

Connection and wiring diagram

for contractors

VIESMANN

Vitocal 200-G
Type BWC 201.B, 400 V~
Type BWC-M 201.B, 230 V~

Heat pump with electric drive


- Brine/water heat pump: 5.7 to 17.4 kW
- With conversion kit to water/water heat pump: 7.5 to 22.6 kW




VITOCAL 200-G




Safety instructions

 Please follow these safety instructions closely to prevent accidents and material losses.

Safety instructions explained

 **Danger**
This symbol warns against the risk of injury.

 **Please note**
This symbol warns against the risk of material losses and environmental pollution.

Note
Details identified by the word "Note" contain additional information.

Target group

These instructions are exclusively intended for authorised contractors.

- Work on the refrigerant circuit may only be carried out by authorised refrigeration engineers.
- Work on electrical equipment must only be carried out by a qualified electrician.
- The system must be commissioned by the system installer or a qualified person authorised by the installer.

Regulations to be observed

- National installation regulations
- Statutory regulations for the prevention of accidents
- Statutory regulations for environmental protection
- Codes of practice of the relevant trade associations
- Relevant country-specific safety regulations

Safety instructions (cont.)**Safety instructions for working on the system****Working on the system**

- Isolate the system from the power supply, e.g. by removing the separate fuse or by means of a mains isolator, and check that it is no longer live.

Note

In addition to the control circuit there may be several power circuits.

 **Danger**

Contact with live components can result in severe injuries. Some components on PCBs remain live even after the power supply has been switched off.

Prior to removing covers from the appliances, wait at least 4 minutes until the voltage has completely dropped out.

- Safeguard the system against reconnection.
- Wear suitable personal protective equipment when carrying out any work.

 **Danger**

Hot surfaces and fluids can lead to burns or scalding.

- Before maintenance and service work, switch OFF the appliance and let it cool down.
- Never touch hot surfaces on the appliance, fittings or pipework.

 **Danger**

Risk of fire: Electrostatic discharge can cause sparks which may be ignited by escaping, flammable refrigerant (R32).

Prior to commencing work, touch earthed objects such as heating or water pipes to discharge static loads.

 **Please note**

Electronic assemblies can be damaged by electrostatic discharge. Prior to commencing work, touch earthed objects such as heating or water pipes to discharge static loads.

Work on the refrigerant circuit


Refrigerants are air displacing, colourless, odourless gases.

- R32 forms flammable mixtures with air.
- R410A is not flammable.

 **Danger**

Direct contact with liquid and gaseous refrigerant can cause serious damage to health.

- Avoid direct contact with liquid and gaseous refrigerant.
- Wear personal protective equipment when handling liquid and gaseous refrigerant.

 **Danger**

Unregulated escape of refrigerant in enclosed spaces can lead to breathing difficulties and suffocation.

- Never breathe in refrigerant vapours.
- Ensure adequate ventilation in enclosed spaces.

Perform the following measures before beginning work on the refrigerant circuit:

- Check the refrigerant circuit for leaks.
- Ensure very good ventilation especially in the floor area and sustain this for the duration of the work.

Safety instructions (cont.)

- Inform all persons in the vicinity of the system about the type of work to be carried out.
- Secure the area surrounding the work area.

Further measures before starting work on the refrigerant circuit with flammable refrigerants (R32):

- Remove all flammable materials and ignition sources from the immediate vicinity of the heat pump.
- Before, during and after the work, check the surrounding area for escaping refrigerant using a suitable refrigerant detector.
This refrigerant detector must not generate any sparks and must be suitably sealed.
- A CO₂ or powder extinguisher must be to hand in the following cases:
 - Refrigerant is being topped up.
 - When soldering or welding work is being carried out.
- Display signs prohibiting smoking.

Danger

Damage to the refrigerant circuit can cause refrigerant to enter the hydraulic system. This can cause serious damage to health.

After completion of the work, professionally vent the hydraulic system on the primary and secondary sides.

Repair work

Please note

Repairing components that fulfil a safety function can compromise the safe operation of the system. Replace faulty components only with genuine Viessmann spare parts.

Auxiliary components, spare and wearing parts

Please note

Spare and wearing parts that have not been tested together with the system can compromise its function. Installing non-authorised components and making non-approved modifications or conversions can compromise safety and may invalidate our warranty. For replacements, use only original spare parts supplied or approved by Viessmann.

Safety instructions for operating the system

What to do if water escapes from the appliance

Danger

If water escapes from the appliance there is a risk of electrocution. Switch OFF the heating system at the external isolator (e.g. fuse box, domestic distribution board).



Danger

If water escapes from the appliance there is a risk of scalding. Never touch hot heating water.

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Notes

- Observe the information on electrical connections in the installation and service instructions.
- In the case of a power supply with power-OFF facility, the power to the control circuit (heat pump control unit) must be supplied without interruption by the power supply utility.
- Identification of electrical equipment (in accordance with IEC 81346-2):
Example: /7.5
/ = cross-reference
7. = sheet number
5 = current path

Electrical equipment

| | |
|---|--|
| B | Pressure switch, temperature switch, thermal relay |
| E | Instantaneous heating water heater |
| F | Fuse, thermal relay |
| J | Plug-in connector |
| K | Contactors, relays |
| M | Motor, circulation pump, motorised valve, compressor |
| N | Controller |
| Q | Mains isolator, power contactor, output relay |
| R | Start-up resistor |
| S | Control switch |
| X | Terminals, plugs |
| Y | 3-way diverter valve |

Sheet 1: Compressor 400 V~

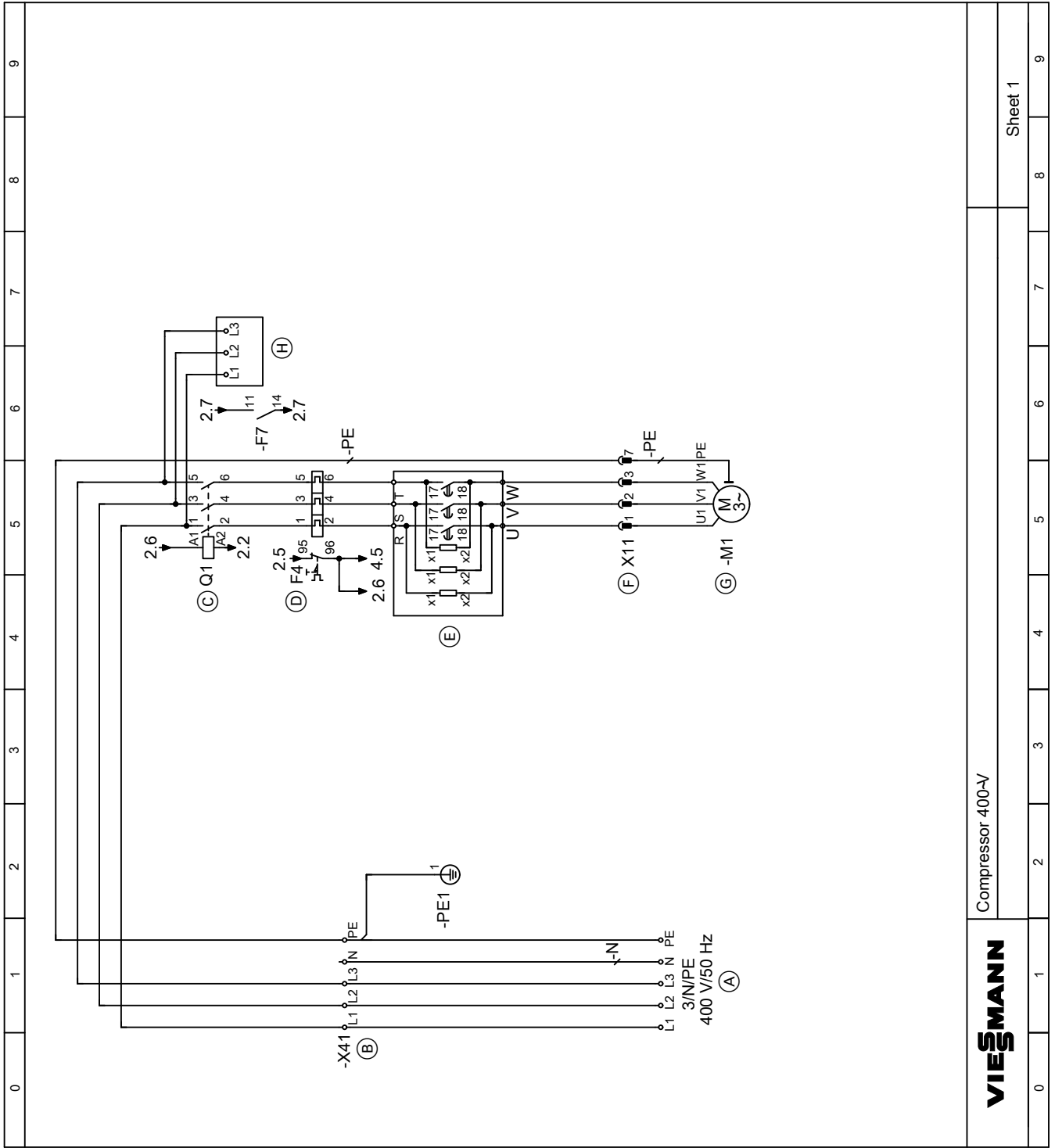


Fig. 1

- (A) Compressor power supply
- (B) Mains terminals, compressor
- (C) Compressor contactor
- (D) Thermal relay, compressor
- (E) Full wave soft starter
- (F) Male jack, compressor
- (G) Compressor motor
- (H) Phase monitor

Compressor 400-V

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Sheet 1

Service

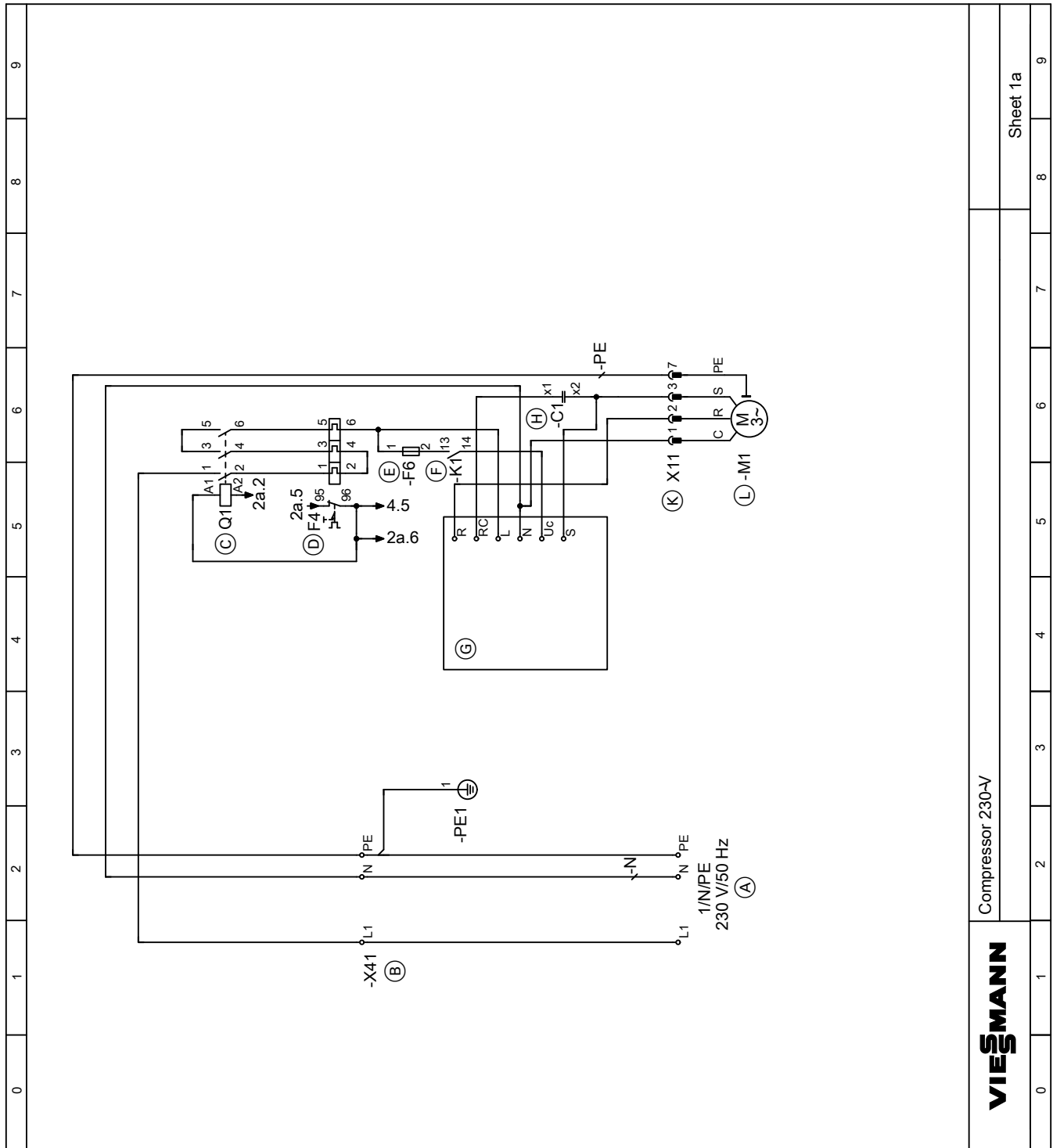


Fig. 2

- (A) Compressor power supply
- (B) Mains terminals, compressor
- (C) Compressor contactor
- (D) Thermal relay, compressor
- (E) Fuse, control circuit of full wave soft starter
- (F) Relay, control circuit of full wave soft starter
- (G) Full wave soft starter
- (H) Run capacitor
- (K) Male jack, compressor
- (L) Compressor motor

For heat pumps with 400 V~ compressor

Sheet 2: Heat pump control unit power supply... (cont.)

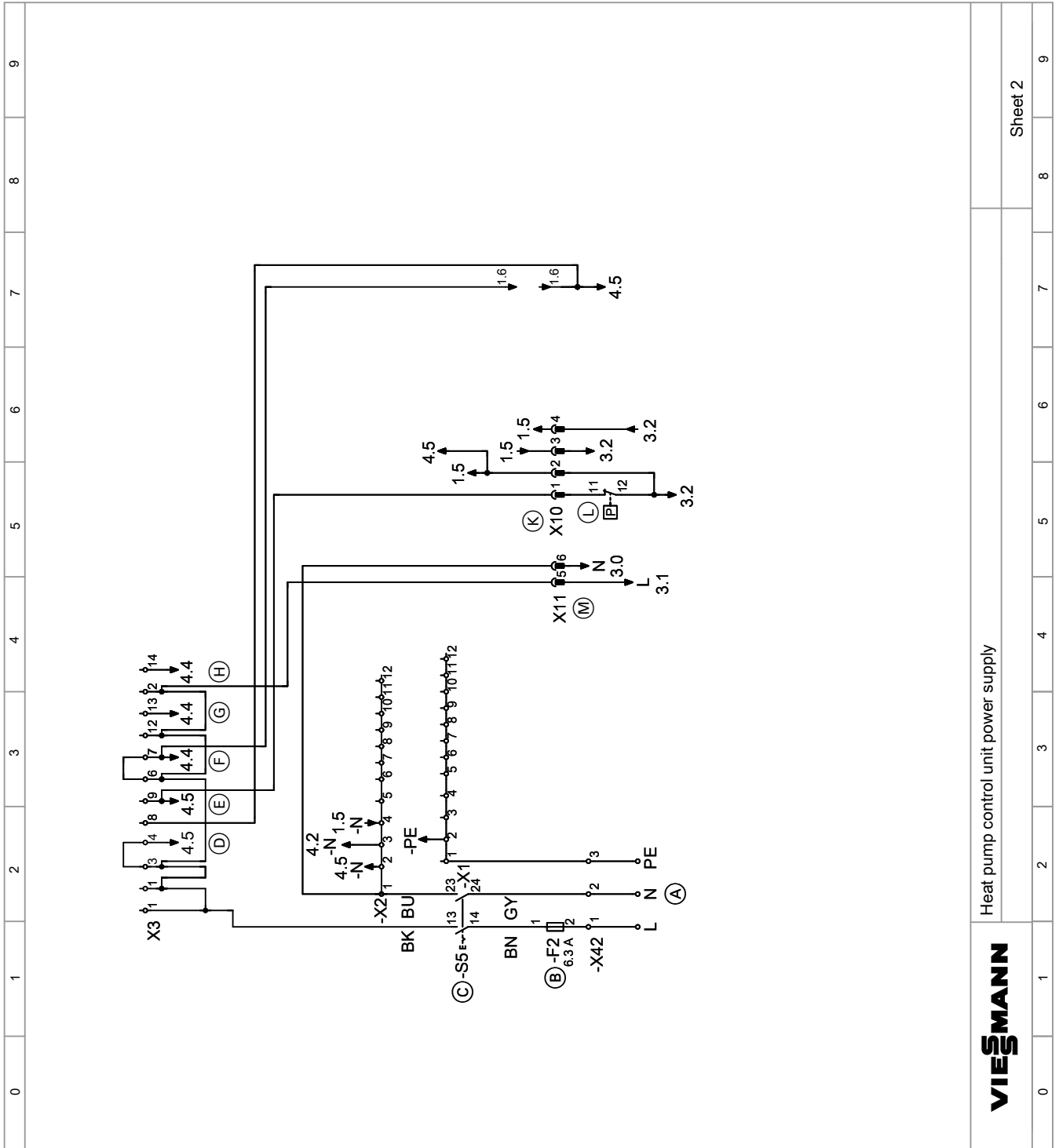


Fig. 3

- (A) Mains terminals, heat pump control unit
- (B) Heat pump control unit fuse 6.3 A (slow)
- (C) Heat pump control unit ON/OFF switch
- (D) Primary circuit flow switch
- (E) Primary circuit pressure switch and/or frost stat
- (F) Power-OFF
- (G) External demand
- (H) External blocking
- (K) Plug, safety chain
- (L) Safety high pressure switch
- (M) Male jack, compressor

Sheet 2a: Heat pump control unit power supply 230 V~

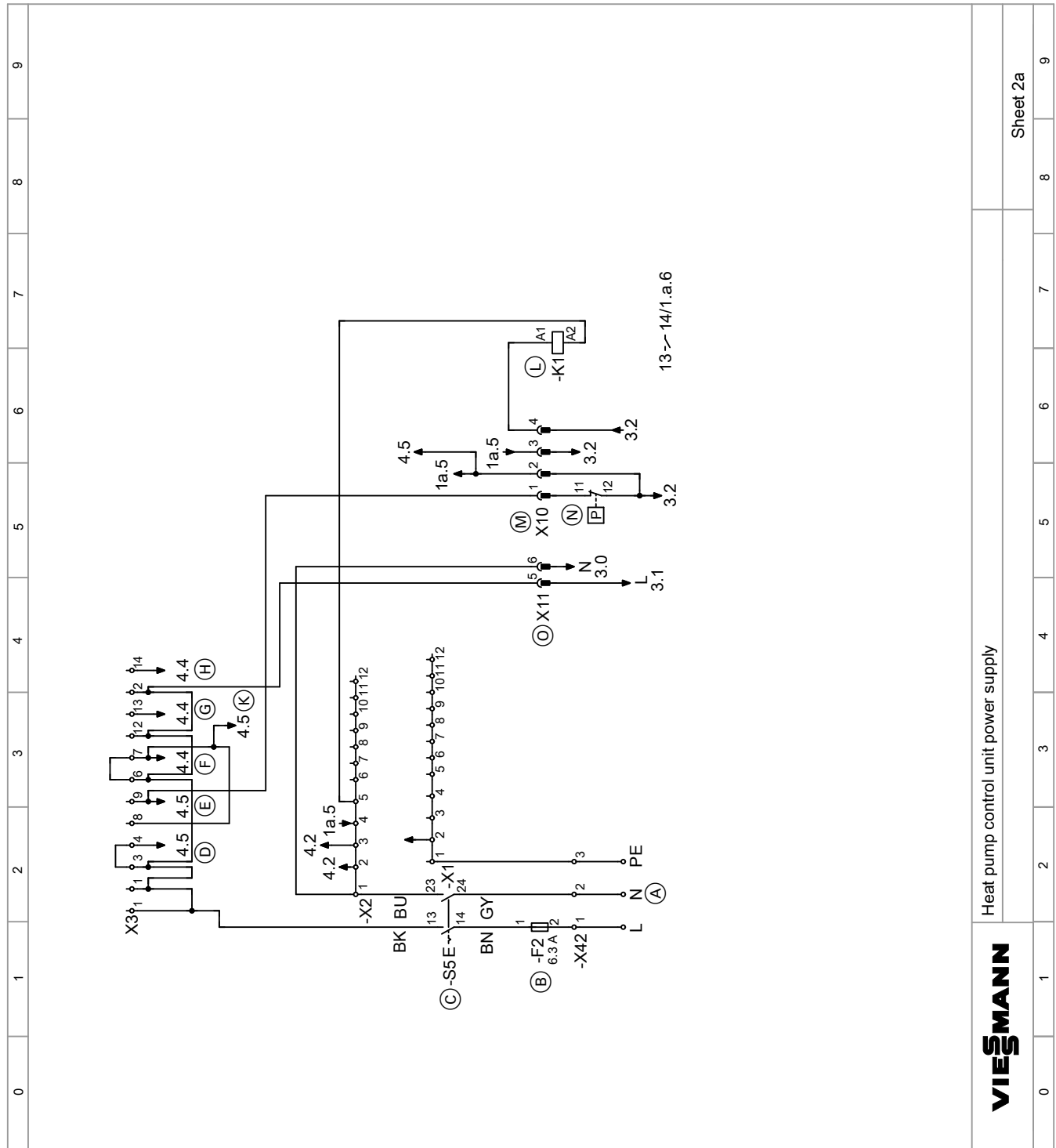


Fig. 4

- | | |
|---|--|
| (A) Mains terminals, heat pump control unit | (H) External blocking |
| (B) Heat pump control unit fuse 6.3 A (slow) | (K) Jumper |
| (C) Heat pump control unit ON/OFF switch | (L) Relay, control circuit of full wave soft starter |
| (D) Primary circuit flow switch | (M) Plug, safety chain |
| (E) Primary circuit pressure switch and/or frost stat | (N) Safety high pressure switch |
| (F) Power-OFF | (O) Male jack, compressor |
| (G) External demand | |

| | | | | | | | | | |
|-------------------------------------|---|---|---|---|---|---|---|---|---|
| Heat pump control unit power supply | | | | | | | | | |
| VIESSMANN | | | | | | | | | |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Sheet 2a | | | | | | | | | |

Sheet 3: EEV PCB (refrigerant circuit controller [4-7])

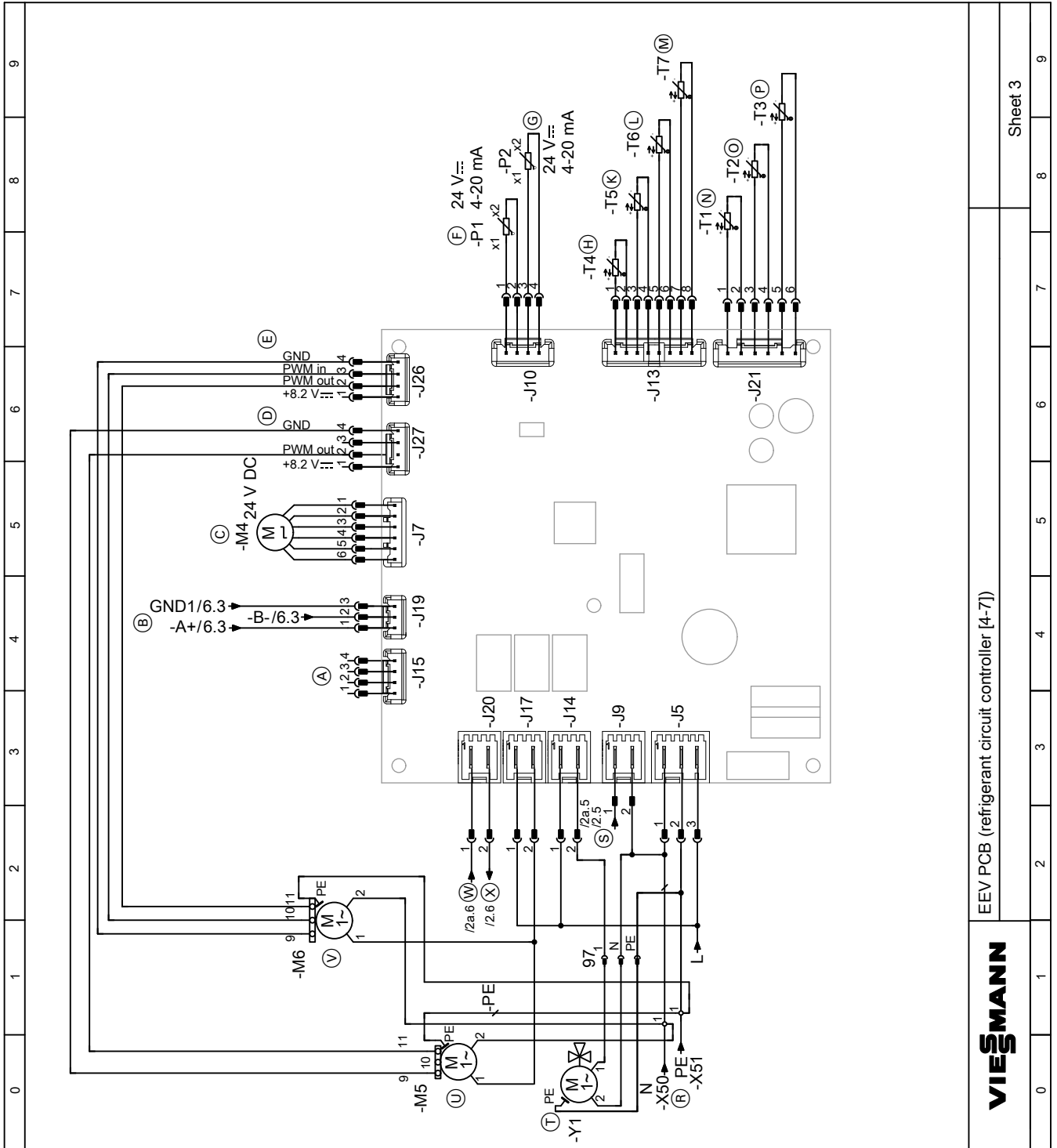


Fig. 5

- (A) Never connect anything here.
- (B) Modbus: Connecting cable to the controller and sensor PCB, terminal X18
- (C) Electronic expansion valve
- (D) PWM signal, primary pump
- (E) PWM signal, secondary pump
- (F) Low pressure sensor
- (G) High pressure sensor
- (H) Suction gas temperature sensor (NTC 10 kΩ)
- (K) Primary circuit flow temperature sensor (NTC 10 kΩ)
- (L) Hot gas temperature sensor (NTC 10 kΩ)
- (M) Liquid gas temperature sensor (NTC 10 kΩ)
- (N) Secondary circuit flow temperature sensor (NTC 10 kΩ)
- (O) Secondary circuit flow temperature sensor downstream of instantaneous heating water heater (NTC 10 kΩ)
- (P) Secondary circuit flow temperature sensor (NTC 10 kΩ)
- (R) Internal power supply (factory connection)
- (S) Safety high pressure switch
- (T) 3-way diverter valve "central heating/DHW heating"

Sheet 3: EEV PCB (refrigerant circuit... (cont.)

- Ⓚ Primary pump
- Ⓥ Secondary pump

- Ⓜ Compressor relay (230 V~)
- ⓧ Enable compressor switching

Sheet 4: Main PCB

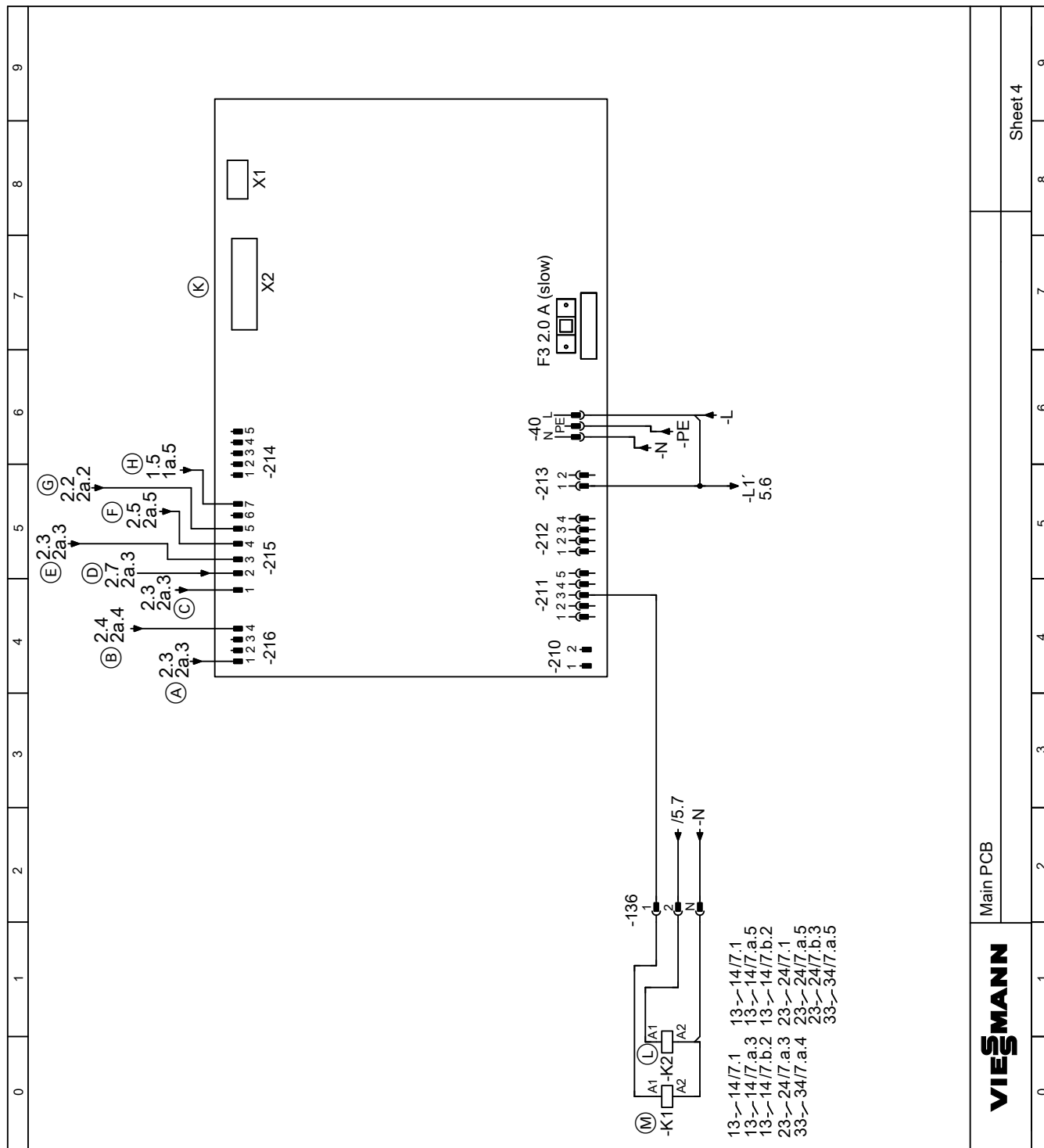


Fig. 6

- (A) External demand
- (B) External blocking
- (C) Power-OFF
- (D) Phase monitor (if installed) or jumper
- (E) Primary circuit pressure switch and/or frost stat

- (F) Safety high pressure switch
- (G) Primary circuit flow switch
- (H) Thermal relay
- (K) Ribbon cable to the controller and sensor PCB

Sheet 4: Main PCB (cont.)

- (L) Output relay for instantaneous heating water heater, stage 2
- (M) Output relay for instantaneous heating water heater, stage 1

Sheet 5: Expansion PCB

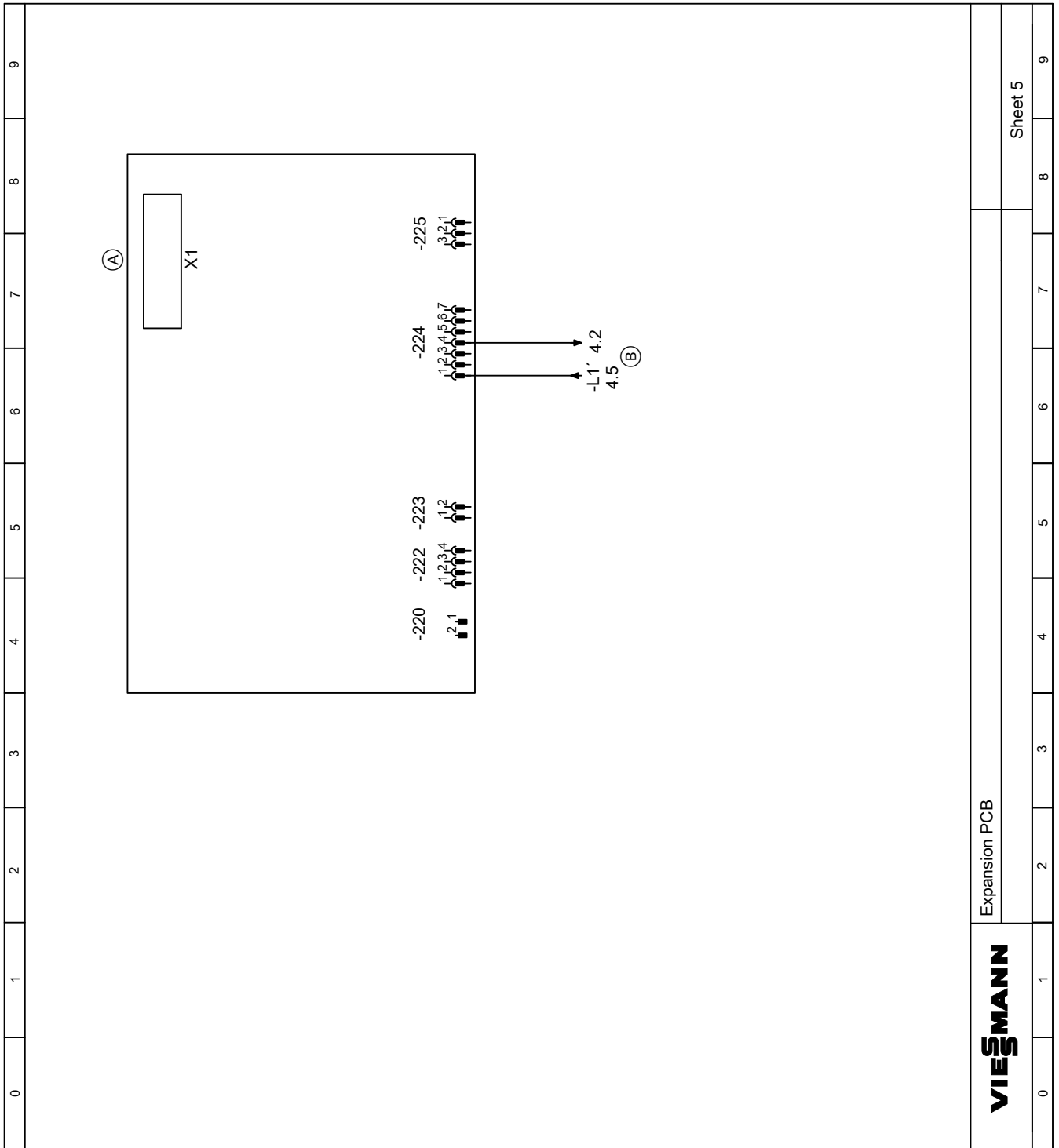


Fig. 7

- (A) Ribbon cable to the controller and sensor PCB
- (B) Instantaneous heating water heater output relay, stage 2

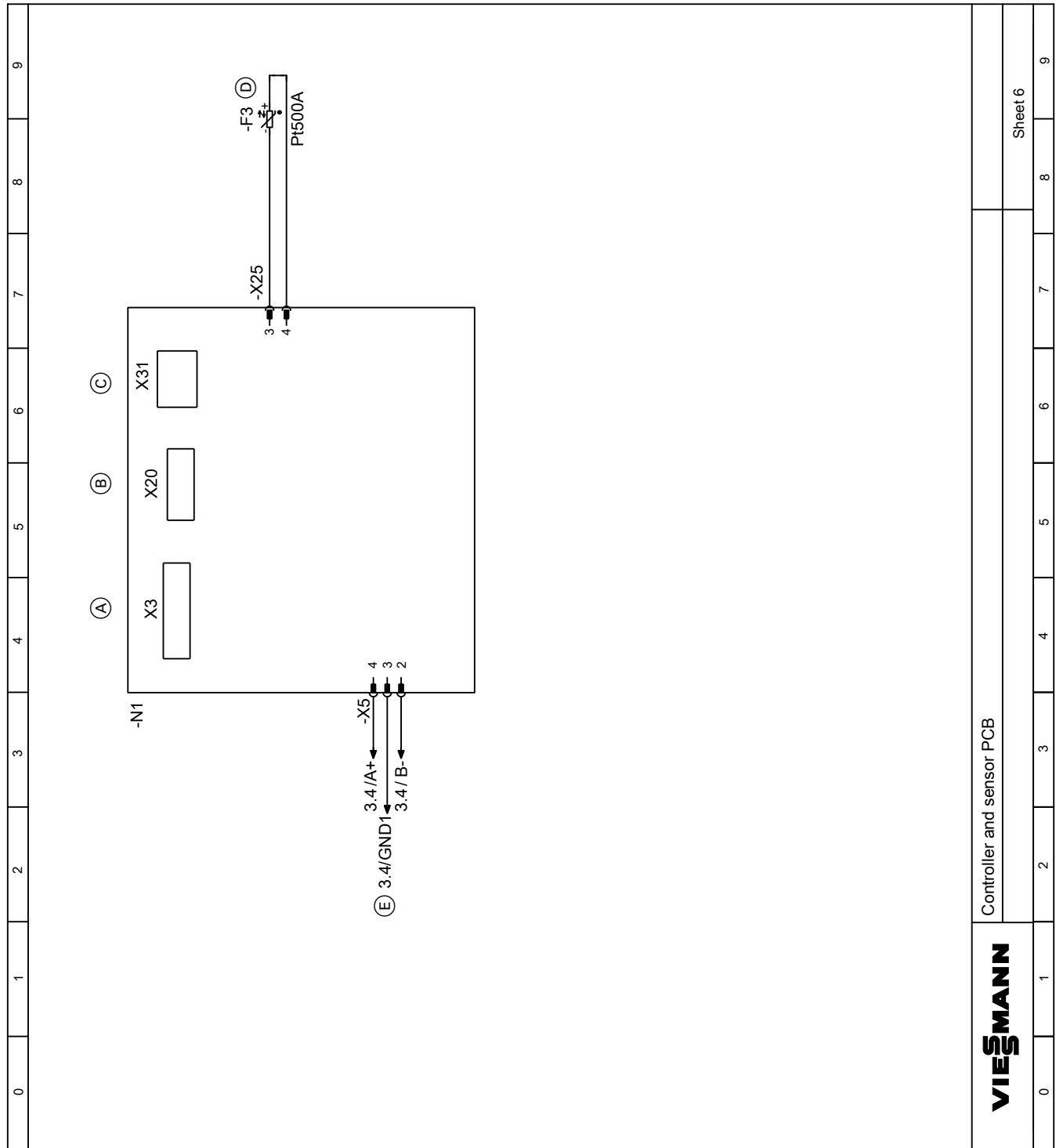


Fig. 8

- (A) Ribbon cable to the main PCB and expansion PCB
- (B) Ribbon cable to the programming unit
- (C) Coding card
- (D) Return temperature sensor, primary circuit
- (E) Modbus: Connecting cable to EEV PCB

For heat pumps with 400 V~ compressor

Sheet 7: Instantaneous heating water heater (cont.)

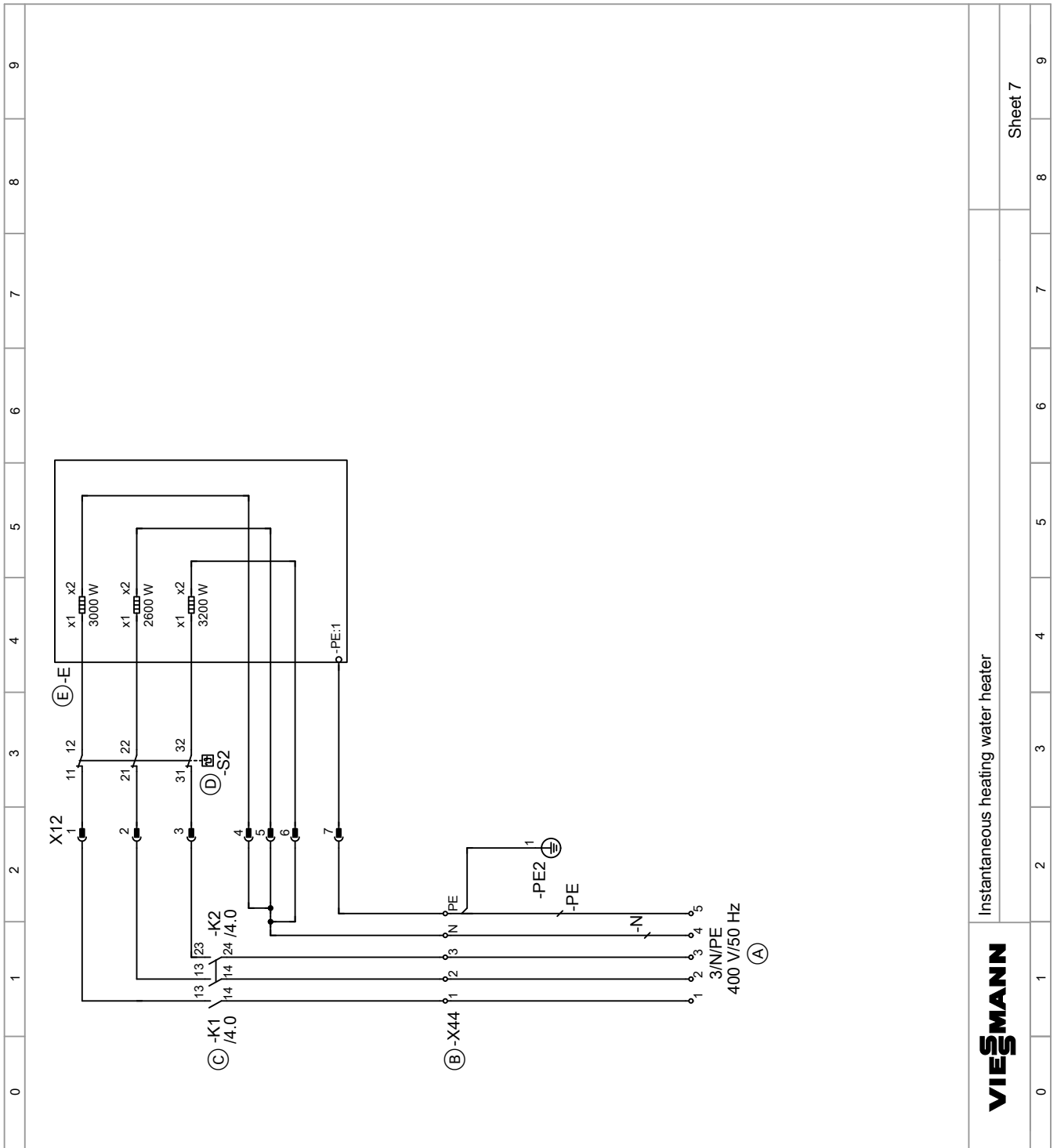


Fig. 9

- (A) Power supply for instantaneous heating water heater
- (B) Mains terminals, instantaneous heating water heater
- (C) Output relay for instantaneous heating water heater:
K1 Stage 1
K2 Stage 2
- (D) High limit safety cut-out for instantaneous heating water heater
- (E) Instantaneous heating water heater

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Instantaneous heating water heater

Sheet 7

Service

For heat pumps with 230 V~ compressor

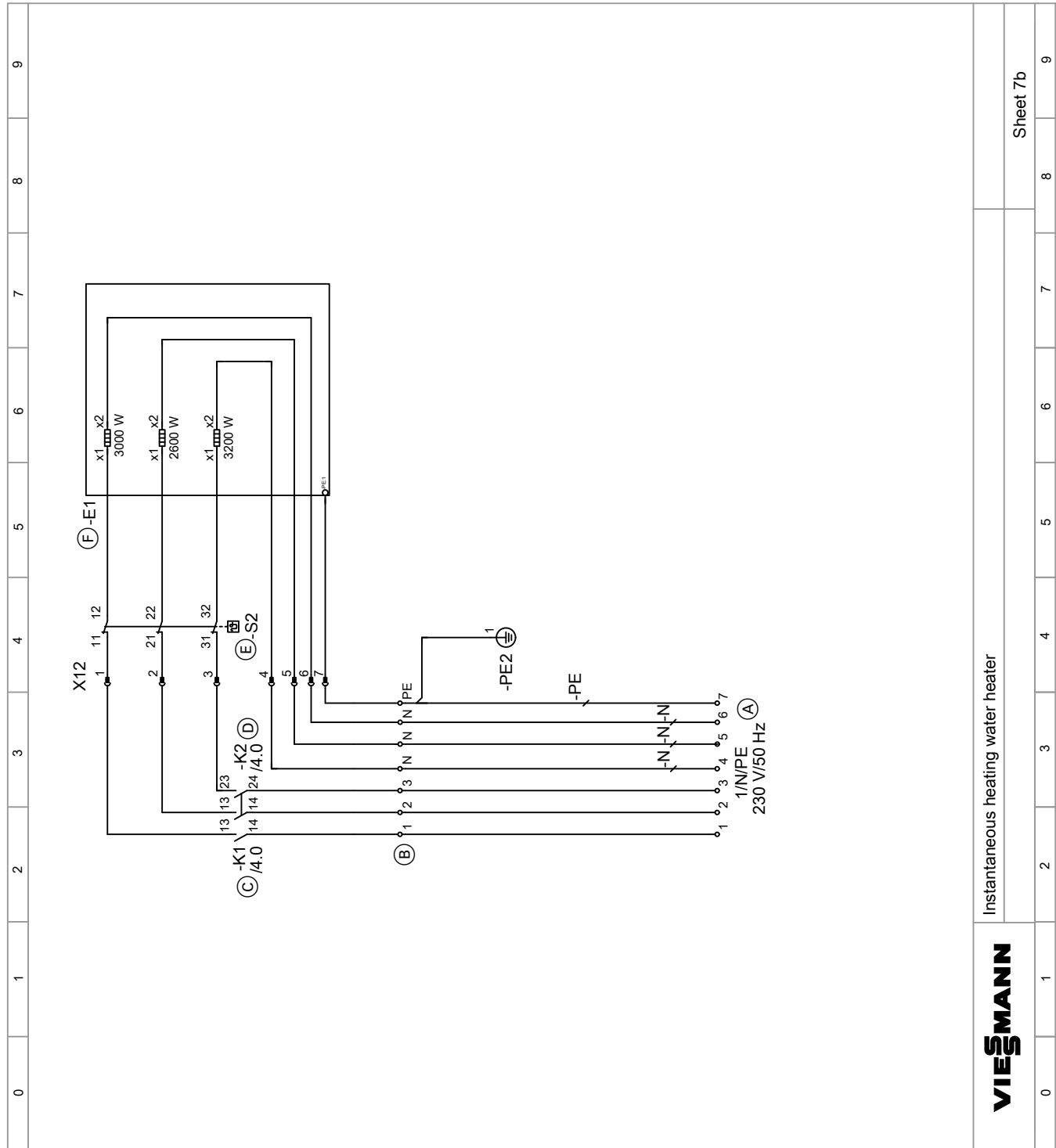


Fig. 10

- (A) Power supply for instantaneous heating water heater
- (B) Mains terminals, instantaneous heating water heater
- (C) Instantaneous heating water heater output relay, stage 1
- (D) Instantaneous heating water heater output relay, stage 2
- (E) High limit safety cut-out for instantaneous heating water heater
- (F) Instantaneous heating water heater





Viessmann Limited
Hortonwood 30, Telford
Shropshire, TF1 7YP, GB
Telephone: +44 1952 675000
Fax: +44 1952 675040
E-mail: info-uk@viessmann.com

Viessmann Werke GmbH & Co. KG
D-35107 Allendorf
Telephone: +49 6452 70-0
Fax: +49 6452 70-2780
www.viessmann.com

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