	A
Liquid heptane	A	C	A	A		A		A	A	A	A	A	A		A	A	A	A
Hexane	B	C	B	A	A			A	A	A	A	A	A	B	B	B	A	B
Chlorinated hydrocarbons		C	C	B		C	C	A		B	B		B		A	A	A	A
Hydrogen	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Harmonium hydrogen		A	A	B	C	A	A	A		A	A	A	C		C	C	C	B
Kerosene	A	C	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Milk	A	A	A	A	B	A	A	A	A	A	A	A		A	A	A	A	A
Methane	A	C	B	A			A	A	A	A	A	A	A	A	A	A	A	A
Methanol	A	A	A	C	A	A	A	A	A	B	A	A	A	A	A	A	A	
Naphtha	B	C	C	A		A	B	A	A	A	A	A	A		B	B	B	A
Aromatic naphtha		C		A		A	C	A	A	A	A	A	A	A	A	A	A	
Ammonium nitrate	A	A	A	B	A	A	A	A		B	A	A	A		C	C	C	
Nitrogen	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Liquid nitrogen (-200°C)								A		A	A	A				A		
Oxygen	C		A	A						A	A	A	B	A	A	A	A	A
Ozone	C	A		A		A		A	C	B	B							B
Perchlorate ethylene				A				A	A	A	A		A			A	A	
Brine	A	A	A	A	A	A	A	A		C				B	B	B	A	
Blood							C	A	C	A	A	A						
Silicone	A	A	A	A	A	A				A	A	A	A		A	A	A	
Caustic soda		A			A	A	A	A		B	B		A					C
Chlorinated solvents		C	C	B		B		A	B		B					A		C
Potassium sulphate	A	A	A	A	B	A	A	A	A	A	A	A	B	C	B	B	C	A
Thinner	C	C	C	C				A	A	A	A	A	A	B	B	B	A	B
Toluene	C	C	C	A	B	A	C	A	A	A	A	A	A	A	A	A	A	A
Trichloroethylene	C	C	C	B	B	A	C	A		B	B							B
Urea	A		A			A	A	A		B	B		A	B		A		B
Water vapor	C	A	C				C	A	B	A	A		B	B	B	A	B	
Vinegar		A		A	B	C		A		B	B		A		B	B	C	
Wines					A	A	A	A	C	A	A	A					B	
Xylene	C	C	C	B	A	A		A	B	A	A	A	A		A	A	A	A

## Electrical installation.

All the coils are for continuous use - permanent or high frequency operation.  
 Check that the coil supplied with the valve has the correct tension and current required. If not, replace it with the adequate coil without changing the valve.  
 The allowed tension variation that does not affect the performance of the valve is -15% to +10% of the nominal tension for AC and -10% to +10% for DC.  
 Except for valve series 1312, 1314, 1344, 1356S, 1388 which are provided with "S" coils, and 1393 series with "C" housing, the other Jefferson models are generally supplied with Shape A or B DIN 43650 Connection (ISO 4400) encapsulated coils.

**Do not energize coil unless mounted on valve**

## Mechanical installation.

- Verify that the working conditions are within the range of differential pressure and temperature indicated on the nameplate of the valve.
- Place a strainer immediately upstream from the valve with the adequate capacity and a mesh smaller than 100 microns.
- The most favorable mounting position is on a horizontal pipeline with the coil upright.
- Pipelines upstream from the valve must be carefully and exhaustively cleaned even before the strainer, by means of purges with compressed air or any other system that guarantees the disposal of solid elements as well as welding bits, gasketing tape, mud, dirt, etc., especially with new pipelines.
- Follow the arrow that indicates the flow direction in the valve's body. The input pressure must always be equal or greater than the output pressure.

## Plug-in coils - DIN 43650 Connection (ISO 4400). IP65 Protection.

Figure "A"

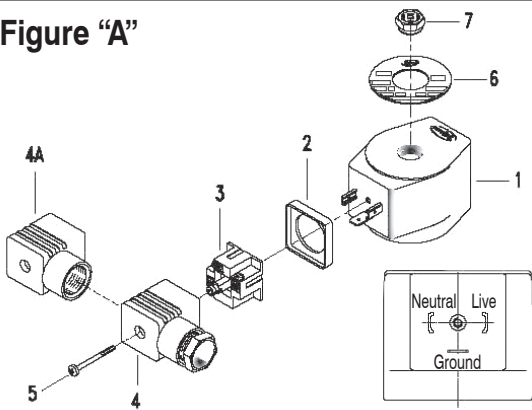
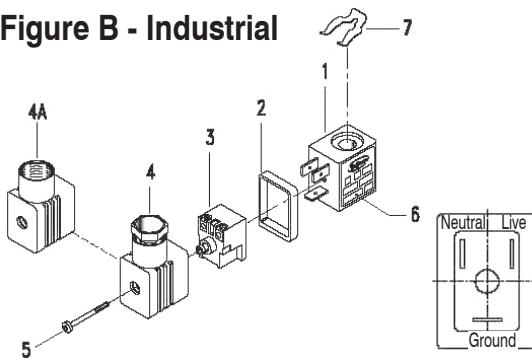


Figure B - Industrial



### Instructions for the electrical connection with strain relief.

1. Unscrew the screw (8) to reach the block (3), where the terminals are. The system is designed to use armored cables with 3 "PG9" conductors. Carry out Neutral - Live - Ground connections.
2. Insert the terminal block into the cover (4) according to the desired entrance angle, in any of the two or four possible positions: Left, Right, Above, Below.
3. Insert the coil blades into the connector. Fasten it with the screw.
4. Finally but very important, tighten the strain relief (7) to make sure that it is hermetic. Otherwise, moisture may enter and cause a short-circuit between the terminals.

### Instructions for the cover with an opening for 1/2 NPT conduit.

1. Follow instructions 1, 2 and 3 for strain relief connector.
2. It is important to be sure that the interconnection is hermetic, so we recommend the use of a sealant or gasketing tape over the threads.

### Coil fixing.

The nut (9) that fixes the coil to the core-tube must be 5 Nm / 0.5 kpm / 3.75 lbf, to prevent the coil from turning round. Avoid unnecessary tension that may damage the core-tube due to excess of torsion.

**Note:** All this is valid both for shape "A" and shape "B" connectors (2026, 2036, 2073 and 2095 series)

## Failure analysis.

Many times solenoid valves fail due to an inadequate selection for certain applications.

In other cases the failures are caused by a defective installation, not having followed the manufacturer's recommendations. In many other cases, because of lack of maintenance, which should be adequate for the kind of job or the efforts the valve is subjected to. Most of the failures that occur when starting a new installation are the result of lack of cleanness in the pipelines between the filter and the valve, due to left-overs of packaging, teflon,

welding residue, mud, etc.

However, in spite of having made a good choice, a good installation and the adequate maintenance, some contingent factors may occur after the installation and disturb a suitable peration.

Jefferson offers its complete post-sales service by phone, e-mail or fax to assist the end user in studying and finding a solution to failures.

The following page shows the most common failures with their possible causes and solution.

PROBLEM	POSSIBLE CAUSES	SOLUTIONS
<b>Make sure in every case that the voltage energy effectively reaches the coil terminals and check that the filtering mesh of the strainer before the valve is in good condition.</b>		
<b>1.Valves do not open when energized (NC) or when de-energized (NO).</b>	<p><b>For direct acting valves</b></p> <p>1.1 Tension less than 15% of the nominal voltage.</p> <p>1.2 Too high a differential pressure for that model.</p> <p>1.3 Burnt coil (with the circuit open).</p> <p>1.4 Plunger jammed with solids.</p> <p>1.5 Damaged plunger.</p> <p><b>For servo operated action valves</b> The same as above plus:</p> <p>1.6 Differential pressure below required for valve model.</p> <p>1.7 Jammed servo piston (in models with servo piston).</p> <p>1.8 Damaged servo piston, servo piston rings or diaphragm.</p> <p>1.9 Pilot orifice blocked.</p> <p>1.10 Pilot gasket damaged or misaligned.</p> <p>1.11 Excessive viscosity.</p>	<p>1.1.1- Check the coil voltage, which must not be less than 85% of the indicated nominal tension. If this is the case, adjust the source to the adequate value.</p> <p>1.2.1- Reduce pressure to the maximum shown on the valve nameplate or change it for a more adequate one.</p> <p>1.3.1- See Burnt Coils.</p> <p>1.4.1- Clean the plunger's core tube and the valve. If the system lacks an adequate strainer before the valve, the problem will subside and service will shut down.</p> <p>1.5.1- Replace the damaged part. Damage may be caused by fluid abrasive elements or high operation frequency over a long period of time and exceeding the element's life. Sometimes it's a combination of both.</p> <p>1.6.1- This factor should be considered when choosing a valve. It may occur due to over-sizing or reduction of differential pressure. If differential pressure cannot be increased by increasing the flow, the valve must be changed for an adequate one.</p> <p>1.7.1- Check that solids have not affected the piston's movement. After cleaning, check that it is not damaged. A strainer must be placed upstream from the valve to eliminate the problem.</p> <p>1.8.1- Change damaged parts. Check that the cause is not dirt. Point 1.4.1. is applicable in this case.</p> <p>1.9.1- Clean the orifice. See 1.4.1., if the orifice is damaged consult <b>Jefferson</b>.</p> <p>1.10.1- This is caused by poor assembly. Change the damaged part and assemble the valve correctly. The o-ring should be correctly arranged in the valve housing.</p> <p>1.11.1- Fluids with viscosities exceeding 60 cSt cannot be used with servo operated valves. If not, change the valve model.</p>
<b>2.The valve remains open</b>	<p><b>For direct acting valves</b></p> <p>2.1 The coil was not de-energized (NC valve) or energized (NO valve).</p> <p>2.2 Plunger jammed with solids.</p> <p><b>For servo assisted valves</b> The same as above plus:</p> <p>2.3 The pilot orifice does not close.</p> <p>2.4 Compensation orifice blocked.</p> <p>2.5 Jammed servo piston.</p> <p>2.6 Servo piston, servo piston rings or diaphragm damaged.</p> <p>2.7 Excessive viscosity.</p>	<p>2.1.1- Check the control circuits.</p> <p>2.2.1- Clean the plunger's core tube and the valve. If the system lacks an adequate strainer before the valve, the problem will subside and service will shut down.</p> <p>2.3.1- Check that the plunger is not jammed or the seats damaged. In the first case, clean it, in the second case, change it. If the orifice seat is damaged, consult <b>Jefferson</b>.</p> <p>2.4.1- Clean the orifice. See 1.4.1., if the orifice is damaged consult <b>Jefferson</b>.</p> <p>2.5.1- Check that solids have not affected the piston's movement. After cleaning, check that it is not damaged. A strainer must be placed upstream from the valve to eliminate the problem.</p> <p>2.6.1- Change the damaged parts. Check that the cause is not dirt. Point 1.4.1. is applicable in this case.</p> <p>2.7.1- Fluids with viscosities exceeding 60 cSt cannot be used with servo operated valves. If not, change the valve model.</p>
<b>3.The coil gives off a burning smell after working for a short period or it burns up frequently.</b>	<p>3.1 Excessive voltage.</p> <p>3.2 Only for AC: Too high a pressure that does not allow the pilot to open, therefore, only inrush current is present, which doubles the holding current.</p> <p>3.3 The coil's nominal tension is less than the source's or does not correspond to its cycling.</p> <p>3.4 Excessive fluid or ambient temperature.</p> <p>3.5 Moisture entering the interior of the coil.</p> <p>3.6 Lack of part of the electromagnetic package when it is not integrated to the coil.</p> <p>3.7 It is energized outside the valve (AC only).</p>	<p>3.1.1- The voltage must not exceed 10% of the nominal tension, and only for brief periods. Correct the voltage.</p> <p>3.2.1- Adjust the maximum working pressure to the maximum shown on the nameplate. If pressure is within the parameters, check that voltage is not less than 85% of the nominal tension.</p> <p>3.3.1- Check that the tension and current type is as indicated on the coil.</p> <p>3.4.1- The fluid, atmosphere and power of the coil determine the internal temperature. As a general rule, the fluid temperature + ambient temperature must not exceed 210 °C. The fluid temperature cannot be above 180 °C. When handling hot fluids and the ambient exceeds 30 °C, it is advisable to fit the valve in the most ventilated area.</p> <p>3.5.1- Check that DIN coils' strain relief is tight and the armored cable corresponds to the connector Pg. For S coils, check that the housing and connection are closed. See mounting recommendations.</p> <p>3.6.1- Replace the missing parts because they are part of the magnetic circuits and their absence results in an increase of the intensity which reduces the force of the magnetic attraction.</p> <p>3.7.1- Do not energize the coil if it is not fitted to the valve.</p>
<b>4.The coil vibrates when energized.</b>	<p>4.1 Insufficient voltage.</p> <p>4.2 Fixed core and plunger surfaces, are dirty or have scales.</p>	<p>4.1.1- Adjust the tension within the permitted parameters.</p> <p>4.2.1- Clean the surfaces. If scales remain there, change the components.</p>
<b>5-Fluid leakage when closed.</b>	<p>5.1 Main or pilot seat damaged or dirty.</p>	<p>5.1.1- Clean or change seats. If the orifice seats are damaged, consult <b>Jefferson</b>.</p>
<b>6-It operates slowly or fails.</b>	<p>6.1 Compensation or pilot orifice partially blocked.</p> <p>6.2 Excessive fluid viscosity.</p> <p>6.3 Temporary excess or lack of differential pressure.</p>	<p>6.1.1- In case of dirt, clean the orifices. In case of damage, consult <b>Jefferson</b>.</p> <p>6.2.1- The fluid's viscosity must not exceed 60 cSt. See 1.11.</p> <p>6.3.1- Check that both differential and opening pressure differential are within the limits indicated in the valve nameplate.</p>

## General Purpose

Catalog Nº	Kit part Nº	
<b>1314</b>		
1314BA06	K14A1	
1314BA08	K14A2	
1314BA12	K14A3	
1314BA16		
1314BE06	K14T1	
1314BE08	K14T2	
1314BE12	K14T3	
1314BE16		
1314BN06	K14N1	
1314BN08	K14N2	
1314BN12	K14N3	
1314BN16		
1314BST06	K14T1	
1314BST08	K14T2	
1314BST12	K14T3	
1314BST16		
1314BV06	K14V1	
1314BV08	K14V2	
1314BV12	K14V3	
1314BV16		
1314BA06A	K14A1	
1314BA08A	K14A2	
1314BA12A	K14A3	
1314BA16A		
1314BE06A	K14T1	
1314BE08A	K14T2	
1314BE12A	K14T3	
1314BE16A		
1314BN06A	K14N1	
1314BN08A	K14N2	
1314BN12A	K14N3	
1314BN16A		
1314BST06A	K14T1	
1314BST08A	K14T2	
1314BST12A	K14T3	
1314BST16A		
1314BV06A	K14V1	
1314BV08A	K14V2	
1314BV12A	K14V3	
1314BV16A		
<b>1327</b>		
1327BA122	K27A	
1327BA172		
1327BA222		
1327BA302		
1327BA402		
1327BA502		
1327BE122		K27E
1327BE172		
1327BE222		
1327BE302		
1327BE402		
1327BE502	K27N	
1327BE522		
1327BN122		
1327BN172		
1327BN222		
1327BN302		
1327BN402		
1327BN402		
1327BN502		
1327BN522		

Catalog Nº	Kit part Nº
<b>1327</b>	
1327BT122	K27T
1327BT172	
1327BT222	
1327BT302	
1327BT402	
1327BV122	K27V
1327BV172	
1327BV222	
1327BV302	
1327BV402	
1327BV502	K27AA
1327BV522	
1327BA122NA	
1327BA172NA	
1327BA222NA	
1327BA252NA	K27A1NA
1327BA302INA	
1327BA402INA	
1327BA502INA	K27EA
1327BE122NA	
1327BE172NA	
1327BE222NA	
1327BE252NA	
1327BE302INA	K27E1NA
1327BE402INA	
1327BE502INA	
1327BN122NA	K27NA
1327BN172NA	
1327BN222NA	
1327BN252NA	K27N1NA
1327BN302INA	
1327BN402INA	
1327BN502INA	K27T1NA
1327BT122INA	
1327BT172INA	
1327BT222INA	
1327BT302INA	
1327BT402INA	K27VA
1327BV122NA	
1327BV172NA	
1327BV222NA	
1327BV252NA	
1327BV302INA	K27V1NA
1327BV402INA	
<b>1335</b>	
1335BA3D	K35A1D
1335BA4D	
1335BA6D	K35A2D
1335BE3D	K35E1D
1335BE4D	
1335BE6D	K35E2D
1335BN3D	K35N1D
1335BN4D	
1335BN6D	K35N2D
1335BV3D	K35V1D
1335BV4D	
1335BV6D	K35V2D
1335BA3	K35A1
1335BA4	
1335BA6	K35A2
1335BE3	K35E1
1335BE4	

Catalog Nº	Kit part Nº
<b>1335</b>	
1335BE6	K35E2
1335BN3	K35N1
1335BN4	
1335BN6	K35N2
1335BV3	K35V1
1335BV4	
1335BV6	K35V2
1335BA3A	K35A1A
1335BA4A	
1335BA6A	K35A2A
1335BE3A	K35E1A
1335BE4A	
1335BE6A	K35E2A
1335BN3A	K35N1A
1335BN4A	
1335BN6A	K35N2A
1335BV3A	K35V1A
1335BV4A	
1335BV6A	K35V2A
1335BA3INA	K35A1INA
1335BA4INA	
1335BA6INA	K35A2INA
1335BE3INA	K35E1INA
1335BE4INA	
1335BE6INA	K35E2INA
1335BN3INA	K35N1INA
1335BN4INA	
1335BN6INA	K35N2INA
1335BV3INA	K35V1INA
1335BV4INA	
1335BV6INA	K35V2INA
<b>1342</b>	
1342BA06	K42A1
1342BA08	K42A2
1342BA12	K42A3
1342BA16	K42A4
1342BA20	K42A5
1342BA24	
1342BE06	K42E1
1342BE08	K42E2
1342BE12	K42E3
1342BE16	K42E4
1342BE20	K42E5
1342BE24	
1342BN06	K42N1
1342BN08	K42N2
1342BN12	K42N3
1342BN16	K42N4
1342BN20	K42N5
1342BN24	
1342BT06	K42T1
1342BT08	K42T2
1342BT12	K42T3
1342BT16	K42T4
1342BT20	K42T5
1342BT24	
1342BV06	K42V1
1342BV08	K42V2
1342BV12	K42V3
1342BV16	K42V4
1342BV20	K42V5
1342BV24	

Catalog Nº	Kit part Nº
<b>1342</b>	
1342BA06INA	K42A1INA
1342BA08INA	K42A2INA
1342BA12INA	K42A3INA
1342BA16INA	K42A4INA
1342BA20INA	K42A5INA
1342BA24INA	
1342BE06INA	K42E1INA
1342BE08INA	K42E2INA
1342BE12INA	K42E3INA
1342BE16INA	K42E4INA
1342BE20INA	K42E5INA
1342BE24INA	
1342BN06INA	K42N1INA
1342BN08INA	K42N2INA
1342BN12INA	K42N3INA
1342BN16INA	K42N4INA
1342BN20INA	K42N5INA
1342BN24INA	
1342BT06INA	K42T1INA
1342BT08INA	K42T2INA
1342BT12INA	K42T3INA
1342BT16INA	K42T4INA
1342BT20INA	K42T5INA
1342BT24INA	K42T5INA
1342BV06INA	K42V1INA
1342BV08INA	K42V2INA
1342BV12INA	K42V3INA
1342BV16INA	K42V4INA
1342BV20INA	K42V5INA
1342BV24INA	K42V5INA
<b>1390</b>	
1390BA2	K90BA1
1390BA3	
1390BA4	K90BA2
1390BE2	
1390BE3	K90BE1
1390BE4	K90BE2
1390BN2	
1390BN3	K90BN1
1390BN4	
1390BN2	K90BN2
1390BT2	
1390BT3	K90BT1
1390BT4	
1390BT4	K90BT2
1390BV2	
1390BV3	K90BV1
1390BV4	
1390BA2INA	K90BA1INA
1390BA3INA	
1390BA4INA	K90BA2INA
1390BE2INA	
1390BE3INA	K90BE1INA
1390BE4INA	
1390BN2INA	K90BN1INA
1390BN3INA	
1390BN4INA	K90BN2INA
1390BT2INA	
1390BT3INA	K90BT1INA
1390BT4INA	
1390BT4INA	K90BT2INA
1390BV2INA	
1390BV3INA	K90BV1INA
1390BV4INA	

## General Purpose

Catalog Nº	Kit part Nº	
<b>1393</b>		
1393BS082	K93T1	
1393BS083		
1393BS084		
1393NS082		
1393NS083		
1393NS084		
1393BS082NA		
1393BS083NA		
1393BS084NA		
1393NS082NA		
1393NS083NA		
1393NS084NA		
<b>2026</b>		
2026BA121		K026A
2026BA171		
2026BA221		
2026BA301		
2026BA122		
2026BA172		
2026BA222		
2026BA302		
2026BE121	K026E	
2026BE171		
2026BE221		
2026BE301		
2026BE122		
2026BE172		
2026BE222		
2026BE302		
2026BN121		K026E
2026BN171		K026N
2026BN221		
2026BN301		
2026BN122		
2026BN172		
2026BN222		
2026BN302		
2026BV121	K026V	
2026BV171		
2026BV221		
2026BV301		
2026BV122		
2026BV172		
2026BV222		
2026BV302		
<b>2036</b>		
2036BA03/4		K036A01
2036BA06		K036A02
2036BA08		K036A03
2036BE03/4		K036E01
2036BE06		K036E02
2036BE08	K036E03	
2036BN03/4	K036N01	
2036BN06	K036N02	
2036BN08	K036N03	
2036BT03/4	K036T01	
2036BT06	K036T02	
2036BT08	K036T03	
2036BV03/4	K036V01	
2036BV06	K036V02	
2036BV08	K036V03	
<b>1359</b>		
1359BS04	K59S1	
1359BS06	K59S2	
1359BS08	K59S3	
1359BS12	K59S4	
1359BS16	K59S5	
1359FS04	K59S1	
1359FS06	K59S2	
1359FS08	K59S3	
1359FS12	K59S4	
1359FS16	K59S5	

## Combustion Use

Catalog Nº	Kit part Nº	
<b>1312 - 2012</b>		
1312BS504	K12B1	
1312BS506	K12B2	
1312BS806		
1312BS808		
1312BSB08		
1312SS504	K12S1	
1312SS506	K12S2	
1312SS806		
1312SS808		
1312SSB08		
1312SS404NA		
1312BS404NA	K12B1	
1312BS406NA	K12B2	
1312BS606NA		
1312BS408NA		
1312BS608NA		
1312SS404NA	K12S1	
1312SS406NA	K12S2	
1312SS606NA		
1312SS408NA		
1312SS608NA		
<b>1330 - 2030</b>		
1330LA0	K30A0	
1330LA04	K30A1	
1330LA06		
2030LA08	K030A1	
2030LA10	K30A2	
1330LA08		
2030LA12	K030A2	
2030LA16	K30A2L	
1330LA08L		
2030LA12L	K030A2L	
2030LA16L	K30AR2	
1330LAR08		
2030LAR12	K030AR2	
2030LAR16	K30A1A	
1330LA04NA		
1330LA06NA	K30A2	
1330LA08NA	K030A2	
2030LA12NA		
2030LA16NA	K30AR2	
1330LAR08NA	K030AR2	
2030LAR12NA		
2030LAR16NA	<b>1332</b>	
1332LA08	K32A1	
1332LA10	K32A2	
1332LA12	K32A3	
1332LA16		
1332LA20	K32A4	
1332LA24		
<b>1356</b>		
1356BT3	K56B1	
1356BT4		
1356BS4-48	K56B2	
<b>1388</b>		
1388LA06D	K88A2D	
1388LA08D	K88A3D	
1388LA10D	K88A5D	
1388LA12D		
1388LA16D	K88A6D	
1388LA06A	K88A2A	
1388LA08A		
1388LA12A	K88A4A	
1388LA16A		
1388LA20A	K88A6A	
1388LA24A		
1388LA06AR	K88A2A	
1388LA08AR		
1388LA12AR	K88A4A	
1388LA16AR		
1388LA20AR	K88A6A	
1388LA24AR		
<b>2088</b>		
RC 2088LA08DL	K088D1L	
RC 2088LA10DL		
RC 2088LA12DL	K088D2L	
RC 2088LA16DL	K088D3L	
RC 2088LA08DR	K088D1R	
RC 2088LA10DR		
RC 2088LA12DR	K088D2R	
RC 2088LA16DR	K088D3R	
RC 2088LA08L	K0881L	
RC 2088LA10L		
RC 2088LA12L	K0882L	
RC 2088LA16L	K0883L	
RC 2088LA08R	K0881R	
RC 2088LA10R		
RC 2088LA12R	K0882R	
RC 2088LA16R	K0883R	

Catalog Nº	Kit part Nº
<b>1388</b>	
11388LA06DS	K88A2D
1388LA08DS	K88A3D
1388LA10DS	
1388LA12DS	K88A5D
1388LA16DS	
1388LA20DS	K88A6D
1388LA24DS	
1388LA06A	K88A2A
1388LA08A	
1388LA12A	K88A4A
1388LA16A	
1388LA20A	K88A6A
1388LA24A	
1388LA06AR	K88A2A
1388LA08AR	
1388LA12AR	K88A4A
1388LA16AR	
1388LA20AR	K88A6A
1388LA24AR	
<b>2088</b>	
RC 2088LA08DL	K088D1L
RC 2088LA10DL	
RC 2088LA12DL	K088D2L
RC 2088LA16DL	K088D3L
RC 2088LA08DR	K088D1R
RC 2088LA10DR	
RC 2088LA12DR	K088D2R
RC 2088LA16DR	K088D3R
RC 2088LA08L	K0881L
RC 2088LA10L	
RC 2088LA12L	K0882L
RC 2088LA16L	K0883L
RC 2088LA08R	K0881R
RC 2088LA10R	
RC 2088LA12R	K0882R
RC 2088LA16R	K0883R
<b>Pneumatic Use</b>	
<b>1323</b>	
1323BA17C	K23AC
1323BA20C	
1323BA25C	K23EC
1323BE17C	
1323BE20C	K23NC
1323BE25C	
1323BN17C	K23VC
1323BN20C	
1323BN25C	K23AD
1323BV17C	
1323BV20C	K23ED
1323BV25C	
1323BA17D	K23AD
1323BA20D	
1323BA25D	K23ED
1323BE17D	
1323BE20D	K23ND
1323BE25D	
1323BN17D	K23ND
1323BN20D	
1323BN25D	K23VD
1323BV17D	
1323BV20D	

Catalog Nº	Kit part Nº
<b>1323</b>	
1323BV25D	K23VD
1323BA17A	K23AA
1323BA20A	
1323BA25A	K23EA
1323BE17A	
1323BE20A	K23NA
1323BE25A	
1323BN17A	K23VA
1323BN20A	
1323BN25A	K23AU
1323BV17A	
1323BV20A	K23EU
1323BV25A	
1323BA17U	K23NU
1323BA20U	
1323BA25U	K23VU
1323BE17U	
1323BE20U	K25AC
1323BE25U	
1323BN17U	K25VC
1323BN20U	
1323BN25U	K25AA
1323BV17U	
1323BV20U	K25VA
1323BV25U	
<b>1325</b>	
1325BA3C	K25AC
1325BA4C	
1325BA6C	K25VC
1325BV3C	
1325BV4C	K25AA
1325BV6C	
1325BA3A	K25VA
1325BA4A	
1325BA6A	K25SA1C
1325BV3A	
1325BV4A	K25SA2C
1325BV6A	
1325SV3C	K25SV1C
1325SV4C	
1325SV6C	K25SV2C
1325SA3A	
1325SA4A	K25SA1A
1325SA6A	
1325SV3A	K25SA2A
1325SV4A	
1325SV6A	K25SV1A
1325SV2A	
<b>1339</b>	
1339LA1	K39A
1339LA2	
1339LA3	K39AV
1339LV1	
1339LV2	K39A
1339LV3	
1339BA1	K39B
1339BA2	
1339BA3	K39BV
1339BV1	
1339BV2	K39A
1339BV3	
1339SA1	K39AV
1339SA2	
1339SA3	K39AV
1339SV1	
1339SV2	K39AV
1339SV3	

## Pneumatic Use

Catog Nº	Kit part Nº
<b>1350</b>	
1350LA1-2-3 1350LTA1-2-3 1350BA1-2-3 1350BTA1-2-3 1350IA1-2-3 1350SA1-2-3	A K50AA
	B K50AB
	C K50AC
	G K50AA
	I K50AC
	D K50AD
	F K50AF
1350LV1-2-3 1350LTV1-2-3 1350BV1-2-3 1350BTV1-2-3 1350IV1-2-3 1350SV1-2-3	A K50VA
	B K50VB
	C K50VC
	G K50VA
	I K50VC
	D K50VD
	F K50VF
<b>1351</b>	
1351LA1-2-3 1351LTA1-2-3 1351BA1-2-3 1351BTA1-2-3 1351IA1-2-3 1351SA1-2-3	A K51AA
	B K51AB
	C K51AC
	G K51AA
	H K51AB
	K K51AA
	N K51AC
	D K51AD
	I K51AF
	F K51VA
	B K51VB
1351LV1-2-3 1351LTV1-2-3 1351BV1-2-3 1351BTV1-2-3 1351IV1-2-3 1351SV1-2-3	C K51VC
	G K51VA
	H K51VB
	K K51VA
	N K51VC
	D K51VD
	F K51VF
<b>1365</b>	
1365BA17C	K65BAC
1365BA22C	
1365BA30C	
1365BA40C	
1365BE17C	K65BEC
1365BE22C	
1365BE30C	
1365BE40C	
1365BN17C	K65BNC
1365BN22C	
1365BN30C	
1365BN40C	
1365BV17C	K65BVC
1365BV22C	
1365BV30C	
1365BV40C	
1365BA17A	K65BAA
1365BA22A	
1365BA30A	
1365BA40A	
1365BE17A	K65BEA
1365BE22A	
1365BE30A	
1365BE40A	

Catog Nº	Kit part Nº
<b>1365</b>	
1365BN17A	K65BNA
1365BN22A	
1365BN30A	
1365BN40A	
1365BV17A	K65BVA
1365BV22A	
1365BV30A	
1365BV40A	
1365BA17U	K65BAU
1365BA22U	
1365BA30U	
1365BA40U	
1365BE17U	K65BEU
1365BE22U	
1365BE30U	
1365BE40U	
1365BN17U	K65BNU
1365BN22U	
1365BN30U	
1365BN40U	
1365BV17U	K65BVU
1365BV22U	
1365BV30U	
1365BV40U	
<b>1375</b>	
1375BA2	K75A2
<b>1387</b>	
1387BA1	K87A1
1387BA2	K87A2
<b>2050</b>	
2050LA02-03-04	A K050AA
2050LTA02-03-04	B K050AB
2050BA02-03-04	C K050AC
2050BTA02-03-04	G K050AA
2050IA02-03-04	I K050AC
2050SA02-03-04	I K050AC
<b>ZC2050</b>	
ZC2050LA02-03-04	A K050AA
ZC2050LTA02-03-04	B K050AB
ZC2050BA02-03-04	C K050AC
ZC2050BTA02-03-04	G K050AA
ZC2050IA02-03-04	I K050AC
ZC2050SA02-03-04	I K050AC
<b>SI2050</b>	
SI2050LA02-03-04	K050ALP
SI2050LTA02-03-04	
SI2050BA02-03-04	
SI2050BTA02-03-04	
SI2050LV02-03-04	K050VLP
SI2050LTV02-03-04	
SI2050BV02-03-04	
SI2050BTV02-03-04	
<b>LP2050</b>	
LP2050LA02-03-04	K050ALP
LP2050LTA02-03-04	
LP2050BA02-03-04	
LP2050BTA02-03-04	
LP2050LV02-03-04	K050VLP
LP2050LTV02-03-04	
LP2050BV02-03-04	
LP2050BTV02-03-04	

Catog Nº	Kit part Nº	
<b>2051</b>		
2051LA02-03-04 2051LTA02-03-04 2051BA02-03-04 2051BTA02-03-04 2051IA02-03-04 2051SA02-03-04	A K051AA	
	B K051AB	
	C K051AC	
	G K051AA	
	H K051AB	
	K K051AA	
	N K051AA	
	M K051AM	
	A K051VA	
	B K051VB	
	C K051VC	
2051LV02-03-04 2051LTV02-03-04 2051BV02-03-04 2051BTV02-03-04 2051IV02-03-04 2051SV02-03-04	G K051VA	
	H K051VB	
	K K051VA	
	N K051VA	
	M K051VM	
	<b>ZC2051</b>	
	ZC2051LA02-03-04	A K051AA
	ZC2051LTA02-03-04	B K051AB
	ZC2051BA02-03-04	C K051AC
	ZC2051BTA02-03-04	G K051AA
	ZC2051IA02-03-04	H K051AB
ZC2051SA02-03-04	K K051AA	
	N K051AA	
	M K051AM	
ZC2051LV02-03-04	A K051VA	
ZC2051LTV02-03-04	B K051VB	
ZC2051BV02-03-04	C K051VC	
ZC2051BTV02-03-04	G K051VA	
ZC2051IV02-03-04	H K051VB	
ZC2051SV02-03-04	K K051VA	
	N K051VA	
	M K051VM	
<b>SI2051</b>		
SI2051LA02-03-04	K051ALP	
SI2051LTA02-03-04		
SI2051BA02-03-04		
SI2051BTA02-03-04		
SI2051LV02-03-04	K051VLP	
SI2051LTV02-03-04		
SI2051BV02-03-04		
SI2051BTV02-03-04		
<b>LP2051</b>		
LP2051LA02-03-04	K051ALP	
LP2051LTA02-03-04		
LP2051BTA02-03-04		
LP2051LV02-03-04	K051VLP	
LP2051LTV02-03-04		
LP2051BV02-03-04		
LP2051BTV02-03-04		
<b>2095/SI2095/LP2095</b>		
2095BA2N3	K095BA2	
2095BA2N5		
<b>ZC2095</b>		
ZC2095BA2N3	K095BA2ZC	
ZC2095BA2N5		
<b>2024</b>		
2024BA2	K024A	
2024BA2-M	K024A-M	

## Special Applications

Catog Nº	Kit part Nº	
<b>1360</b>		
360AV2	K60AV1	
1360PV3	K60PV2	
160TV2	K60AV1	
1360TV3	K60PV2	
160TV4		
<b>2073</b>		
2073LA08S	K073LA1S	
2073LA12S	K73A2S	
2073LH08		
2073LH06	K073LH1	
2073LH12		
2073LH06S	K73H2	
2073LH08S		
2073LH12S	K073LH1S	
	K73H2S	
<b>2094</b>		
Z2094RBD2T	K094RBDZ	
Z2094RBD3T		
Z2094RBD4T		
<b>UC</b>		
1327BT121UC	K27T	
1327BT122UC		
1327BT171UC		
1327BT172UC		
1327BT221UC		
1327BT222UC		
1327BT301UC		
1327BT302UC		
1327BT401UC		
1327BT402UC		
1390BBT2UC		K90BBT1C
1390BBT3UC		
1390BBT4UC	K90BBT2C	
1314BST04UC		
1314BST06UC	K14T1	
1314BST08UC		
1314BST12UC	K14T2	
1314BST16UC		
	K14T3	



## Conversion Table

### Density

	Kg./m <sup>3</sup>	Lb./ft <sup>3</sup>
Kg./m <sup>3</sup>	1	0.0624
Lb./ft <sup>3</sup>	16.018	1

### Temperature

	°F	°C	°K	°R
°F	1	(°F - 32) / 1.8	(°F + 459.69) / 1.8	°F + 459.69
°C	°C x 1.8 + 32	1	°C + 273.16	°C x 1.8 + 491.69
°K	°K x 1.8 - 459.69	°K - 273.16	1	°K x 1.8
°R	°K - 459.69	(°R - 491.69) / 1.8	°R / 1.8	1

### Power

	Kw.	Kcal./H	BTU/H	Refrig. Ton.
Kw	1	860	3412	0.284
Kcal./H	0.00116	1	3.968	0.0003306
BTU/H	0.000293	0.252	1	0.0000833
Refrig.Ton.	3.5168	3024	12000	1

### Volume

	Liters	m <sup>3</sup>	Gall.USA	ft <sup>3</sup>
Liters	1	0.001	0.264	0.0353
m <sup>3</sup>	1000	1	264	35.31
Gall.USA	3.785	0.00378	1	7.481
Ft <sup>3</sup>	28.32	0.02832	0.1337	1

### Pressure

	Kg./cm <sup>2</sup>	KPa.	bar.	Psi.	mm.c.hg.	Inch.c.hg.
Kg./cm <sup>2</sup>	1	98.1	0.981	14.22	736	28.97
KPa.	0.0102	1	0.01	0.145	0.75	0.295
bar.	1.02	100	1	14.5	750	29.53
Psi.	0.0703	6.897	0.069	1	51.76	2.036
mm.c.hg.	0.00136	0.133	0.00133	0.0193	1	25.4
Inch.c.hg.	0.0345	3.39	0.0339	0.491	0.0394	1

### Weight

	kg.	Pounds
kg.	1	2.207
Pounds	0.453	1

### Kinematic Viscosity (approximate)

	m <sup>2</sup> /s	ft <sup>2</sup> /s	cSt	SSU	°E
m <sup>2</sup> /s	1	10.76	10 <sup>6</sup>	4.6 x 10 <sup>6</sup>	7.5 x 10 <sup>6</sup>
ft <sup>2</sup> /s	0.093	1	93000	4.28 x 10 <sup>5</sup>	7 x 10 <sup>5</sup>
cSt.	10 <sup>-6</sup>	10.76 x 10 <sup>-6</sup>	1	4.6	0.133
SSU	2.2 x 10 <sup>-7</sup>	22.8 x 10 <sup>-6</sup>	0.217	1	0.029
°E	7.5 x 10 <sup>-6</sup>	1.43 x 10 <sup>-6</sup>	7.5	34.5	1

#### Note:

Column units: Origin Units.

Line units: Resultant Units.

In order to obtain the results, intersection coefficients must be multiplied by the known value of the origin unit.

For temperature conversion use given formulas.

Jefferson shall not be held responsible for any mistakes in this catalog. The company reserves the right to modify product characteristics provided that they do not affect what has been agreed upon with the client. This catalog was prepared by Jefferson's Technical-Commercial Department. Printed in February 2013.

**BUREAU VERITAS**  
Certification



## Certification

Awarded to

### **JEFFERSON SUDAMERICANA S.A.**

AV. FRANCISCO FERNANDEZ DE LA CRUZ 2016, CIUDAD AUTÓNOMA DE BUENOS AIRES  
ARGENTINA

Bureau Veritas Certification certify that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards detailed below

Standards

**ISO 9001:2008**

Scope of supply

**DISEÑO, DESARROLLO, FABRICACION, COMERCIALIZACION,  
REPARACION Y ASISTENCIA TECNICA DE VALVULAS A SOLENOIDE,  
REGULADORAS DE PRESION Y CONTROLES DE NIVEL.**

**DESIGN, DEVELOPMENT, MANUFACTURING, COMMERCIALIZATION,  
REPAIRS AND TECHNICAL ASSISTANCE OF SOLENOID VALVES,  
PRESSURE REGULATOR VALVES AND MAGNETIC LEVEL SWITCHES.**

Evaluation date: **26 de Marzo de 2010**

Original Approval Date:

**19 de Mayo de 2010**

Next evaluation date before:

**18 de Marzo de 2013**

**18 de Mayo de 2013**

Subject to the continued satisfactory operation of the organisation's Management System, this certificate is valid until:

To check this certificate validity please call +34 11 4000 8100

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organisation

Ing. Marta G. Piaz

Date: **27 de Mayo de 2010**

Certificate Number: **AR-231177**

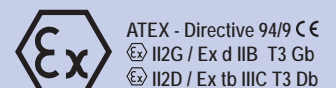


Bureau Veritas Certification  
using the accreditation  
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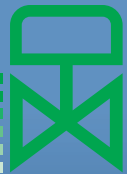
## APPROVALS





**JEFFERSON**  
**SOLENOID VALVES U.S.A. INC**  
**ENGINEERING FOR INDUSTRIAL AUTOMATION**  
Solenoid Valves and Level Switches

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