

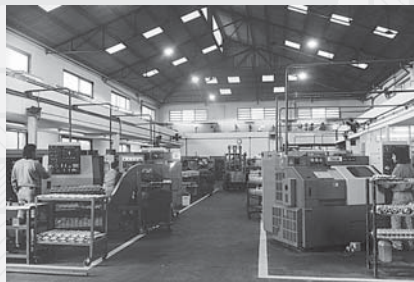


**JEFFERSON
SUDAMERICANA S.A.**

Since its birth more than forty years ago, *Jefferson* Sudamericana has been working with a clear aim ahead - meeting the market's needs with regard to solenoid valves, magnetic level switches and industrial automation equipments by means of innovation and the latest technology. Its organization has been fully redesigned so as to comply with the ISO 9001 Standards. Its constant improvements, high-tech machinery, product engineering and market-designed orientation, and its productive process controlled by specialists make *Jefferson* not only a pioneer, but also a leader in fluid control.

Jefferson's manufacturing plant is located in Buenos Aires City. It includes machining and perforation centers and specially designed computer-assisted machinery with numerical control systems for the entire production to supply the home market and exports.

Its current catalog of standard products includes more than 3,000 items including valve and magnetic level switch models, all of them designed to meet industrial needs in handling all kinds of liquids and gases, such as water, air, steam, oils, refrigerants, oxygen, liquid nitrogen, corrosive products, among others. Laboratories, petroleum, engineering, building, food and beverage, refrigeration, heating, automobile, metallurgical, textile and petrochemical are some of the industries that testify to the quality of each of *Jefferson*'s products.



Its products enjoy international recognition as testified by the approvals of Underwriters Laboratories (UL) in USA and Canadian Standards Association (CSA) in Canada.

Jefferson has also been awarded the Bureau Veritas Quality International Certificate of Approval for its Quality Management System, in accordance with ISO E9001 Standard.

This has allowed *Jefferson* to compete with market leaders in more than 22 countries throughout the 5 Continents, such as the USA, Canada, Mexico, Brazil, Australia, South Africa, Greece and recently Japan, Taiwan and Singapore.

Its international leadership becomes evident with *Jefferson* Solenoibras Ltda. in Brazil, where some of its products are manufactured. In Mexico the products are commercialized by Valjeff SA de CV, as well as in the USA and Canada and important distributors in other countries.

Jefferson continues to grow, by investing in machinery, technology and human resources, increasing its presence in the main industrial projects and jobs, creating technical solutions for the next century, anticipating the challenges provided by the industry.

Jefferson, a leader through all times.



General Catalog / 1

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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 designing 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 inlet/s, passage/s and outlet/s.

Needle type metal guillotine plugs, or elastomer or teflon® 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, except one model that goes up to 100 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 their number of inlets and outlets, solenoid valves are classified as: 2-Way, 3-Way, 4-Way and 5-Way valves.

With respect 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.

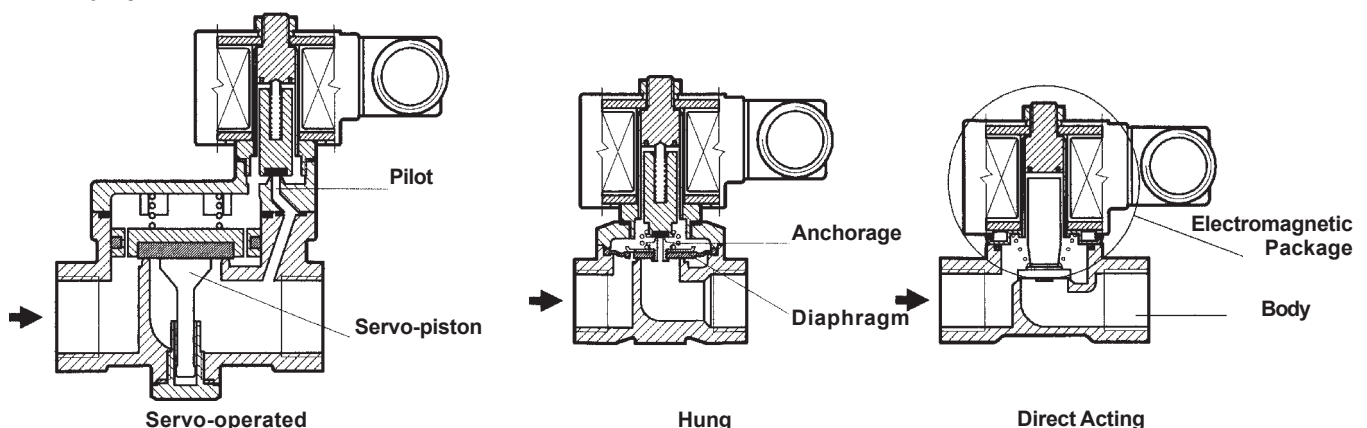
The monostable 2-way valves which close when de-energized are called **Normally Closed Valves**. On the contrary, those which remain open are called **Normally Open Valves**.

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 - Servo operated - Combined

According to their operation mode, valves may be direct acting, servo 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 an operator manually activates a lever ad hoc. **1332** and **1369** Series are examples of said 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 for the electric operator (solenoid) and are operated 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 valves, and large valves that are operated by means of an auxiliary fluid such as air, water or others. The cylinder's size is subjected 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.

Application: uses

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

Said families are:

General purpose valves

These are used in a great variety of systems and different industrial areas which operate with water, air, steam, light oils, neutral gases, 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 wash, 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, and insulating 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 adequate 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 the selection and / or purchase order of 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.

Choosing the right model demands awareness of some data for its application:

Fluid characteristics

The liquid or gaseous product to be controlled 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, said strainer 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 build the body, seal, seat, diaphragm, piston, etc. of the same valve. Each valve series provides the pertinent information.

Size and Type of connection

Connection size is indicated in inches. The connection type depends on the most common use in the application area. For General Use, Combustion, Pneumatics: BSP or NPT threaded, flanged upon request. Refrigeration: SAE flare threads, flanged or ends for welding.

Installation

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

Differential Pressure

Differential pressure, or pressure drop or charge loss, is the static pressure difference between the valve's input and output. Its symbol is Δp .

Maximum Differential Pressure

The maximum when the valve is closed. When this pressure exceeds the maximum value for each model of valve, it cannot operate.

Minimum Differential Operation

It is necessary for servo operated valves to open and remain open, but not for direct acting nor hung valves.

Maximum Line Pressure

It is usually equal to the highest differential pressure, except in cases of residual pressure or vacuum on the outlet side.

Hydraulic Pressure Test

It is the pressure at which the valve's design is tested. It equals 5 times the maximum valve operation pressure. This safety factor amply prevents strain or breakage of the external components due to accidental overpressure in the line.

Counterpressure

Two-way solenoid valves do not allow output

pressure or counterpressure to be greater than the input pressure. If this is the case, it is necessary to use retention valves to prevent the counterpressure from entering the circuit before the valve.

Operation Temperature

Each model indicates the maximum working temperature for the fluid.

This temperature has two limits - the material and the coil thermal class. The surrounding temperature is relevant in this respect, for the coil absorbs the fluid's heat when it exceeds 80°C, adding to the coil's heat, so they 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:

$$\text{Maximum temperature indicated in the valve} + 30^{\circ}\text{C} = \text{fluid's temperature} + \text{ambient temperature.}$$


Ambient Conditions


Other factors play a role apart from temperature, 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. Uncapsulated coils are used with 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). Servo operated valves are slower and range from 50 to 80 ms according to the model and size.

In some models the response time with liquids may double the response time with air, especially when closing.  may correct this according to the 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  Technical Department.

Electric Power Supply

Since there is a special coil for each type of current and voltage with the exact power for each valve, the valves shall only be used with their technically appropriate coil.

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

Flow - Flow Coefficient

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

The value is set experimentally, and it is recognized as the flow coefficient **Kv** for the metric system and **Cv** for the imperial system: pounds, feet, inches, gallons (USA). Calculations are valid only for completely open valves.

The flow coefficient Kv is the water flow in m³/hour that goes through a valve with 1 bar pressure drop, at ambient temperature.

So:

For $\Delta p = 1 \text{ bar}$
 $Q_n = 1 \text{ m}^3/\text{h} \quad K_v = 1$
 Generally
 $Q_n = n \text{ m}^3/\text{h} \quad K_v = n$

Flow coefficient Cv is the water flow through the valve with a pressure drop of one psi, in gallons per minute.

So:

For $\Delta p = 1 \text{ psi}$
 $Q_n = 1 \text{ Gall/Min} \quad C_v = 1$
 Generally
 $Q_n = n \text{ Gall/Min} \quad C_v = n$

<i>Equivalents.</i>	
Cv = 1	Kv = 0,85
Kv = 1	Cv = 1,17

<i>Kv calculation of two valves or more.</i>
- 2 equal valves in series. $K_v_t = K_v_1 \times 0,7$
- 2 equal valves or more or with different sizes in series. $1/K_v_t = 1/K_v_1 + 1/K_v_2 + \dots + 1/K_v_n$
- 2 equal valves or more or with different sizes in parallel. $K_v_t = K_v_1 + K_v_2 + \dots + K_v_n$

Kv_t: Kv equivalent to one solenoid valve that replaces them.

Example:

2 Kv valves = 1 **in series**, are equivalent to 1 valve with Kv = 0,7
 2 Kv valves = 1 **in parallel**, are equivalent to 1 valve with Kv = 2

Kv_t simplifies the calculation using the formulas and graphics all at once, without need for repeating the procedure for each particular valve.

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Formulas for flow calculation

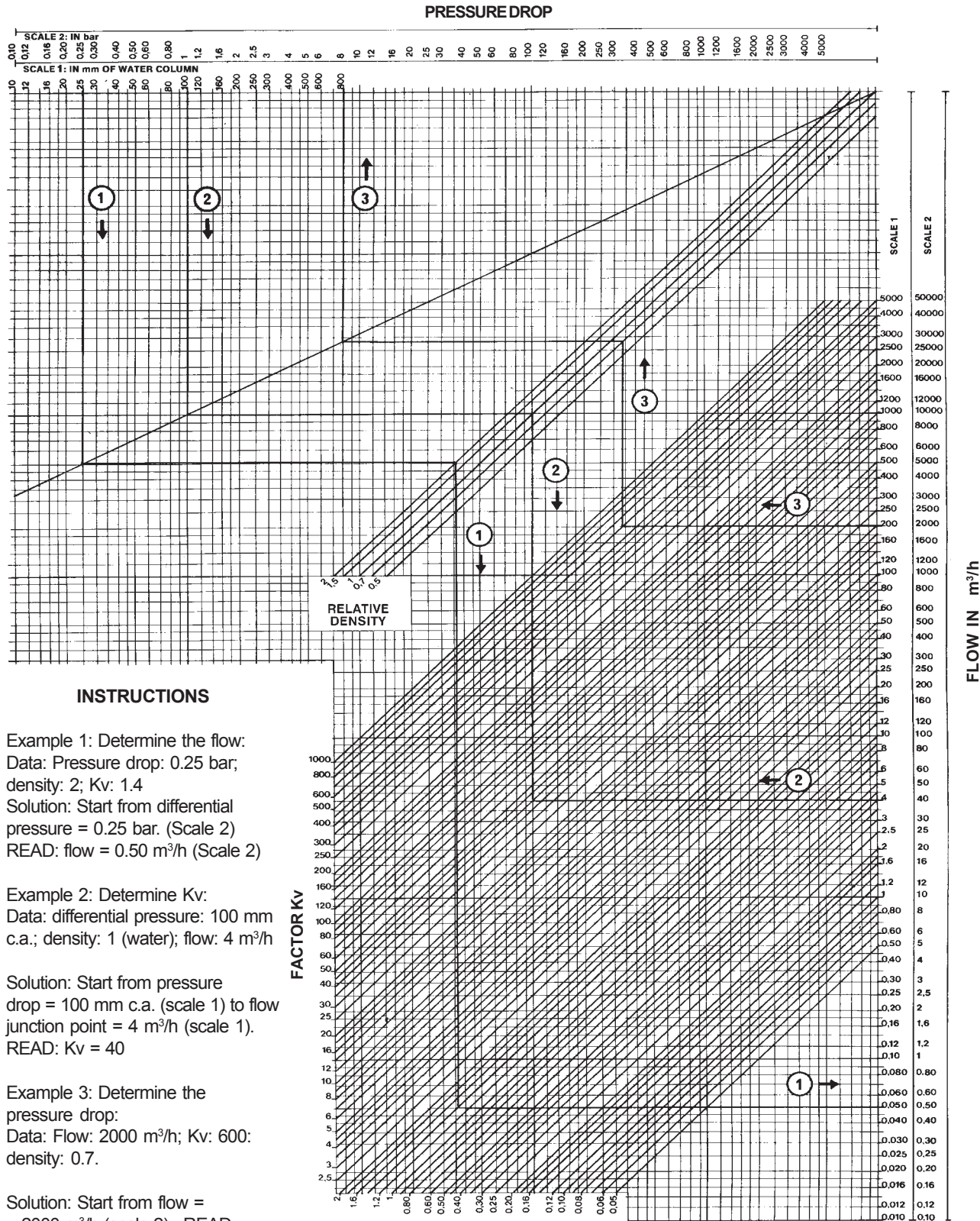
Fluids	Flow Calculation; $Q_n =$ liquids; $Q_n =$ gases; $Q_m =$ steam	Calculation of flow coefficient K_v (m ³ /h)	Pressure drop calculation bar
Liquids	$Q_v = K_v \sqrt{\frac{\Delta p}{\rho}}$	$K_v = Q_v \sqrt{\frac{\rho}{\Delta p}}$	$\Delta p = \left(\frac{Q_v}{K_v}\right)^2$
Kv Correction for liquids more viscous than water	$Q_v = K_{vc} \sqrt{\frac{\Delta p}{\gamma}}$	$K_{vc} = \sqrt{\frac{K_v}{\Delta p} \cdot \frac{\rho}{800}} + K_v$	$\Delta p = \gamma \left(\frac{Q_v}{K_{vc}}\right)^2$
Gases	$P_2 > \Delta p$ $Q_n = 500 \cdot K_v \sqrt{\frac{P_2 \cdot \Delta p}{\rho_n (273+t)}}$	$K_v = \frac{Q_n}{500} \sqrt{\frac{\rho_n (273+t)}{P_2 \cdot \Delta p}}$	$\Delta p = \frac{P_1}{2} - \sqrt{\frac{P_1^2}{4} - C}$ $C = \rho_n T \left(\frac{Q}{500 K_v}\right)^2$
	$P_2 \leq \Delta p$ $Q_n = \frac{250 \cdot K_v \cdot P_1}{\sqrt{\rho_n (273+t)}}$	$K_v = \frac{Q_n \sqrt{\rho_n (273+t)}}{250 \cdot P_1}$	
Dry saturated steam	$P_2 > \Delta p$ $Q_m = K_v \cdot 31,7 \sqrt{\frac{\Delta p}{v_2}}$	$K_v = \frac{Q_m}{31,7} \sqrt{\frac{v_2}{\Delta p}}$	$\Delta p = \left(\frac{Q_m}{K_v \cdot 31,7}\right)^2 \cdot v_2$
	$P_2 \leq \Delta p$ $Q_m = K_v \cdot 22,5 \sqrt{\frac{P_1}{v_1}}$	$K_v = \frac{Q_m}{22,5} \sqrt{\frac{v_1}{P_1}}$	

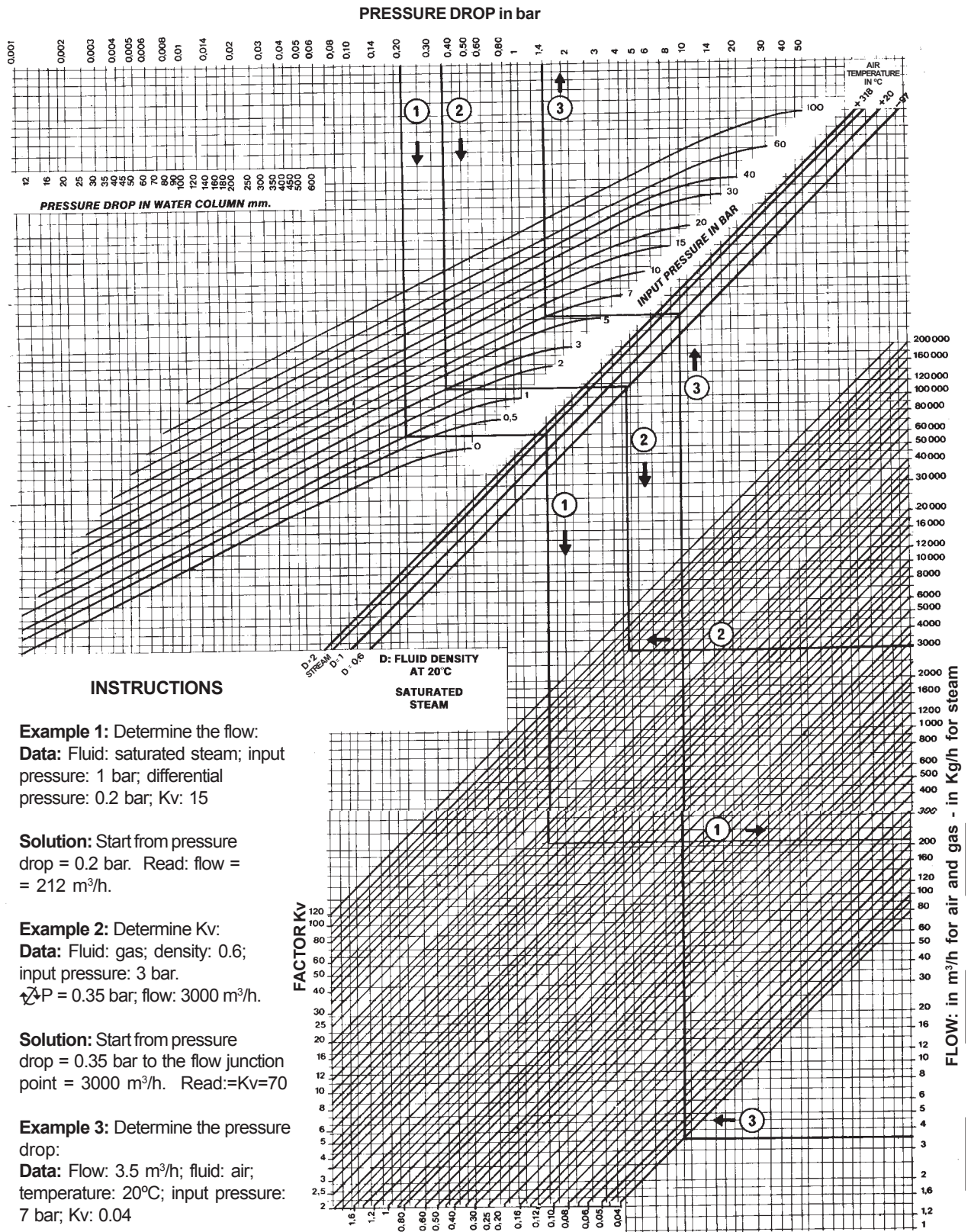
Symbol	Unit	Magnitude
K_v	m ³ /h	Valve flow coefficient when it is completely open
Q_v	m ³ /h	Liquid volumetric flow
Q_n	Nm ³ /h	Gas volumetric flow in normal conditions (atmospheric pressure = 760 mm.Hg. and temperature 25°C).
Q_m	kg/h	Fluid mass flow in dry saturated steam state.
ρ	grs/cm ³	Liquid specific weight at operation temperature.
ρ_n	—	Air relative density in normal pressure and temperature conditions.
t_1	°C	Fluid's temperature before the valve.
T_1	°K	Absolute fluid's temperature before the valve (273 + t ₁).
v_2	m ³ /kg	Steam specific volume at the valve's outlet.
v_1	m ³ /kg	Steam specific volume at P ₁ pressure and t ₁ temperature (overheat).
P_1	bar	Absolute pressure at the valve's inlet = gauge pressure + atmospheric pressure.
Δp	bar	Pressure drop through the valve.
P_2	bar	Absolute pressure at the valve's outlet. $P_2 = P_1 - \Delta p$
ν	cSt	Liquid's kinematic viscosity at operation temperature.
K_{vc}	—	Corrected Kv due to viscosity.

Physical properties of some gases and liquids					
Gases at 20°C and 760 mm.Hg.		Liquids			
Gas	Density relative to air (ρ_n)	Liquid	Temp. in °C	P.E. grs/cm ³ (ρ)	Kinem. viscos. cSt (ν)
Acetylene	0,91	Water	15	1	0,90
Air	1,00	Acetone	15	0,79	0,40
Ammonia	0,72	Ethyl Alcohol	20	0,79	1,50
Argon	1,38	Ammonia	15	0,65	0,24
n-Butane	2,07	Benzene	15	0,88	0,70
Carbon dioxide	1,53	Liquefied Gas gr1	20	0,51	0,10
Carbon monoxide	0,97	Liquefied gas gr2	20	0,57	0,16
Chlorine	2,49	Naphta	20	0,76	1,10
Ethane	1,05	Kerosene	20	0,82	10
Ethylene	0,97	Gas-oil	20	0,90	12
Helium	0,14	Fuel Oil N° 4	20	0,95	14
Hydrochloric Acid	1,27	Residual Fuel Oil	120	0,87	90
Hydrogen	0,07	Light Crude Oil	20	0,91	40
Hydrogen Sulfide	1,19	Heavy Crude Oil	20	0,98	1725
Methane	0,55	SAE 10 Oil	20	0,88	178
Methyl Chloride	1,79	SAE 20 Oil	20	0,89	278
Natural gas (*)	0,65	SAE 30 Oil	20	0,90	409
Bottled gas grade 1	1,50	SAE 40 Oil	20	0,90	690
Bottled gas grade 2	1,90	SAE 50 Oil	20	0,90	1316
Nitric oxide	1,04	Olive Oil	20	0,92	97
Nitrogen	0,97	Corn Oil	20	0,92	118
Nitrous oxide	1,53	Glycerine	20	1,26	626
Oxygen	1,11	Freon 12	20	1,33	0,7
Propane	1,56	Oxygen	-160	1,20	
Ethylene propane	1,45	Nitrogen	-160	0,80	
Sulphur dioxide	2,26	Carbon Dioxide	-160	1,06	

Some properties of the dry saturated water steam		
Absolute pressure bar	Temperature °C	Specific Volume m ³ /kg
0,8	93,5	2,09
1	99,6	1,69
1,1	102,3	1,69
1,2	104,8	1,43
1,3	107,1	1,33
1,5	111,4	1,16
2	120,2	0,89
2,5	127,4	0,72
3	133,5	0,61
3,5	138,9	0,52
4	143,6	0,46
4,5	147,9	0,43
5	151,8	0,38
5,5	156	0,34
6	159	0,32
6,5	161	0,28
7	165	0,27
7,5	168	0,26
8	170	0,24
8,5	173	0,23
9	175	0,22
9,5	177	0,20
10	180	0,19
10,5	182	0,19
11	184	0,18
11,5	186	0,17

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







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. (Prefix ZC)	
	Size G	Size M		Size M		Size M	
	Shape B	Shape A		1/2"NPT Connection		1/2"NPT Connection	
Hz	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

Connector types for DIN connections

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

Key to the formation of the catalog number of the encapsulated coil.

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 cables (one ground cable)
- ZC explosion proof, threaded connection with 3 output cables (one ground cable).
(5 and 6) See Available tension
5 - Tension; 6 - Type of current
(7) Type of connectors (only for DIN connection. See chart).

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

Type of current Hz	Size C	Size M		Size S		Size B
	Class F 155°C	Class F 155°C	Class H 180°C	Class F 155°C	Class H 180°C	Class H 180°C
D/C	C08F		M19H		S48H S60H (1)	B113H (1)
A/C 50 Hz	C08F	M11F M16F	M11H M16H	S28F	S28H S46H S46P (3) S60H (2)	B113H (2)
A/C 60 Hz	C08F	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 Tension - Size C, 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

Key to the formation of the catalog number:

S	20	H	220	50
(1)	(2)	(3)	(4)	(5)

(1, 2 and 3) See fibre coated coils chart.
1 - Coil size; 2 - Power in Watts; 3 - Thermal class.
When it is P, it is class H + polyester coating.
(4 and 5) See available tension chart.
4 - Tension
5 - Type of current.

Thermal Class:

Class F up to 155°C
Class H up to 180°C

Uncapsulated coil housings.



Classification	Coil size				
	C	M	S	S (for 1388)	B
General internal use (Prefix C)	Chromium plated	Plate opening for electric connection of ø 19 mm. Ground connection	Iron 3/4" NF Connector	Iron 1/2" BSP or NPT Connector	Iron 1/2" BSP or NPT Connector
Weather and water proof. NEMA 4x. and IP65 (Prefix Y)	--	Aluminium epoxy paint 1/2" BSP or NPT electric connection	Iron epoxy paint 1/2" BSP or NPT electric connection	Iron epoxy paint 1/2" BSP or NPT electric connection	Iron epoxy paint 1/2" BSP or NPT electric connection
Explosion and weather proof according to IEC 79-1 "d" (Prefix Z)	--	Aluminium epoxy paint 1/2" BSP or NPT electric connection	Iron epoxy paint 1/2" BSP or NPT electric connection	--	--

General Purpose

Page 17-34: Solenoid valves - 2 ways NC and NO.

Serie Nº	Connection ø in inches										Maximum Temp. °C			bar		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	Air and inert gases	Water and light liquids	Thermal oils	Steam	Oxygen	Gasoline	Cryogenic fluids	Vacuum		
1314													○	○	○	0	15	A	A	T	T	N	V	T	A-V
1326													○			0	50	A	A	-	-	N	V	-	A-V
1327													○	○	○	0	100	A	A	T	T	N	V	T	A-V
1335													○	○		0	10	A	A	V	E	N	V	-	A-V
1342													○	○	○	0.2	15	A	A	T	T	N	V	T	-
1390													○	○	○	0.1	15	A	A	T	T	N	V	T	-
1393															○	0	4	T	T	T	T	-	-	-	-
2026													○	○		0	50	A	A	-	E	N	V	-	A-V
2036													○			0.1	10	A	A	-	-	-	-	-	-
2036													○			0.3	10	A	A	-	-	-	-	-	-

* 1327, 1335, 1342, 1390 NC and NO.

Combustion Use

Page 35-52: Solenoid valves - 2 ways NC y NO.

Serie Nº	Connection ø in inches										N. Closed	N. Open	bar		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				Gasoil	Fueloil	Natural V	LPG	Combustion Air
1312											○	○	0	21	-	-	-	S	S	-	S	S
1330											○	○	0	0.2	-			-	-	A	A	A
2030											○	○	0.001	2	-	○	○	-	-	A	A	A
1332											○		0	3	○	-	○	-	-	A	A	A
1356											○		0	20	-	-	-	T	T	T	T	-
1388											○		0	5	-	○	○	-	-	A	A	A
1327											○	○	0	20	-	-	-	V	T	A	A	○
2026											○		0	10	-	-	-	V	-	A	A	○
1335											○	○	0	10	-	-	-	V	-	A	A	○
1390											○	○	0.1	15	-	-	-	V	-	A	A	○

* 1327, 2026, 1335, 1390 see General Use: pages 17-33. - 2030 NC up to 0,16 bar. NO up to 2 bar.

Nomenclature

The letters indicated in Typical Applications refer to the seat, seal and diaphragm materials (if any), as follows:

A = Acrylo-nitrile; **N** = Neoprene®; **E** = Ethyl-propylene; **V** = Viton®; **T** = Teflon®; **S** = AISI 304.

Pneumatic and hydraulic use

Page 53-68: Solenoid valves - 3, 4 and 5 ways.

Serie N°	Connection ø					Pmax bar					Ways			Positions	Monostable	Bistable	Fluids					
	1/8	1/4	3/8	1/2	3/4	Minimum	Maximum				3	4	5				Lubricated Air	Dry Air	Gas	Water	Hydraulic Oil	
							4 & 5 ways															
							NC	NO	DV	CON												
1323						0	-	10	10	20	8	○			2	○		A	A	A	A	A
1325						0,5	-	10	10	-	-	○			2	○		A	A	A	A	A
1339						0,5	10	-	-	-	-	○			3	○		A	A	A	A	A
1350						0,5	10	-	-	-	-	○			2	○	○	A	A	A	A	A
1351						0,5	-	10	10	-	-	○			2	○	○	A	A	A	A	A
1365						0	-	15	8	20	7	○			2	○		A	A	A	A	A
1375	NAMUR Plaque					0,5	10	-	-	-	-				2	○		A	A	-	-	-
1387	NAMUR Plaque					0	-	10	-	-	-	○			2	○		A	A	-	-	-
1387	NAMUR Plaque					0,5	-	10	-	-	-	○			2	○		A	A	-	-	-
2024						0,8	10	-	-	-	-				2	○		A	A	-	-	-

* Hot Air or Gas: Viton® Seats or Seals - NC: Normally Closed. NO: Normally Open. DIV: Divergent. CON: Convergent.

Miscellaneous

Page 69-79

Serie N°	Connection ø in inches													Maximum Temp.	Max. pressure in bar	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				Acids	Alkalis	Distilled Water	Oil Products	Dirty Fluids	Neutral Gases and Air	Thermal Oils
Solenoid Valves for Dust Collector Equipment																							
2073															80	10	no					○	
Solenoid Valves for Corrosives Fluids																							
1360															60	4	no	○	○	○	○	○	○
Solenoid Valves with Manual Reset Device																							
1369															80	20	no			○	○	○	○
Valves with Pneumatic or Hydraulic Operators																							
1372															80	10	yes	○	○	○	○	○	○
Pneumatic or Hydraulic Operators Pneumatic or Hydraulic Operated Valves																							
1310															200	20	yes			○	○	○	○
1311															150	7	yes	○	○	○	○	○	○

*1310, special construction for higher temperature and pressure.


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

Do not oversize, nor undersize the valve. Use the formulas and graphics shown in this manual, which will make your calculations easier.

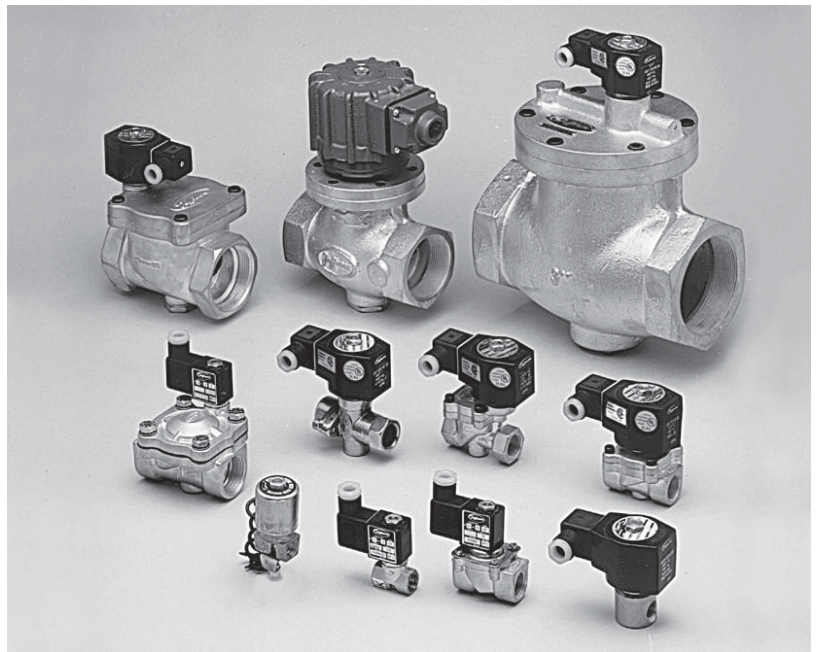
Check that there is a strainer with a mesh smaller than 100 microns immediately upstream of the valve.











Make sure that the installer follows the mounting instructions indicated by Jefferson, especially with respect to the coil connector airtightness when subjected to water or condensation or ambient humidity, and to the thorough cleaning of pipelines before operation.

Find out beforehand which are the advisable repair kits for the maintenance or repair in each case. They are inexpensive and the product designs contemplate a quick change. If the valves have been correctly selected, there is no need to close down the system to carry out the changes. In the **Repair Kits** chapter we indicate the component numbers corresponding to the standard models.

Consult  if you have any doubts when reading this catalog or if you plan to work with an unusual application.

Solenoid
Valves for
General
Purpose
2 ways



1314 Series		Normally closed Servo-operated or hung 18
1326 Series		Normally closed Microvalve Direct acting 20
1327 Series		Normally closed and Normally open Direct acting 22
1335 Series		Normally closed and Normally open Direct acting , Servo-operated or hung 24
1342 Series		Normally closed and Normally open Servo-operated action 26
1390 Series		Normally closed and Normally open Servo-operated action 28
1393 Series		Normally closed and Normally open Direct acting 30
2026 Series		Normally closed Microvalve Direct acting 32
2036 Series		Normally closed Servo-operated action 33
1359 Series		Series "Y" strainer for General Use 34



Main characteristics

Normally closed.
 Servo operated or combined action (hung piston).
 Bronze, stainless steel body.
 BSP or NPT threaded connection.
 Brass, stainless steel servopiston, among others.
 Seals and seats: acrylo-nitrile for neutral fluids up to 80° C and teflon up to 180° C.
 Seals and seats: neoprene, ethyl-propylene and viton for other uses.
 Class **F** or class **H** coils coated with glass fibre and insulating impregnation. Interconnection cables.

Internal general use housing.
 3/4" NF electric connection.

Options:

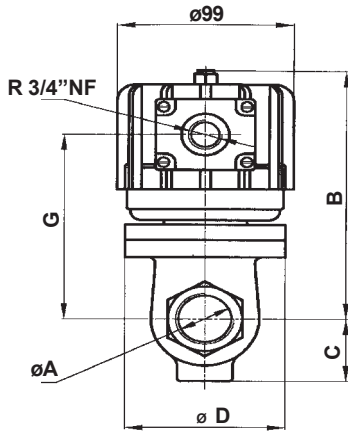
- Explosion and / or weather proof housing.
- Manual operation on the principal orifice.

Technical specifications

Ø Connect.	Ø Passage mm.	Kv Coef. m³/h	Weight in kg.	Maximum temperature and catalog N° according to seat material				
				Acrylo - Nitrile	Neoprene®	Ethylpropylene	Viton®	Teflon®
				80°C	80°C	150°C	180°C	180°C
Bronze body - Hung piston - Minimum Δp : 0 bar - Maximum Δp : 7 bar.								
3/4"	19	6	4	1314BA06A	1314BN06A	1314BE06A	1314BV06A	1314BST06A
1"	26	10	4,9	1314BA08A	1314BN08A	1314BE08A	1314BV08A	1314BST08A
1,1/2"	32	15	6,5	1314BA12A	1314BN12A	1314BE12A	1314BV12A	1314BST12A
2"	38	23	7,3	1314BA16A	1314BN16A	1314BE16A	1314BV16A	1314BST16A
Bronze body - Free piston - Minimum Δp : 0,1 bar - Maximum Δp : 15 bar.								
3/4"	19	6	4	1314BA06	1314BN06	1314BE06	1314BV06	1314BST06
1"	26	10	4,9	1314BA08	1314BN08	1314BE08	1314BV08	1314BST08
1,1/2"	32	15	6,5	1314BA12	1314BN12	1314BE12	1314BV12	1314BST12
2"	38	23	7,3	1314BA16	1314BN16	1314BE16	1314BV16	1314BST16

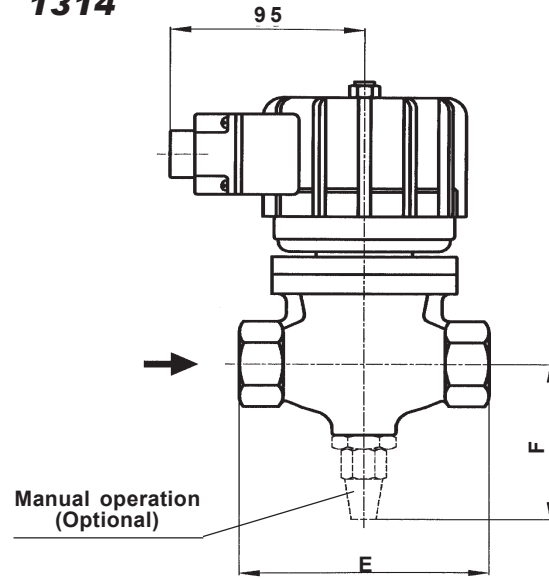
Note: In teflon seat constructions, the piston is made of stainless steel AISI316 and its maximum working pressure with saturated steam is 10 bar (180°C).

General dimensions



øA	B	C	øD	E	F	G
3/4"	150	32	76	100	80	113
1"	157	41	90	122	89	120
1.1/2"	173	49	100	139	97	136
2"	180	51	110	149	100	143

1314



Measurements: mm.

NPT Connections

Add suffix "T" to Catalog N°. Example: 1314BA06AT.

Special Constructions

Stainless steel body:

•AISI304: change letter **B** or **BS** for **S** in the catalog N°. Example: 1314SA08, 1314ST08.

•AISI316: change letter **B** or **BS** for **I** in the catalog N°. Example: 1314IA08, 1314IT08.

Coils

AC 50 Hz: 28W, up to 155°C, S28F type, up to 180°C, S28H type, for 12V, 14V, 110V, 220V, 240V.

AC 60 Hz: 30W, up to 155°C, S30 OR type, up to 180°C, S30H type, for 12V, 24V, 110V, 120V, 220V, 240V.

DC: 48W, up to 180°C, S48H type, for 12V, 24V, 110V, 220V.

Options

- Weather proof housing. Add prefix **Y** to valve catalog. Example: Y1314BST08A.
- Explosion and weather proof housing. Add prefix **Z** to valve catalog. Example: Z1314BST08A.
- Manual operation: on the main orifice. Add suffix **-M** to catalog number. Example: 1314BST08-M.

Recommendations for the installation

Place a strainer with a porosity $\square 100$ upstream of the valve.
Mount the valve **only** on a horizontal pipeline with the coil upright.
The valve input pressure must always be equal or greater than the output pressure.

Applications according to the seat material.

Seat material	Acrylo Nitrile	Neoprene®	Ethyl-Propylene	Viton®	Teflon®
Maximum temperature	+80°C	+80°C	+150°C	+180°C	+180°C
Uses	Water, air, light oils. Gas-oil, 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.	Steam, hot oils, corrosive fluids.



1326 Series



Main characteristics

Normally closed.
Direct acting. No need for minimum differential pressure to operate.
Forged brass compact body.
BSP or NPT threaded connections.
Seats: acrylo-nitrile for neutral fluids up to 80°C.

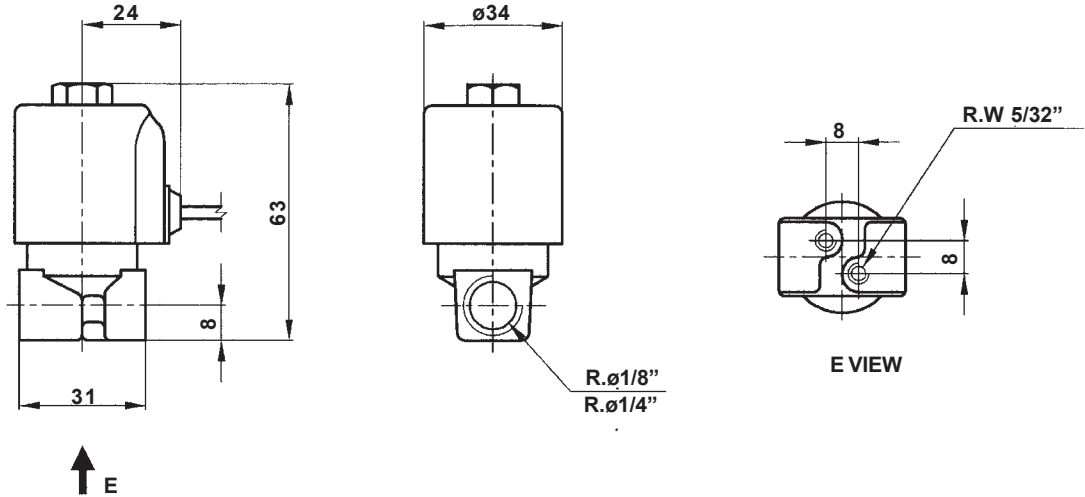
Low consumption coil coated with glass fibre and insulating impregnation.
Output cables for splicing.
Response Time: <10 ms.
Weight: 350 g.

Technical specifications

Ø Connect.	Ø Passage mm.	Kv Coef. m³/h	Maximum Δp in bar	Maximum Temp. and catalog N° according to seat material			
				Acrylo - Nitrile	Neoprene®	Ethyl-propylene	Viton®
				80°C	80°C	150°C	150°C
1/8"	1,25	0,05	50	1326BA121	1326BN121	1326BE121	1326BV121
	1,75	0,09	20	1326BA171	1326BN171	1326BE171	1326BV171
	2,25	0,13	10	1326BA221	1326BN221	1326BE221	1326BV221
	3,00	0,25	4	1326BA301	1326BN301	1326BE301	1326BV301
1/4"	1,25	0,05	50	1326BA122	1326BN122	1326BE122	1326BV122
	1,75	0,09	20	1326BA172	1326BN172	1326BE172	1326BV172
	2,25	0,13	10	1326BA222	1326BN222	1326BE222	1326BV222
	3,00	0,25	4	1326BA302	1326BN302	1326BE302	1326BV302

General dimensions

1326



Measurements: mm.

NPT Connections

Add suffix "T" to the Catalog N°. Example: 1326BE121T.

The housing is for internal use only and it is not humidity or water resistant. The valve allows slightly more pressure at the outlet than at the inlet, but in these cases watertightness is not guaranteed when it is closed.

Coils

AC 50 Hz: 8W - C08F type, for 12, 24, 110, 220, 240 V.
 AC 60 Hz: 8W - C08F type, for 12, 24, 110, 120, 220, 240 V.
 DC: 8W - C08F type, for 12, 24, 110, 220 V.

Recommendations for the installation

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

Applications according to the seat material

Seat material	Acrylo Nitrile	Neoprene®	Ethyl-Propylene	Viton®
Maximum temperature	+80°C	+80°C	+150°C	+150°C
Uses	Water, air, light oils. Gas-oil, 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.



1327 Series



Main characteristics

Normally closed and normally open.
Direct acting. No need for differential pressure to operate.
Brass, iron, stainless steel body.
Seats: acrylo-nitrile for neutral fluids up to 80°C and teflon up to 180°C.
Seats: neoprene, viton and ethyl-propylene for other uses.
1/4" BSP or NPT threaded connections.
DIN 43650 connection encapsulated coils, shape A.
IP65 and NEMA4 protection.

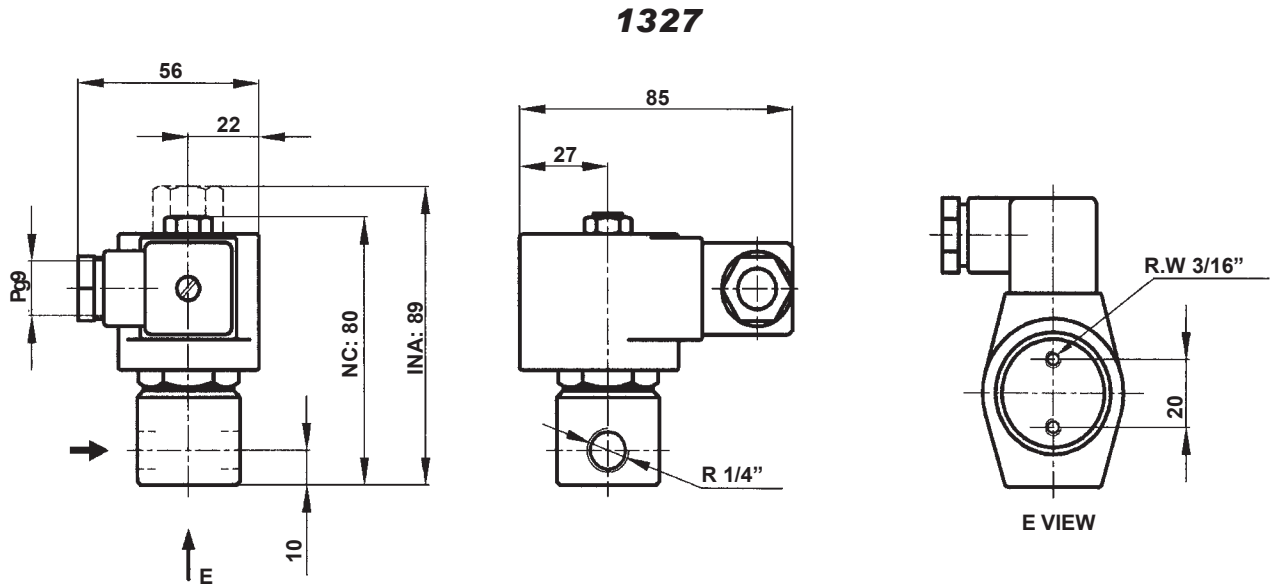
Options:

- Energized coil indicator light.
 - Explosion and / or weather proof coils and housings.
 - Manual operation.
- Approximate weight: 0.5 kg.

Technical specifications

ø Passage mm.	Kv Coeficiente m³/h	Maximum Δp in bar	Maximum Temp. and catalog N° according to seat material				
			Acrylo-Nitrile	Neoprene®	Ethyl-Propylene	Viton®	Teflon®
			80°C	80°C	150°C	180°C	180°C
Brass body - Normally closed							
1,25	0,05	100	1327BA122	1327BN122	1327BE122	1327BV122	1327BT122
1,75	0,09	35	1327BA172	1327BN172	1327BE172	1327BV172	1327BT172
2,25	0,13	20	1327BA222	1327BN222	1327BE222	1327BV222	1327BT222
3,00	0,26	10	1327BA302	1327BN302	1327BE302	1327BV302	1327BT302
4,00	0,43	5	1327BA402	1327BN402	1327BE402	1327BV402	1327BT402
5,00	0,60	3	1327BA502	1327BN502	1327BE502	1327BV502	-
5,25	0,65	2,2	1327BA522	1327BN522	1327BE522	1327BV522	-
Brass body - Normally open							
1,25	0,05	50	1327BA122NA	1327BN122NA	1327BE122NA	1327BV122NA	1327BT122INA
1,75	0,09	20	1327BA172NA	1327BN172NA	1327BE172NA	1327BV172NA	1327BT172INA
2,25	0,13	12	1327BA222NA	1327BN222NA	1327BE222NA	1327BV222NA	1327BT222INA
2,50	0,17	10	1327BA252NA	1327BN252NA	1327BE252NA	1327BV252NA	-
3,00	0,26	10	1327BA302INA	1327BN302INA	1327BE302INA	1327BV302INA	1327BT302INA
4,00	0,43	5	1327BA402INA	1327BN402INA	1327BE402INA	1327BV402INA	1327BT402INA

General dimensions



Measurements: mm.

NPT Connections

Add suffix "T" to the Catalog N°. Example: 1327BA122T.

Special constructions

- Stainless steel body.
- AISI 304: change letter **B** for **S** in the catalog N°. Example: 1327ST302
- AISI 316: change letter **B** for **I** in the catalog N°. Example: 1327IT302.
- Iron body. Change letter **B** for **H** in the catalog N°. Example: 1327HT302.

Coils

- AC 50 Hz: 11W, up to 155°C, MF11C type, up to 180°C, MH11C type, for 12 V, 24 V, 110 V, 220 V, 240 V.
- AC 60 Hz: 13 W, up to 155°C, MF13C type, up to 180°C, MH13C type, for 12 V, 24 V, 110 V, 120 V, 220 V, 240 V.
- DC: 19 W, up to 180°C, MH19C type, for 12 V, 24 V, 110 V, 220 V.

Options

- Explosion and weather proof coils. Add prefix **ZC** to valve catalog. Example: ZC1327BA302.
- Water, weather and saline corrosion proof coils. NEMA 4x. Add prefix **YC** to valve catalog. Example: YC1327BA302.
- Explosion and weather proof housing. Add prefix **Z** to valve catalog. Example: Z1327BA302.
- Manual operation. Add suffix **-M** to catalog N°. Example: 1327BA302-M.
- Energized coil indicator light. See Coils.

Recommendations for the installation

Place a strainer upstream of the valve with a porosity \square 100 \square . 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	Acrylo Nitrile	Neoprene®	Ethyl-Propylene	Viton®	Teflon®
Maximum temperature	+80°C	+80°C	+150°C	+180°C	+180°C
Uses	Water, air, light oils. Gas-oil, 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.	Steam, hot oils, corrosive fluids



1335 Series



Main characteristics

Forged brass, stainless steel body.
BSP or NPT threaded connections.
Encapsulated plug-in coils.
Shape A DIN 43650 Connection. IP65 and NEMA4 Protection.
Normally closed and normally open.
Metal core diaphragm and seats with different resilient compounds, according to the fluid.

Options:

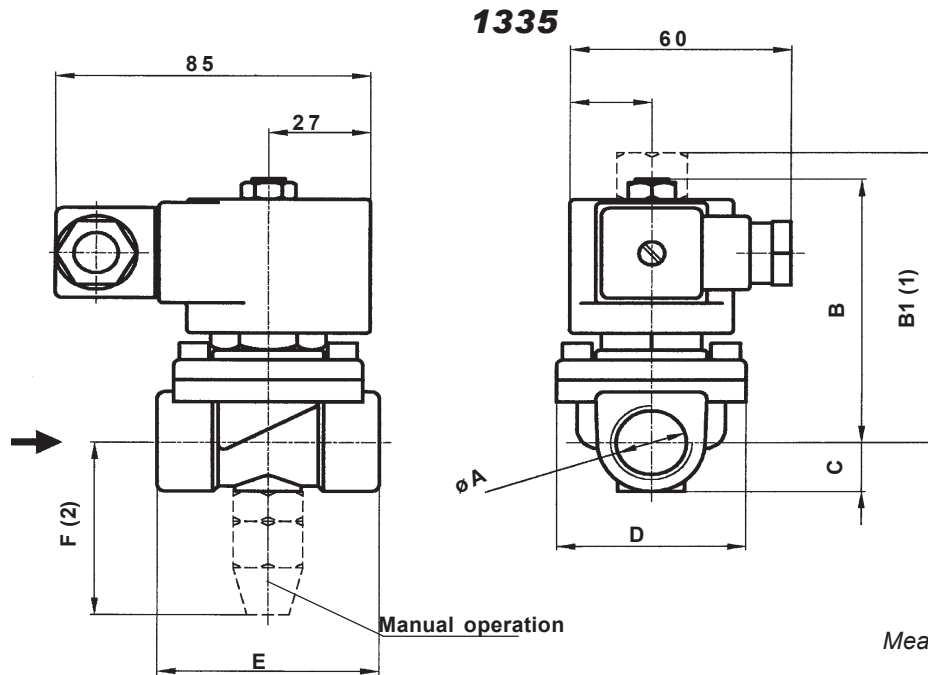
- Energized coil indicator light.
- Explosion and / or weather coils and housings.
- Manual operation.

Technical specifications

Ø Connect.	Ø Passage mm.	Kv Coef. m³/h.	Weight in kg.	Maximum Temp. and catalog N° according to seat and diaphragm materials			
				Acrylo - Nitrile	Neoprene®	Ethyl-propylene	Viton®
				80°C	80°C	150°C	150°C
Brass body - Direct acting - Normally closed - Minimum Δp : 0 bar - Maximum Δp : 0,1 bar.							
3/8"	14	2,35	0,8	1335BA3D	1335BN3D	1335BE3D	1335BV3D
1/2"	14	2,65	0,8	1335BA4D	1335BN4D	1335BE4D	1335BV4D
3/4"	18	4,30	0,9	1335BA6D	1335BN6D	1335BE6D	1335BV6D
Brass body - Servo operated - Normally closed - Minimum Δp : 0,1 bar - Maximum Δp : 10 bar.							
3/8"	14	2,35	0,8	1335BA3	1335BN3	1335BE3	1335BV3
1/2"	14	2,65	0,8	1335BA4	1335BN4	1335BE4	1335BV4
3/4"	18	4,30	0,9	1335BA6	1335BN6	1335BE6	1335BV6
Brass body - Combined acting - Normally closed - Minimum Δp : 0 bar - Maximum Δp : 7 bar.							
3/8"	14	2,35	0,8	1335BA3A	1335BN3A	1335BE3A	1335BV3A
1/2"	14	2,65	0,8	1335BA4A	1335BN4A	1335BE4A	1335BV4A
3/4"	18	4,30	0,9	1335BA6A	1335BN6A	1335BE6A	1335BV6A
Brass body - Servo operated action - Normally open - Minimum Δp : 0,1 bar - Maximum Δp : 10 bar.							
3/8"	14	2,35	0,8	1335BA3INA	1335BN3INA	1335BE3INA	1335BV3INA
1/2"	14	2,65	0,8	1335BA4INA	1335BN4INA	1335BE4INA	1335BV4INA
3/4"	18	4,30	0,9	1335BA6INA	1335BN6INA	1335BE6INA	1335BV6INA

Investment cast AISI 316 stainless steel body; change letter "B" for "I" to catalog number. Example: 1335IV4.

General dimensions



Measurements: mm.

Connection (A)	B	B1	C	D	E	F
R 3/8"	80	88	15	51	60	53
R 1/2"						
R 3/4"	82	90	17	58	72	55

NOTES: (1) Normally open version
(2) Manual operation (optional)

NPT Connections

Add suffix "T" to catalog N°. Example: 1335BA3DT.

Special constructions

- Investment cast AISI316 Body. Change letter **B** for I to Catalog N°. Example: 1335IV4.
- Vacuum systems: Consult **Jefferson**.

Coils

- CA 50 Hz: 11 W, MF11C type, for 12 V, 24 V, 110 V, 220 V, 240 V.
- CA 60 Hz: 13 W, MF13C type, for 12 V, 24 V, 110 V, 120 V, 220 V, 240 V.
- DC: 19 W, MF19C type, for 12 V, 24 V, 110 V, 220 V.

Options

- Explosion and weather proof coils. Add prefix **ZC** to valve catalog. Example: ZC1335BA4.
- Water, weather and saline corrosion proof coils. NEMA 4x. Add prefix **YC** to valve catalog. Example: YC1335BN4.
- Explosion and weather proof housing. Add prefix **Z** to valve catalog. Example: Z1335BA6A.
- Manual operation: Add suffix **-M** to catalog N°. Example: 1335BA4-M.
- Energized coil indicator light. See coil section.

Recommendations for the installation

Place a strainer upstream of the valve with a porosity \square 100 \square . Install the valve in any position, preferably on a horizontal pipeline with the coil upright.

Applications according to the seat and / or diaphragm material.

Seat material	Acrylo Nitrile	Neoprene®	Ethyl-Propylene	Viton®
Maximum Temperature	+80°C	+80°C	+150°C	+150°C
Uses	Water, air, light oils. Gas-oil, 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.



1342 Series



Main characteristics.

Normally closed or normally open.
Piston servo operated action.
Body: Forged brass or bronze, stainless steel, etc..
Seals and seats: acrylo-nitrile for neutral fluids up to 80°C, teflon seat up to 180°C.
Seals and seats: neoprene, ethyl-propylene and viton for other uses.
Shape A DIN 43650 Connection encapsulated coils.
IP65 and NEMA4 Protection.

Options:

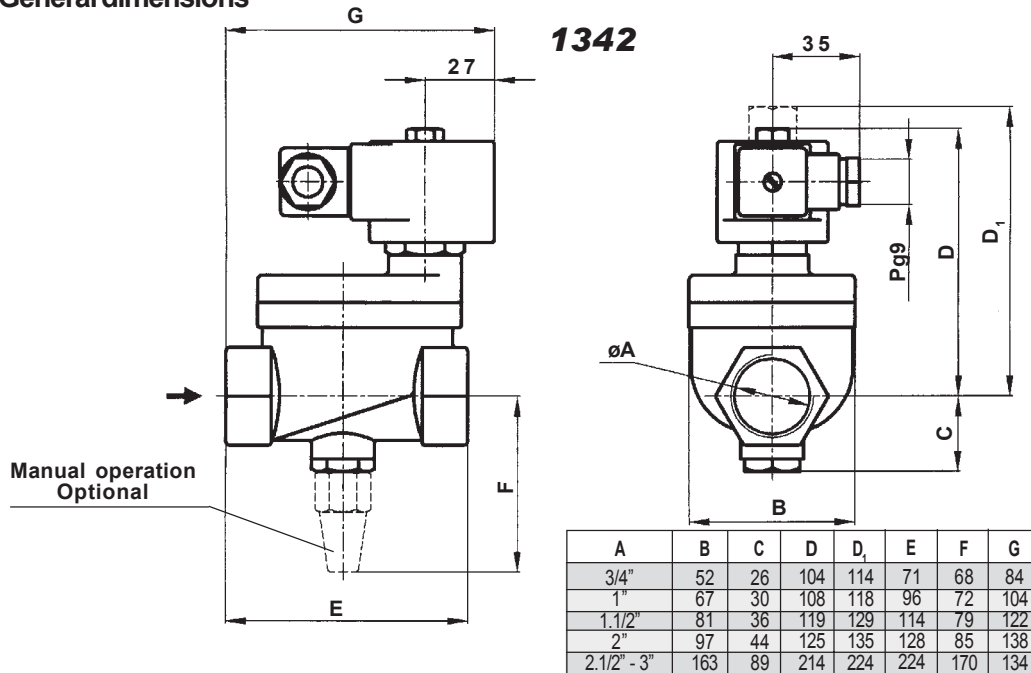
- Energized coil indicator light.
- Explosion and / or weather proof coils and housings.
- Manual operation on principal passage.
- Manual operation on pilot orifice.

Technical specifications

Ø Connect.	Ø Passage mm.	Kv Coef. m³/h	Weight in kg.	Maximum Temp. and catalog N° according to seal and seat materials				
				Acrylo - Nitrile	Neoprene®	Ethyl-propylene	Viton®	Teflon®
				80°C	80°C	150°C	180°C	180°C
Brass body -Normally closed - Minimum Δp with teflon seat: 0,5 bar -others: 0,2 bar - Maximum Δp : 15 bar								
3/4"	20	5	1,2	1342BA06	1342BN06	1342BE06	1342BV06	1342BT06
1"	26	11	1,7	1342BA08	1342BN08	1342BE08	1342BV08	1342BT08
1,1/2"	38	25	3,1	1342BA12	1342BN12	1342BE12	1342BV12	1342BT12
2"	50	40	4,1	1342BA16	1342BN16	1342BE16	1342BV16	1342BT16
2.1/2"	76	66	19,1	1342BA20	1342BN20	1342BE20	1342BV20	1342BT20
3"	76	85	18,2	1342BA24	1342BN24	1342BE24	1342BV24	1342BT24
Brass body -Normally open - Minimum Δp with teflon seat: 0,5 bar -others: 0,2 bar - Maximum Δp : 10 bar								
3/4"	20	5	1,2	1342BA06INA	1342BN06INA	1342BE06INA	1342BV06INA	1342BT06INA
1"	26	11	1,7	1342BA08INA	1342BN08INA	1342BE08INA	1342BV08INA	1342BT08INA
1,1/2"	38	25	3,1	1342BA12INA	1342BN12INA	1342BE12INA	1342BV12INA	1342BT12INA
2"	50	40	4,1	1342BA16INA	1342BN16INA	1342BE16INA	1342BV16INA	1342BT16INA
2.1/2"	76	66	19,1	1342BA20INA	1342BN20INA	1342BE20INA	1342BV20INA	1342BT20INA
3"	76	85	18,2	1342BA24INA	1342BN24INA	1342BE24INA	1342BV24INA	1342BT24INA

Note: In teflon seal and seat constructions, maximum working pressure with saturated steam is 10 bar (180°C).

General dimensions



NPT Connections

Add suffix "T" to Catalog N°. Example: 1342BA06T.

Special constructions

Stainless steel body:
 •AISI304: change letter **B** for **S** in the catalog N°. Example: 1342ST08.
 •AISI316: change letter **B** for **I** in the catalog N°. Example: 1342IT08.

Coils

AC 50 Hz: 11 W, up to 155 °C, MF11C type, up to 180 °C, MH11C type, for 12 V, 24 V, 110 V, 220 V, 240 V.
 AC 50 Hz: 13 W, up to 155 °C, MF13C type, up to 180 °C, MH13C type, for 12 V, 24 V, 110 V, 120 V, 220 V, 240 V.
 DC: 19 W, up to 180 °C, MH19C type, for 12 V, 24 V, 110 V, 220 V.

Options

•Explosion and weather proof coils.
Add prefix **ZC** to the valve catalog.

Example: ZC1342BA08.
 •Water, weather proof and saline corrosion NEMA 4x.
Add prefix **YC** to valve catalog.
Example: YC1342BA08.
 •Explosion and weather proof housing.
Add prefix **Z** to valve catalog.
Example: Z1342BA08.
 •Manual operation on principal orifice.
Add suffix **-M** to catalog N°. Example: 1342BA08-M.
 •Manual operation on pilot orifice.
Add suffix **-MP** to catalog N°. Example: 1342BA08-MP.
 •Energized coil indicator light.
See coil section.

Recommendations for the installation.

Place a strainer upstream of the valve with a porosity \square 100 \square .
 Mount the valve preferably on a 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.

Applications according to the seat material.

Seat material	Acrylo Nitrile	Neoprene®	Ethyl-Propylene	Viton®	Teflon®
Maximum temperature	+80°C	+80°C	+150°C	+180°C	+180°C
Uses	Water, air, light oils. Gas-oil, 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.	Steam, hot oils, corrosive fluids



1390 Series



Main characteristics.

Normally closed and normally open.
Piston servo operated action.
Brass, stainless steel body.
BSP or NPT threaded connection.
Seats: acrylo-nitrile for neutral fluids up to 80°C and teflon up to 180°C.
Encapsulated coils. Shape A DIN 43650 Connection.
IP65 and NEMA4 Protection.

Options:

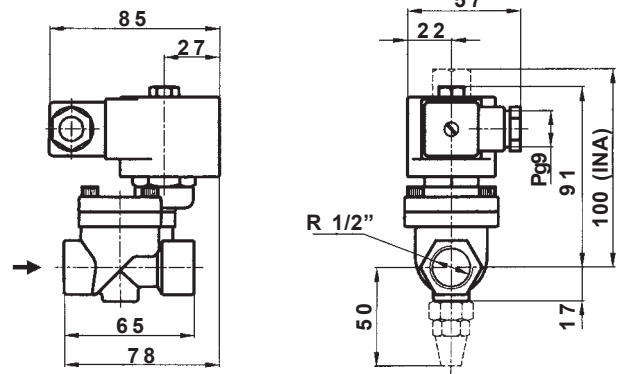
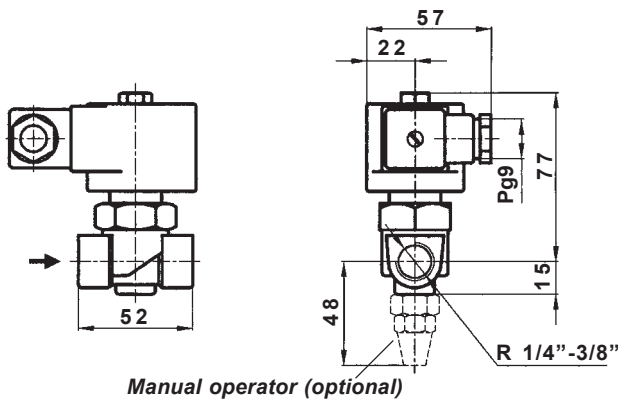
- Energized coil indicator light.
- Explosion and weather proof coils and housings.
- Manual operation.

Technical specifications.

Ø Connect.	Ø Passage mm.	Kv Coef. m³/h	Weight in kg.	Maximum Temperature and catalog N° according to seat				
				Acrylo - Nitrile	Neoprene®	Ethylpropylene	Viton®	Teflon®
				80°C	80°C	150°C	180°C	180°C
Brass body - Normally closed - Minimum Δp : 0,1 bar - Maximum Δp : 15 bar								
1/4"	6	0,80	0,70	1390BA2	1390BN2	1390BE2	1390BV2	1390BT2
3/8"	9	1,60	0,65	1390BA3	1390BN3	1390BE3	1390BV3	1390BT3
1/2"	12	2,35	0,90	1390BA4	1390BN4	1390BE4	1390BV4	1390BT4
Brass body - Normally open - Minimum Δp: 0,1 bar - Maximum Δp: 10 bar								
1/4"	6	0,80	0,70	1390BA2INA	1390BN2INA	1390BE2INA	1390BV2INA	1390BT2INA
3/8"	9	1,60	0,65	1390BA3INA	1390BN3INA	1390BE3INA	1390BV3INA	1390BT3INA
1/2"	12	2,35	0,90	1390BA4INA	1390BN4INA	1390BE4INA	1390BV4INA	1390BT4INA

General dimensions

1390



Measurements: mm.

NPT Connections

Add suffix "T" to Catalog N°. Example: 1390BA2T.

Special constructions

Stainless steel body:
•AISI304: change letter **B** for **S** in the catalog N°. Example: 1390ST4.
•AISI316: change letter **B** for **I** in the catalog N°. Example: 1390IT4.

Coils

AC 50 Hz: 11 W, up to 155 °C, MF11C type, up to 180°C, MH11C type, for 12 V, 24 V, 110 V, 220 V, 240 V.
AC 60 Hz: 13 W, up to 155 °C, MF13C type, up to 180°C, MH13C type, for 12 V, 24 V, 110 V, 120 V, 220 V, 240 V.
DC: 19 W, up to 180°C, MH19C type, for 12 V, 24 V, 110 V, 220 V.

Options

- Explosion and weather proof coils. Add prefix **ZC** to valve catalog. Example: ZC1390BA4.
- Water, weather and saline corrosion proof coils NEMA 4x. Add prefix **YC** to valve catalog. Example: YC1390BA4.
- Explosion and weather proof housing. Add prefix **Z** to valve catalog. Example: Z1390BA4.
- Manual operation: Add suffix **-M** to catalog N°. Example: 1390BA4-M.
- Energized coil indicator light. See coil section.

Recommendations for the installation

Place a strainer upstream of the valve with a porosity \square 100 \square . Mount the valve in any position, preferably on a horizontal pipeline with the coil upright. The valve input pressure must always be \square 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.

Applications according to the seat material.

Seat material	Acrylo Nitrile	Neoprene®	Ethyl-Propylene	Viton®	Teflon®
Maximum temperature	+80°C	+80°C	+150°C	+180°C	+180°C
Uses	Water, air, light oils. Gas-oil, 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.	Steam, hot oils, corrosive fluids.



1393 Series

Main characteristics

Normally closed and normally open.
Direct acting. It does not need minimum differential pressure to operate.
Forged brass, nickel-plated forged brass body.
BSP or NPT threaded connections.
Stainless steel blade type closure teflon seats. The straight passage prevents pressure drops and turbulence caused by the fluid's changing direction as it is the case with conventional valves.

Shape A DIN 43650 connection encapsulated coils.
IP65 and NEMA 4 Protection.

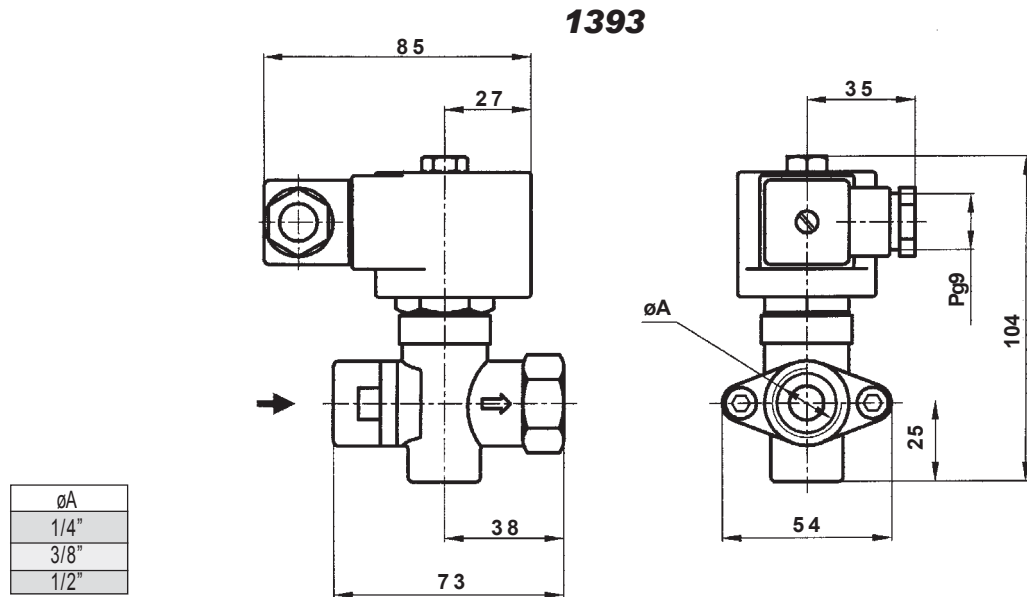
Options:

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

Technical specifications

Ø Connect.	Ø Passage mm.	Kv Coef. m³/h	Δp bar		Weight in kg.	Maximum Temp. in °C	Catalog N°.	
			Minimum	Maximum			Brass	Nickel plated
Normally closed								
1/4"	8	1,80	0	4	0,83	180	1393BS082	1393NS082
3/8"		2,80			0,75		1393BS083	1393NS083
1/2"		2,80			0,77		1393BS084	1393NS084
Normally open								
1/4"	8	1,80	0	4	0,83	180	1393BS082NA	1393NS082NA
3/8"		2,80			0,75		1393BS083NA	1393NS083NA
1/2"		2,80			0,77		1393BS084NA	1393NS084NA

General dimensions



Measurements: mm.

NPT Connections

Add suffix "T" to Catalog N°. Example: 1393BS082T.

Coils

AC 50 Hz: 25 W - MH20C type, for 24, 110, 220 V.
AC 60 Hz: 25 W - MH20C type, for 24, 110, 120, 240 V.
DC: it is not provided.
(Do not exchange for other models).

- Explosion and weather proof coil. Add prefix **ZC** to the catalog N°. Example: ZC1393BS802.
- Water, weather and saline corrosion proof coil NEMA 4x. Add prefix **YC** to the catalog N°. Example: YC1393BS802.
- Energized coil indicator light. See coil section.

Options

•Explosion and weather proof housing. Add prefix **Z** to catalog N°. Example: Z1393BS802

Recommendations for the installation

Place a strainer upstream of the valve with a porosity \square 100 \square . Mount **only** on a horizontal pipeline with the coil upright.

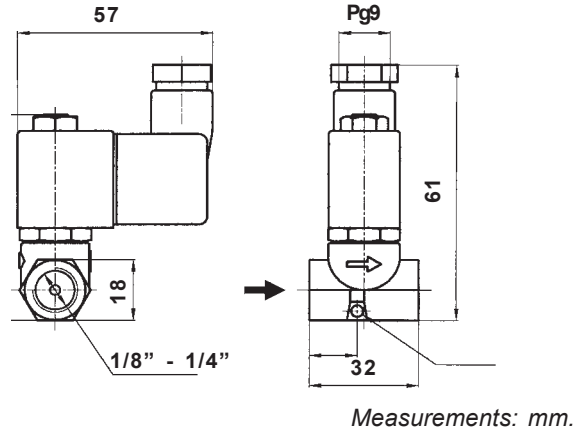
Applications

Steam dryers, autoclaves, boiling pans, fryers, condensation drainers, coffee machines.



2026 Series

General dimensions



Main characteristics

Normally closed.
Direct acting. It does not need minimum differential pressure to operate.
Forged brass compact body.
BSP or NPT threaded connections.
Seat: acrylo-nitrile for neutral fluids up to 80°C.

NPT Connections

Add suffix "T" to the Catalog N°.
Example: 2026BE121T
Seats: neoprene, ethyl-propylene and viton for other uses.
Encapsulated minicoils.
Shape B DIN 43650 connection.
IP65 and NEMA4 Protection.
Response time with air at 6 bar (10 milliseconds)
Approximate weight: 170 g.

Technical specifications

Ø Connect.	Ø Passage mm.	Kv Coef. m³/h	Maximum Δp in bar	Maximum Temperature and catalog N° according to seat material			
				Acrylo - Nitrile	Neoprene®	Ethyl-propylene	Viton®
				80°C	80°C	150°C	150°C
Normally closed - Minimum Δp : 0 bar							
1/8"	1,25	0,05	50	2026BA121	2026BN121	2026BE121	2026BV121
	1,75	0,09	20	2026BA171	2026BN171	2026BE171	2026BV171
	2,25	0,13	10	2026BA221	2026BN221	2026BE221	2026BV221
	3,00	0,25	4	2026BA301	2026BN301	2026BE301	2026BV301
1/4"	1,25	0,05	50	2026BA122	2026BN122	2026BE122	2026BV122
	1,75	0,09	20	2026BA172	2026BN172	2026BE172	2026BV172
	2,25	0,13	10	2026BA222	2026BN222	2026BE222	2026BV222
	3,00	0,25	4	2026BA302	2026BN302	2026BE302	2026BV302

Coils

AC 50 Hz: 6 W - GF06C type, for 12, 24, 110, 220, 240 V.
AC 60 Hz: 6 W - GF06C type, for 12, 24, 110, 220, 240 V.
DC: 6 W, GF06C type, for 12, 24, 110, 220 V.

Recommendations for the installation

Place a strainer upstream of the valve with a porosity \square 100 \square .
Any position, preferably on a horizontal pipeline with the coil upright.


2036 Series ϕ 1"

2036 Series - 3/8" and 1/2"
Main characteristics

Normally closed.
Diaphragm servo-operated action.
Forged brass body.
AISI304 or forged brass die-cast bonnet.

BSP or NPT threaded connections.
Acrylo-nitrile diaphragm with metal core for neutral fluids up to 80°C.
Shape B DIN 43650 connection encapsulated minicoils.
IP65 and NEMA4 Protection.

Technical specifications

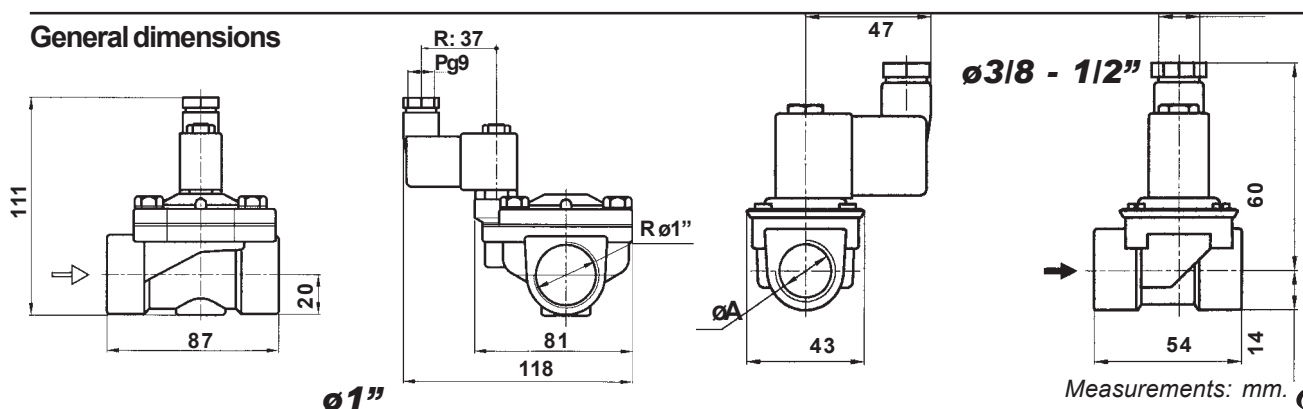
ϕ Connect.	ϕ Passage mm.	Kv Coeficiente m ³ /h	Δp bar		Weight in kg	Max. Temp. in °C	Catalog N°
			Min.	Max.			
Normally closed							
3/8"	10	1,7	0,1	10	0,320	80	2036BA3
1/2"	10	1,9					2036BA4
1"	25	9	0,3		0,980		2036BA8

Coils

AC 50 Hz: 6 W - GF06C type, for 12, 24, 110, 220, 240 V.
AC 60 Hz: 6 W - GF06C type, for 12, 24, 110, 220, 240 V.
DC: 6 W - GF06C type, for 12, 24, 110, 220 V.

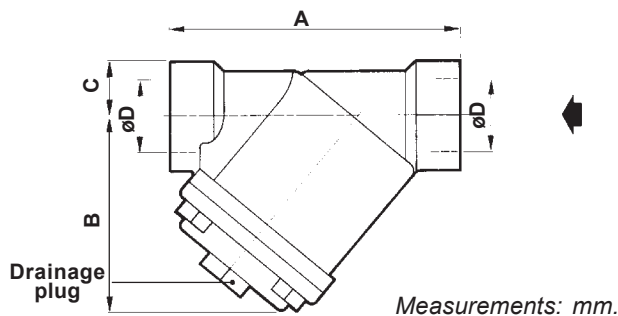
Recommendations for the installation

Place a strainer upstream of the valve with a porosity \square 100 \square .
Preferably on a horizontal pipeline with the coil upright.

General dimensions




General dimensions



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"

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.
Special bronze, carbon steel, stainless steel constructions.
Low pressure drop.

NPT Connections

Add suffix “T” to the Catalog N°.
Example: 1359BS4T.

Technical specifications

ø Connection in inches	Kv Coeficiente m³/h	Maximum pressure bar	Maximum temperature °C	Weight kg	Catalog N°
Bronze body (1)					
1/2	6	10	180	0,4	1359BS4
3/4	12			1,1	1359BS6
1	19			1,7	1359BS8
1.1/2	40			3,2	1359BS12
2	65			5,6	1359BS16
Iron body (2)					
1/2	6	10	180	0,5	1359FS
3/4	12			1	1359FS
1	19			1,6	1359FS
1.1/2	40			3	1359FS12
2	65			5,2	1359FS16
Carbon steel body ASTM A-216 WCB (1)					
1/2	6	15	250	0,5	1359AS4
3/4	12			1	1359AS6
1	19			1,6	1359AS8
1.1/2	40			3	1359AS12
2	65			5,2	1359AS16
Stainless steel body AISI 304 (1)					
1/2	6	15	250	0,5	1359SS4
3/4	12			1	1359SS6
1	19			1,6	1359SS8
1.1/2	40			3,1	1359SS12
2	65			5,3	1359SS16

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

Solenoid valves for liquid fuels

1312 and 1356 Series are direct acting and are applied particularly for the control of all fuel oil grades, both light and heavy, with temperatures up to 180°C and pressure up to 21 bar.. They may also be used for LPG; heavy oil, gas or steam.

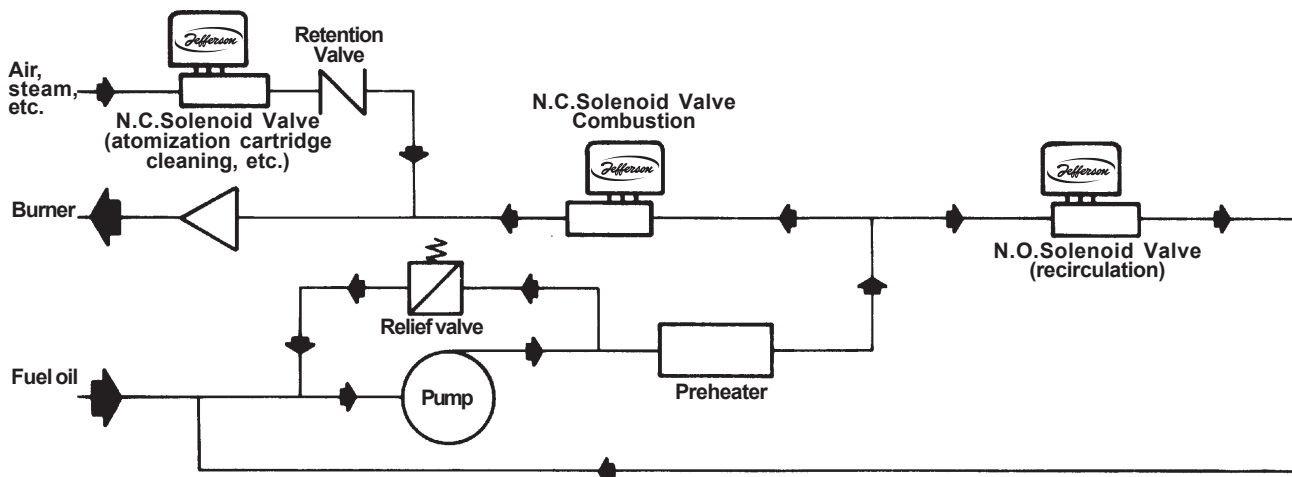
1326, 2026 and 1327 series described in General Purpose section, are also applied to light liquid fuel burners, such as gas-oil or LPG.

Flow chart

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

Δp bar	1356 Series				1312 Series							
	∅ Passage orifice				∅ Passage orifice							
	2,25		5		4		5		8		11	
	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	60	46	199	212	150	148	172	177	418	530	639	884
0,2	72	65	246	300	184	210	212	250	526	750	812	1250
0,35	85	86	295	397	220	278	254	331	640	992	996	1654
0,7	105	122	374	561	277	393	320	468	827	1403	1301	2339
1	118	145	425	671	313	470	363	559	949	1677	1501	2795
2	148	206	550	949	402	664	469	791	1253	2372	2003	3953
4	188	291	723	1342	525	939	614	1118	1678	3354	2707	5590
7	231	385	912	1775	658	1242	771	1479	2142	4437	3479	7395
10	264	460	1061	2121	763	1485	896	1768	2513	5303	4094	8839

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



Solenoid valves for combustible gases

1330 / 2030, 1332 and 1388 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 LPG, propane, manufactured gas, etc., as well as with air or any other noncombustible neutral gas.

The maximum working pressure for **1330 / 2030** series **Normally Closed** diaphragm valves, when used as relief valves in Natural Gas burners, is 0.160 kg/cm².

With respect to the **Normally Open** valves of the same series, it is 0.5 kg/cm² with standard diaphragms and 2kg/cm² with reinforced diaphragms.

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.

Both **1330 / 2030** and **1332** and **1388** Series are optionally provided with microcontacts for proof of closed valve. **1330** (ø 1") and **2030** Series have a reed switch, and the others have an SPDT microswitch.

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 < 5sec.	CT < 360 kwh = = 309.600 kcal./h	CT < 600 kwh = = 516.000 kcal./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 without pilot CT < 600 kwh = = 516.000 kcal./h	CT < 1.200 kwh = = 1.032.000 kcal./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 pilot burners CT < 60 kwh = = 51.600 kcal./h (no need for Mot)	CT < 3.600 kwh = = 3.096.000 kcal./h pilot burners CT < 60 kwh = = 51.600 kcal./h (no need for Mot)
	Two automatic shutoff valves with a venting N.O. valve in between. Mot: 10 sec. Tc < 1 seg.	CT < 12.000 kwh = = 10.320.000 kcal./h	CT < 12.000 kwh = = 10.320.000 kcal./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	CT > 12.000 kwh = = 10.320.000 kcal./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; Ct: Maximum Closing Time in seconds; Mot: Minimum opening time in seconds; MCVV: microcontact for closed valve verification.

Furnace burners requirements

Automatic systems: 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.

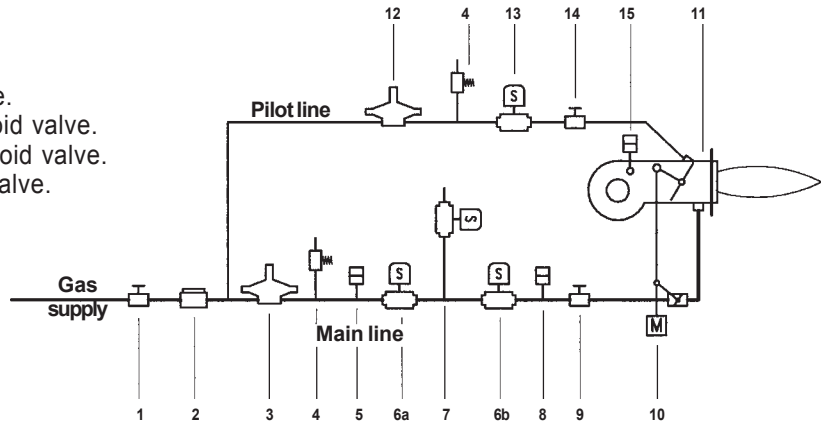
Strainers

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 50µ.

Applications

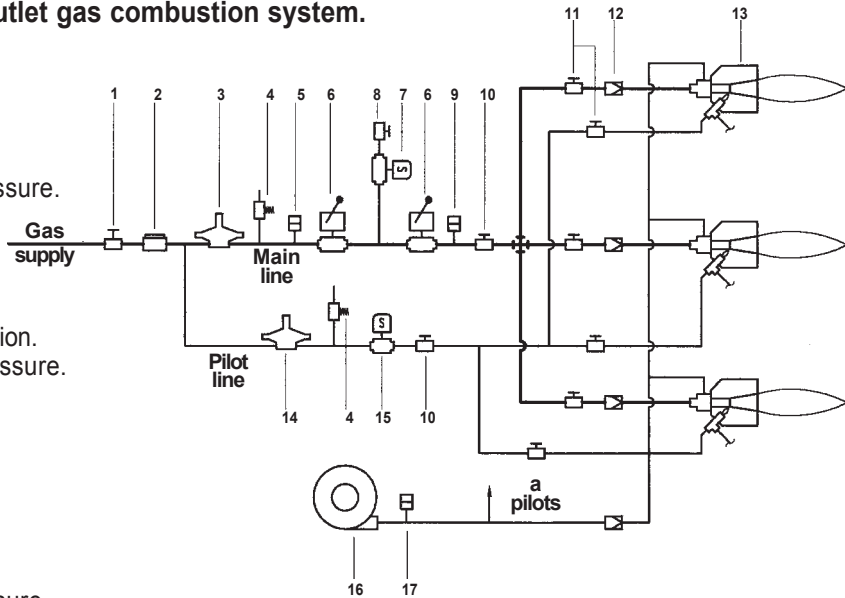
Tandem valves for an automatic gas burner up to 12,000 kw.

- 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 1st Series standard closed *Jefferson* solenoid valve.
- 6b 2nd Series standard closed *Jefferson* solenoid valve.
- 7 Venting standard open *Jefferson* 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 *Jefferson* 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 *Jefferson* manual reset valve.
- 7 Venting standard open *Jefferson* 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 *Jefferson* 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.

$$1/Kv_t = 1/Kv_1 + 1/Kv_2 + \dots + 1/Kv_n$$

- 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.

Flow chart for Natural Gas or other gases. Nm³/h

P ₁	Pressure drop through the valve in mm.c.a.									
	20	40	60	80	100	120	150	200	250	300
200	1,62	2,28	2,79	3,22	3,60	3,94	4,40	5,06		
300	1,62	2,29	2,81	3,24	3,62	3,96	4,42	5,09	5,68	6,20
500	1,64	2,32	2,83	3,27	3,65	4,00	4,46	5,14	5,73	6,26
700	1,65	2,34	2,86	3,30	3,69	4,03	4,50	5,19	5,79	6,32
1000	1,68	2,37	2,90	3,35	3,74	4,09	4,57	5,26	5,87	6,42
1300	1,70	2,40	2,94	3,39	3,79	4,15	4,63	5,33	5,95	6,50
1600	1,72	2,43	2,98	3,44	3,84	4,20	4,69	5,41	6,03	6,59
2000	1,75	2,48	3,03	3,50	3,91	4,28	4,77	5,50	6,14	6,71
2500	1,79	2,53	3,09	3,57	3,99	4,36	4,87	5,62	6,27	6,85
3000	1,82	2,58	3,15	3,64	4,07	4,45	4,97	5,73	6,39	6,99
3500	1,86	2,63	3,22	3,71	4,14	4,54	5,07	5,84	6,52	7,13
4000	1,89	2,68	3,27	3,78	4,22	4,62	5,16	5,95	6,64	7,26
4500	1,93	2,72	3,33	3,85	4,30	4,70	5,25	6,06	6,76	7,39
5000	1,96	2,77	3,39	3,91	4,37	4,78	5,34	6,16	6,88	7,52

P₁ = Gauge pressure at the valve inlet in mm.c.a.

Calculation base:
 Relative density 0,65
 Fluid temperature: 25°C
 Kv=1

Correction factor with respect to 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 Nm³/h
 Input pressure: 500 mm.c.a.
 Admissible pressure drop through the valve: 15%
 Unknown: Kv.

Procedure

- 1st) Flow / correction factor = 120 / 1.04 = 115
- 2nd) Search for value at intersection P₁ = 500 mm.c.a. and Δp = 60 mm.c.a. in the flow chart: value found: 2.83
- 3rd) 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

- 1) Corrected flow / Kv: 115 / 45 = 2.55
- 2) Search for the closest value for P₁ = 500 mm.c.a. in the table, value found: in Δp 40 value: 2.32
- 3) Δp calculation: (2.55 / 2.32)² x 40 = 48 mm c.a.

Pressure drop for Kv = 43

- 1) Corrected flow / Kv: 115 / 43 = 2.67
- 2) Search for the closest value for P₁ = 500 mm c.a. in the table value found: in Δp 60 value: 2.83

- 3) Δp calculation: (2.67 / 2.83)² x 60 = 53 mm c.a.
 in Δp 60 valor: 2,83

Calculation for two valves in series with the same data:

- 1) Corrected flow: 120 / 1.04 = 115
- 2) Search for a value for Δp 60 or Δp 80.
 We chose Δp 80 = 3.27.
- 3) Kv = 115 / 3.27 = 35.2 (2 valves Kv) Kv for one valve: 35.2 / 0.7 = 50.28.
- 4) We must look for a valve with Kv greater than 51 to bring Δp 80 down to < 75 mm c.a. (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 = 55
 Corrected Kv: 55 x 0.70 = 38.5.

Pressure drop for corrected Kv = 38,5

- 1) Corrected flow / Kv: 115 / 38.5 = 2.99
- 2) Search for P₁ = 500 mm c.a. line in the table the Δp with the closest value: 2.83 for Δp = 60.
- 3) Δp calculation: (2.99 / 2.83)² x 60 = 67 mm c.a.

This 67 mm c.a. value belongs to the pressure drop through both valves.



CERTIFIED QUALITY
SYSTEM

Main characteristics

Normally closed and normally open.
Lever activated direct acting. It does not need 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.

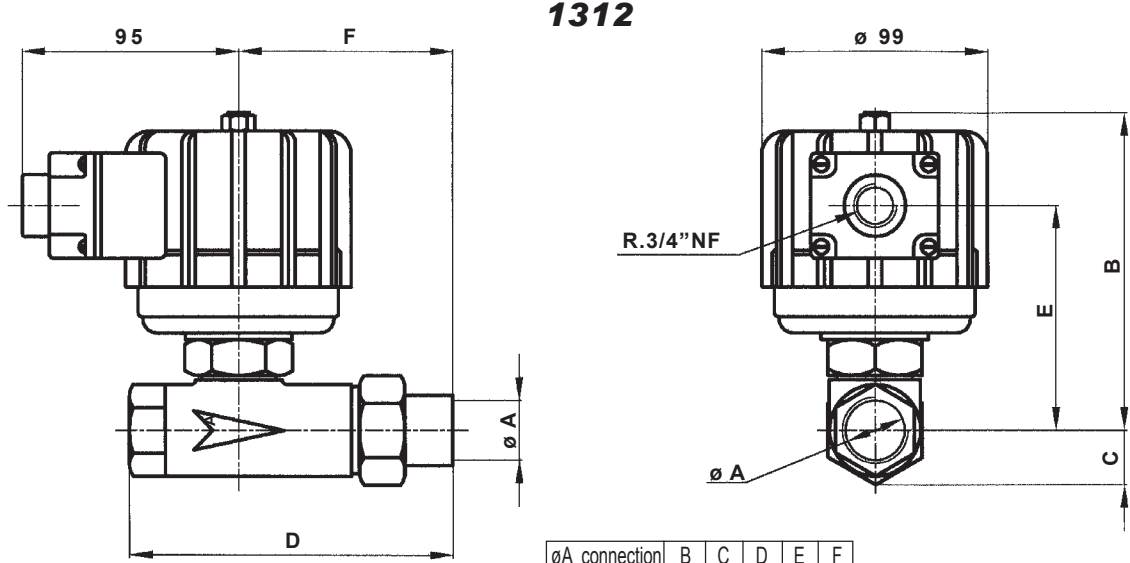
Options:

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

Technical specifications

Ø Conect.	Ø Passage mm.	Kv. Coef. m ³ /h	Maximum Δp in bar	Maximum Temp. in °C	Weight in kg.	Catalog N° according to body material		
						Bronze	AISI 304	
Normally closed								
1/2"	5,0	0,60	21	180	3,4	1312BS504	1312SS504	
3/4"						1312BS506	1312SS506	
1"	8	1,40	12		3,8	1312BS806	1312SS806	
	11	2,50	6			1312BS808	1312SS808	
Normally open								
1/2"	4	0,39	15		180	3,40	1312BS404NA	1312SS404NA
3/4"	5	0,60	12	3,60			1312BS406NA	1312SS406NA
						1312BS506NA	1312SS506NA	
1"	4	0,39	15	3,80		1312BS408NA	1312SS408NA	
						5	0,60	12

General dimensions



1312

øA connection	B	C	D	E	F
1/2"	139	22	126	98	94
3/4"	140	24	143	98	94
1"	147	30	147	106	96

Measurements: mm.

NPT Connections

Add suffix **"T"** to Catalog N°. Example: 1312BS504T.

Recommendations for the installation

Mount the valve **only** on a horizontal pipeline with the coil upright.

Coils

- AC 50 Hz: 46 W, S46H type, for 12, 24, 110, 220 and 240 V.
- AC 60 Hz: 46 W, S46H type, for 12, 24, 110, 120, 220, 240 V.
- DC: 48 W, S48H type, for 12, 24, 110, 220 V.

Options

- Explosion and weather proof housing. Add prefix **Z** to valve catalog. Example: Z1312BS506.
- Weather proof housing. Add prefix **Y** to valve catalog. Example: Y1312BS504.

Applications

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



Main characteristics

Normally closed and normally open.
Direct acting or servo diaphragm versions.
Injected aluminium body.
Stainless steel or aluminium die-cast bonnet.
BSP or NPT threaded connections.
Acrylo-nitrile 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.

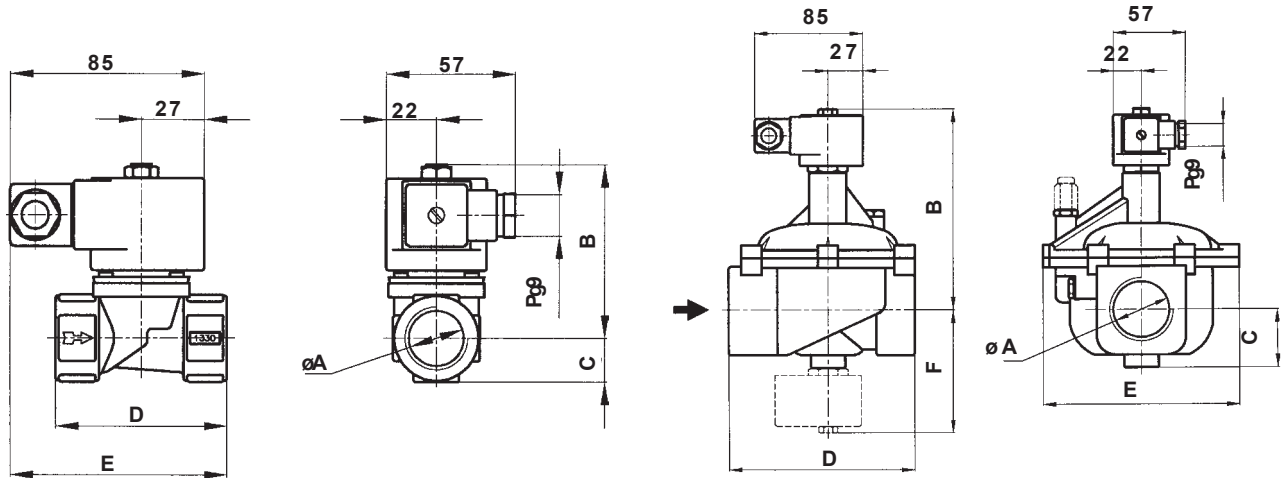
Technical specifications

Ø Connection	Ø Passage mm.	Kv. Coef. m³/h	Differential pressure bar		Weight in kg.	Catalog N°
			Minimum	Maximum		
Normally closed - Direct acting						
1/2"	8	1,7	0	1	0,51	1330LA0
1/2"	18	3,5		0,2	0,50	1330LA04
3/4"	18	4,5		0,1	0,54	1330LA06
1"	32	10		0,05	0,98	2030LA08
1,1/4"	32	12		0,05	0,85	2030LA10
Normally closed - Servo diaphragm - Quick opening						
1"	26	12	0,001	0,5	1,04	1330LA08
1,1/2"	48	35			1,83	2030LA12
2"	51	43			1,61	2030LA16
Normally closed - Servo diaphragm - Slow opening						
1"	26	12	0,001	0,5	1,09	1330LA08L
1,1/2"	48	35			1,88	2030LA12L
2"	51	43			1,66	2030LA16L
Normally closed - Reinforced servo diaphragm						
1"	26	12	0,01	2	1,04	1330LAR08
1,1/2"	45	35			1,83	2030LAR12
2"	45	43			1,61	2030LAR16
Normally open - Servo diaphragm						
1/2"	20	3,5	0,001	0,5	1,16	1330LA04NA
3/4"	20	4,5			1,16	1330LA06NA
1"	26	12			1,04	1330LA08NA
1,1/2"	48	35			1,83	2030LA12NA
2"	51	43			1,61	2030LA16NA
Normally open - Reinforced servo diaphragm						
1"	26	12	0,01	2	1,04	1330LAR08NA
1,1/2"	45	35			1,83	2030LAR12NA
2"	45	43			1,61	2030LAR16NA

Note: 1 Maximum pressure with reinforced coil for 1330LA06 is 0,2 bar.

2 Maximum working pressure in normally closed diaphragm valves is limited to 0,16 kg/cm².

General dimensions



	øA Connection	B	C	D	E
DIRECT ACTING	1/2"	68	16	72	93
	3/4"	75	19	75	95
	1"	90	29	105	77
	1.1/4"				

	øA Connection	B	C	D	E	F
SERVO OPERATED	1"	131	22	157	124	74
	1.1/2"	158	46	146	154	98
	2"					

Measurements: mm.

NPT Connections

Add suffix "T" to the Catalog N°. Example: 1330LA0T.

Coils

AC 50 Hz: 11 W - MF11C type, for 12, 24, 110, 220, 240 V.
 AC 60 Hz: 13 W - MF13C type, for 12, 24, 110, 120, 220, 240 V.
 DC: 19 W - MH19C type, for 12, 24, 110, 220 V.

Options

- Explosion and weather proof coils. Add prefix **ZC** to the valve catalog. Example: ZC1330LA08.
- Water, weather and saline corrosion proof coils NEMA 4x. Add prefix **YC** to the valve catalog. Example: YC2030LA12.

- Explosion and weather proof housing. Add prefix **Z** to the valve catalog. Example: Z2030LA16.
- Microcontact for closed valve verification (position indicator), **only in servo diaphragm models**. Add suffix **I** to the valve catalog. Example: 2030LA12-I.
- Energized coil indicator light. See coil section.

Recommendations for the installation

Place a strainer upstream of the valve with a porosity ≤50µ. Any position, preferably on a horizontal pipeline with the coil upright.

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.



1332 Series



CERTIFIED QUALITY
SYSTEM

Main characteristics

Normally closed.
Direct acting. It does not need minimum differential pressure to operate.
"Free handle" system, i.e., it closes automatically when current is cut off and it opens manually when the electric signal is on.
Injected or cast aluminium body.
Acrylo-nitrile seat.
DIN 43650 Connection encapsulated coils.
IP65 and NEMA 4 Protection.
Closed or open valve viewer.
360° Rotating head.
Response time < 50 milliseconds.

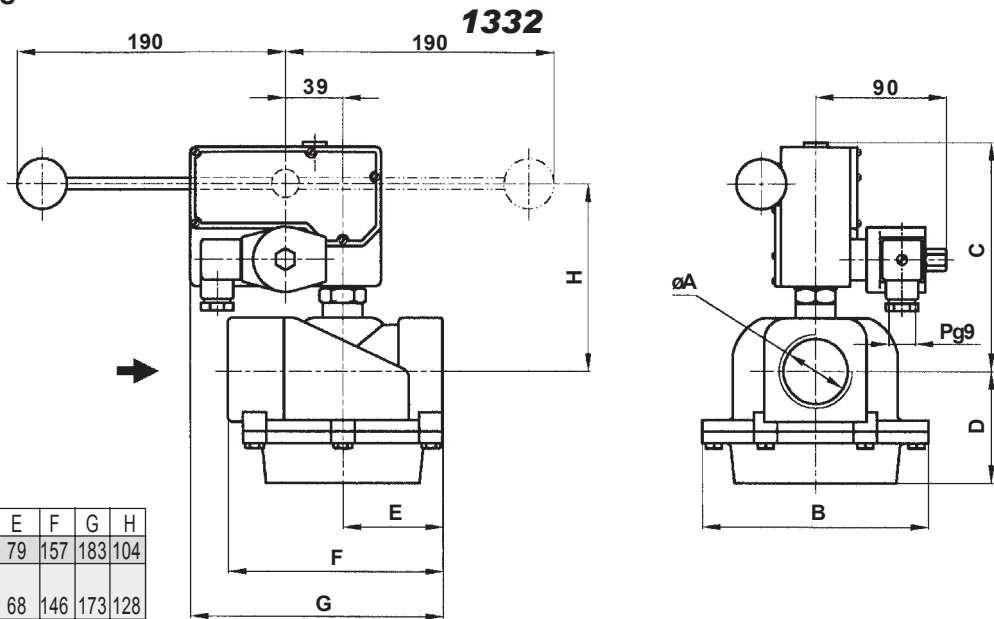
Options:

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

Technical specifications

Ø Connect.	Ø Passage mm.	Kv. Coef. m³/h	Maximum Δp in bar	Max. Temp. in °C	Weight in kg.	Catalog N°
1"	26	13	3	80	2,3	1332LA08
1.1/4"	32	22				1332LA10
1.1/2"	48	30	2		3,3	1332LA12
2"	51	55			3,1	1332LA16
2"	76	60	1		6,2	1332LA20
3"	76	76			6,0	1332LA24

General dimensions



∅A Connection	B	C	D	E	F	G	H
1"	124	133	87	79	157	183	104
1.1/2"	154	157	76	68	146	173	128
2"							
2.1/2"	163	190	135	112	224	-	162
3"							

Measurements mm.

NPT Connections

Add suffix "T" to the Catalog N°.
Example: 1332LA08T.

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.

Coils

- AC 50 Hz: 11 W - MF11C type, for 12, 24, 110, 220 and 240 V.
- AC 60 Hz: 13 W - MF13C type, for 12, 24, 110, 120, 220 and 240 V.
- DC: 19 W - MH19C type, for 12, 24, 110 and 220 V.

Options

- Explosion and weather proof coils.
Add prefix **ZC** to the valve N°.
Example: ZC1332LA08.

- Water, weather and saline corrosion proof coils NEMA 4x.
Add prefix **YC** to the valve N°.
Example: YC1332LA12.
- Explosion and weather proof housing.
Add prefix **Z** to the valve N°.
Example: Z1332LA16.
- Microcontact for closed valve verification.
Add suffix **I** to the valve N°.
Example: 1332LA12-I.
(Explosion proof is not provided).
- Energized coil indicator light.
See coil section.

Recommendations for the installation

Place a strainer upstream of the valve with a porosity $\leq 50 \mu$.
Preferably on a horizontal pipeline with the coil upright.

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.



1356 (t) Series



1356 (s) Series

Main characteristics

Normally closed.
Direct acting. It does not need minimum differential pressure to operate.
Body: bronze, stainless steel, etc..
BSP or NPT threaded connections.
Stainless steel type closure (s).
Teflon seat closure (t).
Class H coil coated with glass fibre and isolating impregnation.
Output cables for splicing (s version).
Internal use housing with an outlet for electric connector (s version).
Encapsulated coil. Shape A DIN 43650 connection (t version).

Options:

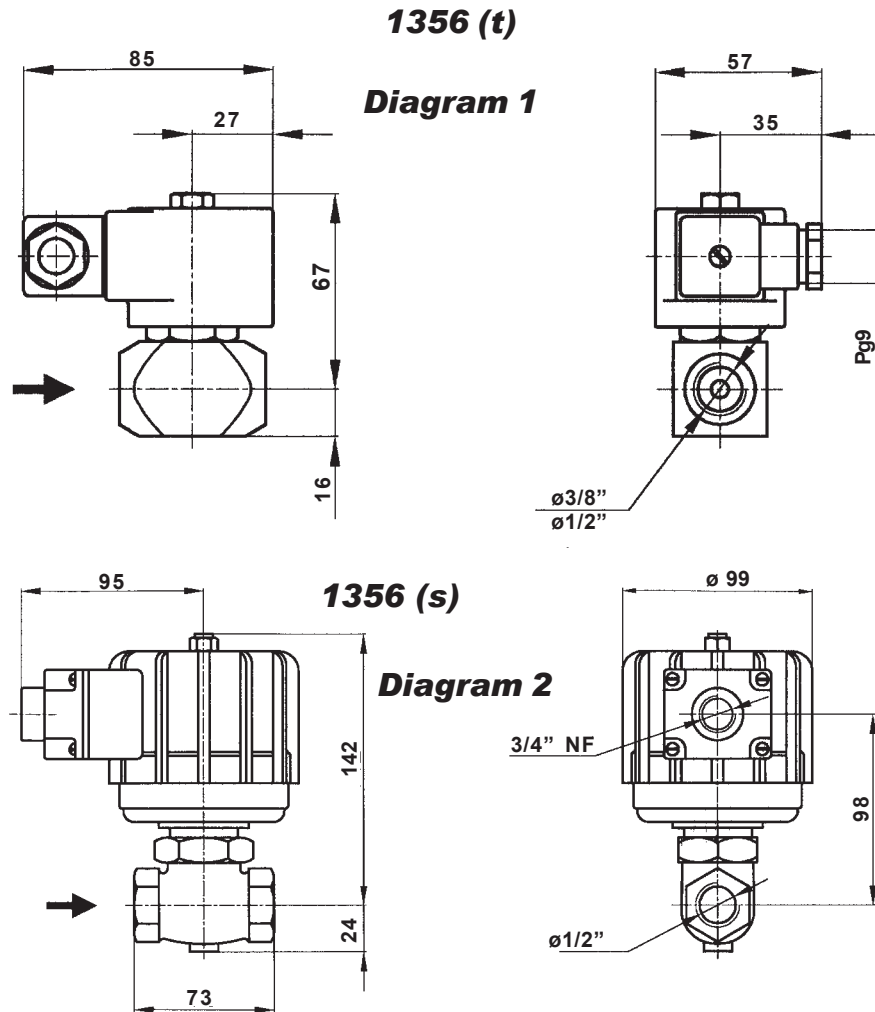
- Explosion and weather proof coils and housings.

It may be used for heavy fluids such as fuel oil, heavy oils, steam and corrosive fluids.

Technical specifications

Ø Connect.	Ø Passage mm.	Kv.Coeff. m ³ /h	Maximum Δp in bar	Electric consumption W.	Weight in kg.	Diagram	Catalog N°
3/8"	2,25	0,13	20	16	0,72	1	1356BT3
1/2"	2,25	0,13	20	16	0,68	1	1356BT4
1/2"	5	0,60	10	46	3,10	2	1356BS4-48

General dimensions



Measurements: mm.

NPT Connections

Add suffix "T" to the Catalog N°.
Example: 1356BT3T.

Coils

(t) Version - diagram 1.
AC 50 Hz: 16 W - MH16C type, for 12, 24, 110, 220 and 240 V.
DC 60 Hz: 16 W - MH16C type, for 12, 24, 110, 120, 220 and 240 V.

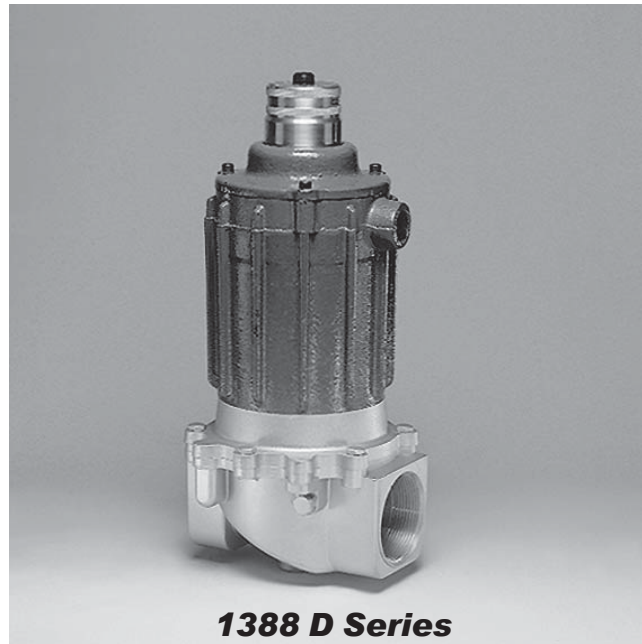
(S) Version - diagram 2.
AC 50 Hz: 46 W - S46H type, for 12, 24, 110, 220 and 240 V.
DC 60 Hz: 46 W - S46H type, for 12, 24, 110, 120, 220 and 240 V.

Recommendations for the installation

- Place a strainer upstream of the valve.
- Diagram 1: Installation: any position.
- Preferably on a horizontal pipeline with the coil upright.
- Diagram 2: Installation: **only** on a 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..



Main characteristics

Normally closed.
Direct acting. It does not need minum differential pressure to operate.
Low and high pressure versions.
Injected or cast aluminium body.
BSP or NPT threaded connections.
Acrylo-nitrile seats.
Class H coils with internal use housings.
It includes the terminals for the electrical connection. Connection for 1/2" BSP pipeline.
For 220V and 110V: current rectifier and transient

reactive overvoltage supsessor.
Quick or two-stage opening.
Both are adjustable.
1st stage: Quick opening from 0 to 80% of the total adjustable stroke.
2nd stage: Adjustable slow opening up to 20 seconds from the end of stage 1 to the total stroke.
Shutoff in less than one second.

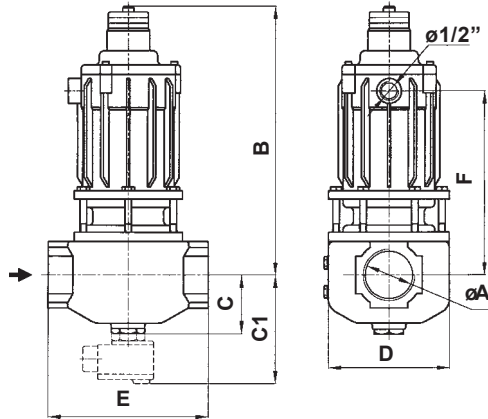
Optional: microcontact for closed valve verification.

Technical specifications

Ø Conect.	Ø Passage mm	Kv. Coef. m³/h	Maximum Δp in bar	Max. temp. in °C	Weight in kg.	Catalog N°	
						Slow opening	Quick opening
Low pressure							
3/4"	24	6	0,2	80	3,7	1388LA06D	1388LA06DS
1"	32	12				1388LA08D	1388LA08DS
1.1/4"	32	15				1388LA10D	1388LA10DS
1.1/2"	48	36				1388LA12D	1388LA12DS
2"	51	49				1388LA16D	1388LA16DS
2.1/2"	76	65	0,1	80	13,8	1388LA20D	1388LA20DS
3"	76	80				1388LA24D	1388LA24DS
High pressure							
3/4"	24	6	5	80	4,5	1388LA06A	1388LA06AR
1"	24	12				1388LA08A	1388LA08AR
1.1/2"	51	36				1388LA12A	1388LA12AR
2"	51	49				1388LA16A	1388LA16AR
2.1/2"	76	65				1388LA20A	1388LA20AR
3"	76	80				1388LA24A	1388LA24AR

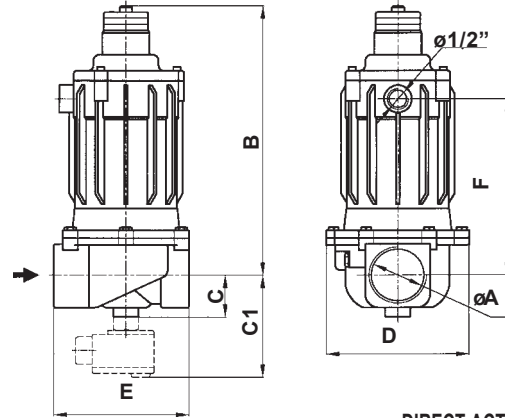
General dimensions

1388



HUNG ACTING

øA Connection	B	C	C1	D	E	F
3/4"	228	44	104	88	117	111
1"						
1.1/2"	323	72	132	147	192	221
2"						
2.1/2"	350	82	142	172	220	248
3"						



DIRECT ACTING

øA Connection	B	C	C1	D	E	F
3/4"	206	44	104	88	117	89
1"	208	29	88	76	105	99
1.1/4"						
1.1/2"	296	46	117	154	146	193
2"						
2.1/2"	302	82	142	172	220	200
3"						

Measurements: mm.

NPT Connections

Add suffix "T" to the Catalog N°. Example: 1388LA06DST.

Coils

For 3/4 to 1.1/4" sizes.

AC 50 and 60 Hz: 60 W - S60HR type, for 110, 120, 220 and 240 V.
(It includes current rectifier).

DC: 60 W - S60H type, for 24, 110 and 220 V.
(No current rectifier).

For size 1.1/2" and more.

AC 50 and 60 Hz: 113 W - 113HR type, for 110, 120, 220 and 240 V.
(It includes current rectifier).

DC: 113 W - 113H type, for 24, 110 and 220 V.
(No current rectifier).

Options

• Microcontact for closed valve verification (position indicator).
Add suffix I to the valve catalog N°. Example: 1388LA06D-I.

Recommendations for the installation

See next page.

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.

General instructions for the installation and maintenance.

Technical characteristics

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

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

Connection size.
Electric consumption in W.
Voltage and current type.

Electrical installation.

All the valves are provided for the different tensions and current types that follow. When the valve has a coil different from the one required, the coil may be changed without changing 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.

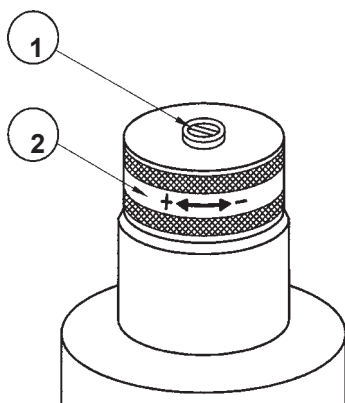
All the coils, except for some special cases, are for continuous use or high operation frequency. When the coil is on for a long time, the housing heats up to the point that contact with hands will only be possible for a short time. Nonetheless, this temperature is normal and safe.

Starting-up

1388 slow opening and quick shutoff solenoid valves comprise two regulation elements: quick stroke regulator and opening time regulator.

Quick stroke regulator adjustment (Pos. 2 in the diagram):
It may be adjusted from 0 to 80% of the total stroke. Percentage decreases when turning the knob clockwise and increases when turning it anti-clockwise. Quick stroke cancels out at the lower limit and the valve opens with regulated delay as from the opening start.

Opening time regulator adjustment (Pos. 1 in the diagram):
It may be adjusted from 0 to 25 seconds. Time increases when turning the knob clockwise and decreases when turning it anti-clockwise. Delay effect cancels out at the lower limit.



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 on a 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.

Instructions for the position indicator calibration.

When present in the valve, the position indicator is already calibrated. If it is to be installed or its calibration is to be corrected, proceed as follows:

Installation:

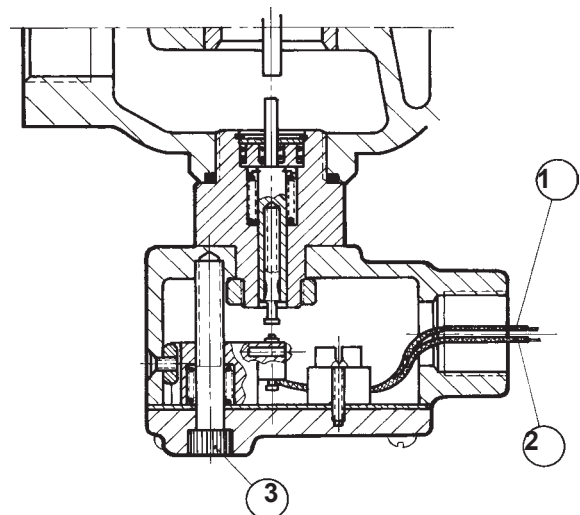
Remove the drainage cap from the valve.

Thread in the position indicator assembly, checking that the corresponding gasket is present.

Calibration:

A continuity tester is necessary.

Connect the tester between the cables (Pos. 1 and 2) and check that there is continuity. If so, turn the screw (Pos. 3) clockwise until contact is eliminated. Then, turn the regulation screw (Pos. 3) anti-clockwise until continuity is set. Energize the coil and check that the circuit opens.



Sequence of operations for 1388 coil change

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

- 1- Cut off electric supply.
- 2- Remove the 3 screws which fasten the bonnet cover (Pos.21).

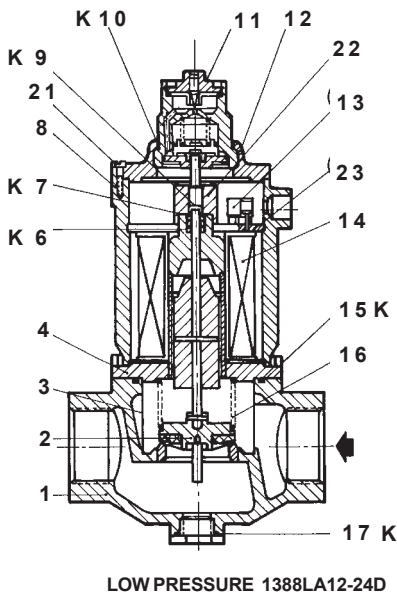
Remove the bonnet cover.

- 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.

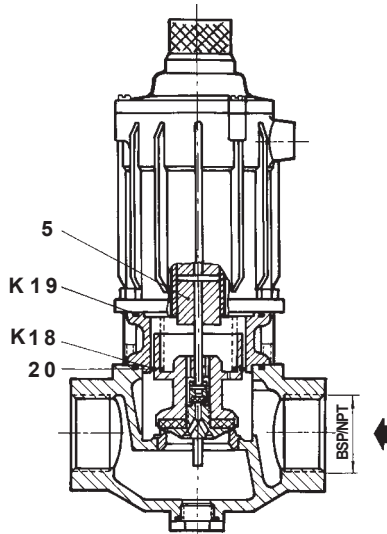
1388LA06-10 (3/4" to 1 1/4") See diagram 2.

- 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 last the coil (Pos. 6).
- 6- Place the new coil and assemble the device following the instructions in the opposite direction.

Diagram 1.



LOW PRESSURE 1388LA12-24D

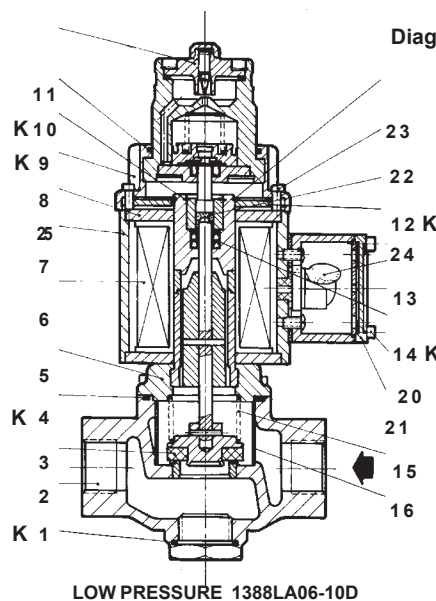


HIGH PRESSURE 1388LA12-24A

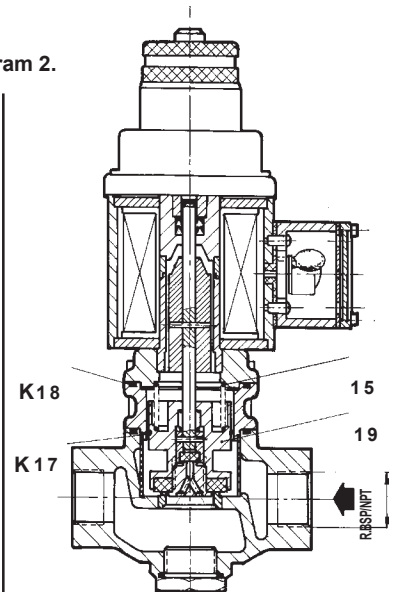
POS	DESCRIPTION	NUMBER	KIT
1	BODY	1	
2	SEAT ASSEMBLY	1	
3	STRAINER	1	
4	BONNET ASSEMBLY	1	
5	PISTON ASSEMBLY - PLUNGER	1	
6	RETAINER	2	K
7	SEEGER RING D.17 DIN 472	1	K
8	HOUSING COVER	1	
9	BUMPER	1	K
10	O-RING	1	K
11	BRAKE ASSEMBLY	2	
12	BONNET COVER	1	
13	RECTIFYING CIRCUIT	1	
14	COIL	1	
15	O-RING	1	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	FLIXING NUT	1	
23	IRON WASHER	1	

POS	DESCRIPTION	NUMBER	KIT
1	O-RING	1	K
2	BODY	1	
3	SEAT ASSEMBLY	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	

Diagram 2.



LOW PRESSURE 1388LA06-10D

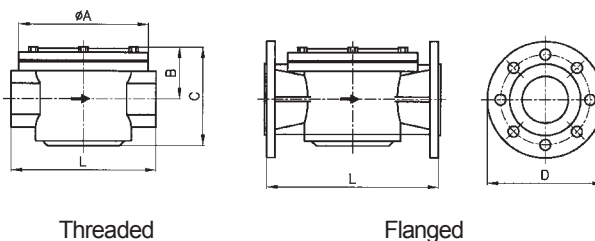


HIGH PRESSURE 1388LA06-10A



391 Series

General dimensions



391

Main characteristics

Aluminium body.
Strainer element with a porosity < 50 microns.
Maximum working pressure

- Standard 1 bar.
- Special 6 bar.

Working temperature from -20°C to 100°C.
Threaded connections from 1/2" to 2 1/2".
Flanged connections ANSI #125 from 3" to 6".

Technical specifications

ø Connection inches	Straining area cm ²	Weight in kg	General dimensions					Catalog N°
			øA	B	C	L	D	
Threaded connections								
1/2"	60	0,6	88	47	80	90	-	391LF04
3/4"								391LF06
1"	135	1,2	134	63	107	135	-	391LF08
1.1/4"								391LF10
1.1/2"	335	2,2	182	72	132	200	-	391LF12
2"								391LF16
2.1/2"	345	3		104	200	220	-	391LF20
Flanged connections								
3"	790	25	262	102	-	330	190	391LF24B
4"	940	30		120	-	350	229	391LF32B
5"	1440	45	355	125	-	480	254	391LF40B
6"	2040	55		170	-	470	280	391LF48B

Measurements in mm.



1323 Series



Main characteristics

3 Ways, 2 positions, normally closed, normally open or universal.
Direct acting. It does not need minimum differential pressure to operate.
Body: brass, iron, stainless steel, etc.
BSP or NPT 1/4" Connection.
Acrylo-nitrile seats for neutral fluids up to 80°C.
Seats: neoprene, viton and ethyl-propylene for other uses.
Encapsulated coils.
Shape A DIN 43650 connection.
IP65 and NEMA4 Protection.

Approximate weight: 0.5 kg.

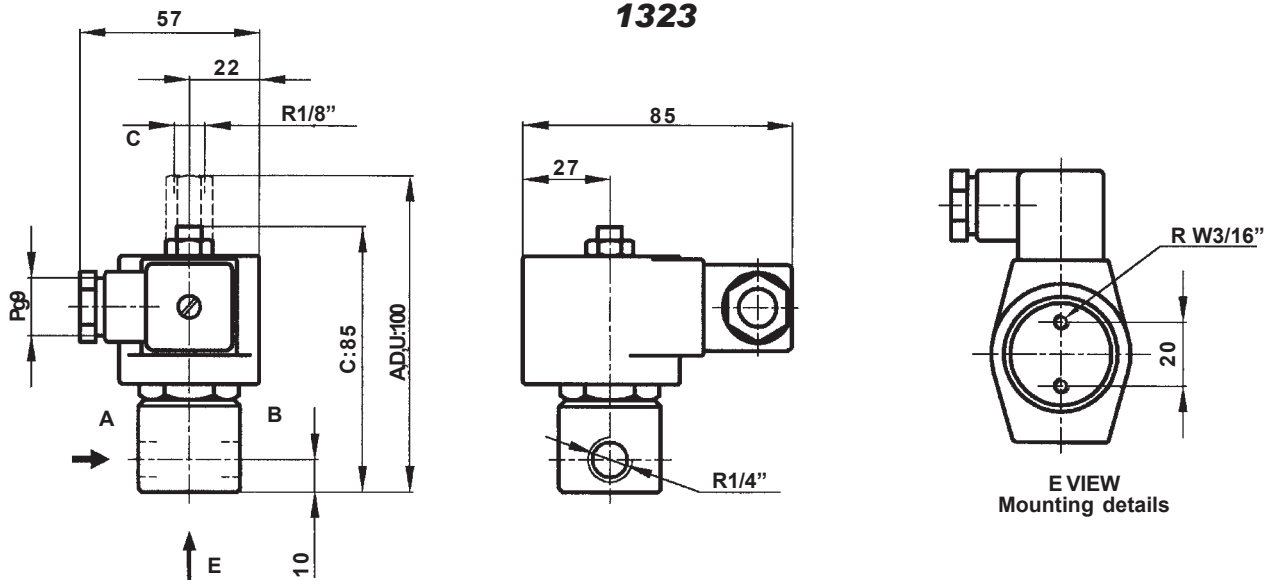
Options:

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

Technical specifications

ø Passage mm.	Coefficient Kv m³/h	Max. Δp bar according to operation				Catálogo Nº and maximum temperature according to seat material			
		NC	NO	DV	CONV	Acrylo - Nitrile 80°C	Neoprene® 80°C	Ethyl-propylene 150°C	Viton® 150°C
"C" Construction - no connector at "C" outlet									
1,75	0,09	10	-	-	-	1323BA17C	1323BN17C	1323BE17C	1323BV17C
2,00	0,10	7	-	-	-	1323BA20C	1323BN20C	1323BE20C	1323BV20C
2,50	0,14	3	-	-	-	1323BA25C	1323BN25C	1323BE25C	1323BV25C
"D" Construction									
1,75	0,09	10	-	20	-	1323BA17D	1323BN17D	1323BE17D	1323BV17D
2,00	0,10	7	-	15	-	1323BA20D	1323BN20D	1323BE20D	1323BV20D
2,50	0,14	3	-	10	-	1323BA25D	1323BN25D	1323BE25D	1323BV25D
"A" Construction - with connector at "C" outlet									
1,75	0,09	5	12	5	5	1323BA17A	1323BN17A	1323BE17A	1323BV17A
2,00	0,10	3	10	3	3	1323BA20A	1323BN20A	1323BE20A	1323BV20A
2,50	0,14	-	3	-	-	1323BA25A	1323BN25A	1323BE25A	1323BV25A
"U" Construction - with connector at "C" outlet									
1,75	0,09	8	12	20	8	1323BA17U	1323BN17U	1323BE17U	1323BV17U
2,00	0,10	6	10	15	6	1323BA20U	1323BN20U	1323BE20U	1323BV20U
2,50	0,14	3	3	10	3	1323BA25U	1323BN25U	1323BE25U	1323BV25U

General dimensions



Measurements: mm.

NPT Connections

Add suffix "T" to the Catalog N°. Example: 1330LA0T.

Special constructions

Stainless steel body AISI 304, AISI 316.

- Explosion and weather proof housing. Add prefix **Z** to the valve N°. Example: Z1323BA17D. (**C** shape is not provided).
- Manual operation. Add suffix **-M** to the valve N°. Example: 1323BA17C-M.
- Energized coil indicator light. See coils section.

Coils

- AC 50 Hz: 11 W - MF11C type, for 24, 110 and 220 V.
- AC 60 Hz: 13 W - MF13C type, for 24, 110, 120 and 240 V.
- DC: 19 W - MH19C type, for 12, 24, 110 and 220 V.

Recommendations for the installation

Place a strainer upstream of the valve with a porosity $\square 100 \square$. Installation: in any position. Preferably on a 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.

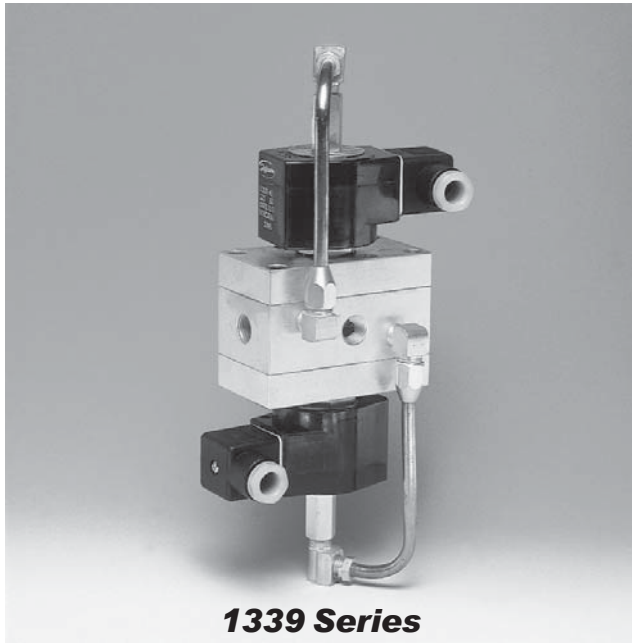
Options

- Explosion and weather proof coils. Add prefix **ZC** to the valve N°. Example: ZC1323BA17C.
- Water, weather and saline corrosion proof coils NEMA 4x. Add prefix **YC** to the valve N°. Example: YC1323BA17C.

Applications

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

Construc.	C ó D	A	D	U	U
De-Energized					
Energized					
Operation manner	NC	NO	DIVERGENT	CONVERGENT	UNIVERSAL



1339 Series



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.
Shape A DIN 43650 connection encapsulated coils.
IP65 and NEMA 4 protection.

Options:

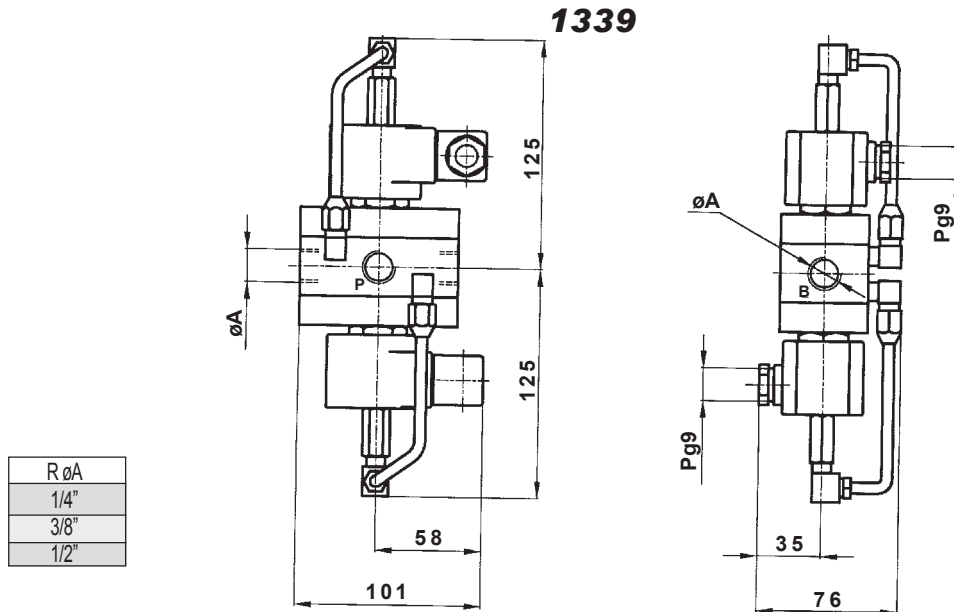
- Energized coil indicator light.
- Explosion and / or weather proof coils and housings.

Technical specifications

Ø Connect.	Ø Passage mm.	Kv Coef. m³/h	Bar Δp		Weight kg. (*)	Catalog N° according to body material		
			Maximum	Minimum		Aluminium	Brass	Stainless steel AISI . 304
Acrylo - Nitrile diaphragm								
1/4"	6	0,34	0,5	10	2,2 (1,3)	1339LA1	1339BA1	1339SA1
3/8"	8	0,68				1339LA2	1339BA2	1339SA2
1/2"	10	1,27				1339LA3	1339BA3	1339SA3
Viton® diaphragm								
1/4"	6	0,34	0,5	10	2,2 (1,3)	1339LV1	1339BV1	1339SV1
3/8"	8	0,68				1339LV2	1339BV2	1339SV2
1/2"	10	1,27				1339LV3	1339BV3	1339SV3

(*) Between brackets, weight with aluminium body.

General dimensions



R ϕA
1/4"
3/8"
1/2"

Measurements: mm.

NPT Connections

Add suffix "T" to the Catalog N°.
Example: 1339LA1T.

Coils

AC 50 Hz: 11 W - MF11C type, for 24, 110, 220 V.
AC 60 Hz: 13 W - MF13C type, for 24, 110, 120 and 240 V.
DC: 19 W - MH19C type, for 12, 24, 110 and 220 V.

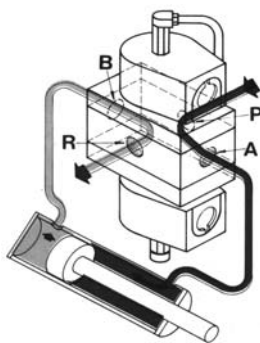
- Water, weather and saline corrosion proof coils NEMA 4x.
Add prefix **YC** to the valve catalog.
Example: YC1339BA2.
- Explosion and weather proof housings.
Add prefix **Z** to the valve catalog.
Example: Z1339SV2.
- Manual operation.
Add suffix **-M** to the valve catalog.
Example: 1339LA3-M.
- Energized coil indicator light.
See coil section.

Options

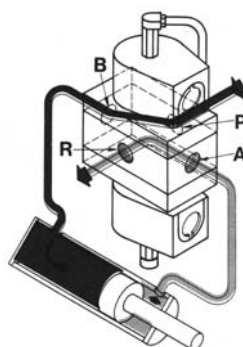
•Explosion and weather proof coils.
Add prefix **ZC** to the valve catalog.
Example: ZC1339BA1.

Recomemendations for the installation

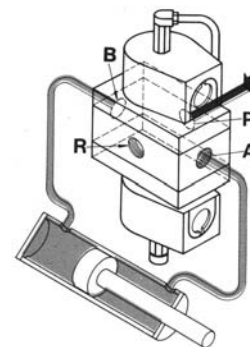
Place a strainer upstream of the valve with a porosity $\square 100 \square$.
Installation: in any position.



POSITION 1
N° 1 Solenoid energized.
Pressure through A and release through B.



POSITION 2
N° 2 Solenoid energized.
Pressure through B and release through A.



POSITION 3
Both solenoids de-energized. 4 ways closed, the cylinder stops in a balanced position with pressure at both sides.

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



Main characteristics

5 ways, 2 positions, monostable or bistable.
Slide servo operated action.
Aluminium, brass, stainless steel body.
BSP or NPT threaded connections.
Acrylo - Nitrile seals for neutral fluids up to 80°C.
Viton seals for other uses.
Teflon sleeve for instrument air and dry gases.
Shape A DIN 43650 connection encapsulated coils.
IP65 and NEMA 4 protection.

Internal or external pilot: electropneumatic or pneumatic.

Options:

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

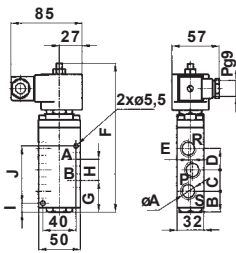
Technical specifications

Ø Connection	Ø Passage mm.	Kv Coef. m³/h	Acrylo - Nitrile seals		Viton® seals	
			no sleeve	with sleeve	no sleeve	with sleeve
Aluminium body						
1/4"	7	0,80	1350LA1*	1350LTA1*	1350LV1*	1350LTV1*
3/8"	7	0,96	1350LA2*	1350LTA2*	1350LV2*	1350LTV2*
1/2"	10	1,90	1350LA3*	1350LTA3*	1350LV3*	1350LTV3*
Brass body						
1/4"	7	0,80	1350BA1*	1350BTA1*	1350BV1*	1350BTV1*
3/8"	7	0,96	1350BA2*	1350BTA2*	1350BV2*	1350BTV2*
1/2"	10	1,90	1350BA3*	1350BTA3*	1350BV3*	1350BTV3*
Stainless steel body AISI 304						
1/4"	7	0,80	NO	1350STA1*	NO	1350SV1*
3/8"	7	0,96		1350STA2*		1350SV2*
1/2"	10	1,90		1350STA3*		1350SV3*

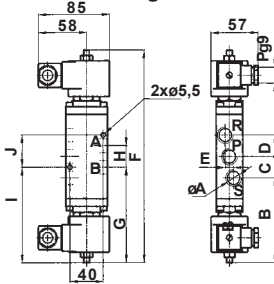
(*) The suffix corresponding to the operation manner must be added to the catalog number according to the table shown in the next page. Example: 1350LA1A.

General dimensions

Operation manner: A, B, G and H
Diagram 1



Operation manner: C and I
Diagram 2

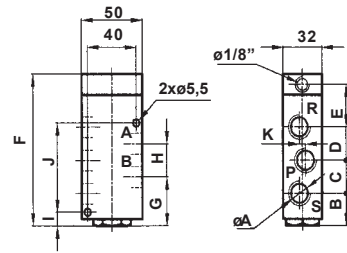


1350

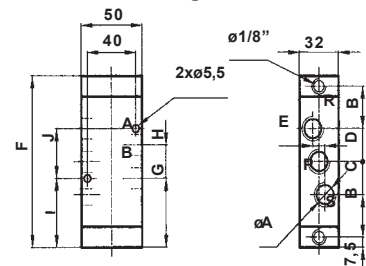
Connection	General dimensions										Weight kg.	
	øA	B	C	D	E	F	G	H	I	J	Aluminium	Brass
Diagram 1												
R1/4"	24	24	24	5	168	36	24	10	64.5	0,820	1,650	
R3/8"	24	24	24	5	168	36	24	10	64.5	0,820	1,650	
R1/2"	23	33	33	-	192	39	33	39	56	0,900	1,820	
Diagram 2												
R1/4"	96	24	24	10	240	108	24	108	36	1,300	2,200	
R3/8"	96	24	24	10	240	108	24	108	36	1,300	2,200	
R1/2"	99	30	30	6	259	114	30	114	49	1,380	2,400	
Diagram 3												
R1/4"	24	24	24	31	110	36	24	10	64.5	0,400	1,250	
R3/8"	24	24	24	31	110	36	24	10	64.5	0,400	1,250	
R1/2"	23	33	33	39	134	39	33	39	56	0,480	1,400	
Diagram 4												
R1/4"	31	24	24	10	126	51	24	51	36	0,460	1,420	
R3/8"	31	24	24	10	126	51	24	51	36	0,460	1,420	
R1/2"	35	30	30	6	144	57	30	57	49	0,540	1,570	

Measurements: mm.

Operation manner: D
Diagram 3



Operation manner: F
Diagram 4



NPT Connections

Add suffix "T" to the Catalog N°. Example: 1350LTV1T.

Coils

AC 50 Hz: 11 W - MF11C type, for 12, 24, 110, 220 and 240 V.
AC 60 Hz: 13 W - MF13C type, for 12, 24, 110, 120, 220 and 240 V.
DC: 19 W - MF19 type, for 12, 24, 110 and 220 V.

Options

- Explosion and weather proof coils. Add prefix **ZC** to the valve N°. Example: ZC1350LA2A.
- Water, weather and saline corrosion proof coils NEMA 4x. Add prefix **YC** to the valve N°. Example: YC1350BA2B.
- Explosion and weather proof housing.

- Add prefix **Z** to the valve N°. Example: Z1350BA3C.
- Manual operation. Add suffix **-M** to the valve N°. Example: 1350SA2C-M.
- Energized coil indicator light. See coils section.

Recommendations for the installation

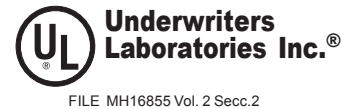
Place a strainer upstream of the valve with a porosity \square 100 \square . Installation: in any position. Preferably on a horizontal pipeline with the coil upright. It is advisable to use lubrication with valves which do not have a teflon sleeve.

Suffix	Bar Δp		Operation manner
	Minimum	Maximum	
Electric operator with internal pilot			
A	1	10	Spring return
B	0,5		Pneumatic return
C	0,5		Bistable
Electric operator with independent pilot			
G	0	10	Spring return
I			Bistable
Pneumatic operator			
D	0	10	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.



1351 Series



FILE MH16855 Vol. 2 Secc.2



FILE LR87427 2M - LR108921-1

Main characteristics

3 ways, 2 positions, normally open or normally closed.
Slide servo operated action.
Aluminium, brass, stainless steel body.
BSP or NPT threaded connections.
Acrylo - Nitrile seals for neutral fluids up to 80°C.
Viton seals for other uses.
Teflon sleeve for instrument air and dry gases.
Shape A DIN 43650 connection encapsulated coils.
IP65 and NEM4 protection.

Internal or external pilot: electropneumatic or pneumatic.

Options:

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

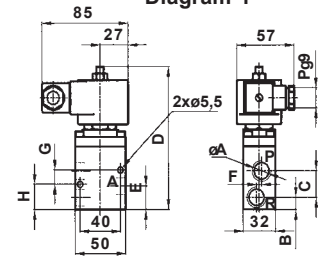
Technical specifications

Ø Connection	Ø Passage mm.	Kv Coef. m³/h	Acrylo - Nitrile seals		Viton® seals	
			with sleeve	no sleeve	with sleeve	no sleeve
Aluminium Body						
1/4"	7	0,80	1351LA1*	1351LTA1*	1351LV1*	1351LTV1*
3/8"	7	0,96	1351LA2*	1351LTA2*	1351LV2*	1351LTV2*
1/2"	10	1,90	1351LA3*	1351LTA3*	1351LV3*	1351LTV3*
Brass Body						
1/4"	7	0,80	1351BA1*	1351BTA1*	1351BV1*	1351BTV1*
3/8"	7	0,96	1351BA2*	1351BTA2*	1351BV2*	1351BTV2*
1/2"	10	1,90	1351BA3*	1351BTA3*	1351BV3*	1351BTV3*
Stainless steel body AISI 304						
1/4"	7	0,80	No	1351STA1*	No	1351SV1*
3/8"	7	0,96		1351STA2*		1351SV2*
1/2"	10	1,90		1351STA3*		1351SV3*

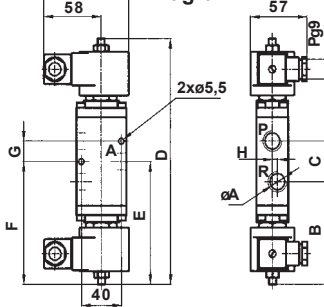
(*) The suffix corresponding to the operation manner must be added to the catalog number according to the table shown in the next page. Example: 1351LA1A.

General dimensions

Operation manner: A, B, G, H, K, L, N and P
Diagram 1



Operation manner: C and M
Diagram 2



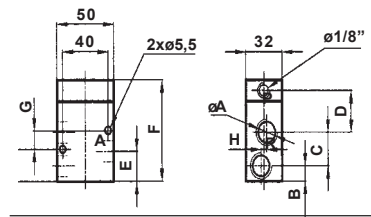
1351

General Dimensions								Weight kg.	
Connection								Material	
øA	B	C	D	E	F	G	H	Aluminium	Brass
Diagram 1									
R1/4"	11	24	130	22	5	13	23	0,680	1,250
R3/8"									
R1/2"	15	31	149	31	-	21,5	31	0,700	1,360
Diagram 2									
R1/4"	95	37	226	113	113	18,5	5	0,680	1,800
R3/8"									
R1/2"	102	47	252	126	126	30	3	1,20	1,950
Diagram 3									
R1/4"	11	24	30	22	72	13	5	0,280	0,800
R3/8"									
R1/2"	15	32	38	31	91	21,5	-	0,300	0,920
Diagram 4									
R1/4"	30	37	56	112	18,5	5	56	0,350	0,970
R3/8"									
R1/2"	38	47	68	137	30	3	68	0,370	0,100

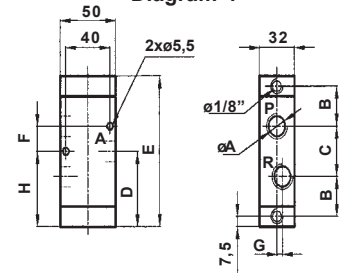
Chart 3: diagram 3: Limit I: for 1/4" and 3/8" it is 23 for 1/2" it is 31.

Measurements: mm.

Operation manner: D, E, I and J
Diagram 3



Operation manner: F
Diagram 4



NPT Connections

Add suffix "T" to the Catalog N°. Example: 1351LTV1T.

Add prefix **YC** to the valve N°. Example: YC1351BA2B.

• Explosion and weather proof housing.

Add prefix **Z** to the valve N°.

Example: Z1351BA3C.

• Manual operation.

Add suffix **-M** to the valve N°.

Example: 1351SA2C-M.

• Energized coil indicator light.

See coils sections.

Coils

AC 50 Hz: 11 W - MF11C type, for 12, 24, 110, 220 and 240 V.

AC 60 Hz: 13 W - MF13C type, for 12, 24, 110, 120, 220 and 240 V.

DC: 19 W - MF19C type, for 12, 24, 110 and 220 V.

Options

• Explosion and weather proof coils.

Add prefix **ZC** to the valve N°.

Example: ZC1351LA2A.

• Water, weather and saline corrosion proof coils NEMA 4x.

Recommendations for the installation

Place a strainer upstream of the valve with a porosity \square 100 \square .

Installation: in any position. Preferably on a horizontal pipeline with the coil upright. It is advisable to use lubrication when valves have no teflon sleeve.

Suffix	Bar Δp		Operation manner
	Minimum	Maximum	
Electric operator with internal pilot.			
A	1	10	Normally closed. Spring return
B	0,5		Normally closed. Pneumatic return
C	0,5		Bistable
G	1		Normally open. Spring return.
H	0,5		Normally open. Pneumatic return
Electric operator with independent pilot			
K	0	10	Normally closed. Spring return
N			Normally open. Spring return
M			Bistable
Pneumatic operator			
D	0	10	Normally closed. Spring return
J			Normally 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.



1365 Series



Main characteristics

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

Direct acting. It does not need minimum differential pressure to operate.

Body: brass, iron, stainless steel, etc.

BSP or NPT 1/4" Connection.

Acrylo - Nitrile seats for neutral fluids up to 80°C.

Seats: neoprene, viton and ethyl-propylene for other uses.

Encapsulated coils. Shape A DIN 43650 connection.

IP65 and NEMA4 Protection.

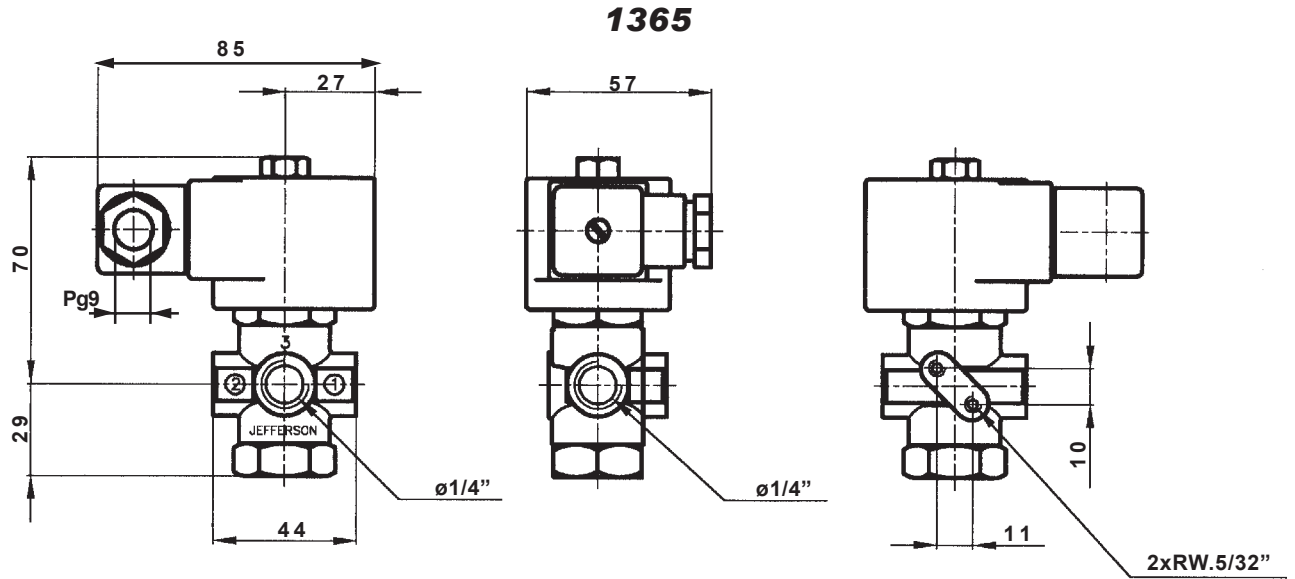
Options:

- Energized coil indicator light.
 - Explosion and / or weather proof coils and housings.
 - Manual operation.
- Approximate weight: 0.6kg.

Technical specifications

Ø Passage	Kv Coef. m³/h	Max Δp bar according to operation				Catalog N° and maximum temperature according to seat material			
		NC	NA	DV	CONV	Acrylo - Nitrile 80°C	Neoprene® 80°C	Ethyl-propylene 150°C	Viton® 150°C
"C" Construction									
1,75	0,08	15	5	20	5	1365BA17C	1365BN17C	1365BE17C	1365BV17C
2,25	0,12	8	3	15	3	1365BA22C	1365BN22C	1365BE22C	1365BV22C
3,00	0,21	4	1	10	1	1365BA30C	1365BN30C	1365BE30C	1365BV30C
4,00	0,30	2	-	8	-	1365BA40C	1365BN40C	1365BE40C	1365BV40C
"A" Construction									
1,75	0,08	7	8	20	7	1365BA17A	1365BN17A	1365BE17A	1365BV17A
2,25	0,12	5	6	15	5	1365BA22A	1365BN22A	1365BE22A	1365BV22A
3,00	0,21	3	4	10	3	1365BA30A	1365BN30A	1365BE30A	1365BV30A
4,00	0,30	1	2	8	1	1365BA40A	1365BN40A	1365BE40A	1365BV40A
"U" Construction									
1,75	0,08	10	7	20	7	1365BA17U	1365BN17U	1365BE17U	1365BV17U
2,25	0,12	8	5	15	5	1365BA22U	1365BN22U	1365BE22U	1365BV22U
3,00	0,21	4	3	10	3	1365BA30U	1365BN30U	1365BE30U	1365BV30U
4,00	0,30	1,5	1,5	8	1,5	1365BA40U	1365BN40U	1365BE40U	1365BV40U

General dimensions



Measurements: mm.

NPT Connections

Add suffix "T" to the Catalog N°.
Example: 1365BA17CT.

Coils

- C.A. 50Hz: 11W - MF11C type, for 24, 110 and 220 V.
- C.A. 60Hz: 13W - MF13C type, for 24, 110, 120 and 240 V.
- C.C.: 19W - MH19C type, for 12, 24, 110 and 220 V.

- Water, weather and saline corrosion proof coils NEMA 4x. Add prefix **YC** to the valve N°.
Example: YC1323BA17C.
- Explosion and weather proof housing. Add prefix **Z** to the valve N°.
Example: Z1323BA17D. (C shape is not provided).
- Manual operation. Add suffix **-M** to the valve N°.
Example: 1323BA17C-M.
- Energized coil indicator light. See coils section.

Options

- Explosion and weather proof coils. Add prefix **ZC** to the valve N°.
Example: ZC1365BA17C.

Recommendations for the installation

Place a strainer upstream of the valve with a porosity \square 100 \square .
Installation: in any position. Preferably on a 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.

Operation manner

ENERGIZED			
DE-ENERGIZED			
	N. CLOSED	N. OPEN	UNIVERSAL



CERTIFIED QUALITY
SYSTEM



1375 Series

Main characteristics

5 ways, 2 positions, monostable.
Spool design servo operated action.
Forged brass body.
Acrylo-nitrile seals.
NAMUR Connections.
Shape A DIN 43650 connection encapsulated coils.
IP65 and NEMA 4 protection.

Options:

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

NPT Connections:

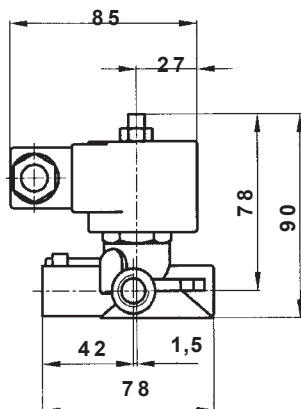
Add suffix «T» to the catalogue N°
Example: 1375 BA2 - NT

Technical specifications

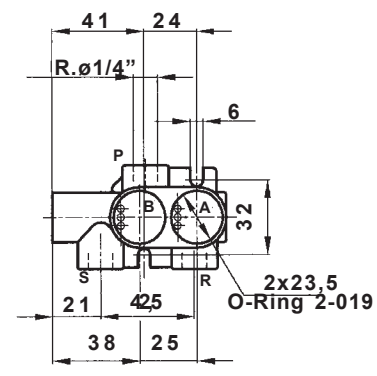
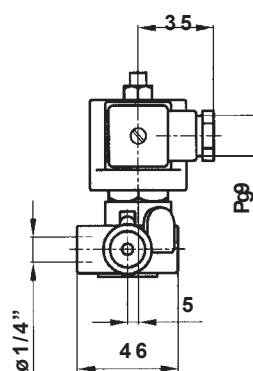
ø Passage mm.	Kv Coef. m³/h	Δp bar		Weight in kg.	Catalog N°
		Minimum	Maximum		
5,5	0,59	0,5	10	0,8	1375BA2-N

General dimensions

1375

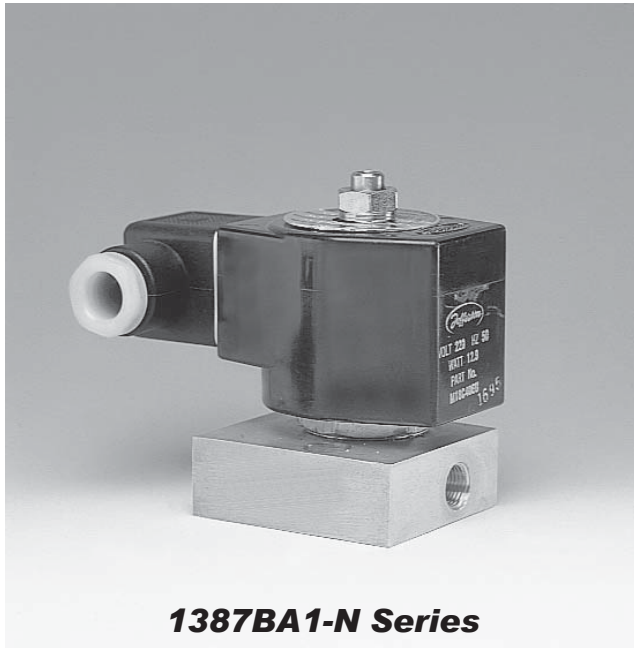


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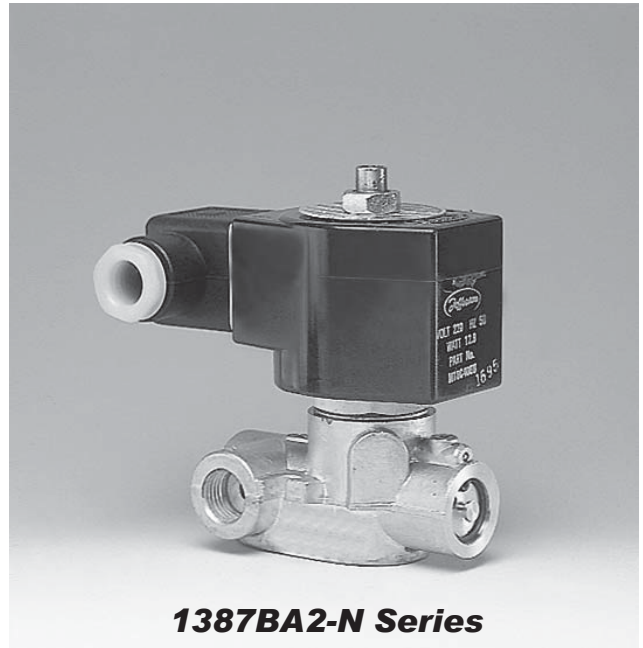


E VIEW

Measurements: mm.



1387BA1-N Series



1387BA2-N Series

Main characteristics

3 ways, 2 positions.
Normally closed.
Direct acting or spool design servo operated action.
Brass body.
Acrylo-nitrile seals.
NAMUR Connection.
Shape A DIN 43650 connection encapsulated coils.
IP65 and NEMA 4 protection.

Options:

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

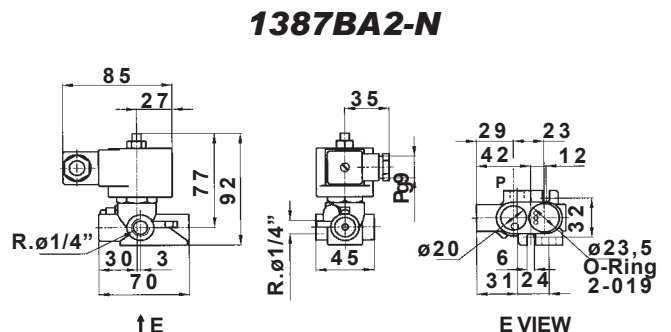
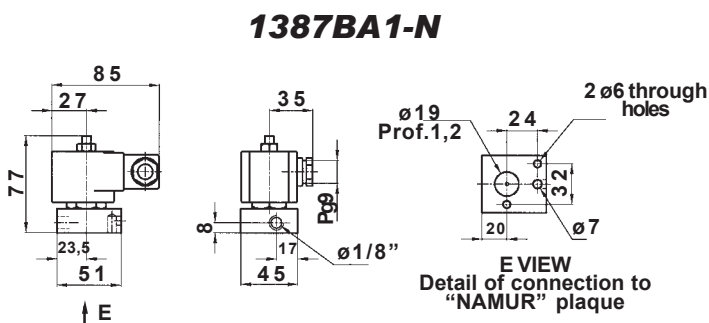
NPT Connections:

Add suffix «T» to the catalogue N°
Example: 138 TBA-INT

Technical specifications

ø Passage mm.	Kv Coef. m³/h	Δp bar		Weight in kg.	Catalog N°
		Mini.	Max.		
1,75	0,09	0	10	0,71	1387BA1-N
5,50	0,59	0,5		0,8	1387BA2-N

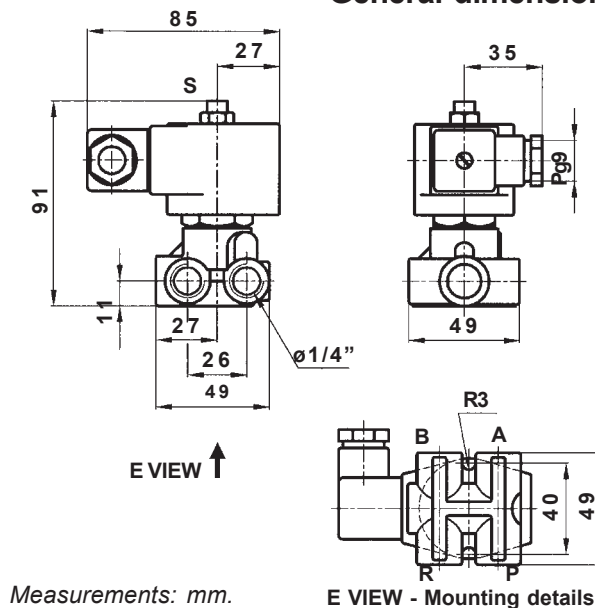
General dimensions



Measurements: mm.



General dimensions



Main characteristics

For compressed air and other neutral gases.
 Forged brass body.
 Acrylo - Nitrile seals and seats.
 BSP or NPT 1/4" threaded connections.
 Servo operated action.
 Shape A DIN 43650 connection encapsulated coil.
 IP65 NEMA 4 protection.

Options:

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

Technical specifications

Ø Connect.	Ø Passage mm.	Kv Coef. m³/h	ΔP bar		Manual Operator	Weight in kg.	Catalog N°	
			Minimum	Maximum			BSP	NPT
1/4"	1,75	0,08	0,8	10	No	0,7	2024BA2	2024BA2T
					Yes		2024BA2-M	2024BA2T-M

NPT Connections

Add suffix "T" to the Catalog N°.
 Example: 2024BA2-MT.

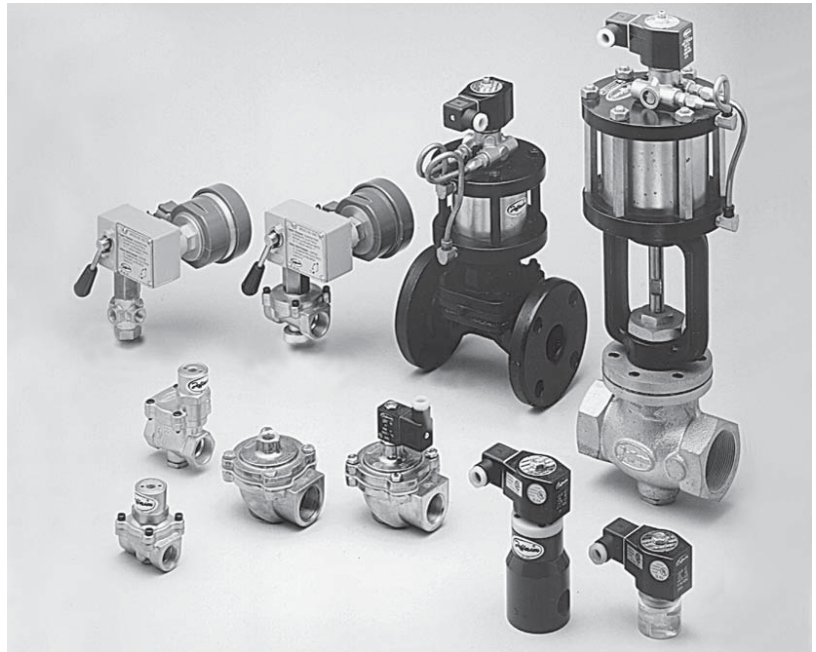
Coils







AC 50 Hz: 11 W - MF11C type, for 24, 110 and 220 V.
 AC 60 Hz: 13 W - MF13C type, for 24, 110, 120 and 240 V.
 DC: 19 W - MF19C type, for 12, 24, 110 and 220 V.

Recommendations for the installation

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

Miscellaneous



1310 Series		Pneumatically operated globe valve 70
1311 Series		Pneumatically operated diaphragm valve 72
1360 Series		Solenoid valve for corrosive fluids 74
1369 Series		Solenoid valve manual reset device 76
2073 Series		Solenoid valve for dust collector 78
1372 Series		Pneumatic operator 79
		Corrosive fluids table 80
		Recommendations for the installation 82
		Problems and solutions 83
		Repair Kits 84



1310 Series



SISTEMA CALIDAD
CERTIFICADO

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.
Acrylo-nitrile, teflon, 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 liquids or neutral steam up to 200°C.

Technical specifications

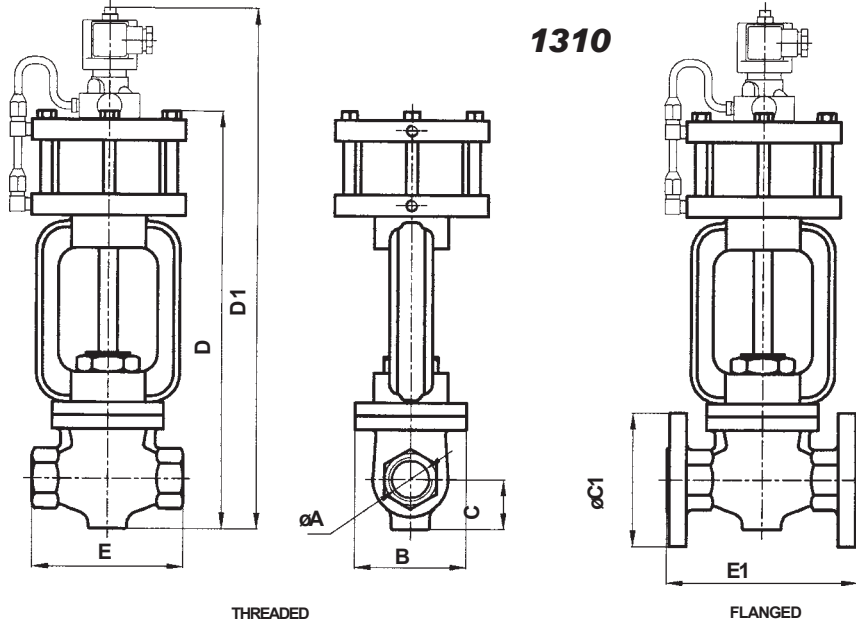
Ø Connect.	Ø Passage mm.	Kv Coef. m³/h	Maximum ΔP in bar	Cylinder Ø inches	Catalog N° according to body and seat material		
					Body material		
					Bronze	Steel	AISI304
					Seat material		
		Acrylo - Nitrile(*)	Stainless steel	AISI304			
3/4"	19	6	20	3"	1310BA06D3	1310AS06D3	1310SS06D3
1"	26	11	20		1310BA08D3	1310AS08D3	1310SS08D3
1.1/2"	32	15	10		1310BA12D3	1310AS12D3	1310SS12D3
2"	38	23	10	4"	1310BA16D4	1310AS16D4	1310SS16D4
2.1/2"	76	66	2		1310BA20D4	1310AS20D4	1310SS20D4
3"	76	85	10	6"	1310BA24D6	1310AS24D6	1310SS24D6
4"	100	150	2		--	1310AS32BD6	1310SS32BD6
6"	150	320	4	8"	--	1310AS48BD8	1310SS48BD8
8"	200	600	3,5	10"	--	1310AS64BD10	1310SS64BD10

(*) For teflon seats change A for T. Example: 1310BT06D3

Note: Maximum temp.: with teflon or steel seat 200°C - with acrylo-nitrile seat 80°C.

Maximum pressure: the maximum pressures are based on an auxiliary pressure of 5 bar.

General dimensions



1310

øA	B	C	øC1	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.

NPT Connections

Add suffix "T" to the Catalog N°. Example: 1310BA06D3T.

Special constructions

Consult Jefferson.

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)

Coil

- AC 50 Hz: 11 W - MF11C type for 12, 24, 110, 220 and 240 V.
- AC 60 Hz: 13 W - MF13C type, for 12, 24, 110, 120, 220 and 240 V.
- DC: 19 W - MH19C type, for 12, 24, 110 and 220 V.

Options

- Explosion and weather proof coils. Add prefix ZC to the valve catalog. Example: ZC1310BT12D3.

- Water, weather and saline corrosion proof coils NEMA 4x. Add prefix YC the the valve catalog. Example: YC1310BT12D3.
- Explosion and weather proof housings. Add prefix Z to the valve catalog. Example: Z1310BT12D3.
- Energized coil indicator light. See coils section.

Recommendations for the installation

Place a strainer upstream of the pilot valve with a porosity $\square 50$ if the fluid is gas or not greater than 100 if the fluid is water. It is advisable that air or other gases be 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 the complete shutoff. Mounting: Preferably on a horizontal pipeline with the operator upright.

Applications

When due to the size, pressure, working temperature, type of fluid or special service conditions there are no adequate solenoid valves available.



1311 Series



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, viton, neoprene, teflon, etc..
5-way, 2 or 3 positions pilot valve.
DIN 43650 connection encapsulated coil. IP65 and NEMA 4 protection.

Minimum auxiliary pressure: 1.5 bar.
It does not need differential pressure to operate.
Standard constructions to work with water, air, light and heavy oils and other liquids or steam.
Fluids: corrosive, viscose with suspended solids, etc..

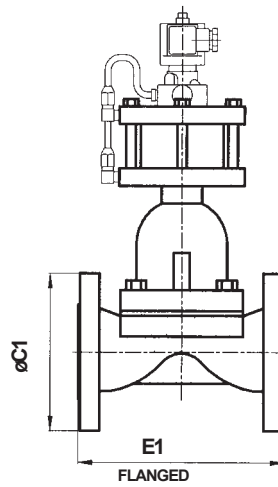
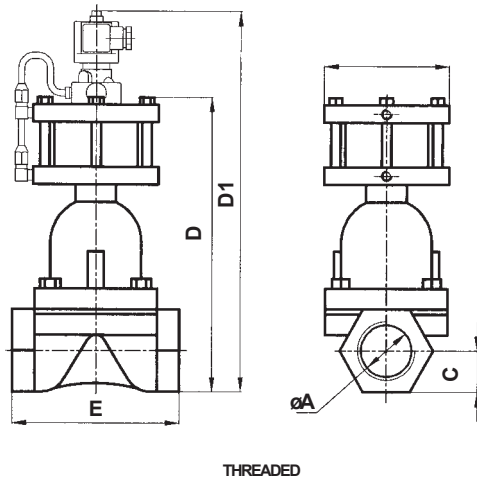
Technical specifications

Ø Connection	Kv Coef. m³/h	Maximum ΔP in bar	Cylinder Ø inches	Catalog N° according to body material		
				Iron	AISI 316	Ebonite lined
3/4"	8	7	3	1311HA06D3	1311IT06D3	1311EV06D3
1"	12	5		1311HA08D3	1311IT08D3	1311EV08D3
1.1/2"	31	5	4	1311HA12D4	1311IT12D4	1311EV12D4
2"	60	3		1311HA16D4	1311IT16D4	1311EV16D4
2.1/2"	89	5	6	1311HA20D6	1311IT20D6	1311EV20D6
3"	127	2		1311HA24D6	1311IT24D6	1311EV24D6
4"	226	3	8	1311HA32D8	1311IT32D8	1311EV32D8
5"	299	2		1311HA40D8	1311IT40D8	1311EV40D8
6"	425	2	10	1311HA48D10	1311IT48D10	1311ET48D10

Note: The diaphragms are made out of natural rubber, teflon or viton for iron bodies, stainless steel and ebonite respectively.
They are provided upon request with other types of diaphragms or body materials.
Maximum pressures are established with an auxiliary pressure of 5 bar.

General dimensions

1311



øA	B	C	øC1	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.

NPT Connections

Add suffix "T" to the Catalog N°.
Example: 1311THA06D3T.

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)

Coil

AC 50 Hz: 11 W - MF11C type, for 12, 24, 110, 220 and 240 V.
AC 60 Hz: 13 W - MF13C type, for 12, 24, 110, 120, 220 and 240 V.
DC: 19 W - MH19C type, for 12, 24, 110, 220 V.

Options

•Explosion and weather proof coils.
Add prefix ZC to the valve catalog.

Example: ZC1310BT12D3.

- Water, weather and saline corrosion proof coils NEMA 4x. Add prefix YC to the valve catalog. Example: YC1310BT12D3.
- Explosion and weather proof housings. Add prefix Z to the valve catalog. Example: Z1310BT12D3.
- Energized coil indicator light. See coils section.

Recommendations for the installation

Place a strainer upstream of the pilot valve with a porosity $\square 50$ if the fluid is gas and not greater than 100 if the fluid is water. It is advisable that air or other gases be lubricated. It is advisable to place the valve on a horizontal pipeline with the operator upright.

Applications

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



Main characteristics

Acrylic, PVC, teflon body.
Viton seals and diaphragms.
Plunger completely isolated from the fluid.
Shape A DIN 43650 connection encapsulated coil.
IP65 and NEMA 4 protection.
Absence of galvanic electrolysis.
It does not contaminate the products it works with.

Options

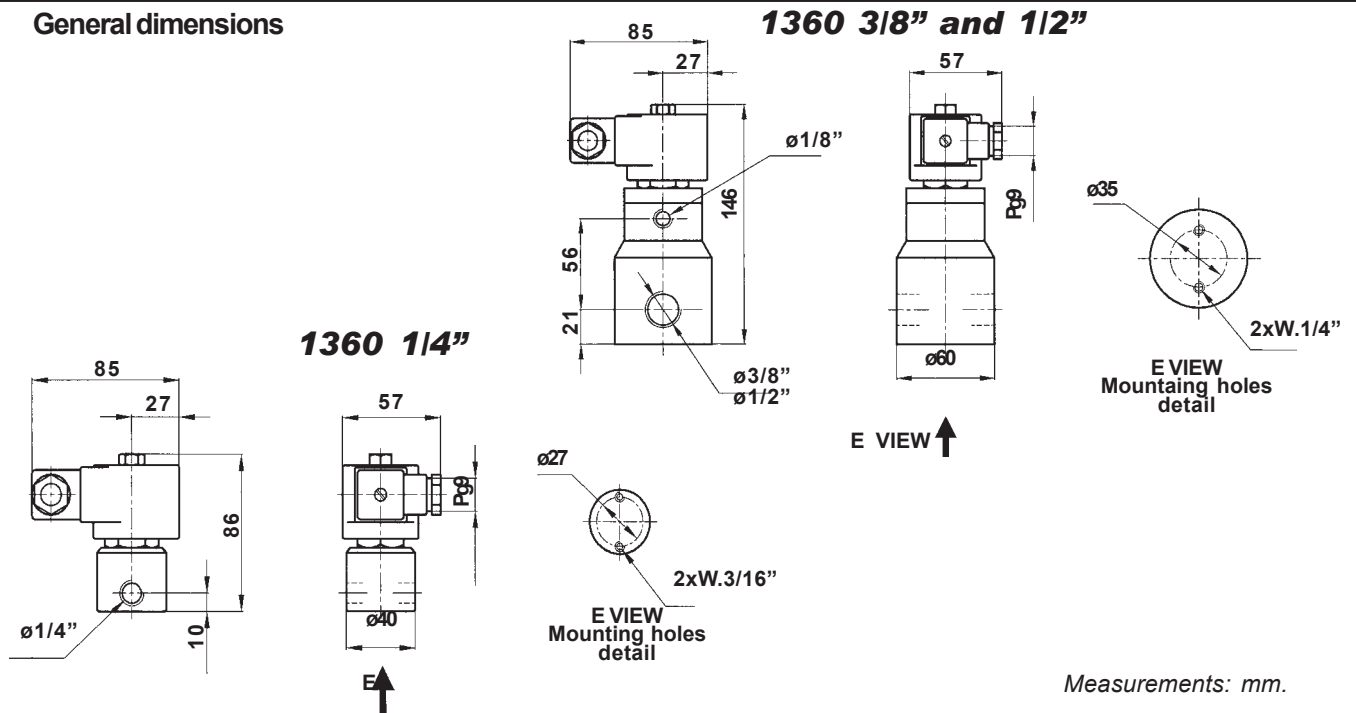
- Energized coil indicator light.
- Explosion and weather proof coils and housings.

Technical specifications

Ø Connect.	Ø Passage mm.	Kv Coef. m ³ /h	Max. pressure bar		Weight in kg.	Figure N°	Catlog N°
			Input	Output			
Acrylic body - Maximum temperature 60 °C							
1/4"	2,25	0,13	1	0,5	0,45	1	1360AV2
PVC body - Maximum temperature 60 °C							
3/8"	7	1	4	2	0,8	2	1360PV3
1/2"							1360PV4
Teflon body - Maximum temperature 150 °C							
1/4"	2,25	0,13	1	0,5	0,45	1	1360TV2
3/8"	7	1	4	2	0,8	2	1360TV3
1/2"							1360TV4

Note: For diaphragms and acrylo - nitrile seals, change letter **V** for **A** in the valve catalog number.
Example: 1360TA4 instead of 1360TV4.

General dimensions



Coils

For diagram 1:

- AC 50 Hz: 11 W - MF11C type, for 24, 110, 220 V.
- AC 60 Hz: 13 W - MF13C type, for 24, 110, 120, 240

For diagram 2:

- AC 50 Hz: 16 W - MF16C, for 24, 110, 220 V.
- AC 60 Hz: 16 W - MF16C, for 24, 110, 120, 240 V.

- Explosion and weather proof housings. Add prefix **Z** to the valve catalog. Example: Z1360TV3.
- Energized coil indicator light. See coil section.

Special constructions

Diaphragms and seals: neoprene, ethyl-propylene, etc..
Used in vacuum.

Options

- Explosion and weather proof coils. Add prefix **ZC** to the valve catalog. Example: ZC 1360AV2.
- Water, weather and saline corrosion proof coils NEMA 4x. Add prefix **YC** to the valve catalog. Example: YC1360PV4.

Recommendations for the installation

Place a strainer upstream of the valve with a porosity \square 100 \square .
Installation: in any position. Preferably on a horizontal pipeline with the coil upright. Do not reduce the solenoid valve's downstream passage with fittings or valves thus increasing the output pressure and hindering proper closure. If a valve is to be installed to control flow, it must be placed upstream of the solenoid valve. In case of usage of spray nozzle it must be checked that the valve's output pressure does not exceed the value shown in the table. Due to the limitations of the body material's mechanical properties, if it is a plastic body the installation must be done very carefully in order not to distort it, especially during threading.

Resistance characteristics of the materials in contact with the fluid.

Bodies			Diaphragms, seals and seats
Teflon	PVC	Acrylic	Viton
It is practically inert to all corrosive products. Atmospheric conditions do not affect it. It is neither hygroscopic nor flammable and has an exceptionally low friction coefficient.	At low temperatures it is excellent for the most severe alkaline products, mineral acids, salts and many other chemical products that corrode conventional materials.	It is a hard and rigid resin. Weather, oxidation and light radiation proof. Common acids and solvents resistant. It is corroded by strong acids: highly concentrated oxidant acids (nitric, sulphuric, hydrochloric).	It is resistant to petroleum and its distillations, most mineral acids and aliphatic and aromatic hydrocarbons which act as solvents to other elastomers. Not advisable for acetone or halogenated hydrocarbons.



Main characteristics

Manual reset and automatic release.
Resetting with energized coil or no electric signal.
The free-handle system leaves the reset lever free from operating while the coil is not energized (case 1369) or

energized (case 1369B).
It is applicable to most of our valve series.

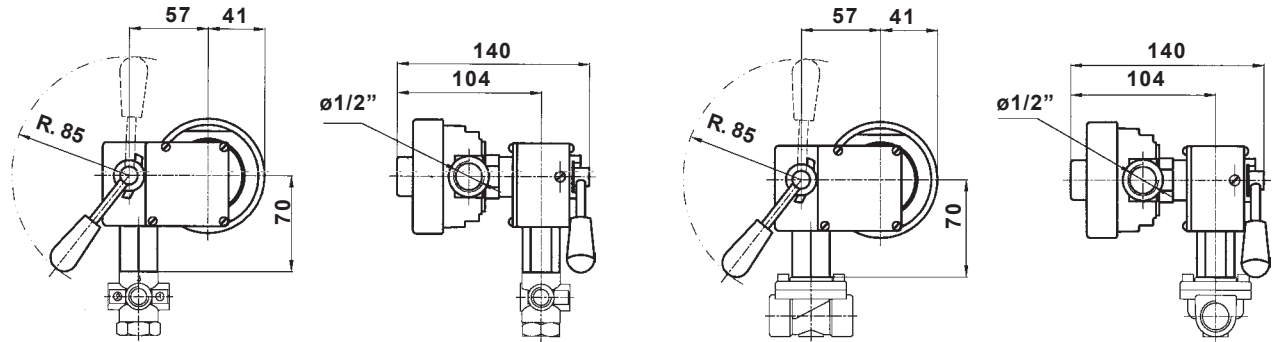
Technical specifications

Ø Connection	1327	1335	1390 1342	1351	1365 1325	1350
1369 device - Resetting with electrical signal						
1/4"	1327BA402-69	-	-	1351LA1A-69	1365BA402-69	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	-	-	-
1369B device - Resetting without electrical signal						
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 normally open.

General dimensions

1369



Measurements: mm.

Coil

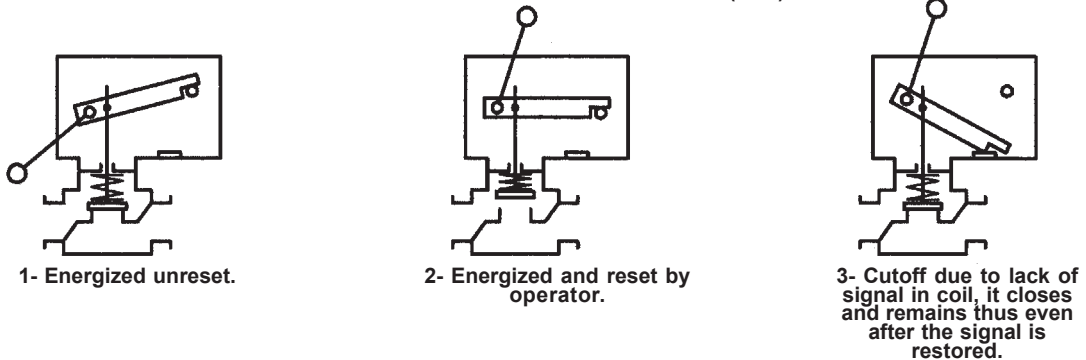
- AC 50 Hz: 11 W - MF11C type, for 12, 24, 110, 220 and 240 V.
- AC 60 Hz: 13 W - MF13C type, for 12, 24, 110, 120, 220 and 240 V.
- DC: 19 W - MH19C type, for 12, 24, 110, 220 V.

Options

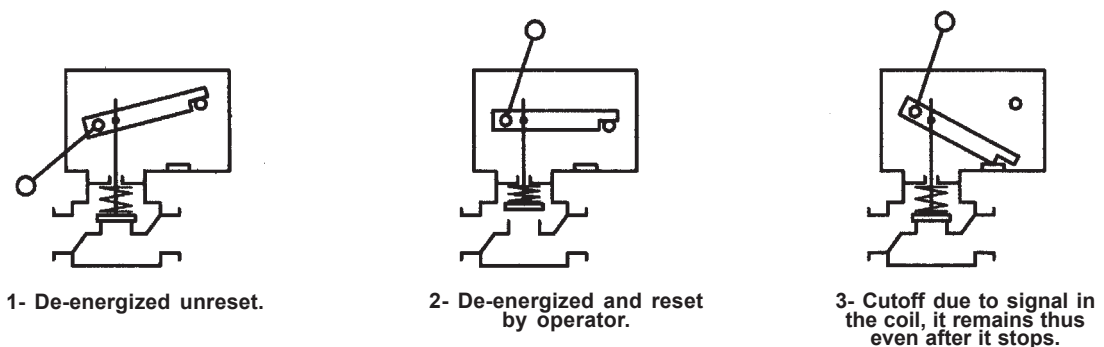
- Weather and explosion proof coils. Add prefix **ZC** to the valve catalog. Example: ZC1335BA3-69.
- Water, weather and saline corrosion proof coils NEMA 4x. Add prefix **YC** to the valve catalog. Example: YC1335BA3-69.
- Explosion and weather proof housings. Add prefix **Z** to the valve catalog. Example: Z1335BA3-69.
- Energized coil indicator light. See coils section.

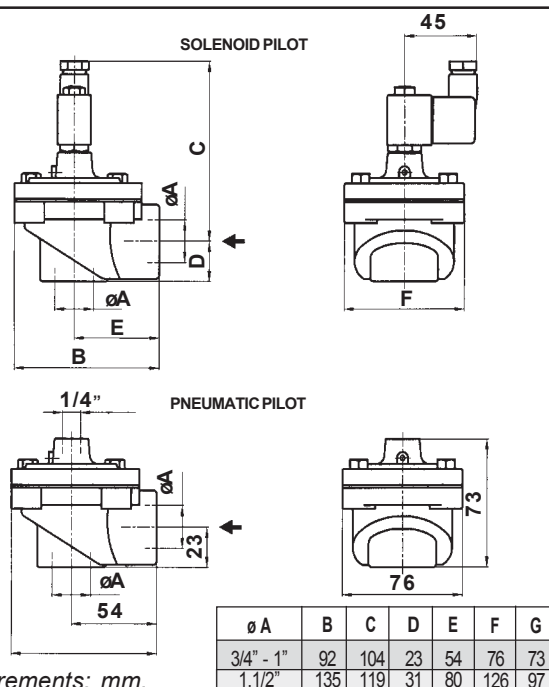
Operation manner

1369 FOR NORMALLY CLOSED VALVES (N.C.)



1369B FOR NORMALLY OPEN VALVES (N.O.)





Main characteristics

High flow and response time.
 Injected or cast aluminium body.
 BSP or NPT threaded angle connections.
 Acrylo - Nitrile or Hytrel diaphragms.
 Electric or pneumatic operation versions.
 6 W encapsulated coils.
 DIN 43650 connection. IP65 and NEMA4 protection.

NPT Connections

Add suffix "T" to the Catalog N°.
 Example: 2073LA06T.

Technical specifications

ø Connect.	ø Passage mm.	Kv Coef. m³/h	ΔP bar		Power W	Max. temp. en °C	Weight in kg.	Catalog N° according to diaphragm material	
			Minimum	Maximum				Acrylo-Nitrile	Hytrel
Integrated solenoid pilot									
3/4"	29	8,7	0,5	10	6	80	0,55	2073LA06S	2073LH06S
1"	29	16						2073LA08S	2073LH08S
1.1/2"	40	29			11		1,3	2073LA12S	2073LH12S
External pneumatic pilot (*)									
3/4"	29	8,7	0,5	10	-	80	0,55	2073LA06	2073LH06
1"	29	16						2073LA08	2073LH08
1.1/2"	40	29					1,3	2073LA12	2073LH12

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

Coils

ø 3/4" and 1".
 AC 50 Hz: 60 Hz and DC: 6 W - MF06C type.
 ø 1 1/2".
 AC 50 Hz: 11 W - MF11C type, for 24, 110 and 220 V.
 AC 60 Hz: 13 W - MF13C type, for 24, 110, 120 and 240 V.
 DC: 19 W - MF19C type, for 12, 24, 110 and 220 V.

Recommendations for the installation

Place a strainer upstream of the valve with a porosity \square 100 \square .
 Installation: in any position, preferably on a horizontal pipeline with the coil upright.



1342-72 Series



1335-72 Series

Main characteristics

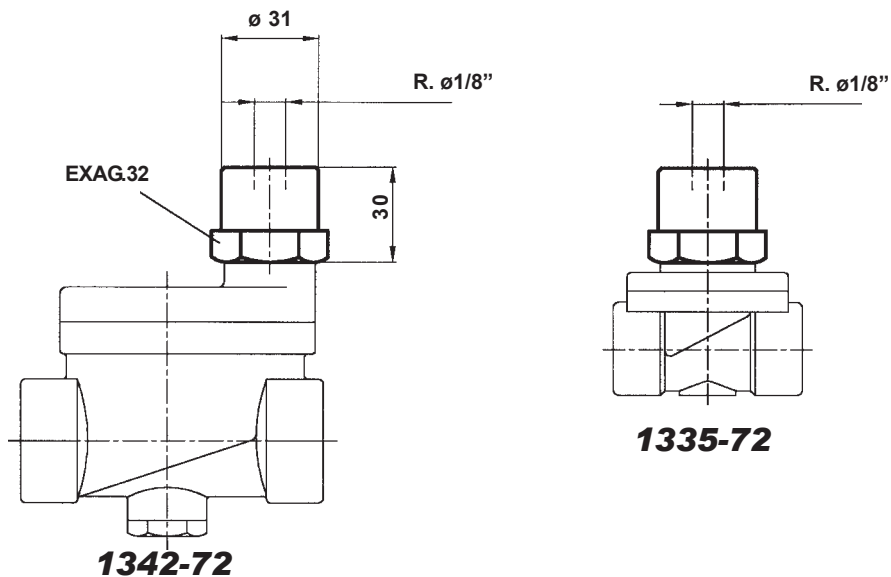
It operates with pneumatic signal.
 It substitutes for the electric operator and can be used with some of the size M solenoid valve models.
 Normally closed and normally open.
 Seats: acrylo-nitrile, viton, etc..
 Minimum operation pressure: 1 bar.
 Maximum operation pressure: 10 bar.

Series that may be adapted to this device

Direct acting: **1327**
 Servo operated action: **1335 - 1342 - 1390.**

For NC models, the minimum pressure is 1 bar.
 For NO models the minimum pressure is the maximum pressure of the fluid to be controlled plus 1 bar.

General dimensions



Measurements: mm.

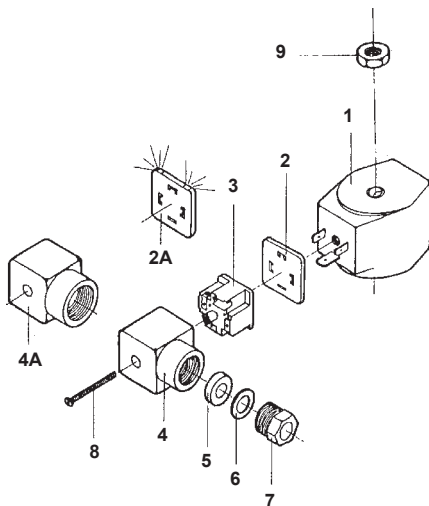
Electrical installation

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 1326 series with "C" coils, the other Jefferson models are generally supplied with Shape A or B DIN 43650 Connection (ISO 4400) encapsulated coils.

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 μ.
- 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, 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.



- 1 Coil
- 2 Gasket
- 2a Gasket with energized coil indicator light. (Upon request).
- 3 Electric terminals block. Maximum wiring section AWG14 (1.6 mm.)
- 4 Cover with opening for armored cable. Strain relief "PG9", cable external f from 6 to 8 mm.. Cover with indicator light upon request.
- 4a Cover with opening for conduit. 1/2 NPT Connection. (Part No 3189-2). Cover with indicator light upon request.
- 5 Strain relief gasket.
- 6 Washer.
- 7 Strain relief.
- 8 Fixing screw.
- 9 Coil fixing nut.

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 four possible positions: Left, Right, Above, Below.
3. Insert the coil blades into the connector. Fasten it with the screw (8).
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 and 2073 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, dirt, 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 operation.

 offers its complete sales service by phone or fax to assist the end user in studying and finding a solution to the failure.

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

PROBLEM	POSSIBLE CAUSES	SOLUTIONS
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.		
1. Valves do not open when energized (NC) or when de-energized (NO).	<p>For direct acting valves</p> <ol style="list-style-type: none"> 1. Tension less than 15% of the nominal voltage. 2. Too high a differential pressure for that model. 3. Burnt coil (with the circuit open). 4. Plunger jammed with solids. 5. Damaged plunger. <p>For servo operated action valves The same as above plus:</p> <ol style="list-style-type: none"> 6. Differential pressure too low. 7. Jammed servo piston. 8. Damaged servo piston, servo piston rings or diaphragm. 9. Pilot orifice blocked. 10. Pilot gasket damaged or mis-aligned. 11. Excessive viscosity. 	<ol style="list-style-type: none"> 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. 2. Reduce pressure to the maximum shown on the valve nameplate or change it for a more adequate one. 3. See Burnt Coils. 4. 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. 5. 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. 6. 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. 7. 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. 8. Change damaged parts. Check that the cause is not dirt. Point 1.4.1. is applicable in this case. 9. Clean the orifice. See 1.4.1., if the orifice is damaged consult Jefferson. 10. This is caused by poor assembly. Change the damaged part and assemble the valve correctly. The O-ring must be correctly fitted. 11. Fluids with viscosities exceeding 60 CST cannot be used with servo operated valves. If not, change the valve model.
2. The valve remains open	<p>For direct acting valves</p> <ol style="list-style-type: none"> 1. The coil was not de-energized (NC valve) or energized (NO valve). 2. Plunger jammed with solids. <p>For servo assisted valves The same as above plus:</p> <ol style="list-style-type: none"> 3. The pilot orifice does not close. 4. Compensation orifice blocked. 5. Jammed servo piston. 6. Servo piston, servo piston rings or diaphragm damaged. 7. Excessive viscosity. 	<ol style="list-style-type: none"> 1. Check the control circuits. 2. 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. 3. 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 Jefferson. 4. Clean the orifice. See 1.4.1., if the orifice is damaged consult Jefferson. 5. 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. 6. Change the damaged parts. Check that the cause is not dirt. Point 1.4.1. is applicable in this case. 7. Fluids with viscosities exceeding 60 cSt cannot be used with servo operated valves. If not, change the valve model.
3. The coil gives off a burning smell after working for a short period or it burns up frequently.	<ol style="list-style-type: none"> 1. Excessive voltage. 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. 3. The coil's nominal tension is less than the source's or does not correspond to its cycling. 4. Excessive fluid or ambient temperature. 5. Moisture entering the interior of the coil. 6. Lack of part of the electromagnetic package when it is not integrated to the coil. 7. It is energized outside the valve (AC only). 	<ol style="list-style-type: none"> 1. The voltage must not exceed 10% of the nominal tension, and only for brief periods. Correct the voltage. 2. 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. 3. Check that the tension and current type is as indicated on the coil. 4. 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. 5. 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. 6. 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. 7. Do not energize the coil if it is not fitted to the valve.
4. The coil vibrates when energized.	<ol style="list-style-type: none"> 1. Insufficient voltage. 2. Dirty fixed core and plunger surfaces, they have scales. 	<ol style="list-style-type: none"> 1. Adjust the tension within the permitted parameters. 2. Clean the surfaces. If scales remain there, change the components.
5. Fluid leakage when closed.	<ol style="list-style-type: none"> 1. Main or pilot seat damaged or dirty. 	<ol style="list-style-type: none"> 1. Clean or change seats. If the orifice seats are damaged, consult Jefferson.
6. It operates slowly or fails.	<ol style="list-style-type: none"> 1. Compensation or pilot orifice partially blocked. 2. Excessive fluid viscosity. 3. Temporary excess or lack of differential pressure. 	<ol style="list-style-type: none"> 1. In case of dirt, clean the orifices. In case of damage, consult Jefferson. 2. The fluid's viscosity must not exceed 60 cSt. See 1.11. 3. Check that both differential and opening pressure differential are within the limits indicated in the valve nameplate.

General Purpose

Catalog N°	Kit part N°	
1314		
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		
1326		
1326BA121	K26A	
1326BA171		
1326BA221		
1326BA301		
1326BA122		
1326BA172		
1326BA222		
1326BA302		
1326BE121		K26E
1326BE171		
1326BE221		
1326BE301		
1326BE122		
1326BE172		
1326BE222	K26V	
1326BE302		
1326BN121		
1326BN171	K26N	
1326BN221		
1326BN301		
1326BN122		

Catalog N°	Kit part N°
1326	
1326BN172	K26N
1326BN222	
1326BN302	
1326BV121	K26V
1326BV171	
1326BV221	
1326BV301	
1326BV122	
1326BV172	
1326BV222	
1326BV302	
1327	
1327BA122	K27A
1327BA172	
1327BA222	
1327BA302	
1327BA402	
1327BA502	K27E
1327BA522	
1327BE122	
1327BE172	
1327BE222	
1327BE302	K27E
1327BE402	
1327BE502	
1327BE522	
1327BN122	
1327BN172	K27N
1327BN222	
1327BN302	
1327BN402	
1327BN502	
1327BN522	K27T
1327BT122	
1327BT172	
1327BT222	
1327BT302	
1327BT402	K27T
1327BT122	
1327BT172	
1327BT222	
1327BT302	
1327BT402	K27V
1327BV122	
1327BV172	
1327BV222	
1327BV302	
1327BV402	K27AA
1327BV502	
1327BV522	
1327BA122NA	
1327BA172NA	
1327BA222NA	K27AINA
1327BA252NA	
1327BA302INA	
1327BA402INA	
1327BA502INA	
1327BE122NA	K27EINA
1327BE172NA	
1327BE222NA	
1327BE252NA	
1327BE302INA	
1327BE402INA	K27EINA
1327BE502INA	
1327BN122NA	
1327BN172NA	
1327BN222NA	

Catalog N°	Kit part N°
1327	
1327BN252NA	K27NA
1327BN302INA	K27NINA
1327BN402INA	
1327BN502INA	K27TINA
1327BT122INA	
1327BT172INA	
1327BT222INA	
1327BT302INA	
1327BT402INA	K27VA
1327BV122NA	
1327BV222NA	
1327BV252NA	K27VINA
1327BV302INA	
1327BV402INA	
1327BV502INA	
1327BV522INA	
1335	
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	
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
1335BV6INA	K35V2INA

Catalog N°	Kit part N°
1335	
1335BV3INA	K35V1INA
1335BV4INA	
1335BV6INA	
1342	
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	
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

General Purpose

Catalog N°	Kit part N°	
1342		
1342BV20INA	K42V5INA	
1342BV24INA	K42V5INA	
1390		
1390BA2	K90BA1	
1390BA3		
1390BA4		
1390BE2	K90BE1	
1390BE3		
1390BE4	K90BE2	
1390BN2	K90BN1	
1390BN3		
1390BN4		
1390BT2	K90BT1	
1390BT3		
1390BT4		
1390BV2	K90BV1	
1390BV3		
1390BV4		
1390BA2INA	K90BA1INA	
1390BA3INA		
1390BA4INA	K90BA2INA	
1390BE2INA	K90BE1INA	
1390BE3INA		
1390BE4INA		
1390BN2INA	K90BN1INA	
1390BN3INA		
1390BN4INA	K90BN2INA	
1390BT2INA	K90BT1INA	
1390BT3INA		
1390BT4INA		
1390BV2INA	K90BV1INA	
1390BV3INA		
1390BV4INA		
1393		
1393BS082	K93T1	
1393BS083		
1393BS084		
1393NS082		
1393NS083		
1393NS084		
1393BS082NA		
1393BS083NA		
1393BS084NA		
1393NS082NA		
1393NS083NA		
1393NS084NA		
2026		
2026BA121		K026A
2026BA171		
2026BA221		
2026BA301		
2026BA122		
2026BA172		
2026BA222		
2026BA302		
2026BE121	K026E	
2026BE171		
2026BE221		
2026BE301		
2026BE122		
2026BE172		
2026BE222		

Catalog N°	Kit part N°
2026	
2026BE302	K026E
2026BN121	K026N
2026BN171	
2026BN221	
2026BN301	
2026BN122	
2026BN172	
2026BN222	K026V
2026BN302	
2026BV121	
2026BV171	
2026BV221	
2026BV301	
2026BV122	K026E
2026BV172	
2026BV222	
2026BV302	
2036	
2036BA3/4	K036A1
2036BA8	K036A2

Combustion Use

Catalog N°	Kit part N°
1312	
1312BS504	K12B1
1312BS506	K12B2
1312BS806	
1312BS808	
1312BSB08	
1312SS504	K12S1
1312SS506	K12S2
1312SS806	
1312SS808	
1312SSB08	
1312BS404NA	K12B1
1312BS406NA	K12B2
1312BS606NA	
1312BS408NA	
1312BS608NA	
1312SS404NA	K12S1
1312SS406NA	K12S2
1312SS606NA	
1312SS408NA	
1312SS608NA	
1330 - 2030	
1330LA0	K30A0
1330LA04	K30A1
1330LA06	
2030LA08	K030A1
2030LA10	
1330LA08	K30A2
2030LA12	K030A2
2030LA16	
1330LA08L	K30A2L
2030LA12L	K030A2L
2030LA16L	
1330LAR08	K30AR2
2030LAR12	K030AR2
2030LAR16	
1330LA04NA	K30A1A
1330LA06NA	
1330LA08NA	K30A2
2030LA12NA	K030A2
2030LA16NA	
1330LAR08NA	K30AR2

Catalog N°	Kit part N°
1330 - 2030	
2030LAR12NA	K030AR2
2030LAR16NA	
1332	
1332LA08	K32A1
1332LA10	K32A2
1332LA12	K32A3
1332LA16	
1332LA20	K32A4
1332LA24	
1356	
1356BT3	K56B1
1356BT4	
1356BS4-48	K56B2
1388	
1388LA06D	K88A2D
1388LA08D	K88A3D
1388LA10D	
1388LA12D	K88A5D
1388LA16D	
1388LA20D	K88A6D
1388LA24D	
1388LA06DS	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	

Pneumatic Use

Catalog N°	Kit part N°
1323	
1323BA17C	K23AC
1323BA20C	
1323BA25C	
1323BE17C	K23EC
1323BE20C	
1323BE25C	
1323BN17C	K23NC
1323BN20C	
1323BN25C	
1323BV17C	K23VC
1323BV20C	
1323BV25C	
1323BA17D	K23AD
1323BA20D	
1323BA25D	
1323BE17D	K23ED
1323BE20D	
1323BE25D	
1323BN17D	K23ND
1323BN20D	
1323BN25D	

Catalog N°	Kit part N°
1323	
1323BV17D	K23VD
1323BV20D	
1323BV25D	
1323BA17A	K23AA
1323BA20A	
1323BA25A	
1323BE17A	K23EA
1323BE20A	
1323BE25A	
1323BN17A	K23NA
1323BN20A	
1323BN25A	
1323BV17A	K23VA
1323BV20A	
1323BV25A	K23AU
1323BA17U	
1323BA20U	
1323BA25U	K23EU
1323BE17U	
1323BE20U	
1323BE25U	K23NU
1323BN17U	
1323BN20U	
1323BN25U	K23VU
1323BV17U	
1323BV20U	
1323BV25U	K25AC
1325BA3C	
1325BA4C	
1325BA6C	K25VC
1325BV3C	
1325BV4C	
1325BV6C	K25AA
1325BA3A	
1325BA4A	
1325BA6A	K25VA
1325BV3A	
1325BV4A	
1325BV6A	K25SA1C
1325SA3C	
1325SA4C	
1325SA6C	K25SA2C
1325SV3C	
1325SV4C	
1325SV6C	K25SV1C
1325SA3A	
1325SA4A	
1325SA6A	K25SA2A
1325SV3A	
1325SV4A	
1325SV6A	K25SV1A
1325SV2A	
1325SV2A	
1339	
1339LA1	K39A
1339LA2	
1339LA3	
1339LV1	K39AV
1339LV2	
1339LV3	
1339BA1	K39B
1339BA2	
1339BA3	

Pneumatic Use

Catalog N°	Kit part N°	
1339		
1339BV1	K39BV	
1339BV2		
1339BV3		
1339SA1	K39A	
1339SA2		
1339SA3		
1339SV1	K39AV	
1339SV2		
1339SV3		
1350		
1350LA1	A	K50LA1A
1350LA2	B	K50LAB
1350LTA1	C	K50LAC
1350LTA2	G	K50LA1A
1350SA1	I	K50LAC
1350SA2	D	K50A1D
	F	K50A1F
1350LA3	A	K50LA2A
	B	K50LAB
	C	K50LAC
	G	K50LA2A
	I	K50LAC
	D	K50A2D
1350LV1	A	K50LV1A
	B	K50LVB
	C	K50LVC
	G	K50LV1A
	I	K50LVC
	D	K50V1D
1350LV2	A	K50LV2A
	B	K50LVB
	C	K50LVC
	G	K50LV2A
	I	K50LVC
	D	K50V2D
1350BA1	A	K50BA1A
	B	K50BAB
	C	K50BAC
	G	K50BA1A
	I	K50BAC
	D	K50A1D
1350BA3	A	K50BA2A
	B	K50BAB
	C	K50BAC
	G	K50BA2A
	I	K50BAC
	D	K50A2D
1350BV1	A	K50BV1A
	B	K50BVB
	C	K50BVC
	G	K50BV1A
	I	K50BVC
	D	K50V1D
1350BV3	A	K50BV2A
	B	K50BVB
	C	K50BVC

Catalog N°	Kit part N°	
1350		
1350BV3	G	K50BV2A
	I	K50BVC
	D	K50V2D
	F	K50V1F
1350BTV3		
1351		
1351LA1	A	K51LA1A
	B	K51LA1B
	C	K51LAC
	G	K51LA1A
	H	K51LA1B
	K	K51LA1A
	N	
	M	K51LAC
	D	K51A1D
	I	
	F	K51A1F
	1351LA3	A
B		K51LA1B
C		K51LAC
G		K51LA2A
H		K51LA1B
K		K51LA2A
N		
M		K51LAC
D		K51A2D
I		
F		K51A1F
1351LV1		A
	B	K51LV1B
	C	K51LVC
	G	K51LV1A
	H	K51LV1B
	K	K51LV1A
	N	
	M	K51LVC
	D	K51V1D
	I	
	F	K51V1F
	1351LV3	A
B		K51LV1B
C		K51LVC
G		K51LV2A
H		K51LV1B
K		K51LV2A
N		
M		K51LVC
D		K51V2D
I		
F		K51V1F
1351BA1		A
	B	K51BA1B
	C	K51BAC
	G	K51BA1A
	H	K51BA1B
	K	K51BA1A
	N	
	M	K51BAC
	D	K51A1D
	I	
	F	K51A1F
	1351BA3	A
1351BTA3	B	K51BA1B

Catalog N°	Kit part N°		
1351			
1351BA3	C	K51BAC	
	G	K51BA2A	
	H	K51BA1B	
	K	K51BA2A	
	N		
	M	K51BAC	
	D	K51A2D	
	I		
	F	K51A1F	
	1351BV1	A	K51BV1A
		B	K51BV1B
		C	K51BVC
G		K51BV1A	
H		K51BV1B	
K		K51BV1A	
N			
M		K51BVC	
D		K51V1D	
I			
F		K51V1F	
1351BV3		A	K51BV2A
	B	K51BV1B	
	C	K51BVC	
	G	K51BV2A	
	H	K51BV1A	
	K	K51BV2A	
	N		
	M	K51BVC	
	D	K51V2D	
	I		
	F	K51V1F	
	1365		
1365BA17C	K65BAC		
1365BA20C			
1365BA25C			
1365BE17C	K65BEC		
1365BE20C			
1365BE25C			
1365BN17C	K65BNC		
1365BN20C			
1365BN25C			
1365BV17C	K65BVC		
1365BV20C			
1365BV25C			
1365BA17A	K65BAA		
1365BA20A			
1365BA25A			
1365BE17A	K65BEA		
1365BE20A			
1365BE25A			
1365BN17A	K65BNA		
1365BN20A			
1365BN25A			
1365BV17A	K65BVA		
1365BV20A			
1365BV25A			
1365BA17U	K65BAU		
1365BA20U			
1365BA25U			
1365BE17U	K65BEU		
1365BE20U			
1365BE25U			

Catalog N°	Kit part N°	
1365		
1365BN17U	K65BNU	
1365BN20U		
1365BN25U		
1365BV17U	K65BVU	
1365BV20U		
1365BV25U		
2024		
2024BA2	K024A	
2024BA2-M	K024A-M	
Miscellaneous		
1360		
1360AV2	K60AV1	
1360PV3	K60PV2	
1360TV2	K60AV1	
1360TV3	K60PV2	
1360TV4		
2073		
2073LA06	K073LA1	
2073LA08		
2073LA12	K73A2	
2073LA06S	K073LA1S	
2073LA08S		
2073LA12S	K73A2S	
2073LH06	K073LH1	
2073LH08		
2073LH12	K73H2	
2073LH06S	K073LH1S	
2073LH08S		
2073LH12S	K73H2S	

Strainer for General Purpose

1359	
1359BS04	K59S1
1359BS06	K59S2
1359BS08	K59S3
1359BS12	K59S4
1359BS16	K59S5
1359FS04	K59S1
1359FS06	K59S2
1359FS08	K59S3
1359FS12	K59S4
1359FS16	K59S5
1359AS04	K59S1
1359AS06	K59S2
1359AS08	K59S3
1359AS12	K59S4
1359AS16	K59S5
1359SS04	K59S1
1359SS06	K59S2
1359SS08	K59S3
1359SS12	K59S4
1359SS16	K59S5

Magnetic Level Switches



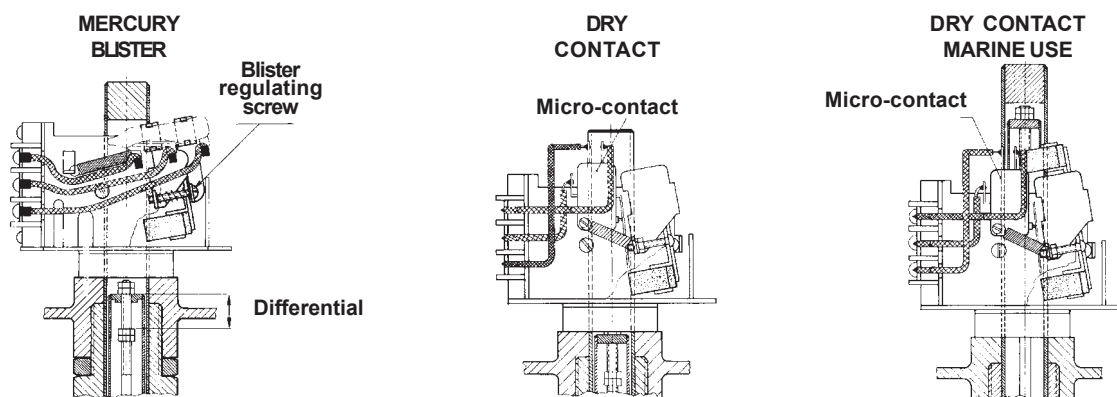
1317 Series		Magnetic level switches for water boilers 92
2017 Series		External float magnetic level switches for general use 94
2049 Series		External float magnetic level switches for general use 94
1340 Series		Magnetic level switches for internal float tank Top mounting 97
1340A Series		Internal float magnetic level switches Lateral mounting 98
1376 Series		Internal displacer magnetic level switches 100
1380 Series		External displacer magnetic level switches 100

JEFFERSON SUDAMERICANA S.A. has developed a wide range of float and displacer magnetic level switches, which are placed in the interior or the exterior of the container to be controlled.

The magnetic system eliminates the technical problems of other devices, such as blocked stuffing boxes, worn-out diaphragms, corroded electrodes, and besides, it offers the advantage of containing all the mechanical and electrical elements on the same hydrometric column. This arrangement simplifies the time and cost of installation. Its high-quality mercury switches made of special "Pirex" glass, allow to protect its operation from any factor affecting the electric contacts, such as suspended dust, humidity, etc., as well as preventing any possible "contact stickings" due to excess of current or short-circuits.

Electromagnetic mechanisms

One, two or three mechanisms arranged in the head with SPDT, DPDT or SPST mercury contacts, allow a wide range of functioning combinations. SPDT dry contacts, normal or hermetically closed, are provided as an options construction. Another type of construction is that for marine use, vibration or rolling proof, with SPDT dry contacts.



Float magnetic level switches

There are two basic types: internal float such as **1340** series, or external float (with pressure receiver) such as **1317**, **2017** and **2049** series.

Operation

The following diagrams show the simple and safe way in which level switch mechanisms work. The float is raised by the liquid, and this in turn raises the magnetic sector of the device which moves within the antimagnetic casing, thus deriving in an attraction in the least

distant point from the magnets and the mercury contacts commutation/switching, which are suspended by a high-precision pivot system.

A secondary regulating screw provides the optimum inclination to ensure that the mercury contact is absolutely reliable.

If dry contacts are used instead of mercury switches, the design is similar except for a smaller lever which follows the rotating movement.

In those places where the system may undergo vibrations or rolling movements, as it is the case in marine use, the device uses two magnets instead of one, such as it is shown in diagram 2.

Diagram 1: Mercury Contact

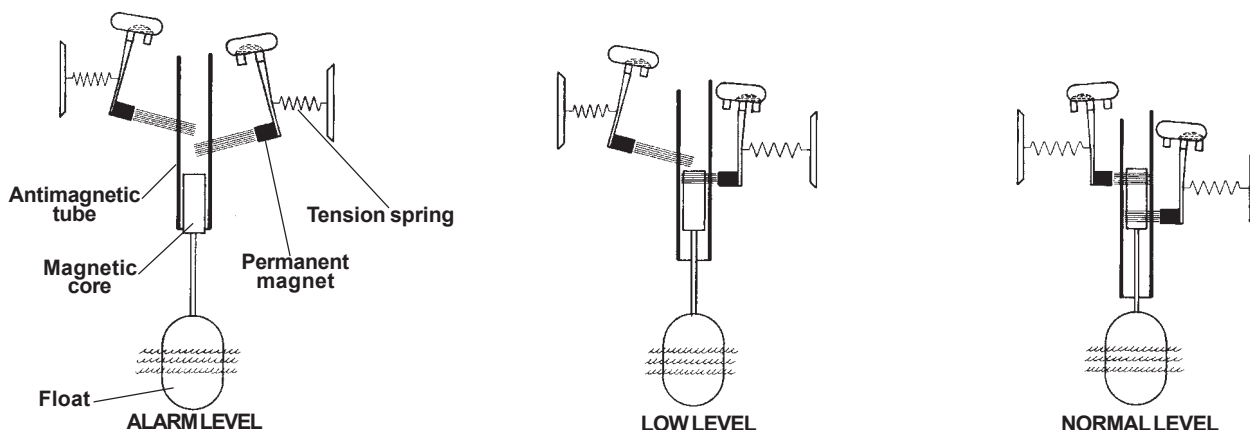
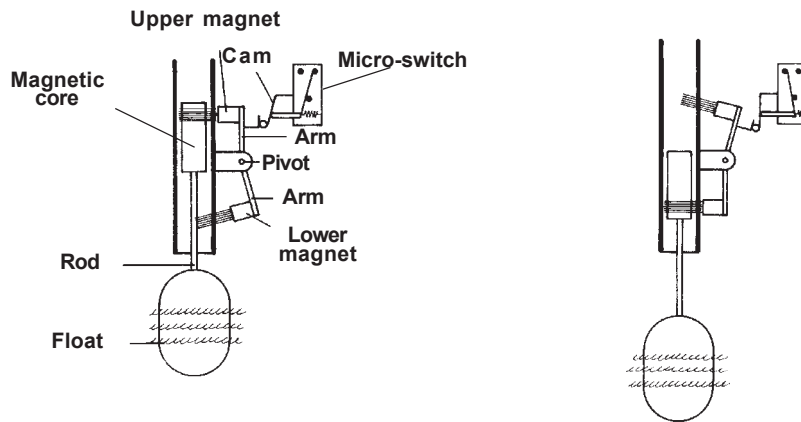


Diagram 2: Dry contact - Marine use



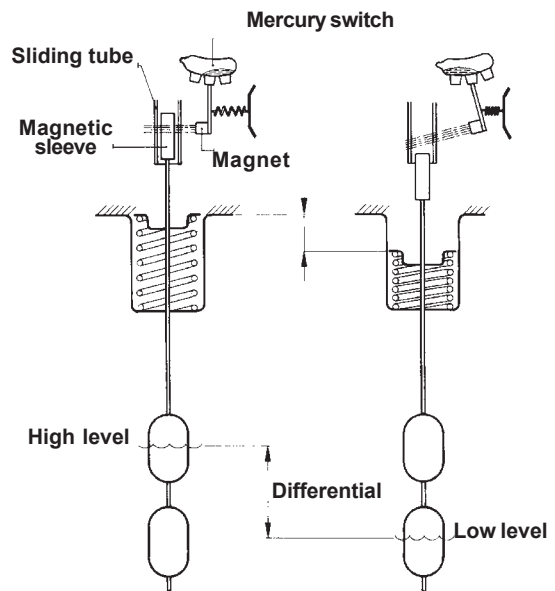
Displacer magnetic level switches

There are two types:
1376 internal displacer or **1380** series external displacer.

Operation

Displacer magnetic level switches follow the Archimedean principle to operate:

The decrease of the relative weight of the displacers when immersed in the fluid transform a high level differential into a small displacement of the magnetic core. The displacers which are held by a cable add their weights to exercise a force on the spring, thus compressing it to reach a position of equilibrium. The arrow of the spring is connected to a rod which runs across the sliding tube (see diagram). The different magnetic cores are arranged along this rod, attracting the magnets when they reach their respective attraction zones and setting them free when out of their attraction area (plus its hysteresis) in a downward direction, in a similar way to that described for the float systems. The displacer does not float, but it loses weight as it sinks in the fluid, modifying the spring arrow and consequently the position of the magnetic cores, thus causing the effect previously described.



OPERATION DIAGRAM

General and optional characteristics

Mounting and types of connections

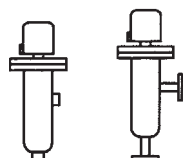
External float or displacer level switches are installed in a lateral position to the container to be controlled, by means of threaded or flanged connections. According to their position with respect to the control, they are called side-side or side-bottom. Side-side are also

provided with a threaded or flanged outlet at the bottom of the control for the purge.

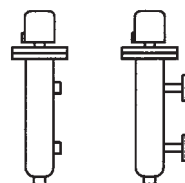
Internal float or displacer level switches are top mounting in **1376** and **1340J** series and lateral mounting in **1340A** series, both by means of threaded or flanged connections, according to the descriptions for each series.



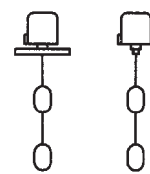
LATERAL MOUNTING



SIDE-BOTTOM MOUNTING



SIDE-SIDE MOUNTING



TOP MOUNTING

Level limits and differentials

Differential: It is the distance between the different level limits. They are not externally adjustable in the case of float level switches. In the case of displacer level switches, the differential regulation is carried out with the displacers set along the holding cable. There is a minimum differential called hysteresis in each mechanism, which is between the magnet attraction limit during rise and the detachment limit during descent. In float level switches the normal differential is approximately 25 mm, but it can be internally regulated between 15 and 80 mm in some models. In tandem two-float models, the differential can be much greater, although it is not advisable for it to exceed 500 mm., because it may be replaced with a displacer system.

In standard constructions, the minimum hysteresis of a displacer is 40 mm.. This differential may be extended to many meters in those models which use two displacers. The differential between the operation of 2 float model mechanisms is 40 mm., and in special constructions it can be reduced to 10 mm or extended up to 500 mm with two floats. In displacer models the minimum differential between two mechanisms is 200 mm.. The maximum is limited by the cable's length.

Level limits: These refer to the medium point of the top connection for external float models or the lower part of the mounting flange in models **1376** and **1340J**. In the case of **1340A**, it is established from the connection medium point taking (approximately) from the middle of the differential, up to the higher limit and down for the lower limit.

Head and protection housing types

As it is shown by the dimensional diagrams, there are 9 different types.

C-Standard head with flat sheet metal cover. (Not indicated in the Catalog No).

A-Head with disperser bridge, finned housing and signalling lights.

H-Head with disperser bridge and finned housing, weather proof.

Y- Weather proof hermetic head. IP65 protection.

T-Weather and saline corrosion proof head.

Z-Weather and explosion proof hermetic head.

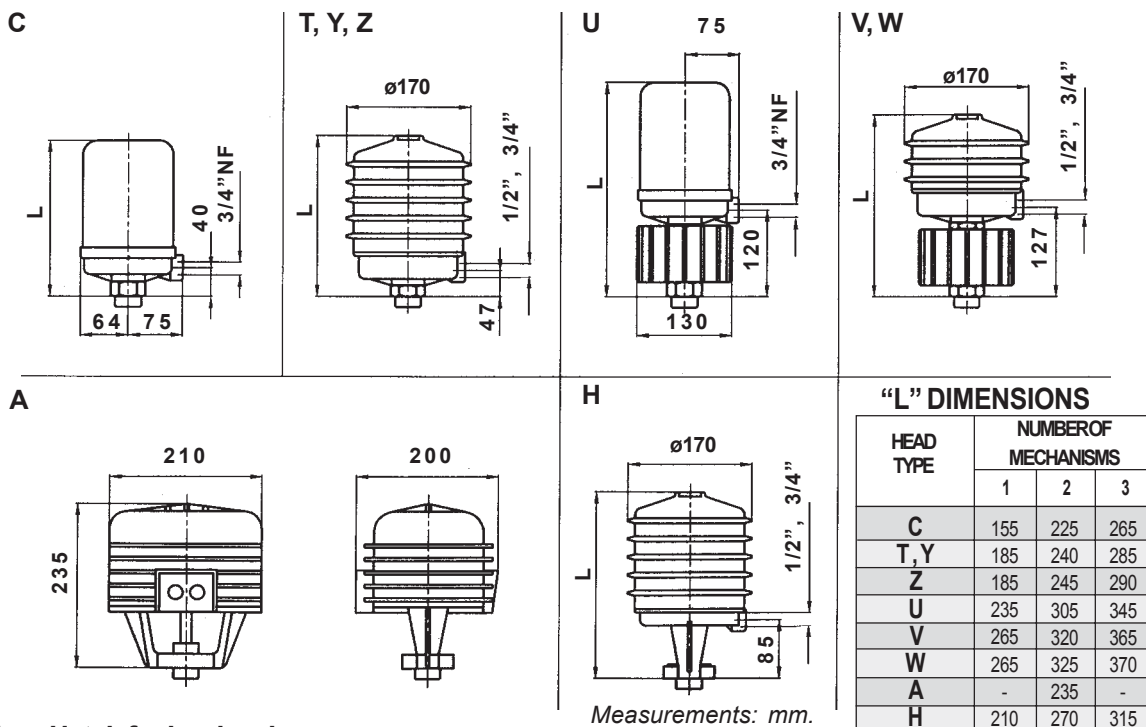
IRAM-IAP-IEC 79-0 and 79-1 certification.

U-Head with disperser neck and flat sheet metal cover.

V-Head with disperser neck and weather proof housing. IP65 protection.

W-Head with disperser neck and explosion and weather proof housing, similar to Z type.

The ways in which the different options can be added to the Catalog No are indicated in the series descriptions.



Additional latch for low level

A second latch for lack of water may be added to boiler models with A heads: the sparkplug, which directly contacts the water mirror in the boiler.

This effective system is comprised of a small panel located

in the connection box place and an electric circuit, a transformer and the connection terminals.

The safety electrode is placed on the higher part of the boiler dome.

Visual level

The level cocks are constructed in brass. The level tube is made of \varnothing 5/8" temperate Pirex glass. The tube purging cock is also provided. The maximum pressure is 18 bar and the maximum temperature is 220°C. Frequent purges guarantee the correct reading, for it may be distorted due to obstructions in the communication vessels.

Manual reset

By means of this device and in case of level failure (high level alarm or low level alarm) the signal remains on even when the controlled liquid level has returned to its normal limit, thus establishing the existence of a failure. The replacement must be carried out manually by the operator once he has studied the reasons of the anomaly.

Verification cocks

These are used when visual levels are not available, or if they are out of service (generally due to breakage) or more frequently, to check their correct reading.

Access flanges

These are available for models **1317**, **2017** and **1380**. They allow an internal inspection of the body and the floats or displacers in order to be cleaned. They are very important when the controlled fluid has deposit or corrosive elements, as it is in the case with level switches for boilers.

Purges

It is necessary, especially in level switches for boilers, to have a purging device for the level switch pressure body. In side-side connection bodies there is a third way that allows the manual or automatic purging device to be installed. It is advisable to carry out this operation at least twice a day.

Pressure body

This body belongs to the **1317**, **2017**, **2049** and **1380** series. It may be constructed with different materials and thickness, according to the fluid, density, pressure and working temperature. In the case of boilers up to 18 bar, it is a grey cast body. In other cases, it is welded carbon or AISI 304 or 316 stainless steel.

Hydraulic test: All the different body models are subjected to a hydraulic test 1.5 times the maximum working pressure. In some cases and when they have interior access flanges, this test may be carried out without the float when the testing pressure exceeds the float limit

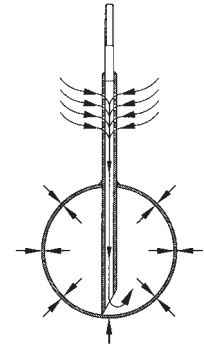
pressure so as to prevent it from collapsing.

Floats

Most models are provided with only one float. However, systems with high differential need two tandem floats. The floats and rods that transmit the level changes are made of AISI 304 or AISI 316 stainless steel.

Compensated floats

This type of float allows to work with very high pressures without collapsing because the pressure inside the float is compensated with the environment. The system is used either for high level switch or high and low level switch. It cannot be used only for low level because the equipment cannot be completely flooded.



COMPENSATED FLOAT

Low density and high pressure floats

These are special floats larger than the standard ones, with a balanced weight/volume relation and collapse resistance, so it is possible to work with fluids of 0.5 density and pressure up to 60 bar.

Interphase level switches

It can be either a float (most cases) or displacer system. It makes it possible to detect the lower fluid when both phases are liquid but composed of fluids of different specific weights. Constructions are special according to the respective densities. If there are density variations in the fluids, the lowest possible density of the lower fluid and the highest possible density that the least dense fluid (upper) can achieve shall be indicated.

Displacers

These are made of AISI 304 or AISI 316 stainless steel, as well as the messenger cable. The size and weight vary according to the different types of models that are constructed in special or standard manners. They include fixing nuts that allow them to be placed along the messenger cable.

Data needed for requesting or consulting

Maximum working pressure - Maximum working temperature - Lower and higher fluid nature and density - Control functions - Device to operate - Mounting type - Distance between each level limit - Ambient conditions of the place of installation.



Main characteristics

Pressure range: 0 to 18 bar.
 Maximum temperature: 280°C.
 Relative density: 0.8 to 1.5.
 1" BSP or NPT threaded connections.
 Access flanges to the control interior allows easy inspection and cleaning.
 AISI 304 or 316 stainless steel float.
 High-quality mercury contacts which eliminates problems of humidity, dust or stuck contacts.
 One, two or three stages (mechanisms).

Additional:

- Manual reset.
- Verification cocks.

Options:

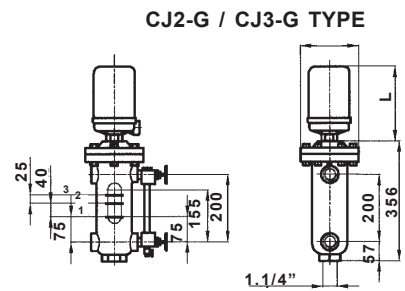
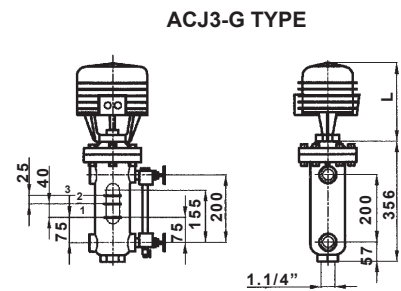
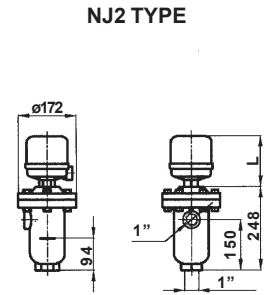
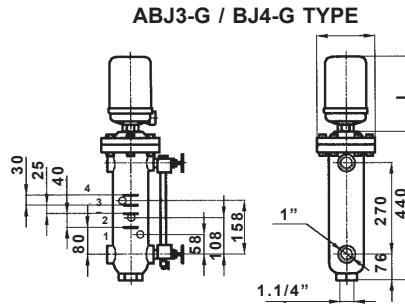
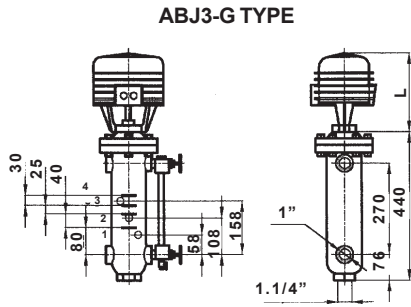
- Dry contact mechanisms.
- Marine use mechanisms.
- Explosion and / or weather proof heads.
- Head with disperser neck.

Technical specifications

Stages or mechanisms	Function	Connection		Head	Catalog N°	
		Distance	Type		W/O visual "L"	With visual "L"
1	Low level alarm	150	L . F	Standard	1317NJ2	NO
		200	L - L		1317CJ2	1317CJ2-G
2	Pump start-up and stop + low level	200	L - L		1317CJ3	1317CJ3-G
		270	L - L		1317BJ3	1317BJ3-G
		200	L - L		1317ACJ3	1317ACJ3-G
270	L - L					
2	Ditto before +safety sparkplug	200	L - L	Disperser bridge and indicator lights	1317ABJ3	1317ABJ3-G
		270			1317ACJ3B	1317ACJ3B-G
					1317ABJ3B	1317ABJ3B-G
3	Pump + high level alarm + low level alarm	270	L - L	Standard	1317BJ4	1317BJ4-G

General dimensions

1317



NOTE: the "L" Dimensions are shown on page 90.

Measurements: mm.

Special constructions

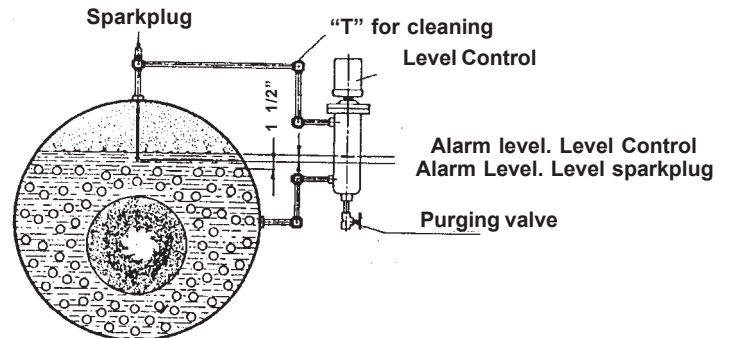
For pressures ranging from 40 to 60 bar.
(See 2017 Series).
Flanged connections (See 2017 Series).
AISI 304 or 316 stainless steel body (See 2017 Series).
Vibration or marine use proof mechanisms.

Optionals

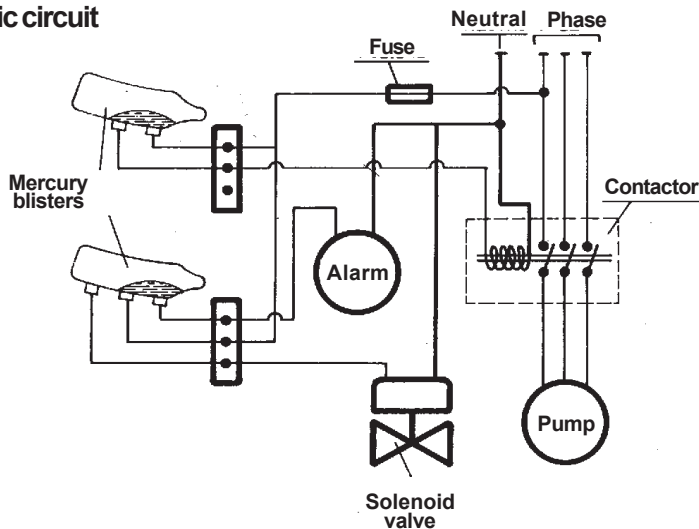
Verification cocks.
Add prefix V to the control catalog.
(Except for 1317NJ2).
Manual reset.
Add prefix R to the control catalog.

Mounting

Steam connections must be taken from the highest point of the boiler and it is advisable for this line to go down towards the one column free from low points or places prone to deposit accumulation. The "T" indicated in the diagram allows to clean all the sections both of the steam line and the liquid line. It is not allowed to connect devices that may consume steam or water from the columns, but it is allowed to mount pressure gauges or other instruments.



Electric circuit





Main characteristics

Wide range of models.
Low density and high pressure models.
Liquid temperature up to 400°C.
AISI 304 or 316 stainless steel float.
High-quality mercury blisters which eliminate the problems of humidity, dust or stuck contacts.
One, two or three stages (mechanisms).

Options:
•Dry contact mechanisms.
•Marine use mechanisms.
•Explosion and/or weather proof heads.
•Heads with disperser neck.
Special constructions
AISI 304 and 316 stainless steel.

2017 Series

Access flanges to the control interior for inspection and cleaning.
General industrial applications: petroleum refineries, petrochemical industries, high pressure boilers.

2049 Series

No access flanges.
General industrial applications: petroleum refineries, petrochemical industries, high pressure boilers.

Technical specifications

Type	Min. Density	Float		Catalog N° for usual functions			
		Maximum pressure bar		2017 Series (with access flanges)		2049 Series (no access flanges)	
		Working	Test	1 mechanism	2 mechanisms	1 mechanism	2 mechanisms
Single float - Small Differentials							
J	0,5	18	27	2017J2(*)-[]	2017J3(*)-[]	2049J2(*)-[]	2049J3(*)-[]
P	0,7	40	60	2017P2(*)-[]	2017P3(*)-[]	2049P2(*)-[]	2049P3(*)-[]
B	0,5	60	90	2017B2(*)-[]	2017B3(*)-[]	2049B2(*)-[]	2049B3(*)-[]
C (1)	0,5	100	150	2017C2(*)-[]	2017C3(*)-[]	2049C2(*)-[]	2049C3(*)-[]
F	(2)	60	90	2017F2(*)-[]	2017F2(*)-[]	2049F2(*)-[]	2049F2(*)-[]
Double Float - Large Differential							
J	0,6	18	27	2017JD2(*)-[]	2017JCD3(*)-[]	2049JD2(*)-[]	2049JCD3(*)-[]
P	0,8	40	60	2017PD2(*)-[]	2017PCD3(*)-[]	2049PD2(*)-[]	2049PCD3(*)-[]
B	0,6	60	90	2017BD2(*)-[]	2017BCD3(*)-[]	2049BD2(*)-[]	2049BCD3(*)-[]
F	(2)	60	90	2017FD2(*)-[]	2017FCD3(*)-[]	2049FD2(*)-[]	2049FCD3(*)-[]

Notes:

(1) Compensated float.

(2) Interphase.

(*) The head that corresponds to this catalog has a standard housing, mercury contacts and 3/4" NF electric connection. If another type of head or work function is to be chosen, follow the instructions for the options.

[] In order to complete the catalog number, the body characteristics, size and type of connection must be indicated according to the following key:

A	L	20	B	108
(1)	(2)	(3)	(4)	(5)

(1) Body material:

- A- Carbon steel.
- S- AISI 304 stainless steel.
- I- AISI 316 stainless steel.

(2) Mounting type:

- F- Side-Bottom
- L- Side-side with purging connection.
- C- Side-Bottom in L

(3) Distance between connections:

- 20- 200mm (only L mounting).
- 25- 250mm
- 30- 300mm
- 35- 350mm
- 40- 400mm

(4) Type of connection:

- P- BSP
- T- NPT
- B- Flange

(5) Connection size and series:

Size	Threaded		Flanged (ANSI)		
	#2000	#3000	#150	#300	#600
3/4"	206	306	106	206	406
1"	208	308	108	208	408
1.1/2"	212	312	112	212	412
2"	216	316	116	216	416

Example: Type B float; 1 mechanism; carbon steel body; no access flanges; side-side mounting; 300 mm distance; 1" NPT threaded connection; 0.5 density; 40 bar pressure.

Catalog number:

2049B2- A L 30 T 308

Options

Mechanism and contact types

Add the suffix according to the following table:

- SPDT or SPST mercury contacts (not indicated).

D- DPDT mercury contacts.

S- SPDT dry contacts (microswitch).

H- hermetically sealed dry contacts.

M- Marine use. Dry contacts.

Example:

2017B2S- A L 30 T 308

(1)(2)(3)(4)(5)

Types of head and electric connections

Electric connection	Electric Types of heads (see page 90)							
	A	H	Y	Z	U	V	W	T
1/2" BSP	AR	HR	YR	ZR	UR	VR	WR	TR
1/2" NPT	AS	HS	YS	ZS	US	VS	WS	TS
3/4" BSP	AP	HP	YP	ZP	UP	VP	WP	TP
3/4" NPT	AT	HT	YT	ZT	UT	VT	WT	TT

Example: 2017B2SZT-AL30T308

Functions

1- Simple switch - 1 mechanism (13 mm differential).

2- Simple switch or pump start-up and stop - 1 switch - 25 mm differential.

3- Pump start-up and stop + low level switch - 2 mechanisms.

3b- Pump start-up and stop + low level switch + safety sparkplug (with A head 2017 Series only) - 2 mechanisms.

4- Pump start-up and stop + low level switch + high level switch - 3 mechanisms.

5- High level switch + low level switch - 2 mechanisms.

6- High level switch + very high level switch - 2 mechanisms.

7- Low level signal + high level signal + very high level signal - 3 mechanisms.

8- Low level switch + very low level switch - 2 mechanisms.

D2- Large differential. Pump start-up and stop. 1 mechanism.

D3- Large differential. Pump start-up and stop + low level switch. 2 mechanisms.

D4- Large differential. Pump start-up and stop + low level switch + high level switch.

D5- Large differential. High level switch + low level switch.

Example:
Catalog No: **2017P5SZT-AL30B208**

Operation manner 5 - dry contacts - explosion and weather proof housing - 3/4" NPT electric connection.

Type P float - carbon steel body - access flanges - side-side mounting - 300 mm distance - ANSI 300 f1 flanged connection.

Function differentials

In cases of large differential, it depends on the distance between mounting connections and may be established upon request.

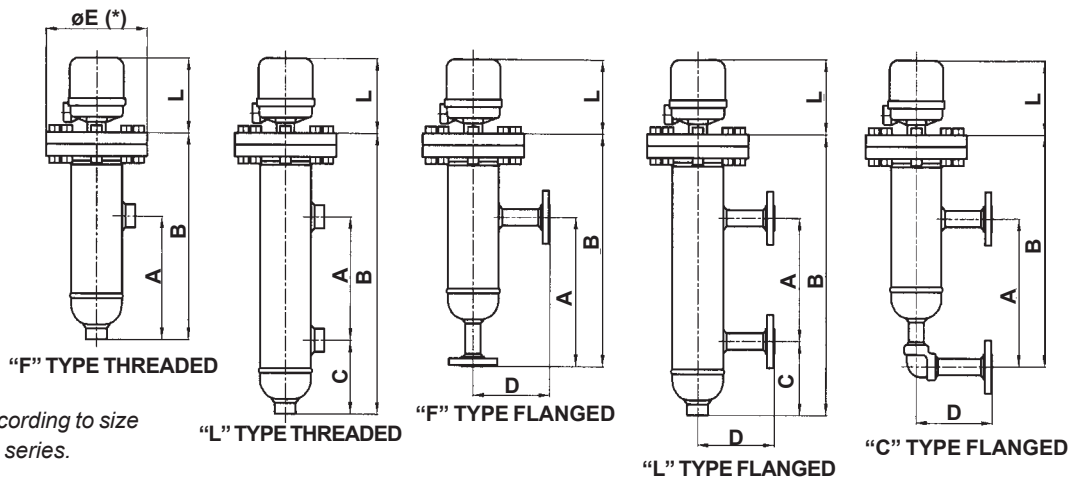
Limits	1	2	3	4	5	6	7	8
1-2	13	25	25	30	65	10	30	10
2-3	--	--	40	25	--	--	60	--
3-4	--	--	--	40	--	--	--	--

Measurements: mm.

Special constructions

The established distances and limits are for standard constructions. There are special constructions with distances and limits in accordance with the customer's needs.

General dimensions



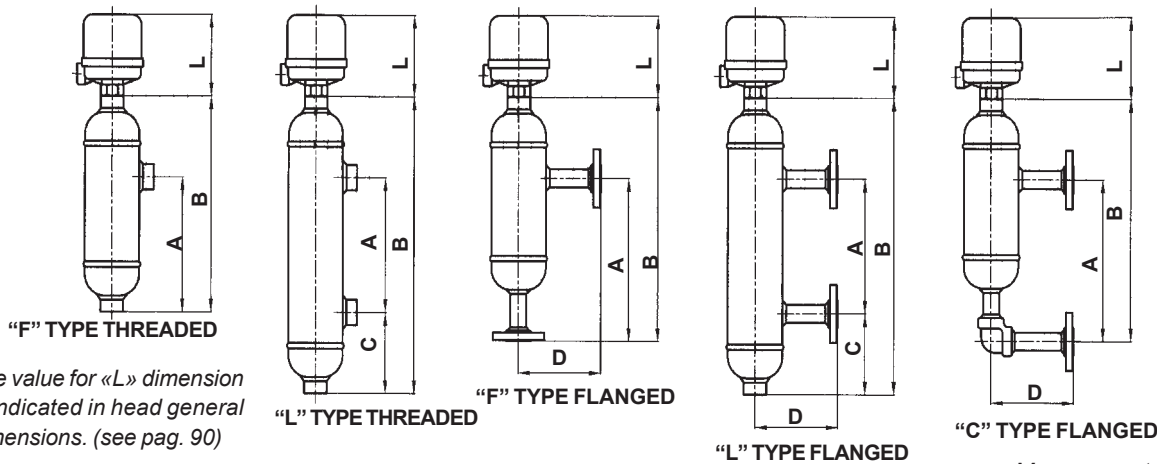
(*) øE: according to size and flange series.

MODEL	F TYPE				L TYPE				F TYPE				L TYPE				C TYPE			
	THREADED		THREADED		FLANGED		FLANGED		FLANGED		FLANGED		FLANGED		FLANGED		FLANGED			
	A	B	A	B	C	A	B	D	A	B	C	D	A	B	C	D	A	B	D	
2049J	-	-	200	500	-	-	-	-	200	500	-	-	-	-	-	-	-	-	-	
2049P	250	400	250	550	-	-	-	-	250	550	-	-	-	-	-	-	-	-	-	
2049C	300	450	300	600	-	-	-	-	300	600	-	-	-	-	-	-	-	-	-	
2049F	350	500	350	650	150	300	450	170	350	650	150	170	300	450	150	170	350	500	170	
	400	550	400	700	-	400	550	-	400	700	-	-	400	550	-	-	400	550	-	

MODEL	F TYPE				L TYPE				F TYPE				L TYPE				C TYPE			
	THREADED		THREADED		FLANGED		FLANGED		FLANGED		FLANGED		FLANGED		FLANGED		FLANGED			
	A	B	A	B	C	A	B	D	A	B	C	D	A	B	C	D	A	B	D	
2017J	-	-	200	520	-	-	-	-	200	520	-	-	-	-	-	-	-	-	-	
2017P	250	420	250	570	-	-	-	-	250	570	-	-	-	-	-	-	-	-	-	
2017C	300	470	300	620	150	300	470	150	300	620	150	170	300	470	150	170	350	520	170	
2017F	350	520	350	670	-	350	520	170	350	670	-	-	350	520	170	-	350	520	170	
	400	570	400	720	-	400	570	-	400	720	-	-	400	570	-	-	400	570	-	

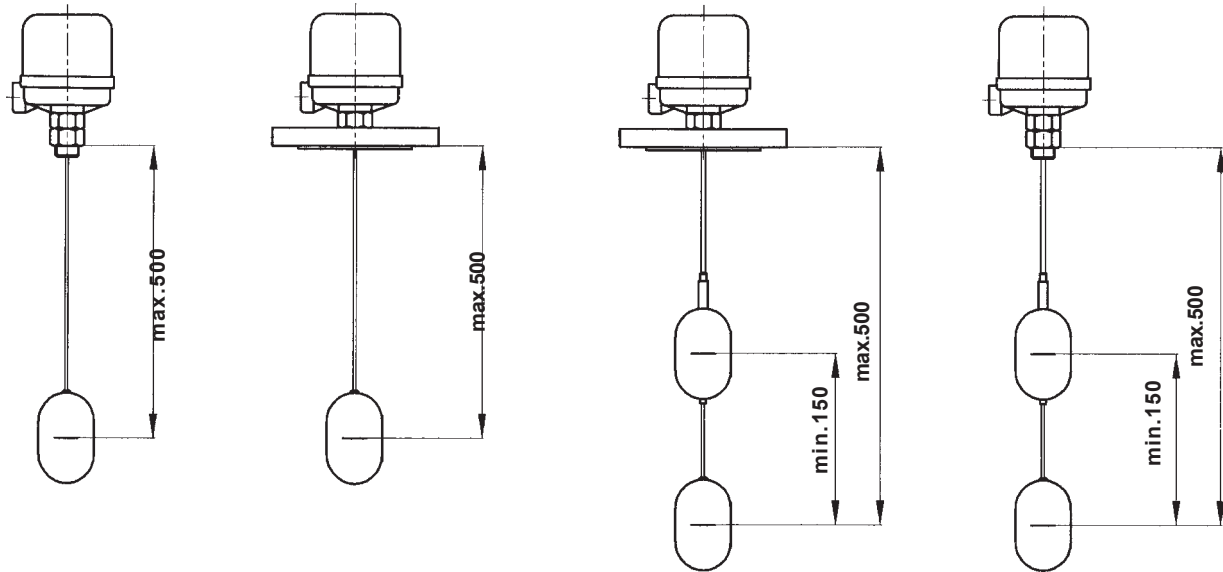
MODEL	F TYPE				L TYPE				F TYPE				L TYPE				C TYPE			
	THREADED		THREADED		FLANGED		FLANGED		FLANGED		FLANGED		FLANGED		FLANGED		FLANGED			
	A	B	A	B	C	A	B	D	A	B	C	D	A	B	C	D	A	B	D	
2049B	-	-	200	530	-	-	-	-	200	530	-	-	-	-	-	-	-	-	-	
	250	400	250	580	-	-	-	-	250	580	-	-	-	-	-	-	-	-	-	
	300	450	300	630	180	300	450	170	300	630	180	170	300	450	180	170	350	520	170	
	350	500	350	680	-	350	500	170	350	680	-	-	350	500	170	-	350	520	170	
	400	550	400	730	-	400	550	-	400	730	-	-	400	550	-	-	400	550	-	

MODEL	F TYPE				L TYPE				F TYPE				L TYPE				C TYPE			
	THREADED		THREADED		FLANGED		FLANGED		FLANGED		FLANGED		FLANGED		FLANGED		FLANGED			
	A	B	A	B	C	A	B	D	A	B	C	D	A	B	C	D	A	B	D	
2017B	-	-	200	550	-	-	-	-	200	550	-	-	-	-	-	-	-	-	-	
	250	420	250	600	-	-	-	-	250	600	-	-	-	-	-	-	-	-	-	
	300	470	300	650	180	300	470	170	300	650	180	170	300	470	180	170	350	520	170	
	350	520	350	700	-	350	520	170	350	700	-	-	350	520	170	-	350	520	170	
	400	570	400	750	-	400	570	-	400	750	-	-	400	570	-	-	400	570	-	



The value for «L» dimension is indicated in head general dimensions. (see pag. 90)

Measurements: mm.


1340J2-R
1340J2-B
1340JD2-B
1340JD2-R

Measurements: mm.

Main Characteristics

Low level switch or small differential control.
 Top mounting.
 Threaded or flanged connections.
 Stainless steel float and rods.
 One, two or three stages.
 High-quality SPDT mercury contacts.
 Level limits up to 500 mm.

Options:

- Dry contact mechanisms.
- Marine use mechanisms.
- Explosion and / or weather proof housings.
- Heads with disperser necks.

Technical specifications

Type	Float			Catalog N° for usual functions			
	Min. Density	Maximum pressure bar		Threaded connection (3)		Flanged connection (4)	
		Working	Test	1 mechanism	2 mechanisms	1 mechanism	2 mechanisms
Single Float - Small differentials							
J	0,5	18	27	1340J2-R	1340J3-R	1340J2-B	1340J3-B
P	0,7	60	90	1340P2-R	1340P3-R	1340P2-B	1340P3-B
B	0,5	60	90	1340B2-R	1340B3-R	1340B2-B	1340B3-B
C (1)	0,5	100	150	1340C2-R	1340C3-R	1340C2-B	1340C3-B
F	(2)	60	90	1340F2-R	1340F3-R	1340F2-B	1340F3-B
Double Float - Large Differential							
J	0,6	18	27	1340JD2-R	1340JD3-R	1340JD2-B	1340JD3-B
P	0,8	60	90	1340PD2-R	1340PD3-R	1340PD2-B	1340PD3-B
B	0,6	60	90	1340BD2-R	1340BD3-R	1340BD2-B	1340BD3-B
F	(2)	60	90	1340FD2-R	1340FD3-R	1340FD2-B	1340FD3-B

Note: (1) Only high level compensated float.
 (2) Interphase - Indicate density for each fluid.
 (3) NPT connection - Change R for T. Example: **1340J2-T**.
 (4) $\varnothing 4''$ Flanges and series according to the maximum working pressure.
 Options: Mechanisms - heads - flanges: see **2017 Series**.



CERTIFIED QUALITY SYSTEM

1340 A Series

Main characteristics

Gray cast, carbon steel body.
 Stainless steel AISI 304 or 316 rods and float.
 Lateral mounting by means of threaded and flanged connections.
 Differential selection through rod length request.
 Large differentials control by means of the combination of two tandem equipments.
 High-quality SPDT mercury contacts.

Options:

- Dry contact mechanisms.
- DPDT mercury contact mechanisms.
- Marine use mechanisms.
- Explosion and / or weather proof heads.
- Heads with disperser neck.
- AISI 304 and 316 special constructions.

Technical specifications

Body		Diagram	Maximum pressure	Catalog N° according to rod length in mm.			
Material	Connection(*)			170	200	300	400
Gray cast	R. BSP 2.1/2"	1	10	1340A-R	1340A-20R	1340A-30R	1340A-40R
	R. NPT 2.1/2"	1	10	1340A-T	1340A-20T	1340A-30T	1340A-40T
	Brida cuadr.	2	10	1340A-B	1340A-20B	1340A-30B	1340A-40B
	B. Rosc ø3"	3	10	1340A-RB310	1340A-20RB310	1340A-30RB310	1340A-40RB310
Welded carbon steel	R. BSP ø3"	4	20	1340A-AR3	1340A-20AR3	1340A-30AR3	1340A-40AR3
	R. NPT ø3"	4	20	1340A-AT3	1340A-20AT3	1340A-30AT3	1340A-40AT3
	R. BSP ø4"	4	20	1340A-AR4	1340A-20AR4	1340A-30AR4	1340A-40AR4
	R. NPT ø4"	4	20	1340A-AT4	1340A-20AT4	1340A-30AT4	1340A-40AT4
	B. #150 ø3"	5	20	1340A-AB310	1340A-20AB310	1340A-30AB310	1340A-40AB310
	B. #150 ø4"	5	20	1340A-AB410	1340A-20AB410	1340A-30AB410	1340A-40AB410
	B. #300 ø3"	5	40	1340A-AB320	1340A-20AB320	1340A-30AB320	1340A-40AB320
B. #300 ø4"	5	40	1340A-AB420	1340A-20AB420	1340A-30AB420	1340A-40AB420	

Note: (*) Flanges - see dimensions in diagram 2 - 125 Series flanges threaded to the cast body
 F#150 and F#300 according to ANSI B16.5

General dimensions

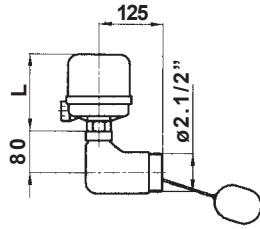


Diagram 1

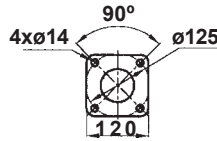
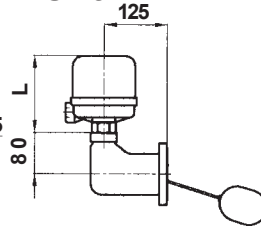


Diagram 2

1340



Threaded flange
 $\phi 3''$ #125

Diagram 3

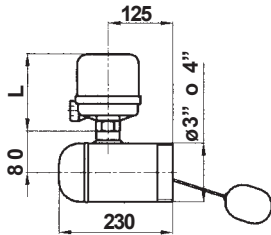


Diagram 4

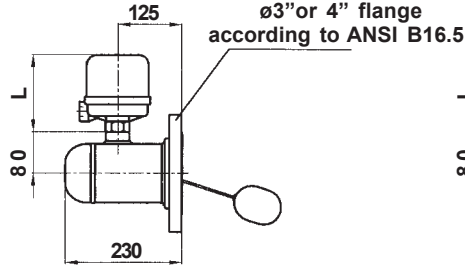


Diagram 5

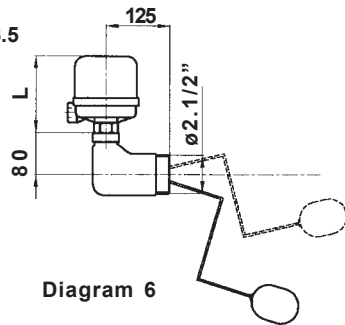


Diagram 6

Measurements: mm.

Differentials according to rod length

Length mm	Differential in mm.	
	Minimum	Maximum
170	25	115
200	30	140
300	40	190
400	50	240

**Options:
Mechanism and contact types**

Add the suffix according to the following table.
 - SPDT or SPST mercury contacts (not indicated).
 D- DPDT mercury contacts.
 S- SPDT dry contacts (microswitch).
 H- Hermetically sealed dry contacts.
 M- Marine use - Dry contacts.
 Example: 1340AS-30B.

Cast stainless steel body:

AISI 304: change letter S to the cast model catalog Nr.
 Examples: 1340A-SR; 1340A-S30T; 1340A-S40B

Welded stainless steel body:

AISI 304: change letter A of the second module of the welded model catalog number for letter S.
 Example: 1340A-30SB310

*Z rod: Add suffix Z to the catalog Nr.

Examples: 1340A-30BZ; 1340A-30AB310Z
 (See diagram 6).

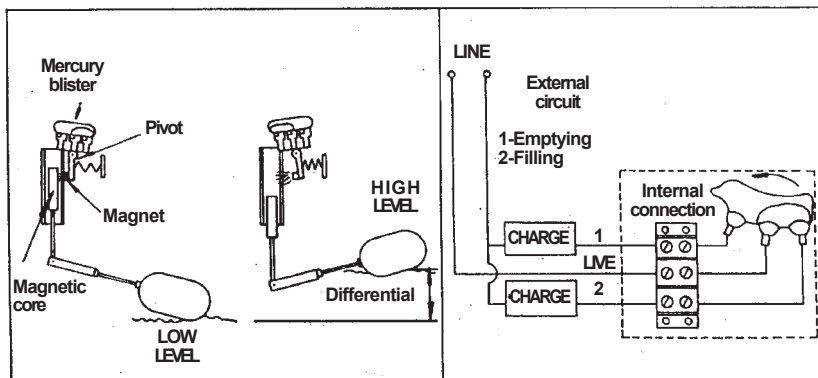
Type of head and electrical connection

Add the suffix according to the following table

Electrical connection(R)	Head types (see page 90)					
	Y	Z	U	V	W	T
1/2" BSP	YR	ZR	UR	VR	WR	TR
1/2" NPT	YS	ZS	US	VS	WS	TS
3/4" BSP	YP	ZP	UP	VP	WP	TP
3/4" NPT	YT	ZT	UT	VT	WT	TT

Example: 1340AYR-30B; 1340ASYR-30B

Operation and connection diagram





Main characteristics

Versatility. It can control all types of fluids in their multiple intrinsic and external conditions: viscous, corrosive, foamy, dirty, subjected to ripple or shaking.
Multiple functions. One, two or three mechanisms.
Differential or adjustable levels: by means of the displacer's changes of position, independently, along the suspension cable.
Stainless steel displacers, cable and spring holder.
High-quality SPDT mercury contacts.

- Options:**
- Dry contact mechanisms.
 - Marine use mechanisms.
 - Explosion and / or weather proof heads.
 - Head with disperser neck.

1376 Series . Internal float

Stainless or carbon steel mounting flanges.
Easy to transport. No need for rods, because the displacers are attached to a winding cable.
Easy to install.
Standard supply: cable length: 3000 mm.

1380 Series . External float

Welded carbon or stainless steel pressure body.
Access flanges for inspection and cleaning.
Threaded and flanged mounting connections.

Technical specifications

Mechanism	Displacers	Function	Catalog N°	
			1376 Series	1380 Series
1	1	Low level or high level	1376P-[]	1380P-[]
1	2	Start-up and stop (1)	1376AP-[]	1380AP-[]
2	2	Low level + high level	1376LH-[]	1380LH-[]
2	3	Start-up - stop + low level	1376APL-[]	1380APL-[]
2	3	Start-up - stop + high level	1376APH-[]	1380APH-[]
3	4	Start-up - stop + low level + high level	1376APLH-[]	1380APLH-[]
2	3	Start-up - stop 1st + Start-up - stop 2nd (2)	1376APM-[]	1380APM-[]
2	4	Start-up - stop 1st + Start-up - stop 2nd (2)	1376APD-[]	1380APD-[]
3	3	Low level - medium level - high level	1376LMH-[]	1380LMH-[]



Note:

- (1) **Start-up - stop:** pump, valve, other devices.
- (2) **Start-up - stop 1st and 2nd:** two pumps or two valves, etc.
Contacts are **SPDT**, therefore, the **start-up - stop Function** works both with emptying and filling.

[] **1376 series** In order to complete the catalog number, the body characteristics, size and type of connection shall be indicated as follows:

Mounting flanges

ø	Carbon steel			AISI 304			AISI 316		
	#150	#300	#600	#150	#300	#600	#150	#300	#600
4	A410	A420	A440	S410	S420	S440	I410	I420	I440
5	A510	A520	A540	S510	S520	S540	I510	I520	I540
6	A610	A620	A640	S610	S620	S640	I610	I620	I640

Notes: 150, 300, 600: Flanges according to ANSI B16.5
Example: 1376P-A410 4" Mounting flange ANSI 150 (standard supply).

1380 Series

[] In order to complete the catalog number, the body characteristics, size and type of connection shall be indicated as follows:

A	L	20	B	108
(1)	(2)	(3)	(4)	(5)

(1) Body material:

- A- Carbon steel
- S- Stainless steel AISI 304
- I- Stainless steel AISI 316

(2) Mounting type:

- F- Side-Bottom
- L- Side-side with purging connection
- C- Side-Bottom in L

(3) Distance between connections:

- 20- 200mm (only L mounting)
- 25- 250mm
- 30- 300mm
- 35- 350mm
- 40- 400mm

(4) Type of connection:

- P- BSP
- T- NPT
- B- Flange
- W- Socket Weld

(5) Series and size of connection

Size	Threaded		Flanged (ANSI)		
	#2000	#3000	#150	#300	#600
3/4"	206	306	106	206	406
1"	208	308	108	208	408
1.1/2"	212	312	112	212	412
2"	216	316	116	216	416

Example: 1380P-AL30B208



Options

Types of mechanisms and contacts

Add the suffix according to the following table:
- SPDT or SPST mercury contacts (not indicated).
D- DPDT mercury contacts.
S- SPDT dry contacts (microswitch).
H- Hermetically sealed dry contacts.
M- Marine use. Dry contacts.

Example:
 1380PS-A L 30T 308
 (1)(2)(3)(4)(5)

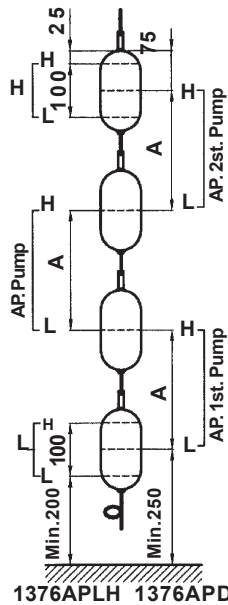
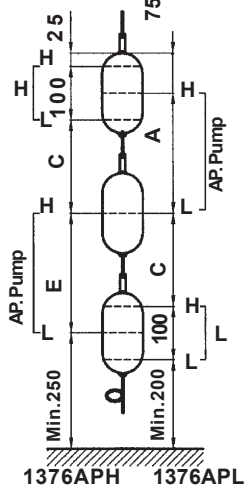
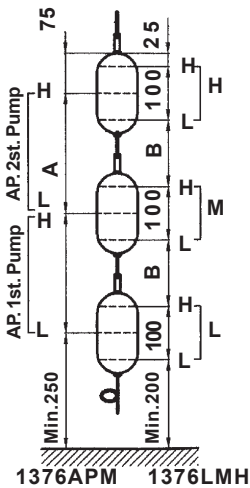
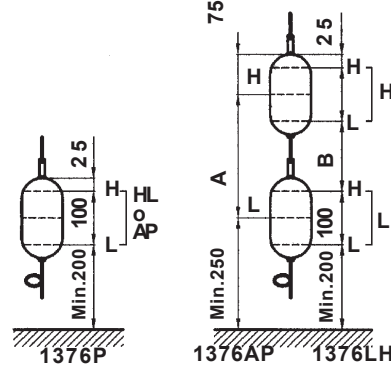
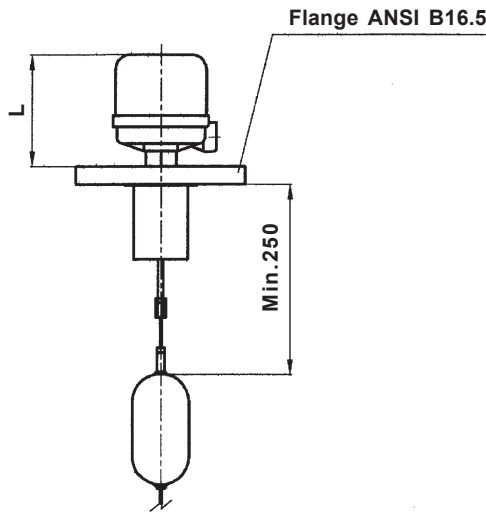
Head types and electrical connection

Electrical connection	Head types (see page 90)						
	H	Y	Z	U	V	W	T
1/2" BSP	HR	YR	ZR	UR	VR	WR	TR
1/2" NPT	HS	YS	ZS	US	VS	WS	TS
3/4" BSP	HP	YP	ZP	UP	VP	WP	TP
3/4" NP	HT	YT	ZT	UT	VT	WT	TT

Example:
 1376APZR-A410
 Suspension cable: Standard supply: 3000 mm.
 Other lengths upon request.

General dimensions

1376

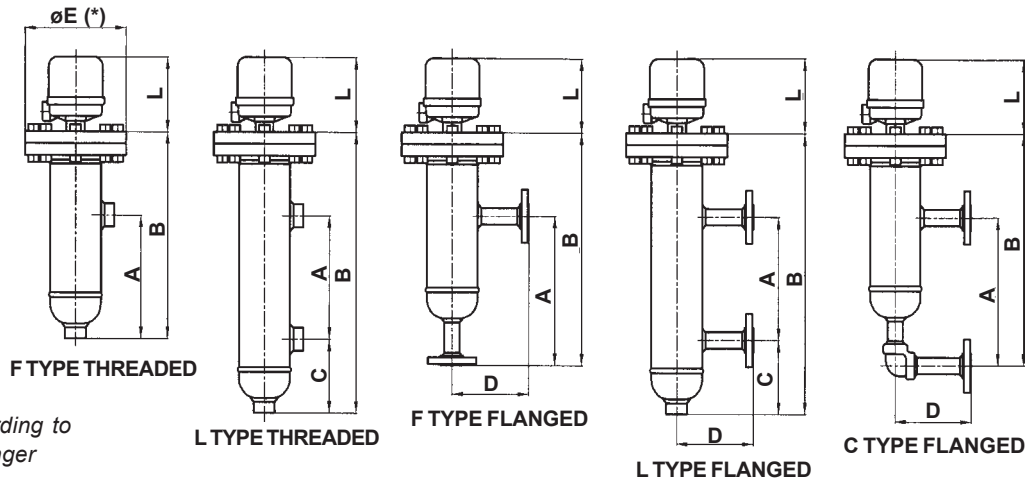


Reference	Variable Distances	
	Min.	Max.(*)
A	200	2470
B	100	2370
C	150	2420

Measurements: mm.

General dimensions

1380

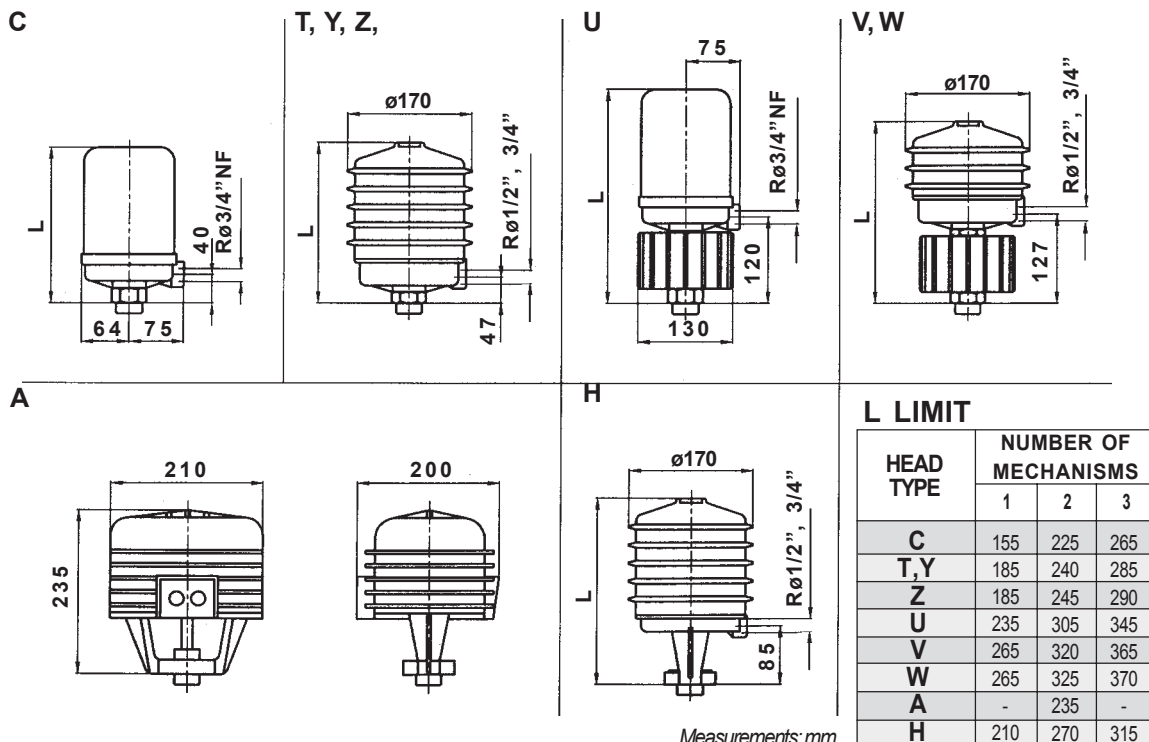


(*) ϕE : according to
size and flanger
series

Model	"F" Type Threaded		"L" Type Threaded			"F" Type Flanged			"L" Type Flanged				Tipo "C" Flanged			
	A	B	A	B	C	A	B	D	A	B	C	D	A	B	C	
1380J	-	-	200	520	150	-	-	-	200	520	150	170	200	520	150	
1380P	-	-	250	570		300	470	300	620	250			570	250		570
1380C	300	470	350	620		350	520	350	670	350			670	350		670
1380F	350	520	400	720		400	570	400	720	400			720	400		720
	400	570														

Measurements: mm.

Head general dimensions



Measurements: mm.

Unit Conversion Table

CRECENTA (0541) 372-766/735

Density

	Kg./m ³	Lb./ft ³
Kg./m ³	1	0.0624
Lb./ft ³	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	°R - 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 ³	Gall.USA	ft ³
Liters	1	0.001	0.264	0.0353
m ³	1000	1	264	35.31
Gall.USA	3.785	0.00378	1	7.481
Ft ³	28.32	0.02832	0.1337	1

Pressure

	Kg./cm ²	KPa.	bar.	Psi.	mm.c.hg.	Inch.c.hg.
Kg./cm ²	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 ² /s	ft ² /s	cSt	SSU	°E
m ² /s	1	10,76	10 ⁶	4,6 x 10 ⁶	7,5 x 10 ⁶
ft ² /s	0,093	1	93000	4,28 x 10 ⁵	7 x 10 ⁵
cSt.	10 ⁻⁶	10,76 x 10 ⁻⁶	1	4,6	0,133
SSU	2,2 x 10 ⁻⁷	22,8 x 10 ⁻⁶	0,217	1	0,029
°E	7,5 x 10 ⁻⁶	1,43 x 10 ⁻⁶	7,5	34,5	1

Note: Column units: Origin Units.
 Line units: Resultant Units.
 In order to obtain the resultants, both unit intersection coefficients must be multiplied by the known value of the origin unit.
 Formulas are applied in the case of temperature.

Jefferson does not take responsibility for any fortuitous mistakes that may appear in this catalog.

We reserve the right to change the product characteristics without previous warning, provided that this does not alter the agreement with the customers. This catalog was prepared by Jefferson's Technical-Commercial Department and it was printed in March 1998.



Certificate of Approval

Awarded to

JEFFERSON SUDAMERICANA S.A.,
BUENOS AIRES,
ARGENTINA.

*Bureau Veritas Quality International certify that the
Quality Management System of the above supplier
has been assessed and found to be in accordance
with the requirements of the quality
standards detailed below*

QUALITY STANDARDS

BS EN ISO 9001:1994

SCOPE OF SUPPLY

DESIGN, DEVELOPMENT, MANUFACTURING, COMMERCIALIZATION AND
SERVICE OF SOLENOID VALVES, PRESSURE REGULATOR VALVES AND
MAGNETIC LEVEL SWITCHES.
DISEÑO, DESARROLLO, FABRICACION, COMERCIALIZACION Y SERVICIO
DE VALVULAS A SOLENOIDE, REGULADORAS DE PRESION Y CONTROLES
DE NIVEL.

Original approval date: 21ST NOVEMBER, 1996

Subject to the continued satisfactory operation of the supplier's
Quality Management System, this Certificate is valid for a period of three years from:

21ST NOVEMBER, 1996

Date 18TH DECEMBER, 1996



Aewley
For Bureau Veritas Quality International

Certificate No: 19458

SF06/B

The use of the Accreditation Mark indicates accreditation in respect of those activities covered by the accreditation certificate number 008

APPROVALS



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