



1. Connection diagram for supply voltage and connection box

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Symbols, terms and warnings

Prohibition symbol



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

Danger symbol



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

Scope

These instructions apply to the EXHAUSTO EXact control system. Please refer to the product instructions regarding accessories and extra equipment.

The instructions must be fully observed to ensure personal safety and to protect the equipment and ensure its correct operation. EXHAUSTO A/S accepts no liability for accidents caused by equipment not used in accordance with the manual's instructions and recommendations.

Warnings



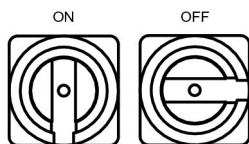
- The work must be performed by an authorised electrician, in accordance with locally applicable regulations and legislation.

Warnings:

Opening the unit



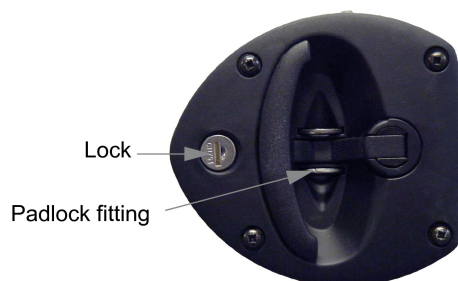
Do not open the service doors before the supply voltage has been disconnected at the isolation switch. The isolation switch is positioned on the left side of the connection box on top of the unit.



Lock the VEX unit during operation

The VEX unit must always be locked during operation:

- use the cylinder lock in the handle. **Remember** to remove the key from the lock
- Or use a padlock. Use the handle's built-in padlock fixture



Information plate

The VEX unit information plate shows:

- VEX model type (1)
- Unit production no. (2)

 EXHAUSTO A/S Exhausto A/S, 10000 København V, Denmark T: +45 33 44 44 44 F: +45 33 44 44 44 E: info@exhausto.dk			
Type	V350HREC	Icu = 10kA	
	No./Year 1234567/2011		
Supply	Voltage: 3x230V+PE/3x400V+N+PE ~50Hz	Current:	15A/15A

NB:

Have the production number ready at all times when contacting EXHAUSTO A/S.



1. Connection diagram for supply voltage and connection box

1.1 Connection diagram

Diagram

The diagram on the following page illustrates the connection of the power supply, HMI display panel and various accessories that can be connected to the connection box.

Diagram explanation given on the following page

Term	Description	Supplied by
-A1	Connection box	EXHAUSTO
-A2	Connection box for heating coil/cooling unit	EXHAUSTO
-A3	Connection box for electric heating coil (if fitted)	EXHAUSTO
-F1	Distribution board fuses	Customer
-Q1	Distribution board group switch	Customer
-F2	Connection box control fuses	EXHAUSTO
-Q2	Connection box isolation switch	EXHAUSTO

NB:

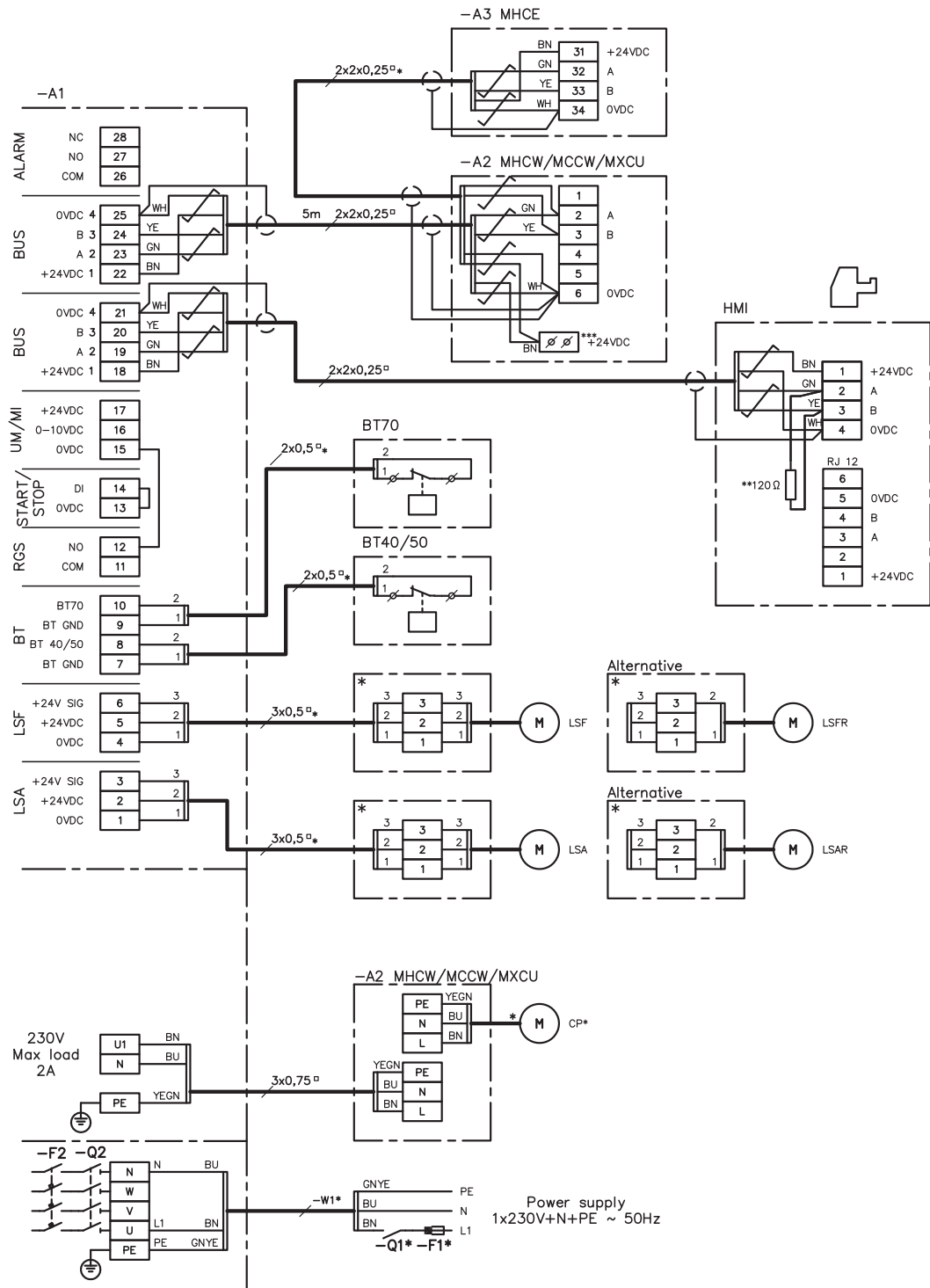
Other parts, shown on the front page of the VEX instructions, are supplied by EXHAUSTO

Accessories

See instructions for the relevant accessories:

- HCW water heating coil
- HCE electrical heating coil
- CCW cold water coil
- MXCU, module for external cooling unit

1.1.1 Connection diagram for supply voltage and connection box



* Not supplied by EXHAUSTO

** 120 Ω terminating resistor

*** Terminal block for continuation of 24 VDC

1.1.2 Termination

The first and last devices on the bus must be terminated. The diagrams below show two termination examples. See location of jumper JP2 on the connection board in the section "Terminal board for connection board".

If	Then	See diagram no.
HMI is the only device on the bus (bus connector optional)	The jumper must be connected to JP2, which applies a resistance of 120 Ω	1
Multiple devices are connected to the second bus connector	The outermost device must be terminated. JP2 may not be used	2
The bus connectors are not used	The jumper must be connected to JP2 as per diagram 1, which applies a 120 Ω resistance	1

1.

End Termination "ON"

2.

Termination "OFF"

End Termination "ON"

Termination "OFF"

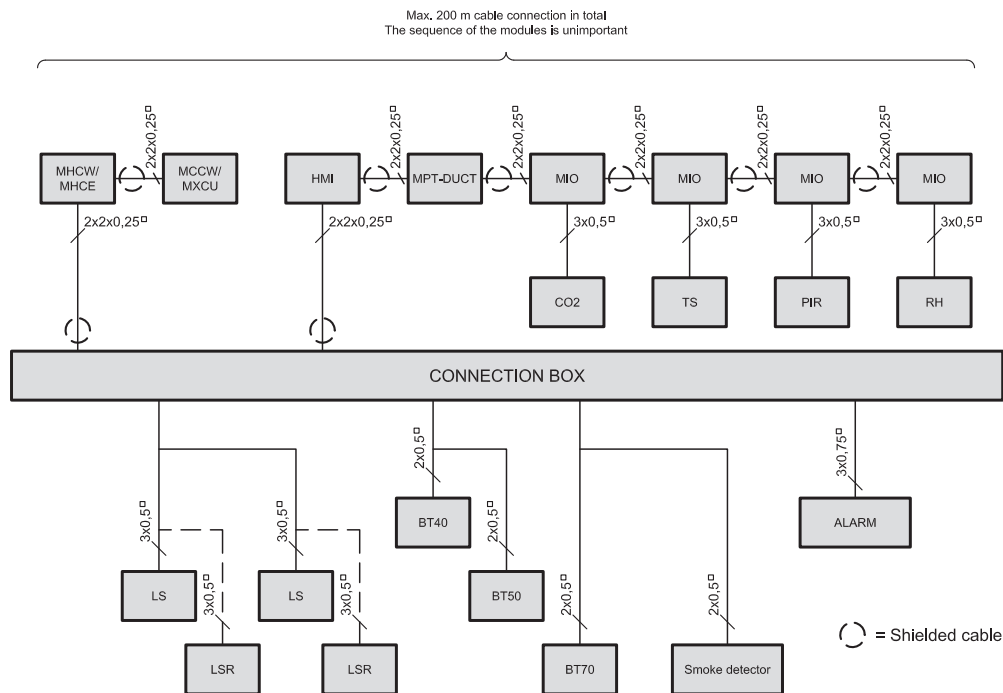
End Termination "ON"

RD12508-01

RD12509-01

1.2 Cable plan

The cable plan below shows the accessories that can be connected in the connection box.





2. Installation of the VEX

2.1 Installation

Air handling unit

The electrical installation for the air handling unit comprises the following connections:

Connection to air handling unit:

- Connection box
- Optional electrical heating coil HCE
- Optional water heating coil HCW
- Optional MXCU module for external cooling unit
- Optional CCW cold water coil

2.1.1 Connections in the connection box

Wiring configurations

Wiring configurations for the terminal board in the connection box are shown in the table below.

Wiring configurations	See section
Supply voltage	2.2
EXact control panel via MODBUS	1
MODBUS components, via MODBUS	In the instructions for the relevant component
Control box for heating coil (water heating coil), MHCW module, via MODBUS	in the HCW water heating coil instructions
Control box for heating coil (electric heating coil), MHCE module, via MODBUS	in the HCE electric heating coil instructions
Control for external MXCU cooling unit	in the MXCU module instructions
Control for cold water coil MCCW	in the cold water coil CCW instructions
External start/stop*	Below
Closing damper, exhaust air LSA/LSAR	1
Outdoor air closing damper LSF/LSFR	1
Fire thermostats BT 40/50/70 or smoke detector*	1 and below

External start/stop and BT

Note following jumper settings for connection board

If	Then
External start/stop is used	Remove the jumper between terminals 13 and 14
BT not used	Fit a jumper across terminals 7 and 8 and across terminals 9 and 10

2.2 Dimensioning and electrical installation



- The supply cable must be dimensioned and installed in accordance with applicable rules and regulations.
- The earth terminal (PE) must always be connected.

Diagram

The supply voltage must be connected to the isolation switch as shown in the diagram in the section "Connection diagram for supply voltage and connection box".

2.2.1 Installation requirements and recommendations

Isolation switch and control fuses

An isolation switch and control fuses are built into the unit to provide overload and short-circuit protection.

Fuses

The fuses must be suitable for:

- Short-circuit protection of the unit
- Short-circuit protection of supply cable
- Overload protection of supply cable

Max. rating

Maximum fuse rating is 63 A (gG/gL).

Power supply cable

When dimensioning the supply cable, the conditions at the installation location, including temperature and cable duct layout, must be taken into consideration.

Earth leak circuit breaker

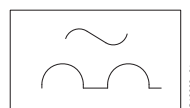


- The unit must be protected against indirect contact.

If current earth leak circuit breakers are fitted in the installation, they must be of a type that meets the following requirements:



- PFI type A breaker that breaks the circuit when a vagrant current with DC content (pulsating DC) in accordance with EN 61008.
- The circuit breakers must be marked with the following symbol:



- Cutout time must be max. 0.3 s.

When there is current leakage

A leak current of up to 100 mA can be generated.

Wiring

VEX type	Voltage	Dimensioned power consumption (max. phase current)
VEX340	1 x 230 V+N+PE	12.5 A

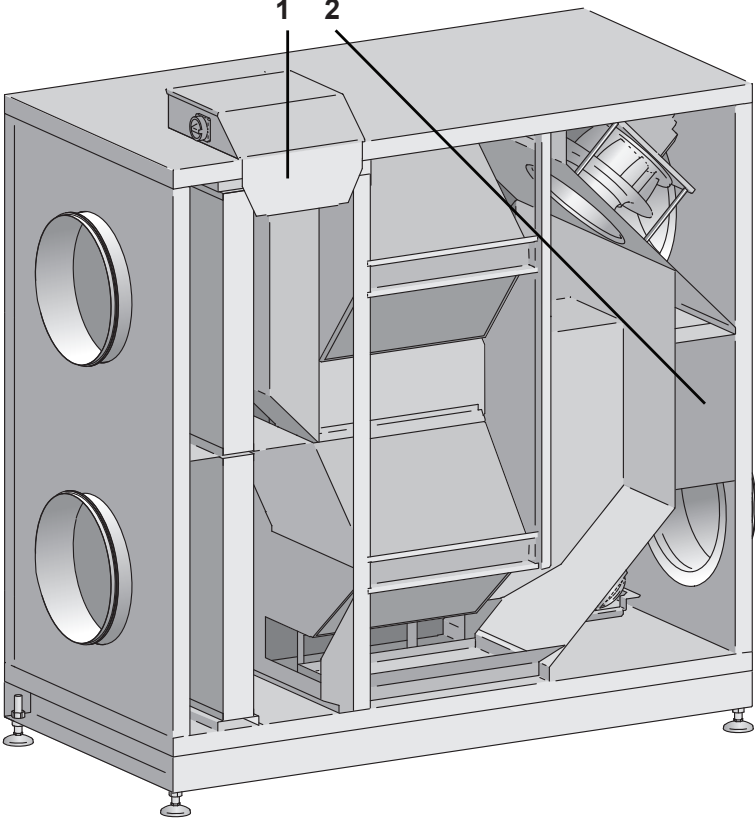
Short-circuit current

Maximum short circuit current (I_{cu}), in accordance with EN60947.2 is 10 kA.

Accessories	Accessory types HCW, CCW and XCU do not require separate supply cables and can be directly connected to the VEX control system box.
Terminals (U1, N)	May only be used with the above-mentioned accessories, and can have a maximum load of 2 A. A maximum of one HCW (heating) and one CCW/XCU (cooling) can be connected. The EXact control prevents both operating at the same time.
Equalising connections	 Equalising connections must be established between the VEX and HCE-type accessories.

2.3 Electrical components

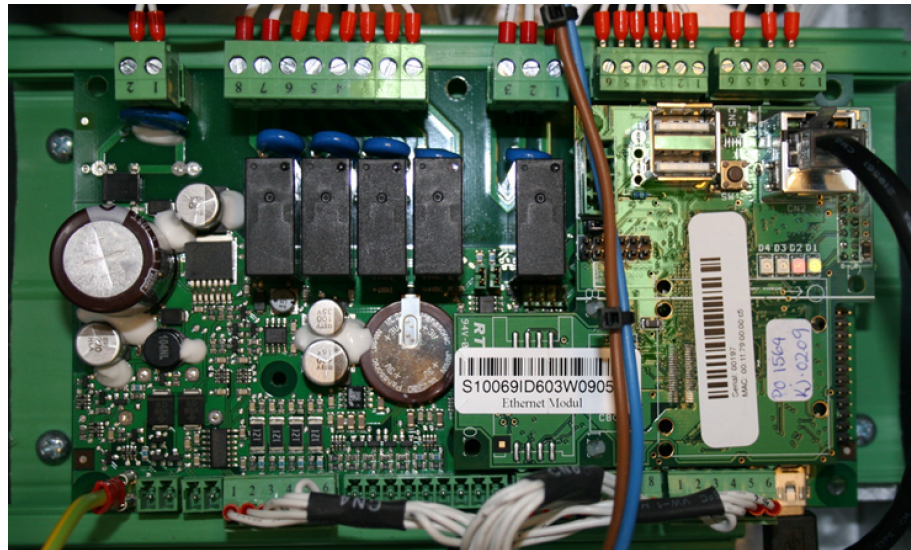
Positioning of electrical components



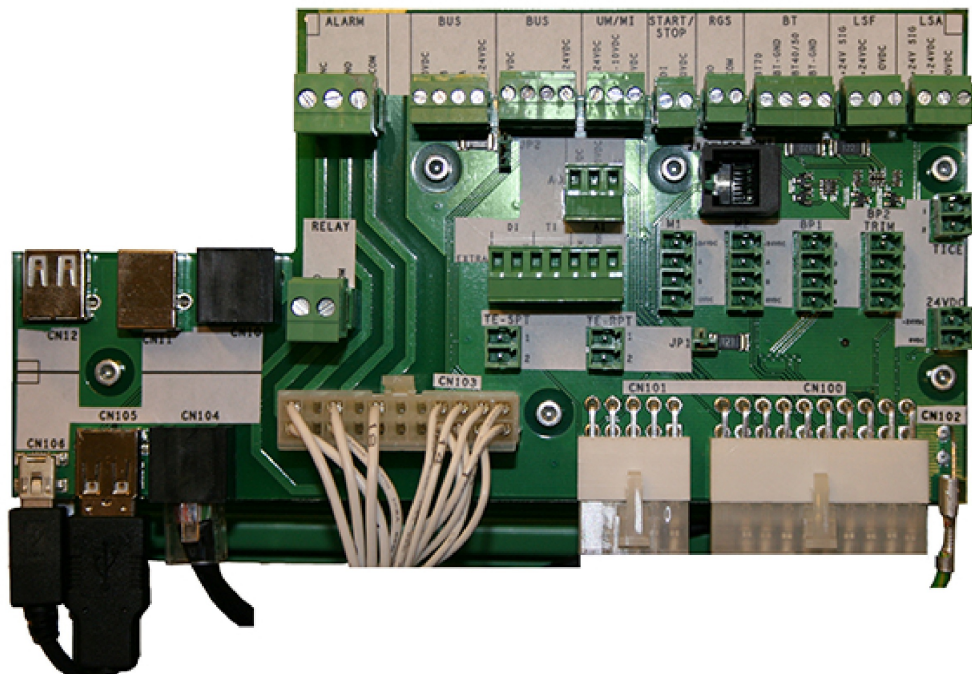
1. Connection box • Main control • Connection board • 24 V power supply • Control system fuses • Isolation switch	2. Motor control
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2.3.1 Components in the connection box

Main control



Connection board



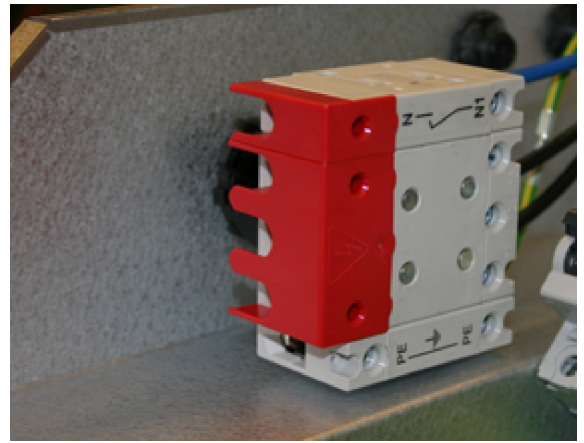
Control fuses



Isolation switch, inside

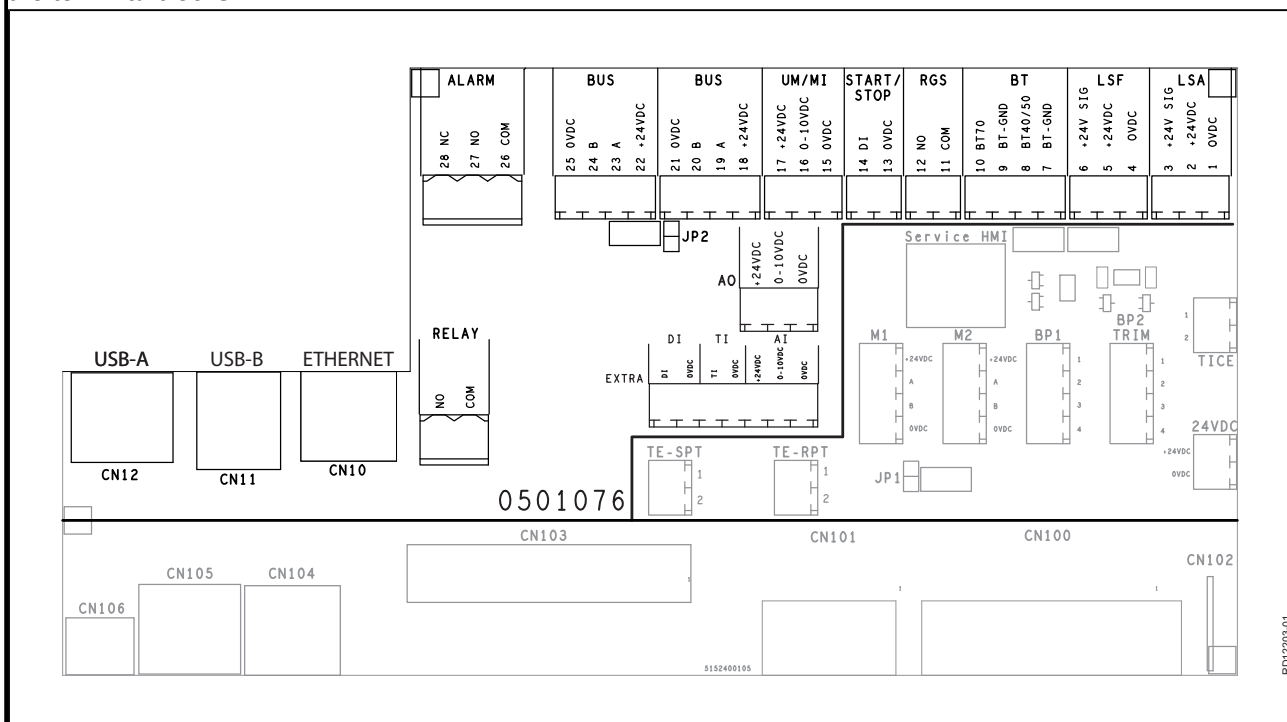
Connect supply voltage here!

Remove the red cover when connecting



2.3.2 Connection box terminal blocks

The layout drawing below gives an overview of components (standard + accessory) that can be connected to the terminal blocks.

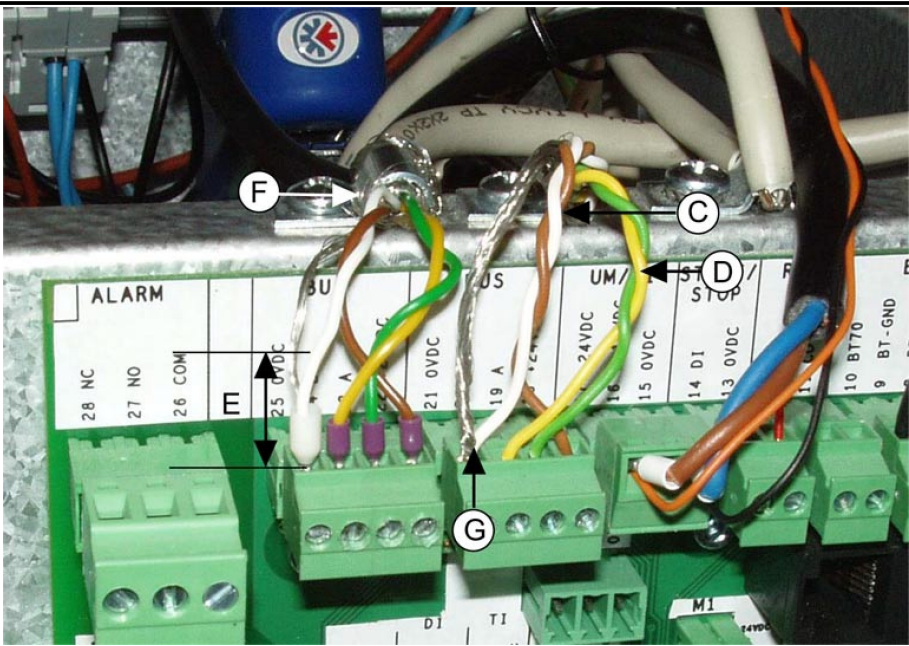


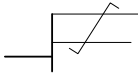
Component	Terminal board connection	Description
LSA	1 - 3	- LS, exhaust air closing damper - LSAR, exhaust air closing damper with spring-return
LSF	4 - 6	- LS, outdoor air closing damper - LSFR, outdoor air closing damper with spring return
BT	7 - 10	- BT40, BT50, BT70 - Smoke detector or other fire detection switch
RGS	11 - 12	- Closes when the unit starts - Breaks when the unit stops
START/STOP	13 - 14	Start/stop function
UM/MI	15 - 17	Reserved for future use
BUS	18 - 21	Bus for external parts
BUS	22 - 25	Bus for external parts
Alarm	26 - 28	General alarm
Ethernet		PC or network connection
USB-A		For service use
USB-B		For service use
Other board connections		
DI		Reserved for future use
TI		Reserved for future use
AO		Reserved for future use
AI		Reserved for future use
RELAY		For use with any internal light fitted to unit
Jumper		
JP2		Termination option, see section 1

2.3.3 Connecting shielded cable to MODBUS

Cable type The MODBUS requires shielded cable 2 x 2 x 0.25 □.

Connection Wires and screen must be connected as shown in the table below



Procedure			See
Wires Symbol: Twisted pair 	1	Carefully strip the wires - as little as possible and ensure they do not become damaged/broken	
	2	Twist 0 V and 24 V wires together as a twisted pair	C
	3	Twist A and B wires together as twisted pair	D
		The wires must be twisted together as close to the terminal as possible - max. distance from the terminal: 1.5 cm	E
Screen	1	Strip the screen before the cable clamp (F)	
	2	Fit clamp so that it surrounds the screen and secures the cable	F
	3	Take some of the cable screen and run it into the terminal 0 V connection with the 0 V wire	G

2.3.4 Service – connection of additional HMI control panel

An additional HMI control panel connected during servicing will take control of the unit. Refer to the EXact basic instructions for further information.

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