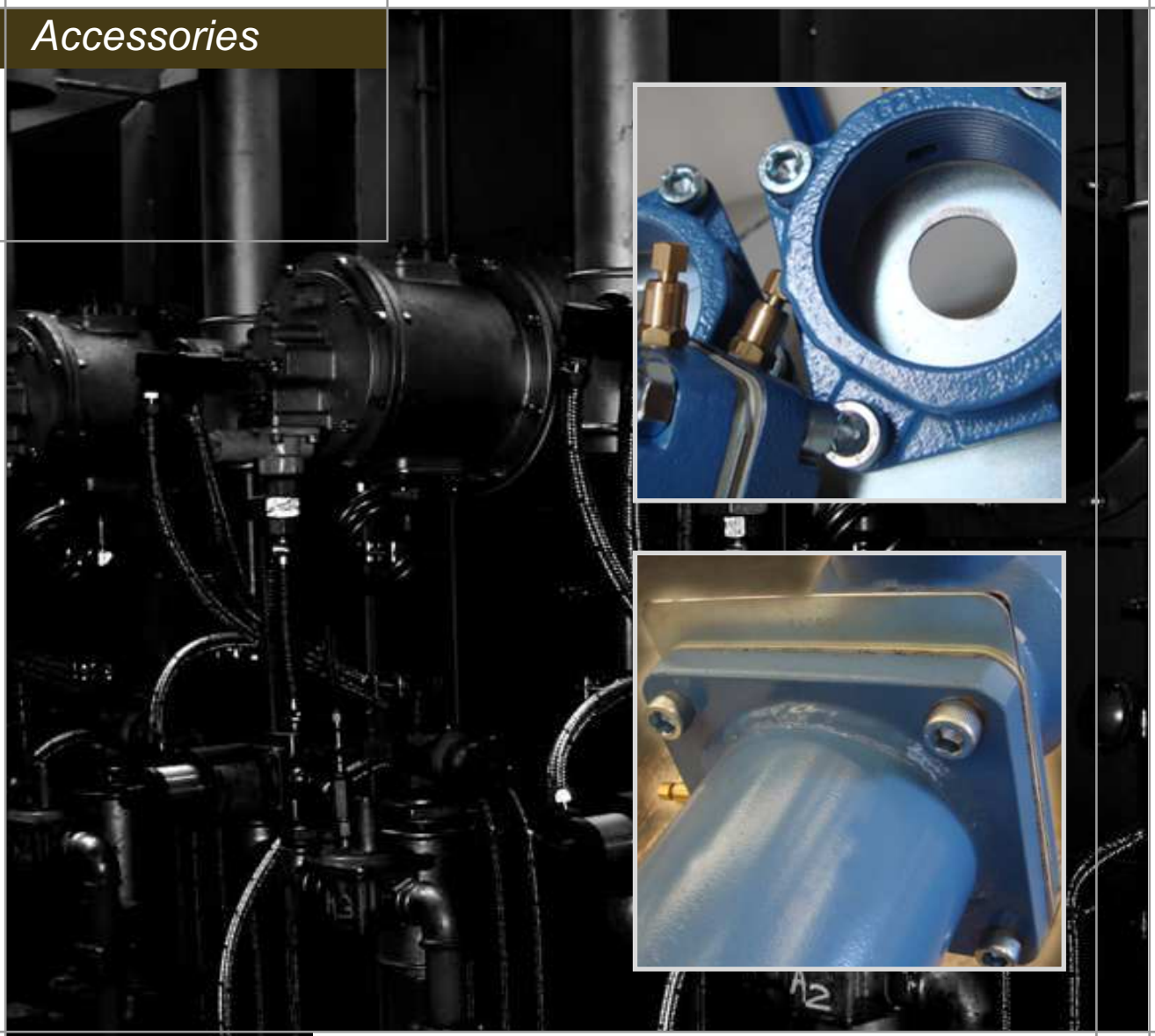
ESA PYRONICS INTERNATIONAL
SIAD Group

Accessories



Orifice Flow Meters

POP-S (E5720 rev. 05 - 20/03/2013)

GENERAL WARNINGS:

■ All installation, maintenance, ignition and setting must be performed by qualified staff, respecting the norms present at the time and place of the installation.

■ To avoid damage to people and things, it is essential to observe all the points indicated in this handbook. The reported indications do not exonerate the Client/User from observing general or specific laws concerning accidents and environmental safeguarding.

■ The operator must wear proper DPI clothing (shoes, helmets...) and respect the general safety, prevention and precaution norms.

■ To avoid the risks of burns or high voltage electrocutaion, the operator must avoid all contact with the burner and its control devices during the ignition phase and while it is running at high temperatures.

■ All ordinary and extraordinary maintenance must be performed when the system is stopped.

■ To assure correct and safe use of the combustion plant, it is of extreme importance that the contents of this document be brought to the attention of and be meticulously observed by all personnel in charge of controlling and working the devices.

■ The functioning of a combustion plant can be dangerous and cause injuries to persons or damage to equipment. Every burner must be provided with certified combustion safety and supervision devices.

■ The burner must be installed correctly to prevent any type of accidental/undesired heat transmission from the flame to the operator or the equipment.

■ The performances indicated in this technical document regarding the range of products are a result of experimental tests carried out at ESA-PYRONICS. The tests have been performed using ignition systems, flame detectors and supervisors developed by ESA-PYRONICS. The respect of the above mentioned functioning conditions cannot be guaranteed if equipment, which is not present in the ESA-PYRONICS catalogue, is used.

DISPOSAL:

To dispose of the product, abide by the local legislations regarding it.

GENERAL NOTES:

■ In accordance to the internal policy of constant quality improvement, ESA-PYRONICS reserves the right to modify the technical characteristics of the present document at any time and without warning.

■ It is possible to download technical sheets which have been updated to the latest revision from the **www.esapyronics.com** website.

■ The products manufactured by ESA-PYRONICS have been created in conformity to the **UNI EN 746-2:2010** Norms: Equipment for industrial thermal process - Part 2: Safety requirements for combustion and the movement and treatment of combustible elements. This norm is in harmony with the Machine Directive **2006/42/CE**. It is certified that the products in question respect all the requirements prescribed by the above mentioned Norms and Directives.

■ Certified in conformity with the **UNI EN ISO 9001** Norm by DNV GL.

CERTIFICATIONS:

UNI ISO 7/1 Pipe threads for coupling with seals on threads. Size, tolerances and designation.

The products comply with the requirements of the Eurasian market (Russia, Belarus and Kazakhstan) and are exempt from the EAC certification ref. **Doc. 01-11/437**

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The POP-S calibrated orifice flow meters are accessories designed for indirect air or gas flow measurement via the reading of charts, tables or instruments.
The orifice ports are accurately machined for precision measurements. Each orifice flange has its serial number and orifice diameter printed on tab for easy identification and selection.


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APPLICATIONS

- Flow measurements.
- Differential pressure reference for burner calibration.
- Flow direction control coupled with pressure switches.
- Combustion chamber prepurge control or burner ignition at minimum potential (according to the EN764/2 Norm).

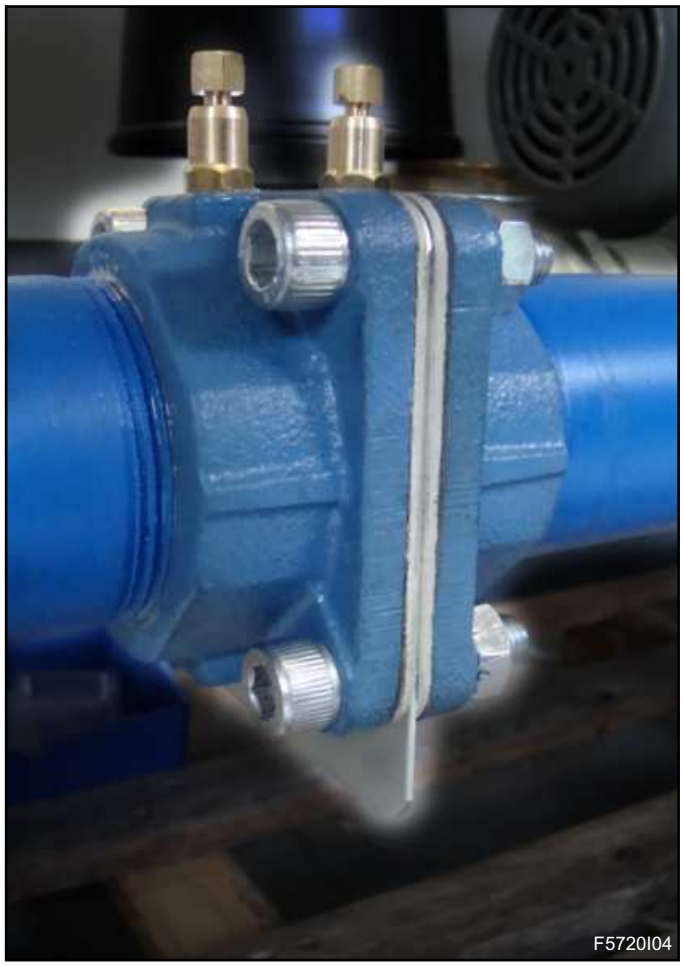
CHARACTERISTICS

Primary measuring element:

- Threaded flanges (according to UNI ISO 7/1) G25
- Welding flanges: Fe 360
- Orifice port: galvanized Fe 360/ AISI304
- Maximum operating temperature: 400 °C
- Maximum operating pressure: 400 mbar
- Gasket: AFM-34 / X-Plus

Impulse line kit (optional):

- Pressure outlet: OT58
- Fittings: nickel-plated brass/AISI321
- Connecting pipes (by customer): copper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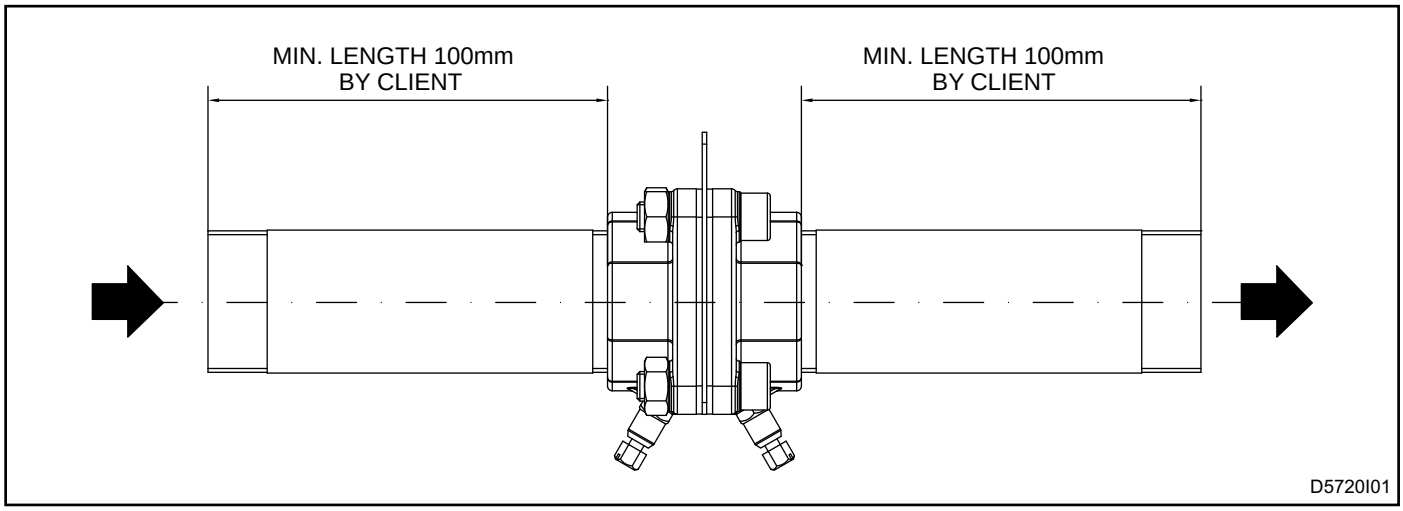
DESCRIPTION

The POP-S plates are simple flow measuring orifices for measuring fluid flow through differential pressure devices. The flow measurement principle is based on the installation of a calibrated orifice inside the piping. The presence of this orifice causes a static pressure difference between the upstream and downstream sections of the orifice.

Measuring takes place via a secondary element, consisting mainly of a differential pressure gauge or a pressure transmitter. In combustion plants, calibrated flanges are the ideal instrument for measuring and controlling air and gas flow. The AIR/GAS ratio regulation in burners is simplified when the precise combustion air and fuel gas flow volumes are known.



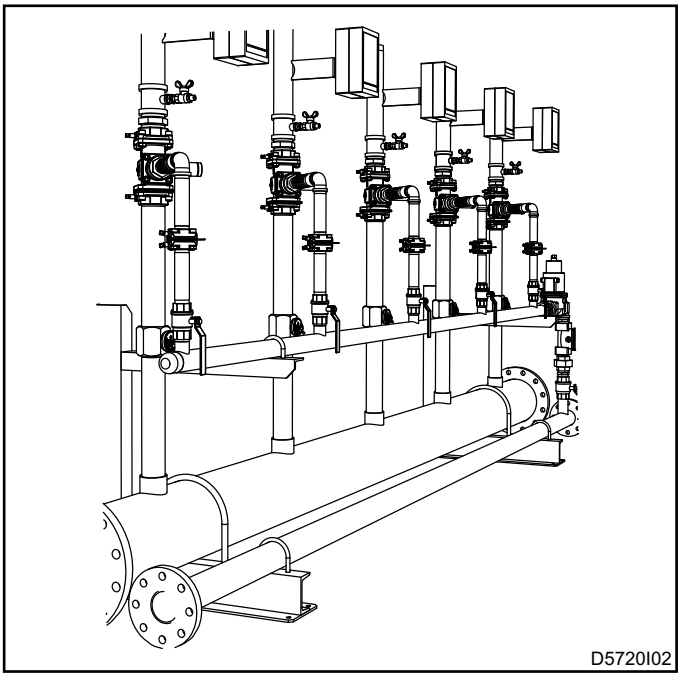
INFORMATION FOR SIZING

To be able to correctly size the port of the orifice found inside the POP-S calibrated flanges, the following project data must be known:

- Fluid type
- Nominal flow rate of the pipeline
- Differential pressure on the calibrated flange
- Operating pressure and temperature
- Nominal diameter of the pipeline (DN)
- Internal diameter of the pipeline (if not standard)

POSITION OF THE MEASURING ORGAN

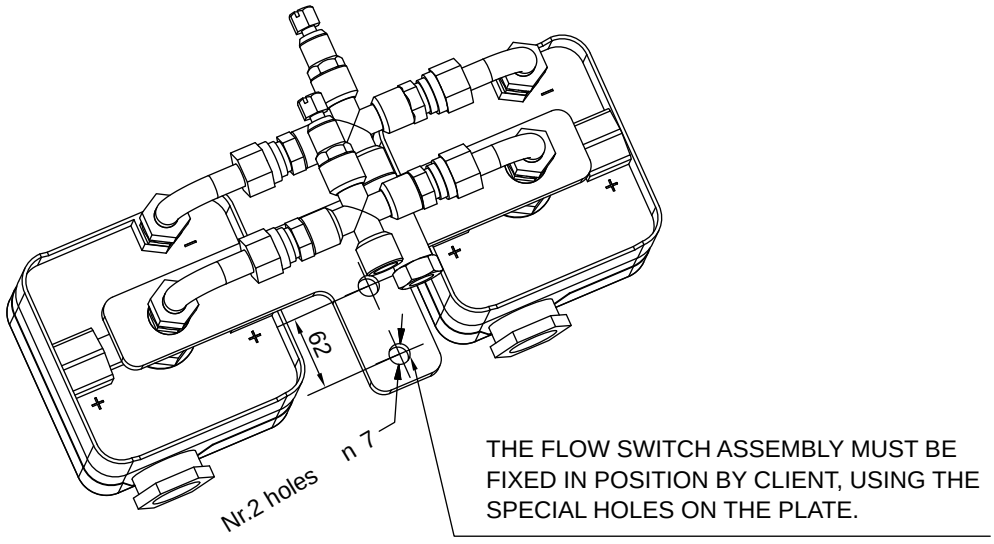
Seen as the POP-S calibrated flanges are not manufactured according to the UNI EN5167-2 Norm, they do not need to have lengthy parts upstream or downstream. Correct installation entails a rectilinear part of at least 100mm upstream and downstream. The POP-S calibrated flange must have a constant inlet pressure. This is why it must be installed immediately after the interception valve or however, upstream any regulation or flow organ.



FLOW SWITCH

The 2010 version of the EN746/2 Norm updated the part for the check that must be done regarding the purging of the combustion chamber during furnace start-up and burner ignition with nominal power higher than 120kW, which must necessarily take place below 33% of the power. Following this update, it is not sufficient to use a minimum air pressure switch on the piping that ensures the correct blower ignition, but a differential pressure switch must also be used (that in this case becomes a minimum air flow switch) that can read the Dp (differential pressure) of a calibrated flange and that allows chamber purge to be activated as soon as the measured air flow rises above 80% of the maximum nominal flow of the plant.

In the same way, it is not possible to switch the burners on at minimum potential relying exclusively on the servomotor limit switch. But a differential pressure switch is used (that in this case becomes a maximum air flow switch) which gives burner ignition consent below 33% of the nominal power of each burner. For the above mentioned applications, it is advisable to use a POP-S calibrated flange that is correctly connected to a pair of differential pressure switches as indicated in the diagram. A special kit for mounting the pressure switches can be supplied.



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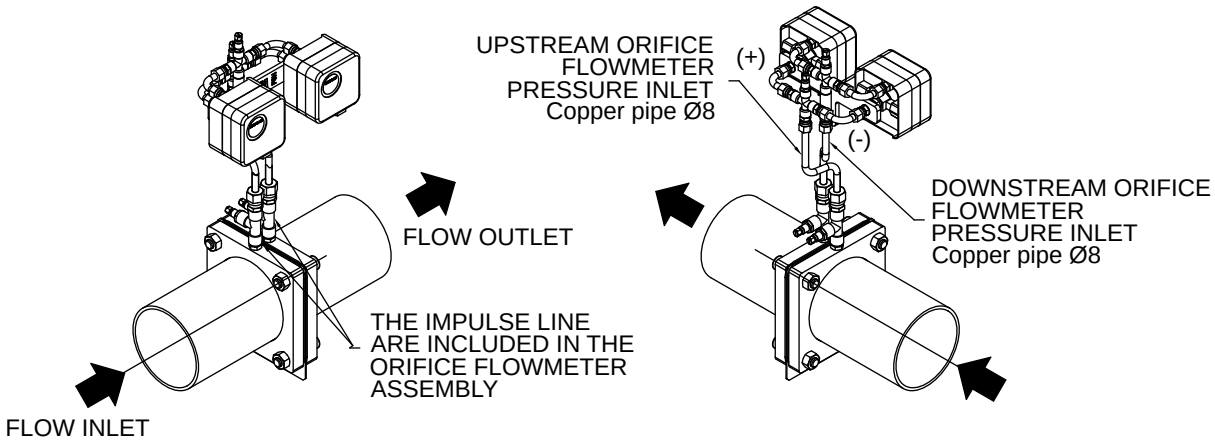
FLOW SWITCH ASSEMBLY FOR ORIFICE FLOWMETER MOD. POP-S



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WARNINGS

■ The POP-S flanges are suitable for strict flow measurements such as readings for electronic ratio regulation or consumption measures (fiscal and non).

■ Make sure that the operating pressure and the fluid temperature are lower than the maximum values allowed.

■ Check the correct installation according to the indications given in the appropriate paragraph of this data sheet.

■ Any type of alteration or repair carried out by third parties may compromise the application safety and automatically invalidates the warranty conditions.

INSTALLATION

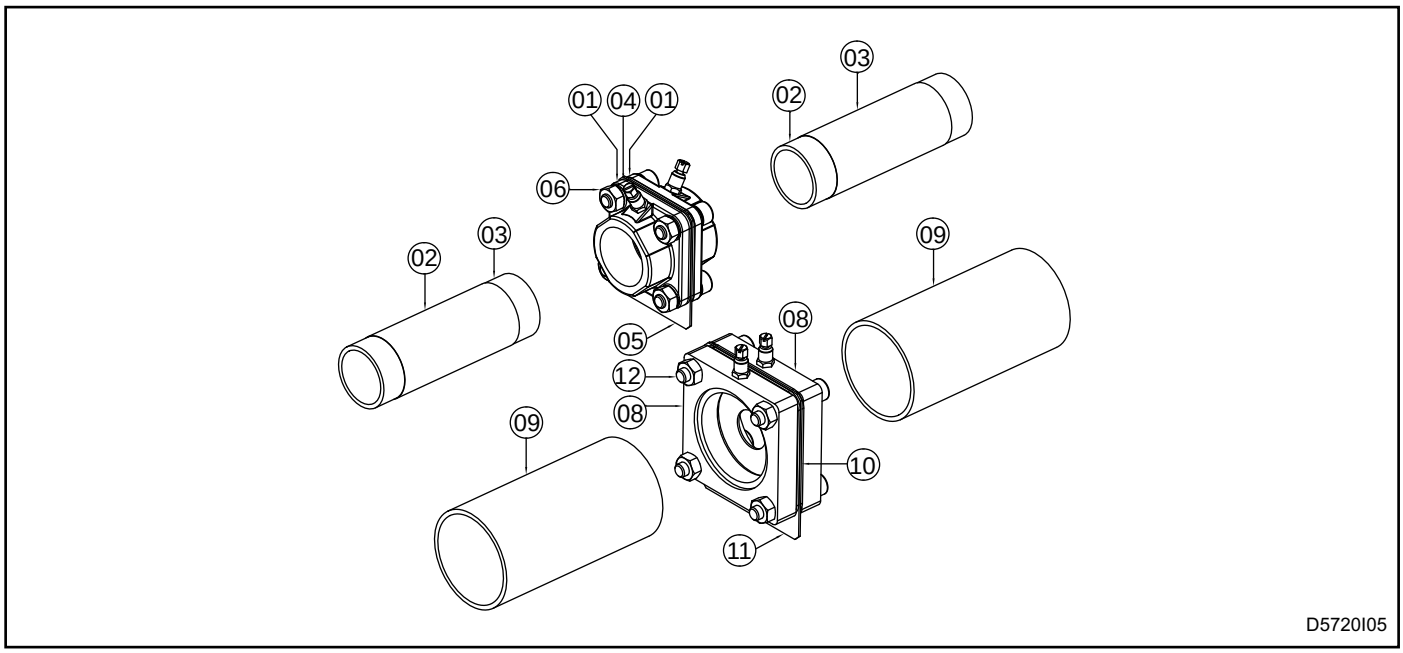
Maintenance and installation must be performed by qualified staff respecting the norms in force. After installation it is always advisable to check the tightness of the threads or flanged connections.

MOUNTING OF THREADED FLANGES

1 - Disassemble the flange.
2 - Using thread sealing paste, screw the flanges (**pos. 01**) one by one onto the piping (**pos. 02**), guaranteeing adequate thread tightness (**pos. 03**).
3 - Make sure that there are no foreign objects inside the flange (**pos. 01**) or in the pipes (**pos. 02**) before assembling. If necessary, remove any impurities.
4 - Check the correct alignment of the connecting pipes (**pos. 02**) and check that the distance between the pipes and assembly is correct (flanges **pos. 01** / gaskets **pos. 04** / orifice **pos. 05**), to avoid exerting tension on the piping during the tightening phase.
5 - Position the gaskets (**pos. 04** selected according to the type of fluid) and insert the bolts (**pos. 06**).
6 - Position the calibrated orifice (**pos. 07**), keeping the printed information facing downwards.
7 - Using suitable tools, progressively screw on the bolts (**pos. 06**) crosswise, avoiding excessive tightening.
8 - Check the tightness of the threaded connections (**pos. 03**) with a leak detection product by pressurizing the pipe.

MOUNTING OF WELDING FLANGES

1 - Disassemble the flange.
2 - Make sure that there are no foreign objects inside the flange (**pos. 08**) or in the pipes (**pos. 09**) before assembling. If necessary, remove any impurities.
3 - Check the correct alignment of the connecting pipes (**pos. 09**) and check that the distance between the pipes and assembly is correct (flanges **pos. 08** / gaskets **pos. 10** / orifice **pos. 11**), to avoid exerting tension on the piping during the tightening phase.
4 - Weld the flanges (**pos. 08**) at the ends of the piping (**pos. 09**), eliminating any remaining welding burrs.
5 - Position the gaskets (**pos. 10** selected according to the type of fluid) and insert the bolts (**pos. 12**).
6 - Position the calibrated orifice (**pos. 11**), keeping the printed information facing downwards.
7 - Using suitable tools, progressively screw on the bolts (**pos. 12**) crosswise, avoiding excessive tightening.
8 - Check the tightness of the flanged connections with a leak detection product by pressurizing the pipe.



GENERAL MAINTENANCE PLAN

Operation	Type (*)	Advised time	Notes
Gasket integrity	O	annually	Check that there are no gas leaks towards the outside.
Bolt tightening	S	annually	Reduce to half-yearly in applications with vibrations.

NOTES:
Key: O=ordinary / E=extraordinary
(*) it is advisable to replace the gaskets each time the flanges are disassembled.

EXTRAORDINARY MAINTENANCE

For correct maintenance of the POP-S flanges, scrupulously follow the instructions below that are to be carried out with the plant off.

BOLT TIGHTENING

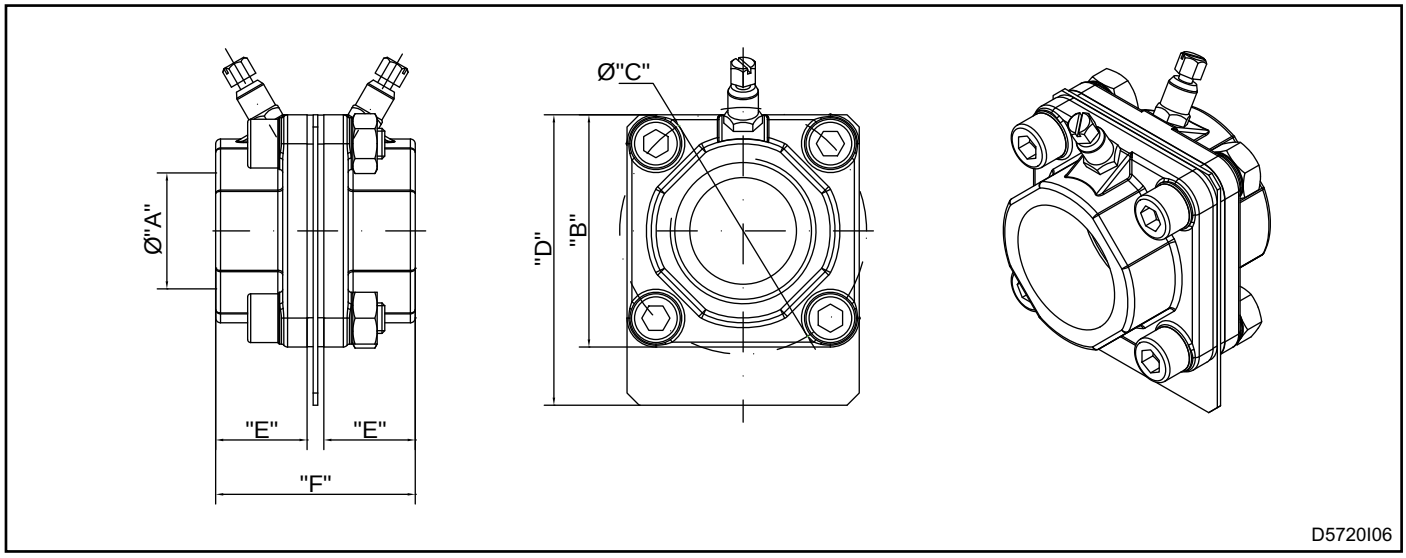
1 - Bolt tightening check must take place with the plant off.

GASKET REPLACEMENT

2 -Progressively unscrew the screws that hold the valve in a criss-cross way. Extract the orifice and replace the gaskets.

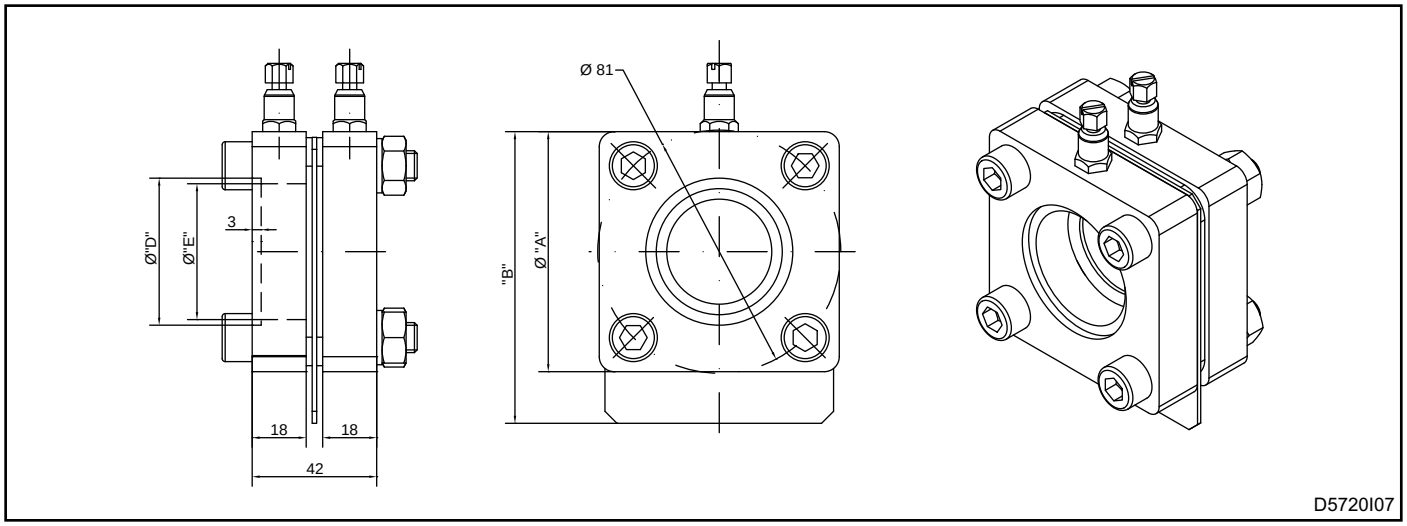
3 - Clean the inside of the orifice with a clean cloth and compressed air. Do not use any tools that could damage the internal parts.

OVERALL DIMENSIONS OF THREADED MODEL



Model	Threaded connections ø A	B [mm]	ø C [mm]	D [mm]	E [mm]	ø F [mm]	Mass [Kg]
3 POP-S	G - 3/8”	60	60,3	79	21	48	1.0
4 POP-S	G - 1/2”	60	60,3	79	21	48	0,9
6 POP-S	G - 3/4”	60	60,3	79	21	48	0,8
8 POP-S	G - 1”	60	60,3	79	21	48	0,8
10 POP-S	G - 1.1/4”	76,2	81	95	30,5	67	1,3
12 POP-S	G - 1.1/2”	76,2	81	95	30,5	67	1,1
16 POP-S	G - 2”	87,3	96,8	107	30,5	67	1,5

OVERALL DIMENSIONS OF FLANGED MODEL



Model	Pipe connections ø	ø A [mm]	B [mm]	ø C [mm]	ø D [mm]	ø E [mm]	Mass [Kg]
20 POP-S	2.1/2”	100	122	111,1	77	68	2.0
24 POP-S	3”	110	130	123,8	90	80	2,4
32 POP-S	4”	150	172	168,1	115	106	4,4
40 POP-S	5”	200	222	235	142	133	8,0
48 POP-S	6”	200	222	235	170	157	6,5

ORDERING CODE - COMPLETE FLANGE WITH CALIBRATED OFRIFICE

	-	POP - S	
01			

MODEL	01
3	**3**
4	**4**
6	**6**
8	**8**
10	**10**
12	**12**
16	**16**
....	**...**
see table pg. 8	

ORDERING CODE - ONLY CALIBRATED OFRIFICE

	-	OP - S	
01			

MODEL	01
3	**3**
4	**4**
6	**6**
8	**8**
10	**10**
12	**12**
16	**16**
....	**...**
see table pg. 8	