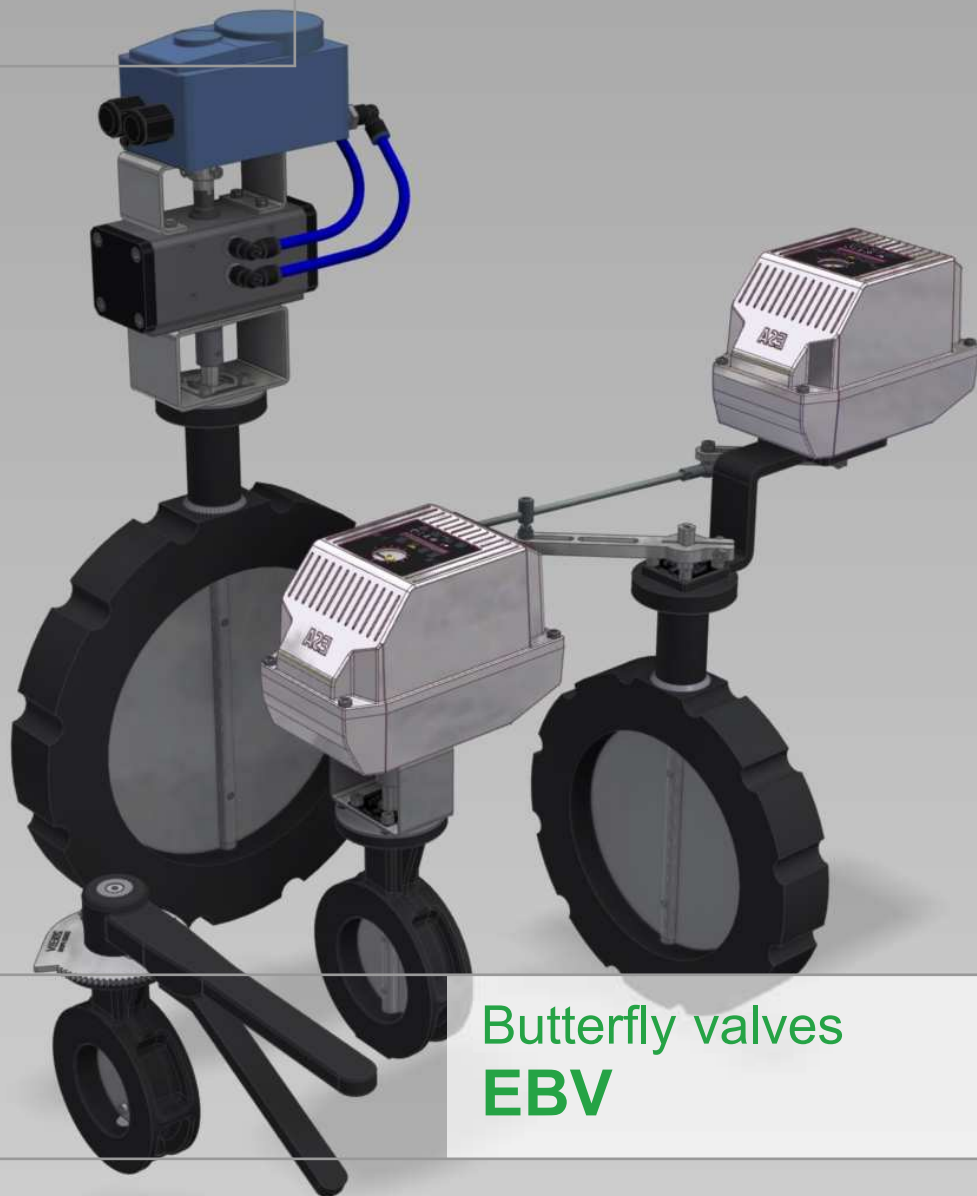


**E1305** rev.2.00 - 09/07/2020



Butterfly valves  
**EBV**

## GENERAL WARNINGS



- Each manual, including this one, is an integral part of the ESA catalog.
- Each manual may contain errors or give rise to interpretative doubts. ESA invites you to report any interpretative errors or doubts but will not be able to consider such occurrences as the cause of any disputes.
- This manual and all its parts (logos, texts, photos, tables, graphics, etc...) cannot be reproduced or modified in whole or in part without the written consent of ESA.
- The technical information relating to the design, installation, regulation and operation of the combustion plant intended to host ESA products must be previously shared with ESA. Failing this, ESA declines all responsibility in relation to damage to things and people deriving from improper use of the products.
- In general, a combustion plant is not designed for drying oven refractories. In case of use, ESA declines any responsibility in this regard.
- The performance of the products indicated in each manual is the result of tests conducted using ESA equipment at our Research and Development Center, under certain operating conditions. These performances cannot be guaranteed using other equipment or outside the aforementioned conditions.
- The design, installation, adjustment and operation of a combustion plant require compliance with all applicable safety standards and regulations. ESA declines all responsibility in relation to its products, if used in plants or in circumstances in which the regulations in force in the place of use are not respected.
- All installation, maintenance, ignition and calibration operations must be carried out by qualified personnel in compliance with all the points indicated in this manual. The indications given in this document do not exempt the customer/user from observing the general and specific legal provisions.
- All personnel responsible for checking and operating the device must be informed of the contents of this manual and must strictly follow its instructions. The operator must wear suitable clothing and PPE according to the legal requirements, respecting the general safety and risk prevention rules. If clarifications, additional information or training are required, contact the ESA sales offices.
- ESA reserves the right to modify the technical characteristics of the products by updating the relative manual at any time and without notice. By consulting the website **www.esapyronics.com** it is possible to download the manuals updated to the latest revision in Italian and English.

## LOGISTICS AND DISPOSAL



- **Transport:** protect the equipment from shocks, vibrations, atmospheric agents, etc... Upon receipt of the product, check the labeling in accordance with the order and promptly notify any discrepancies and/or transport damage.
- **Storage:** store the product in a suitable place, according to the product specifications.
- **Packaging:** the material used must be disposed of according to local regulations.
- **Disposal:** comply with local legislation on this matter.

## CERTIFICATIONS



**CE** according to Annex II No. 1B of the Machinery Directive **2006/42/EC**: the valve implemented is considered a partly completed machine, for which the declaration of incorporation is available.



**EAC** for the Eurasian market (Russia, Belarus and Kazakhstan).

- ESA adopts the Quality System certified by DNV GL in compliance with the **UNI EN ISO 9001** standard.
- ESA adopts the Code of Ethics and Behavior pursuant to Legislative Decree **231/01**.
- ESA products are designed, manufactured and controlled in compliance with the Directives/Regulations, in particular **UNI EN 746-2** "Industrial thermal process equipment - Part 2: Safety requirements for combustion and for the handling and treatment of fuels" harmonized to the Machinery Directive **2006/42/EC**.

## DESCRIPTION

The EBV series identifies leaky butterfly valves designed to quickly and accurately regulate air or fumes flow rates in low pressure ducts. They are available in different configurations, manual or automatic. The EBV series valves are divided into three models:

- EBV-M: composed of a valve body and a manual control lever complete with locking device for opening in several positions.
- EBV-D: the valve is connected directly to an electric or pneumatic actuator.
- EBV-L: the valve is connected to an actuator mounted on a spacer plate by means of a system of levers that allow precise adjustment. The "L" version is highly recommended for hot air.

## FEATURES

### Technical features

Fluids:	Non-aggressive gases according to EN437, hot air and flue gases.
Maximum working pressure:	450 [mbar] @ 60 [°C]    200 [mbar] @ 550 [°C] 180 [°WC] @ 140 [°F]    80 [°WC] @ 1020 [°F]
Maximum fluid temperature:	550 [°C] 1020 [°F]
Operating temperature:	-20 ÷ +60 [°C] -4 ÷ +140 [°F]
Storage temperature:	0 ÷ +25 [°C] 32 ÷ 77 [°F]
Leakage with closed valve:	about 2% (metal seal models on request)
Available sizes:	from DN50 PN16 to DN500 PN16 on ISO 7005 flange
Rotation angle:	0-90°
Coupling flanges:	not included
Flange gaskets:	not included
Valve body base connection:	ISO5211 (F.05/F.07)

### Constructive features

Valve body:	Cast iron G40
Valve body treatment:	Phosphating
Lens holder shaft:	AISI303 in option AISI316
Valve disc:	AISI304 in option AISI316
Manual operation lever:	Aluminum (M version)
Actuator support plate:	AISI304
Actuator coupling rod:	Aluminum
Valve control lever:	AISI304+Fe360 galvanized
Shaft seal:	Graphite (special seals on request)

### Electric motorizations

Coupling with valve:	direct (D) or with levers (L)
Off/min/max management:	ESA SERIO TPF E7301
3-point floating management:	ESA SERIO FLT E7302
Proportional management:	ESA SERIO PRP E7303

### Pneumatic motorizations

Coupling with valve:	direct (D)
Valve control type:	ON/OFF or proportional
Pilot air pressure:	see specific documentation
Pilot air filtration degree:	see specific documentation

## GALLERY

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F1305101

**EBV-M** manual



F1305102

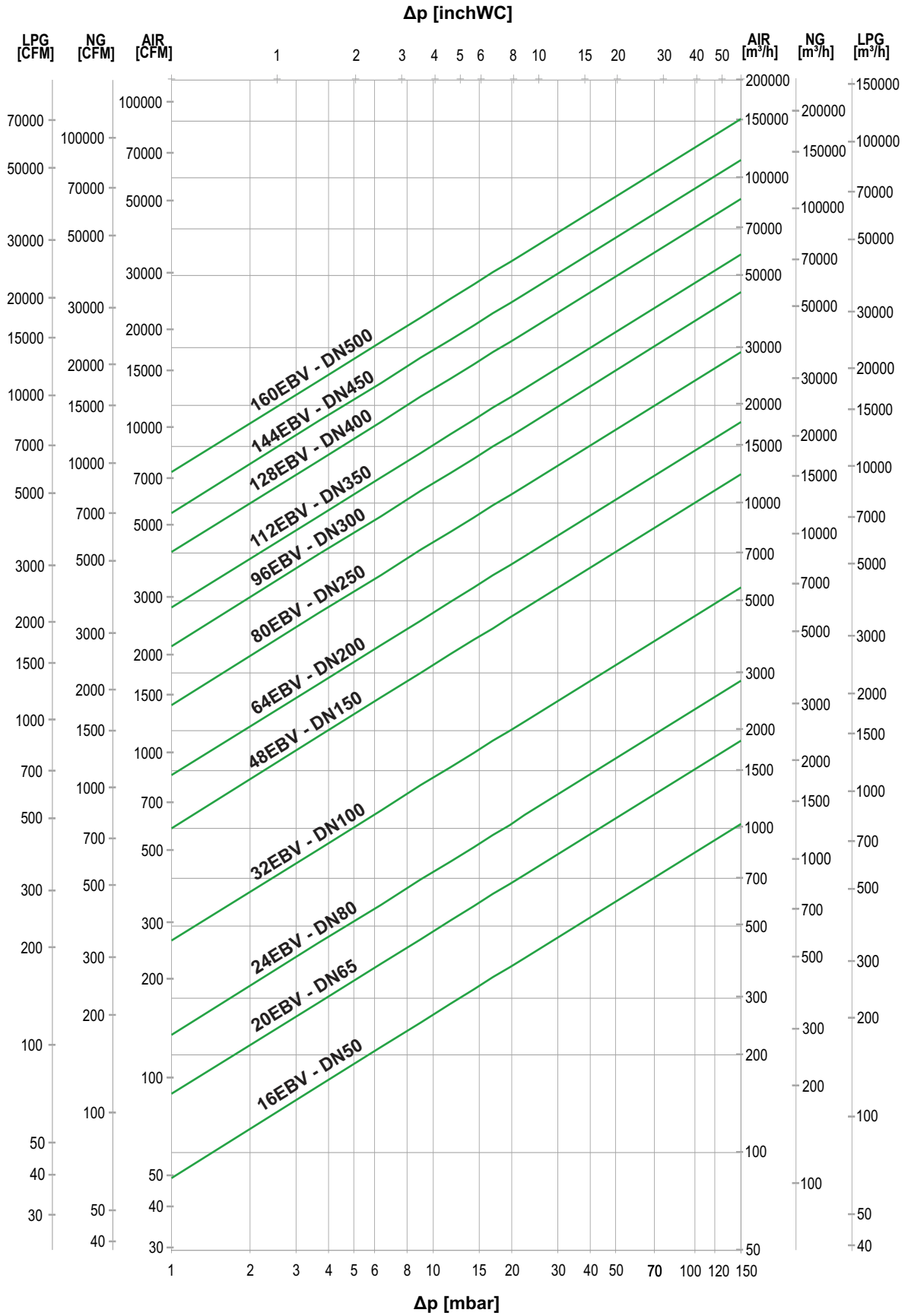
**EBV-D** direct connection



F1305103

**EBV-L** connection with levers

**FLOW CHART FULLY OPEN VALVE**

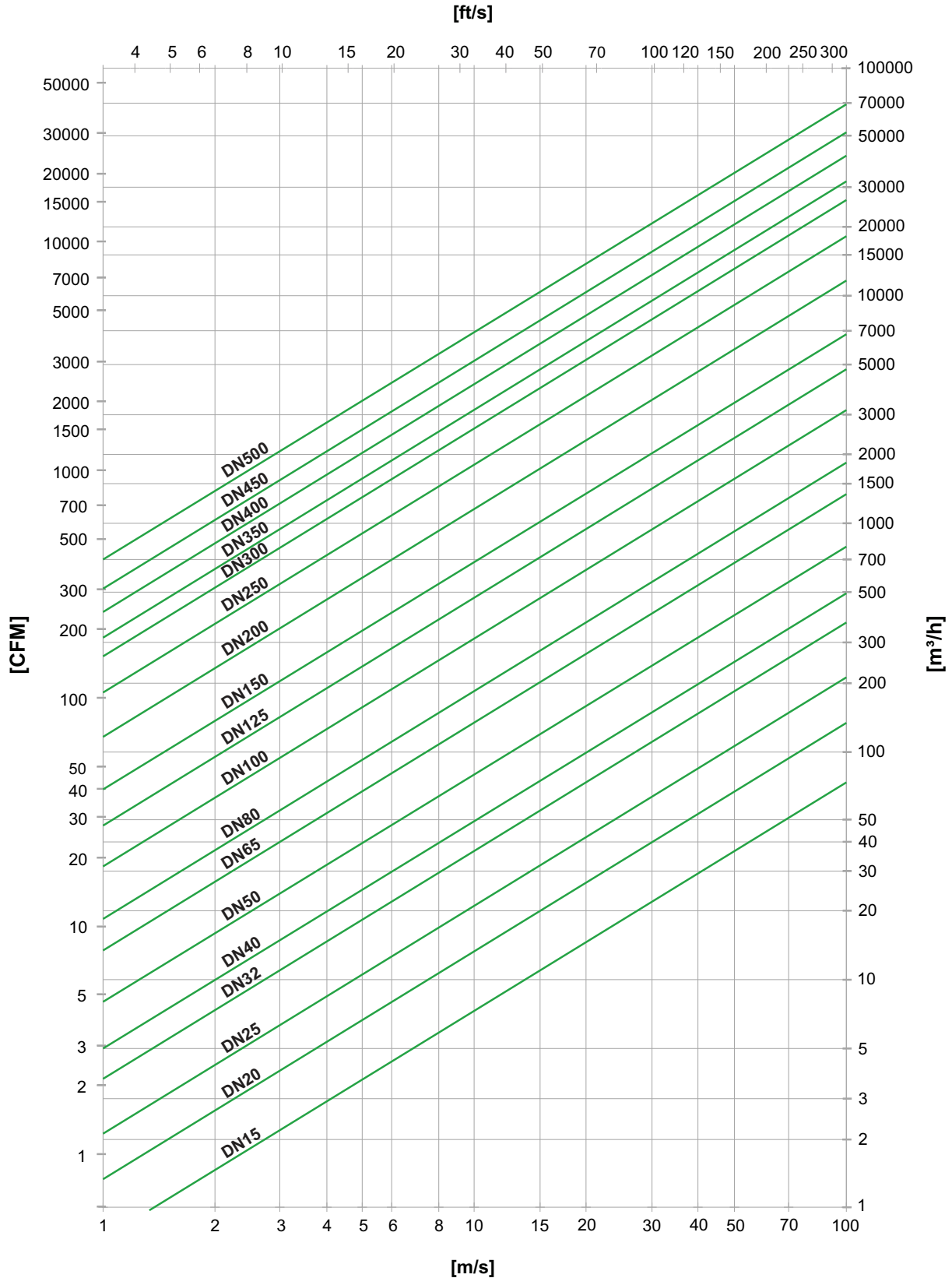


T=0 [°C] e P<sub>s</sub>=1013 [mbar]

G1305101

## VELOCITY CHARTS

To correctly size noise and pressure drops, the maximum recommended flow velocity inside a pipe must be limited to 30 [m/s] or 5920 [ft/min] (ESA recommends <20 [m/s] or 3950 [ft/min]). The speeds are calculated taking into account carbon steel pipes according to the standard EN 10255 Medium Series. Different pipe thicknesses will correspondingly result in different flow rates.



G1602102

## FLOW CALCULATION OF A GAS OTHER THAN AIR

The flow rate diagram refers to the three main fluids used in applications relating to combustion plants (air, natural gas and LPG).

To calculate the valve flow rate, relative to a gas other than those listed above, starting from the air flow rate resulting from the graph, the following formula can be used:

$$Q_{\text{gas}} = \sqrt{\frac{1.2928}{\rho_{\text{gas}}}} * Q_{\text{air}}$$

T= 0 [°C] e P<sub>s</sub> 1013 [mbar]

knowing the density of the gas whose flow rate is to be calculated. Typical densities of some common gases can be found below:

Gas type	ρ <sub>gas</sub> @0 [°C] [Kg/m <sup>3</sup> ]	MM molecular mass [-]
Air	1.2928	28.96
Natural gas	0.78	18.2
LPG (95% propane)	2.01	45.50
Nitrogen	1.25	28.01
BFG (60% N <sub>2</sub> , 24% CO, 12% CO <sub>2</sub> , 4% H <sub>2</sub> )	1.29	28.89
COG (50% H <sub>2</sub> 30% CH <sub>4</sub> 3% C <sub>n</sub> H <sub>m</sub> 7% CO 3% CO <sub>2</sub> 7% N <sub>2</sub> )	0.553	12.39
CO <sub>2</sub>	1.976	44.01
Exhausted from NG (3% O <sub>2</sub> )	1.243	27.85
Exhausted from LPG (3% O <sub>2</sub> )	1.271	28.47

### EX.1

To calculate the flow rate of a 32EBV valve at 10 [mbar] of Δp, used for natural gas, the air flow rate is obtained on the graph (specifically, it reads about 1450 [m<sup>3</sup>/h]).

Using the above formula:

$$Q_{\text{gas}} = \sqrt{\frac{1.2928}{0.78}} * 1450 = 1866 \text{ [m}^3\text{/h]}$$

This simplified formula calculates a volumetric flow rate in [m<sup>3</sup>/h]; to have a reference in [Nm<sup>3</sup>/h] the following parameters must be taken into consideration:

- P<sub>in</sub> input pressure
- Fluid temperature
- Altitude of the application (this value changes the P<sub>atm</sub>)

The following exercise explains the conversion process between [m<sup>3</sup>/h] and [Nm<sup>3</sup>/h].

### EX.2

To calculate the flow rate of a 32EBV valve at 10 [mbar] of Δp with an inlet pressure of 80 [mbar], used for preheated air at T<sub>ref</sub>=500 [°C], the air flow rate is obtained on the graph in [m<sup>3</sup>/h]:

$$Q_{\text{air } 0 \text{ [}^\circ\text{C]}} = 1450 \text{ [m}^3\text{/h]}$$

Now we need to transform [m<sup>3</sup>/h] into [Nm<sup>3</sup>/h], using the following procedure.

Obtain the density of the gas at the operating temperature and pressure with the following formula:

$$\rho_{\text{air } 500 \text{ [}^\circ\text{C]}} = \frac{P_{\text{atm}} + P_{\text{in}}}{\left(\frac{8314}{\text{MM}}\right) * T \text{ [}^\circ\text{K]}}$$

## CALCULATION OF THE FLOW OF A GAS OTHER THAN AIR

where is it:

- $P_{atm}$  atmospheric pressure at a given altitude.
- $P_{in}$  pressure at the valve inlet.
- $MM$  molecular mass of the gas used.
- $T$  temperature in degrees Kelvin of the gas.

which, with the project data it results:

$$\rho_{air\ 500\ [^{\circ}C]} = \frac{101325 + 8000}{\left(\frac{8314}{28.96}\right) * 773.15} = 0.493\ [kg/m^3]$$

Now we calculate the flow rate with the following formula:

$$Q_{[Nm^3/h]} = \frac{\rho_{air\ 500\ [^{\circ}C]}}{\rho_{air\ 0\ [^{\circ}C]}} * Q_{[m^3/h]}$$

Which with the project data results:

$$Q_{[Nm^3/h]} = \frac{0.493}{1.2928} * 1450 = 552.4\ [Nm^3/h]$$

To select the size of a valve starting from a plant data with flow rate in  $[Nm^3/h]$ , the reverse procedure is carried out, obtaining the density at a given temperature and using the inverse formula with respect to the previous one:

$$Q_{[m^3/h]} = \frac{\rho_{gas\ 0\ [^{\circ}C]}}{\rho_{gas\ Tref}} * Q_{[Nm^3/h]}$$

## VALVE SIZING

If the valve has the shut-off function:

- selected the diameter of the pipe according to the maximum speed to be respected ( $<20[m/s]$ )
- select the same size of the valve (ex. for a DN100 pipe the shut-off valve will be a 32EBV).

If the valve has a flow control function:

- selected the diameter of the pipe according to the maximum speed to be respected ( $<20[m/s]$ ).
- considering that, for optimal valve regulation, the  $\Delta p$  must be approximately 25 ÷ 30% of the valve inlet pressure ( $a = \Delta p/p_1 = 0.25 \div 0.30$ ) and that the pressure downstream of the valve  $p_2$  is a known variable, calculate the  $\Delta p$  of the valve according to the following formula:

$$\Delta p_{100\%} = \frac{a * p_2}{(1 - a)}$$

Ex. Select an air valve with  $p_2 = 45\ [mbar]$  and flow rate  $V = 600\ [Nm^3/h]$ . In order not to exceed the recommended flow rate, DN100 pipes can be used.

The pressure drop will be:

$$\Delta p_{100\%} = \frac{0.3 * 45[mbar]}{(1 - 0.3)} = 19.3[mbar]$$

The EBV valve diagram shows that the valve that guarantees the required flow rate is DN65. Given the diameter of the pipes, the valve will be installed in the pipe with two reductions DN100xDN65. The inlet pressure to the pipeline must therefore be:

$$p_1 = \Delta p_{100\%} + p_2 = 64.3[mbar]$$

This datum, added to other line pressure losses possibly present upstream of the valve, will be used for the correct sizing of the combustion fan.

## WARNINGS

The EBV series valves are regulating and not safety devices, the tightness is guaranteed only for leaks to the outside, they are not suitable for interception of fuels and are not part of the protection system according to EN746-2.

Any modification or repair performed by unauthorized personnel compromises the safety of the application and automatically invalidates the general warranty conditions. For correct use, observe the following warnings.



- Make sure that all system features are compatible with the valve specifications: hydraulic connections, type of fluid, operating pressure, flow rate, temperature range, voltage, etc...
- Avoid excessive amounts of sealant in case of threaded connections, which could enter the valve.
- Before proceeding with any installation or service operation, close the upstream air / gas flow and disconnect the power supply.
- If the valve is equipped with an actuator, respect the "Warnings" specified in the technical documentation of the same.
- If the valve accidentally falls, it can suffer permanent damage; in this case it is mandatory to replace the equipment.
- Avoid water hammer.
- Any dirt chips, welding residues or sealing materials must not come into contact with the internal parts of the valve.
- It is good practice to install a filter upstream of the supply piping.
- Do not damage the sealing surfaces of the flanges.



- To avoid the risk of burns and electrocution, the operator must not come into contact with electrical devices.
- Operate on the actuator and connected devices only in the absence of power supply.
- Check that the utilities do not have an absorption higher than the maximum capacity of the limit switch contacts or of the feedback signal.
- In order not to damage the electric actuator, do not manually rotate the shaft, let alone force its movement by acting on the lever or using tools.

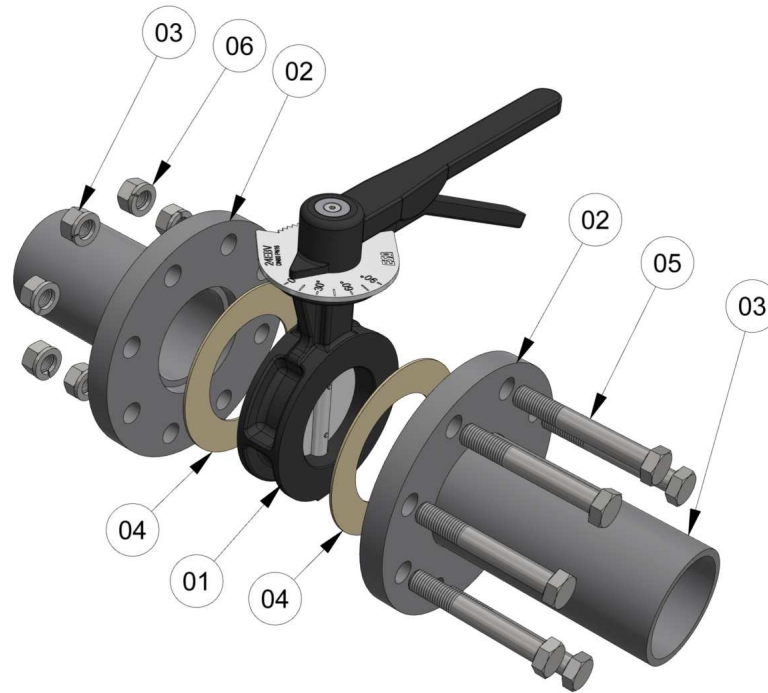


- In insulated pipes, check that there is sufficient space for tightening the bolts.
- Do not insulate the butterfly valve with thermal insulation.
- To improve heat dissipation, rotate the butterfly valve during assembly so that the actuator or handle are positioned to the side of the pipe.
- In case of media temperature > 250 [°C] 482 [°F], insert heat sink plates.
- Check the thermal resistance of the gaskets.



- Work on the actuator and on the connected devices paying attention, for the EBV-L versions, to the movement of the return levers between the valve shaft and the servomotor.

## EBV-M / EBV-D / EBV-L INSTALLATION



D1305I01

The EBV series valves are not equipped with coupling flanges and gaskets: they must be suitable for the type of valve and the application.

The valve can be installed in a horizontal or vertical position not upside down, respecting a straight section of upstream and downstream piping of at least 2xDN.

Maintain a distance from the surrounding obstructions that allows free air circulation and proper maintenance. In the case of installing contiguous valves, check that there is no interference between the levers during their movement.

For the installation of EBV-D or EBV-L valves, also refer to the technical documentation of the actuator.

- A** Check that the valve (**pos.01**) is completely closed, otherwise it will not be able to be inserted / extracted from the pipe.
- B** Weld the flanges (**pos.02**) at the ends of the pipes, eliminating any welding burrs.
- C** Check the correct alignment of the pipes and the gauge between the flanges, in order to avoid exerting tension on the pipes during the tightening phase.
- D** Make sure that no foreign bodies are present inside the valve or in the piping before carrying out the assembly.
- E** Insert the bolts (**pos.05**) in the fixing holes of one of the two flanges (**pos.02**) and position the valve and the first gasket (**pos.04**); then fit the remaining nuts (**pos.03**), washers (**pos.06**) and gasket (**pos.04**). Use only suitable tools and avoid excessive tightening.
- F** After assembly, check the correct opening and closing movement of the valve and its moving parts before starting the flow in the pipeline.
- G** The external seal of the valve and its gaskets must be carried out through a functional test at a test pressure 1.1 times the working pressure.
- H** In case of installation on pipes with preheated air, rotate the valve during assembly so that the actuator or the handle are on the side of the pipe for better heat dissipation.
- I** In insulated pipes, provide adequate space for mounting the valve fastening bolts.

## SEQUENCE OF SCREWS TIGHTENING ON ATTACHMENT FLANGES

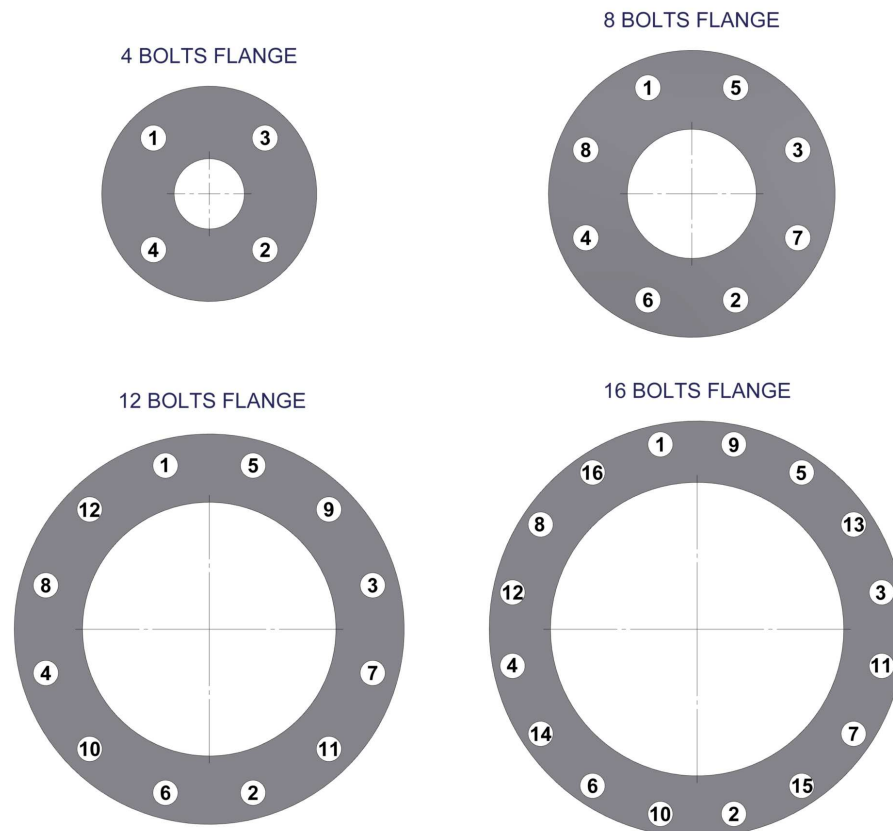
Tighten the bolts and nuts in a crisscross pattern, using a minimum of three tightening passes and maximum bolt stress as defined in the tables below.

STEP 1: Torque up to a maximum of 30% of the final torque value according to the torque sequence. Make sure the gasket is compressed evenly.

STEP 2: Torque up to a maximum of 60% of the final torque value.

STEP 3: Torque at final torque value (100%).

After completing the three basic torque steps, retighten the nuts at least once using the final torque crosswise until no further nut rotation is observed.



D1305I02

4 bolt flange: 1,2,3,4

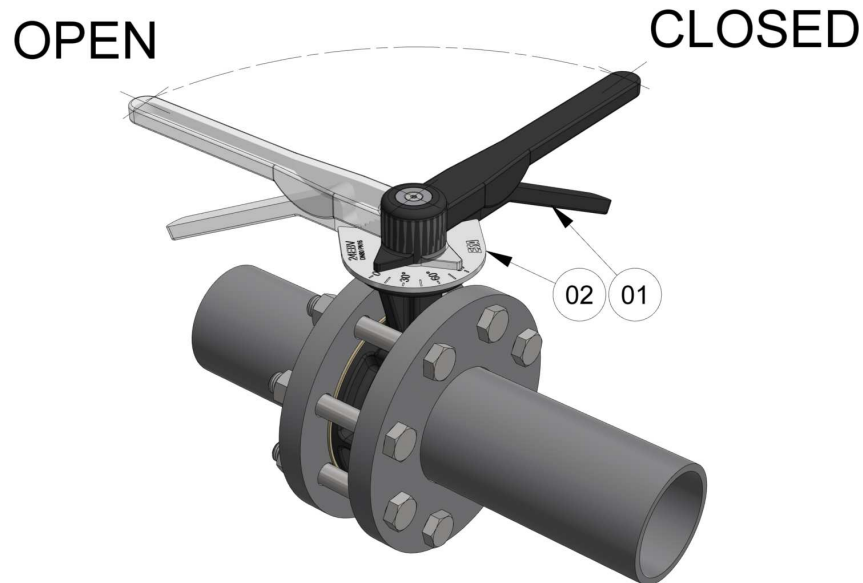
8 bolt flange: 1,2,3,4,5,6,7,8

12 bolt flange: 1,2,3,4,5,6,7,8,9,10,11,12

16 bolt flange: 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16

DN [mm]	PN16 [Nm]	[Ft/lbs]
15/20/25	50	37
32/40/50	50	37
65/80	70	52
100/125	90	66
150/200	120	88
250	150	111
300	200	148
350	250	184
400	300	221
450/500	400	295

## EBV-M REGULATION AND CALIBRATION



D1305I03

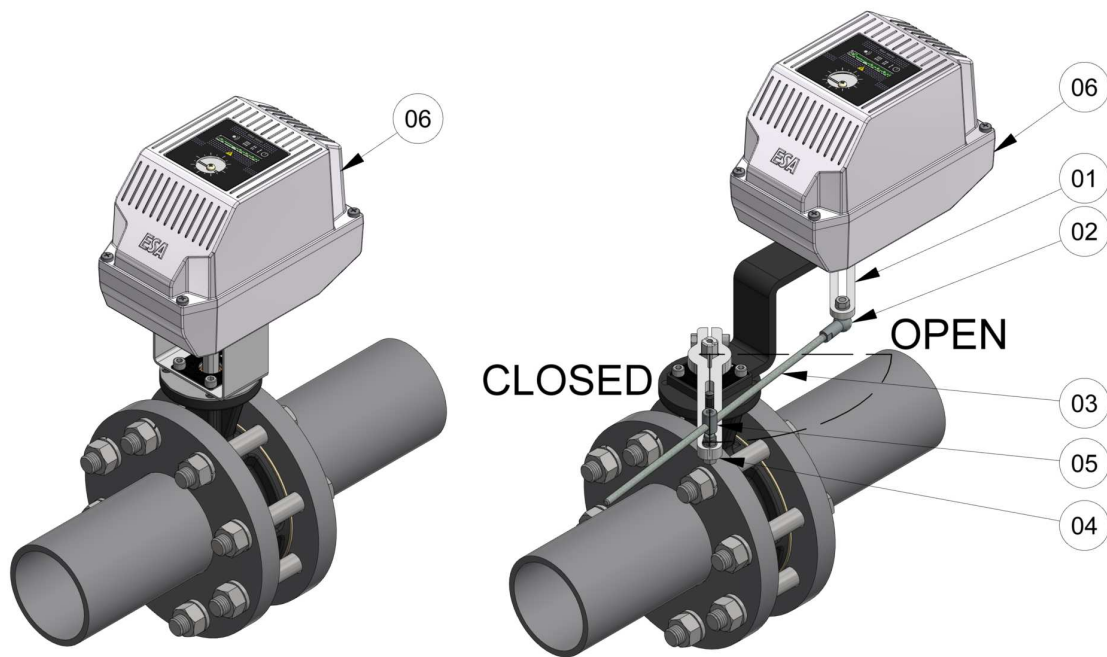
To calibrate the EBV-M manual valves, use the opening and closing limits indicated on the toothed metal disc positioned under the lever as references.

During the adjustment phase, monitor the pressure and flow rate parameters of the pipeline using suitable instruments (calibrated flanges, differential pressure gauges, etc...).

The valve rotation angle is 90°: when the lever is perpendicular to the pipe the valve is CLOSED, when it is in the longitudinal position the valve is OPEN.

- A** Grasp the lever (**pos. 01**) and, acting on the underlying arm, release the locking device from the disc (**pos. 02**).
- B** Rotate the lever (**pos. 01**) to the new position.
- C** Release the arm under the lever (**pos. 01**), checking that the blocking device engages the toothed disc (**pos. 02**) in the new position.
- D** If several valves are adjusted on the outlets of the same duct, check that the previously performed calibrations have not undergone any changes, otherwise carry out the adjustment again.

## EBV-D & EBV-L REGULATION AND CALIBRATION



D1305104

EBV-D & EBV-L valves are supplied with a preliminary calibration with 0±90° adjustment. During the adjustment phase, monitor the pressure and flow rate parameters of the pipeline using suitable instruments (calibrated flanges, differential pressure gauges, etc...).

- The EBV-Ds are adjusted by acting on the actuator stroke, referring to the technical documentation of the same.
- The EBV-L are calibrated by acting on levers and return joints: acting on the stroke of the actuator, in particular in the floating and proportional versions, would reduce its accuracy. If there is an ESA SERIO servomotor, proceed as follows:

**A** Open the actuator cover to access the local control station. Activate the "Manual" mode using the specific selector, disabling the remote control.

**B** Command the actuator to close, so that the valve closes completely.

**C** Loosen the rod locking dowel located on the joint (**pos. 04**). Adjust the minimum opening by sliding the rod (**pos. 03**) into the joint and move the valve using the slotted lever (**pos. 05**), until the required flow rate is reached. At the end, tighten the grain.

**D** Command the actuator so that the valve opens completely.

Check the flow rate between minimum and maximum opening: if the maximum flow rate is reached before the actuator reaches full opening, the valve stroke must be reduced, otherwise it must be increased. The goal can be achieved in two ways:

**E** - bring the joint (**pos. 02**) close to the actuator pin (**pos. 06**), making it slide into the slotted lever (**pos. 01**).

- remove the joint (pos. 04) from the pin by sliding it into the slotted lever (**pos. 05**).

**F** Carry out the minimum opening adjustment again as described in point **C**.

Check the new regulation by repeating the operations indicated between points **D** and **E** until the required flow regulation is obtained.

**G** Activate the "automatic" mode using the specific selector, checking that the commands from the control system are consistent with the movement of the actuator.

**H** At the end, close the lid, checking the correct positioning of the gasket and making sure that the electrical conductors do not remain pressed between the lid and the base.

**I** It is recommended to mark the locking positions of the joints on the levers: this maintains the set setting in case of replacement of the actuator.

## MAINTENANCE

All maintenance operations, due to the short times and working conditions in which they can be carried out, involve a greater risk of errors and accidents and must therefore be carried out after careful and in-depth analysis of the risks for the operators and for the process, putting all necessary precautions in place.

Operation	Frequency [months]	Note
Gaskets integrity	12	Check that there are no leaks to the outside with adequate leak detection liquids. In case of replacement, follow the instructions given in the INSTALLATION paragraph.
Bolt tightening	12	6 months in vibration applications.
Valve movement	6	Check that the valve rotates without friction, lubricate if necessary.
Valve calibration	12	Check the pressure and flow rate parameters of the pipeline using suitable instruments (calibrated flanges, differential pressure gauges, etc...). If necessary, repeat the calibration operations.
Butterfly valve maintenance	12	Check the condition of the internal elements, clean with a clean cloth and compressed air, taking care not to damage the internal parts.

Component	Useful life [years]	Command cycles
Valve tightness control systems	10	250.000
Pressure switches	10	N/A
Burner control device	10	250.000
UV flame sensor / electrodes	10.000 operating hours	
Gas regulators	10	N/A
Solenoid valves	10	250.000
Relief valve	10	N/A
Regulation valve	10	N/A
Regulators	10	N/A
Servomotors	10	N/A

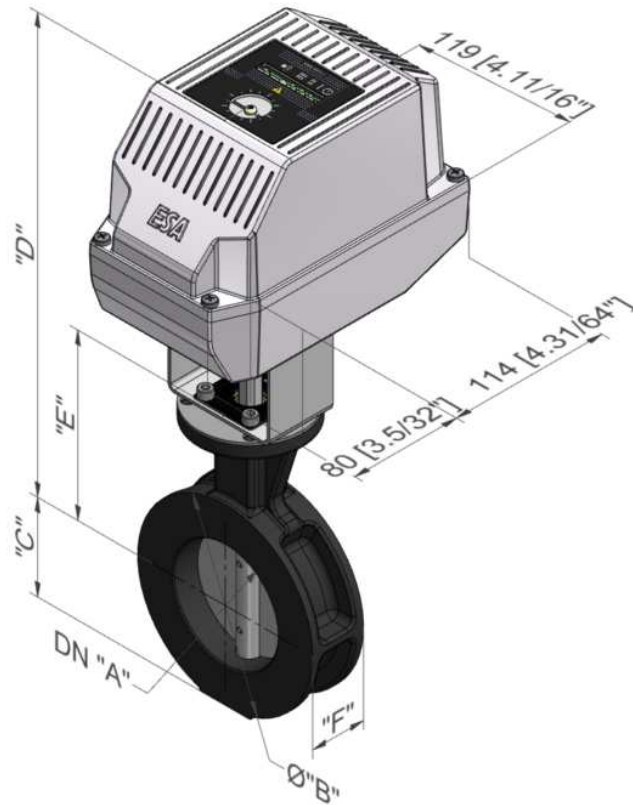
## EBV-M OVERALL DIMENSIONS



D1305I05

Model	DN "A"	Ø "B"		"C"		"D"		"F"		Mass	
		[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[Kg]	[lbs]
<b>16EBV-D</b>	DN50	103	4.1/16	56	2.13/64	105	4.9/64	33	1.19/64	2.2	4.9
<b>20EBV-D</b>	DN65	122	4.51/64	60	2.23/64	154	6.1/16	40	1.37/64	3.0	6.6
<b>24EBV-D</b>	DN80	138	5.7/16	68	2.43/64	174	6.27/32	40	1.37/64	3.6	7.9
<b>32EBV-D</b>	DN100	158	6.7/32	81	3.3/16	184	7.1/4	46	1.13/16	5.0	11
<b>48EBV-D</b>	DN150	212	8.11/32	110	4.21/64	204	8.1/32	54	2.1/8	7.0	15.4
<b>64EBV-D</b>	DN200	290	11.27/64	145	5.45/64	277	10.29/32	50	1.31/32	16.8	37
<b>80EBV-D</b>	DN250	350	13.25/32	175	6.57/64	307	12.3/32	50	1.31/32	23.0	50.7
<b>96EBV-D</b>	DN300	405	15.15/16	203	7.63/64	334	13.5/32	55	2.11/64	30.0	66.2
<b>112EBV-D</b>	DN350	460	18.7/64	233	9.11/64	360	14.11/64	55	2.11/64	43.5	95.9
<b>128EBV-D</b>	DN400	525	20.43/64	290	11.27/64	380	14.61/64	55	2.11/64	51.5	113.6
<b>144EBV-D</b>	DN450	555	21.27/32	300	11.13/16	405	15.15/16	60	2.23/64	56.2	123.9
<b>160EBV-D</b>	DN500	640	25.13/64	320	12.19/32	480	18.57/64	60	2.23/64	61.0	134.5

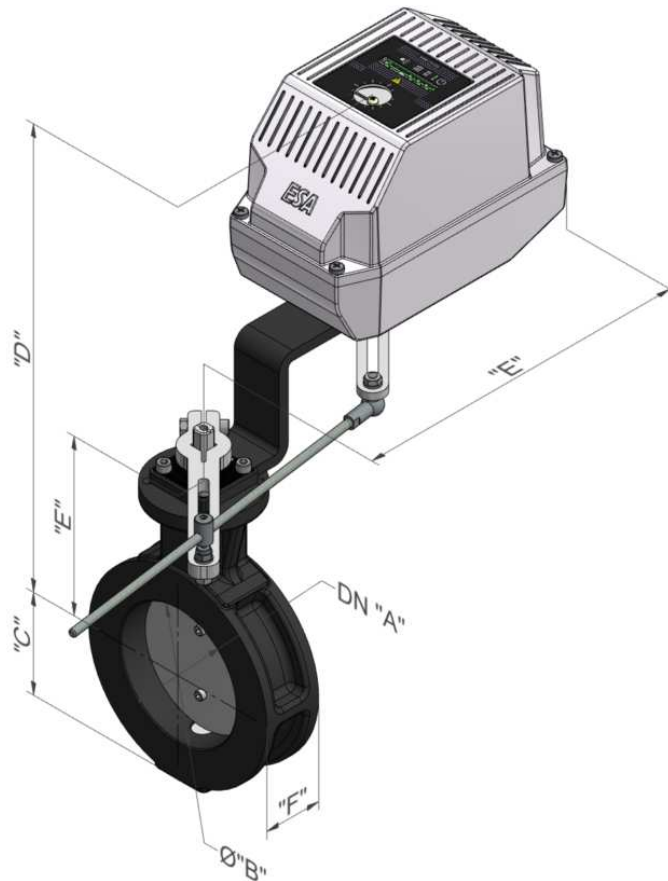
**EBV-D OVERALL DIMENSIONS ELECTRIC ACTUATOR ESA SERIO**



D1305I06

Model	DN "A"	Ø "B"		"C"		"D"		"E"		"F"		Mass	
		[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[Kg]	[lbs]
<b>16EBV-D</b>	DN50	103	4.1/16	56	2.13/64	310	12.13/64	105	4.9/64	33	1.19/64	4.7	10.4
<b>20EBV-D</b>	DN65	122	4.51/64	60	2.23/64	313	12.21/64	108	4.1/4	40	1.37/64	5.5	12.1
<b>24EBV-D</b>	DN80	138	5.7/16	68	2.43/64	333	13.7/64	128	5.3/64	40	1.37/64	6.0	13.2
<b>32EBV-D</b>	DN100	158	6.7/32	81	3.3/16	343	13.1/2	138	5.7/16	46	1.13/16	7.5	16.5
<b>48EBV-D</b>	DN150	212	8.11/32	110	4.21/64	363	14.19/64	158	6.7/32	54	2.1/8	9.0	19.8
<b>64EBV-D</b>	DN200	290	11.27/64	145	5.45/64	436	17.11/64	231	9.3/32	50	1.31/32	18.2	40.1
<b>80EBV-D</b>	DN250	350	13.25/32	175	6.57/64	466	18.11/32	261	10.9/32	50	1.31/32	23.8	52.5
<b>96EBV-D</b>	DN300	405	15.15/16	203	7.63/64	493	19.13/32	288	11.11/32	55	2.11/64	31.4	69.2
<b>112EBV-D</b>	DN350	460	18.7/64	233	9.11/64	524	20.5/8	319	12.9/16	55	2.11/64	44.5	98.1
<b>128EBV-D</b>	DN400	525	20.43/64	290	11.27/64	543	21.3/8	338	13.5/16	55	2.11/64	52.0	114.7
<b>144EBV-D</b>	DN450	555	21.27/32	300	11.13/16	569	22.13/32	364	14.21/64	60	2.23/64	57.2	126.1
<b>160EBV-D</b>	DN500	640	25.13/64	320	12.19/32	569	22.13/32	364	14.21/64	60	2.23/64	62.0	136.7

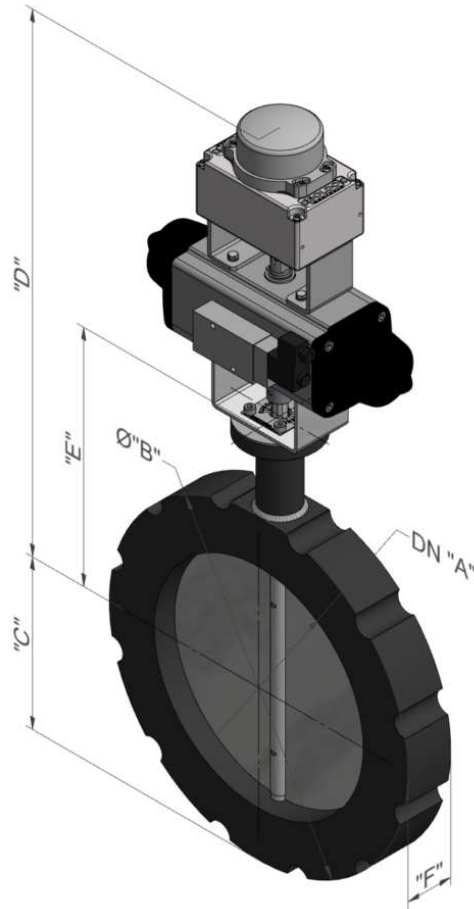
**EBV-L OVERALL DIMENSIONS ELECTRIC ACTUATOR ESA SERIO**



D1305107

Model	DN "A"	Ø "B"		"C"		"D"		"E"		"F"		Mass	
		[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[Kg]	[lbs]
<b>16EBV-L</b>	DN50	103	4.1/16	56	2.13/64	328	12.29/32	108	4.1/4	33	1.19/64	5.2	11.5
<b>20EBV-L</b>	DN65	122	4.51/64	60	2.23/64	331	13.1/32	108	4.1/4	40	1.37/64	6.0	13.2
<b>24EBV-L</b>	DN80	138	5.7/16	68	2.43/64	351	13.13/16	128	5.3/64	40	1.37/64	6.5	14.3
<b>32EBV-L</b>	DN100	158	6.7/32	81	3.3/16	361	14.7/32	138	5.7/16	46	1.13/16	7.5	16.5
<b>48EBV-L</b>	DN150	212	8.11/32	110	4.21/64	391	15.25/64	158	6.7/32	54	2.1/8	10.0	22.1
<b>64EBV-L</b>	DN200	290	11.27/64	145	5.45/64	454	17.7/8	231	9.3/32	50	1.31/32	19.0	41.9
<b>80EBV-L</b>	DN250	350	13.25/32	175	6.57/64	484	19.1/16	261	10.9/32	50	1.31/32	25.0	55.1
<b>96EBV-L</b>	DN300	405	15.15/16	203	7.63/64	511	20.1/8	288	11.11/32	55	2.11/64	32.0	70.6
<b>112EBV-L</b>	DN350	460	18.7/64	233	9.11/64	542	21.11/32	319	12.9/16	55	2.11/64	45.0	99.2
<b>128EBV-L</b>	DN400	525	20.43/64	290	11.27/64	561	22.3/32	338	13.5/16	55	2.11/64	52.5	115.8
<b>144EBV-L</b>	DN450	555	21.27/32	300	11.13/16	587	23.7/64	364	14.21/64	60	2.23/64	57.7	127.2
<b>160EBV-L</b>	DN500	640	25.13/64	320	12.19/32	587	23.7/64	364	14.21/64	60	2.23/64	62.5	137.8

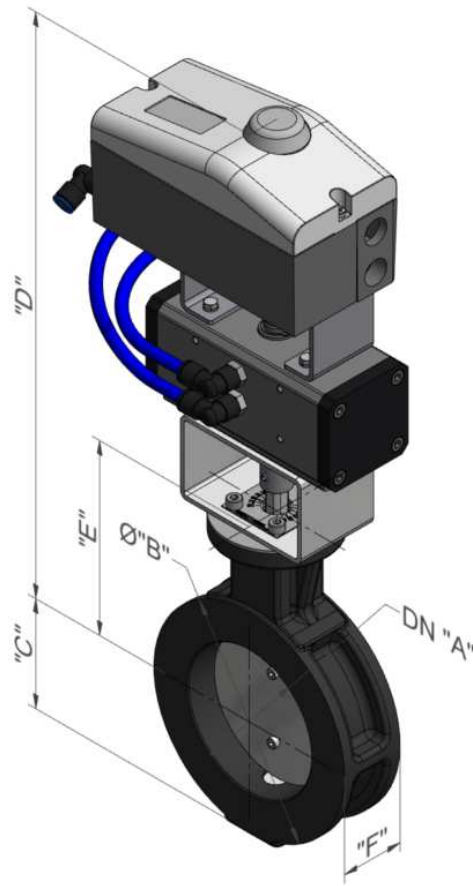
**EBV-D OVERALL DIMENSIONS ON-OFF PNEUMATIC ACTUATOR**



D1305I08

Model	DN "A"	Ø "B"		"C"		"D"		"E"		"F"		Mass	
		[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[Kg]	[lbs]
16EBV-L	DN50	103	4.1/16	56	2.13/64	413	16.17/64	105	4.9/64	33	1.19/64	6.2	13.7
20EBV-L	DN65	122	4.51/64	60	2.23/64	416	16.3/8	108	4.1/4	40	1.37/64	7.0	15.4
24EBV-L	DN80	138	5.7/16	68	2.43/64	436	17.11/64	128	5.3/64	40	1.37/64	7.5	16.5
32EBV-L	DN100	158	6.7/32	81	3.3/16	446	17.9/16	138	5.7/16	46	1.13/16	8.5	18.7
48EBV-L	DN150	212	8.11/32	110	4.21/64	466	18.11/32	158	6.7/32	54	2.1/8	11.0	24.3
64EBV-L	DN200	290	11.27/64	145	5.45/64	539	21.7/32	231	9.3/32	50	1.31/32	20.0	44.1
80EBV-L	DN250	350	13.25/32	175	6.57/64	569	22.13/32	261	10.9/32	50	1.31/32	26.0	57.3
96EBV-L	DN300	405	15.15/16	203	7.63/64	596	23.15/32	288	11.11/32	55	2.11/64	33.0	72.8
112EBV-L	DN350	460	18.7/64	233	9.11/64	627	24.11/16	319	12.9/16	55	2.11/64	46.0	101.4
128EBV-L	DN400	525	20.43/64	290	11.27/64	646	25.7/16	338	13.5/16	55	2.11/64	53.5	118
144EBV-L	DN450	555	21.27/32	300	11.13/16	672	26.29/64	364	14.21/64	60	2.23/64	58.7	129.4
160EBV-L	DN500	640	25.13/64	320	12.19/32	672	26.29/64	364	14.21/64	60	2.23/64	63.5	140

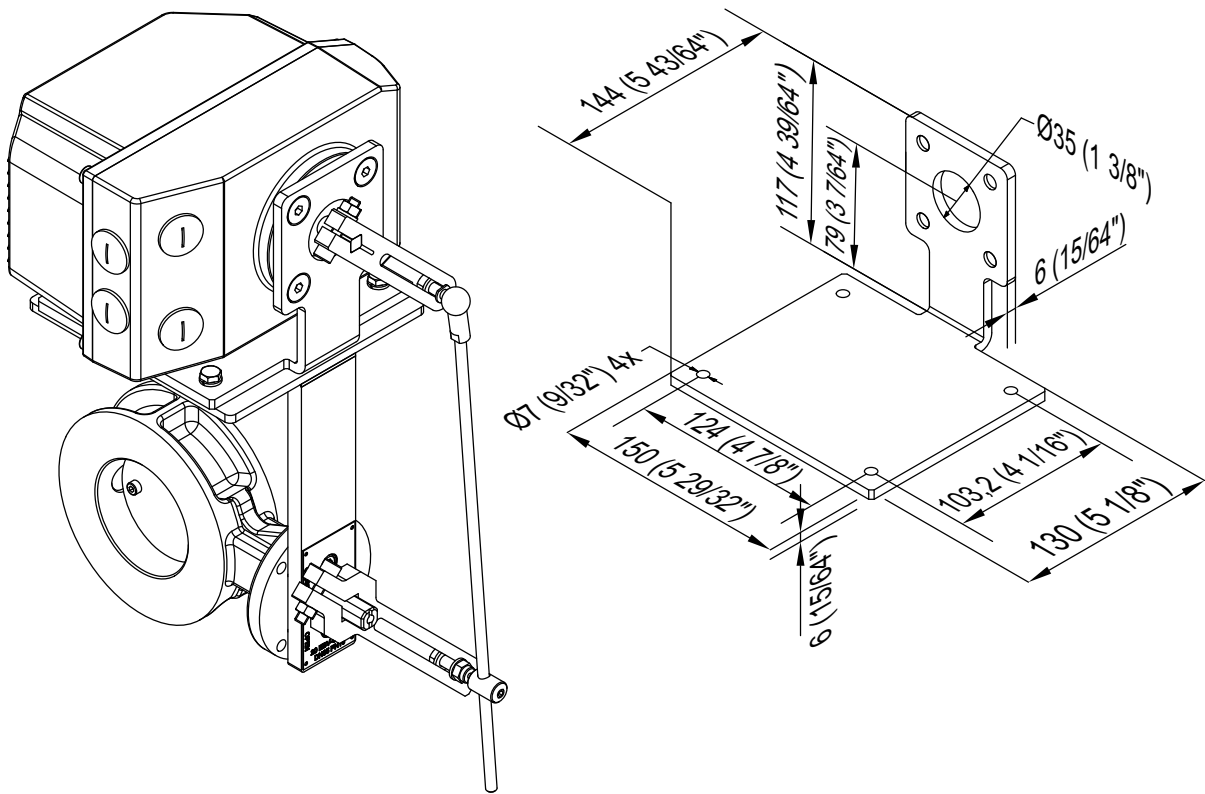
**EBV-D OVERALL DIMENSIONS PROPORTIONAL PNEUMATIC ACTUATOR**



D1305I09

Model	DN "A"	Ø "B"		"C"		"D"		"E"		"F"		Mass	
		[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[Kg]	[lbs]
<b>16EBV-D</b>	DN50	103	4.1/16	56	2.13/64	369	14.17/32	105	4.9/64	33	1.19/64	4.2	9.3
<b>20EBV-D</b>	DN65	122	4.51/64	60	2.23/64	372	14.41/64	108	4.1/4	40	1.37/64	5.0	11
<b>24EBV-D</b>	DN80	138	5.7/16	68	2.43/64	392	15.7/16	128	5.3/64	40	1.37/64	5.5	12.1
<b>32EBV-D</b>	DN100	158	6.7/32	81	3.3/16	402	15.53/64	138	5.7/16	46	1.13/16	6.5	14.3
<b>48EBV-D</b>	DN150	212	8.11/32	110	4.21/64	422	16.39/64	158	6.7/32	54	2.1/8	9.0	19.8
<b>64EBV-D</b>	DN200	290	11.27/64	145	5.45/64	495	19.31/64	231	9.3/32	50	1.31/32	18.0	39.7
<b>80EBV-D</b>	DN250	350	13.25/32	175	6.57/64	525	20.43/64	261	10.9/32	50	1.31/32	24.0	52.9
<b>96EBV-D</b>	DN300	405	15.15/16	203	7.63/64	552	21.47/64	288	11.11/32	55	2.11/64	31.0	68.4
<b>112EBV-D</b>	DN350	460	18.7/64	233	9.11/64	583	22.61/64	319	12.9/16	55	2.11/64	44.0	97
<b>128EBV-D</b>	DN400	525	20.43/64	290	11.27/64	602	23.45/64	338	13.5/16	55	2.11/64	51.5	113.6
<b>144EBV-D</b>	DN450	555	21.27/32	300	11.13/16	628	24.23/32	364	14.21/64	60	2.23/64	56.7	125
<b>160EBV-D</b>	DN500	640	25.13/64	320	12.19/32	628	24.23/32	364	14.21/64	60	2.23/64	61.5	135.6

## OVERALL DIMENSIONS SERVOMOTOR ADAPTATION SUPPORT



D1305110

- The support for the new ESA SERIO servomotor allows it to be mounted on EBV valves that use obsolete servomotors.

**ORDERING CODE**

- EBV -  -  -  -

01
02
03
04
05

VALVE DIMENSIONS	cod.	01
DN50/PN16	16	
DN65/PN16	20	
DN80/PN16	24	
DN100/PN16	32	
DN150/PN16	48	
DN200/PN16	64	
DN250/PN16	80	
DN300/PN16	96	
DN350/PN16	112	
DN400/PN16	128	
DN450/PN16	144	
DN500/PN16	160	

03 VALVE VERSION	cod.
Standard	LT
Speciale	...

04 ACTUATOR	cod.
ESA SERIO off/min/max	TPF
ESA SERIO floating	FLT
ESA SERIO proportional	PRP
Pneumatic actuator	CPAP
Special actuator	...

VALVE CONTROL	cod.	02
Manual lever	M	
Direct coupling actuator	D	
Actuator coupled with levers	L	

05 ACTUATOR PARAMETERS	cod.
ESA SERIO-TPF vedi E7301	...
ESA SERIO-FLT vedi E7302	...
ESA SERIO-PRP vedi E7303	...
Actuator CPAP OFF/ON (*)	DPF
Actuator CPAP proportional with positioner (**)	...

**Note**

(\*) The code is completed with the voltage of the actuator control solenoid valve.

(\*\*) The code is completed with the model of the positioner.

# ESA contacts



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