

REC27.100A2

Basic unit with integrated fuel / air ratio control for forced draft burners



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1 Safety notes

1.1 Warning notes



WARNING

To avoid injury to persons, damage to property or the environment, the following warning notes must be observed!

The REC27.100A2 is safety devices! Do not interfere with or modify the units.

The chapters covering the REC27.100A2 contain additional warning notes which should also be observed when using the different unit versions!

After commissioning and after each service visit, check the flue gas values across the entire load range!

The present Basic Documentation describes a wide choice of applications and functions and shall serve as a guideline. The correct functioning of the units is to be checked and proven by function checks on a test rig or on the plant itself!

- All activities (mounting, installation and service work, etc.) must be performed by qualified staff.
- Degree of protection IP40 as per DIN EN 60 529 for the basic unit must be ensured through adequate mounting by the burner or boiler manufacturer.
- Before performing any work in the connection area of the REC27.100A2, disconnect the unit from the mains supply (all-polar disconnection). If plant is not shut down, there is a risk of electric shock.
- Protection against electric shock hazard on the REC27.100A2 and on all connected electrical components must be ensured through adequate mounting.
- After each activity (mounting, installation and service work, etc.), check to ensure that wiring is in an orderly state and that the parameters are correctly set.
- Fall or shock can adversely affect the safety functions. Such units must not be put into operation even if they do not exhibit any damage.

- When programming the fuel / air ratio control curves, the commissioning engineer is obliged to constantly watch the quality of the combustion process (e.g. by means of a flue gas analyzer) and, in the event of poor combustion values or dangerous conditions, take appropriate actions, e.g. by shutting down the system manually.
- The connectors of the connecting cables for the RDI21.10A9 display and operating unit or other accessories, such as the OCI410 (plugged into the BCI interface), may only be removed or exchanged when the plant is shut down (all-polar disconnection), since the BCI interface does not provide safe separation from mains voltage.
- The connections for the SQM3... or SQN1... actuators do not provide safe separation from mains voltage. Prior to connecting or changing one of these actuators, the plant must be shut down (all-polar disconnection).

To ensure safety and reliability of the REC27.100A2 system, the following points must also be observed:

- Condensation and ingress of humidity must be avoided. Should such conditions occur, make sure that the unit will be completely dry before switching on again!
- Static charges must be avoided since they can damage the unit's electronic components when touched.

Recommendation: Use ESD equipment

- If the unit fuse was blown due to overload or a short-circuit at the connection terminals, the REC27.100A2 must be replaced since the switching contacts might have been damaged.
- If error codes 95...98 appear during operation, this may be an indication of contact problems and the REC27.100A2 should be replaced.

1.2 Mounting notes

- Ensure that the relevant national safety regulations are complied with
- In the geographical areas where DIN regulations are in use, the requirements of VDE must be satisfied, especially DIN / VDE 0100, 0550 and DIN / VDE 0722
- Observe the European / Asian / North American regulations relating to standards
- The REC27.100A2 basic unit must be secured with fixing screws M4 (UNC32) or M5 (UNC24) by observing a maximum tightening torque of 1.8 Nm and by making use of all 4 fixing points. The additional mounting surfaces on the housing are provided to improve mechanical stability. These must fully rest on the mounting surface to which the unit is secured. The flatness of that mounting surface must be within a tolerance band of 0.3 mm.

1.3 Setting and parameter setting notes

- When adjusting the electronic fuel / air ratio control system integrated in the REC27.100A2, allow for sufficient amounts of excess air since – over a period of time – the flue gas settings will be affected by a number of factors (e.g. density of air, wear of actuators and controlling elements, etc.). For this reason, the flue gas values initially set must be checked at regular intervals.
- To safeguard against inadvertent or unauthorized parameter transmissions from the PC software to the burner control, the OEM must assign an individual burner identification (ID) for each burner. Compliance with this regulation is mandatory to ensure that the REC27.100A2 system will prevent parameter sets of some other plant (with unsuited and possibly dangerous parameter values) from being transmitted to the REC27.100A2 system via the PC tool. In addition, the fuel / air ratio control parameters must be manually approached and the combustion values checked.
- With the REC27.100A2 system, it is to be noted that the unit's characteristics are determined primarily by the specific parameter settings rather than the type of unit. This means that, among other things, each time a plant is commissioned, the parameter settings must be checked and the REC27.100A2 must not be transferred from one plant to another without adapting the parameter settings to the new plant.
- When using the ACS410 PC software, the safety notes given in the relevant Operating Instructions (CC1J7352) must also be observed.
- A password protects the parameter level against unauthorized access. The OEM allocates individual passwords to the setting levels he can access. The standard passwords used by Siemens must be changed by the OEM. These passwords are confidential and may only be given to persons authorized to access such setting levels.
- The responsibility for setting the parameters lies with the person who – in accordance with his access rights – made changes to the respective setting level.

NOTA:

In particular, the OEM (burner and / or boiler manufacturer) will assume responsibility for the correct parameter settings in compliance with the standards covering the specific applications (e.g. EN 676, EN 267, EN 1643, etc.).

1.4 Standards and certificates



Conformity to EEC Directives

- Electromagnetic compatibility EMC (immunity)
- Directive for gas-fired appliances
- Low-voltage directive

2004/108/EC

90/396/EEC

2006/95/EC



ISO 9001: 2000
Cert. 00739



ISO 14001: 2004
Cert. 38233



1.5 Service notes

1.5.1 Disposal notes



The unit contains electrical and electronic components and must not be disposed of together with household waste.

Legal and currently valid legislation must be observed.

17 Operating the RDI21.10A9 unit

17.1 Description of the unit / display and buttons

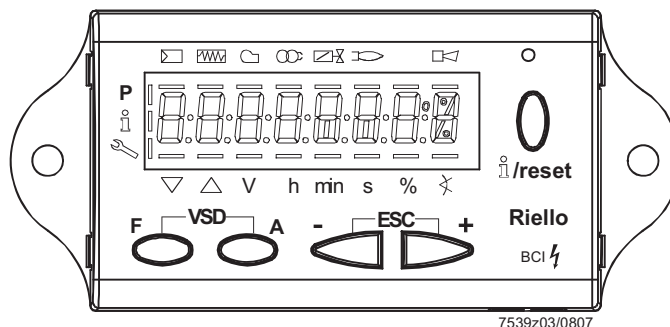








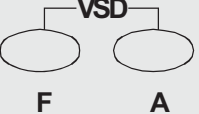







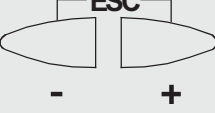




Figure 44: Description of the unit / display and buttons

Button	Function
 F	Button F - For adjusting the fuel actuator (keep  depressed and adjust the value by pressing  or )
 A	Button A - For adjusting the air actuator (keep  depressed and adjust the value pressing  or )
 F A	Buttons A and F - For changing to parameter setting mode P (press simultaneously  and  plus  or )
 info	Info and Enter button - For navigating in info or service mode * Selection (symbol flashing) (press button for <1 s) * For changing to a lower menu level (press button for 1...3 s) * For changing to a higher menu level (press button for 3...8 s) * For changing the operating mode (press button for > 8 s) - Enter in parameter setting mode - Reset in the event of fault - One menu level down
 -	- button - For decreasing the value - For navigating during curve adjustments in info or service mode
 +	+ button - For increasing the value - For navigating during curve adjustments in info or service mode
 - +	+ and - button: Escape function (press  and  simultaneously) - No adoption of value - One menu level up

17.2

Meaning of symbols on the display

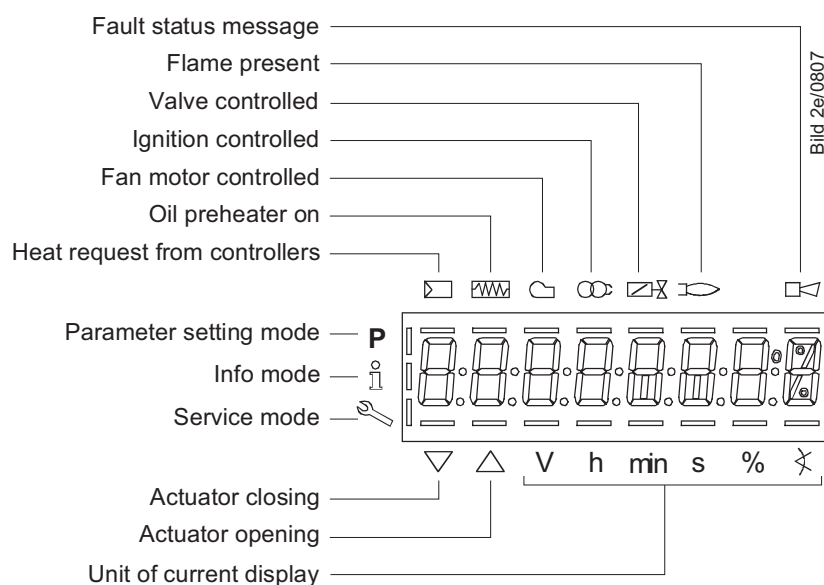


Figure 45: Display

17.3

Brightness of the display

Only available with backlit LCD:

The function of the backlit display is dependent on the type of basic unit used.


The brightness of the display can be adjusted from 0...100 % via parameter 126.

The brightness of the display can be adjusted from 0...100 % using the following parameter:

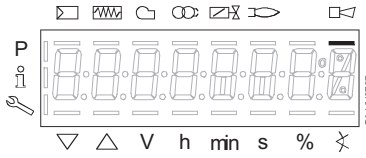
No.	Parameter
126	Brightness of display

17.4 Special functions


17.4.1 Manual lockout



info
plus other button




Bld 3/07/07

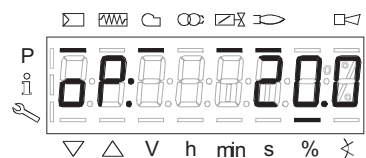
Press  **together** with any other button.

The basic unit switches instantly to the lockout position, no matter what the operating position.

The display shows the fault status message, except when in parameter setting mode.

17.4.2 Manual control (manual request for output)






Bld 4/07/07

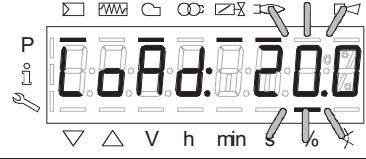
Burner is in operation.

The display shows **oP:** on the left, the **percentage** of the current output on the right.


Example: **oP: 20.0**



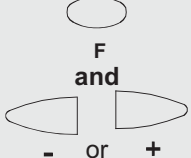
F
1 s



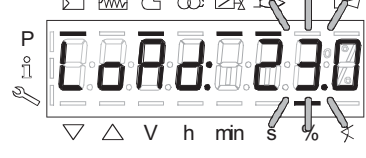
Bld 5/07/07

Press  for 1 s.



The display shows **LoAd:**, the current output flashes.




F
and
- or **+**

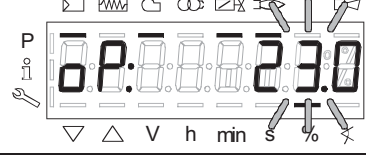


Bld 6/07/07


Press  or  to adjust the required manual output.

Example: **oP: 23.0**

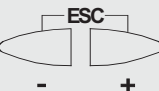




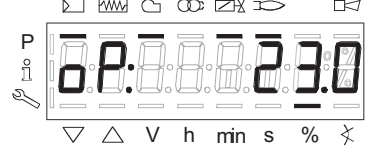
Bld 7/07/07

Release .

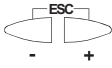
The current manual output flashes, indicating that manual control is activated.



ESC
- **+**



Bld 8/07/07

Press  for 3 s to return to automatic mode.

The output no longer flashes.

The display shows **oP:** on the left, the **percentage** value on the right.

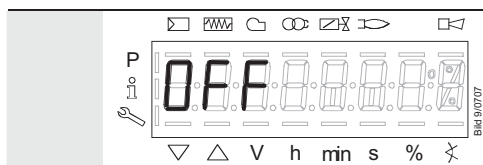
Example: **oP: 23.0**

18 Operation basic unit via RDI21.10A9

18.1 Normal display

Normal display is the standard display in normal operation, representing the highest menu level. From the normal display, you can change to the info, service or parameter level.

18.1.1 Display in standby mode



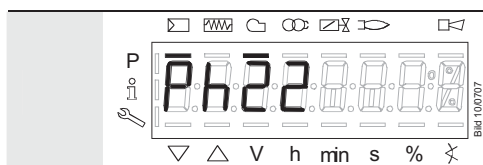
Unit is in standby mode.


Note:

OFF flashes when the manual OFF function is activated.

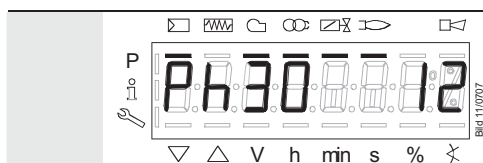
18.1.2 Display during startup / shutdown

18.1.2.1. Display of program phases



The unit is in **Phase 22**. The controller calls for heat. The bar below the  symbol appears. The individual program phases and controlled components are displayed in accordance with the program sequence.

18.1.2.2. Display of program phase with remaining running time until end of the phase is reached



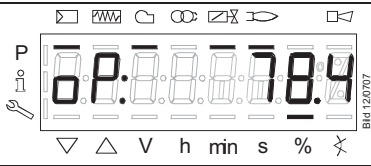
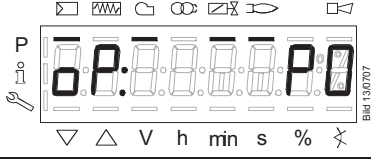
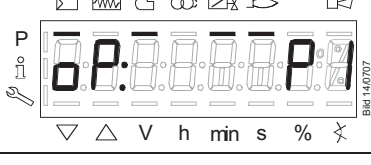
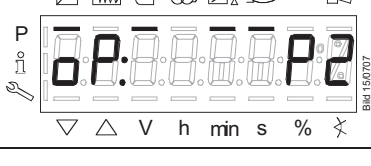
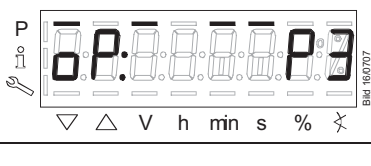
The unit is in **Phase 30** and shows the remaining running time in that phase.

Example: 12 s, Phase 30

18.1.2.3. List of phase displays

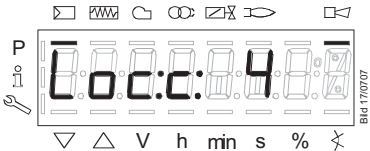


Phase	Function
Ph00	Lockout phase
Ph01	Safety phase
Ph10	t10 = home run
Ph12	Standby (stationary)
Ph22	t22 = fan ramp up time (fan motor = ON, safety shutoff valve = ON)
Ph24	Traveling to the prepurge position
Ph30	t1 = prepurge time
Ph36	Traveling to the ignition position
Ph38	t3 = preignition time
Ph40	TSA1= 1st safety time (ignition transformer ON)
Ph42	TSA1 = 1st safety time (ignition transformer OFF), t42 = preignition time OFF
Ph44	t44 = interval 1
Ph50	TSA2 = 2nd safety time
Ph52	t52 = interval 2
Ph60	Operation 1 (stationary)
Ph62	t62 = max. time low-fire (operation 2, preparing for shutdown, traveling to low-fire)
Ph70	t13 = afterburn time
Ph72	Traveling to the postpurge position
Ph74	t8 = postpurge time
Ph80	t80 = valve proving test evacuation time
Ph81	t81 = leakage time test time atmospheric pressure, atmospheric test
Ph82	t82 = leakage test filling test, filling
Ph83	t83 = leakage test time gas pressure, pressure test
Ph90	Gas shortage waiting time

18.1.3 Display of operating position


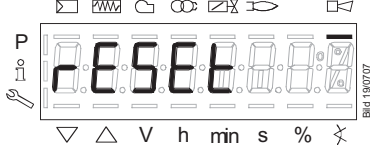

	<p>Display oP stands for «Operating position reached».</p> <p>Modulating mode: Current output in %</p>
	<p>Display oP: P0 stands for «Ignition point».</p> <p>Multistage mode: Current fuel stage</p>
	<p>Display oP: P1 stands for «Stage 1».</p> <p>Multistage mode: Current fuel stage</p>
	<p>Display oP: P2 stands for «Stage 2».</p> <p>Multistage mode: Current fuel stage</p>
	<p>Display oP: P3 stands for «Stage 3».</p> <p>Multistage mode: Current fuel stage</p>

18.1.4 Fault status message, display of errors and info




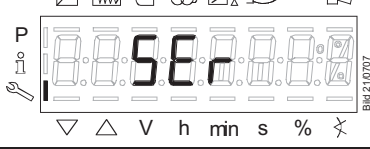


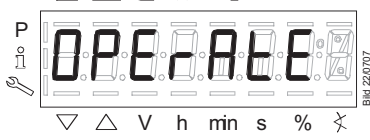
18.1.4.1. Display of errors (faults) with lockout

	<p>The display shows Loc.; the bar under the fault status message  appears.</p> <p>The unit is in the lockout position.</p>
	<p>The display shows current error code c: alternating with diagnostic code d: (refer to «Blink code list»).</p> <p>Example: Error code 4 / diagnostic code 3</p>

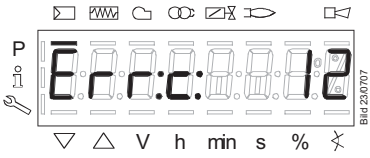
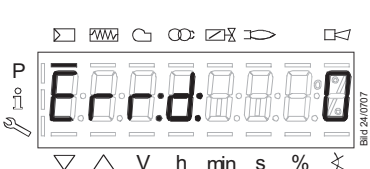

18.1.4.2. Reset

		<p>When pressing  for 1 s, rESEt appears on the display.</p> <p>When the button is released, the basic unit will be reset.</p>
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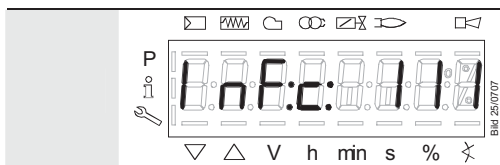
18.1.4.3. Activating info / service mode from lockout

		
		<p>When pressing  for >3 s, the display shows InFo, SEr and then OPeRAtE.</p>
		<p>When the button is released, a change to info / service mode will be made.</p>

18.1.4.4. Error with safety shutdown

	<p>The display shows Err.</p> <p>The unit initiates safety shutdown.</p>
	<p>The display shows current error code c: alternating with diagnostic code d:.</p> <p>Press  to return to the normal display.</p> <p>Example: Error code 12 / diagnostic code 0</p>


18.1.4.5. General information



The unit displays an event which does not lead to shutdown.

The display shows current error code **c**: alternating with diagnostic code **d**.



Press  to return to the display of phases.

Example: Error code **111** / diagnostic ode **0**

Note:

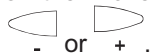
For meaning of the error and diagnostic codes, refer to section «Error code list». When an error has been acknowledged, it can still be read out from the error history.



20 Info level

The info level displays information about the basic unit and operation in general.




Note:

On the info level, you can display the next or the previous parameter by pressing



Instead of pressing , you can also press  for <1 s.

Note:

Press   or  for >3 s to return to the normal display.

Note:

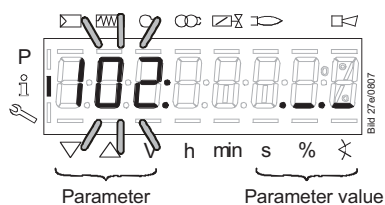






Fig. 47: Info level

No change of values on the info level!

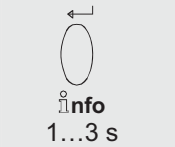
If the display shows  below the parameter value, the value may consist of more than 5 digits.

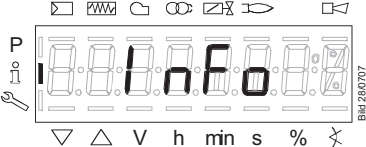
The value is displayed by pressing  for > 1 s and < 3 s.


Press  for > 3 s or press   to return to the selection of the parameter numbers (parameter no. flashes).


No.	Parameter
Info level	
167	Fuel volume resettable (m ³ , l, ft ³ , gal)
162	Operating hours resettable
163	Device operating hours with power applied
164	Startups resettable
166	Total number of startups
113	Burner identification
107	Software version
108	Software variant
102	Identification date
103	Identification number
104	Parameter set preassignment: Customer code
105	Parameter set preassignment: Version
143	Reserved
End	

20.1 Display of info level



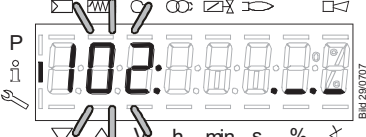


Press  until **InFo** appears.

When releasing , you are on the info level.

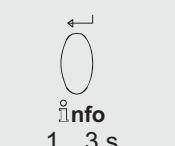
20.2 Display of info values (examples)

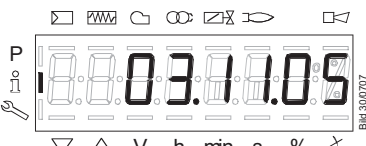
20.2.1 Identification date




The display shows parameter **102**: flashing on the left, characters **_._** on the right.

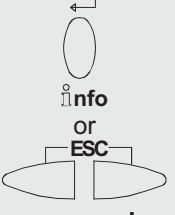
Example: **102**: **_._**

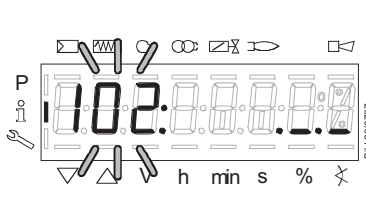






Press  for 1...3 s to show the identification date **TT.MM.JJ.**

Example: Identification date **03.11.05**



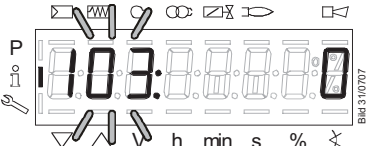


Press  for >3 s or  to return to the display of parameters.

To the next parameter



20.2.2 Identification number




The display shows parameter **103**: flashing on the left, identification number **0** on the right.

Example: **103**: **0**

To the next parameter



or  **<1s**



Back to the previous parameter

20.2.3 Identification of burner

		<p>The display shows parameter 113: flashing on the left, characters ._. on the right.</p> <p>Example: 113: ._.</p>
<p>info 1...3 s</p>		<p>Press for 1...3 s to show the burner's identification.</p> <p>Default setting: -----</p> <p>Example: 3</p>
<p>info or ESC</p>		<p>Press or to return to the display of parameters.</p>

The burner's identification can be set on the parameter level!

To the next parameter			Back to the previous parameter
-----------------------	--	--	--------------------------------

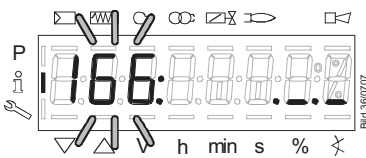
20.2.4 Number of startups resettable

		<p>The display shows parameter 164: flashing on the left, characters ._. on the right, since display of the number of startups may comprise more than 5 digits.</p> <p>Example: Parameter 164: ._.</p>
<p>info 1...3 s</p>		<p>Press for 1...3 s to show the number of startups (resettable).</p> <p>Example: 36</p>
<p>info or ESC</p>		<p>Press or to show parameter 164 flashing again.</p>

The number of startups can be reset on the parameter level!


To the next parameter			Back to the previous parameter
-----------------------	--	--	--------------------------------

20.2.5 Total number of startups

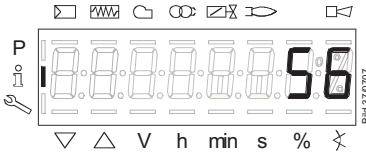


The display shows parameter **166**: flashing on the left, characters **. _ . _** on the right, since the display of the total number of startups may comprise more than 5 digits.

Example: Parameter **166**: **. _ . _**




info
1...3 s



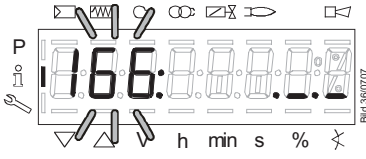
Press **info** for 1...3 s to show the total number of startups.

Example: **56**



info
or
ESC

- **+**



Press **info** or **-** **+** to return to the display of parameters.

To the next parameter



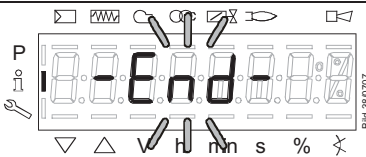
+



-

Back to the previous parameter


20.2.6 End of the info level




When this display appears, you have reached the end of the info level.

The display shows **– End –** flashing.


To the start of the info level



+

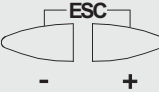


or **info**
<1s




-

Back to the previous parameter

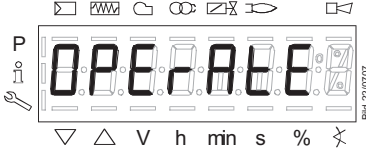


- **+**

or

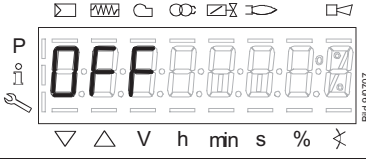


info
> 3 s



Press **info** for >3 s or **-** **+** to return to the normal display.

OPERATE appears for a short moment.







When this display appears, you are back on the normal display and you can change to the next level mode.

21 Service level



The service level is used to display information about errors including the error history and information about the basic unit.

Note:

When on the service level, you can press  or  to display the next or the previous parameter.

Instead of pressing , you can also press  for <1 s.

Note:

Press  or  for >3 s to return to the normal display.

Note:

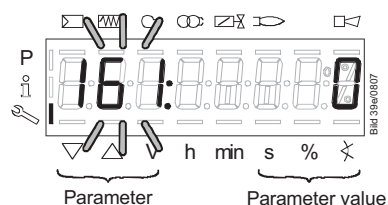





Figure 48: Service level


No change of values on the service level.

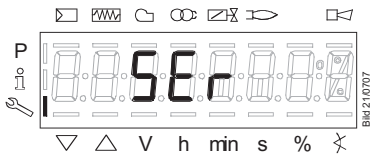
If characters **---** are displayed by the parameter, the value may consist of more than 5 digits.


Press  for >1 s and < 3 s to display the value.


Press  for >3 s or  to return to the selection of the parameter number (flashing).

21.1 Display of the service level





Press  for >3 s until **SEr** appears.

When releasing , you are on the service level.

No.	Parameter
Service level	
954	Flame intensity
960	Actual fuel throughput in unit of volume / h (m ³ /h, l/h, ft ³ /h, gal/h)
121	Manual output Undefined = automatic operation
922	Step position of actuators Index 0 = fuel Index 1 = air
161	Number of faults
701	Fault history: 701-725.01.Code
.	
.	
725	

21.2 Display of service values (example)

21.2.1 Number of faults

		<p>The display shows parameter 161: flashing on the left, the number of faults that occurred thus far on the right 0.</p> <p>Example: Parameter 161: 0</p>
--	--	--

<p>To the next parameter</p>		<p>Back to the previous parameter</p>
------------------------------	--	---------------------------------------

21.2.2 Error history

Refer to section «Parameter with index, without direct display / Example of parameter 701: Error history»!



Can be deleted for service (refer to chapter 23 «Parameter list»)!

21.2.3 Intensity of flame

		<p>The display shows parameter 954: flashing on the left.</p> <p>On the right, the flame's intensity is displayed as a percentage.</p> <p>Example: 954: 0.0</p>
--	--	--

<p>To the next parameter</p>		<p>Back to the previous parameter</p>
------------------------------	--	---------------------------------------

21.2.4 End of the service level

		<p>When this display appears, you have reached the end of the service level.</p> <p>Display – End – appears flashing.</p>
--	--	--

<p>To the start of the service level</p>		<p>Back to the previous parameter</p>
--	--	---------------------------------------

		<p>Press to return to the normal display.</p> <p>OPERAtE appears for a short moment.</p>
--	--	--

		<p>When this display appears, you are back on the normal display and you can change to the next level mode.</p>
--	--	---

22 Parameter level

The parameters stored in the basic unit can be displayed or changed on the parameter level.

The change to the parameter level requires a password.

Siemens supplies the REC27.100A2 gas burner controls with the factory settings according to «Type summary».

The OEM can change the Siemens default settings to match his own requirements.

With the REC27.100A2, the burner control's characteristics are determined primarily through parameterization. Every time the unit is recommissioned, the parameter settings must be checked. The REC27.100A2 must never be transferred from one plant to another without matching the parameters to the new plant.



Caution

Parameters and settings may only be changed by **qualified staff**.

If parameters are changed, responsibility for the new parameter settings is assumed by the person who – in accordance with the access rights – has made parameter changes on the respective access level.

After parameterization, the OEM must check to ensure that safe burner operation will be warranted.

The OEM which made the settings is always responsible for the parameters, their settings and compliance of the respective application with the relevant national and international standards and safety regulations, such as EN 676, EN 267, EN 1643, etc.

Siemens, its suppliers and other Group Companies of Siemens Ltd. do not assume responsibility for special or indirect damage, consequential damage, other damage, or damage resulting from wrong parameterization.



Warning

If the factory settings are changed, all changes made must be documented and checked by the OEM.

The OEM is obliged to mark the unit accordingly and to include at least the list of device parameters and settings in the burner's documentation.

Siemens also recommends attaching an additional mark on the REC27.100A2 in the form of an adhesive label. According to EN 298, the label should be easy to read and wipe proof.

The label with a maximum size of 70 mm x 45 mm can be attached to the upper part of the housing.

Example of label:

OEM logo	
Type / part no.: 1234567890ABCD	
<u>CAUTION! OEM settings:</u>	
Parameter no.	
225 = 30 s (t1)	226 = 2 s (t3)
230 = 10 s (t4)	234 = 0 s (t8)
240 = 1 (repetition)	
257 = 2 s (t3n)	TSA = t3n + 0.7 s
259 = 30 s (t11)	
260 = 30 s (t12)	

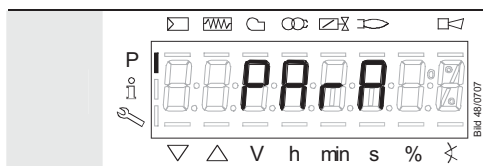
22.1 Entering the password



Note

The **OEM's** password must consist of **5** characters, that for the **heating engineer** of **4** characters.

		<p>Press button combination to display CodE.</p>
		<p>When releasing the buttons, 8 bars appear the first of which flashes.</p>
		<p>Press or to select a number or letter.</p>
		<p>Press to confirm the value.</p> <p>The value entered changes to a minus sign (-).</p> <p>The next bar starts flashing.</p>
		<p>Press or to select a number or letter.</p>
		<p>After entry of the last character, the password must be confirmed by pressing .</p> <p>Example: Password consisting of 4 characters.</p>



As a confirmation of correct entry, **PArA** appears for a maximum of 2 s.

Note:

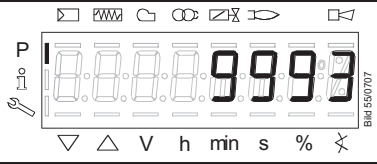
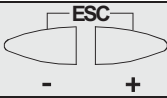
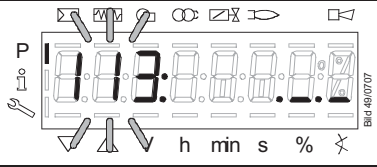

For the entry of passwords or burner IDs, the following numbers and letters can be used:

	= 1		= A		= L
	= 2		= b		= n
	= 3		= C		= o
	= 4		= d		= P
	= 5		= E		= r
	= 6		= F		= S
	= 7		= G		= t
	= 8		= H		= u
	= 9		= I		= Y
	= 0		= J		

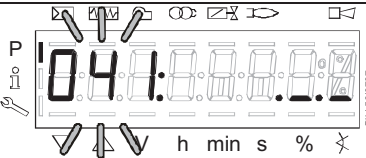


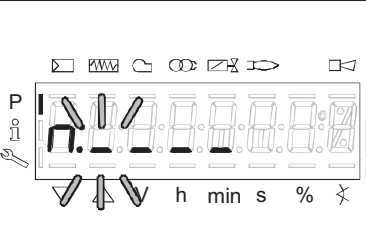


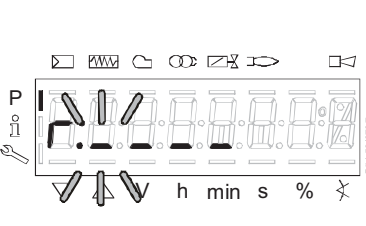


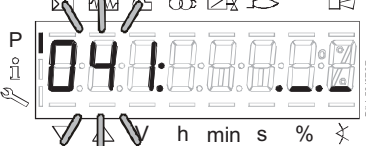
22.2 Entering the burner's identification

The burner's identification is to be entered like a password (character by character), but from right to left and concluding with “_”.

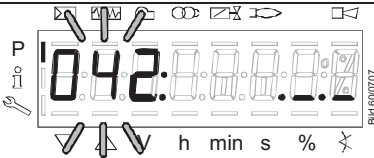

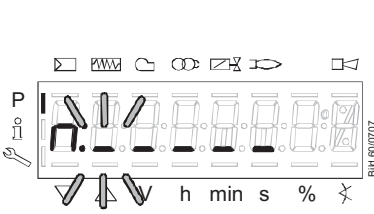

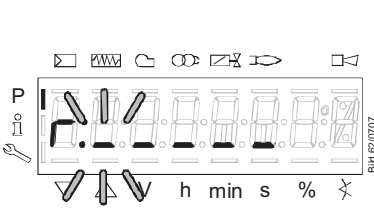


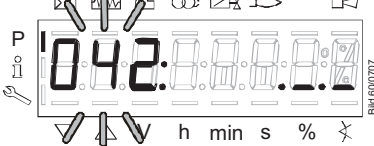
		<p>Parameter 113: flashes.</p> <p>Press to go to editing mode.</p>
		<p>You are on the display for undefined burner identification.</p> <p>8 bars appear.</p>
		<p>Press or to select a number.</p> <p>Example: Number 3 flashes</p>
		<p>Press to confirm the value.</p> <p>Make the entry number by number</p>
		<p>Press or to select the next number.</p> <p>Example: Number 9 flashes</p>
	<p style="text-align: center;">• • •</p>	<p>After entry of the last number, burner identification must be confirmed by pressing .</p>

	<p>The display no longer flashes. Example: Burner identification 9993</p>
	
	<p>Press  to return to the parameter level. PARAmeter 113: for burner identification</p>

22.3 Changing the heating engineer's password

		<p>Parameter 041: flashes.</p> <p>Press  to go to level c: for password changes.</p>
		<p>Letter n: for new appears flashing.</p> <p>Proceed as described in section «Entering the password» and enter the new password (4 characters).</p> <p>After entry of the last character, the password must be confirmed by pressing .</p>
		<p>Letter r: for repeat appears flashing.</p> <p>Proceed as described in section «Entering the password» and repeat entry of the new password.</p> <p>After entry of the last character, the password must be confirmed by pressing .</p>
		<p>SEt confirms that the new password has been saved.</p>
		<p>Parameter 041: flashes again.</p>

22.4 Changing the OEM's password

	<p>Parameter 042: flashes.</p> <p>Press  to go to level c: for password changes.</p>
	<p>Letter n: for new appears flashing.</p> <p>Proceed as described in section «Entering the password» and enter the new password (5 characters).</p> <p>After entry of the last character, the password must be confirmed by pressing .</p>
	<p>Letter r: for repeat appears flashing.</p> <p>Proceed as described in section «Entering the password» and repeat entry of the new password.</p> <p>After entry of the last character, the password must be confirmed by pressing .</p>
	<p>SEt confirms that the new password has been saved.</p>
	<p>Parameter 042: flashes again.</p>

22.5 Use of the parameter level

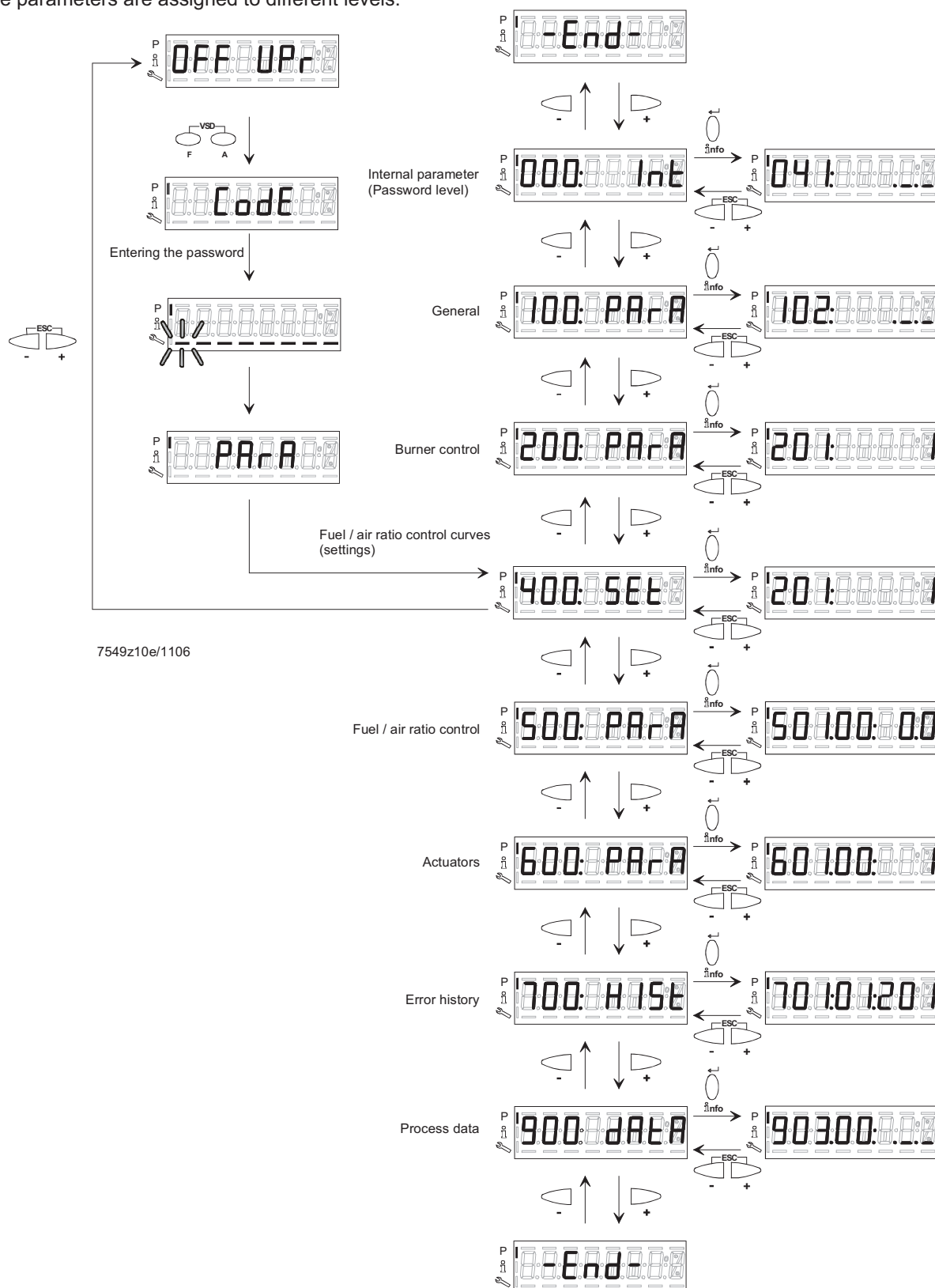
The parameters stored in the REC27.100A2 basic unit can be displayed and changed on the parameter level.

Normally, all parameters have been set by the burner manufacturer – with the exception of those for the fuel train and for fuel / air ratio control.

A description of parameter level **400**, which is used for setting the fuel train and the ratio curve, is given in chapter «Fuel / air ratio curves – settings and commissioning».

22.6 Assignment of the parameter levels

The parameters are assigned to different levels.



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The following sections explain the operating philosophy behind the parameter levels using a number of examples.



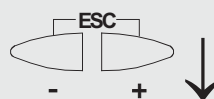
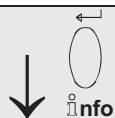
Chapter «Safety notes on settings and parameterization» must be particularly observed!

22.7 Parameters without index, with direct display

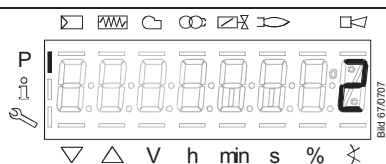
22.7.1 Using the example of parameter 208: Program stop

		<p>ParAmeter level 200: for burner controls.</p>
		<p>Press to go to menu level 200:</p>
		<p>Press + to select «Program stop».</p> <p>Display: Parameter 208: flashes, value 0 does not.</p>
		<p>Press to go to editing mode.</p> <p>Display: Program stop time set Here: Value 0 → corresponding to program stop deactivated</p>
		<p>Press or to select the required program stop time.</p> <p>0 = deactivated 1 = PrePurgP (Ph24) 2 = IgnitPos (Ph36) 3 = Interv1 (Ph44) 4 = Interv2 (Ph52)</p> <p>Example: 2 IgnitPos (Ph36)</p>

Adopt the value!



Discard the change!



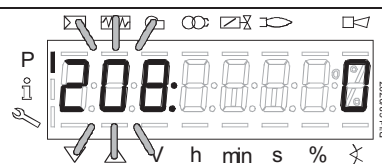
Press  to return to editing mode.

The value set will be adopted.

Note:

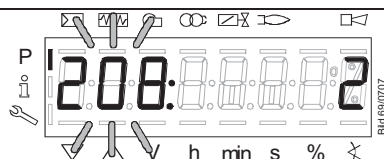
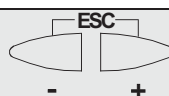
To detect potential display errors, the value is displayed one position shifted to the right.


Display: Value 2



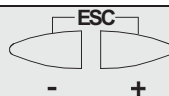
Press - + to return to the parameter level.


Display: Parameter 208: flashes, value 0 does not.



Press  to return to the parameter level.

PArAmeter 208: flashes, value 2 does not.



Press  to return to the parameter level.

PArAmeter 200: for burner controls.

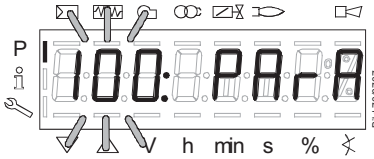



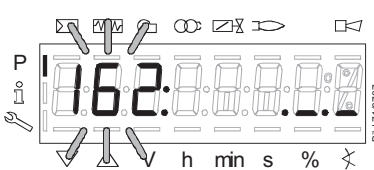


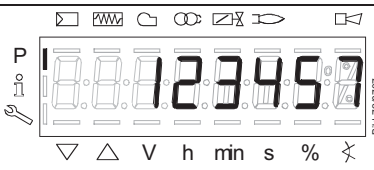

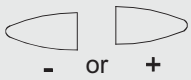
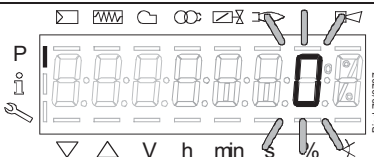


To the next parameter level



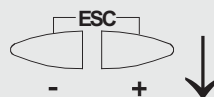
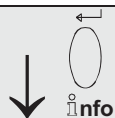
Back to the previous parameter level

22.8 Parameters without index, with no direct display (with parameters having a value range > 5 digits)

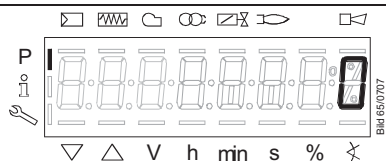
22.8.1 Using the example of parameter 162: Operating hours resettable

		<p>ParAmeter level 100: for general.</p>
		<p>Press  to go to menu level 100.</p>
		<p>Press  to select «Operating hours resettable».</p> <p>Display: Parameter 162: flashes, characters -.- do not.</p>
		
		<p>Press  to go to editing mode.</p> <p>Display: 123457</p>
		<p>You can press  or  to set the number of operating hours to 0.</p> <p>Display: Operating hours 0 flashes</p>

Adopt the value!



Discard the change!



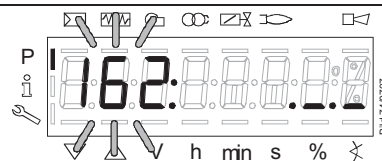
Press  to return to editing mode.

The value set will be adopted.

Note:

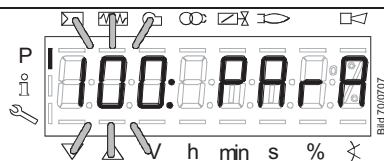
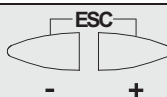
To detect potential display errors, the value is displayed one position shifted to the right.

Display: Value 0



Press - + to return to the parameter level.

Display: Parameter **162**: flashes, characters '---' do not.



Press - + to return to the parameter level.

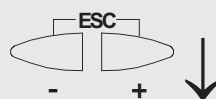
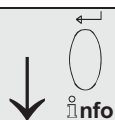
PArAmeter 100: for general

22.9 Parameter with index, with direct display

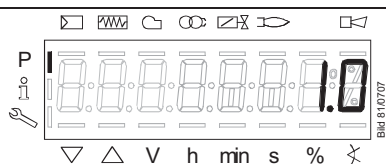
22.9.1 Using the example of parameter 501: Non-flame positions fuel actuator


		<p>ParAmeter level 500: for fuel / air ratio control.</p>
		<p>Press to go to menu level 500:</p> <p>Display: Parameter 501. flashes, index 00: and value 0.0 do not.</p>
		<p>Press to go to the index.</p> <p>Display: Parameter 501. does not flash, index 00: flashes, value 0.0 does not.</p>
- or +		<p>Press or to select the required index.</p> <p>.00 = no-load position .01 = prepurge position .02 = postpurge position</p> <p>Display: Index 01: for prepurge position flashes, value 0.0 does not.</p>
		<p>Press to go to editing mode.</p> <p>Display: Value 0.0</p>
- or +		<p>Press or to select the required prepurge position.</p> <p>Example: 1.0</p>

Adopt the value!



Discard the change!



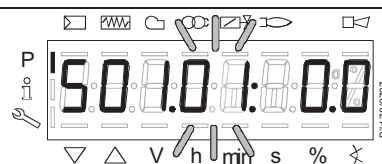
Press  to return to editing mode.

The value set will be adopted.

Note:

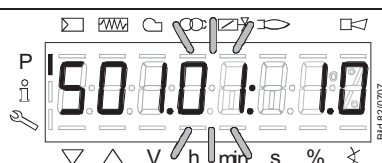
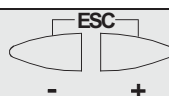
To detect potential display errors, the value is displayed one position shifted to the right.

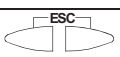
Display: Value 1.0



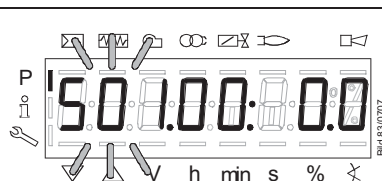
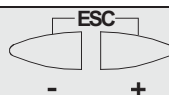
Press  to return to the index.


Display: Parameter **501**. does not flash, index **01**: flashes, value **0.0** has not changed and does not flash.



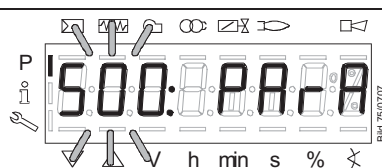
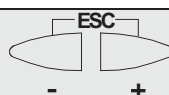
Press  to return to the index.


PArAmeter 501: does not flash, index **01**: flashes, value **1.0** does not.



Press  to return to the parameter level.

Display: Parameter **501**. flashes, index **00**: and value **0.0** do not.



Press  to return to the parameter level.

PArAmeter 500: for fuel / air ratio control.

22.10 Parameters with index, with no direct display

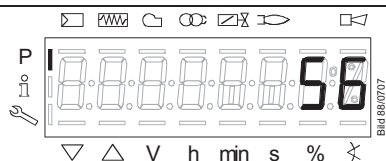
22.10.1 Using the example of parameter 701: Errors

Refer to chapter «Error code list»!



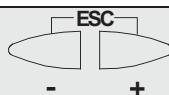
Can be deleted for service, refer to chapter «Parameter list»!

		<p>HISTorie 700: for error history.</p>
		<p>Press to go to the parameter level.</p>
		<p>Press to select parameter 701.</p> <p>Display: Parameter 701. flashes, index 01: and value 201 do not.</p>
		<p>Press to go to index 01:</p> <p>Display: Parameter 701. does not flash, index 01: flashes, value 201 does not.</p>
<p>To the next index</p>		<p>Back to the previous index</p>
		<p>Press to select the index:</p> <ul style="list-style-type: none"> .01 = error code .02 = diagnostic code .03 = error class .04 = error phase .05 = startup counter .06 = Load <p>Example: Parameter 701., index 05: for startup counter, diagnostic code ..</p>



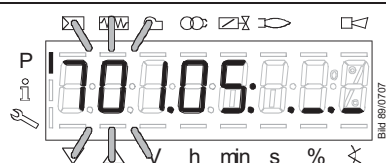
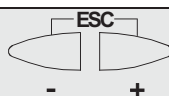
Press to go to display mode.

Display: Value **56**



Press to return to the index.

Display: Parameter **701.** does not flash, index **05:** flashes, characters **-. -** do not.



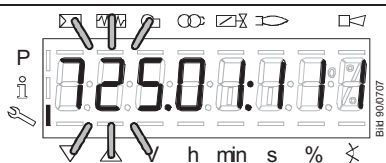
Press to return to the parameter level.

Display: Parameter **701.** flashes index **05:** does not, characters **-. -** do not.

To the next older error



•
•
•



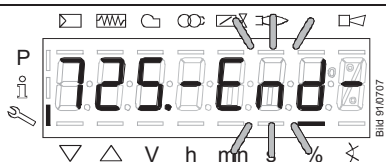
Parameters cover the period of time back to the last error since history was deleted (max. to parameter **725.**)

Example:
Parameter **725.**, index **01:**, error code **111**

To the next parameter



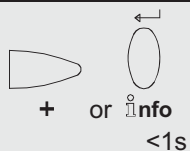
Back to the previous parameter



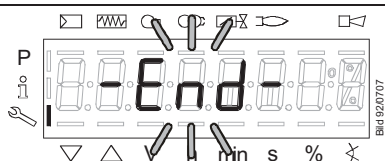
When this display appears, you have reached the end of the error history index.

Display **– End –** appears flashing.

To the next parameter

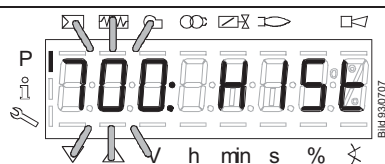
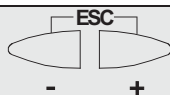


Back to the previous parameter



When this display appears, you have reached the end of the error history.

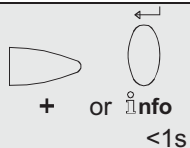
Display – **End** – appears flashing.



Press  to return to the parameter level.

HIST 700: for error history

To the next parameter



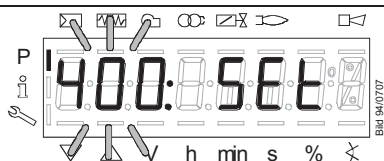
Back to the previous parameter



Note:

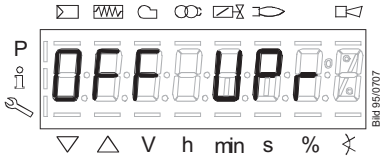
If you wish, you can delete the error history via parameter **130**.
To delete the display, set the parameter to **1** and then to **2**.
The error history is deleted when the parameter has returned to **0**.

22.11 Fuel / air ratio curves – settings and commissioning



The display shows **400:** flashing on the left, **SEt** appears on the right.

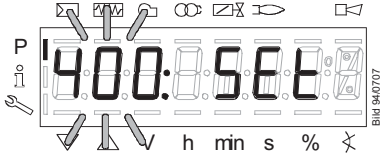
22.11.1 Initial commissioning




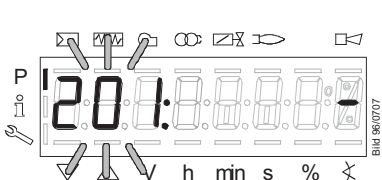
An unprogrammed unit or a unit whose operating mode has been reset or changed displays **OFF UPr**.


For initial commissioning, change to the parameter level (refer to chapter «Operation»).

The settings can then be made on parameter level **400**.



Press  to select parameter **400** for initial commissioning and for setting fuel / air ratio control.

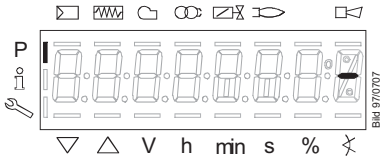



Press  to go to the settings for fuel / air ratio control and parameter **201** for selecting the operating mode.

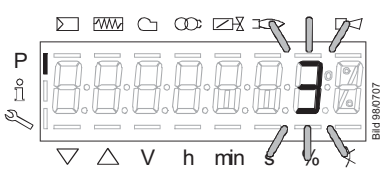
201: appears flashing.



Note: Ensure that the fuel train is correctly set in accordance with the type of burner.

No.	Parameter	Actuator controlled	
		Air	Fuel
201	Burner operating mode (fuel train, modulating / multi-stage, actuators, etc.)	x	x
	-- = undefined (delete curves)		
	1 = gas modulating (G mod)		
	2 = gas modulating with pilot valve (Gp1 mod)		
	3 = gas modulating with pilot valve (Gp2 mod)		
	4 = oil modulating (Lo mod)		
	5 = oil 2-stage (Lo 2 stage)		---
	6 = oil 3-stage (Lo 3 stage)		
	7 = gas modulating (G mod pneu)		
	8 = gas modulating (Gp1 mod pneu)		
	9 = gas modulating (Gp2 mod pneu)		



Press  to go to editing mode.



Press  or  to select the required setting.

Example: **3** for gas modulating with pilot valve (Gp2 mod)

Press to save the selected setting.

Press to return to the parameter level.

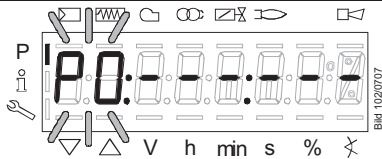
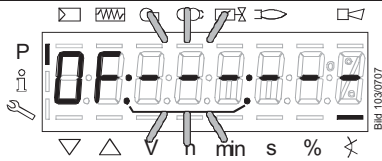

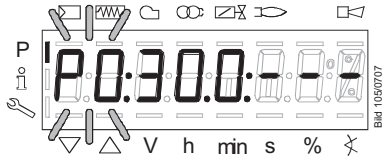



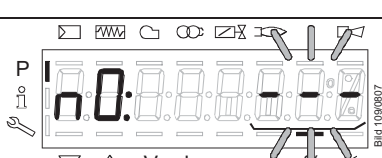
To the next parameter



- For operating modes 1, 2, 3, 4, 7, 8 and 9, refer to subsection «Setting curve points P0, P1 and P9 for modulating mode («Gmod», «Gp1 mod», «Gp2 mod» and «Lo mod»))»
- For operating modes 5 and 6, refer to subsection «Setting the curve points for multistage mode («Lo 2 stage» and «Lo 3 stage»))»

22.11.2 Setting curve points P0 and P9 for modulating mode («G mod», «Gp1 mod», «Gp2 mod» and «Lo mod»)

Example of «G mod»

		<p>Display P0 appears flashing.</p> <p>Curve point for ignition load.</p>
	<p>Keep F depressed.</p> <p>You are now in setting P0 of fuel setting F for ignition position P0.</p>	
	<p>Press simultaneously F and - or + to set ignition position P0 of the fuel damper.</p> <p>Example: 30.0</p>	
		<p>Release F.</p> <p>The selected value will be adopted.</p> <p>Example: 30.0</p>
	<p>Keep A depressed.</p> <p>You are now in setting P0 of air actuator A for ignition position P0.</p>	
	<p>Press simultaneously A and - or + to set ignition position P0 of the air actuator.</p> <p>Example: 22.0</p>	
		<p>Release A.</p> <p>The selected value will be adopted.</p> <p>Example: 22.0</p>
	<p>Keep F and A depressed.</p> <p>You are now in setting n0, speed n is for ignition position n0</p>	

Press simultaneously **F** and **A** and **-** or **+** to adjust speed **n0** of the load controller.

Example: **20.0**

Release **F** and **A**.

The selected value will be adopted.

Example: **20.0**

To the next curve point

~~Back to the previous curve point~~

Press **+**.

P9 appears flashing.

Curve point for high-fire.

Same procedure as with **P0**

Note:

If **-** is pressed first, the display jumps to 90!

To the next curve point

Back to the previous curve point

Press **+**.

The display shows **run** (identification of start for setting the curve parameters).

Note: When pressing **info**, you are given the choice of proceeding with the "warm settings" (refer to subsection «Warm settings for modulating mode («G mod», «Gp1 mod», «Gp2 mod» and «Lo mod»)» or, by pressing **ESC** **-** **+**, with the "cold settings" (refer to subsection «Cold settings for «G mod», «Gp1 mod», «Gp2 mod» and «Lo mod»)»).

22.11.3 Setting curve points P0 and P9 for «G mod pneu», «Gp1 mod pneu» and «Gp2 mod pneu»



Refer to subsection «Setting curve points P0 and P9 for modulating mode («G mod», «Gp1 mod», «Gp2 mod» and «Lo mod»)»!

Here, only the air must be adjusted with **A**.

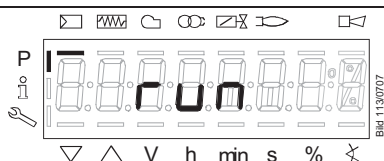
22.11.4 Warm settings for modulating mode («G mod», «Gp1 mod», «Gp2 mod» and «Lo mod»)

Note:

With the "warm settings", the burner is started up after pressing **InFo**. Fuel / air ratio control can now be accurately set while the flame is present. When traveling along the precalculated curve to high-fire point **P9**, all intermediate curve points (**P2...P8**) must be set.

Automatic operation is released when – after reaching **P9** – the curve settings are quit by pressing **ESC**. If the curve settings are aborted earlier (**ESC** or shutdown due to fault), start prevention **OFF UPr** continues to be active until all points are set.

If required, the gas pressure can be set at the high-fire point. In case the gas pressure is changed, all points must be checked by traveling along the curve downward and – if required – must be readjusted.



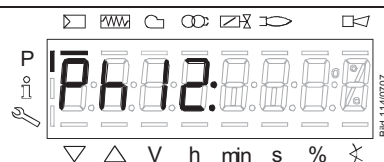
Identification of start for setting the curve parameters.



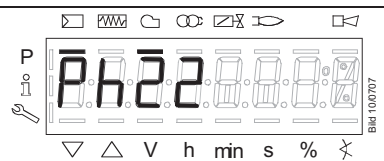
When there is a request for heat.

Note:

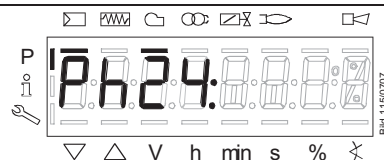
If, during the time the curve is parameterized, an error occurs which leads to safety shutdown, parameterization of the curve will be quit.



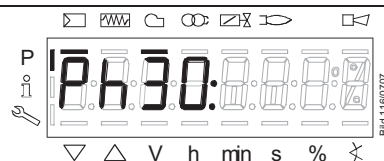
Phase «Standby» (stationary)



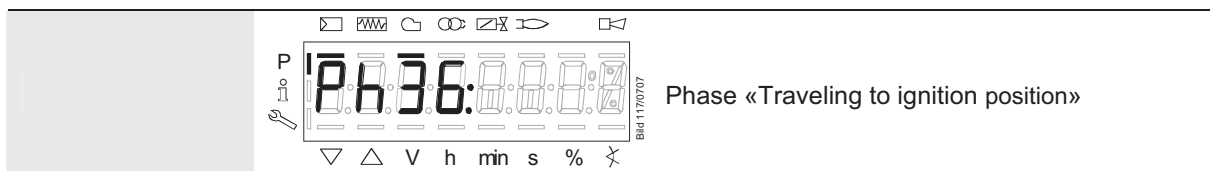
Phase «Fan ramp up» (fan motor = ON, safety shutoff valve = ON)



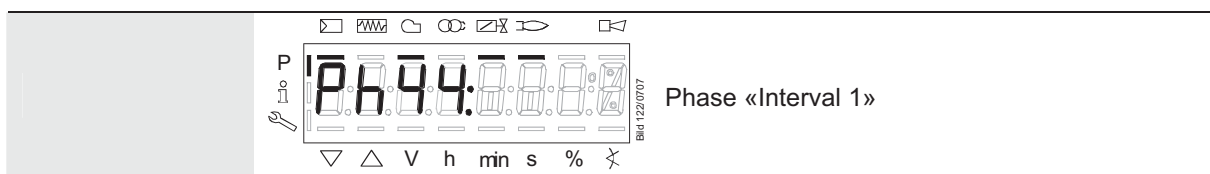
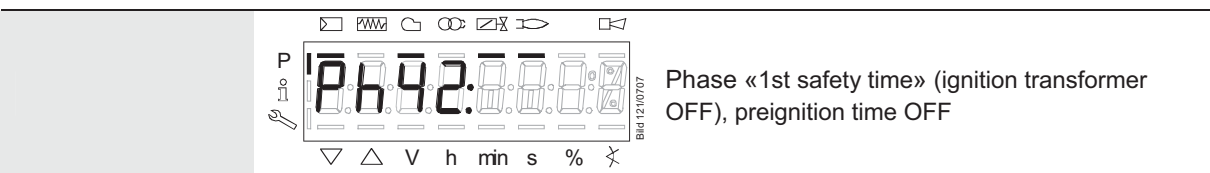
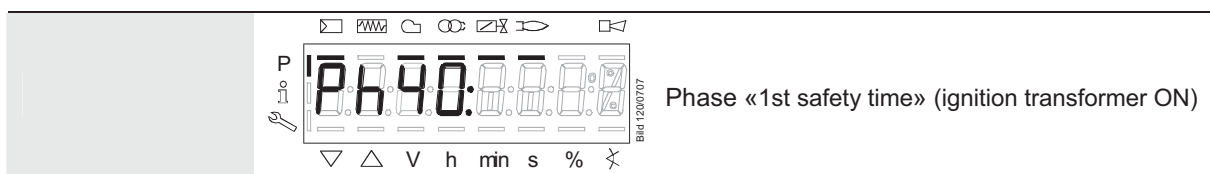
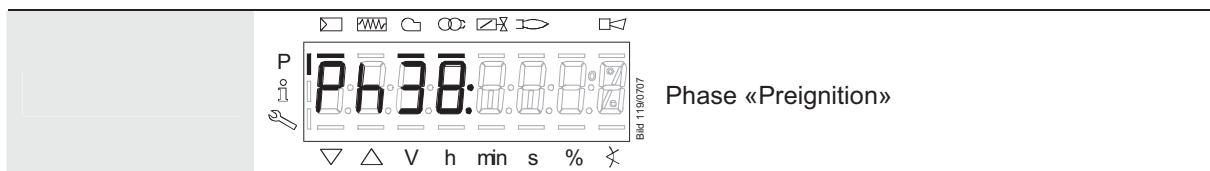
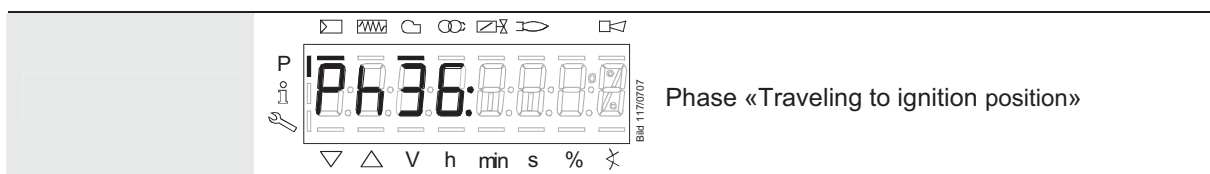
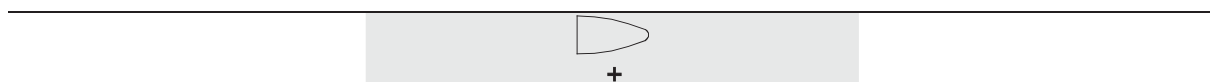
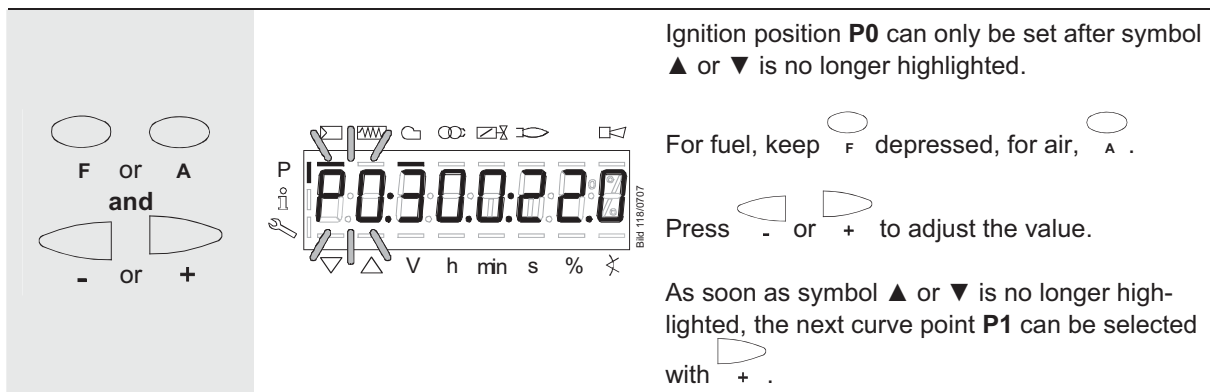
Phase «Traveling to prepurge position»





Phase «Purge»

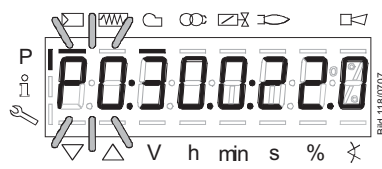


Wait until the burner is in operation and symbol ▲ or ▼ is no longer highlighted!
 The startup sequence stops in Phase 36 «Traveling to ignition position».
 The ignition position can be adjusted under "cold" conditions.







Starting the “warm settings”



F or A
and

- or +




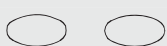

Ignition position **P0** can only be set when symbol ▲ or ▼ is no longer highlighted.

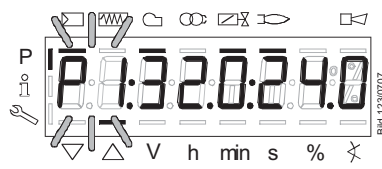
For fuel, keep  depressed, for air, .

Press  or  to adjust the value.

As soon as symbol ▲ or ▼ is no longer highlighted, the next curve point **P1** can be selected with .








F or A
and

- or +




Low-flame position **P1** can only be set when symbol ▲ or ▼ is no longer highlighted.

The value will be adopted from **P0**.

For fuel, keep  depressed, for air, .

Press  or  to adjust the value.

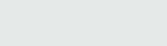
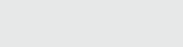
As soon as symbol ▲ or ▼ is no longer highlighted, the next curve point **P2** can be selected with .

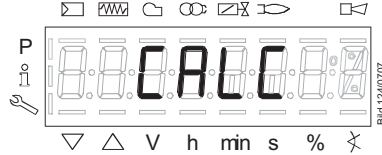
To the next curve point





Back to the previous curve point


F or A
and

- or +



When changing from **P1** to **P2** for the first time, curve points **P2...P8** will automatically be calculated and saved.

CALC appears for a short moment.

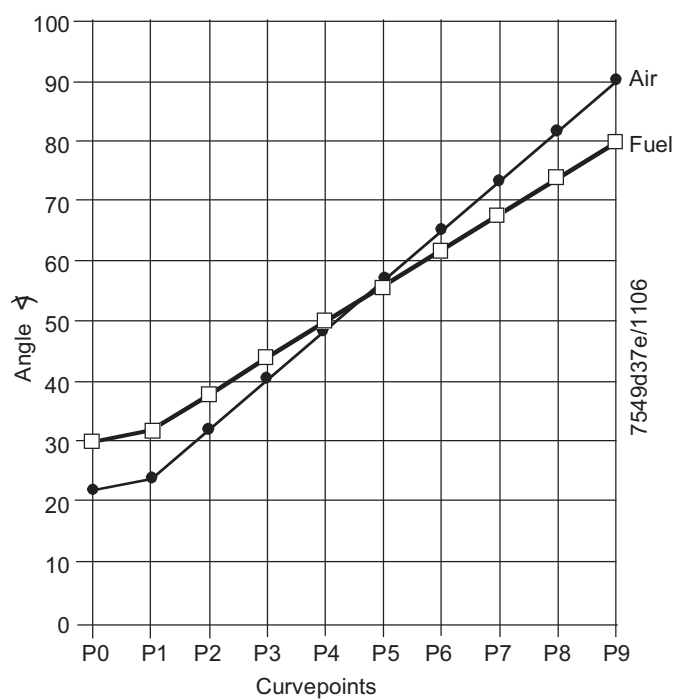


Figure 49: Setting the curve points

Note:
Curve points **P2 to P8** are automatically calculated as a straight line between **P1** and **P9**.

Example 1 = gas modulating

P0, P1 and P9 are set as described:	Curve point	Value 1 fuel	Value 2 air
	P0	30.0	22.0
	P1	32.0	24.0
	P9	80.0	90.0

P2 through P8 have automatically been calculated:	Curve point	Value 1 fuel	Value 2 air
	P2	38.0	32.3
	P3	44.0	40.5
	P4	50.0	48.8
	P5	56.0	57
	P6	62.0	65.3
	P7	68.0	73.5
	P8	74.0	81.8

Continue the same way with P2 through P9!

High-fire position **P9** can only be set when symbol ▲ or ▼ is no longer highlighted. If required, readjust the gas pressure.

For fuel, keep **F** depressed, for air, **A**.

Press **-** or **+** to adjust the value. As soon as symbol ▲ or ▼ is no longer highlighted, the next curve point **P8** can be selected with **-**.

After setting the high-fire point (P9), either a change to parameter 546 (automatic operation) can be made (Esc) or all curve points can be run through in the reverse order. If the gas pressure is changed, all curve points must be checked and – if required – readjusted.

-

+

The maximum capacity is displayed. If the display shows - - - -, the maximum capacity has not yet been specified. The system can be run up to 100 %.

You can press to go to editing mode, enabling you to change the maximum capacity.

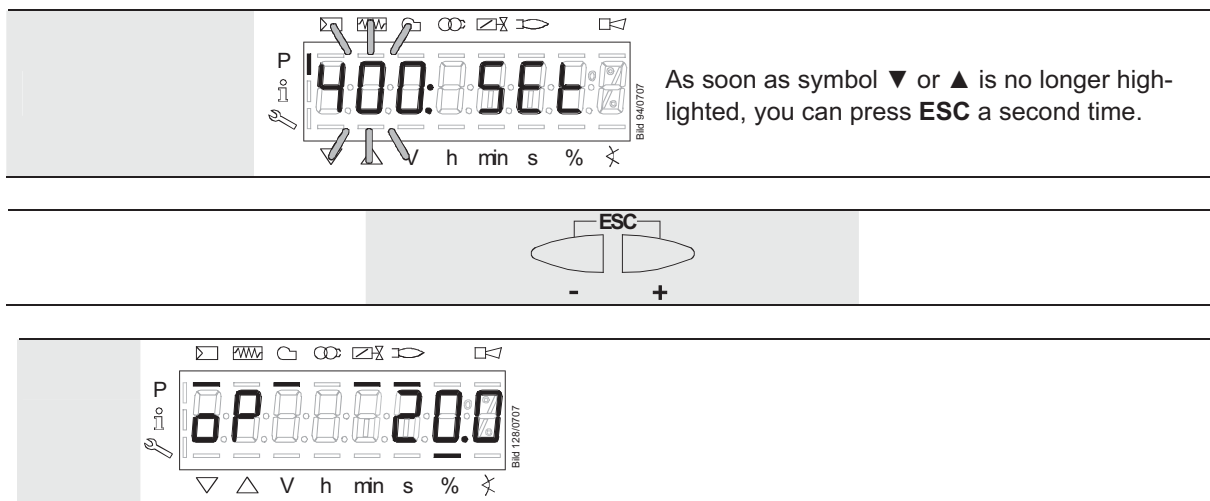
To the next parameter

The minimum capacity is displayed. If the display shows - - - -, the minimum capacity has not yet been entered. The system can be run down to 20 %.

You can press to go to editing mode, enabling you to change the minimum capacity.

Completing parameterization of the curve

Back to the previous parameter




The “warm settings” for fuel / air ratio control by the REC27.100A2 are now completed.

22.11.5 Warm settings for modulating mode («G mod pneu», «Gp1 mod pneu» and «Gp2 mod pneu»)



Refer to subsection «Warm settings for modulating mode («G mod», «Gp1 mod», «Gp2 mod» and «Lo mod»)!

Here, only the air must be adjusted with  .

22.11.6 Cold settings for «G mod», «Gp1 mod», «Gp2 mod» and «Lo mod»



Refer to subsection «Warm settings for modulating mode («G mod», «Gp1 mod», «Gp2 mod» and «Lo mod»)!


With no flame, however, no actuator travel and no automatic operation after the settings have been made.

22.11.7 Cold settings for «G mod pneu», «Gp1 mod pneu» and «Gp2 mod pneu»



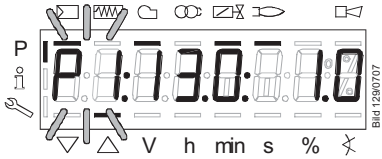

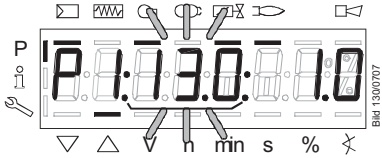

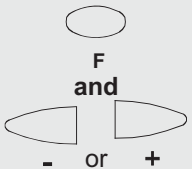
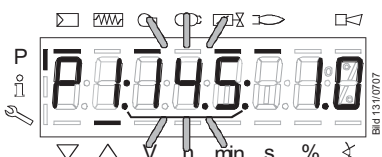



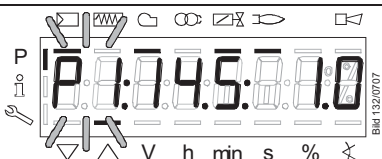




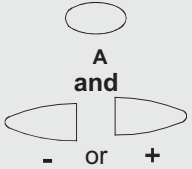
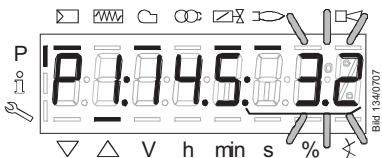



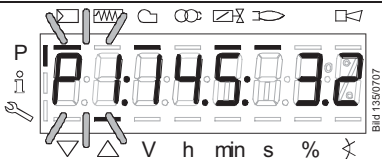





Refer to subsection «Warm settings for modulating mode («G mod», «Gp1 mod», «Gp2 mod» and «Lo mod»)!

With no flame, however, no actuator travel and no automatic operation after the settings have been made.

Here, only the air must be adjusted with  .

22.11.8 Editing the curve points

To the next curve point		or		To select the curve point
				The selected curve point is displayed.
				Keep  depressed. The fuel actuator has been selected for editing.
				Keep  depressed and press  or  to adjust the fuel actuator. In the case of "warm settings", the actuator follows directly the adjustments made. The changes are saved.
				After releasing  , the curve point is selected again.
				Keep  depressed. The air actuator has been selected for editing.
				Keep  depressed and press  or  to adjust the air actuator. In the case of "warm settings", the actuator follows directly the adjustments made. The changes are saved.
				After releasing  , the curve point is selected again.
To the next curve point				Back to the previous curve point

22.11.9 Interpolating the curve points

Identification of start for setting the curve parameters.

Example 1 = gas modulating

P0, P1 and P9 are set as described:	Curve point	Value 1 fuel	Value 2 air
	P0	30.0	22.0
	P1	32.0	24.0
	P9	80.0	90.0

P2 through P8 have automatically been calculated:	Curve point	Value 1 fuel	Value 2 air
	P2	38.0	32.3
	P3	44.0	40.5
	P4	50.0	48.8
	P5	56.0	57
	P6	62.0	65.3
	P7	68.0	73.5
	P8	74.0	81.8

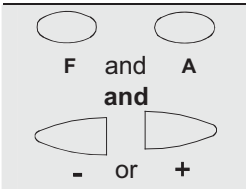
P5 shall now be changed:

Keep depressed.

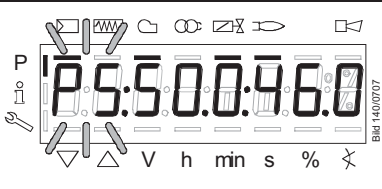
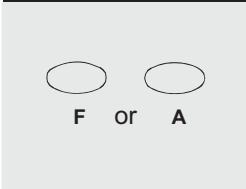
Example:

Press to change the value as required.

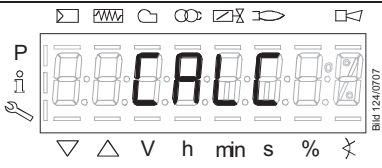
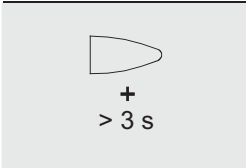
Example: 50.0



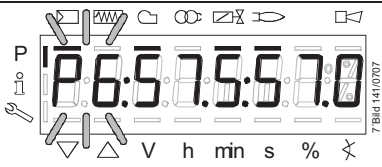
Press or to change the value as required.
Example: **00.0**



Release or .
The required value will be adopted.
Example: **P5:50.0:46.0**



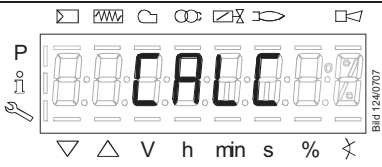
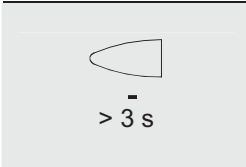
Keep depressed for >3 s.
CALC appears.



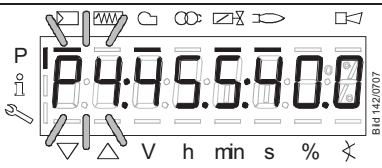
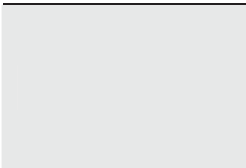
The display jumps to **P6**.

All curve points from **P5 to P9** have now been automatically recalculated (linear interpolation):

Curve point	Value 1 fuel	Value 2 air
P5	50.0	46.0
P6	57.5	57.0
P7	65.0	68.0
P8	72.0	79.0
P9	80.0	90.0



Keep depressed for >3 s.
CALC appears.

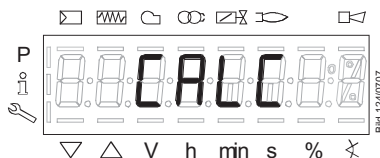


The display jumps to **P4**.

All curve points from **P1 to P5** have now been automatically recalculated (linear interpolation):

Curve point	Value 1 fuel	Value 2 air
P5	50.0	46.0
P4	45.5	40.0
P3	41.0	35.0
P2	36.5	29.5
P1	32.0	24.0

> 3 s +



- > 3 s

If it is not only the current curve point that shall be changed but all other curve points in the direction of travel as well, a new straight line from the current curve point to **P9** (press +) or **P1** (press -) can be calculated by a long push on - or +.

Display **CALC**

Example of presentation

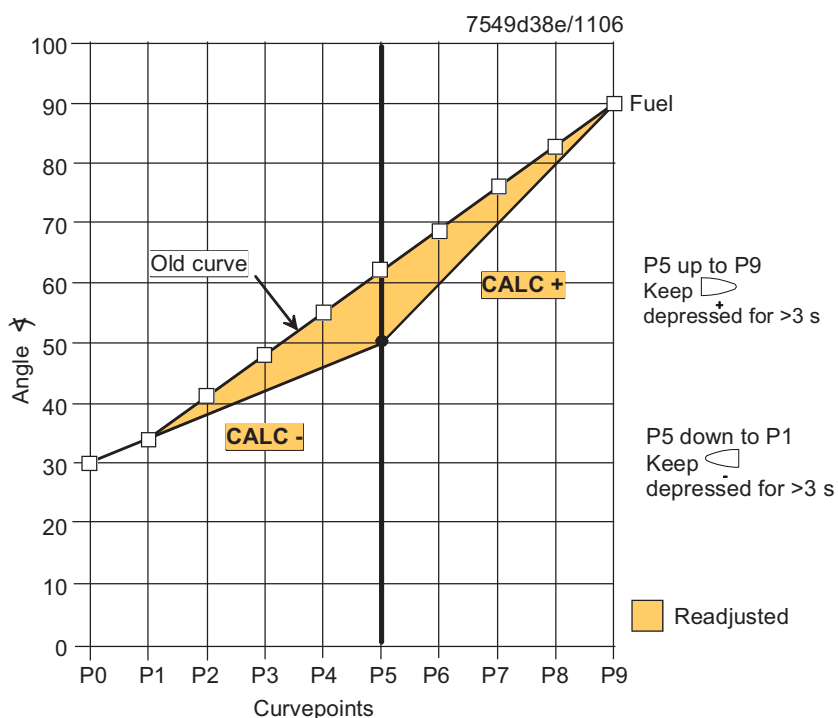


Figure 50: Changing several curve points

22.11.10 Setting the curve points for multistage mode («Lo 2 stage» and «Lo 3 stage»)

Example of «Lo 2 stage»

		<p>P0 appears flashing.</p> <p>Curve point for ignition load.</p>
		<p>Keep depressed.</p> <p>You are now at P0 of air actuator A.</p>
		<p>Press simultaneously and or to adjust ignition position P0 of the air actuator.</p> <p>Example: 20.0</p>
		<p>Now, release .</p> <p>The selected value will be adopted.</p> <p>Example: 20.0</p>
		<p>Identification of start for setting the curve parameters.</p>

Note: You are now given the choice of proceeding with the “warm settings” by pressing (refer to subsection «Warm settings for modulating mode «G mod», «Gp1 mod», «Gp2 mod» and «Lo mod»), or with the “cold settings” by pressing (refer to subsection «Cold settings for «G mod», «Gp1 mod», «Gp2 mod» and «Lo mod»).

22.11.11 Warm settings for «Lo 2 stage» and «Lo 3 stage»

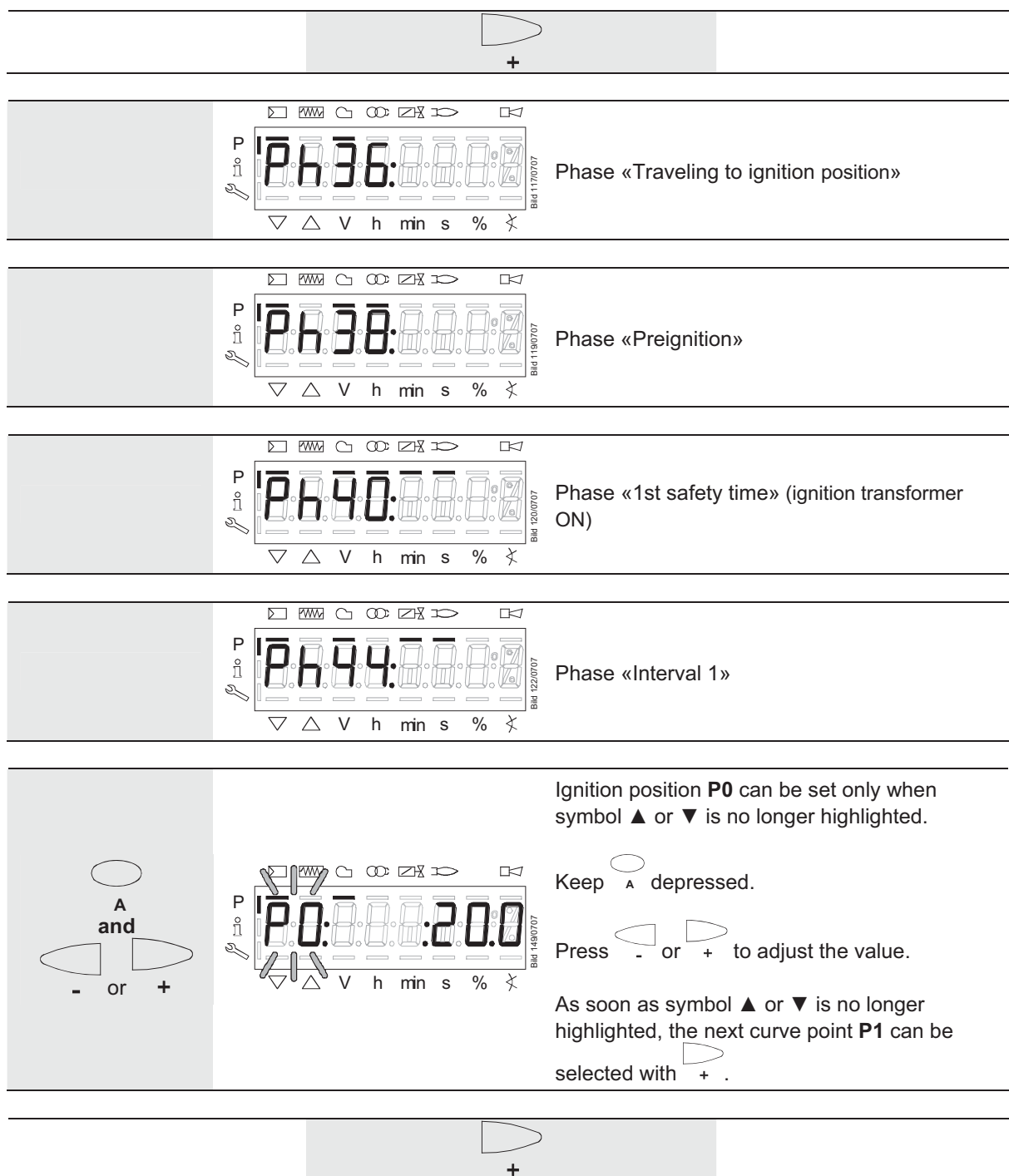
		<p>Identification of start for setting the curve parameters.</p>
		<p>Provided the controller is enabled!</p>
		<p>Phase «Standby» (stationary)</p>
		<p>Phase «Fan ramp up» (fan motor = ON, safety shutoff valve = ON)</p>
		<p>Phase «Traveling to prepurge position»</p>
		<p>Phase «Purging»</p>
		<p>Phase «Traveling to ignition position»</p>

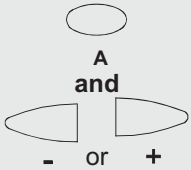
Wait until the burner is in operation and symbol ▲ or ▼ is no longer highlighted!

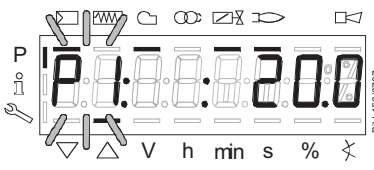
The startup sequence stops in Phase 36 «Traveling to ignition position».

The ignition position can be adjusted under "cold" conditions.

		<p>Ignition position P0 can be set only when symbol ▲ or ▼ is no longer highlighted.</p> <p>Keep A depressed.</p> <p>Press - or + to adjust the value.</p> <p>As soon as symbol ▲ or ▼ is no longer highlighted, the next curve point P1 can be selected with +.</p>
--	--	--











Low-fire position **P1** can be set only when symbol ▲ or ▼ is no longer highlighted.

Set stage 1 **P1**.

Fuel valve **V1** is switched on.

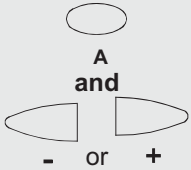
Keep  depressed.

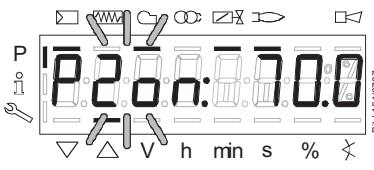
Press  or  to adjust the value.

As soon as symbol ▲ or ▼ is no longer highlighted, the next curve point **P2on** can be selected with .

To the next curve point











Curve point **P2on** can be set only when symbol ▲ or ▼ is no longer highlighted.

Set switch-on point stage 2 **P2**.

Fuel valve **V2** is still off.

Keep  depressed.

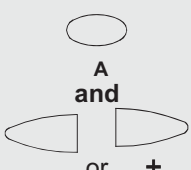
Adjust the value with  or .

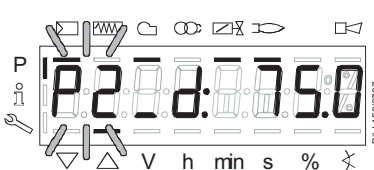
As soon as symbol ▲ or ▼ is no longer highlighted, the next curve point **P2_d** can be selected with .

To the next curve point




Back to the previous curve point








Curve point **P2_d** can be set only when symbol ▲ or ▼ is no longer highlighted.

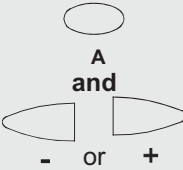
Fuel valve **V2** is still off and the system remains at curve point **P2on**. Presetting of operating stage **P2** with no travel, aimed at cutting the operating time if there is shortage of air.

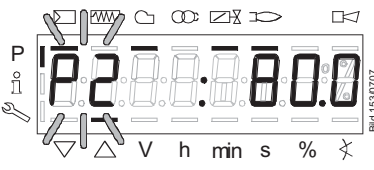
Keep  depressed.

Press  or  to adjust the value.

As soon as symbol ▲ or ▼ is no longer highlighted, the next curve point **P2** can be selected with .


To the next curve point			Back to the previous curve point
	+	-	








Curve point **P2** can only be adjusted when symbol ▲ or ▼ is no longer highlighted.

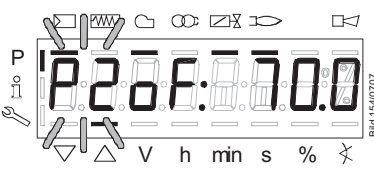
Fuel valve **V2** will be switched on.

Keep  depressed.

Press  or  to adjust the value.

As soon as symbol ▲ or ▼ is no longer highlighted, the next curve point **P2of** can be selected with .

		Back to the previous curve point
	-	




Curve point **P2of** is now adjusted.

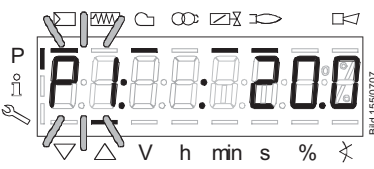
The system remains at P2.

Adjust the switch-off point with no travel.

Now, the curve point is approached dynamically when traveling from **P2** to **P1**.


As soon as symbol ▲ or ▼ is no longer highlighted, the next curve point **P1** can be selected with .

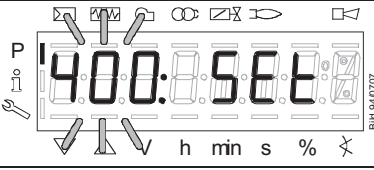
To the next curve point			Back to the previous curve point
	+	-	



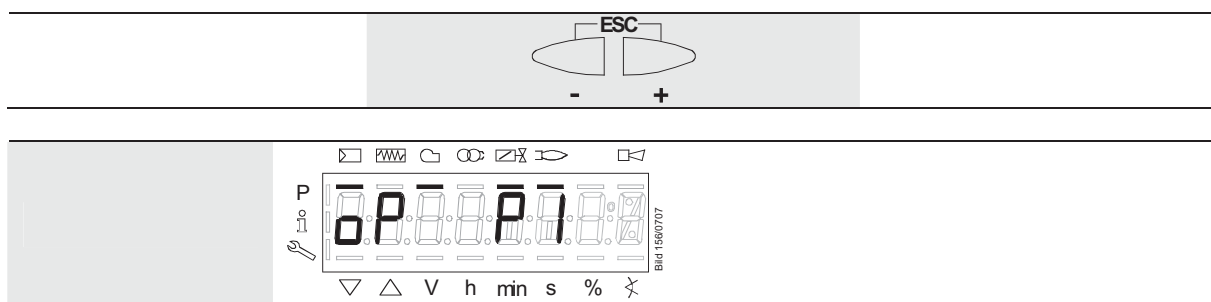
Automatic mode will be released when, after reaching **P1**, the curve settings are quit with **ESC**.

If the settings are aborted earlier (**ESC** or shutdown due to fault), start prevention **OFF UPr** is still active until all curve points are set.

	
- +	



As soon as symbol ▲ or ▼ is no longer highlighted, **ESC** can be pressed a second time.



The "warm settings" for fuel / air ratio control of the REC27.100A2 have now been configured.

22.11.12 Cold settings for multistage mode («Lo 2 stage» and «Lo 3 stage»)



Refer to subsection «Warm settings for «Lo 2 stage» and «Lo 3 stage»!
But with no flame, no traveling of the actuators, and no automatic operation after the settings have been made.

23 Parameter list

Par. no.	Parameter	Number of elements	Type	Edit	Value range Min. Max.	Resolution	Default setting	Password level
Internal parameters								
41	Password heating engineer (4 characters)	1	Std_u16	Edit	0 65535	1		OEM
42	Password OEM (5 characters)	1	Std_u16	Edit	0 65535	1		OEM
General								
102	Identification date	1	Date	Read only	0 255	1		Info / Service
103	Identification number	1	Std_u16	Read only	0 65535	1		Info / Service
104	Preselected parameter set: Customer code	1	Std_u8	Read only	0 255	1		Info / Service
105	Preselected parameter set: Version	1	Hex_16	Read only	0 0xFFFF	1	V 01.05	Info / Service
107	Software version	1	Hex_16	Read only	0 0xFFFF	1	V 01.80	Info / Service
108	Software variant	1	Std_u8	read only	0 255	1	1	Info / Service
113	Burner identification	1	Std_s32	Edit	0 99999999	1	Undefined	Info / Service Password level write: HF
121	Manual output Undefined = automatic mode	1	Load	Edit / clear	0 %	0.1 %	Undefined	Info / Service
125	Mains frequency 0 = 50 Hz 1 = 60 Hz	1	Selection	Edit	0	1	0	SO
126	Display brightness	1	Std_u8	Edit	0 %	1 %	75 %	SO
127	Timeout via menu operation	1	Std_u8	Edit	10 min	1 min	30 min	OEM
128	Fuel meter: Pulse valency (pulses / volumetric flow unit)	1	Std_u16	Edit	0 400	0.01	0	SO
130	Delete display of error history To delete the display, set the parameter to 1, then to 2 Response 0: Job successful Response: -1: Timeout of 1_2-Sequence	1	Std_s8	Edit	-5 2	1	0	SO
141	Operating mode building automation 0 = off 1 = Modbus 2 = reserved	1	Selection	Edit	0 2	1	0	SO
142	Setback time in the event of communication breakdown	1	Std_u16	Edit	0 s	1 s	600 s	SO (BA)
143	Reserved	1	Std_u8	Edit	1	1	1	Info / Service
144	Reserved	1	Std_u16	Edit	10 s	1 s	30 s	SO
145	Device address for Modbus	1	Std_u8	Edit	1	1	1	SO

Par- No.	Parameter	Number of elements	Type	Edit	Value range Min. Max.	Resolution	Default setting	Password level
146	Baud rate for Modbus 0 = 9600 1 = 19200	1	Selection	Edit	0 1	1	0	SO
147	Parity for Modbus 0 = none 1 = odd 2 = even	1	Selection	Edit	0 2	1	0	SO
148	Performance standard at interruption of communication with building automation For modulation operation the setting range is as follows: 0...19.9 = burner off 20...100 = 20...100 % burner rating For multistage operation apply to setting range: 0 = burner OFF, P1, P2, P3 Invalid = no performance standards of the building automation	1	Load	Edit / clear	0 % 100 %	0.1 %	Undefined	SO (BA)
161	Number of faults	1	Std_u16	Read only	0 65535	1	0	Info / Service
162	Operating hours resettable	1	Std_s32	Reset	0 h 999999 h	1 h	0 h	Info / Service
163	Operating hours device on supply	1	Std_s32	Read only	0 h 999999 h	1 h	0 h	Info / Service
164	Number of startups resettable	1	Std_s32	Reset	0 999999	1	0	Info / Service
166	Total number of startups	1	Std_s32	Read only	0 999999	1	0	Info / Service
167	Fuel volume resettable (m³, l, ft³, gal)	1	Std_s32	Reset	0 99999999	1	0	Info / Service

Par- No.	Parameter	Number of elements	Type	Edit	Value range Min. Max.	Resolution	Default setting	Password level
200	Burner control							
201	Burner operating mode (fuel train, mod / multistage, actuals, etc.) -- = undefined (delete curves) 1 = Gmod 2 = Gp1 mod 3 = Gp2 mod 4 = Lo mod 5 = Lo 2 stage 6 = Lo 3 stage 7 = G mod pneu 8 = Gp1 mod pneu 9 = Gp2 mod pneu	1	Selection	Edit / clear	1	1	Undefined	SO
208	Program stop 0 = deactivated 1 = PrePurgP (Ph24) 2 = IgnitPos (Ph36) 3 = Interv1 (Ph44) 4 = Interv2 (Ph52)	1	Selection	Edit	0	1	0	SO (BA)
210	Alarm in the event of start prevention 0 = deactivated 1 = activated	1	Selection	Edit	0	1	0	SO
211	Fan ramp up time	1	Time	Edit	2 s	0.2 s	2 s	SO
212	Max. time down to low-fire	1	Time	Edit	0.2 s	0.2 s	45 s	SO
213	Min. time home run	1	Time	Edit	2 s	0.2 s	2 s	OEM
214	Max. time start release	1	Time	Edit	0.2 s	0.2 s	25 s	OEM
215	Repetition limit safety loop	1	Std_u8	Edit	1	1	16	SO
217	Max. time to detector signal	1	Time	Edit	5 s	0.2 s	30 s	OEM
221	Gas: Active detector flame evaluation 0 = QRB... / QRC... 1 = ION / QRA...	1	Selection	Edit	0	1	1	SO
222	Gas: Prepurging 0 = deactivated 1 = activated	1	Selection	Edit	0	1	1	SO
223	Repetition limit pressure switch-min-gas	1	Std_u8	Edit	1	1	16	SO
225	Gas: Prepurge time	1	Time	Edit	20 s	0.2 s	20 s	SO
226	Gas: Preignition time	1	Time	Edit	0.2 s	0.2 s	2 s	SO

Par- No.	Parameter	Number of elements	Type	Edit	Value range		Resolution	Default setting	Password level
					Min.	Max.			
227	Gas: Safety time 1 (TSA1)	1	Time	Edit	0.2 s	10 s	0.2 s	3 s	OEM
229	Gas: Time to respond to pressure faults within «TSA1» and «TSA2»	1	Time	Edit	0.2 s	9.8 s	0.2 s	1.8 s	OEM
230	Gas: Interval 1	1	Time	Edit	0.2 s	60 s	0.2 s	2 s	SO
231	Gas: Safety time 2 (TSA2)	1	Time	Edit	0.2 s	10 s	0.2 s	3 s	OEM
232	Gas: Interval 2	1	Time	Edit	0.2 s	60 s	0.2 s	2 s	SO
233	Gas: Afterburn time	1	Time	Edit	0.2 s	60 s	0.2 s	8 s	SO
234	Gas: Postpurgue time	1	Time	Edit	0.2 s	108 min	0.2 s	0.2 s	SO
237	Gas: Pressure switch-max / POC input 0 = deactivated 1 = pressure switch-max 2 = POC	1	Selection	edit	1	2	1	1	SO
240	Gas: Repetition limit loss of flame	1	Std_u8	Edit	1	2	1	2	OEM
241	Gas: Execution leakage test 0 = no leakage test 1 = leakage test on startup 2 = leakage test on shutdown 3 = leakage test on startup and shutdown	1	Selection	Edit	0	3	1	2	SO
242	Gas: Leakage test evacuation time	1	Time	Edit	0.2 s	10 s	0.2 s	3 s	OEM
243	Gas: Leakage test time atmospheric pressure	1	Time	Edit	0.2 s	60 s	0.2 s	10 s	OEM
244	Gas: Leakage test filling time	1	Time	Edit	0.2 s	10 s	0.2 s	3 s	OEM
245	Gas: Leakage test time gas pressure	1	Time	Edit	0.2 s	60 s	0.2 s	10 s	OEM
246	Gas: Waiting time gas shortage	1	Time	Edit	0.2 s	60 s	0.2 s	10 s	OEM
261	Oil: Active detector flame evaluation 0 = QRB... / QRC... 1 = ION / QRA...	1	Selection	Edit	0	1	1	0	SO
262	Oil: Prepurging 0 = deactivated 1 = activated	1	Selection	Edit	0	1	1	1	OEM
265	Oil: Prepurge time	1	Time	Edit	15 s	60 min	0.2 s	15 s	SO
266	Oil: Preignition time	1	Time	Edit	0.2 s	60 min	0.2 s	2 s	SO
267	Oil: Safety time 1 (TSA1)	1	Time	Edit	0.2 s	15 s	0.2 s	5 s	OEM
269	Oil: Time to respond to pressure faults within «TSA1» and «TSA2»	1	Time	Edit	0.2 s	14.8 s	0.2 s	1.8 s	OEM

Par- No.	Parameter	Number of elements	Type	Edit	Value range Min.	Max.	Resolution	Default setting	Password level
270	Oil: Interval 1	1	Time	Edit	0.2 s	60 min	0.2 s	2 s	SO
271	Oil: Safety time 2 (TSA2)	1	Time	Edit	0.2 s	15 s	0.2 s	5 s	OEM
272	Oil: Interval 2	1	Time	Edit	0.2 s	60 min	0.2 s	2 s	SO
273	Oil: Afterburn time	1	Time	Edit	0.2 s	60 s	0.2 s	8 s	SO
274	Oil: Postpurge time	1	Time	Edit	0.2 s	108 min	0.2 s	0.2 s	SO
280	Oil: Repetition limit loss of flame	1	Std_u8	Edit	1	2	1	2	OEM
281	Oil: Time oil ignition 0 = short preignition (Ph38) 1 = long preignition (with fan) (Ph22)	1	Selection	Edit	0	1	1	1	SO
400	Fuel / air ratio control curves								
401	Ratio control curves fuel actuator	13	Std_s16	Edit	0°	90°	0.1°	0°; 0°; 15°; unde- fined	SO
402	Ratio control curve air actuator	13	Std_s16	Edit	0°	90°	0.1°	0°; 90°; 45°; unde- fined	SO
500	Fuel / air ratio control								
501	No-flame positions fuel actuator Index 0 = standby position Index 1 = prepurge position Index 2 = postpurge position	3	Std_s16	Edit	0°	90°	0.1°	0°; 0°; 15°	SO
502	No-flame positions air actuator Index 0 = standby position Index 1 = prepurge position Index 2 = postpurge position	3	Std_s16	Edit	0°	90°	0.1°	0°; 90°; 45°	SO
545	Lower load limit for modulation	1	Load	Edit / clear	20 %	100 %	0.1 %	undefined	SO (BA)
546	Upper load limit for modulation	1	Load	Edit / clear	20 %	100 %	0.1 %	undefined	SO (BA)

Par- No.	Parameter	Number of elements	Type	Edit	Value range		Resolution	Default setting	Password level
					Min.	Max.			
600	Actuators								
601	Selection of reference point Index 0 = fuel Index 1 = air 0 = closed (< 0°) 1 = open (> 90°)	2	Selection	Edit	0	1	1	1; 0	OEM
602	Actuator's direction of rotation Index 0 = fuel Index 1 = air 0 = counterclockwise 1 = clockwise (only SQM3...)	2	Selection	Edit	0	1	1	0; 0	OEM
606	Tolerance limit of position monitoring [0.1°] Greatest position error where a fault is securely detected -> shutdown band: (P606-0.6°) to P606	2	Std_u8	edit	0.5°	2.5°	0.1°	1,7°; 1,7°	SO
645	Configuration of analog output 0 = DC 0...10 V 1 = DC 2...10 V 2 = DC 0 / 2...10 V	1	Std_u8	Edit	0	2	1	2	SO
700	Error history								
701	Error history: 701-725.01.Code	25	Std_u8	Read only	0	255	1	0	Info / Service
•	Error history: 701-725.02.Diagnostic code	25	Std_u8	Read only	0	255	1	0	Info / Service
•	Error history: 701-725.03.Error class	25	Std_u8	Read only	0	6	1	0	Info / Service
•	Error history: 701-725.04.Phase	25	Std_u8	Read only	0	255	1	0	Info / Service
•	Error history: 701-725.05.Startup counter	25	Std_s32	Read only	0	99999999	1	0	Info / Service
725	Error history: 701-725.06.Load	25	Load	Read only	0 %	100 %	0.1 %	0 %	Info / Service

Par- No.	Parameter	Number of elements	Type	Edit	Value range		Resolution	Default setting	Password level
					Min.	Max.			
900	Process data								
903	Current output Index 0 = fuel Index 1 = air	2	Load	Read only	0 %	100 %	0.1 %	0 %	Info / Service
922	Incremental position of actuators Index 0 = fuel Index 1 = air	2	Std_s16	Read only	-50°	150°	0.01°	0°	Info / Service
942	Active heat source	1	Selection	Read only	0	255	1	0	SO
947	Result of contact sampling (bit-coded)	2	Std_u8	Read only	0	255	1	0	Info / Service
950	Required relay state (bit-coded)	1	Std_u8	Read only	0	255	1	0	Info / Service
954	Intensity of flame	1	Std_u8	Read only	0 %	100 %	1 %	0 %	Info / Service
960	Actual flow rate (m³/h, l/h, ft³/h, gal/h)	1	Std_u16	read only	0	6553,5	0,1	0	Info / Service
961	Status for external modules and display	1	Std_u8	Read only	0	255	1	0	Info / Service
981	Error memory: Code	1	Std_u8	read only	0	255	1	0	Info / Service
982	Error memory: Diagnostic code	1	Std_u8	read only	0	255	1	0	Info / Service
992	Error flags	10	Hex_32	Reset	0	0xFFFFFFFF	1	0	SO

Legend:

Std_u8 8 Bit integer, non-signed
Std_u16 16 Bit integer, non-signed
Std_u32 32 Bit integer, non-signed
Std_s8 8 Bit integer, signed

Note:

This data type is also used to mark an invalid or non-signed value by using the value of «-1»!

Std_s16 16 Bit integer, signed

Note:

This data type is also used to mark an invalid or non-signed value by using the value of «-1»!

Std_s32 32 Bit integer, signed

Note:

This data type is also used to mark an invalid or non-signed value by using the value of «-1»!

24 Error code list

Error code	Diagnostic code	Meaning for REC27.100A2 system	Recommended measures
2	4	No flame at the end of TSA1	
3	#	Air pressure failure	
	0	Air pressure switch off	
	1	Air pressure switch on	
	4	Air pressure on – start prevention	
4	#	Extraneous light	
	0	Extraneous light during startup	
	1	Extraneous light during shutdown	
	2	Extraneous light during startup – start prevention	
7	3	Loss of flame	
12	#	Valve proving test	
	0	V2 leaking	Check if the valve on the burner side is leaking. Check if pressure switch for the leakage test is closed when there is no gas pressure.
	1	V1 leaking	Check if the valve on the gas side is leaking.
20	0	Pmin No min. gas / oil pressure	
21	#	Pmax / POC	
	0	Pmax: Max. gas / oil pressure exceeded POC: POC open	Check wiring and open-circuit. POC: Check if the valve's closing contact is closed.
	1	POC closed	Check wiring. Check if the valve's closing contact opens when valve is controlled.
22	0	Safety loop / burner flange open	
50	#	Internal error	Make a reset; if error occurs repeatedly, replace the unit
51	#	Internal error	Make a reset; if error occurs repeatedly, replace the unit

Error code	Diagnostic code	Meaning for REC27.100A2 system	Recommended measures
55	#	Internal error	Make a reset; if error occurs repeatedly, replace the unit
56	#	Internal error	Make a reset; if error occurs repeatedly, replace the unit
57	#	Internal error	Make a reset; if error occurs repeatedly, replace the unit
58	#	Internal error	Make a reset; if error occurs repeatedly, replace the unit
60	0	Internal error: No valid load controller	Make a reset; if error occurs repeatedly, replace the unit
65	#	Internal error	Make a reset; if error occurs repeatedly, replace the unit
66	#	Internal error	Make a reset; if error occurs repeatedly, replace the unit
67	#	Internal error	Make a reset; if error occurs repeatedly, replace the unit
70	#	Error fuel / air control: Position calculation modulating	
	21	Load invalid	No valid load
	26	Curve points undefined	Adjust the curve points for all actuators
71	#	Special position undefined	
	0	Standby position	Parameterize the standby position for all actuators used
	1	Postpurge position	Parameterize the postpurge position for all actuators used
	2	Prepurge position	Parameterize the prepurge position for all actuators used
	3	Ignition position	Parameterize the ignition position for all actuators used
72	#	Internal error fuel / air control	Make a reset; if error occurs repeatedly, replace the unit
73	#	Internal error fuel / air control	
	21	Position calculation, multistep load invalid	No valid load
	26	Position calculation, multistep curve points undefined	Adjust the curve points for all actuators
75	#	Internal error fuel / air ratio control	
	1	Data clocking check, current load different	
	2	Data clocking check, target load different	
	4	Data clocking check, target positions different	
	16	Data clocking check, different positions reached	
76	#	Internal error fuel / air control	Make a reset; if error occurs repeatedly, replace the unit
84	#	Curve slope actuators	
	Bit 1 Valency 2..3	Fuel actuator: Curve too steep in terms of ramp rate	The slope of the curve may be a maximum position change of 31° between 2 curve points in modulating mode
	Bit 2 Valency 4..7	Air actuator: Curve too steep in terms of ramp rate	The slope of the curve may be a maximum position change of 31° between 2 curve points in modulating mode
85	#	Referencing error ones actuators	

Error code	Diagnostic code	Meaning for REC27.100A2 system	Recommended measures
	Bit 0 Valency 1	Referencing error of fuel actuator	Referencing of fuel actuator not successful. Reference point could not be reached. 1. Check to see if actuators have been mixed up 2. Check to see if actuator is locked or overloaded
	Bit 1 Valency 2...3	Referencing error of air actuator	Referencing of fuel actuator not successful Reference point could not be reached. 1. Check to see if actuators have been mixed up 2. Check to see if actuator is locked or overloaded
	Bit 7 Valency ≥ 128	Referencing error due to parameter change	Parameterization of an actuator (e.g. the reference position) has been changed. To trigger new referencing, this error will be set
86	#	Error fuel actuator	
	0	Position error	Target position could not be reached within the required tolerance band. 1. Check to see if actuator is locked or overloaded.
	Bit 0 Valency 1	Open-circuit	Open-circuit detected at the actuator's terminals. 1. Check wiring.
	Bit 3 Valency ≥ 8	Curve too steep in terms of ramp rate	The slope of the curve may be a maximum position change of 31° between 2 curve points in modulating mode
	Bit 4 Valency ≥ 16	Sectional deviation in comparison with last referencing	Actuator was overloaded or mechanically twisted. 1. Check if the actuator is blocked somewhere along its working range. 2. Check to see if the torque is sufficient for the application.
87	#	Error air actuator	
	0	Position error	Target position could not be reached within the required tolerance band. 1. Check to see if actuator is locked or overloaded.
	Bit 0 Valency 1	Open-circuit	Open-circuit detected at the actuator's terminals. 1. Check wiring.
	Bit 3 Valency ≥ 8	Curve too steep in terms of ramp rate	The slope of the curve may be a maximum position change of 31° between 2 curve points in modulating mode
	Bit 4 Valency ≥ 16	Sectional deviation in comparison with last referencing	Actuator was overloaded or mechanically twisted. 1. Check if the actuator is blocked somewhere along its working range. 2. Check to see if the torque is sufficient for the application.
90	#	Internal error burner control	
91	#	Internal error burner control	
93	#	Error flame signal acquisition	

Error code	Diagnostic code	Meaning for REC27.100A2 system	Recommended measures
	3	Short-circuit of sensor	Short-circuit at QRB... 1. Check wiring. 2. Flame detector possibly fault.
95	#	Error relay supervision	
	3 Ignition transformer 4 Fuel valve 1 5 Fuel valve 2 6 Fuel valve 3	External power supply active contact	Check wiring
96	#	Error relay supervision	
	3 Ignition transformer 4 Fuel valve 1 5 Fuel valve 2 6 Fuel valve 3	Relay contacts have welded	Test the contacts: 1. Unit connected to power: Fan output must be dead. 2. Disconnect power: Disconnect fan. No resistive connection between fan output and neutral conductor allowed. If one of the 2 tests fails, release the unit since contact have definitively welded and safety can no longer be ensured.
97	#	Error relay supervision	
	0	Safety relay contacts have welded or external power supply fed to safety relay	Test the contacts: 1. Unit connected to power: Fan output must be dead. 2. Disconnect power: Disconnect fan. No resistive connection between fan output and neutral conductor allowed. If one of the 2 tests fails, release the unit since contacts have definitively welded and safety can no longer be ensured.
98	#	Error relay supervision	
	2 Safety valve 3 Ignition transformer 4 Fuel valve 1 5 Fuel valve 2 6 Fuel valve 3	Relay does not pull in	Make a reset; if error occurs repeatedly, replace the unit
99	#	Internal error relay control	Make a reset; if error occurs repeatedly, replace the unit
100	#	Internal error relay control	Make a reset; if error occurs repeatedly, replace the unit
105	#	Internal error contact sampling	

Error code	Diagnostic code	Meaning for REC27.100A2 system	Recommended measures
	0 Pressure switch min 1 Pressure switch max 2 Pressure switch valve proving test 3 Air pressure 4 Load controller open 5 Load controller on/off 6 Load controller closed 7 Safety loop / Burner flange 8 Safety valve 9 Ignition transformer 10 Fuel valve 1 11 Fuel valve 2 12 Fuel valve 3 13 Reset	Stuck-At failure	Can be caused by capacitive loads or supply of DC voltage to the mains voltage inputs. The diagnostic code indicates the input where the problem occurred
106	#	Internal error contact request	Make a reset; if error occurs repeatedly, replace the unit
107	#	Internal error contact request	Make a reset; if error occurs repeatedly, replace the unit
108	#	Internal error contact request	Make a reset; if error occurs repeatedly, replace the unit
110	#	Internal error voltage monitor test	Make a reset; if error occurs repeatedly, replace the unit
111	0	Power supply undervoltage	Mains voltage to low
112	0	Mains voltage recovery	Error code for triggering a reset on power restoration (no error)
113	#	Internal error mains voltage supervision	Make a reset; if error occurs repeatedly, replace the unit
115	#	Internal error system counter	
116	0	Life in critical range	The unit's life expectancy has been exceeded. Replace it.
117	0	Life exceeded Operation no longer allowed	Switch-off threshold has been reached.
120	0	Interrupt limitation fuel counter input	Too many disturbance pulses at the fuel meters input. → Improve EMC
121	#	Internal error EEPROM access	Make a reset, repeat last parameterization / check. Restore the parameter set, if error occurs repeatedly, replace the unit
122	#	Internal error EEPROM access	Make a reset, repeat last parameterization / check. Restore the parameter set, if error occurs repeatedly, replace the unit
123	#	Internal error EEPROM access	Make a reset, repeat last parameterization / check. Restore the parameter set, if error occurs repeatedly, replace the unit

Error code	Diagnostic code	Meaning for REC27.100A2 system	Recommended measures
124	#	Internal error EEPROM access	Make a reset, repeat last parameterization / check. Restore the parameter set, if error occurs repeatedly, replace the unit
125	#	Internal error EEPROM read access	Make a reset, repeat last parameterization / check. If error occurs repeatedly, replace the unit
126	#	Internal error EEPROM write access	Make a reset, repeat last parameterization / check. If error occurs repeatedly, replace the unit
127	#	Internal error EEPROM access	Make a reset, repeat last parameterization / check. Restore the parameter set, if error occurs repeatedly, replace the unit
128	0	Internal error EEPROM access - synchronization during initialization	Make a reset; if error occurs repeatedly, replace the unit
129	#	Internal error EEPROM access – command synchronization	Make a reset, repeat last parameterization / check. If error occurs repeatedly, replace the unit
130	#	Internal error EEPROM access - timeout	Make a reset, repeat last parameterization / check. If error occurs repeatedly, replace the unit
131	#	Internal error EEPROM access - page on abort	Make a reset, repeat last parameterization / check. If error occurs repeatedly, replace the unit
132	#	Internal error EEPROM register initialization	Make a reset; if error occurs repeatedly, replace the unit
133	#	Internal error EEPROM access – Request synchronization	Make a reset, repeat last parameterization / check. If error occurs repeatedly, replace the unit
134	#	Internal error EEPROM access – Request synchronization	Make a reset, repeat last parameterization / check. If error occurs repeatedly, replace the unit
135	#	Internal error EEPROM access – Request synchronization	Make a reset, repeat last parameterization / check. If error occurs repeatedly, replace the unit
136	1	Restore started	Restore of a backup has been started (no error)
137	#	Internal error – backup / restore	
157		Restore – ok, but backup < data set of current system	Restore successful, but backup data set is smaller than in the current system
241		Restore – interruption concerning unpassable ASN	<i>The Backup has a unpassable ASN and may not restore of the unit</i>
242		Backup – backup made is inconsistent	Backup is faulty and cannot be transferred back
243		Backup – data comparison between µCs faulty	Repeat reset and backup
244		Backup data are incompatible	Backup data are incompatible with the current software version, restore not possible
245		Access error to parameter Restore_Complete	Repeat reset and backup
246		Restore – timeout when storing in EEPROM	Repeat reset and backup
247		Data received are inconsistent	Backup data set invalid, restore not possible

Error code	Diagnostic code	Meaning for REC27.100A2 system	Recommended measures
	248	Restore cannot at present be made	Repeat reset and backup
	249	Restore – abortion due to unsuitable burner identification	Backup has an unsuitable burner identification and must not be transferred to the unit
	250	Backup – CRC of one page is not correct	Backup data set invalid, restore not possible
	251	Backup – burner identification is not defined	Define burner identification and repeat backup
	252	After restore, pages still on ABORT	Repeat reset and backup
	253	Restore cannot at present be made	Repeat reset and backup
	254	Abortion due to transmission error	Repeat reset and backup
	255	Abortion due to timeout during restore	Make a reset, check the connections and repeat the backup
146	#	Timeout building automation interface	Refer to User Documentation Modbus (A7541)
	1	Modbus timeout	
	2	Reserved	
165	#	Internal error	
166	0	Internal error watchdog reset	
167	#	Manual locking	Unit has been manually locked (no error)
	1	Manual locking by contact	
	2	Manual locking by RD121.10A9	
	3	Manual locking by PC tool	
168	#	Internal error management	Make a reset; if error occurs repeatedly, replace the unit
169	#	Internal error management	Make a reset; if error occurs repeatedly, replace the unit
170	#	Internal error management	Make a reset; if error occurs repeatedly, replace the unit
171	#	Internal error management	Make a reset; if error occurs repeatedly, replace the unit
200	#	System error-free	No error
201	#	Start prevention	Start prevention because unit has not been parameterized
	1	No operating mode selected	
	2..3	No fuel train defined	
	4..7	No curves defined	
	8..15	Standardized speed undefined	
	16..31	Backup / restore was not possible	
202	#	Internal operating mode selection	Redefine the operating mode (parameter 201)
203	#	Internal error	Redefine the operating mode (parameter 201). Make a reset; if error occurs repeatedly, replace the unit
204	Phase number	Program stop	Program stop is active (no error)

Error code	Diagnostic code	Meaning for REC27.100A2 system	Recommended measures
205	#	Internal error	Make a reset; if error occurs repeatedly, replace the unit
206	0	Inadmissible combination of units (basic unit - RD121.10A9)	
207	#	Version compatibility basic unit - RD121.10A9	
	0	Basic unit version too old	
	1	RD121.10A9 version too old	
208	#	Internal error	Make a reset; if error occurs repeatedly, replace the unit
209	#	Internal error	Make a reset; if error occurs repeatedly, replace the unit
210	0	Selected operation mode is not released for the basic unit	Select a released operation mode for the basic unit
240	#	Internal error	Make a reset; if error occurs repeatedly, replace the unit
245	#	Internal error	Make a reset; if error occurs repeatedly, replace the unit
250	#	Internal error	Make a reset; if error occurs repeatedly, replace the unit

The logo consists of the word "RIELLO" in a bold, red, sans-serif typeface. The letters are closely spaced and have a slightly distressed or industrial feel.

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