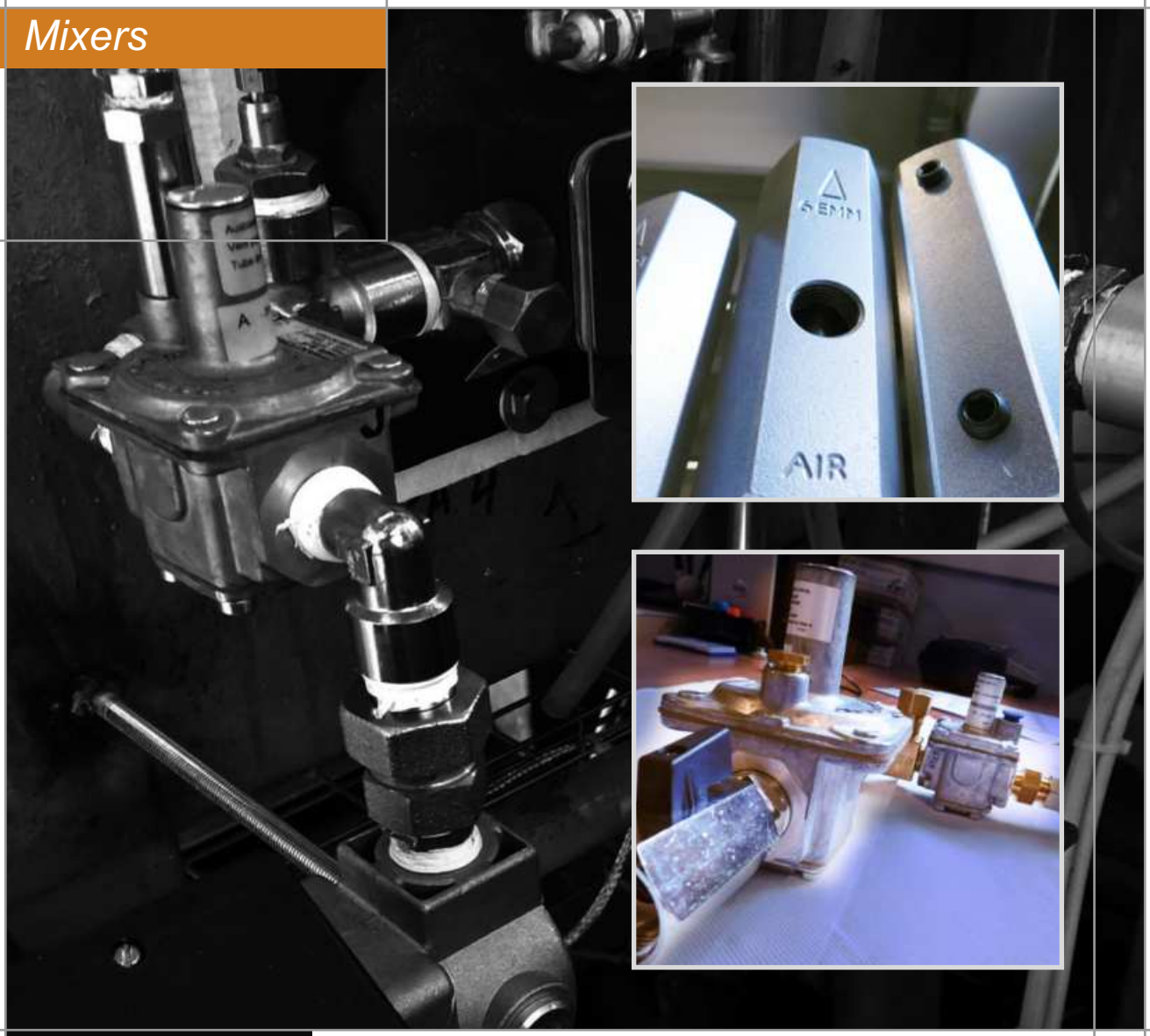
ESA PYRONICS INTERNATIONAL
SIAD Group

Mixers



Venturi proportional mixers

EMM & EMMTR (E2351 rev. 04 - 11/07/2017)

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:

EAC 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 EMM mark identifies a series of aluminum mixers air and gas type "venturi", while the abbreviation EMMTR identifies a series of EMM mixers with a mixing group.

APPLICATIONS

- Pilot burners.
- Pre-mix burners up to 40 kW (in stoichiometric ratio).

CHARACTERISTICS

GENERAL:

- Function: with various types of fuel
- Air and gas inlets: separate and adjustable
- Maximum operating pressure: 500 mbar
- Maximum fluid temperature: 60 °C
- Flow direction and mounting position: any

MATERIAL COMPOSITION:

- EMM mixer: Aluminum

NB: regarding the materials of the mixing group components please follow the technical specifications.

DESCRIPTION

The EMM series identifies proportional gas and air mixers. The air passing through a port produces an aspiration in the throat section by dragging the fuel gas. The amount of dragged gas is easily adjustable through a micrometer valve. Once set, the fuel ratio to air remains constant on a wide range of flow (maintaining constant gas pressure). A pressure regulator can be used to maintain constant gas pressure, exactly at atmospheric pressure, for all gas flows. The total potency of the blend sent to the burner is controlled by a single valve on the combustion air line. This valve can be motorized for automatic process control. EMMTR preassembled groups include a zerogovernor on the gas line. The mixers have a typical turn-down of 3: 1 depending on capacity. If larger intervals are required or if multiple mixers are connected to a single regulator, it is recommended to use ESA series BZR regulators (see data sheet E5102).

EMM

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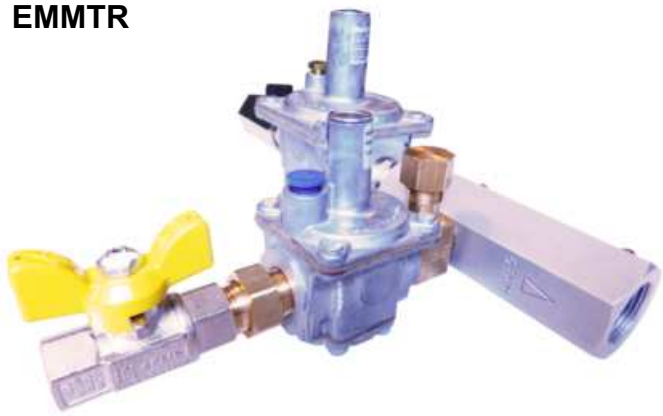
EMMTR



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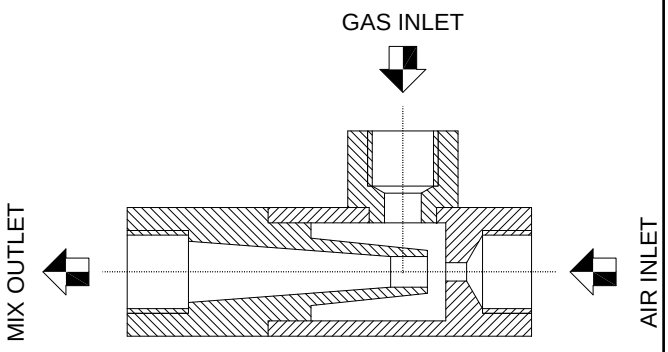

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WARNINGS

■ Make sure that the working pressure and the temperature fluid is below the maximum allowed.
■ Check the correct installation of the mixer before starting the flow in the pipeline.
■ In the event of malfunctioning of the mixer, follow the indications of this manual in the "MAINTENANCE "or contact the ESA PYRONICS assistance service
■ Any modification or repair carried out by third parties can compromises the security of the application and makes automatically guarantee the general warranty conditions

INSTALLATION

Arrange the mixer in such conditions as not to be exposed to direct radiation from heat sources, or held by combustion products, liquids, solvents or corrosive gases.

CHOICE OF THE MIXER

1 - The potentials shown in the table refer to 100% of primary process air.
2 - Determine the maximum potential of the burner or burner to be fed with the mixer at the mixture pressure corresponding to the pressure of combustion air.
3 - Multiply the total potential for the percentage primary ventilation (air / gas ratio) required.
4 - If the requested potential falls between two types of mixtures we should choose the smallest model for have a greater potential range.
5 - Select the balanced modulator according to the potential of the burner and the type of gas.

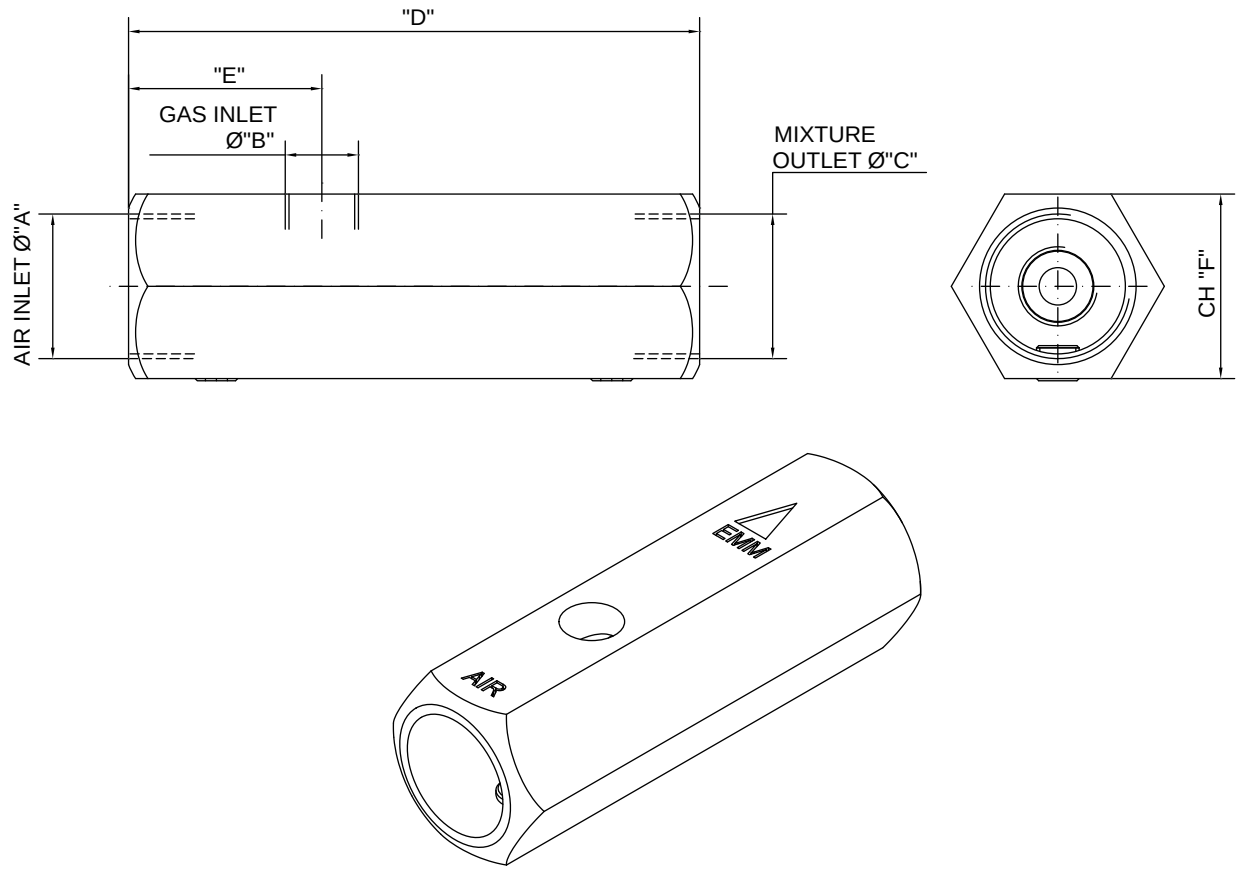
INSTALLATION

1 - Check that the line pressure is lower than maximum permissible operating pressure.
2 - Only the mixer, (without zerogovernor) can be mounted in every position.
3 - Ensure that no foreign bodies have entered inside the mixer before carrying out the assembly possibly blow with compressed air.
4 - Make sure that the threads conform to those of the mixer according to the UNI ISO 7/1 standard.
5 - Use thread sealers or similar paste on the male threads of the pipes.
6 - The air inlet is marked on the mixer body. The pipes that will be connected must be of the same diameter of the respective entrance to reduce pressure drop.
7 - Check the correct alignment of the pipes attachment. Keep a distance from the walls that allow free air circulation.
8 - The correct assembly of a mixer equipped with zerogovernor always provides horizontal positioning of the membrane and consequently the actual zerogovernor
9 - The zerogovernor should be mounted the nearest possible to the micrometric gas regulation valve.
10 - It is preferable to mount a zerogovernor for each mixer. The distance between the zerogovernor and the mix the operator must be as small as possible to reduce the loading notes that should never be higher than 0.25 mbar.
11 - The connections between the mixture output and the user input must be at least the same diameter as the the mixture output. Do not insert any valves or restriction of any kind on the mixture piping. Mixture valves or restrictions of any kind. Never exceed a pressure drop of 0.2 mbar / mt of piping in the mixing pipe.
12 - To start the burner open the gas tap, open the air cock and switch on. To obtain the type of flame desired, act on the micrometric valves placed on the air and gas lines.

FLOW TABLE

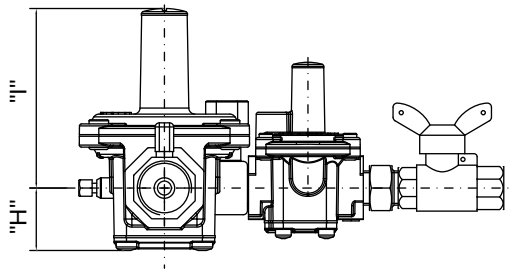
Model	Minimum passing section to the burner (mm^2)	POWER [kW]				
		Air pressure [mbar]				
		3,5	17,6	35,2	70,4	105,6
		Mixture pressure [mbar]				
		1	5	10	20	30
2 EMM	33,2	0,9	2,1	2,9	4,1	5
3 EMM	43,3	1,2	2,6	3,5	5,3	6,4
4 EMM	62,6	1,8	4,1	5,6	7,9	9,7
6 EMM	117	3,3	7,3	10,3	14,7	17,9
8 EMM Ø 8,5	201	5,7	12,8	18	25,5	31,2
8 EMM Ø 11,5	247	10,9	24,5	34,6	49	60
12 EMM	450	22.44	50.5	71	100	122

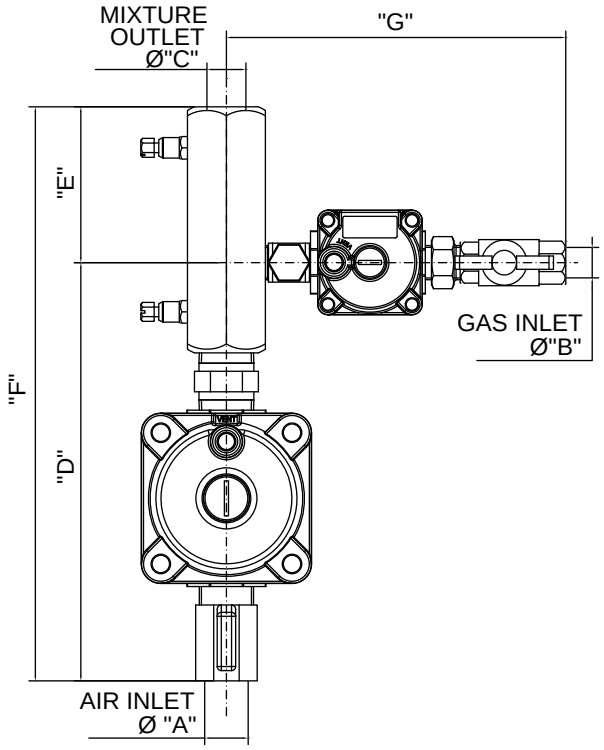
OVERALL DIMENSIONS - EMM



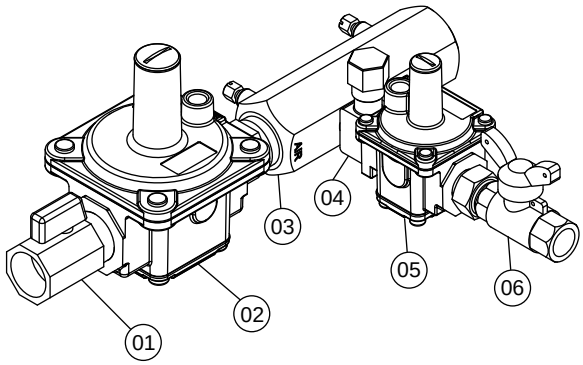
Model	Ø "A"	Ø "B"	Ø "C"	"D" [mm]	"E" [mm]	"F" [mm]	Mass [Kg]
2 EMM	G 1/4"	G 1/4"	G 3/8"	90	37	28	0,2
3 EMM	G 3/8"	G 1/4"	G 3/8"	90	37	30	0,25
4 EMM	G 1/2"	G 3/8"	G 1/2"	110	44	32	0,4
6 EMM	G 3/4"	G 3/8"	G 3/4"	120	44	38	0,45
8 EMM Ø 8,5	G 1"	G 3/8"	G 1"	130	44	42	0,45
8 EMM Ø 11,5	G 1"	G 3/8"	G 1"	130	44	42	0,45
12 EMM	G 1.1/2"	G 1/2"	G 1.1/2"	180	50	60	0,95

OVERALL DIMENSIONS - EMMTR





Pos.	Description
01	Air interception ball valve
02	Air pressure stabilizer
03	"Venturi" mixer
04	Micrometric regulation gas valve
05	Gas flow stabilizer
06	Gas interception ball valve



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Model	Ø "A"	Ø "B"	Ø "C"	"D" [mm]	"E" [mm]	"F" [mm]	"G" [mm]	"H" [mm]	"I" [mm]	Mass [Kg]
2 EMMTR	G 1/4"	G 3/8"	G 1/4"	150	59	209	172	25	61	0,95
3 EMMTR	G 3/8"	G 3/8"	G 3/8"	150	59	209	172	25	61	0,95
4 EMMTR	G 1/2"	G 3/8"	G 1/2"	184	66	250	170	30	88	1,25
6 EMMTR	G 3/4"	G 3/8"	G 3/4"	210	75	285	165	30	88	1,40
8 EMMTR	G 1"	G 3/8"	G 1"	264	86	350	173	37	97	2,30

GENERAL MAINTENANCE PLAN

Maintenance and installation must be carried out by qualified personnel, in compliance with current regulations; once installed, it is always advisable to perform a tightness test of the threads.

Operation	Type	Advised time	Notes
Thread integrity	O	yearly	Make sure there are no leaks towards the outside.
Maintenance of mixer	S	yearly	Check the conditions of the mixer.

Notes: Key: O = ordinary; S = extraordinary

ORDINARY MAINTENTANCE

For correct maintenance of the EMM mixers strictly follow the following instructions. Before carrying out maneuvers with the system on, assess that the process and operator safety is not compromised, if necessary check with the system turned off.

INTEGRITY CHECK

■ The integrity of the threads can be checked visually. If necessary, use liquid to look for leaks.

EXTRAORINDARY MAINTENANCE

For correct maintenance of the EMM mixers, follow the following instructions carefully to be carried out with the system switched off.

MIXER MAINTENANCE

1 - Unscrew and extract the mixer from the piping and check the status of the internal components.
2 - Clean the inside of the mixer body and the unit with a clean cloth and compressed air. Do not use tools that could damage internal parts.
3 - Reassemble the mixer in its housing, according to the steps indicated in the "INSTALLATION" section.

ORDERING CODES - SINGLE VENTURI MIXER - EMM

Model	01
2 EMM	**2**
3 EMM	**3**
4 EMM	**4**
6 EMM	**6**
8 EMM-8.5	**8 - 8.5**
8 EMM-11.5	**8 - 11.5**
12 EMM	**12**

ORDER CODES - MIXER WITH ADJUSTMENT GROUP

Model	01
2 EMMTR	**2**
3 EMMTR	**3**
4 EMMTR	**4**
6 EMMTR	**6**
8 EMMTR	**8**