



# SLOVENSKI STANDARD

## oSIST prEN 12067-2:2020

01-februar-2020

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### Regulatorji razmerja plina in zraka za plinske gorilnike in plinske aparate - 2. del: Elektronski tip

Gas/air ratio controls for gas burners and gas burning appliances - Part 2: Electronic types

Gas-Luft-Verbundregleinrichtungen für Gasbrenner und Gasgeräte - Teil 2:  
Elektronische Ausführung

Dispositifs de régulation du rapport air/gaz pour brûleurs à gaz et appareils à gaz - Partie 2: Dispositifs électroniques

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Ta slovenski standard je istoveten z: prEN 12067-2

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#### ICS:

23.060.40	Tlačni regulatorji	Pressure regulators
27.060.20	Plinski gorilniki	Gas fuel burners

oSIST prEN 12067-2:2020

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 12067-2**

November 2019

ICS

Will supersede EN 12067-2:2004

English Version

## Gas/air ratio controls for gas burners and gas burning appliances - Part 2: Electronic types

Dispositifs de régulation du rapport air/gaz pour brûleurs à gaz et appareils à gaz - Partie 2: Dispositifs électroniques

Gas-Luft-Verbundregleinrichtungen für Gasbrenner und Gasgeräte - Teil 2: Elektronische Ausführung

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 58.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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**prEN 12067-2:2019 (E)****European foreword**

This document (prEN 12067-2:2019) has been prepared by Technical Committee CEN/TC 58 “Safety and control devices for burners and appliances burning gaseous or liquid fuels”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 12067-2:2004.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directives.

For relationship with EU Directives, see informative Annexes ZA and ZB, which are integral parts of this document.

It should be noted that the following significant changes compared to the previous edition have been incorporated in this European Standard:

- a) alignment with EN 13611:2019;
- b) title changed to include liquid fuel and to bring it in line with the title of EN 13611:2019
- b) integration of the requirements for fuel/air ratio using oil as the fuel;
- c) addition of the control types ERS and ERT and
- d) updating to EN 60730-1:2016;
- e) update requirements for fault reaction time and fault tolerating time;
- f) updating the Annexes for sensors and actuators (see, Annex AA);
- g) including the use of pressure and combustion products sensing devices already conforming to EN 1854:2010, EN 60730-2-6:2016, and EN 16340:2014 respectively;
- h) new Annex Guideline for the integration of ERC, ERS or ERT into the appliances (see, Annex DD);
- i) new Annex Guideline for the definition of limits for safe operation on the appliance (see, Annex EE.)
- j) new Annex Requirements for using alternative actuators on application level (see, Annex FF.)



## Introduction

This document recognizes the safety philosophy specified by CEN/TC 58 dealing with the safety, construction and performance of controls for burners and appliances burning gaseous or liquid fuels and to their testing.

This document refers to clauses of EN 13611:2019 and adapts them, indicating the changes by stating “with the following modification”, “with the following addition”, “is replaced by the following” or “is not applicable”. It also adds clauses or subclauses to the structure of EN 13611:2019 which are particular to this standard (prEN 12067-2:2019). Additional subclauses or annexes are either numbered starting from 101 or are designated as Annex AA, BB, CC etc. However, it should be noted that these clauses and subclauses are not indicated as additions in the text.

EN 12067-2 compliance for electronic fuel/air ratio control system cannot be claimed based upon SIL classification in accordance with EN 61508.

SIL classification cannot be claimed based upon compliance with this document only. A supplementary method for SIL determination is specified in EN 13611:2019, Annex J.

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**prEN 12067-2:2019 (E)****1 Scope**

This document specifies the safety, construction and performance requirements for electronic fuel/air ratio control system (ERC), electronic fuel/air ratio supervision system (ERS) and electronic fuel/air ratio trim system (ERT) intended for use with burners and appliances burning gaseous or liquid fuels. It also describes the test procedures for evaluating these requirements and specifies information necessary for installation and use.

This document is applicable to

- closed loop fuel/air ratio control systems, see 3.101;
- fuel/air ratio supervision systems, see 3.102;
- closed loop fuel/air ratio trim systems, see 3.103;

and does not differentiate into classification by heat input.

NOTE 1 European Standards for burners, appliances or processes which use ERC, ERS or ERT can override the requirements of this document.

NOTE 2 Provisions for production control are not part of this document.

**2 Normative references**

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 88-1:2011+ A1:2016, Pressure regulators and associated safety devices for gas appliances — Part 1: Pressure regulators for inlet pressures up to and including 50 kPa

EN 298:2012, *Automatic burner control systems for burners and appliances burning gaseous or liquid fuels*

EN 267:2019, *Forced draught burners for liquid fuels*

EN 676:2019, *Forced draught burners for gaseous fuels*

EN 1854:2010, *Pressure sensing devices for gas burners and gas burning appliances*

EN 13611:2019, *Safety and control devices for burners and appliances burning gaseous and/or liquid fuels - General requirements*

EN 16340:2014, *Safety and control devices for burners and appliances burning gaseous or liquid fuels - Combustion product sensing devices*

EN 60730-1:2016, *Automatic electrical controls - Part 1: General requirements*

EN 60730-2-6:2016, *Automatic electrical controls - Part 2-6: Particular requirements for automatic electrical pressure sensing controls including mechanical requirements*

EN 60529:1991+A2:2013, *Degrees of protection provided by enclosures (IP Code)*

EN 61000-6-2, *Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments*

EN 61000-6-4, *Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13611:2019 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

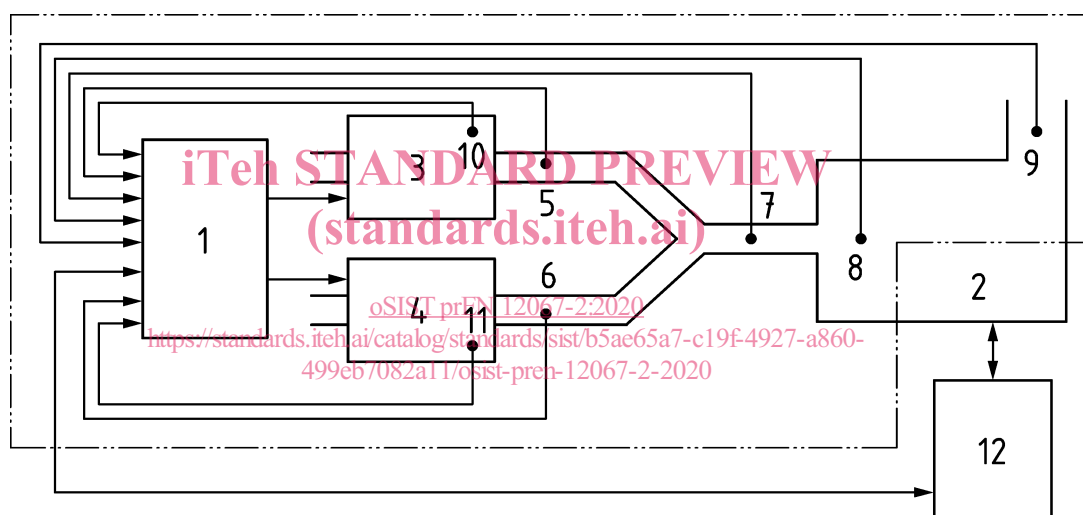
- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

#### 3.101

##### electronic fuel/air ratio control system (ERC)

closed loop system consisting of the electronic control unit, actuating elements for the fuel flow and the air flow as a minimum, and allocated feedback signal(s)

Note 1 to entry: Figure 1 shows an example of different feedback alternatives. For details, see also Table 1.



#### Key

1	electronic control unit (ECU)	8	sensor flame
2	combustion process	9	sensor flue gas
3	actuator air	10	actuator air feedback
4	actuator fuel	11	actuator fuel feedback
5	sensor air	12	automatic burner control system
6	sensor fuel		
7	sensor fuel/air mixture	-----	scope of ERC

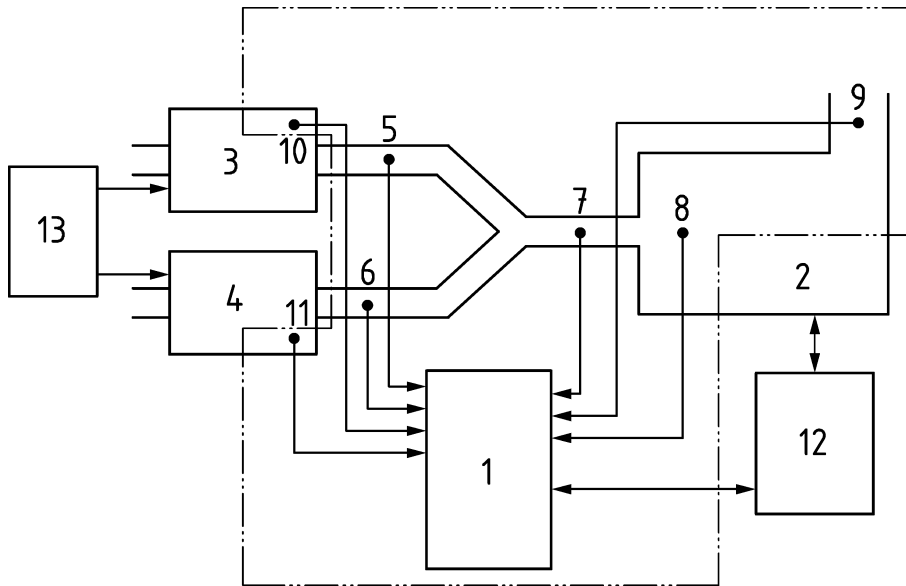
**Figure 1 — Scope of the electronic fuel/air ratio control system (ERC)**

#### 3.102

##### electronic fuel/air ratio supervision system (ERS)

supervision system consisting of electronic control unit and sensor(s), providing at least one output signal to indicate if the combustion process is in safe state or not

Note 1 to entry: Figure 2 shows an example of different feedback alternatives. For details, see also Table 1.



**Key**

- |   |                               |    |                                 |
|---|-------------------------------|----|---------------------------------|
| 1 | electronic control unit (ECU) | 8  | sensor flame                    |
| 2 | combustion process            | 9  | sensor flue gas                 |
| 3 | actuator air                  | 10 | actuator air feedback           |
| 4 | actuator fuel                 | 11 | actuator fuel feedback          |
| 5 | sensor air                    | 12 | automatic burner control system |
| 6 | sensor fuel                   | 13 | arbitrary control               |
| 7 | sensor fuel/air mixture       |    |                                 |

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----- scope of ERS  
oSIST prEN 12067-2:2020

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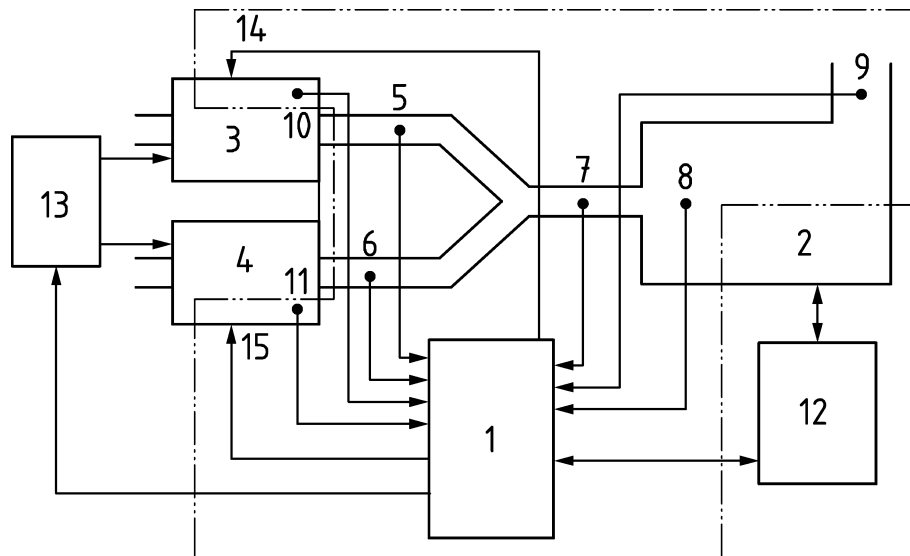
**Figure 2 — Scope of the electronic fuel/air ratio supervision system (ERS)**

**3.103**

**electronic fuel/air ratio trim system (ERT)**

closed loop system consisting of the electronic control unit, actuating element(s) or control output(s) to influence the fuel/air ratio controlled by other means, and the allocated feedback signal(s)

Note 1 to entry: Figure 3 shows an example of different feedback alternatives. For details, see also Table 1.

**Key**

1	electronic control unit (ECU)	9	sensor flue gas
2	combustion process	10	actuator air feedback
3	actuator air	11	actuator fuel feedback
4	actuator fuel	12	automatic burner control system
5	sensor air	13	arbitrary control
6	sensor fuel	14	trim signal air
7	sensor fuel/air mixture	15	trim signal fuel
8	sensor flame		

oSIST scope of ERT:2020  
<https://standards.iteh.ai/catalog/standards/sist/b5ae65a7-c19f-4927-a860-499eb7082a11/osist-pr-en-12067-2-2020>

**Figure 3 — Scope of the electronic fuel/air ratio trim system (ERT)**

**3.104****electronic control unit (ECU)**

electronic main control module incorporating all inputs and outputs for the ERC, ERS or ERT function

**3.105****actuator**

device for controlling the amount of fuel and/or air

**3.106****sensor**

device which gives a signal related to a physical property to which it responds

**3.107****combustion process**

chemical reaction between fuel and air to produce heat

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**3.108 safe state**

state of the system with the following characteristics:

- a) the system passively assumes a state in which the output signal(s) ensure a safe situation under all circumstances or;
- b) the system actively executes a protective action causing it to shutdown and lock-out, or;
- c) the system remains in operation, continuing to satisfy all safety related functional requirements

**3.109 fault tolerating time (FTT)**

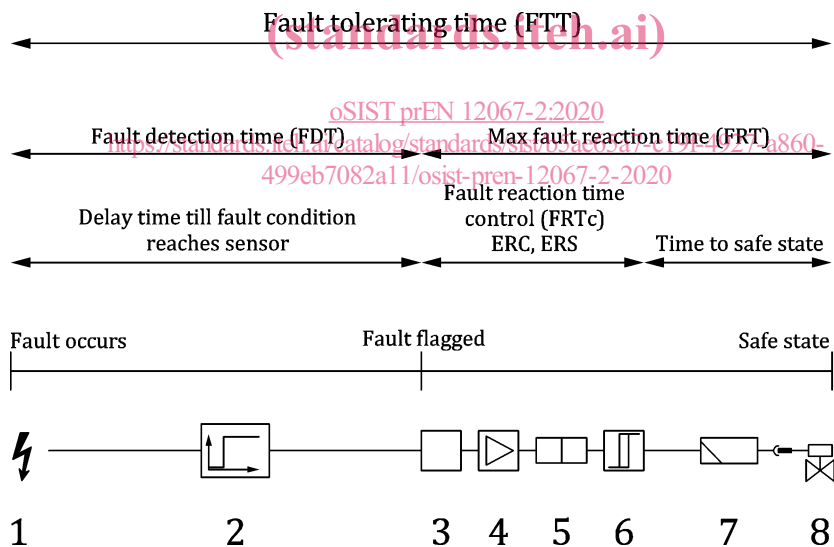
time between the occurrence of a fault and reaching a safe state, which is tolerated by the application without resulting in a hazardous situation

Note 1 to entry: For illustration of the fault tolerating time, see Figure 4.

**3.110 Fault reaction time control (FRTc)**

time that the ERC, ERS or ERT needs from the moment the fault condition reaches the sensor to the moment of an initialization to reach a safe state

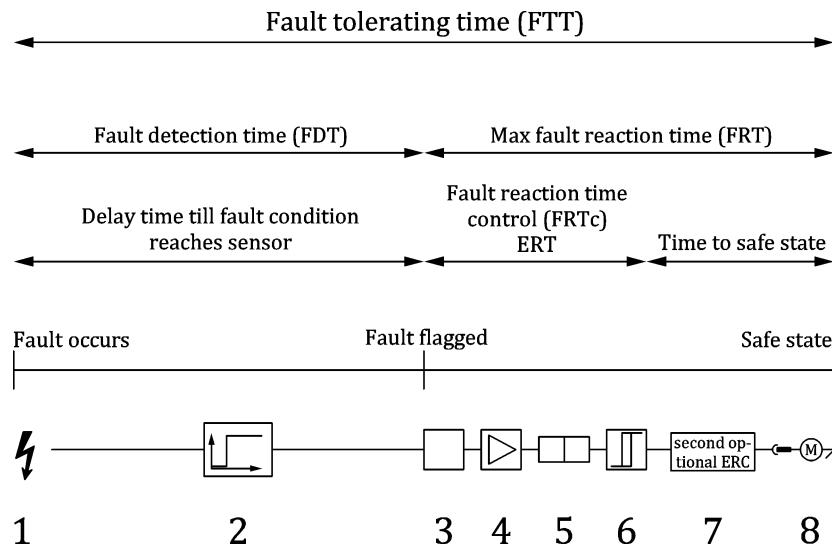
Note 1 to entry: For illustration of the fault reaction time control for ERC and ERS, see Figure 4.



- Key**
- 1 Fuel/air ratio moves outside of the safe area of the application
  - 2 effect of fault condition reaches the sensor
  - 3 sensor e.g. position sensors, flue gas sensors outputs effect of fault
  - 4 sensor output is amplified
  - 5 amplified signal passes filter
  - 6 effect of fault condition is flagged by limit switch
  - 7 flag is processed by automatic burner control
  - 8 safe state is reached

**Figure 4 — Relationship between fault tolerating time and fault reaction time control for ERC and ERS**

Note 2 to entry: For illustration of the fault reaction time control for ERT, see Figure 5.



**Key**

- 1 Fuel/air ratio moves outside the safe area of the application
- 2 effect of fault condition reaches the sensor
- 3 Sensor e.g. position sensors, flue gas outputs effect of fault
- 4 sensor output is amplified
- 5 amplified signal passes filter
- 6 effect of fault condition is flagged by limit switch
- 7 flag is processed by automatic burner control
- 8 (Trimming) actuating element influences the fuel/air ratio

**Figure 5 — Relationship between fault reaction time control for ERT**

**3.111**

**non-volatile lock-out**

safety shutdown condition of the system, where a restart can only be accomplished by a manual reset of the system and by no other means

[SOURCE: EN 298:2012, 3.121.1]

**3.112**

**volatile lock-out**

safety shutdown condition of the system, where a restart can only be accomplished by either a manual reset of the system or an interruption of the mains power and its subsequent restoration

[SOURCE: EN 298:2012, 3.121.2]

**3.113**

**normal operation**

operation of the ERC, ERS or ERT control system within its specification including the effect of influences which may occur during intended operation

Note 1 to entry: Examples of influences on sensors are given in Table AA.1.

**3.114**

**abnormal operation**

operation under the effect of internal failures of the ERC, ERS or ERT control system