

Electronics



Microprocessor Flame Control

ESA GENIO (E7020 rev. 02 - 26/01/2010)



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 electrocution, 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.

CERTIFICATIONS:



ESA GENIO complies with **EN298** Certificate to EC-87/02/61a/M1 / Rev 01 issued by Notified Body 0087. ESA GENIO complies with European Union directives: Directive **90/396/EEC** Gas, Machinery Directive **2006/42/EC**, Low Voltage Directive 2006/95/EC, 89/336/EEC Electromagnetic immunity, in conjunction with EN298, EN230 and EN746-2

The products conform to the requirements for the Russian market and according to **GOST** and **GOSGORTEKHNAZDOR** certificates.



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ESA GENIO is a microprocessing flame control device able to pilot a single-stage burner, giving a simple and thorough status display of the burner. The instrument is supplied in a sturdy thermoplastic cover and predisposed for cable outlet, that can be pre-wired on request and for the ignition transformer housing.

APPLICATIONS

- Flame control for single gas stage burners
- Flame control suitable for electrode or unirod detection, even combined between the two
- Local flame control, assembled near the burner.



F7020I03

CHARACTERISTICS

- | | |
|--------------------------------|-------------------------------|
| ■ Supply voltage | 115/230 Vac |
| ■ Frequency: | 45÷65 Hz |
| ■ Absorption without load: | 10 VA max |
| ■ Operating temperature: | 0÷60°C |
| ■ Storage temperature: | -20 ÷80°C |
| ■ Protection fuse: | 3,15 A |
| ■ Maximum output flow: | 3A @ 230 V cos Q = 0,5 |
| ■ Probe voltage: | 280Vac |
| ■ Minimum ionization current: | 3 µA |
| ■ Current limit at the probe: | 1Ma |
| ■ Purge time: | 0÷65 sec (multiplo di 5 sec) |
| ■ First safety time: | 3-5-7-10 sec |
| ■ Intervention time: | 1 sec |
| ■ Resistance to burner count: | 1,8 KW ¼ W 1% |
| ■ Container: | thermoplastic |
| ■ Size: | 200X120X93 mm |
| ■ Protection degree: | IP40 |
| ■ Weight: | 1200 g |
| ■ Mounting position: | any |
| ■ Detection probes: | Detection electrode or unirod |
| ■ Electrode probe line length: | < 2mt |



F7020I04

DESCRIPTION

In the front ESA GENIO has a power switch, a block button and three generic indication leds: power, burner status and lockout. The instrument signals the burner lockout conditions to the control system closing a volt free contact, or else by giving the burner status without faults via an output with calibrated resistance to be connected

to a burner counting system. ESA GENIO allows to change the purging time and enable recirculation even during the installation phase, while the safety and intervention time are fixed and modifiable only by the manufacturer.

FUNCTIONING

When ESA GENIO is powered, it carries out burner ignition by activating the ignition transformer and the gas solenoid valve, keeping the gas valve open with flame present. In case the flame doesn't form or goes out, the instrument shuts off the gas valve and signals the lockout conditions, and by pressing the front reset button, the functioning is reset. Before trying to switch on the burner, ESA GENIO waits for the set purging time. With recycling always on, if the flame goes out the instrument automati-

cally carries out burner re-ignition. The power switch allows to switch off the burner locally, without signalling burner lockout to the control system. In the following table burner ignition sequence is specified with the output status indication:

BURNER IGNITION CYCLE PHASE	GAS VALVE OUTPUT	TRANSFORMER OUTPUT	BURNER COUNT OUTPUT	BURNER LOCKOUT OUTPUT
Esa Genio off	Deactivated	Deactivated	Resistance on	Deactivated
Purging phase according to set time	Deactivated	Deactivated	Resistance on	Deactivated
Ignition phase according to set time	Activated	Activated	Resistance on	Deactivated
Flame on	Activated	Deactivated	Resistance on	Deactivated
Recycle for flame failure	Deactivated	Deactivated	Resistance on	Deactivated
Lockout for flame failure	Deactivated	Deactivated	Resistenza off	Activated
Lockout for ignition failure	Deactivated	Deactivated	Resistenza off	Activated
Lockout for illegal flame during first ignition	Deactivated	Deactivated	Resistenza off	Activated
General card lockout	Deactivated	Deactivated	Resistenza off	Activated

DISPLAY SECTION

The display section is composed of three diagnostic LEDs that indicate the different ignition cycle phases and the type of burner lockout.

BURNER IGNITION CYCLE PHASE	GREEN LED POWER SUPPLY 	YELLOW LED BURNER STATUS 	RED LED LOCKOUT PRESENT 
Esa Genio Off	Off	Off	Off
Prepurge phase according to set time	Steady on	Slow flashing	Off
Ignition phase according to set time	Steady on	Fast flashing	Off
Flame on	Steady on	Steady on	Off
Recycle for flame failure	Steady on	Off	Off
Lockout for flame failure	Steady on	Slow flashing	Steady on
Lockout for failed ignition	Steady on	Slow 1 flashing / 2 fast	Steady on
Lockout for illegal flame before ignition	Steady on	Fast flashing	Steady on
General card lockout	Steady on	Steady on	Steady on
Software lockout for indefinite period of time	Steady on	Fast flashing	Off

The software lockout phase is indicated if reset attempts are carried out close to each other. To reset the functioning switch off and restart the instrument.

PARAMETER SETTING

ESA GENIO allows to change the purging time and enables recycling via the Dip-switches placed on the card of

the instrument. The parameters must be modified with the instrument off.

Enable/disable recirculation

The attempt to recycle after flame burn out, is enabled by taking the first Dip-switch to the "ON" position. When this Dip-switch is on "OFF", restart is disabled and when the flame goes out the instrument shuts off the gas valve and stops in lockout with the relative indication.

Purge Time Setting

The purging time is set via four Dip-switches that combined with each other allow a range from 0 to 65 seconds, depending on what has been expressed in the table below. This opportunity allows to perform burner ignition in sequence even with only one ignition signal, or to change the purging time during the installation phase.

Recirculation OFF	
Recirculation ON	

Purge: 0 sec.		Purge: 30 sec.	
Purge: 1 sec.		Purge: 35 sec.	
Purge: 3 sec.		Purge: 40 sec.	
Purge: 5 sec.		Purge: 45 sec.	
Purge: 10 sec.		Purge: 50 sec.	
Purge: 15 sec.		Purge: 55 sec.	
Purge: 20 sec.		Purge: 60 sec.	
Purge: 25 sec.		Purge: 65 sec.	

In the following table the maximum allowed limit times are indicated. Refer to the specific rules to determine the correct applicable parameters during installation, choosing values that do not compromise the instrument safety. If

values that are not permitted by the standard EN298 but only by EN746-2 are set, only the reference norm is indicated on the label of the instrument and therefore ESA GENIO is applicable.

APPLICATION	NORM	SAFETY TIME	REACTION TIME	NOTES
Gas burners	EN298	-	maximum 1 s	Recycle and re-ignition allowed
	EN676	Depend on the application maximum 5 s	maximum 1 s	According to the allowed application only one recycle attempt. "Prepurge" mode specified in the Norm.
	EN746-2	Depend on the application maximum 10 s	Depends on the application maximum 2 s	According to the application, one recycle attempt is allowed at flame signal loss, two automatic unlocks and high temperature functioning. "Prepurge" mode specified in the Norm.
Oil burners	EN230	Depend on the application maximum 20 s	maximum 1 s	According to the application, recycle and re-ignition allowed. "Prepurge" mode specified in the Norm.
	EN746-2	Depend on the application maximum 10 s	Depends on the application maximum 2 s	According to the application, one recycle attempt is allowed at flame signal loss, two automatic unlocks and high temperature functioning. "Prepurge" mode specified in the Norm.

INSTALLATION

For correct installation follow the instructions below:

1 - Avoid placing ESA GENIO near intense magnetic or electric fields and do not expose directly to irradiation or heat sources. Do not place it near combustion products, liquids, solvents or corrosive gases.

2 - Installation must be carried out by qualified personnel respecting the Norms in force at the time and place of installation.

3 - All processing of the container necessary for the application of the instrument, must guarantee a protection degree equal to or not less than IP40.

4 - This device is intended for permanent and fixed electric connection. Check the correct connection after installation. Inversion of the phase/neutral connection could compromise the safety of the instrument,

5 - The wire connecting the ignition transformer to the electrode on the burner must be specifically for high voltage and not shielded. The length of the HT wire (High tension) must not exceed the measurement indicated, otherwise the ignition transformer must be placed near the burner. The HT wire must be placed far from power supply cables and not in metal ducts: ideally it should be left in

open air.

6 - In carrying out the electrical connection refer to the technical documentation, observing the polarity between phase and neutral. The choice of conductors and their location must be suitable for the application.

7 - Before powering the instrument ensure that the voltage, frequency and capacity are correct, and verify that the users do not have an absorption greater than the maximum capacity of output contacts.

8 - Always make sure that the earth protection is connected with suitable conductors to its terminals and to all the metallic casings of the elements involved.

9 - The instrument is intended for non-intermittent operation, therefore the control system must control the switching off of the burners within 24 hours of uninterrupted operation.

10 - Before carrying out any operation make sure that the instrument has been disconnected.

WARNINGS

For correct use of the flame control, follow the instructions below.

■ ESA GENIO is intended for permanent and fixed electrical connection. Inverting the phase/neutral connection could compromise the safety of the system. Do not use different phases between the various voltage inputs and do not apply voltage across the output terminals or serial communication.

■ Check the correct connection after installation. Before powering the instrument ensure that voltage and frequency are correct, verify that the users do not have an absorption greater than the maximum capacity of the output contacts.

■ The inputs of the thermostat (digital input or expansion) are not safety inputs, but only command inputs for turning on and off of the burner to be able to control the temperature. To obtain a safety shut off, disconnect power to the device. The same recommendation applies to instruments managed with serial communication.

■ The command of the digital input must be impulsive and need not be present during the self diagnosis of the instrument when the input's function is to reset or stop, Only reset and Only stop; meanwhile it must be stable when the inlet's function is Thermostat, High temperature, Main On/OFF e Air ON/OFF.

■ The power supply for the gas solenoid valves must be derived only by the outputs from ESA GENIO.

■ Management of the solenoid valves is not permitted by other devices (relays, PLC ..), which receive the command from the instrument.

■ If there are disturbances in other equipment during

the ignition phase of the burner, for the connection of the HT wire to the ignition electrode, use the anti-disturbance filter connector.

■ For Unirod detection systems use only specific ignition transformers, which allow the operation for ignition and detection with a single electrode.

■ Avoid the overheating of the ignition system control devices (solenoid valves and transformers). Consider a minimum time between one ignition and another equal to the sum of the pre-purging time + the first safety time + 5 additional sec.

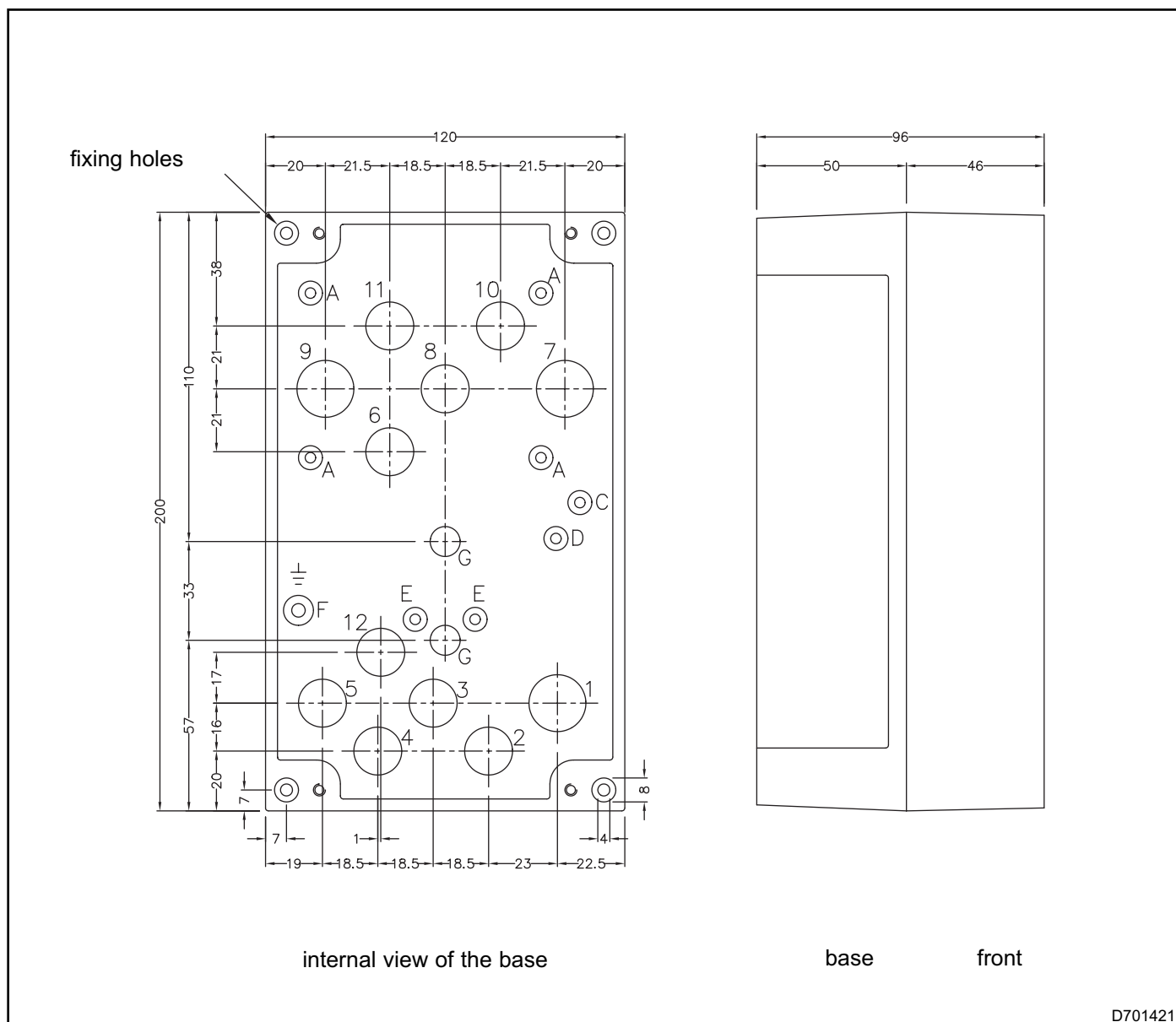
■ In choosing the the configuration parameters analyze, in addition the specific rule, possible risks linked to certain operation modes, choosing values that do not compromise the application safety.

■ Operate on the instrument and on the connected devices only in the absence of supply voltage. Before disconnecting the instrument make sure that the conductors have been numbered.

■ In case of malfunctioning the ESA GENIO must be sent back to the manufacturer to be repaired. Any modifications or repair attempted by third parties automatically cause the guarantee to expire and compromise the application safety.

■ ESA GENIO is an instrument that controls the burner safety organs. It is not meant to be a burner regulation instrument, for which specific devices exist.

OVERALL DIMENSIONS



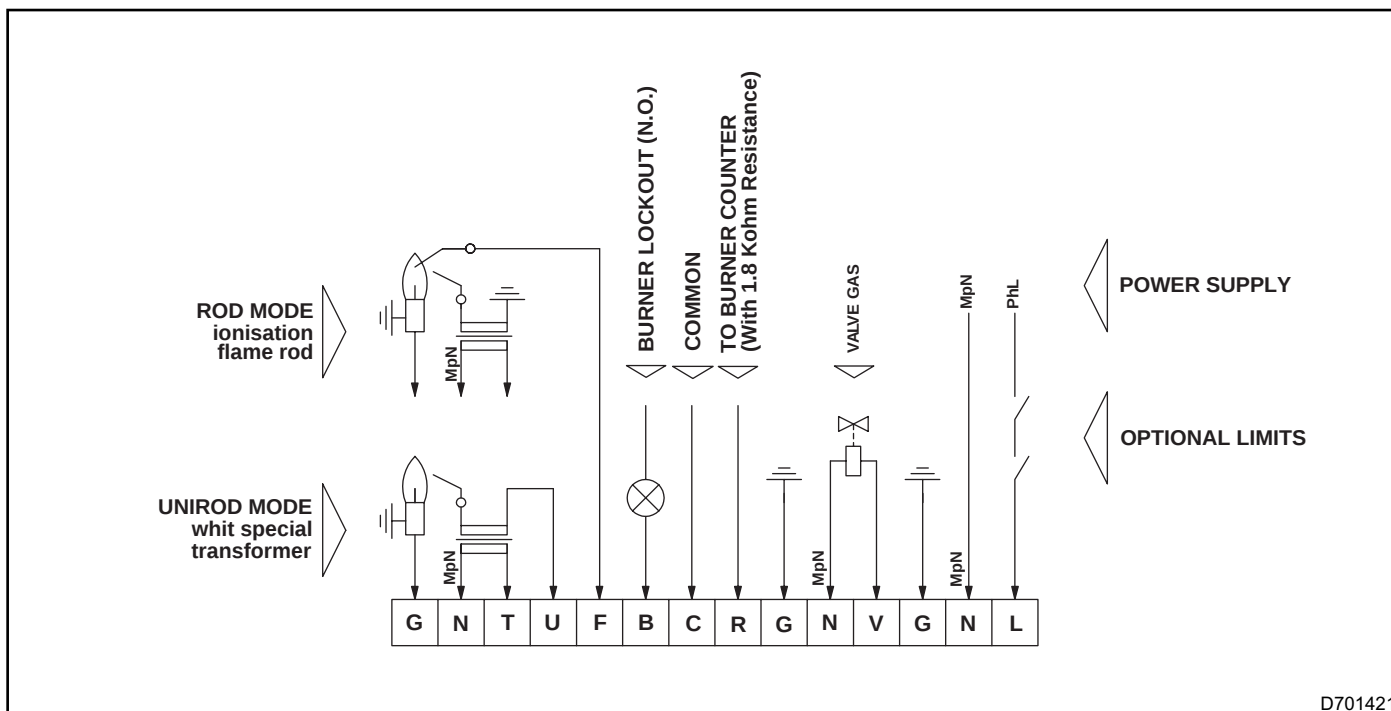
Preformed holes	Diameter mm	Gland
1	19	PG11 - M20x1
2-3-4-5-12	16	PG9 - M16x1
6-8-10-11 *	16	PG9 - M16x1
7-9 *	19	PG11 - M20x1

* The mounting of the gland precludes the possibility of using cable 6÷11 passages.

Pos.	Elements
A	For fixing the transformer
C	Not used
D	Not used
E - E	Not used
F	Terminal for grounding
G - G	Rear mounting plate or collar (tube ½ ") - M6

The installation of expansion cards, precludes the possibility to mount the transformer inside ESA ESTRO, in which case the ESA TRAFO box must be used to contain the ignition transformer (E5004).

OVERALL DIMENSIONS



D701421

Pos.	Description	Pos.	Description
G	Earth protection of burner frame	R	Output for burner count (resistance di 1.8Kohm)
N	Neutral ignition transformer	G	Earth protection
T	Ignition transformer phase	N	Neutral gas valve 1st stage
U	Unirod input signal	V	Phase gas valve 1st stage
F	Flame detection input	G	Earth protection
B	Burner output in lockout (N.O.)	N	Neutral power
C	Common for output lockout or burner count	L	Power phase

ORDERING CODE

ESA GENIO

01	02	03	04	05	06	07
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CYLCE START		01
Automatic start (autostart)	A	

PREVENTILATES		02
from 0 to 65 seconds (see tab.pag.4)	(*)	

1° SAFETY TIME		03
3 seconds	03	
5 seconds	05	
7 seconds	07	
10 seconds	10	

1st GAS STAGE OUTPUT		04
Intermittent (continuous)	C	

05	SPECIAL	
	Standard	/
	Transformer installation	T
	Rack version	R
	Wiring	C
	Combined with Esa Trafo	A

06	VOLTAGE SUPPLY	
	115 V ac +10 -15%	115
	230 V ac +10 -15%	230

07	BEHAVIOUR AT FLAME FAILURE	
	Lockout stop	N
	Activates recirculation	Y

(*) enter the value (in seconds)

ESA worldwide distribution



AUTHORIZED DISTRIBUTION STAMP



*If you have any doubt about the qualification or identity of the distributor, please check that they appear on our website **www.esapyronics.com** in the Sales Contacts section, or contact us directly at **esa@esacombustion.it***



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