ENERVEX
SMDS™ - MODULATING DAMPER SYSTEM

READ AND SAVE THESE INSTRUCTIONS!

C (UL)® US
LISTED
UL File E467733
UL File E484712

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Symbol Legend

The following terms are used throughout this manual to bring attention to the presence of potential hazards, or to important information concerning the product.

DANGER: Indicates an imminent hazardous situation which, if not avoided, will result in death, serious injury or substantial property damage.

WARNING: Indicates an imminent hazardous situation which, if not avoided, may result in personal injury or property damage.

DANGER: Indicates an imminent electrical shock hazard which, if not avoided, will result in death, serious injury or substantial property damage.

How to use this manual

This installation manual does not contain any system design documentation. System design documentation is available from any authorized ENERVEX representative. Accessories, fans, and motor speed controllers are not covered by this manual. Please refer to these component's individual manuals.

TO REDUCE THE RISK OF FIRE, ELECTRICAL SHOCK OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

1. Use this unit in the manner intended by the manufacturer. If you have questions, contact the manufacturer at the address or telephone number listed on the front of the manual.

2. Before servicing or cleaning the unit, switch off at service panel and lock service panel to prevent power from being switched on accidentally.

3. Installation work and electrical wiring must be done by a qualified person(s) in accordance with applicable codes and standards.

4. Follow the appliance manufacturer's guidelines and safety standards such as those published by the National Fire Protection Association (NFPA), and the American Society for Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), and the local code authorities.

5. This unit must be grounded.

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Content

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1. GENERAL INFORMATION

1.1 Introduction

These instructions provide both general guidelines and special requirements for all parts in the SMDS product line. Before specifying a design or beginning an installation please carefully review these instructions. Contact local building or fire officials about restrictions and installation inspection in your area.

1.2 Features

The SMDS is a self-sensing, modulating damper and draft control system used to maintain a required pressure negative or positive) in an appliance connector. It can be used with Category I, II, III & IV heating appliance systems

The system consists of a single-blade SDF or SDM, Modulating Damper with an integrated and programmable EBC 24, Modulating Pressure Control. The EBC 24 controls the damper position and maintains a constant draft for the heating appliance connector. The SMDS system is supplied as a complete integrated prewired package with a single-blade damper and attached actuator, control(s), bi-directional pressure sensor, draft probe and under- and over-pressure safety functions. The system has true under-pressure and over-pressure protection independant of a damper end-switch. If excessive pressure builds up between the heating appliance outlet and the damper, the heating appliance will be shut down and the damper will open completely to relieve the pressure.

The SDF Damper has pressure-tight shaft bearings and the single-blade damper has a Viton Seal that prevents flue gas from flowing back into the heating appliance when not operating.

It has condensate-blockage prevention system for positive pressure appliances. "Plug-n-Play" monitors all terminals and registers components attached. Any errors detected during operation are shown on the digital display screen.

USB and integrated webserver for remote monitoring, configuration and firmware upgrade is standard and so is the selectable and adjustable bi-directional and uni-directional operating modes.

Modbus protocal is included with the EBC 24 controller and allows it to operate as a Modbus slave device. It can respond to a master device (typically a heating appliance) but cannot initiate communications.

The system is available in sizes from 4" to 18" ID. The SDF Damper unit is rated for 1400°F continuous operation and is resistant to corrosion due to the 316L-PCM stainless steel construction.

1.3 Components

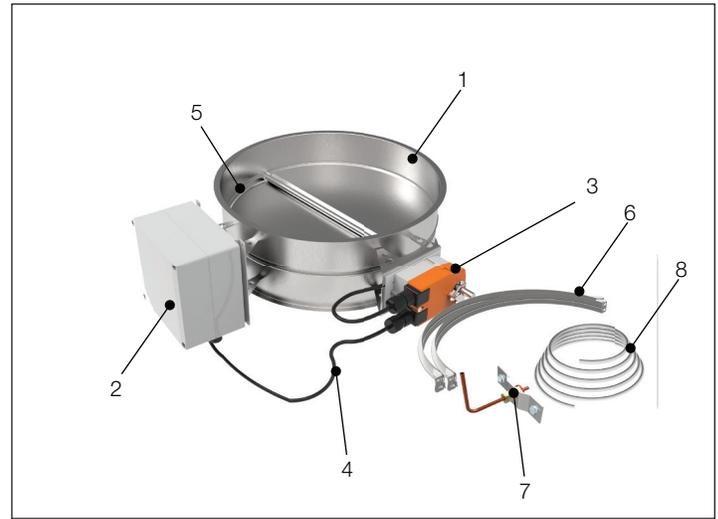The SMDS system consists of the components shown in Fig. 1.

Fig 1

1. SDF Damper
2. EBC 24 Controller with pressure sensor
3. Actuator
4. Wire connection
5. Viton Seal
6. V-bands
7. Stack Probe
8. Silicone Tube

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1.4 Shipping

The SMDS unit is shipped in a protected in a corrugated box.

Do not place other products or items on top of the box.

After unpacking, the product must be handled in a way to prevent damage to the collars and the ventilator housing.

1.5 Listings

The SDF Modulating Damper is UL Listed to UL 378 for Draft Equipment, UL 17 for Vent or Chimney Connector Dampers for Oil-Fired Appliances and ULC/ORD-C378 (1975) for Draft Equipment.

The EBC 24 Modulating Fan Control is UL Listed to UL 378 for Draft Equipment, UL 60947 for Low Voltage Switchgear and Controlgear and CSA C22.2 No. 14-95 Standard for IndustrialControl Equipment.

Meets ANSI Z21.66-1996 Automatic Vent Damper Devices For Use With Gas-fi red Appliances and all requirements of NFPA54 (ANSI Z223.1), National Fuel Gas Code, IFGC, International Fuel Gas Code and IMC, the International Mechanical Code and most other relevant codes.

1.6 Warranty

2-year factory warranty (see back cover). Complete warranty conditions are available from ENERVEX Inc.

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2. SPECIFICATIONS AND DIMENSIONS

2.1 Specifications

EBC 24 Control		
Power supply	V	1x120VAC / 60 Hz
Amperage	A	0.4T/6.3T/250V(JDYX2/8)
Operating temperature	°F/°C	-4 to 122 / -20 to 50
Range of operation	inWC / Pa	-1.00 to +1.00 / -250 to +250
Tolerance	inWC / Pa	0.01 / 3 +/-10%
Output Current	mA	max. 10
Max. Load		120 VAC / 8A
Real-time PID Control Method		Infinitely variable
Real-time PID Signal Stability		+/- 0.5%
Ramp Up/Down Time	Seconds	max 20
Output	VDC	0-10
EMC standard	Emission	UL 60947
	Immunity	EN50 082-2
XTP Sensor		
Mode		Bi-directional
Power supply	VDC	12-36 / 24V
Amperage	mA	<20
Output	VDC	0-10
Operating temperature	°F / °C	0 to 160 / -18 to 71
Accuracy		+/- 0.08%
Stack Probe		
Dimensions	H in / mm	4.25 / 108
	I in / mm	3.50 / 89
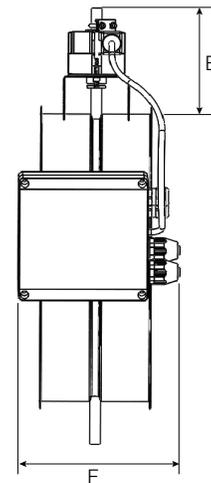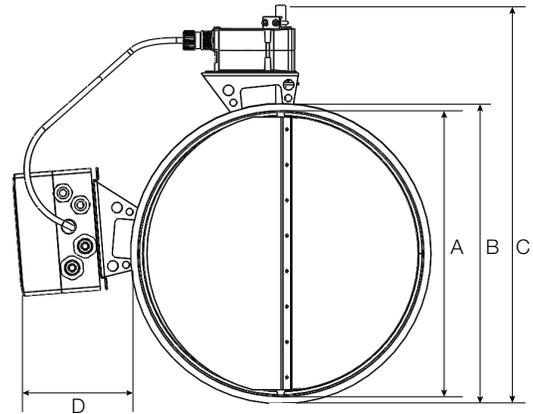
2.2 Dimensions

in/mm	SDF 4	SDF 6	SDF 8	SDF 10	SDF 12	SDF 14	SDF 16	SDF 18
A	3.94 / 100	5.91 / 150	7.87 / 200	9.84 / 250	11.81 / 300	13.78 / 350	15.75 / 400	18.00 / 457
B	4.88 / 124	6.85 / 174	8.82 / 224	10.79 / 274	12.76 / 324	14.72 / 374	16.69 / 424	19.00 (483)
C	8.86 / 225	10.83 / 275	12.80 / 325	14.76 / 375	16.73 / 425	18.70 / 475	20.67 / 525	22.91 / 582
D	5.13 / 130	5.13 / 130	5.13 / 130	5.13 / 130	5.13 / 130	5.13 / 130	5.13 / 130	5.13 / 130
E	5.04 / 128	5.04/ 128	5.04/ 128	5.04/ 128	5.04/ 128	5.04/ 128	5.04/ 128	5.04/ 128
F	6.89 / 175	6.89 / 175	6.89 / 175	6.89 / 175	6.89 / 175	6.89 / 175	6.89 / 175	6.89 / 175
G	8.00 / 203	8.00 / 203	8.00 / 203	8.00 / 203	8.00 / 203	8.00 / 203	8.00 / 203	8.00 / 203
H	4.25 / 108	4.25 / 108	4.25 / 108	4.25 / 108	4.25 / 108	4.25 / 108	4.25 / 108	4.25 / 108
I	3.50 / 89	3.50 / 89	3.50 / 89	3.50 / 89	3.50 / 89	3.50 / 89	3.50 / 89	3.50 / 89

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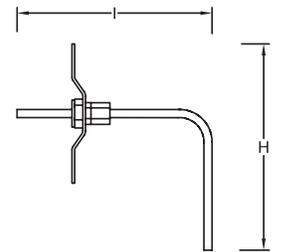
3. MECHANICAL INSTALLATION

3.1 Positioning

Place the SDF or SDM in the heating appliance connector. An arrow indicating the flow direction is provided on the product label - make sure to follow this.

Insert the stack probe between the appliance and the SDF preferably at a min. distance of 3 times the connector diameter away from any elbow or tee. See Fig. 2.

A 45° Lateral Tee should be used between the appliance connector and the common header if connected to a horizontal section. See Fig. 3.

> ⚠ The stack probe should preferably be placed at a min. distance of 3 times the connector diameter away from any tee or fitting.

3.2 Assembly

The SDF connects to most standard pressure stacks with 1/2" flanges using V-bands and silicone sealant. Follow the procedures outlined in the stack manufacturer's installation manual for specific instructions.

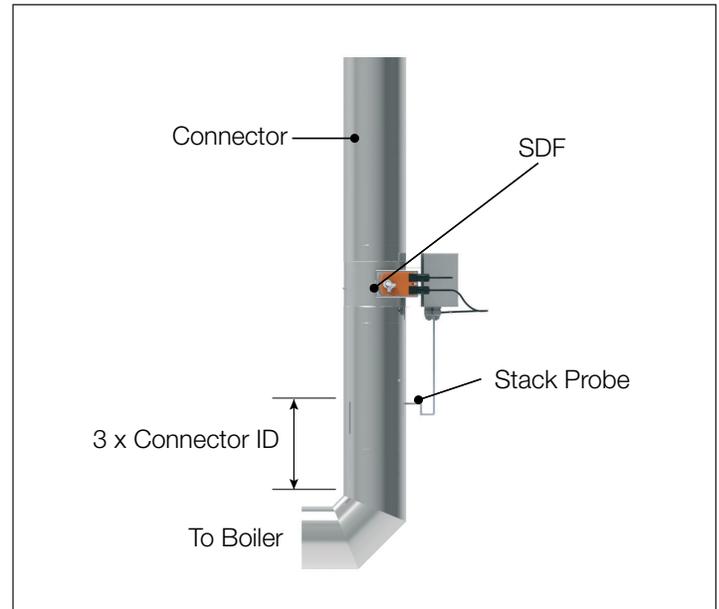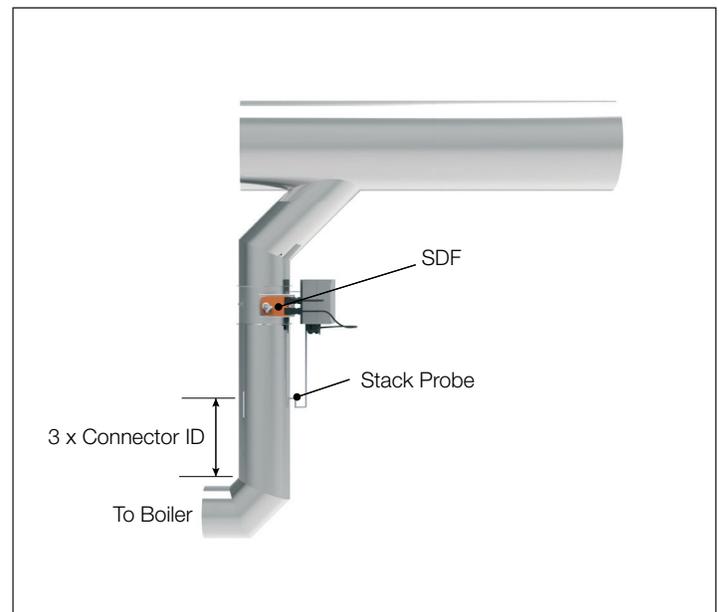It is recommended that a drain section be installed directly downstream of the damper.

Fig 2

Fig 3

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4. ELECTRICAL INSTALLATION

4.1 General

The SDF's actuator and the XTP sensor are both pre-wired inside the EBC 24 control box.

There are two safety systems available. One for excessive pressure and one for inadequate draft.

The terminals' uses are shown below and the terminal layout are shown in Fig 4:

> ### DANGER
> Turn off electrical power before servicing. Contact with live electric components can cause shock or death.

> ⚠️ EBC 24 is designed for 1x120VAC power supply only.

> ⚠️ The wiring in this manual is in accordance with NFPA 70. All field wiring must be installed in flecible or rigid metal conduit and comply with local codes, or in their absence, the National Electrical Code, NFPA 70.

Terminal	Use
1	Power Supply - G (Ground)
2	Power Supply - L1
3	Power Supply - N
4	Fan Motor Out - N
5	Fan Motor Out - L1 (regulating)
6	Fan Motor Out - G (Ground)
7	VFD Relay - NO
8	VFD Relay - C
9	Alarm Out - NC
10	Alarm Out - NO
11	Alarm Out - C
12	Voltage Input from Appliance / Boiler 1 Thermostat, Optocoupler (+) (10-120VAC/VDC)
13	Voltage Input from Appliance / Boiler 1 Thermostat, Optocoupler (-) (10-120VAC/VDC)
14	Burner 1 Relay Contact - NO (max 120VAC, 4A
15	Burner 1 Relay Contact - C (max 120VAC, 4A
16	Voltage Input from Appliance / Boiler 2 Thermostat, Optocoupler (+) (10-120VAC/VDC)
17	Voltage Input from Appliance / Boiler 2 Thermostat, Optocoupler (-) (10-120VAC/VDC)

Terminal	Use
18	Burner 2 Relay Contact - NO (max 120VAC, 4A
19	Burner 2 Relay Contact - C (max 120VAC, 4A
20	Control Signal - VFD (0VDC)
21	Control Signal - VFD (0-10VDC)
22	XTP - 0VDC Power Supply (transducer)
23	XTP - 24VDC Power Supply (transducer)
24	XTP - 0-10VDC Return Signal (transducer)
25	RS485 0V
26	RS485 A
27	RS485 B
28	0VDC Power Supply
29	24VDC Power Supply (Max 100mA)
30	PDS - NC (nNrmally Closed) Proven Draft Switch
31	PDS - NO (Normally Open)Proven Draft Switch
32	PDS - C Proven Draft Switch
33	Buzzer - 24VDC Supply
34	Not used
35	Buzzer Signal

Fig 4

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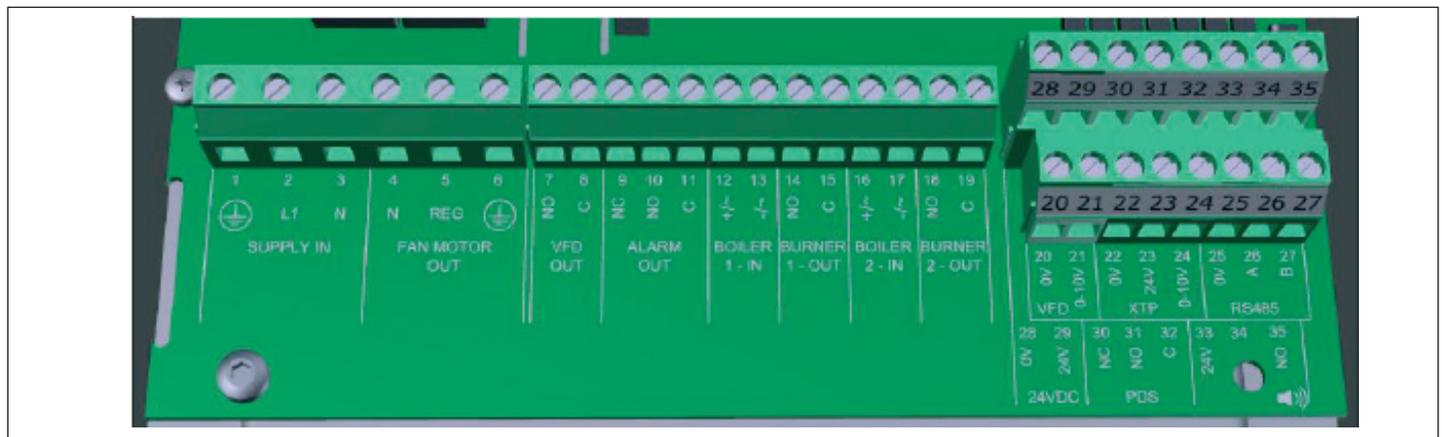
4.2 Wiring Diagram

The SMDS System is shipped pre-assembled and pre-wired for easy installation.

The integrated XTP sensor has a pressure range of -1.00 to +1.00 inchWC. It defaults to intermittent mode, so it requires a call for heat on the boiler input terminals 12/13 or 16/17.

The following are the only connections required when wiring the system (see Fig. 5):

• Terminals 1, 2, and 3 are for required the 120V power supply.
• Call for heat for Boiler 1(terminals 12/13).
• Relay Output signals for Boiler 1 (terminals 14/15)
• Modbus RTU communication can be established through RS-485 terminals 25, 26 and 27.
• Wire Damper control signal (Y-WH) to terminal 21.

Fig 5

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5. START-UP AND CONFIGURATION

5.1 General

When power is supplied to the control it will go through a start-up procedure to detect and check all components and appliances installed.

After turning ON power, the first screen shows the current setup mode. It should show Damper mode. See Fig. 6.

Second screen asks you to enter a pin code. See Fig. 7. Enter the code "3142". The cursor will default to the first digit. Press the ▲ button until it shows "3", then pres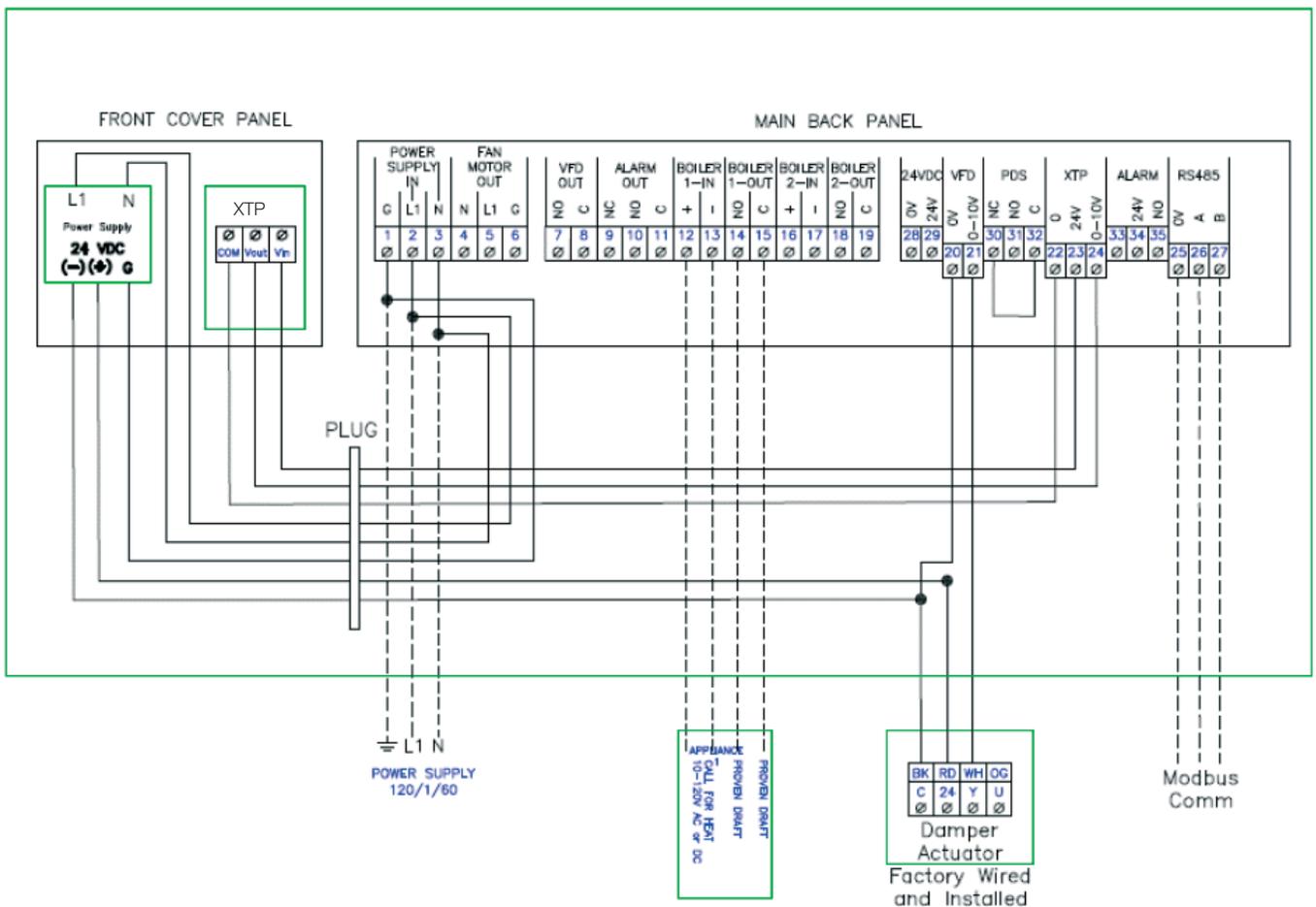s the "√" key to accept. If you overshoot the number, use the ▼ button to go back. The cursor will jump to next position. Repeat the procedure until all digits are entered.

The control will continue the start up procedure and show the current software version. See Fig. 8

Finally, the Main Menu will show. See Fig 9.

5.2 Basic Control Set-up

Once in the Main Menu the control can be programmed. To move around in a menu use the ▲ and ▼ buttons and press the "√" key to select the desired menu item.

Most parameters are pre-programmed from factory and do not need to be changed. The control is set up to operate in bi-directional mode as default. For all the default parameter setups, please see Section 8.

The most common parameters to adjust are:

- Pressure Set Point (SP)
- Alarm Limit
- Alarm Delay

5.3 Set Pressure Set Point (Menu 11)

For setting the draft or exhaust pressure. The value shows up as negative value on the display. The lowest possible value is 0.0 inWC. (The [inWC] units can be changed to [Pa] in the menu 512.)

Navigate to "REGULATION" -> "SET PRESSURE". Enter the desired set point using the ▲ and ▼ buttons.

5.4 Set Alarm Limit (Menu 162)

For setting the alarm limit.

Navigate to menu 1625 and ensure it is set to yes. Once set to yes use menus 1621 & 1622 to set the minimum and maximum alarm limits.

If exhaust pressure goes outside of the alarm limit range then the alarm countdown will begin. When the pressure returns within the alarm limit range the timer resets.
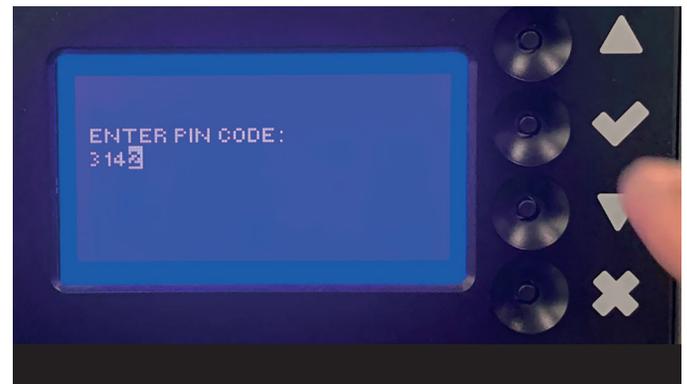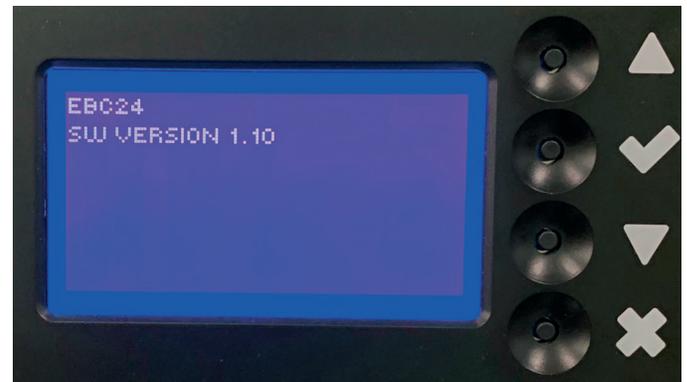

Fig 6

Fig 7

Fig 8

Fig 9

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5.5 Set Alarm Delay (Menu 163)

For setting the Alarm Delay.

Navigate to "REGULATION" -> PROPERTIES" -> "ALARM DELAY". Enter the setting in Seconds (0-120s).

5.6 Suggested Parameter Setting for SMDS System

For most applications, we recommend parameter settings as shown in Fig. 10

5.7 Modbus Access (Menu 334)

To activate Modbus follow these steps:

Navigate to "SERVICE" -> "OPTION" -> "MODBUS". Enter the values for BAUDRATE, PARITY and ADDRESS.

5.8 Saving and Loading Configuration File (Menu 36)

To save or load a configuration file.

To SAVE a configuration file, navigate to "SERVICE" -> "USB CONFIG" -> "SAVE CONFIG FILE". Enter the file name, using the up and down buttons.

To LOAD a configuration file, navigate to "SERVICE" -> "USB CONFIG" -> "LOAD CONFIG FILE". Enter the file name, using the up and down buttons.

5.9 Data Logging to a USB Drive (Menu 362)

The controller can be set to log onto a USB-memory stick.

Navigate to "SERVICE" -> "USB CONFIG" -> "SAVE CONFIG FILE". Two files will be created: one with the alarm log and one with the values of the XTP sensors and 0-10V. The files are .CSV files. The output format is:

[Unix time], [Exhaust XTP 0-1024], [Intake XTP 0-1024], [Exhaust VFD 0-1024], [Intake VFD 0-1024], [Damper Out 0-1024], [MODS XTP 0-1024]. The value between 0-1024 is a fraction of 10V, meaning that a value of 423 equals 4.13 V.

5.10 Upgrading Firmware (Menu 365)

The EBC24 can be firmware upgraded using a USB-memory stick.

1. Insert the USB-memory stick with the firmware in the USB connector on the front of the control.

2. Go to the 365 menu, and select the correct file to be programmed.

3. Press the button to start the update. The update takes approx. two minutes.

Note! If the programming fails, power off the control. Press the "X" button and power up the control again. Doing this will re-upload the latest working firmware.

Controls Setting for SMDS System		
Menu Item	Parameter	Setting
11	Setpoint	*TBD at startup
12	Operation Mode	Intermittent
131	Pre-purge Time	30 sec
141	Post-purge Time	30 sec
151	Sensor Min	-1.000 inWC
152	Sensor Max	1.000 inWC
162	Alarm Limit	300%
163	Alarm Delay	60 sec
164	Speed Min	0
169	Pressure Mode	Bidirectional
1610	Application	Mods

*Draft Setpoint depends on system setup and stack probe location.

Table 1

⚠ Do not adjust parameters - other than suggested in paragraphs 5.2 to 5.9 - without the advice and supervision of an authorized factory representative.

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5.11 Actuator SET-UP AND Testing

The actuator is factory wired and ready to operate. However, before operating follow this procedure:

1. Verify wiring per system application in Section 4.2 of this manual.
1. Turn ON the power to the SMDS system.
1. Verify the direction rotation of the actuator by observing the indicator mark on the end of the damper shaft. When the damper is energized with 0 VDC input voltage, the damper should be in the closed position. If the damper is open at 0 VDC, change the position using the actuator clutch on the actuator face to reverse the rotation. Hold down the clutch button and rotate the damper shaft to the close position. See Fig. 10
1. Verify the Failsafe Position by removing input power to the damper actuator. When power is cut to the system, the damper should return to the fully open position. If the damper does not open, reverse the rotation by changing the failsafe switch position(CW/CCW) on the face of the actuator. See Fig 11

Clutch

Fig 10

Failsafe Switch

Fig 11

6. MODBUS RTU TRANSMISSION MODE

The EBC24 has a Modbus RTU communication protocol. An RS-485 standard connection is provided via terminals 25, 26 and 27 of the controller. This wiring system allows point to point and multi-point system connections. The EBC24 is a slave device in the network. The default communication baud rate is 19200, but the controller can be configured to other rates. The maximum cable length is 4000 ft (1220 meters) and the conductor size depends on the specific network. In general cable 18 AWG twisted pair, shielded cable is required. Communication cable should never be routed alongside line voltage and the cable type and insulation should be in accordance to national and local electrical codes.

See Table 2 for the required port pinout.

6.1 EBC24 Electrical Connections

The network cable should be connected to each EBC24 terminals following a daisy chain configuration as shown in the figure below. Route the network cable, from the master to each controller A(-), B(+) and 0V(G). Wire the shield to ground (0V), only on one side of the network. On larger networks a 120ohm termination resistor is required to prevent network reflection. Typically, this resistor is installed at the beginning and end of each network, across terminals 26 and 27. See Fig. 12

6.2 Communication parameters

The EBC24 controller allows read only communication of most parameters, except the start/stop bit and the setpoint bit. Those could be written as well. The default communication parameters are set to 19200 baud rate, 8 bit, even parity. See following Table 3 for additional Modbus RTU parameters and descriptions.

Terminal	Description
25	0V (Ground)
26	(A-) Negative Terminal
27	(B+) Postive Terminal

Table 2
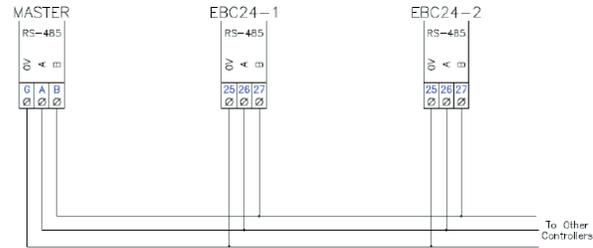
Fig 12

Modbus for ENERVEX SMDS								
Modbus:		RTU						
Baudrate:		Configurable		9600, 19200 (default), 38400, 56000, 57600				
Parity:		Configurable		None, Odd, Even (default				
Register Name	R/W	Register Type	Register Address	Unit	Min	Max	Scale	Remark
Start/Stop	R/W	Holding	0	-	0	0		Bit 0, Burner 1 On, bit 1: Burner 2 On
Setpoint	R/W	Holding	1	Pa			1	
Alarm	R	Input	4096					0: No Alarm 1: Draft Alarm (exhaust 2: Overdraft alarm (MODS mode) 3: Draft alarm (intake mode) 4: Power fault 5: Exhaust error (missing xtp in exh mode) 6: Intake error 7: Start alarm 8: Reserved / not implemented 9: Draft alarm (from PDS) 10: Hardware fault (PDS input fault)
Pressure	R	Input	4097	Pa			1	
VFD Putput	R	Input	4098	%			1	
PDS	R	Input	4099					0: Both open 1: NO closed (ie. Error!) 2: NC closed (ok) 3: Both closed (hardware fault)

Table 3

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7. SETTINGS & TROUBLESHOOTING

7.1 Troubleshooting

Most terminal connections are monitored for proper operation. LED lights indicate operating status. If a light is lit, it indicates everything is functioning properly while a light out indicates a problem on the circuit it monitors. In addition, fault codes are shown on the display.

The fault codes are shown in table 4.

The fault codes are:

Display	Explanation
Exhaust Draft Alarm	Insufficient draft pressure. Can be caused by: 1. Chimney fan does not have enough capacity 2. Mechanical or electrical fan failure 3. Blocked chimney 4. Introduction of excessive dilution air 5. XTP sensor not responding correctly
Intake Draft Alarm	Incorrect boiler room pressure. Can be caused by: 1. Intake fan does not have enough capacity 2. Mechanical or electrical fan failure 3. Blocked intake 4. XTP sensor not responding correctly
Draft Alarm	If the jumper between terminal 30 and 32 is removed or if a PDS is connected, this error occurs.
Power Fault	Indicates there has been a power fault/cut during operation, where the control has been restarted/Power Cycled.
Exhaust Error	Indicates a disconnected signal from the XTP-Sensor on the exhaust side to the control Can be caused by: 1. Loose connections 2. Faulty XTP-sensor 3. Faulty controller
Start Alarm	Indicates that the control has not been able to release the heating appliance(s) within 15 minutes.
Hardware Error	Missing signal from PDS-function. Indicates a faulty function.

Table 4

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8. MENU SYSTEM

8.1 Parameter Table

The menu system provides access to all the controller's
functions, parameters and default values.

Menu	Sub-menu			Display	Description	Range	Default
1				**REGULATION**			
	11			SET PRESSURE	Adjustment of exhaust setpoint.	-4 to 4 inWC	-0.1 inWC
	12			OPERATION MODE	Continuous or intermittent operation. In intermittent mode the exhaust fan runs only if one or more boiler inputs are active.	Continuous/ Intermittent	Intermittent
	13			PRE-PURGE	Pre-purge settings.		
		131		TIME	Pre-purge time in seconds	0-1800	0
		132		SPEED MODE	Select variable if the pre-purge should be controlled by the XTP-sensor or have a fixed speed.	Variable / FIX 20-100%	FIX 100%
	14			POST-PURGE			
		141		TIME	Post-purge settings.	0-1800	0
		142		SPEED MODE	Select variable if the post-purge should be controlled by the XTP-sensor or have a fixed speed.	Variable / FIX 20-100%	Variable
	15			SENSOR			
		151		RANGE MIN	XTP minimum pressure in inWC	-4 - 4	-1 inWC
		152		RANGE MAX	XTP Maximum pressure in inWC	0 -4	1 inWC
	16			PROPERTIES			
		161		ALARM PRECENTAGE	Select the alarm limit of the draft. The value is in % of the set point.	If 1610 = "Negative" ->50 - 80 %. If 1610 = "Positive" -> 150 - 300 %	"64 % (1610 = "Negative") 144 % (1610 = "Positive")
		162		ALARM MANUAL			
			1621	LOW ALARM LIMIT	"The low part of the limits for the Intake/ Exhaust draft alarm"	MENU 151 to MENU 11	-0.4 inWC
			1622	HIGH ALARM LIMIT	"The high part of the limits for the intake/ Exhaust draft alarm"	MENU 11 to MENU 152	0.4 inWC
			1623	"MODS LOW ALARMLIMITS"	"The low part of the limits for the MODS draft alarm"	MENU 151 to MENU 11	-0.6 inWC
			1624	"MODS HIGH ALARMLIMITS"	"The high part of the limits for the MODS draft alarm"	MENU 11 to MENU 151	0.6 inWC
			1625	"USE MANUAL LIMITS"		Yes / No	Yes
		163		ALARM DELAY	Select a alarm delay from 0-120 seconds.	0 – 120 s	15
		164		SPEED MIN	Mimimum speed of the fan	0 – MENU 165	15 %
		165		SPEED MAX	Maximum speed of the fan.	MENU 164-100%	100
		166		PRESSURE Xp	Proportional gain.	0-30	15
		167		PRESSURE Ti	Integral gain.	0-30	8
		168		SAMPLING RATE	Set the sampling rate for the PID Loop	2-10 ms	10
		169		PRESSURE MODE	Positive, negative or bidirectional pressure in the stack.	"Positive, Negative or Bidirectional"	Bidirectional
		1610		APPLICATION	Sets if the control has to work as Exhaust or Intake	Exhaust / Intake / Mods	Exhaust
2							
		21		ERROR	The error is shown here		
		22		ERROR LOG	The last 10 alarms will be saved in the menu.		
		23		RESET	Selecting "AUTO" will automatic reset the alarm after 15 seconds. If "MAN" is selected, the "X" has to be pressed.	MAN / AUTO	AUTO
3				**SERVICE**			
	31			VERSION	Software version is showed.		
	32			I/O-VIEW			
		321		BURNER I/O AUX OUT XXX AUX IN XX	In this menu the status of the boiler I/O is shown. By pressing √ the AUX OUT relays can be activated by pressing up and down. Multiple activations of the √ button will move from relay 1 to 6		
		322		XTP AND FAN I/O XTP x.xV OFF VFD x.xV OFF	XTP, VFD and VFD relay status for Exhaust.		
		323		DRAFT INPUT ON / OFF	Draft Input I/O status.		

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Menu	Sub-menu		Display	Description	Range	Default
		324	ALARM OUT OFF	Alarm relay output status.		
	33		OPTION			
		331	BEARING CYCLE	Selecting "YES" will enable a bearing cycle on present fans, if the boilers has not been active for 24 hours.	ON / OFF	ON
		332	DRAFT INPUT DELAY	The delay before the control goes into Draft Alarm	0-20 s	0 s
		333	PRIME	Selecting a number from 0-250 will enable the prime function. This allows the boilers to be activated even though no sufficient draft is present.	0-250 s / OFF	0 s
		334	MODBUS			
			3341 BAUDRATE		9600-57600	19200
			3342 PARITY		EVEN, ODD, NONE	EVEN
			3343 ADDRESS	Modbus address	1-247	1
			3344 START ENABLE	If Start Enable is set to "On" the controller can be started and stopped using modbus	ON / OFF	OFF
		335	START ALARM	If the parameter is set to 0, the control will go into start alarm after 15 minutes with insiffient pressure. When set to 1-15 minutes, the control will go to alarm state after the set delay	0-15 min	15
	34		FACTORY	If "YES" is selected, a factory reset will be performed.	YES / NO	NO
	35		MANUAL MODE	Entering a value from 10-100 % will start the fan at the set speed.		
		351		TRIAC/VFD Output	0-100 %	0
	36		USB CONFIG			
		361	FORMAT USB	Selecting "YES" will format the USB flash drive. Notice! All data will erased!	YES / NO	NO
		362	DATA LOG USB / INTERNAL	Selecting "USB" will store the alarm log on the USB flash drive, "INT" will store the log in the internal memory.	USB / INT	INT
		363	SAVE CONFIG FILE	Selecting "YES" provides the possibility to select configurationfiles stored on the USB flash drive.	YES / NO	NO
		364	LOAD CONFIG FILE	Selecting "YES" will download the current configuration to the USB flash drive.	YES / NO	NO
		365	UPGRADE FIRMWARE	This function provides the possibility to upgrade the firmware by means of a USB Stick		
	37		ENABLE PIN	If enabled, the user will have to enter the PIN "3142" to access the menu	ON / OFF	OFF
4			**USER INTERFACE**			
	41		DISPLAY			
		411	LANGUAGE	Language	ENG / FRA / ESP	ENG
		412	UNITS	Pa or inWC units	Pa / inWC	inWC
		413	LCD BACKLIGHT	LCD backlight turned on or not. The USE parameter will cause the backlight to be turned on if a button is pressed.	ON / OFF / USE	ON
		414	LCD CONTRAST		10 – 100 %	50
		415	DISPLAY DRIVER	Changes how the LCD driver is driven. Change the settings from AUTO if the display is hard to read.	Low Density, High Density and AUTO	AUTO

⚠ Do not adjust parameters - other than suggested in paragraphs 5.2 to 5.9 - without the advice and supervision of an authorized factory representative.

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