

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

LMV27.210A2WH

ELECTRONIC COMBUSTION MANAGER

Used with the applicable W-FM 50 / LMV27 OEM configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Weishaupt W-FM 50 installation and operating instruction 83250302, March 2010; cover identifies LMV27.210A2WH

Installation and operating instruction



3 Product description

3 Product description

3.1 Function

3.1.1 Valve proving

The valve proving gas pressure switch checks the soundness of the valves. It signals the combustion manager if the pressure increases or decreases to an impermissible level during valve proving.

Valve proving is carried out automatically by the combustion manager:

- after every controlled shutdown,
- prior to burner start following lockout or power outage.

1. Test phase (function sequence for valve proving valve 1):

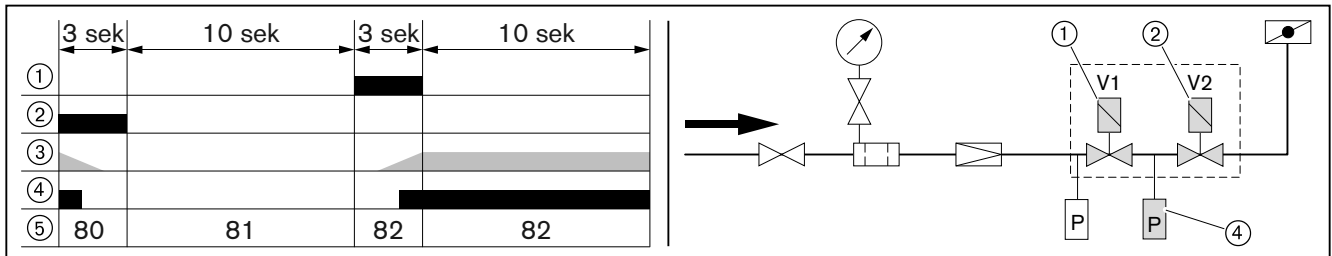
- valve 1 closes,
- valve 2 closes after a delay,
- the gas escapes and the pressure between valve 1 and valve 2 reduces,
- both valves remain closed for 10 seconds.

If the gas pressure increases to above the set value during these 10 seconds, valve 1 is leaking. The combustion manager initiates a controlled shutdown.

2. Test phase (function sequence for valve proving valve 2):

- valve 1 opens, valve 2 remains closed,
- the gas pressure between valve 1 and valve 2 increases,
- valve 1 closes again,
- both valves remain closed for 10 seconds.

If the gas pressure decreases to below the set value during these 10 seconds, valve 2 is leaking. The combustion manager initiates a controlled shutdown.



- ① Valve 1
- ② Valve 2
- ③ Pressure between valve 1 and valve 2
- ④ Valve proving gas pressure switch
- ⑤ Operating phases

3.1.2 Low gas programme

The low gas pressure switch checks the gas connection pressure from phase 22. If the preset gas pressure is not achieved, a low gas programme is initiated.

In the low gas programme the combustion manager carries out a safety shutdown and initiates a restart after the low gas waiting time (10 seconds). This low gas waiting time doubles after every unsuccessful start attempt. If the start attempts exceed the repetition limit value (parameter 223) the combustion manager goes to lockout. If the burner starts, the repetition counter is reset automatically.

3 Product description

3.1.3 Manual load

If a signal is applied to input X5-03:1 (burner ON), each load setting within the load limit can be selected manually. When manual load is activated, the current load flashes in the operating display. Manual load can be activated either by key combination or via parameter 121. Manual load via parameter 121 offers additional functions.

Load default	Function	
	Parameter 121	Key combination
----	Manual load deactivated	not possible
0.0 ... 19.9	Manual OFF, remains active even after fuel changeover.	not possible
P0	Initiate ignition position (only multi stage operation)	not possible
20.0 ... 100.0 P1 ... P3	Initiate load setting within the load limits. Values outside of the load limits can be adjusted, but not initiated. If the load limits are extended during active manual load, the burner reacts accordingly.	Initiate load setting within the load limits. Only values within the load limits can be adjusted.

For the duration of commissioning (400 Set), manual load is ignored.
With the exception of Manual OFF, manual load is deactivated during fuel changeover.

Manual load via key combination

Activate manual load:

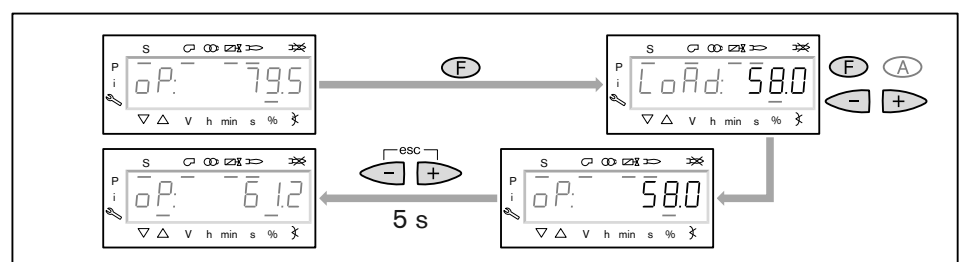
- ▶ Press and hold [F] key.
- ✓ The display shows LoAd.
- ▶ Set manual load using [+] or [-] key.
- ✓ The manual load set flashes in the operating display.

Manual load burner OFF:

- ▶ Drive to minimum load position and release [F] and [-] keys.
- ▶ Press [F] and [-] keys again.

Deactivate manual load:

- ▶ Press and hold [esc] key for 5 seconds.



Manual load via parameter 121

- ▶ Enter password (see Ch. 5.2.1).
- ▶ Select parameter 121
- ▶ Press [ENTER] key.
- ▶ Set manual load using [+] or [-] key.
- ▶ Press [ENTER] key.
- ✓ Manual load is initiated.

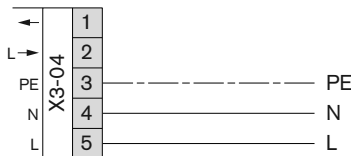
3 Product description

3.2 Inputs

3.2.1 Voltage supply

The voltage supply is connected to inputs X3-04:3-5 of the W-FM50.

The mains frequency is set in parameter 125.



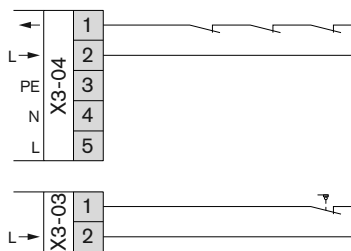
3.2.2 Safety circuit

In the diagnostic code, the inputs X3-03:1/2 and X3-04:1/2 are combined as safety circuit. If one of the inputs is open, at least one safety shutdown is triggered. If the repetition value is exceeded an open input leads to lockout. The repetition value can be set in parameter 215.

At input X3-04:1/2 all external components of the safety circuit are switched in sequence, these include:

- Emergency-Off switch
- Safety temperature limiter (STL)
- Low water safety interlock, etc.

The burner flange limit switch is connected to input X3-03:1/2.



3.2.3 Reset

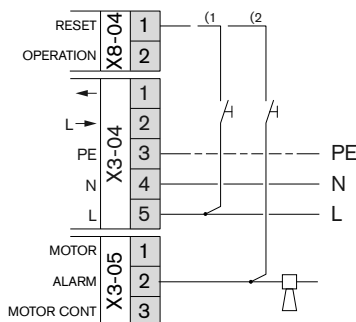
A reset button can be connected to input X8-04:1. If lockout occurs, the combustion manager can be reset by pressing the push button for 1 to 6 seconds. Longer or shorter operation of the push button is ignored by the combustion manager and does not lead to a reaction.

With lockout function ⁽¹⁾

If the push button is also required for manual lockout, it must be connected to mains input X3-04:5 (L). If the combustion manager is in an operating phase, pressing the push button for 1 to 6 seconds will initiate a manual lockout.

Without lockout function ⁽²⁾

If the push button is not required to carry out manual lockout it must be connected to alarm output X3-05:2.

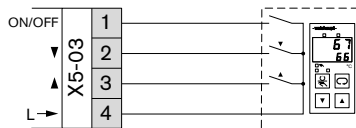


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3.2.4 Load controller via contacts

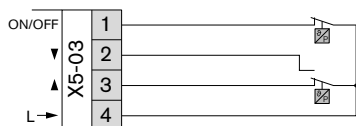
The contact for the heat demand is connected to input X5-03:1 (burner ON).

The load control distinguishes between multi-stage and modulating operation. The type of operation is set in parameter 201.



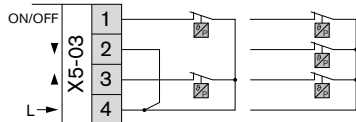
Modulating operation with load controller

If input X5-03:2 (CLOSED) is activated, the burner rating reduces. If input X5-03:3 (OPEN) is activated, the burner rating increases. If none of the two inputs is activated, the burner rating remains unchanged.



Modulating operation with thermostat

If thermostats or pressure regulators are connected to inputs X5-03, the modulating fuel can only be operated in sliding two stage operation. At heat demand input X5-03:2 (CLOSED) is activated and the burner drives to partial load. If the temperature drops below the value set, input X5-03:3 (OPEN) is activated and the burner drives to full load. If a signal is applied to input X5-03:3, input X5-03:2 is ignored.

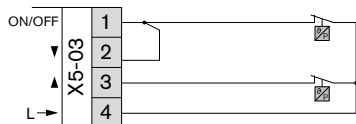


Multi-stage operation (fuel oil only)

Two and three stage:

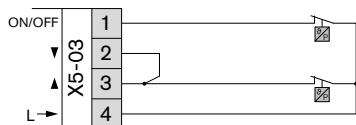
Input	Type of operation	
	two stage	three stage
X5-03:1	stage 1	stage 1
X5-03:2	stage 1	stage 2
X5-03:3	stage 2	stage 3

If input X5-03:3 is activated during 3 stage operation, the burner drives to stage 3, the signal from stage 2 is no longer relevant.



Low impact start:

At heat demand and with a bridge between terminal 1 and 2 the burner ignites in stage 1 and then automatically drives to stage 2. If input X5-03:2 is also activated the burner drives to stage 3.

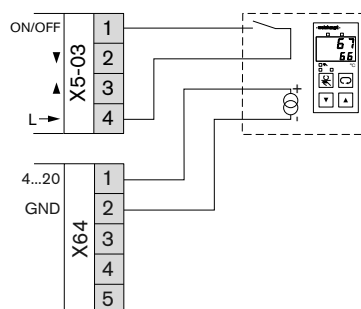


Change-over release:

A bridge connects terminals 2 and 3. At heat demand the burner drives to stage 1. If inputs X5-03:2/3 are then activated simultaneously the burner drives via stage 2 to stage 3.

3 Product description

3.2.5 Load controller analogue input



The contact for the heat demand is connected to input X5-03:1 (burner ON).

The analogue load signal is connected to terminals X64:1 (4 ... 20 mA) and X64:2 (GND). A signal of less than 3 mA deactivates the analogue input and the load presetting at input X5-03:2/3 has priority (parameter 942). If no load controller is connected to input X5-03:2/3, the combustion manager remains at the current rating until heat demand is interrupted.

Modulating operation

In modulating operation, parameter 123 (see Ch. 5.3.1) determines the minimum setting point.

Signal on X64:1/2	Load W-FM
3 ... 4 mA	20 %
20 mA	100 %

Multi-stage operation

In multi-stage operation a hysteresis of 1 mA exists between the operating points, which eliminates unnecessary load changes.

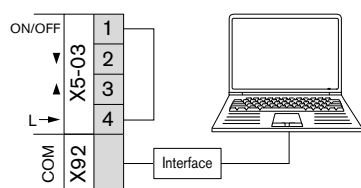
Two stage:

Signal on X64:1/2	Load W-FM
3 ... 5 ... 12 mA	Stage 1
13 ... 15 ... 20 mA	Stage 2

Three stage:

Signal on X64:1/2	Load W-FM
3 ... 5 ... 7 mA	Stage 1
8 ... 10 ... 12 mA	Stage 2
13 ... 15 ... 20 mA	Stage 3

3.2.6 Load controller building management



A Bus interface for building management can be connected to input COM X92.

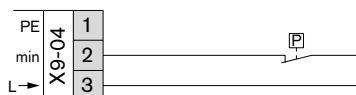
- Modbus: Bus-Interface Modbus OCI412.10 (Order No.: 660 285)
- eBus: Adapter MPA eBUS (Order No.: 743 090)

For burner start, input X5-03:1 (burner ON) must be connected to voltage output X5-03:4. Load presetting is then carried out by the building management system.

The settings required for Bus communication are set in parameters 141 to 148.

3 Product description

3.2.10 Valve proving gas pressure switch



The opening contact of the valve proving gas pressure switch must be connected to input X9-04. Input X9-04 is only active during valve proving (see Ch. 3.1.1). The time of the valve proving can be set in parameter 241.

If the pressure set is not achieved in phase 81 (test without pressure), the contact closes.

If the pressure set is exceeded in phase 83 (test with system pressure), the contact opens.

3.2.11 Flame sensor

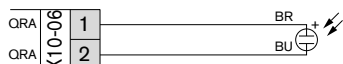
If the flame signal in phase 44 does not equate to the value required, the combustion manager initiates a lockout.

If the flame signal during operation does not maintain the required value, the combustion manager initiates a controlled shutdown with restart. Two controlled shutdowns in sequence lead to lockout.

A flame signal at heat demand (phase 12) leads to start prevention.

A flame signal during pre-purge (phase 30 to 36) or post-purge (phase 78) leads to lockout after one repetition and repeated occurrence.

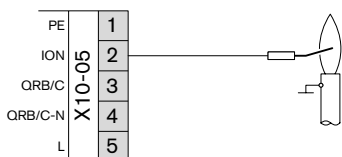
Parameter 954 shows the current flame signal as a percentage value.



QRA...

The flame sensor QRA... (UV cell) is connected to input X10-06.

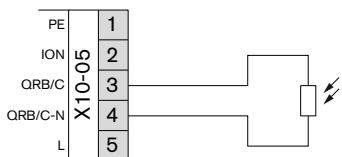
	Flame signal Parameter 954
Response limit extraneous light	greater than 18 %
Operation	min 24 %



Ionisation electrode

The ionisation electrode is connected to input X10-05:2.

	Flame signal Parameter 954
Sensor current min.: 4 µA	approx. 30 %
Sensor current max.: 16 ... 40 µA	100 %



QRB...

The flame sensor QRB... (photo resistor) is connected to input X10-05:3/4.

	Flame signal Parameter 954
Response limit extraneous light (resistance less than 400 kΩ)	approx. 10 %
Operation (resistance less than 230 kΩ)	approx. 16 %
Short circuit identification (resistance less than 0.5 kΩ)	-

3 Product description

3.4 Technical data

3.4.1 Electrical data

Combustion Manager

	W-FM 50
Mains voltage/frequency	230 V/50 ... 60 Hz
Max. consumption	30 W
Max. prefusing	16 A slow
Internal unit fuse	6.3 A slow
Type of protection	IP 00

Actuator

	STE 50 1.2 Nm	STE 50 3 Nm
Mains voltage/frequency	DC/AC 24 V/ 50 ... 60 Hz	DC/AC24 V/ 50 ... 60 Hz
Max. consumption	7.5 W	10 W
Torque	1.2 Nm	3 Nm
Setting time	5 s/90°	4 s/90°
Type of protection	IP 54	IP 54
Class of protection	II	II

ABE

Mains voltage	DC 5 V
Max. consumption	50 mW
Type of protection (front)	IP54 to ICE 529
Type of protection (rear)	IP40 to ICE 529
Class of protection	II to DIN EN 60 730-1

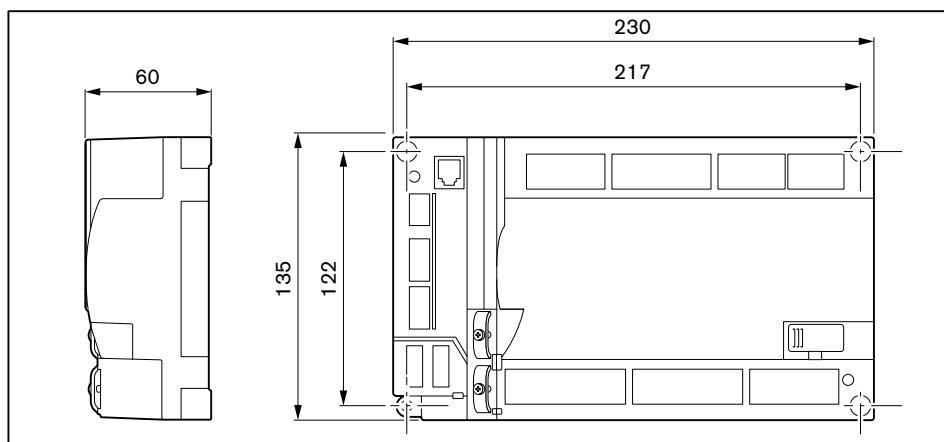
3.4.2 Ambient conditions

Temperature in operation	-20 ... +60 °C
Temperature during transport / storage	-20 ... +60 °C
relative humidity	max 95 %, no dew point

3 Product description

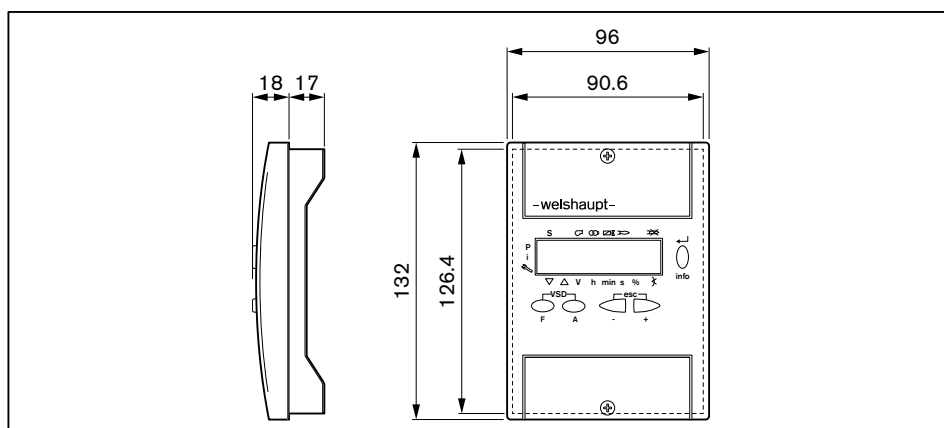
3.4.3 Dimensions

Combustion manager



Display and operating unit

Recess dimension: 127 x 91 mm ± 5 mm



8 Servicing

8 Servicing

8.1 Safety components

Safety components

Vital safety components must be replaced as soon as they reach their predefined lifetime.

The predefined lifetime is not the warranty time specified in the terms and conditions of delivery and payment.

Safety component	Lifetime according to construction	CEN-Standard
ABE / Combustion Manager	10 years or 250 000 operating cycles	EN 230 / 298
Actuators	10 years or 2 000 000 operating cycles	EN 12067-2

9 Troubleshooting

9 Troubleshooting

9.1 Procedures for fault conditions

Fault memory

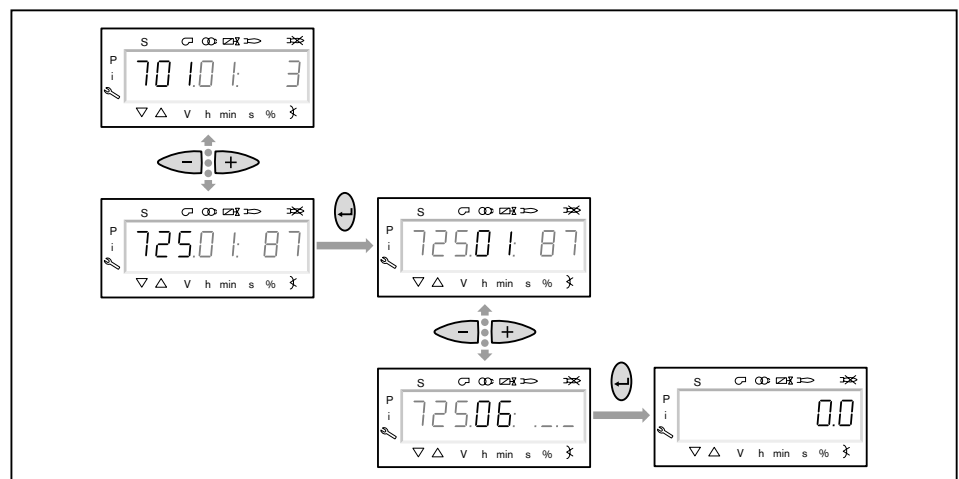
The combustion manager stores the last 25 faults and lockouts in the fault history (parameter 700), 701 is the fault, which occurred last. The fault history can be called up in the service level or password level.

Display fault history

- ▶ call up service level or password level (see Ch. 5.2).
- ▶ Select faults in sequence using [+] or [-] key.
- ▶ Press [ENTER] key (in service level 1 to 3 s).
- ✓ Fault level flashes.
- ▶ Select fault level in sequence using [+] key.

If . . . appears in the display in fault level 05 and 06:

- ▶ Press [ENTER] key (in service level 1 to 3 s).
- ✓ Value is displayed.



No.	Level	Meaning
701	.01 =	Error codes (see Ch. 9.2)
...	.02 =	Diagnostic code (see Ch. 9.2)
725	.03 =	Fault class (arranges faults by priority) 0 = Lockout, highest priority 1 = Safety shut down with software reset 2 = Low voltage 3 = Safety shut down in safety phase 4 = Safety shutdown start prevention 5 = Safety shutdown shutdown 6 = Signal without switch off reaction
	.04 =	Operating phase Operating phase at time of fault (see Ch. 3.1.7.1).
	.05 =	Start-up counter Number of start-ups at time of fault. Press [ENTER] key to display.
	.06 =	Rating Load at time of fault. Press [ENTER] key to display.