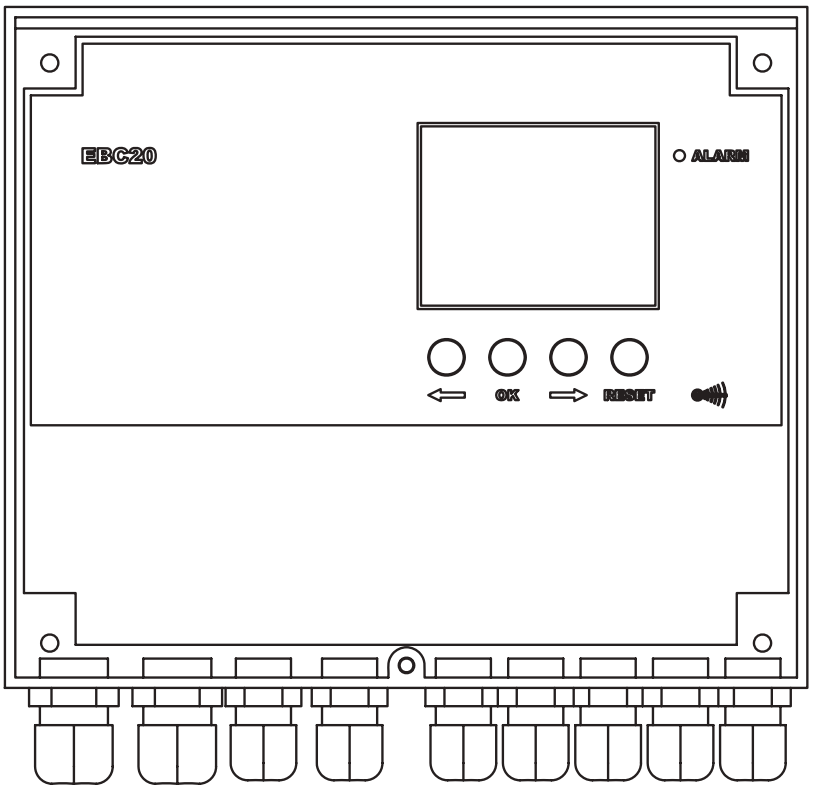
EBC20



UK

Instructions for fitting, installation and operation

Read and save these instructions!

exodraft
CHIMNEY DRAFT TECHNOLOGY

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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.

Prohibition symbol:

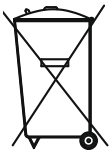
Failure to observe instructions marked with a prohibition symbol may result in serious injury or death.

Danger symbol:

Failure to observe instructions marked with a danger symbol may result in personal injury and/or damage to the unit.

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

- Use this unit in the manner intended by the manufacturer. If you have questions, contact the supplier at the address or telephone number listed on the back of the manual.
- Before servicing or cleaning the unit, switch off at service panel and lock service panel to prevent power from being switched on accidentally.
- Installation work and electrical wiring must be done by a qualified person(s) in accordance with applicable codes and standards.
- Follow the appliance manufacturer's guidelines and safety standards and the local code authorities
- This unit must be grounded.



No special requirements. Disposal should be carried out in accordance with statutory regulations related to the disposal of electronic waste.

Job name: _____

Fitter: _____

Installation date: _____

1. Product information

Description

The EBC20 (**exodraft** Boiler Control) is a specially designed control component for constant pressure regulation of chimney draft. The EBC20 comes in two versions:

- EBC20EU01 for indoor installation
- EBC20EU02 for outdoor installation

By changing the operating mode, the EBC20 can also:

- Act as a 2-stage speed regulator (see section 3).
- Control the supply of fresh air to the boiler room (see section 4).

Layout of the instructions

The EBC20 can control an **exodraft** chimney fan or an **exodraft** supply air fan.

There are seven sections to the instructions:

- Read section 1. "Product information".
- Read the section that deals with the required control methods:
  - Section 2: Pressure-controlled regulation of **exodraft** fans (factory-set).
  - Section 3: Two-step speed regulation of **exodraft** fans.
  - Section 4: Pressure-controlled regulation of **exodraft** supply air fan.
- Read sections 5–7.

Section 2,3, and 4 deals with the following:

Section 2:  **Pressure-controlled regulation of exodraft chimney fans (default).**

- The EBC20 ensures and monitors constant pressure in a chimney.
- The EBC20 is designed for use with boiler systems with 1- and 2-stage burners.
- The EBC20 can also be used for boiler systems with modulating burners.
- The control system monitors chimney draft and shuts down the burner in the event of errors (the alarm-diode on the EBC20 will turn on).
- The control system is intended for both solid fuel boilers, atmospheric gas boilers, condens and forced draft boilers for oil and gas.
- The EBC20 can control a chimney fan directly or indirectly via a frequency converter.

Section 3: 

2-stage speed regulation of exodraft chimney fans.

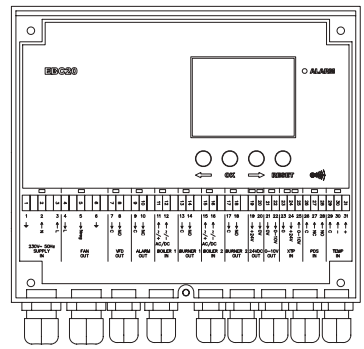
- The EBC20 can be used as a 2-stage speed regulator for **exodraft** chimney fans.
- The EBC20 monitors chimney draft and shuts down the burner in the event of errors (the alarmdiode on the EBC20 will turn on).
- The control system is intended for 1- or 2-stage atmospheric gas boilers.
- The EBC20 can control a chimney fan directly or indirectly via a frequency converter.

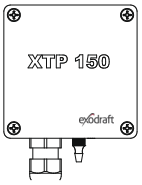
Section 4:  **Pressure-controlled regulation of exodraft supply air fans.**

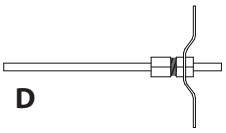
- The EBC20 can be used to control an **exodraft** BESB or BESF box fan.
- The EBC20 ensures and monitors constant pressure in a boiler room.
- The control system monitors the pressure in the boiler room and shuts down the burner in the event of errors (the alarmdiode on the EBC20 will turn on).
- The EBC20 can control a supply air fan directly or indirectly via a frequency converter.

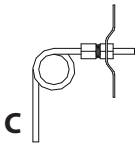
1.1 Delivery

The EBC20 is delivered with the following:











Pos.	Part	Item no.	Function
A	EBC20	EBC20EU01	Controls **exodraft** fans and chimney fans. For indoor installation.
		EBC20EU02	Controls **exodraft** fans and chimney fans. For outdoor installation.
B	Pressure transducer (XTP)	0501022	Measures difference air pressure in the boiler room or chimney, or outdoor atmospheric pressure.
C	Measuring probe	0500512	Measures pressure in the chimney. (EBC20EU01)
D	Measuring probe	3200484	Measures pressure in the chimney. (EBC20EU02)
E	2 m silicone hose	2000335	Supplies the pressure transducer (XTP) with reference pressure from the measuring probe or from outdoors.
	Instructions	3002878	Instructions for fitting, installation and operation.

1.2 Accessories

Part	Item no.	Function
Relay	ES12	If more than 2 boilers are connected.
Extern PDS	PDSBOX	Measures pressure in chimney.
Isolation switch	REP-AFB	Isolation switch

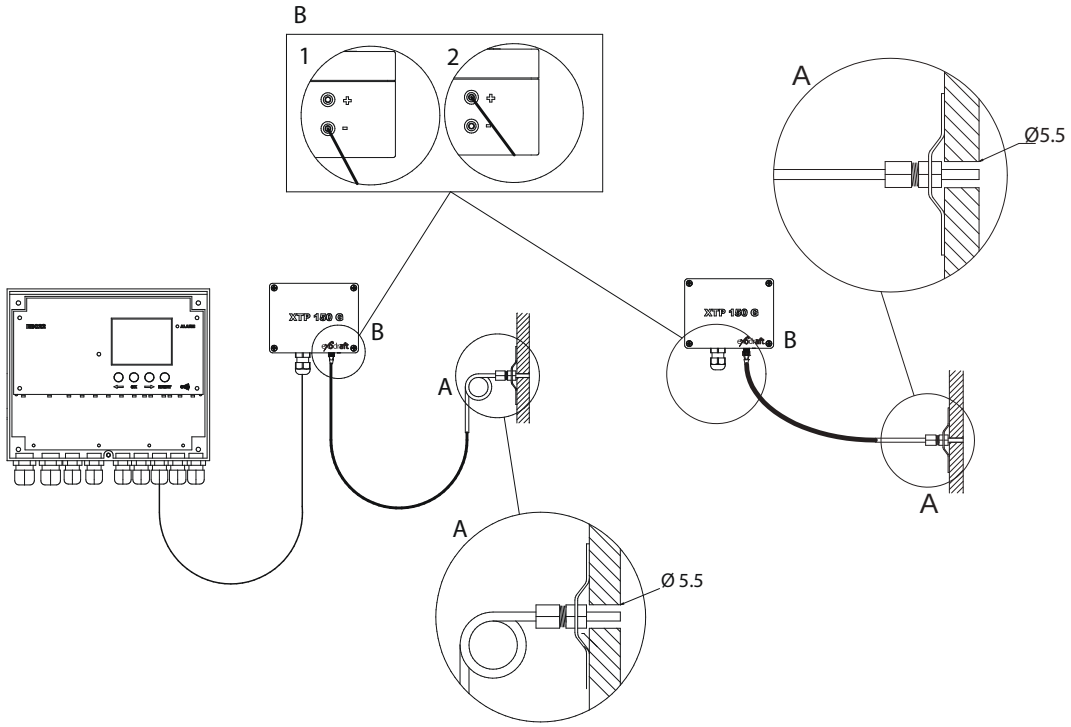
1.3 Fitting

1.3.1 Cable length

Max. cable length between EBC20 and XTP: 100 m.
Max. cable length between EBC20 and chimney fan / fan: 100 m.

1.3.2 Connection diagram

The EBC20 is to be fitted and connected as shown in the diagram below.



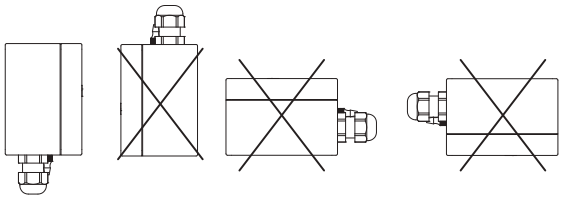
Control of …	Fitting procedure
Chimney fan Remark!	• Fit the EBC20 and the pressure transducer (XTP) in the boiler room. • Fit the measuring probe(A) in the boiler flue or in the manifold. However, for atmospheric boilers, the probe must always be positioned after the draft hood. • Connect the hose from the measuring probe to the negative terminal on the pressure transducer (B"1"). • When the measuring probe is placed outside, it must be mounted in a way that prevents condensate or ice from being formed. A straight probe is delivered with the EBC20EU02. • The EBC20EU should be mounted in a way that protects it against rain/snow.
Supply air fan	• Fit the EBC20 and pressure transducer (XTP) in the boiler room. • Connect the hose for measuring reference pressure (outdoor atmospheric pressure) to the negative terminal (B"1") on the pressure transducer. Run the hose outside the building to a place that is not affected by wind, rain, etc. If appropriate, fit the free end of the hose in a box as described at the top of the next page.
Note	Special aspects if you require **positive pressure*** in the chimney/boiler room: • Connect the hose to the positive terminal on the pressure transducer (B"2") • In menu 16 (see page 13) set the value to 2 (positive pressure). For operation of the service menu, see page 12 • Please note that the EBC20 is supplied with only 2 m of hose.

NB!

***The default setting of the EBC20 is for negative pressure regulation, but local authority requirements may state that positive pressure must be maintained.**

The pressure transducer cannot be mounted inside an air tight enclosure. It uses the atmospheric pressure as reference pressure.

Make sure to position the pressure transducer the right way up.



NB
Do not blow into the valves on the XTP.

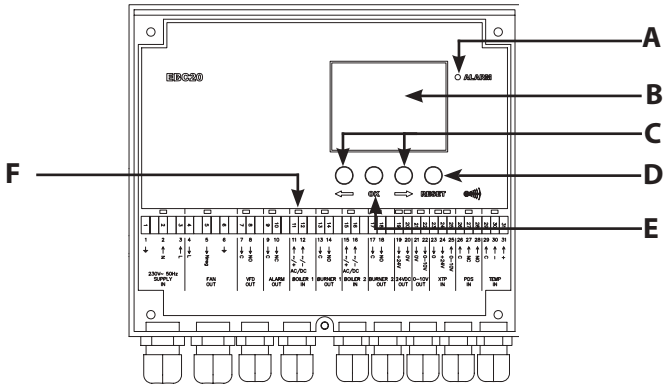
Outdoor fitting of the pressure transducer (XTP)

When fitting the pressure transducer outdoors, make sure to position it in a place where it is not affected by wind, rain, etc. When fitted outdoors, the pressure transducer should ideally be positioned in a box with a hole (dia. 2 mm) in the bottom. The purpose of this box is to assure correct reference pressure – through the hole – and to keep water out.

If the pressure transducer is positioned in a place where insects have access to the free end, fitting a sinter filter is recommended.

1.4 Layout of the user interface

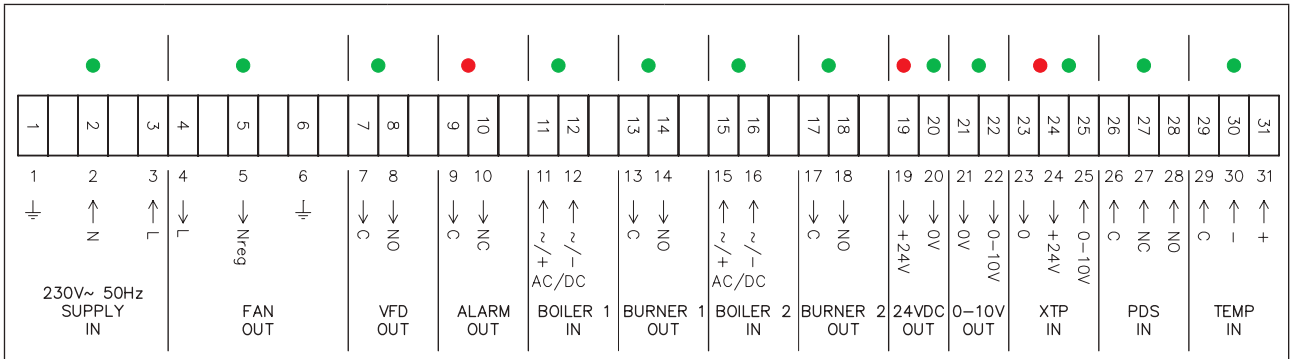
1.4.1 Panel



Pos.	Part	Function
A	Alarm	• indicates alarms
B	Display	• displays operation and changes in the user interface (menu system) • indicates alarms • shows normal operation status
C	and	• forward or back in the menu system • increase/reduce set point
D	RESET	• reset alarm • return to operation screen
E	OK	• select menu item • confirm/save changes of set point or parameters
F	Light emitting diodes	• shows status of inputs and outputs

1.4.2 Light emitting diodes and terminal board

The chart below lists the connection options for the terminal boards and explains the various colours of the light emitting diodes.



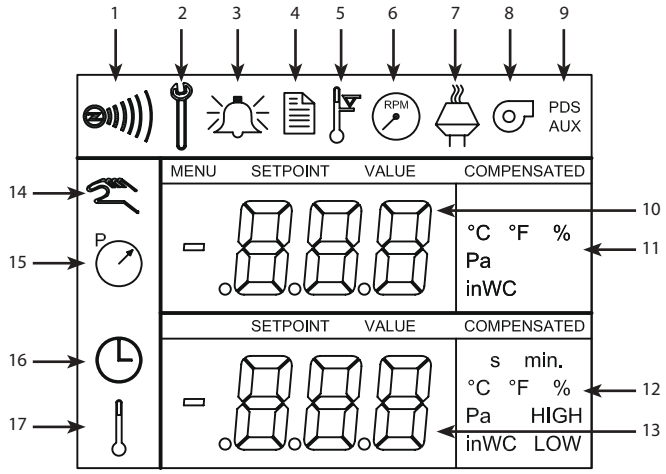
No.	Designation	Max. load	Meaning when the light diode is …
1, 2 & 3	SUPPLY IN	230-240VAC +/- 10%	green: the EBC20 is connected to a power supply
4, 5 & 6	FAN OUT	3A	green: the triac output is active
7 & 8	VFD OUT	250VAC, 8A, AC3	green: the relay is connected
9 & 10	ALARM OUT	250VAC, 8A, AC3	red: the relay is open
11 & 12	BOILER 1 IN	18 - 230VDC / VAC	green: the input is active
13 & 14	BURNER 1 OUT	250VAC, 4A, AC3	green: the relay is connected
15 & 16	BOILER 2 IN	18 - 230VDC / VAC	green: the input is active
17 & 18	BURNER 2 OUT	250VAC, 4A, AC3	green: the relay is connected
19 & 20	24 VDC OUT	100mA	green: power supply OK red: overload
21 & 22	0 - 10 V OUT*	20mA	green: the output is active
23, 24 & 25	XTP IN		green: XTP connected red: return voltage >12 VDC
26, 27 & 28	PDS IN **		green: C & NO are connected
29, 30 & 31	TEMP IN		green: temperature sensor connected

* Cable length between 0-10V output (terminal 21 & 22) must not exceed 100 m and must be of a shielded cable 3 x 0,75 $mm^{2.}$

** Terminals 26, 27 & 28 can however also be used for connecting other auxiliary surveillance equipment.

1.4.3 Display

The diagram below shows the layout of the display on the EBC20. All possible display values are stated:



Pos.	Shows …
1	Symbol indicating the connection of Z-wave
2	Symbol for service menu
3	Symbol for alarms. Displayed in the event of an alarm, along with the illumination of the alarm diode.
4	Symbol for the operational settings of the service menu (see section 1.6) and the alarm log.
5	Symbol for overheating
6	Symbol for 2-stage speed regulation of **exodraft** chimney fan
7	Symbol for pressure-controlled regulation of **exodraft** chimney fan
8	Symbol for pressure-controlled regulation of **exodraft** supply air fan
9	Symbol indicating: • PDS error • PDS check (flashing)
10	• Operation screen: current pressure • Menu screen: current menu
11	Units
12	Units
13	Menu screen ("VALUE" and, in some cases, "SETPOINT" displayed): Setpoint for the menu item in question
14	Temperature symbol, indicates: • Operation screen: current temperature • Menu screen: temperature parameter setting
15	Timer indicator
16	Pressure symbol indicating that: • Operation screen: Pos. 10 is displaying pressure • Menu screen: You are currently altering a pressure parameter
17	Symbol for commissioning

1.5 Introduction to the user interface

Display

The purpose of the display (see previous page) is to present:

- Operating information (pressure, etc.)
- Alarms
- Setpoints
- Parameters

Menu structure

The menu system in the EBC20 contains:

- User menu (for operation by daily users).
- Service menu (for operation by qualified technical staff).

Layout of the user interface

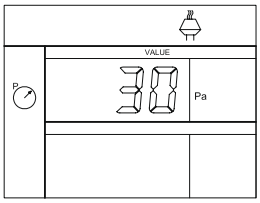
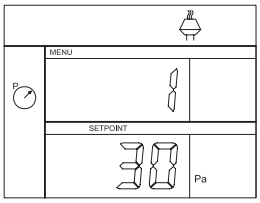
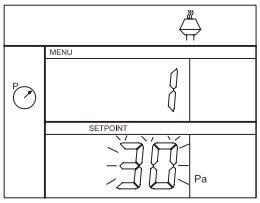
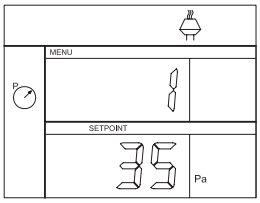
The user interface is operated through four buttons with the following functions:

Button	Function
OK	• Activate the user menu • Edit and save settings • Activate service menu (press and hold for 3 seconds)
nd	• Go to menu item, and adjust value
RESET	• Return to operation screen from any point in the menu system • Reset alarm when manual reset is selected in menu 25, see page 13

1.6 Set-up

1.6.1 Setting the chimney draft

To set the pressure in the chimney, follow the procedure detailed below.

Step.	Action...	The display shows...
1	• Start the heating system. • The EBC20 displays the actual pressure (in this example 30 Pa).	
2	• Briefly press OK to enter the user menu.	
3	• Press OK • Press ← and → until the required pressure appears in the lower display.	
4	• Press OK to confirm the setting	
5	• To finish and return to the operation screen, press RESET	

NB

This procedure only applies to setting up the chimney draft.
If you wish to:

- Set the EBC20 up for 2-stage speed regulation of a chimney fan, see page 25
- Set the EBC20 up for pressure control of a supply air fan, see page 31

1.7 Service menu

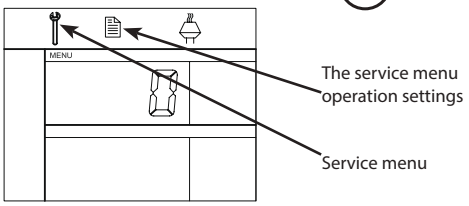
The service menu is only to be operated by qualified staff.

For an overview of the **service menu,** see page 13.

Operation of the **user menus** is described in sections 2, 3 and 4.

Navigation in the service menu

- To activate the service menu, press and hold OK for 3 seconds.



- Operation is carried out using the buttons as described in section 1.5 Introduction to the user interface, page 10.
- The upper display (pos. 10 on page 9) presents the number of the menu, with the set point for this menu being shown in the lower display (pos. 13 on page 9).
- Menus whose last digit is "0" are exit menus. These are used to navigate one level back. To do so, press OK.
- To activate the editing options for a menu item, press OK. The set point will start flashing.
- Confirm and save selection with OK.
- To exit the service menu, press RESET. This will take you back to the operation screen. Alternatively, you can navigate back one level at a time if you wish to set multiple menu items.

For examples of how to use the service menu, see 1.7.1

1.7.1 Overview of the service menu

The service menu is built up in four levels:

Menu level 1		Menu level 2		Menu level 3		Function	Base settings for the three applications		
							Default	RPM	
0	Exit Service menu					Return to operation screen			
1	Operation settings	***10***	Exit operation settings						
		11	Operating mode			Setting of control/operating function 1 = Pressure-controlled regulation 2 = 2-stage speed regulation 3 = Supply air regulation	1		
		12	°C/°F			Select measuring unit for temperature 1 = °C, 2 = °F	1 (°C)	1 (°C)	1 (°C)
		13	Pa/inWC			Measuring unit for pressure: 1 = Pa, 2 = inWC	1 (Pa)	1 (Pa)	1 (Pa)
		14	Software versions	***140***	Exit				
				141	Controller version	View Controller software version	x.xx	x.xx	x.xx
				142	Safety version	View Safety software version	x.xx	x.xx	x.xx
				143	Display version	View Display software version	x.xx	x.xx	x.xx
		15	Select XTP measurement range	***150***	Exit				
				151	Set Low XTP value	from -500 Pa to 0 Pa	0 Pa	N/A	0 Pa
				152	Set High XTP value	from 0 Pa to 500 Pa	150 Pa	N/A	150 Pa
		16	Positive/negative pressure			1 = negative pressure 2 = positive pressure	1	N/A	1
		17	OEM functions	***170***	Exit				
				171	Cooker function	Switch Cooker function ON and OFF	N/A	OFF	N/A
		18	Reset to defaults			Reset to defaults. If you select "YES", a 10-second countdown will start, during which you can cancel your choice by pressing any button.	NO	NO	NO
2	Alarm	20	Exit Alarm						
		21	Alarm Log	***210***	Exit				
				211-219		The 9 most recent alarms			
		22	Reset alarm log			Resets alarm log	NO	NO	NO
		23	Flow Alarm limit			Set Flow Alarm limit in %: 50-80 % (Alarm when pressure is below xx%) 100-300 % (Alarm when pressure is above xx%)	64 %	N/A	300 %
		24	Flow Alarm delay			Set Flow Alarm delay, 10–60 s	15 s	15 s	15 s
		25	Reset auto / manual			1 = automatic, 2 = manual	1 (Auto)	1 (Auto)	1 (Auto)

The service menu is built up in four levels:

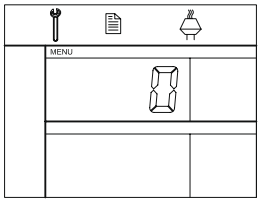
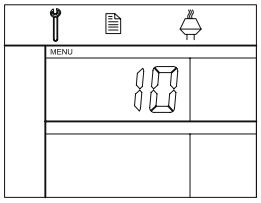
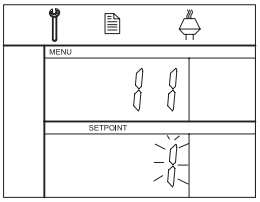
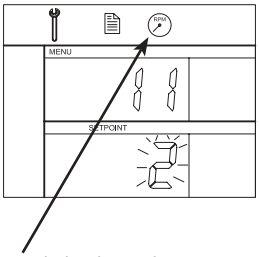
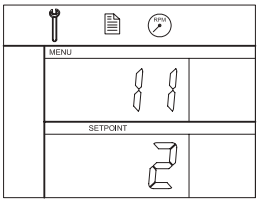
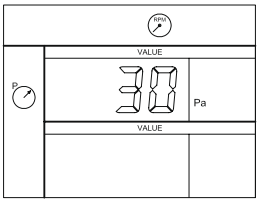
Menu level 1	Menu level 2	Menu level 3	Function	Base settings for the three applications		
				Default	RPM	
3 Configuration	***30*** Exit settings					
	31 PDS/AUX config		1 = PDS, 2 = C-NO	2 (C-NO)	1 (PDS) (Locked)	2 (C-NO)
	32 Triac settings	***320*** Exit				
		321 U_{min}	Min. output voltage in % of 230 V AC, 35-100 %	35 %	N/A	35 %
		322 U_{max}	Max. output voltage in % of 230 V AC, 35-100 %	100 %	N/A	100 %
	33 0–10 V settings	***330*** Exit				
		331 U_{min}	Min. output voltage in % of 10 V DC, 0-100 %	0 %	N/A	0 %
		332 U_{max}	Max. output voltage in % of 10 V DC, 0-100 %	100 %	N/A	100 %
	34 Manual fan mode	***340*** Exit				
		341 Manual Fan mode on/off	Switch Manual Fan mode on and off	OFF	OFF	OFF
		342 Manual Fan mode speed	Set the motor manually, 35–100 %	35 %	35 %	35 %
	35 Regulation parameters	***350*** Exit				
		351 Amplification Xp	Set proportional amplification, 0.2 to 5	2,2	N/A	1,2
		352 Integration time T_i	Set integration time from 1 to 30 s	5	N/A	3
		353 Differential time T_d	Set differential time from 1 to 30 s	1	N/A	5
		354 Sample time	Set sample time from 1 to 999 ms	300 ms	N/A	300 ms
	36 Boiler controlled prepurge	***360*** Exit			-	
		361 ON/OFF	Forced boiler controlled prepurge ON/OFF	OFF	-	OFF
		362 Fan speed	Manual setting (35 - 100%)	100%	-	100%
		363 Input priority	OFF = Forced boiler controlled prepurge ON = Boiler 1	OFF	-	OFF
4 Temperature sensor	***40*** Exit temperature sensor					
	41 Sensor ON/OFF		Sensor ON or OFF	OFF		OFF
	42 Autostart/-stop	***420*** Exit				
		421 ON/OFF	Sensor ON or OFF	OFF		OFF
		422 Start temperature	Set start temperature between 5-450 °C	40 °C		40 °C
		423 Stop temperature	Set stop temperature between 0-445 °C	35 °C		35 °C
	43 Pressure function	***430*** Exit				
		431 ON/OFF	Pressure function ON or OFF	OFF		OFF
		432 Temperature limit	Set temperature limit between 5-450 °C	250 °C		50
	44 Alarm	***440*** Exit				
		441 ON/OFF	Alarm ON or OFF	OFF		OFF
		442 Temperature limit	Set temperature limit between 25-450 °C	450 °C		450 °C
		443 Alarm delay	Set delay for temperature limit alarm between 0-60 sec.	5		5

1.7.2 Changing between the operating functions (- RPM -)

Default operating function

As its base function, the EBC20 is factory set to pressure-controlled regulation of **exodraft** chimney fans (operating function 1)

How to change the operating function:

Step	Action...	The display shows...
1	• Press and hold OK for 3 seconds	
2	• Press → to go to menu 1 • Press OK to go to menu 10	
3	• Press → to go to menu 11 • Press OK	
4	• Press → until the symbol and number for the operating function you require is displayed. The three operating functions are: 1. Pressure-controlled regulation of **exodraft** chimney fans (default) 2. 2-stage speed regulation of **exodraft** chimney fans 3. Pressure-controlled regulation of **exodraft** supply air fan	 symbol is changed
5	• Press OK to confirm and save selection	
6	To finish and return to the operation screen, press RESET	

2. Pressure-controlled regulation of exodraft chimney fan

2.1 Use

Area of use

- The EBC20 is designed for use with boiler systems with 1- and 2-stage burners.
- The EBC20 can also be used for boiler systems with modulating burners.
- The EBC20 can also be used for multiple boiler systems.
- The control system is intended for:
  - solid fuel boilers
  - atmospheric gas boilers
  - forced draft boilers for oil and gas
  - condensing boilers
- The EBC20 can control a chimney fan directly or indirectly via a frequency converter.

2.2 Method of operation

General function

- The control system monitors chimney draft and disconnects the burner in the event of errors (the alarm-diode on the EBC20 will turn on).
- When the boiler thermostat demands heat, the chimney fan will start at max. voltage, the burner start is delayed.
- When the EBC20 registers sufficient chimney draft, the burner is released.
- The EBC20 maintains the set pressure by regulating the voltage. The pressure is shown in the display.
- In the event of an insufficient pressure the burner will be disconnected after 15 seconds. "Insufficient pressure" is less than 64% of the set value, corresponding less than 80% flow.
- When the boiler switches off, the chimney fan is also stopped. However, it is possible to set a post-purge period for the chimney fan (see page 23). Alternatively, the control system can be set up to keep the chimney fan running continuously (see page 20).

Light emitting diodes and output signals

All inputs and outputs are linked to light emitting diodes for the monitoring and service of the system (1.4.2 Light emitting diodes and terminal board, page 8).
The EBC20 has 0–10V output signals for controlling multiple chimney fans via frequency converters or motor power relays.

2.3 Electrical connection

This work must be performed by a qualified electrical engineer, in accordance with locally applicable rules and legislation.

The installation of the supply cable must be carried out in accordance with applicable regulations and legislation.
The earth terminal (⏚) must always be connected.

When connecting pressure transducer (XTP) and frequency converter, shielded cable must be used.

Isolation switch

exodraft stresses that according to EU's Machinery Directive an isolation switch must be set up in the fixed installation.
The isolation switch is not supplied by **exodraft**. Available as an extra.

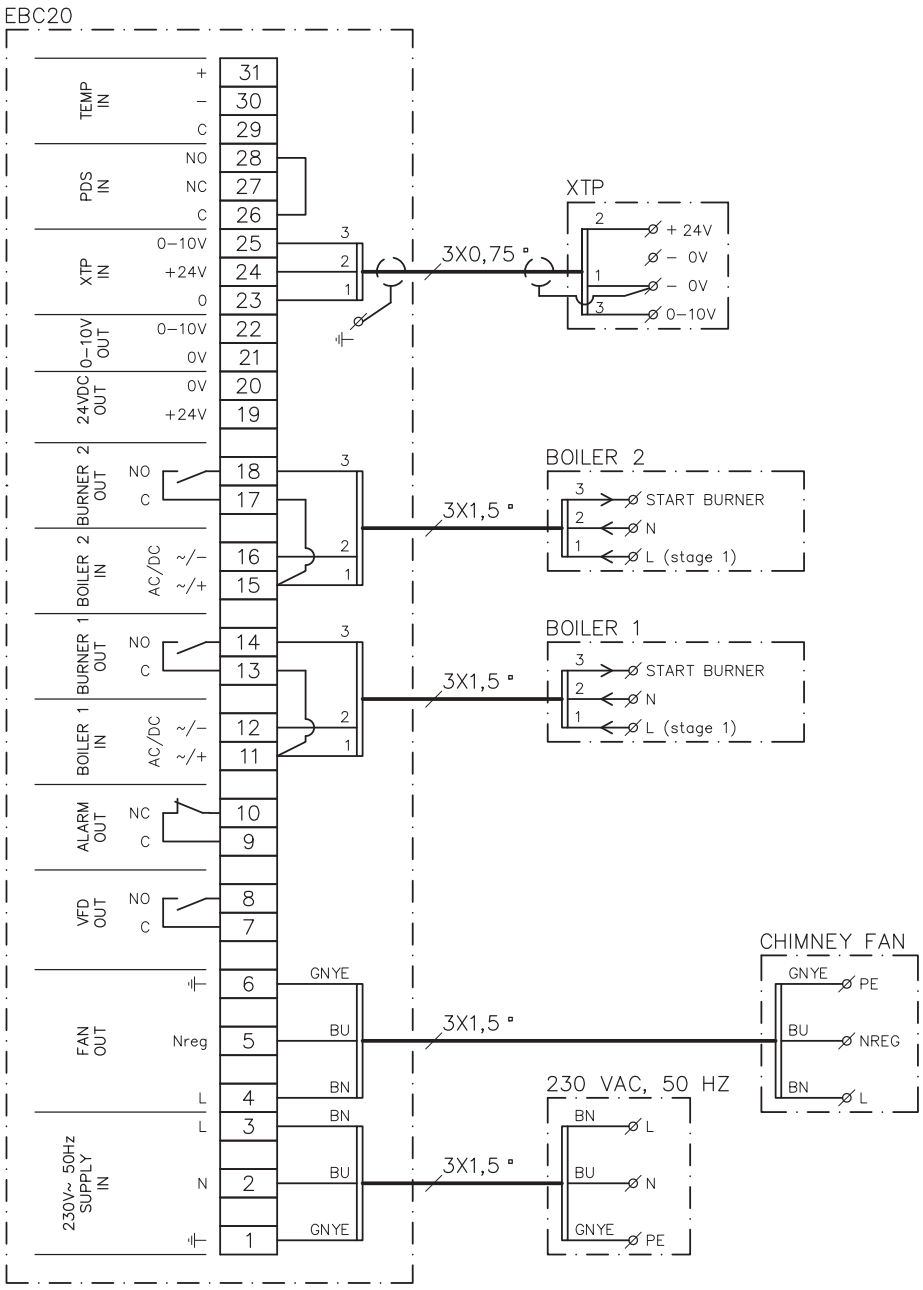
2.4 Sample wiring diagrams

As a constant pressure regulator for **exodraft** chimney fans, the EBC20 can be connected to a range of different signals. The following pages are sample wiring diagrams, and show the following:

- **2.4.1 Single- or two boiler application, page 17**
- **2.4.2 Single boiler application with potential free contact in boiler, page 18**
- **2.4.3 Single boiler application with extra fail-safe protection using PDS, page 19**
- **2.4.4 Single boiler application with a frequency converter, page 20**
- **2.4.5 Two boiler application with permanent chimney fan operation, page 21**
- **2.4.6 Solid fuel boiler with temperature sensor, page 22**

exodraft recommends that you contact the boiler manufacturer for details of correct connection of the boiler control system.

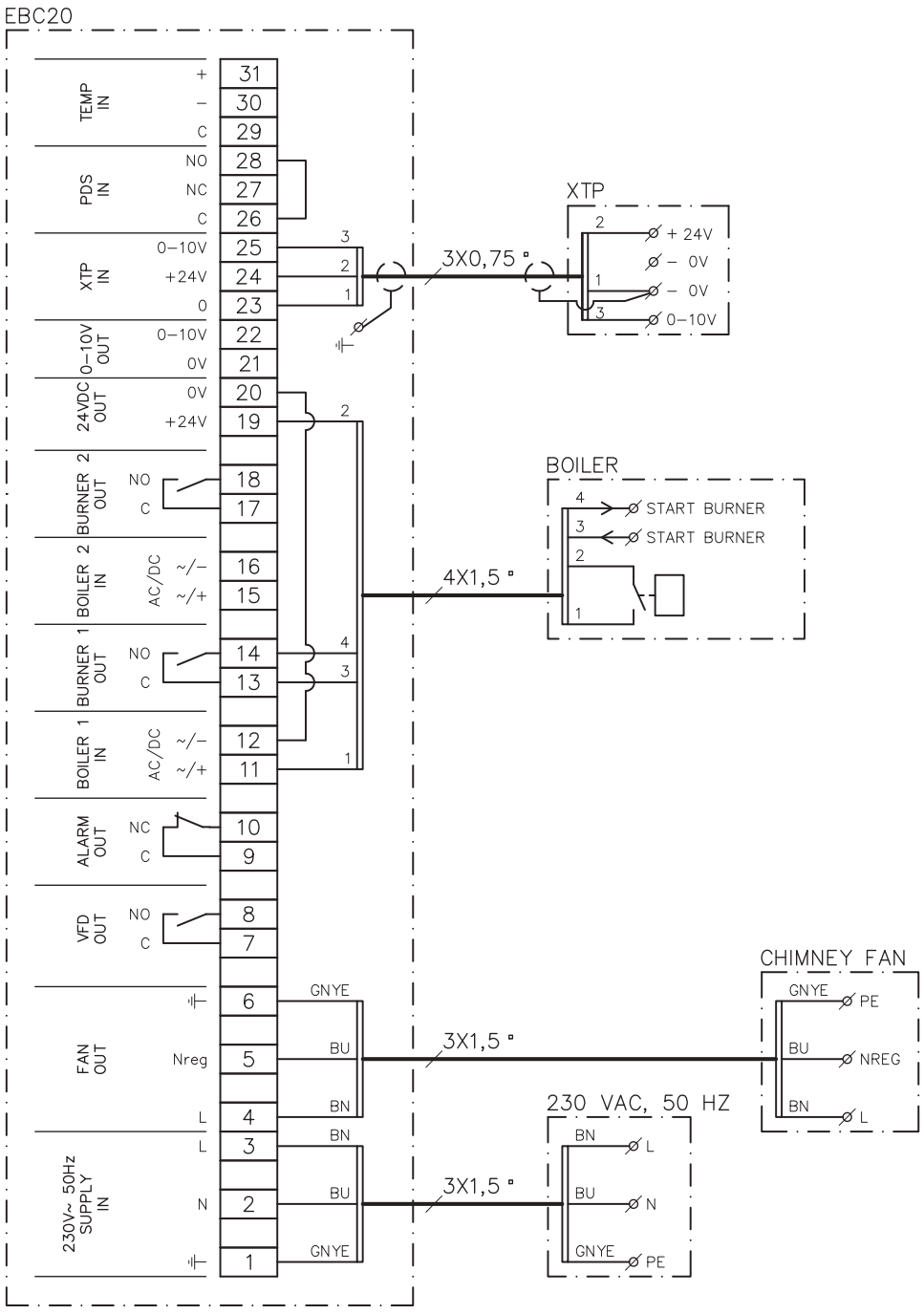
2.4.1 Single- or two boiler application



This example shows how to connect a voltage signal (18–230 V AC/DC) for the EBC20 to start/stop the fan from one or two independent boilers:

- Connect the supply voltage to terminals 1–3
- Connecting the boilers:
  - Connect the burner start signal (L) to terminal 11 & 15
  - Connect the neutral wire to terminal 12 & 16
  - The start signal for the burner is sent from terminal 14 & 18
- Loop terminals 11 and 13
- Loop terminals 15 and 17
- Connect the chimney fan to terminals 4–6
- Connect the pressure transducer (XTP) to terminals 23–25 using a a shielded cable 3x0,75 mm^2 and connect the cable shielding to the cable bracket

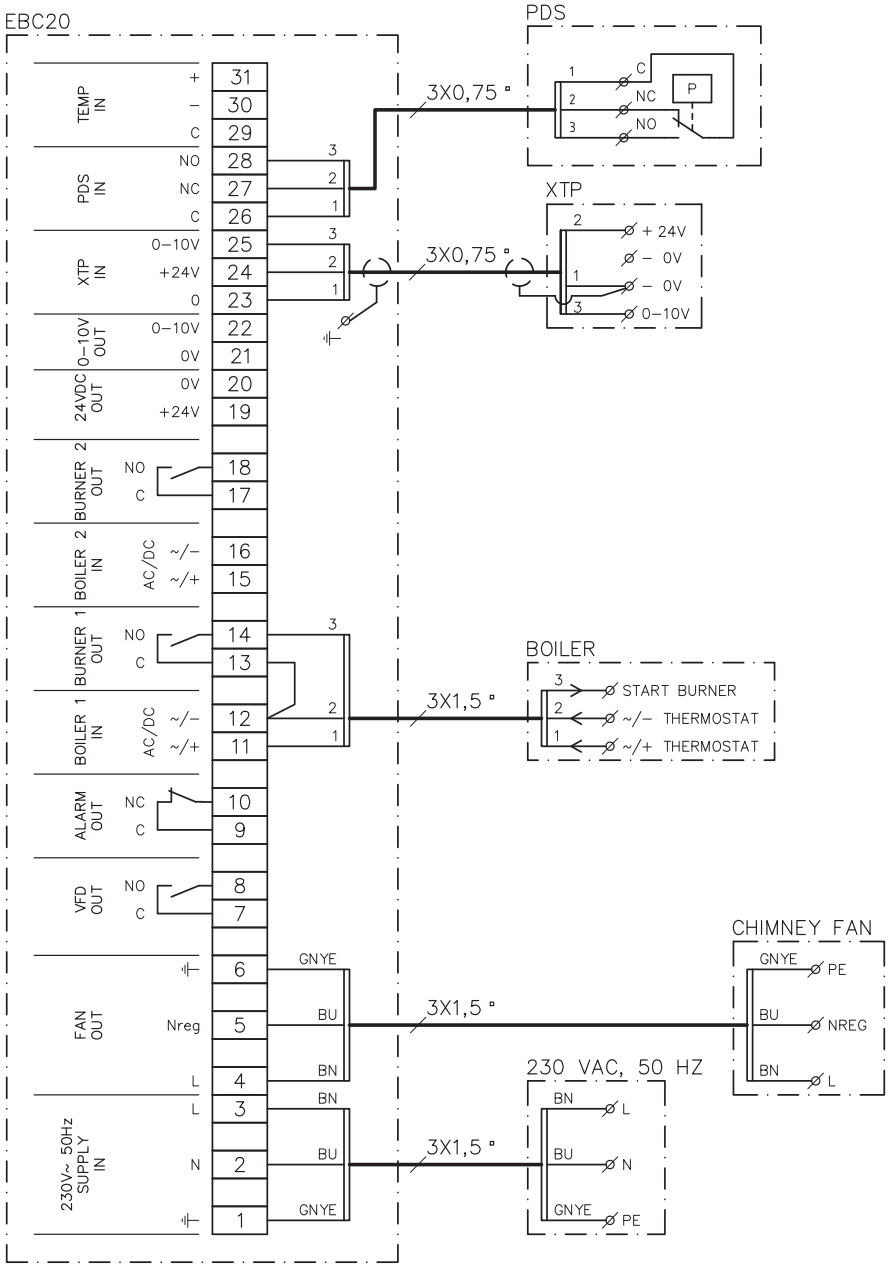
2.4.2 Single boiler application with potential free contact in boiler



This example shows how to connect a potential free contact to the EBC20 to start/stop the fan:

- Connect the supply voltage to terminals 1–3
- Connection to the boiler:
  - Connect the potential free contact to terminals 11 & 19
  - Loop terminals 12 & 20
  - Connect the burner start signal to terminals 13 & 14
- Connect the chimney fan to terminals 4–6
- Connect the pressure transducer (XTP) to terminals 23–25 using a a shielded cable 3x0,75 mm^2 and connect the cable shielding to the cable bracket

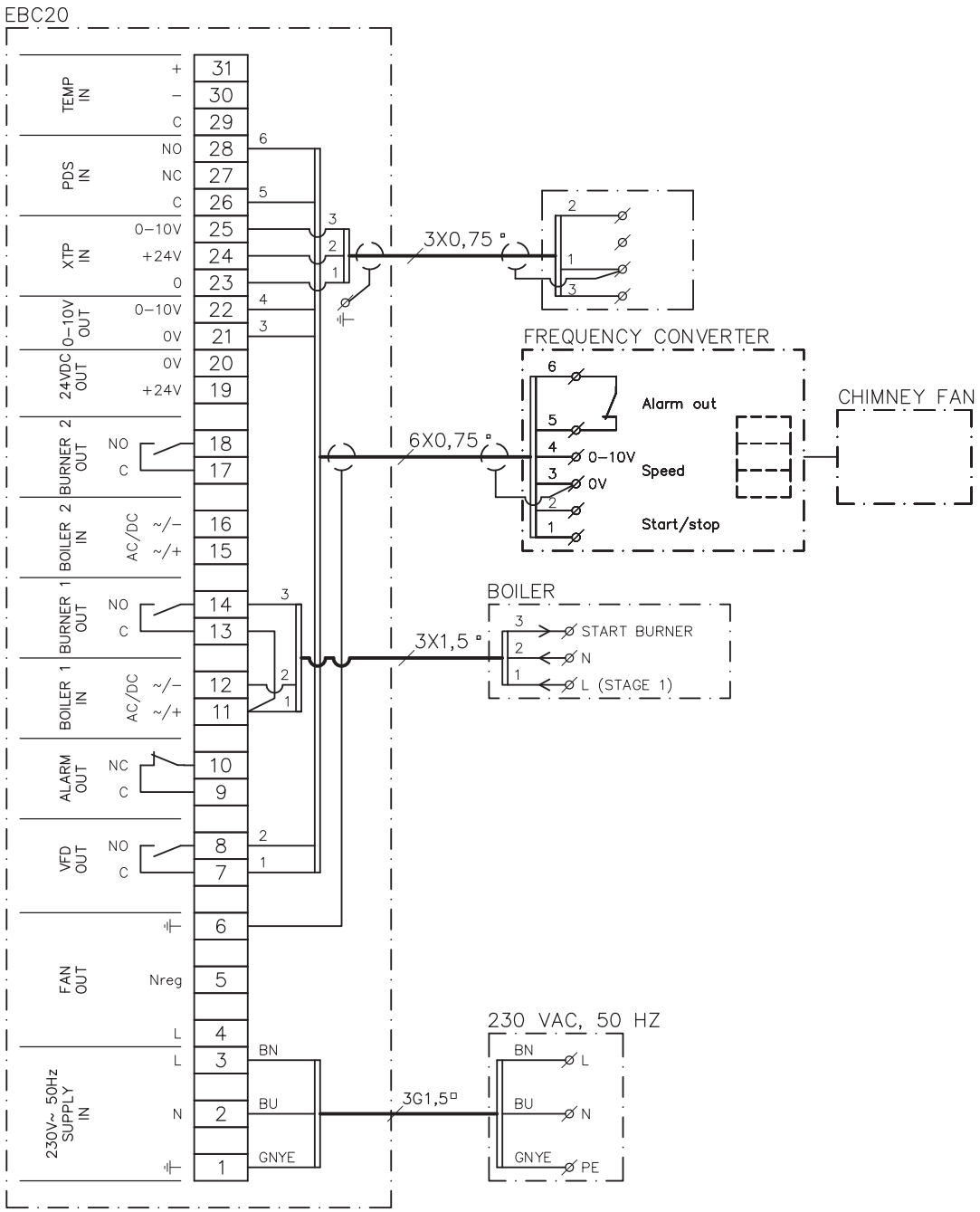
2.4.3 Single boiler application with extra fail-safe protection using PDS



This example shows how to connect a PDS to the EBC20. The PDS carries out extra fail-safe protection.

- Connecting a PDS:
  - Remove the factory fitted loop between terminals 26 and 28
  - Connect the PDS between terminals 26 and 28
- Connect the supply voltage to terminals 1–3
- Connect the burner startsignal (-) to terminal 12
- The start signal to the burner comes back on terminal 14
- Connect the burner start signal (+) to terminal 11
- Loop terminals 12 and 13
- Connect the chimney fan to terminals 4–6
- Connect the pressure transducer (XTP) to terminals 23–25 using a a shielded cable 3x0,75 mm^2 and connect the cable shielding to the cable bracket
- Set the value in menu 31 to 1 (PDS connected).
- NB: If $\frac{PDS}{AUX}$ is flashing, the EBC20 is preparing for a PDS-check.

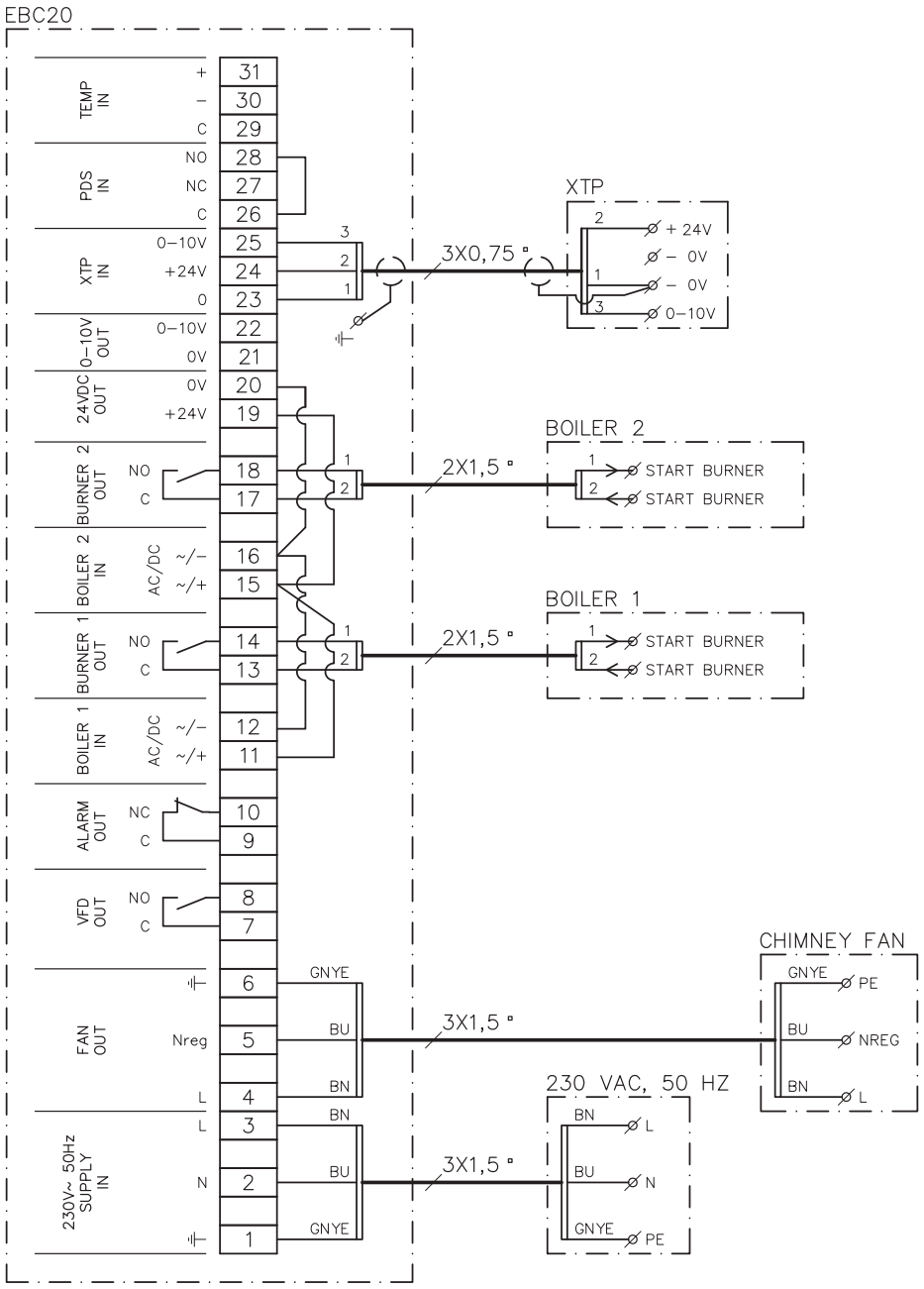
2.4.4 Single boiler application with a frequency converter



This example shows which inputs/outputs on the EBC20 need to be connected to a frequency converter if the chimney fan is to be controlled by such a unit:

- Connect the supply voltage to terminals 1–3
- Frequency converter:
  - Connect terminals 7 & 8 to the start/stop input on the frequency converter
  - Connect terminals 21 & 22 to the frequency converter input for external speed regulation
  - Terminals 26 and 28 can be connected to the frequency converter alarm output
- Connect the pressure transducer (XTP) to terminals 23–25 using a a shielded cable 3x0,75 mm^2 and connect the cable shielding to the cable bracket
- Connecting the boiler:
  - Connect the burner start signal (L) to terminal 11
  - Connect the neutral wire to terminal 12
  - Loop terminals 11 and 13
  - The start signal for the burner is sent from terminal 14

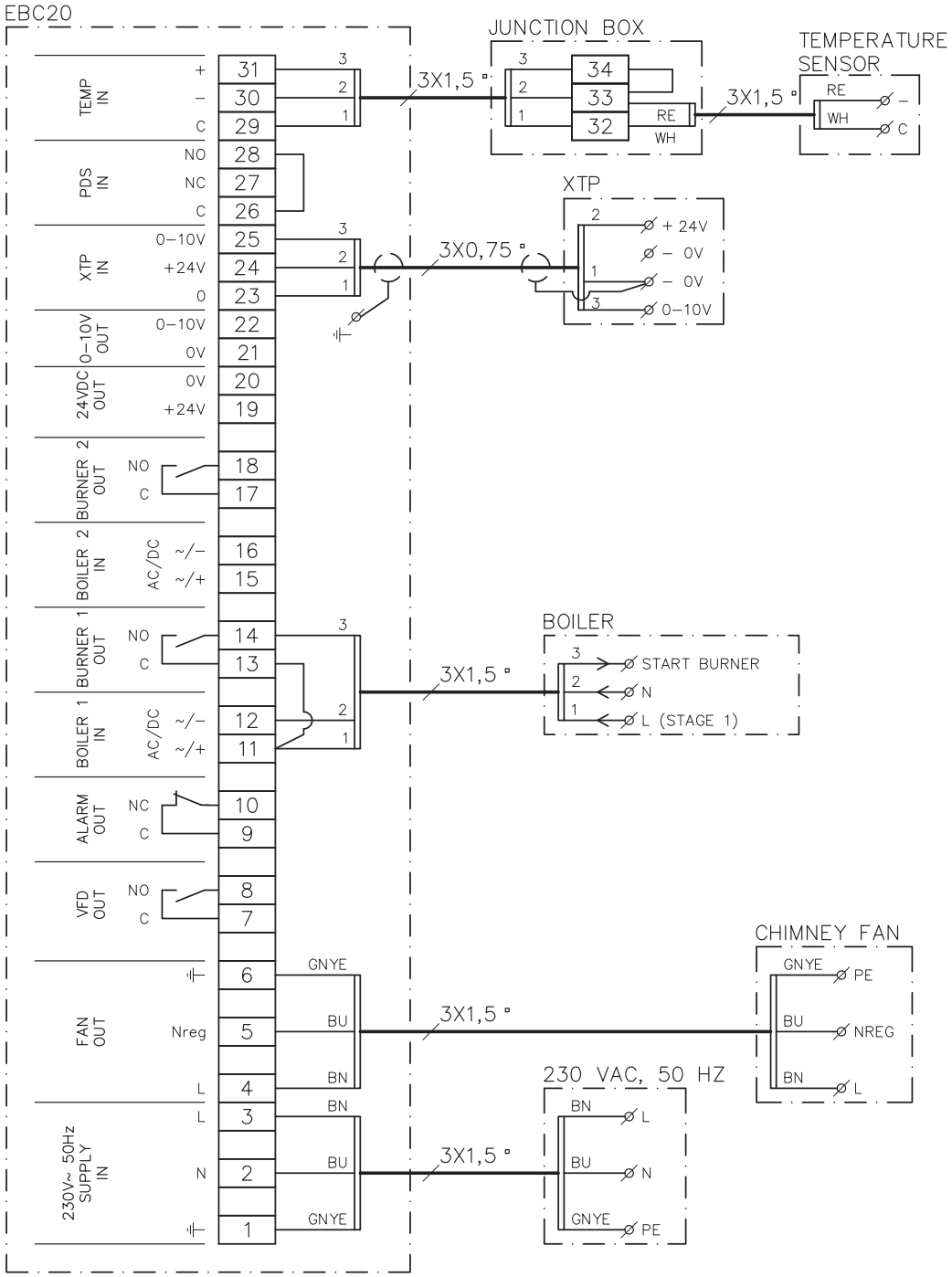
2.4.5 2 boiler application with continuous operation of chimney fan



This example shows how to connect the EBC20 if you require continuous operation of the chimney fan from one or two boilers:

- Connect the supply voltage to terminals 1–3
- Loop terminals 11 & 15 & 19
- Loop terminals 12 & 16 & 20
- Connection to boiler (example with 2 boilers):
  - Connect the boiler 1 start signal to terminals 13 & 14
  - Connect the boiler 2 start signal to terminals 17 & 18
- Connect the chimney fan to terminals 4–6
- Connect the pressure transducer (XTP) to terminals 23–25 using a a shielded cable 3x0,75 mm² and connect the cable shielding to the cable bracket

2.4.6 Solid fuel boiler with temperature sensor



This example shows how a ventilator can be turned on and off by means of a temperature sensor in the flue:

- Connect the supply voltage to terminals 1–3.
- Connecting the boiler:
  - Connect the burner start signal (L) to terminal 11.
  - Connect the neutral wire to terminal 12.
  - Loop terminals 11 and 13.
  - The start signal from the burner comes from terminal 14.
- Connect the ventilator to terminals 4 and 6.
- Connect the pressure transducer (XTP) to terminals 23 and 25.
- Using a junction box connect the temperature sensor to terminals 29 and 31.
- Set menu 41 to "ON". Other settings should be chosen from menu 4.

2.5 User menu

2.5.1 Layout of the user menu

The user menu consists of a single level and provides access to 4 parameters:

Menu	Function	Range
1	Setting the required pressure	Depending on the XTP-range set in menus 151 and 152
2	Setting pre-purge period	0-999 s
3	Setting post-purge period	0-60 min
4	Displaying current alarm (see alarm overview page 36)	-

When the instructions refer to the menu numbers 1,2,3 and 4 it is understood that these numbers refer to the user menus.

2.5.2 Operating the user menu

Adjust the set point for user menu items 1–4 in the same way as shown in the example in page 11
To operate menu items 1–4, use the buttons as follows:

Step	Press...	To...
1	OK	Activate the user menu
2	◄ and ►	Go to the menu item you wish to edit
3	OK	Edit the menu item selected
4	◄ and ►	Adjust the required set point
5	OK	Confirm and save the required set point
6	RESET	Return to operation screen. NB: If you do not press RESET the EBC20 will automatically return to the operation screen after 30 seconds

You can always undo an action (that you have not confirmed by pressing OK) and return to the operation screen by pressing RESET.

Alarms
For alarm handling (menu 4), see page 35.

2.6 Set-up

For setting up the EBC20, see section 1.6 Set-up, page 11.

2.7 Commissioning

Commissioning on the EBC20 must be carried out to ensure a correct draft from the system.

⚠ Commissioning should be carried out by staff with the appropriate training, and with the authorisation to do so according to local legislation.

Do as follows:

Step	Action...
1	Provisional draft setting (negative pressure): • Press OK to go to Menu 1. • Press OK • Press ← or → until the negative required pressure appears in the display. • Press OK to confirm and save the set point. • Press RESET to return to the operation screen.
2	• Start the system. • Wait until the boiler starts and the draft has stabilised. The current draft will be shown in the display.
3	Final adjustment of draft: • Check the draft on the boiler. • If draft is not correct, repeat the procedure from step 1.
4	Check that the monitoring system shuts off the boiler. To simulate an error situation, disconnect the hose from the pressure transducer (XTP). Burner is switched off (diode switches off) and the alarm diode illuminates.
5	After completing the commissioning, check the start-up function by restarting the system.

For the set point values, please refer to the data for the boiler in question. However, the following values can be considered typical:

- Boilers with forced draft: typically 20–30 Pa
- Boilers with atmospheric burners: typically 5–10 Pa

Set up according to site conditions can be determined by boiler commisioning engineer.

2.8 Special functions

2.8.1 Turning the ventilator on and off by means of a temperature sensor in the flue

The EBC20-boiler control can turn the ventilator on and off automatically by means of the temperature sensor, however the ventilator can also be turned on and off manually.

2.8.2 Boiler controlled prepurge

Boiler controlled prepurge is used to activate functionalities, when forced pre-/postpurge is required, or the ventilator is needed during pause mode on e.g. a stoker boiler.

This function can be used for activating the ventilator in an optional rotational speed from 35-100% without pressure regulation. Among other this can be useful, if the boiler itself is required to control pre- and post-purge. It is possible to preset any rotational speed between 35 and 100%, and choose how the forced prepurge or constant pressure regulation should be prioritised depending on the number of active boilers and their current operating status.

3. 2-stage speed regulation of exodraft chimney fan

3.1 Use

Area of use

- The EBC20 can be used as a 2-stage speed regulator for an **exodraft** chimney fan.
- The control system is intended for 1- or 2-stage atmospheric gas boilers.
- The EBC20 can control a chimney fan directly or indirectly via a frequency converter.

3.2 Method of operation

General function

- The EBC20 monitors chimney draft and disconnects the boilers in the event of errors (the alarmdiode on the EBC20 will turn on).
- When the boiler thermostat demands heat, the chimney fan will start at max. voltage.
- When the monitoring system measures sufficient chimney draft, the burner is released, and voltage to the chimney fan is regulated according to the setpoint for stage 1 (LOW).
- When stage 2 (HIGH) is activated, the EBC20 regulates the voltage to the chimney fan according to the set point for stage 2.
- It is possible to set pre-purge and post-purge periods for the chimney fan.
- In the event of insufficient draft, the burner will be disconnected after 15 seconds. "Insufficient draft" is draft less than the value set on the PDS during commissioning.

Step-up function

- The step-up function in the EBC20 prevents unintentional disconnection of the system on account of changes in wind and weather conditions.
- The step-up function performs a stepped increase of the voltage as a result of protracted draft errors. In principle, this can be repeated until maximum voltage has been reached.

3.3 Electrical connection

This work must be performed by a qualified electrical engineer, in accordance with locally applicable rules and legislation.

The installation of the supply cable must be carried out in accordance with applicable regulations and legislation.
The earth terminal (⏚) must always be connected.

Isolation switch

exodraft a/s stresses that in accordance with EU's Machinery Directive an isolation switch must be set up in the fixed installation.

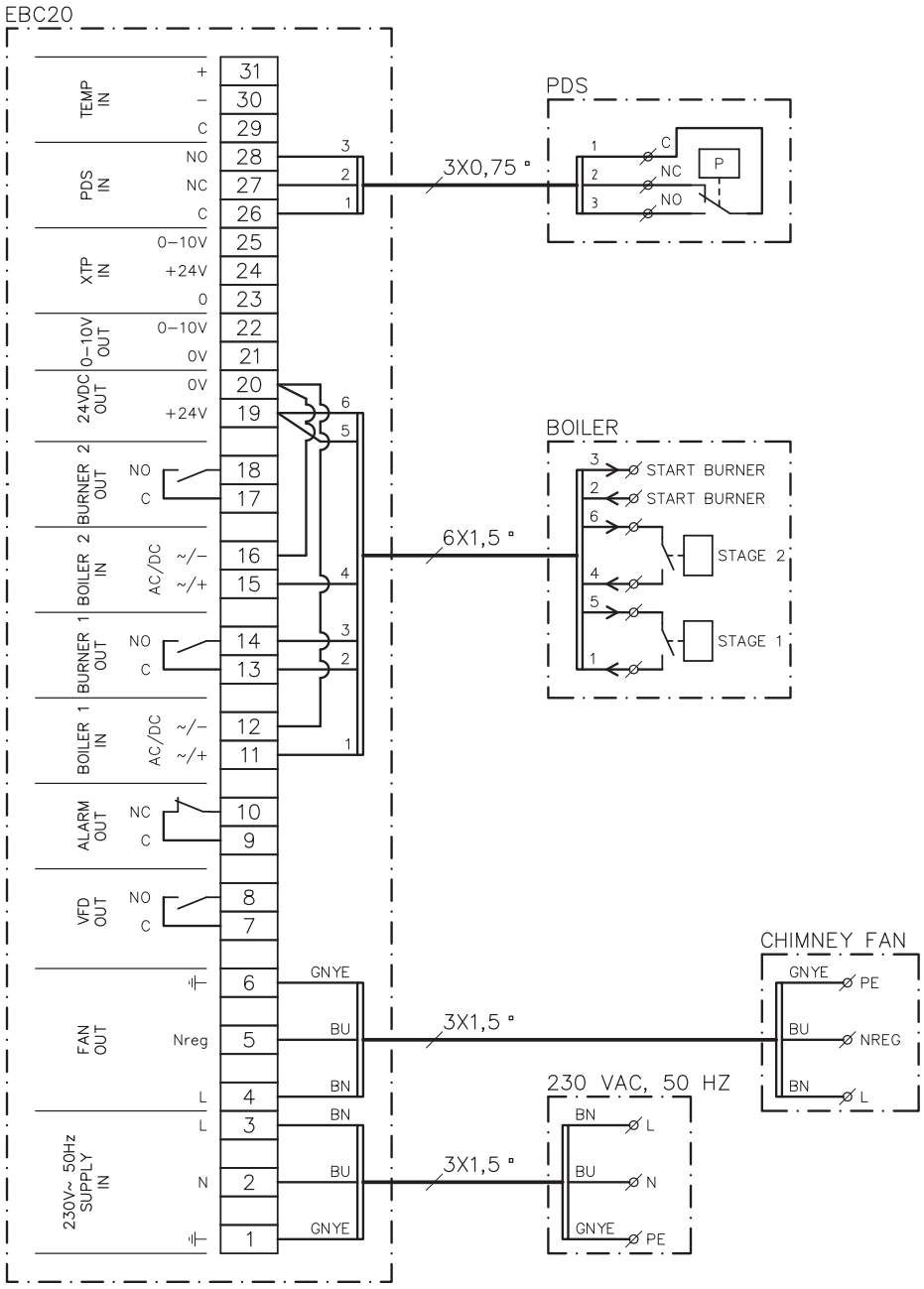
The isolation switch is not supplied by **exodraft**. Available as an extra.

3.4 Sample wiring diagrams

As a 2-stage speed regulator for **exodraft** chimney fans, the EBC20 can be connected to a range of different signals. The following sections contain two sample wiring diagrams showing:
3.4.1 1 x 2-stage boiler, page 26
3.4.2 2 x 1-stage boilers, page 27

exodraft recommends that you contact the boiler manufacturer for details of correct connection of the boiler control system.

3.4.1 1 x 2-stage boiler

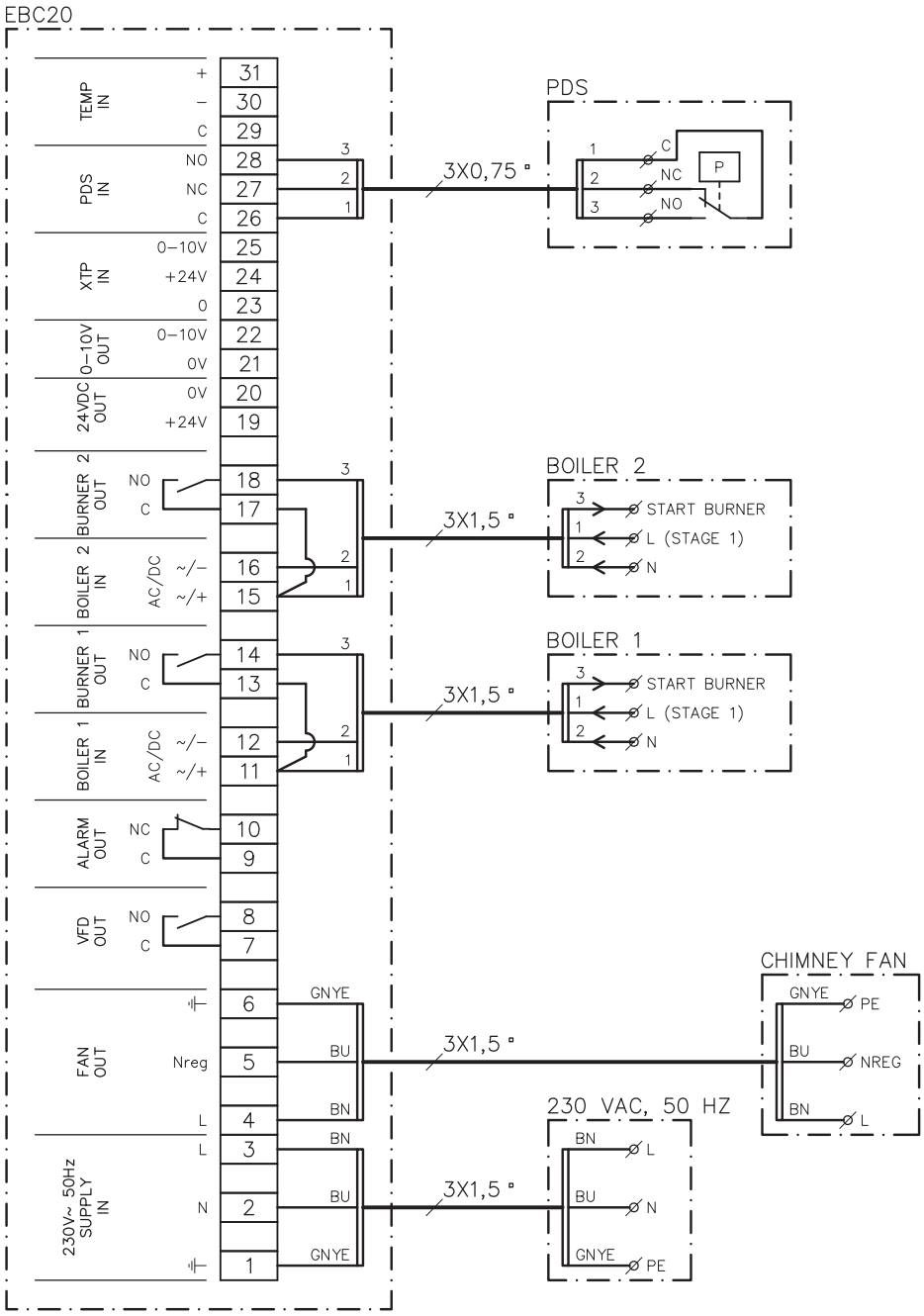


This example shows which inputs/outputs on the EBC20 need to be connected to a 2-stage boiler:
The boiler outputs for stages 1 & 2 are two potential free contact sets.

- Connect the supply voltage to terminals 1–3
- Loop terminals 12 & 20
- Loop terminals 16 & 20
- Connection to the boiler:
- Connect stage 1 (potential free contact) to terminals 11 and 19
  - Connect stage 2 (potential free contact) to terminals 15 and 19
  - Connect the burner start signal to terminals 13 & 14
- Connect the chimney fan to terminals 4–6
- Connect the PDS to terminals 26-28
- Set the value in menu 31 to 1 (PDS connected)

NB: If PDS AUX is flashing, the EBC20 is preparing for a PDS-check.

3.4.2 2 x 1-stage boilers



This example shows which inputs/outputs on the EBC20 need to be connected to 2 x 1-stage boilers. The boiler output for stage 1 is a voltage signal.

- Connect the voltage to terminals 1–3
- Loop terminals 11 & 13
- Loop terminals 15 & 17
- Connection to the boilers:
    - The start signal for the burner from boiler 1 is connected to terminal 14
    - Connect boiler 1 (N) to terminal 12
    - Connect the start signal for boiler 1 (L) to terminal 11
    - The start signal for the burner from boiler 2 is connected to terminal 18
    - Connect boiler 2 (N) to terminal 16
    - Connect the start signal for boiler 2 (L) to terminal 15
- Connect the chimney fan to terminals 4–6
- Adjust the value in menu 31 to 1 (PDS connected)

NB: If PDS AUX is flashing, the EBC20 is preparing for a PDS-check.

3.5 User menu

3.5.1 Layout of the user menu

The user menu provides access to 5 functions:

Menu	Function	Range
1	Setting of the chimney fan output for stage 1 (LOW)	35-100%
2	Setting of the chimney fan output for stage 2 (HIGH)	35-100%
3	Setting the pre-purge period for the chimney fan	0-999 s
4	Setting the post-purge period for the chimney fan	0-60 min
5	Displaying current alarm (see alarm overview page 36)	-

When the instructions refer to the menu numbers 1, 2, 3, 4 and 5 it is understood that these numbers refer to the user menus.

3.5.2 Operating the user menu

Setting up the operating function

Before you can use the EBC20 as a 2-stage speed regulator for **exodraft** chimney fans, you must change the operating function.
The procedure for setting up the operating function is described on page 15.

Using the buttons

To operate menu items 1–5, use the buttons as follows:

Step	Press...	To...
1	OK	Activate the user menu
2	← and →	Go to the menu item you wish to edit
3	OK	Edit the menu item selected
4	← and →	Adjust the required set point
5	OK	Confirm and save the required set point
6	RESET	Return to operation screen. NB: If you do not press RESET the EBC20 will automatically return to the operation screen after 30 seconds

You can always undo an action (that you have not confirmed by pressing OK) and return to the operation screen by pressing RESET.

Adjust the set points for user menu items 1–4 as shown in the example on the following page.

Alarms

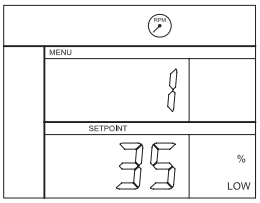
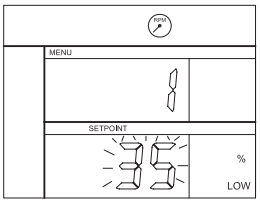
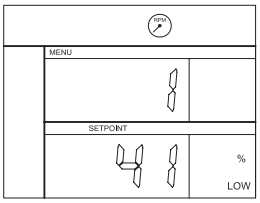
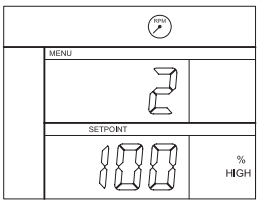
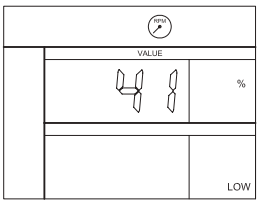
For alarm handling (menu 5), see page 35.

3.6 Set-up

NB
Remember to set up the operating function of the EBC20 as described on page 15

3.6.1 Setting the chimney fan output

Use the following procedure to adjust the chimney fan output:

Step	Action...	The display shows...
1	• Press OK to go to menu 1. The output for stage 1 (LOW) will be displayed.	
2	• Press OK	
3	• Press ← and → until the output you require for stage 1 (LOW) (in this example 41%) is displayed. • Press OK to confirm and save the setpoint	
4	Only for 2-stage systems: • Press → to go to menu 2 and the settings for stage 2 (HIGH).	
5	• Repeat steps 2–3 of the procedure, only this time use them to regulate stage 2. • To finish, press RESET.	

NB
If you do not press any buttons for 30 seconds, the EBC20 will automatically switch back to the operation screen.

3.7 Commissioning

Commissioning must be carried out on the EBC20 to ensure a correct draft from the system.



Commissioning should be carried out by staff with the appropriate training, and with the authorisation to do so according to local legislation.

Do as follows:

Step	Action...
1	Setting chimney fan stage 1 (LOW) • Press OK to go to Menu 1. • Press OK • Press ← or → to set the "LOW" value to max (100%). • Press OK to confirm and save the set point. • Press RESET to return to the operation screen.
2	• Start the system on stage 1.
3	• Wait until the PDS is connected (PDS diode lights green).
4	• Access menu 1 as described in step 1. • Slowly adjust "LOW" to the correct draft. • If the PDS shows an error (the alarm diode and PDS/AUX flashes), adjust the setting of the PDS.
5	Only for 2-stage systems: • Start the system on stage 2. • Access menu 2 and slowly adjust "HIGH" to the correct draft. • Both boiler thermostats 1 and 2 must be connected (the BOILER 1 IN and BOILER 2 IN diodes light green).
6	Check that the monitoring system shuts down the boiler. If necessary, you can simulate an error condition by disconnecting the hose from the negative terminal on the PDS.
7	After completing the commissioning, check the start-up function.

Refer to the boiler manufacturer's technical data for relevant pressure requirements and adjust the %-values accordingly. However the following value can be considered typical:

- Boilers with atmospheric burners: typically 5–10 Pa.

4. Pressure-controlled regulation of exodraft supply air fan

4.1 Use

General

- The EBC20 can be used to control an **exodraft** BESB or BESF box fan.
- The EBC20 can control a supply air fan directly or indirectly via a frequency converter.

Positioning

Fit the EBC20 and pressure transducer (XTP) in the boiler room as described in section 1.3 Fitting, page 5 .

4.2 Method of operation

General function

- The control system monitors the pressure in the boiler room and disconnects the burner in the event of errors (the alarmdiode on the EBC20 will turn on).
- When the pressure in the boiler room changes, the EBC20 will change the fan speed in order to meet the setpoint pressure for the boiler room.
- The EBC20 is linked to the boiler system in such a way that when a heating requirement arises, the EBC20 will start the fan and delay the start of the boiler until the pressure in the boiler room is sufficient.
- A safety function ensures that if the pressure in the boiler room is insufficient, the EBC20 will shut down the boilers.

4.3 Electrical connection

This work must be performed by a qualified electrical engineer, in accordance with locally applicable rules and legislation.

The installation of the supply cable must be carried out in accordance with applicable regulations and legislation.
The earth terminal (⏚) must always be connected.

When connecting pressure transducer (XTP) and frequency converter, screened cable must be used.

Isolation switch

exodraft a/s stresses that in accordance with EU's Machinery Directive an isolation switch must be set up in the fixed installation.

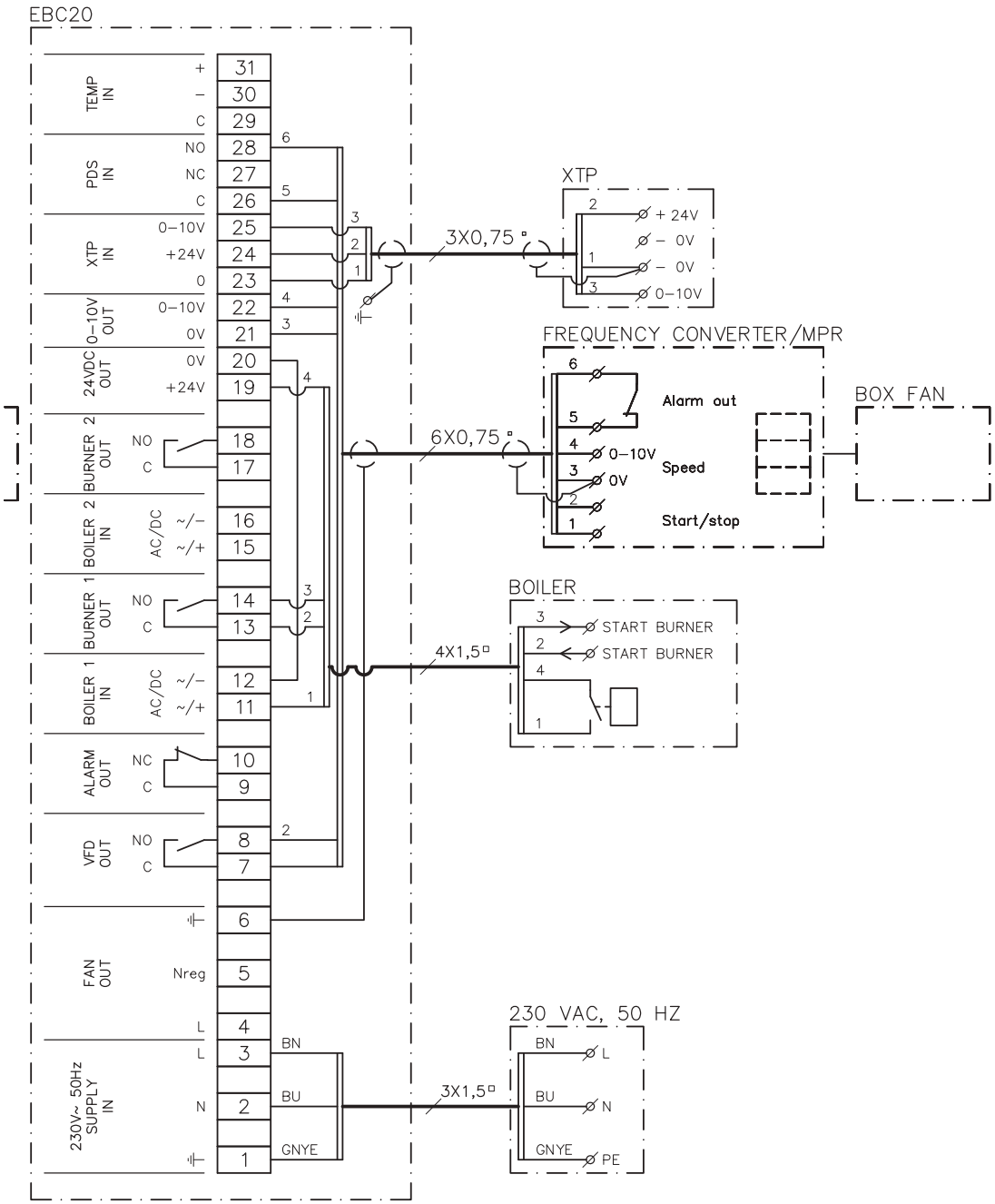
The isolation switch is not supplied by **exodraft**. Available as an extra.

4.4 Sample wiring diagram

The following sample wiring diagram shows how to connect the EBC20 to a frequency converter/MPR relay.

exodraft recommends that you contact the boiler manufacturer for details of correct connection of the boiler control system.

4.4.1 Connection of frequency converter/MPR relay



This example shows which inputs/outputs on the EBC20 need to be connected to the frequency converter/MPR relay.

- Connect the supply voltage to terminals 1–3
- Loop terminals 12 & 20
- Connection to the boiler:
  - Connect the burner start signal to terminals 13 & 14
  - Connect the potential free contact to terminals 11 & 19
- Frequency converter:
  - Connect terminals 7 & 8 to the start/stop input on the frequency converter
  - Connect terminals 21 & 22 to the frequency converter input for external speed regulation
  - Terminals 26 & 28 can be connected to the frequency converter alarm output
- Connect the pressure transducer (XTP) to terminals 23–25 using a a shielded cable 3x0,75 mm^2 and connect the cable shielding to the cable bracket

4.5 User menu

Layout of the user menu

The user menu consists of a single level and provides access to 4 parameters:

Menu	Function	Range
1	Setting the required pressure	Depending on the XTP-range set in menus 151 and 152
2	Setting the pre-purge period for the fan	0-999 s
3	Setting the post-purge period for the fan	0-60 min
4	Displaying current alarm (see alarm overview page 36)	-

When the instructions refer to the menu numbers 1, 2, 3 and 4 it is understood that these numbers refer to the user menus.

4.5.1 Operating the user menu

Setting up the operating function

Before you can use the EBC20 for pressure controlled regulation of **exodraft** supply air fans, you will have to change the operating function.
For setting up the operating function, see page 15.

Using the buttons

Step	Press...	To...
1	OK	Activate the user menu
2	◄ and ►	Go to the menu item you wish to edit
3	OK	Edit the menu item selected
4	◄ and ►	Adjust the required set point
5	OK	Confirm and save the required set point
6	RESET	Return to operation screen. NB: If you do not press RESET the EBC20 will automatically return to the operation screen after 30 seconds

You can always undo an action (that you have not confirmed by pressing OK) and return to the operation screen by pressing RESET.

Adjust the set points for user menu items 1–4 as shown in the example on the following page.

Alarms

For alarm handling (menu 5), see page 35.

4.6 Set-up

Setting the pressure

To set up the EBC20, do the following:

Step	Action...
1	• Follow the procedure on page 15 for changing the operating function into pressure-controlled regulation of an **exodraft** supply air fan (operating function 3).
2	• Follow the procedure page 11 for setting the required pressure in the boiler room. The procedure is the same as for setting a chimney draft. The only difference is that the symbol is shown in the display on completion of step 1. Set the pressure in accordance with locally applicable requirements.

4.7 Commissioning

Commissioning of the EBC20 must be carried out so that the supply air fan ensures correct pressure in the room.

Commissioning should be carried out by staff with the appropriate training, and with the authorisation to do so according to local legislation.

Do as follows:

Step	Action...
1	Provisional setting of the pressure in the boiler room • Press OK to go to Menu 1 • Press OK • Press ← and → to adjust the value until the required pressure is shown in the display • Press OK to confirm and save the set point • Press RESET to return to the operation screen
2	Start the boiler system at max. output
3	Check that the control system regulates to the set point
4	Check the safety monitoring
5	• If appropriate, simulate error conditions by switching off the supply air fan • Burner is switched off (diode switches off) and the alarm diode illuminates
6	After completing the commissioning, check the start-up function by restarting the system

For the set point values, please refer to the data for the boiler in question. However, ± 5 Pa can be considered typical.

5. List of alarms and troubleshooting

⚠ Some systems require a special start-up procedure following safety shut-down. Follow this procedure before pressing the RESET button.

5.1 Alarm handling

There are two levels of alarm handling:

- Resetting a current alarm (user menu)
- Resetting the alarm log (service menu)

5.1.1 Resetting a current alarm

An alarm situation in the system is indicated by the illumination of the EBC20 alarm diode (see page 7), and by the appearance of the alarm symbol in the display.

Automatic reset
If menu 25 is set to automatic reset (1), the EBC20 will attempt to reset an alarm every 10 seconds. If error persists, check the alarm overview (next page) for solution.

Manual reset
If menu 25 is set to manual reset (2), alarms must be manually reset.
In the event of an alarm, undertake the following procedure:

Step	Action...
1	Go to menu 4 (menu 5 for operating function 2, RPM) to display the current alarm.
2	Check the alarm overview (next page) to identify the alarm number.
3	Solve the error.
4	• Press RESET to reset the alarm* • The alarm diode will switch off, and the alarm symbol will disappear from the display.
5	Restart the system if necessary.

*The EBC20 will automatically return to the main screen if no buttons are pressed for 30 seconds. If this happens, repeat step 1.

5.1.2 Resetting the alarm log

The alarm log (menus 211–219) is a list of the 9 most recent alarms.
To reset the alarm log, do the following:

Step	Action...
1	Go to menu 22 and select YES.
2	A 10-second countdown will start. Within these 10 seconds, you can cancel your choice by pressing any button. If you do not press any buttons, the alarm log will be reset.
3	• Press RESET to return to the main screen

5.1.3 Alarm overview

The table below presents an overview of the alarms that may occur (the alarm numbers are displayed in the alarm menu).

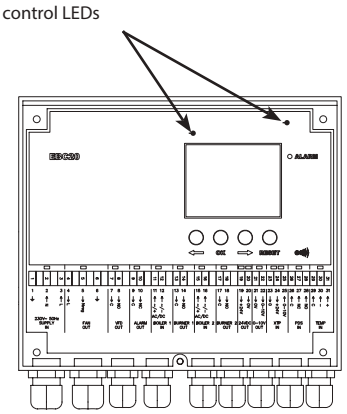
Alarm	Error type	Solution
A00	No error	
A01	XTP flow alarm. Defaults (menu 23): Chimney fan: < 64% of set pressure Air supply fan: > 300% of set pressure	Check: • The flue, the chimney and the chimney fan for blockages. • The commissioning. • That the measuring probe and the spigots on the pressure transducer are not blocked.
A02	PDS check error	Check: • The setting of the monitoring unit (the PDS). • The connection to the PDS. • The PDS's switch function.
A03	PDS error (flow error)	Check that: • The PDS is connected. • The PDS is correctly adjusted in relation to the set point. • Menu 31 has been set correctly (1).
A04	XTP Start Timer error (flow error)	• Check: • the hose to the pressure transducer. • the commisioning. • the chimney fan is of sufficient capacity.
A10	XTP not connected	
A11	PDS not connected	Check the PDS connection.
A13	AUX alarm (alarm for terminals 26–28)	Check: • the connections to terminals 26–28. • the setting in menu 31 (2) • the loop between terminals 26 and 28. • If XTP is connected : power off/on the unit. • If error persist contact dealer (defective unit).
A14	Temperature sensor not connected	
A16	24 VDC overloaded	Check: • the load on terminals 19-20. • If error persists, contact dealer (defective unit).
A17	XTP connected (error only for the 2-stage speed regulation function (RPM))	Remove the XTP. The XTP must not be fitted in speed-regulation mode.
A18	XTP overload	Check if XTP is defective.
A81	E2prom read failure	• Reset to defaults (menu 18). • Turn the EBC20 off. • Restart again. • If error persists, contact dealer (defective unit).
A82	Error in Safety relay circuit	
A83	Error in Safety relay circuit	
A84	Error in Safety relay circuit	
A85	Safety No HeartBeat	
A86	Safety input circuit error	
A87	Safety input circuit error	
A88	Safety input circuit error	
A89	Faulty heartbeat from safe processor detected	
A98	Faulty main processor	• Reset to defaults (menu 18). • Turn the EBC20 off. • Restart again. • If error persists, contact dealer (defective unit).
A99	Faulty main processor	

5.2 More troubleshooting

5.2.1 Program running

If there is doubt about whether the EBC20 is running: Check if the control LEDs are flashing.

To view the control LEDs: Remove the front panel.

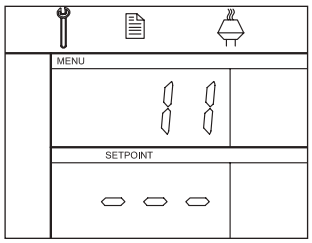


⚠ This work must be performed by a qualified electrical engineer.

5.2.2 Communication error

If the display shows three horizontal lines in the lowest display box:

Press RESET and repeat the setting.



If the errror persists, then the EBC20 is faulty. Contact dealer.

6. Technical specifications

General

Height x width x depth:	204.3 mm x 239.5 mm x 77.2 mm
Weight:	1.62 kg
Protection class:	IP54
Casing material:	ABS PA 758 (Acrylnitrile Butadiene Styrene PolyAmide 758)
Supply voltage:	230–240 VAC +/- 10 %, 50 Hz +/- 1 %
Power consumption:	Max. 475 W
Stand by consumption	Max. 2 W
Fuse:	T4 A
Ambient temperature:	-20 °C to 60 °C
Regulation range:	-500 Pa to 500 Pa
Wiring from EBC20 to chimney fan / fan	Max. 100 m.

Inputs

Digital inputs (BOILER 1 IN & BOILER 2 IN):	18 to 230 VAC / VDC
Pressure sensor-input (XTP IN):	0 to 10 VDC, 20 mA
Pressure switch input (PDS IN):	24 VDC, 20 mA
Temperature sensor (TEMP IN):	-30 to +500 °C

Outputs

Digital output relays (BURNER1 OUT & BURNER 2 OUT):	250 VAC, 4 A, AC3
Motor regulator (FAN OUT):	Supply voltage -3 %, Max. 3 A, AC3
Motor start/stop relay (VFD OUT):	250 VAC, 8 A, AC3
Control signal 0–10 VDC (0-10V OUT):	20 mA
24 VDC supply (24VDC OUT):	100 mA
Alarm output relay (ALARM OUT):	250 VAC, 8 A, AC3

Pressure transducer (XTP)

Height x width x depth:	75mm x 92mm x 49.1mm
Protection class:	IP54
Ambient temperature:	0 °C to 70 °C
Wiring to EBC20	Max. 100 m. shielded cable

7. EU declaration of conformity

DK: EU-Overensstemmelseserklæring **GB: Declaration of Conformity** **DE: EU-Konformitätserklärung** **FR: Déclaration de conformité de l'Union Européenne** **NO: EU-Samsvarserklæring**	**NL: EU-Conformiteits verklaring** **SE: EU-Överensstämmelsedeklaration** **FI: EU-Vaatimustenmukaisuusvakuutus** **IS: ESS-Samræmisstaðfesting** **IT: Dichiarazione di Conformità Unione Europea**
exodraft a/s **C.F. Tietgens Boulevard 41** **DK-5220 Odense SØ**	
-erklærer på eget ansvar, at følgende produkter: -hereby declares that the following products: -erklärt hierdurch auf eigene Verantwortung, daß folgende Produkte: -déclare, sous sa propre responsabilité, que les produits suivants: -erklærer på eget ansvar at følgende produkter:	-veklaart dat onderstaande producten: -deklarerar på eget ansvar, att följande produkter: -vastaa siltä, että seuraava tuote: -Staðfesti à eigin àbyrgð, að eftirfarandi vörur: -dichiara con la presente che i seguenti prodotti:
EBC20	
-som er omfattet af denne erklæring, er i overensstemmelse med følgende standarder: -were manufactured in conformity with the provisions of the following standards: -die von dieser Erklärung umfaßt sind, den folgenden Normen: -auxquels s'applique cette déclaration sont en conformité avec les normes ci-contre: -som er omfattet av denne erklæring, er i samsvar med følgende standarder:	-zijn vervaardigd in overeenstemming met de voorschriften uit de hieronder genoemde normen en standaards: -som omfattas av denna deklaration, överensstämmer m ota tämä selvitys koskee, on seuraavien standardien mukainen: -sem eru meðtalin i staðfestingu Pessari, eru i fullu samræmi við eftirtalda staðla: -sono stati fabbricati in conformità con le norme degli standard seguenti:
EN 60335-1, EN60335-2-102, EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 301489-1, EN 301489-3, EN 14459:2008	
-i.h.t bestemmelser i direktiv: -in accordance with -entsprechen gemäß den Bestimmungen der folgenden Richtlinien: -suivant les dispositions prévues aux directives: -i.h.t bestemmelser i direktiv:	-en voldoen aan de volgende richtlijnen: -enligt bestämmelserna i följande direktiv: -seuraavien direktiivien määräysten mukaan: -med tilvisun til àkvarðana eftirlits: -in conformità con le direttive:
-Lavspændingsdirektiv: -the Low Voltage Directive: -Niederspannungsrichtlinie: -Directive Basse Tension: -Lavspenningsdirektivet:	-de laagspanningsrichtlijn: -Lågspänningsdirektivet: -Pienjännitedirektiivi: -Småspennueftirlitið: -Direttiva Basso Voltaggio:
2006/95/EC	
-EMC-direktivet: -and the EMC Directive: -EMV-Richtlinie: -Directive Compatibilité Electromagnétique: -EMC-direktivet:	-en de EMC richtlijn: -EMC-direktivet: -EMC-direktiivi: -EMC-eftirlitið: -Direttiva Compatibilità Elettromagnetica:
2004/108/EC	
Odense, 01.03.2011 -Adm. direktør -Managing Director Jørgen Andersen	-Algemeen directeur -Geschäftsführender Direktor -Président Directeur Général -Verkställande direktör -Toimitusjohtaja -Framkvemdastjori -Direttore Generale



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