TOOLTEMP

Manual of instruction

Temperature control unit TT-170

with Temperature Controller MP-888



CE

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Version: 07

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General information

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In case of inconsistencies in the English translation, the German version shall prevail.

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Attachments:

- **Electrical diagram MP-888 EL-1709_V01**

1. General Safety Information

1.1. Safety Symbols

DANGER	
	**Denotes imminent danger.** **Failure to heed the information can result in death or grave personal injury (disability)!**

WARNING	
	**Denotes a dangerous situation.** **Failure to heed the information can result in death or grave personal injury (disability)!**

CAUTION	
	**Denotes a potentially dangerous situation.** **Failure to heed the information can result in property damage as well as minor or moderate personal injury!**

NOTE	
	**Denotes general information, useful advice to users and work recommendations, which, however, do not have any influence on the safety and health of personnel.**

1.2. Range of Application

This general safety information is generally valid for all temperature control units from TOOL-TEMP.

1.3. Intended Use

The TOOL-TEMP temperature control unit is built according to the current state of the art and the generally accepted principles of safety engineering. The temperature control unit is intended solely for the normal use for heating and/or cooling of injection and die casting moulds, extruders, calendars, mixers and other consumers in areas in which there is no risk of explosion.

Any use beyond this shall be deemed to constitute improper use. The manufacturer is not responsible for damage resulting from improper use; the user is solely responsible for such risks. The temperature control unit may not be used under other operating conditions and/or with other media, in deviation from our specifications, without the prior consent of TOOL-TEMP.

Use as intended also entails compliance with the operating, servicing and maintenance conditions stipulated by the manufacturer. The temperature control unit may only be operated, serviced and maintained by personnel who are familiar with these tasks and have been instructed as to the risks.

1.4. Safety Information

1.4.1. General Information

The TOOL-TEMP temperature control unit is safe to operate, but this device can pose danger to life and limb if it is used incorrectly or for a purpose other than that intended. It should be noted that this poses risks to the life and limb of the user or third parties, adverse effects on the equipment and other material assets belonging to the user, and risks to the efficient operation of the equipment.

Start-up (i.e., commencement of intended use) is prohibited until it has been determined that the temperature control unit has been set up and wired in accordance with the Machinery Directive (2006/42/EC). EN 60204-1 (Safety of Machinery) must also be observed.

These operating instructions must be read carefully before turning on and operating the temperature control unit. The information regarding the intended use and foreseeable misuse must be observed. Local safety regulations must also be obeyed.

If the temperature control unit is used in combination with products by other manufacturers, their notices and safety regulations must also be obeyed.

1.4.2. Process Monitoring

In plants in which a temperature control system malfunction leads to endangerment of the operating personnel or destruction of the plant, an independent process monitor that shuts down the plant reliably must be used.

1.4.3. Information for Operators and Personnel

The operator and all persons who are tasked with working on the temperature control unit must obey the fundamental regulations regarding work safety and accident prevention. The operator must ensure that only persons who have read and understood these operating instructions, particularly the chapter on safety, work on the temperature control unit.

Any working methods that have a negative effect on the technical safety of the temperature control unit must not be used. The operator must ensure that the temperature control unit is operated only in flawless condition. If necessary, the company using the equipment must obligate the operating personnel to wear protective clothing.

For all tasks having to do with set-up, start-up, operating, modification of operating conditions and operational modes, maintenance, inspection and repair, any shut-down procedures stated to be necessary in the operating instructions must be followed.

1.4.4. Changing the Parameterisation

The parameterisation of the control system may only be carried out by personnel trained by TOOL-TEMP. In particular, no parameters in the device configuration may be changed without consulting TOOL-TEMP.

The relevant accident prevention regulations and the generally accepted principles of safety engineering, occupational medicine and structural engineering must be observed. The national safety regulations must also be obeyed.

1.4.5. Residual risks

Any unauthorised modifications and changes to the temperature control unit as well as unauthorised changes to the parameterisation of the control system are prohibited for reasons of safety.

If the temperature control unit is damaged, it must not remain in use; the defective part must be replaced or repaired immediately. Only original TOOL-TEMP replacement parts may be used. Damage due to use of thirdparty parts voids any and all warranty claims.

DANGER	
	**The temperature control unit must be rendered currentless before it is opened! Press the main switch on the temperature control unit and unplug mains plug!** **Danger due to electrical shock!**

Repair leaks in the temperature control circuit (device, connecting lines, consumers, etc.) immediately.

The temperature control unit may only be operated when all safety systems are completely installed and intact. The temperature control unit must be protected against sprays and cleaning agents.

Before detaching connecting lines in the temperature control circuit and depending on the outlet temperature, allow the temperature control unit to cool down first and then turn it off. Check that the pump is no longer running.

WARNING	
	**Important - danger of injury in the event of escaping water!**

1.5. Using this Documentation

This documentation contains important information for safe, economical operation and for proper maintenance of the device.

Compliance with this documentation helps to avoid danger, minimise repair costs and downtime, and increase the dependability and service life of the unit/system.

NOTE	
	**The operating instructions should be kept near the corresponding unit and always be accessible to operating and maintenance personnel.**

1.5.1. Additional Documentation

The included documentation is completely correct for the basic versions of units. Components that do not belong to the basic hardware are noted as extra equipment. The corresponding additional documents are included with special versions of devices. Any additional documents supplement and/or replace the descriptions contained in this documentation, which are then either invalid or only conditionally valid.

2. Overview temperature control unit

2.1. Front view



1	**Temperature Controller MP-888**
2	**ON/OFF-Switch unit (green)**
3	**ON/OFF-Switch heating (green)**
4	**Control lamp thermal relay pump left (red)** Thermal relay of the pump motor has responded, unit switches off. **Control lamp Temperature monitoring right (red)** The maximum temperature of the unit is exceeded. The unit switches off.
5	**Level control lamp pre-warning left (yellow)** lights Unit continues to run, level has to be corrected **Level control lamp right (yellow)** lights Unit switches off, level has to be corrected
6	**Main switch** Emergency stop
7	**Name plate with following details:** 
8	**Switch cabinet – safety device**
9	**Coverage – safety device**

2.2. Rear view



10	**To mould**	**⅜“**	**BSP female thread**
11	**From mould**	**⅜“**	**BSP female thread**
12	**Cooling water outlet**	**⅜“**	**BSP female thread**
13	**Cooling water inlet with water filter**	**⅜“**	**BSP female thread**
14	**Manually refill with overflow**	**1“**	**BSP male thread**
15	**Overflow**		
16	**Drainage**		

2.3. Identification of residual risk on the unit

On the temperature control unit following pictograms are mounted to identify the residual risk.



DANGER	
	**The temperature control unit must be rendered currentless before it is opened! Turn off the main switch on the temperature control unit and disconnect the power cord from the wall socket!** **Danger due to electrical shock!**

3. Technical Specifications

Temperature range	up to 90°C with water	
Temperature control	self-optimizing, electronic microprocessor controller MP-888	
Heating capacity	3 kW	
Pump capacity	motor 0,27 kW 50 Hz max. 2,2 bar / max. 15.2 l/min 60 Hz max. 2.9 bar / max. 19.1 l/min	
Cooling capacity	30 kW at 90°C	
Filling amount	min. 3,5 litres, max. 5 litres	
Connections	to mould	⅜“ BSP female thread
	from mould	⅜“ BSP female thread
	cooling water inlet with water filter	⅜“ BSP female thread
	cooling water outlet	⅜“ BSP male thread
Dimensions (L×W×H)	640 × 200 × 490 mm, incl. castors	
Weight	approx. 36 kg empty	
Category of protection	IP-44	
Electric	In separate switch cabinet, easily accessible from the front	
Colour	silver-grey RAL 7001	
Heat exchanger	low-maintenance	
Noise level(dBA)	< 70 dBA (distance 3 m)	

4. EC – Declaration of conformity

CE - Konformitätserklärung
CE - Declaration of conformity

TOOLTEMP

Hersteller / *manufacturer*

Tool-Temp AG
Industriestrasse 30
CH-8583 Sulgen - Switzerland

Hiermit erklären wir, dass die nachfolgend bezeichneten Maschinen
Herewith we declare that the following listed machines

Produktbezeichnung *Designation of the machine*	**Typenbezeichnung** *model or type of machine*	**ab Baujahr** *since year of manufacture*
Temperiergerät *temperature control unit*	TT-22, TT-30/160, TT-44, TT-71, TT-100, TT-108, TT-118, TT-137, TT-138, TT-142, TT-DW160, TT-168, TT-170, TT-180, TT-181, TT-188, TT-248, TT-AC250, TT-288, TT-288/2, TT-OIL300, TT-388, TT-388/2, TT-390, TT-390/2, TT-407, TT-409, TT-410, TT-430, TT-508, TT-510, TT-608, TT-708, TT-725, TT-1000, TT-1358, TT-1368, TT-1398, TT-1500, TT-1548, TT-SB2C, TT-13502	2023
Wasserkühlgerät *water chiller*	TT-5500, TT-14500, TT-28500, TT-29000, TT-29800, TT-54500, TT-108000, TT-216000, TT-300000	2023

den grundlegenden Anforderungen der Richtlinie 2006/42/EG entsprechen.
meet the basic requirements of the guideline 2006/42/EC.

Richtlinien *directives*	**2014/30/EU**	**(Elektromagnetische Verträglichkeit)** *(Electromagnetic compatibility directive)*
	2014/35/EU	**(Niederspannungsrichtlinie)** *(Low voltage directive)*
Europäische Normen *European Standards*	EN ISO 12100:2010, EN 60204-1:2018, EN 61439-1:2021, EN 61439-2:2021, EN 61000-6-2:2019, EN 61000-6-4:2019	

Ferner erklären wir, dass die speziellen technischen Unterlagen gemäss Anhang VII Teil B der Richtlinie 2006/42/EG erstellt wurden und verpflichten uns diese auf Verlangen den Marktaufsichts-behörden in schriftlicher oder elektronischer Form zu übermitteln.
Furthermore we declare that the relevant technical documentation according to 2006/42/EC, Appendix VII, Part B has been issued and we commit ourselves to forward the documents on request to the market regulators as written documents or electronically.

Name des Dokumentenbevollmächtigten: *Name of the person which is responsible for the documentation:* Jasmine Koller

Adresse der benannten Person: *Address of the nominated person:* Tool-Temp AG, Industriestrasse 30, 8583 Sulgen

S. Koller

Sulgen, 27.10.2022 — Serge Koller

Ort und Datum *Place and date* — **Technischer Leiter** *Technical Director*

Anmerkung: Diese Erklärung entspricht einer Herstellererklärung im Sinne der EG-Maschinenrichtlinie 2006/42/EG, Anhang II B. Etwaige Änderungen an dem oben beschriebenen Erzeugnis lassen die Gültigkeit dieser Erklärung erlöschen.
Remark: This declaration is made in the sense of the EC-General Instruction for the Machinery 2006/42/EC, Appendix II B. After changings at the above described equipment this declaration will expire.

5. Installation

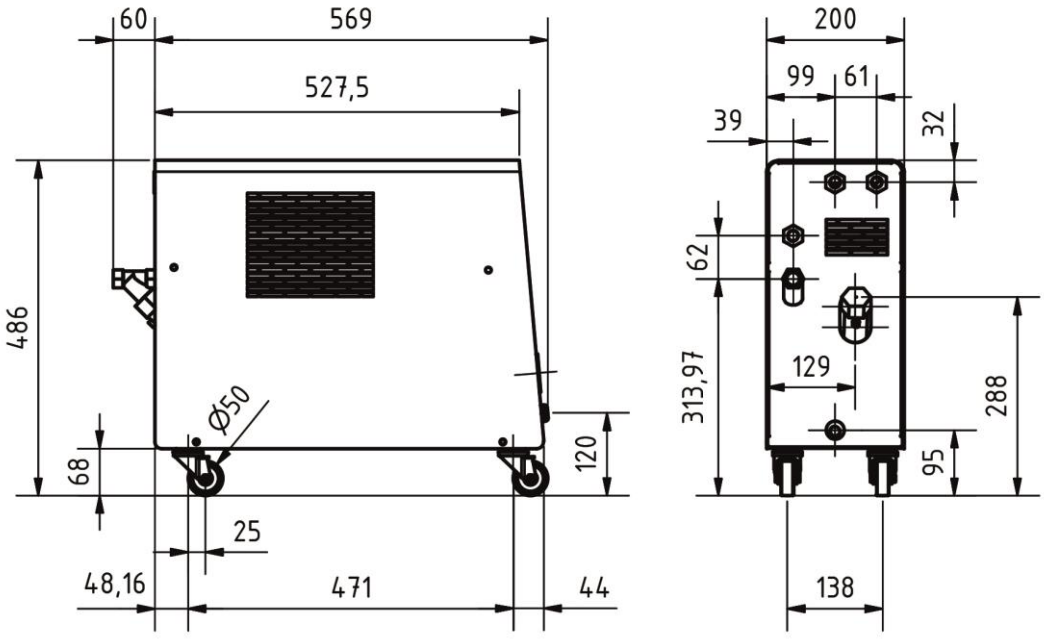
Before starting the unit the electrical and hydraulic connections have to be installed. The installation of the unit has to be done in the order of the following chapters. After the proper installation the unit is ready to use.

DANGER	
	**The temperature control unit must only be operated with water. Do not use solvents or other explosive substances such as petrol, toluene, etc. in the water.**

CAUTION	
	**When starting the unit without the prescribed connections the unit can be damaged.** **Water quality – do not use water with chlorine addition.**

NOTE	
	**Observe the General Safety Information!** **Before installing corresponding chapter of the manual should be read!**

5.1. Installing and dimensions of the temperature control unit



The temperature control unit is designed for an ambient temperature of +10 up to 40°C. Sufficient ventilation must be ensured during set-up. The distance between the temperature control unit and other facilities must be at least 10cm. The ventilation opening must be free.

- Check the unit of completeness and possible damages.
- The unit has to be installed in a suitable location on even ground. It must be stand on castors.
- The unit is not protected against splash water and is not suitable for use in hazardous location. The unit must not be used in the open air.
- The unit must not be transported lying. Lying transport destroy the unit.

WARNING	
	**The temperature control unit can release excess pressure. Danger of injury in the event of escaping steam!** **Never start up the unit without the protection cover!** **Never use the unit in hazardous location!** **Repair leaks immediately!** **Observe local laws during set-up!**

CAUTION	
	**The temperature control unit may be pressurised!** **Only when the pressure gauge shows 0 bar, disconnect hoses!**

5.2. Connections

Before installing the connecting lines between temperature control unit and consumer must be subjected following inspections:

- Verify that channels on the consumers are unobstructed
- Remove fouling, e.g. remove shaving in the lines
- Rust and lime deposits must be removed because the greatly interfere with the heat exchange between consumer and heat transfer medium and increase the pressure drop in the consumer.

For the connecting lines (to and from mould, cooling water inlet and outlet, etc.) the following internal diameters of hoses are recommended:

Thread on the unit	Internal hose-Ø
3/8“	10 mm
1/2“	15 mm
3/4“	20 mm
1“	25 mm
DN32	32 mm

Quick release couplings will give reduced flow. If the recommended tube size cannot be connected to the mould, the connection at the mould should be reduced and not the connection on the temperature control unit. In that way pressure drops can be avoided.

For the cooling water connections it's enough to use pressure- and temperature-resistant rubber hoses. The tap water pressure has to be between 2,0 and 5,0 bar. We recommend to conduct the water from the unit (cooling water outlet) to an unpressurized outlet.

WARNING	
	**To ensure the operational safety is essential to use pressure- and temperature-resistant hoses. Pressure-resistant up to 20 bar / temperature-resistant up to +200°C.** **For reason of safety, the cooling must always be connected!**

NOTE	
	**Process water filter on the return line reduces contamination in the unit, which can cause a unit failure (pollution of the solenoid valve).** **Mark and take down the maximum temperature for which the connections are suitable!**

5.3. Power supply

Compare supply voltage and frequency with the information on the serial plate. Verify the rating of the preliminary fuse according to the information in the electrical diagram. Observe local laws during set-up!

Power cable:

Phases	black / black / black	L1 / L2 / L3
Earth	yellow/green	PE

WARNING	
	**The unit may only be connected by a competent electrician.** **Ensure easy access to means for cutting the power supply (mains adapter or mains connection), the access must be positioned in a distance of 0.6 and 1.9m above the access level.** **Do not connect the power supply until the heating medium hoses are connected!**

5.4. Initial operation - Filling (Water operation)

The temperature control unit has to be connected hydraulically and electrically. Possible block valve must be open.

- Switch on the unit electrically: Turn on the main switch and press the unit ON/OFF-switch
- After switching on the unit the pump starts and fills the system with water, as well as automatically ventilating the machine. In the meantime the yellow lamp lights. The unit can stop and start until the system is completely filled. If only the yellow lamp is lit, the unit is running and no horn sounds, the automatic refilling is running.

5.4.1. Pumpendrehrichtung prüfen

At the rear side of the unit the direction of rotation can be checked. The unit has been connected to the main supply, hoses must be mounted and heat transfer medium has been filled. Identify the sense of rotation of the motor by switching it on shortly. The sense of rotation must be clockwise as shown by the arrow.
If the sense of rotation is anti-clockwise invert two phases on the electrical connection. This has to be done by a qualified electrician.

5.4.2. Display of pump pressure

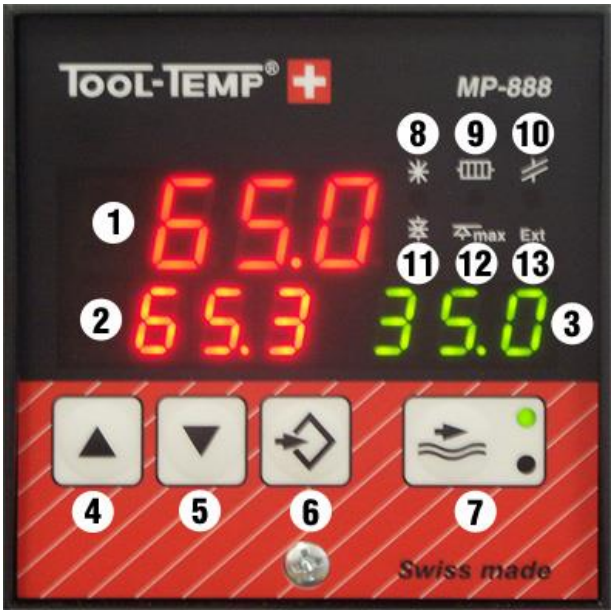
The pump pressure is shown on the manometer

WARNING	
	**The temperature control unit may be pressurised!** **Only when the pressure gauge shows 0 bar, disconnect hoses!**

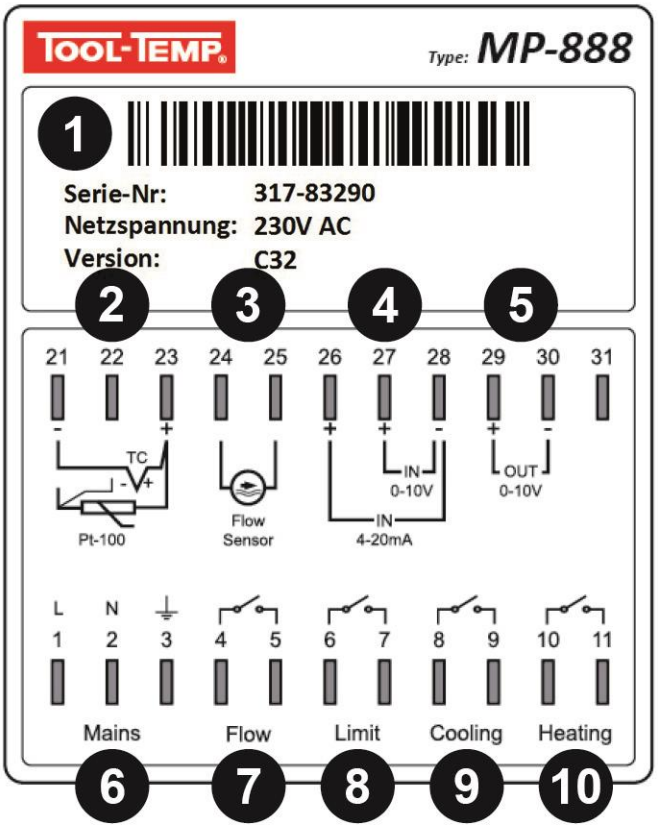
6. Operations

The unit is controlled by the temperature controller MP-888.
The temperature controller MP-888 is a universal controller for all TOOL-TEMP units.

6.1. Overview MP-888



1	**Display of set value**	
2	**Display of actual value**	
3	**Flow control** Display of the current flow in litres/min, English or American gallons/min.	
4	**Up arrow**	Raise of set value
5	**Down arrow**	Reduction of set value
6	**Program button**	
7	**Flow control** Flow control active Alarm flow control	 LED green LED red
8	**LED Cooling** Lights up when the cooling relay is active	
9	**LED Heating** Lights up when the heating relay is active	
10	**LED Sensor failure** Lights up when the sensor is intermitted	
11	**LED Temperature deviation control** Lights up when the difference between set and actual temperature is too high	
12	**LED Maximum temperature** Lights up when the maximum temperature has been reached	
13	**LED External temperature control** Lights up when the set value is applied from extern	



1	**Technical specifications**
2	**Temperature sensor connection** 21+23 Temperature sensor – note + / - 22 Pt-100 compensation
3	**Flow control – encoder signal**
4	**Connection external set point** 26+28 Analog input 4 - 20mA 27+28 Analog input 0 - 10 V
5	**Connection actual value - output** 29+30 Analog output 0 - 10V
6	**Power supply** 1 230V AC 2 Neutral 3 PE
7	**Flow control (alarm)**
8	**Temperature monitoring, temperature deviation alarm**
9	**Cooling (command)**
10	**Heating (command)**

6.2. Parameter settings MP-888 – without flow control

Each unit requires a different programme setting. For each model is a programme defined that not every parameter must be set manually. In this program the model specific settings are saved.

Model: TT-170			**Program: P42**
	Function	**Factory adjusted**	**Description**
P1	Maximum temperature	**95.0°C / 203.0°F** (0.0...400.0°C) (32.0...752.0°F)	If the maximum temperature exceeds, the heating and cooling are inactive and the maximum temperature LED lights up on the controller.
P2	Temperature deviation control (Deviation between set and actual temperature)	**5.0°C / 9.0°F** (0…20.0°C) (0…36.0°F)	The limit determines the maximum deviation from the nominal value, which is still tolerated. If the actual temperature outside the set point window the alarm will sound and the Temperature deviation control LED lights. If the restart lock (P24) is turned on, the temperature deviation control is active only when it reaches the set temperature. A set point changes the start-up lock again.
P3	Flow measurement function	0: Manual **1: Automatic**	If the automatic flow measurement is enabled, after 20s the measured flow is stored and monitoring is enabled. The green LED lights up.
P4	Alarm value flow	**8.0 L** (0.1…999.9 L)	(P3) set to manual Alarm is triggered when the set value is fallen short of.
P20	Temperature unit	**1: °C** 2: °F	Change the temperature unit When the unit started the selected unit will be indicated for a short time.
P23	Analog input	**1: Voltage 0-10V** 2: Current 0-20 mA 3: Current 4-20 mA	Analog input for setpoint selection. 0-10 V (switching threshold <0.1V) 0-20 mA (switching threshold <0.5mA) 4-20 mA (switching threshold <0.1mA)
P27	Temperature at 0 V INPUT	**0.0°C / 32°F** (-50.0...399.9°C) (-58.0...751.8°F)	Lower scaling point of the voltage analog input 0 V corresponds to 0°C
P28	Temperature at 0 V INPUT	**400.0°C / 752°F** (-49.9…400.0°C) (-57.8…752.0°F)	Upper scaling point of the voltage analog input 10 V corresponds to 400°C
P29	Temperature at 0/4 mA INPUT	**0.0°C / 32°F** (-50.0...399.9°C) (-58.0...751.8°F)	Lower scaling point of the voltage analog input 4 mA corresponds to 0°C

P30	Temperature at 20 mA INPUT	**400.0°C / 752°F** (-49.9…400.0°C) (-57.8…752.0°F)	Upper scaling point of the voltage analog input 20 mA corresponds to 400°C
P31	Temperature at 0 V OUTPUT	**0.0°C / 32.0°F** (-50.0…399.9°C) (-58.0…751.8°F)	Lower scaling point of the voltage analog output 0 V corresponds to 0°C
P32	Temperature at 10 V OUTPUT	**400.0°C / 752°F** (-49.9…400.0°C) (-57.8…752.0°F)	Upper scaling point of the voltage analog output 10 V corresponds to 400°C
P45	Relation between cooling- and heating capacity	**0** (0...50)	Adjusting of the cooling capacity 0: 2-point cooling (Standard) 1: cooling capacity maximum 50: cooling capacity minimum
P53	Flow unit	**0: Flow OFF** 1: Impulse (Hz) 2: litres/min 3: US gallons/min 4: Imperial gallons/min	Flow unit to display 1 US gallon = 3.785 litres 1 Imperial gallon = 4.546 litres
P60	Flow measurement Calibration table	0 = Manual **1 = Small units 1** 2 = Medium units 3 = Large units 4 = Reserve 5 = Small units 2 6 = Reserve	Selection oft he calibration table for flow measurement

Navigation in the controller

Enter into the controller and navigate to the different parameter:

- To enter into the programme of the controller, the program button has to be pressed for 3 seconds.
- To move from parameter to parameter, press the programme button.





Setting the parameter value:
With the two arrow buttons the value of the parameters can be adjusted.



Save the parameter settings:

- To save the parameter settings and get back to the control function, the flow button must be pressed.
- To save the parameter settings and move to the next parameter, the programme button must be pressed.





6.3. Setting of the temperature – Heating / Cooling

The required temperature on the temperature controller can be adjusted with the arrow buttons.
The heating mode is indicated by the red diode on the temperature controller. The unit can only heat when the 0-1 switch (heating) is active.

The cooling mode is indicated by the green diode on the temperature controller.

7. Safety and monitoring devices

7.1. Pump

The pump motor is fitted with an overload relay and pre-switch automatic cut-outs.

7.2. Heating – Temperature monitoring

In the temperature controller the maximum temperature (95°C) is limited. Exceeding this temperature the heaters switch off.
A safety thermostat (100°C) with automatic reset protects additionally the system. Exceeding this temperature the unit stops automatically and the indication lamp lights. The unit switches on again when the temperature has been dropped permitted.

WARNUNG	
	**Do not put the maximum temperature in the controller higher, deeper values are allowed!** **The temperature control unit can excess overpressure – risk of injury from escaping steam!**

7.3. Level control

The unit is mounted with a level switch. If the system loses water, the yellow indication lamp lights and the unit refills automatically until the level is reached, the yellow indication lamp will switch off.
If not enough water is in the unit the pump switches off, the yellow indication lamp lights and the horn sounds. The unit fills automatically and the pump will switch on automatically as soon as the level is high enough.

8. Maintenance

Inspection and maintenance have to be done by instructed staff (competent).

The following maintenance intervals may be required subject to use and environment:

Water filter	clean / replace	every month
Pump motor	blow out the fan	every 6 months
Hoses and pipes	check tightness	every 6 months
Pump	check tightness	every 6 months
Bolts and seals	check tightness	every 12 months

8.1. Inspection

Before starting the unit has to be checked the general condition of the temperature control unit, the electrical connection and the tightness of the connections and hoses (including the consumer).

8.2. Cleaning

The temperature control unit has to be checked and cleaned periodically. Before maintenance the unit has to be disconnected from the power supply.

8.3. Repair

Established defects must be repaired. To guarantee safety the unit must be repaired with original TOOL-TEMP spare parts only.

WARNING	
	**The temperature control unit must be currentless before opening!** **Press the main switch on the temperature control unit and pull out the mains plug!** **There is a danger of electric shock!** **Caution – risk of injury from leaking hot water!**

9. Out-of-service / transport

Cool the temperature control unit down, mould drainage, turn it off, press the main switch and disconnect the power supply. Disconnect all hoses from the temperature control unit.
The temperature control unit is to be emptied before shipping. The danger of freezing (bursting of pipes or other components) at low temperatures can be reduced. The unit must be transported or stored in the operating position!

CAUTION	
	**Drain the unit to avoid freezing damages!** **Avoid compressed air, blowing out with compressed air can damage the unit!** **Never transport the unit lying – Lying transport will destroy the unit!**

10. Disposal

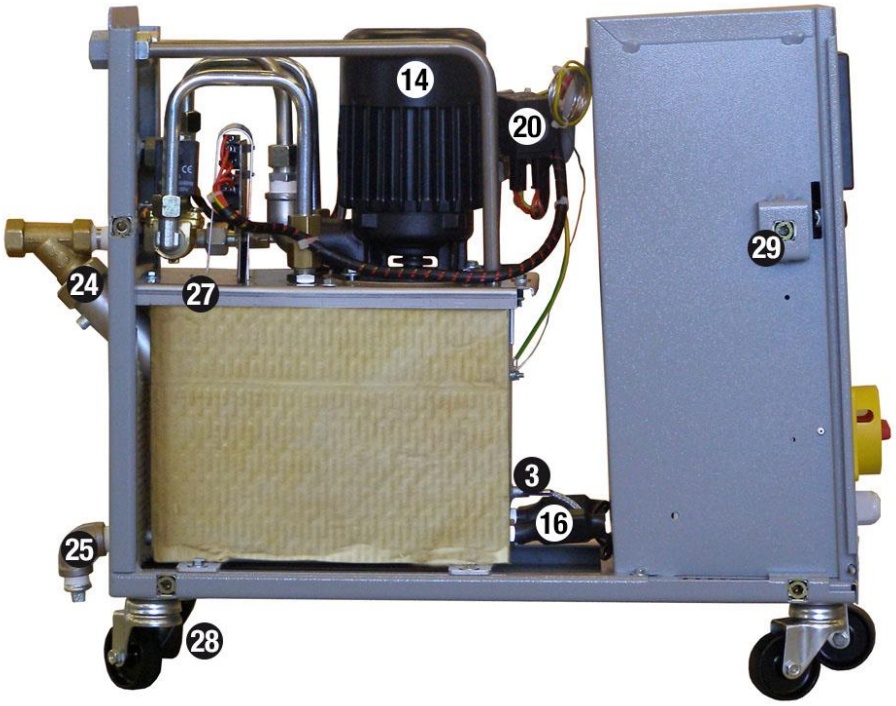
The temperature control unit must be drained completely and disposed of in accordance with local regulations.
The temperature control unit can also be returned to TOOL-TEMP for disposal.

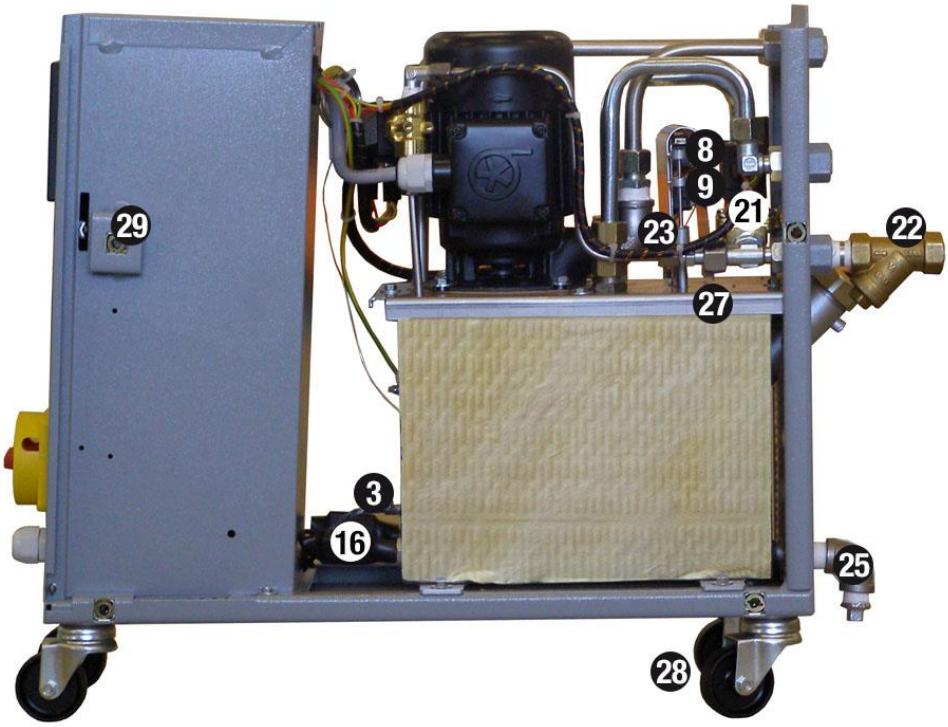
11. Failure corrective action

Symbol	Symptom	Probable cause	Correction
0 - I	Green ON/OFF-switch as well as all lamps do not light	• Fuse defective • Possibly transformer or switch defective	• Replace the 5 x 20 mm 1 A fuse • Replace defective parts
	Red lamp “thermal relay” lights	• Overload relay of the pump motor has responded • Unit switches off (pump) • Possibly 2-phase running	• Let the motor cool down • Open the unit and press the blue button of the overload relay “**motor**” • Check the electrical connection When the motor has cooled down the unit switches on again.
	Red lamp „temperature monitoring“ lights and the unit switches off	• Maximum temperature of the unit is reached – thermostat has respond	• Try to establish the cause, maybe too low adjustment of the thermostat • Check the controller • Check the contactors
	Left yellow lamp „level control“ lights, unit works	• Not enough heat transfer medium in the circuit • Level switch defective • Automatic filling defective or not connected	• Cool the unit below 60°C • Search leakage and repair it
	Right (and left) yellow lamp „level control“ lights, unit switches off	• Not enough heat transfer medium in the circuit • Level switch defective	• Cool the unit below 60°C • Search leakage and repair it • Replace defective parts
	The required temperature will not be reached, heating lamp on the controller lights	• Solenoid valve of the water cooling system not closed or defective • Maybe to big consumer • Heating defective • Contactor of heating defective	• Clean the solenoid valve, check signal to valve and function, repair or replace it • Contact the supplier • Measure resistance of heating • Replace contactor

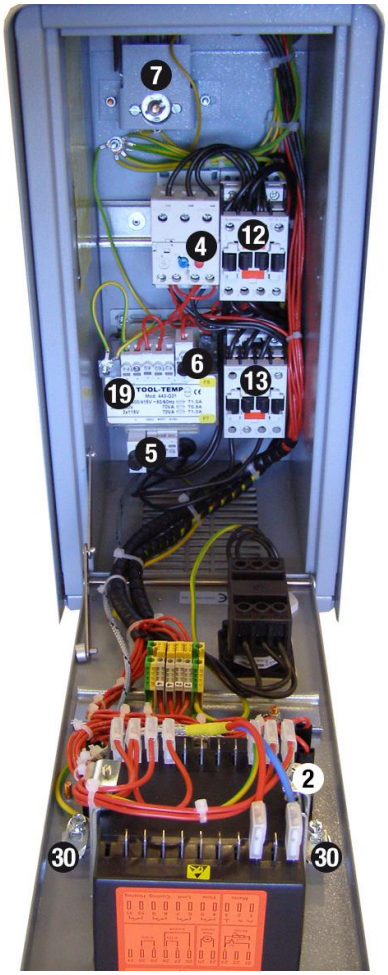
12. Components and spare parts

12.1. Overview components and spare parts






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TOOL-TEMP
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12.2. List components and spare parts

	Art.-Nr.	ELD-Code	Description	Comment
1	Fa0800326 Fa0800328	N 1	Digital temperature controller MP-888 Digital temperature controller MP-888	new revised
2	Fa0900003		Fixing clips for controller MP-888	As a pair incl. straining screw
3	Wa1000036	B 1	Temperature probe FeKo	cable length 1200 mm, with angle plug 6.3 mm
4	Gb0700822 Gb0700823	F 1	Motor protection relay 0.63 – 1.0A Motor protection relay 1.0 – 1.6A	3 x 380 – 480V 50/60Hz 3 x 200 – 240V 50/60Hz
5	Gl0200003 Gl0200001	F 7	Fuse 1A primary T1, 6.3 x 32 mm Fuseholder big	Packing of 10 pieces
6	Gl0200000 Gl0200002	F 8	Fuse 1A secondary T1, 5 x 20 mm Fuseholder small	Packing of 10 pieces
7	Gf0101200	F 10	Capillary pipe thermostat 80°C – 370°C	
8	Gf0100001	F 15	Level switch for level control	Unit off
9	Gf0100001	F 15/2	Level switch for level control	Auto. filling
10	Gk0300400	H 4/1 H 4/2	Lamp level control – Unit off Lamp level control – Auto. filling	Doublelamp (yellow)
11	Gk0300500	H 6 H 7	Indication lamp motor overload Lamp safety thermostat	Doublelamp (yellow)
12	Gb0101210	K 1	Contactor 32A pump motor (main contactor)	3 x 380 – 480V 50/60Hz 3 x 200 – 240V 50/60Hz
13	Gb0101210	K 3	Contactor 32A	heating
14	Eb0300002 Eb0300001	M 1	Pump type L with pump motor 0.22kW Pump type L with pump motor 0.22kW	200 – 230V 50/60Hz 380 – 415V 50Hz 380 – 480V 60Hz
15	Gk0701802	Q 1	Main switch 40A	without locking
16	Gm0100801 Gm0100701 Gm0100901	R 1	Heating 3000 Watt Heating 3000 Watt Heating 3000 Watt	3 x 380 – 415V 50Hz 3 x 200 – 230V 50/60Hz 3 x 440 – 480V 60Hz
17	Gk0300704	S 1 / H 1	Switch "ON-OFF" unit	

18	Gk0300704	S 2 / H 2	Switch "ON-OFF" green	Heating
19	Gc0100610	T 1	Transformer 70VA	380 – 415V 50Hz
20	Df0200000 Df0200930 Df0200600	Y 1	Solenoid valve 3/8“ Repair kit for solenoid valve 3/8“ Trip coil 230V 50/60Hz	water cooling Composed of: membrane, spring, plug Ø 12 mm
21	Df0200110 Df0200920 Df0200600	Y 3	Solenoid valve 1/4“ (18bar) Repair kit for solenoid valve 1/4“ (18bar) Trip coil 230V 50/60Hz	Auto. filling Composed of: spring and plug Ø 12 mm
22	De0100400		Water filter 3/8“, with mesh bottom	cooling water inlet
23	Wd0100007		Float	Complete with rod and 4 set collars
24	Ca2000502		Screw cap refill pipe 1“	
25	De0300205		Drain angle 90°	for tank drain
26	Wc0100003		Heat exchanger	
27	Db0500200		Seal for tank cover	length 900 mm
28	Dc0100000		Steering rollers Ø 50 mm	central fixing
29	Bb0300004		Screw fastener-Set for case	consisting of: bayonet screwing and cage
30	Bb0300101		Turning lock with snap closure	electrical cabinet door
31	Wf0100062		Insulation set	

	Deutsch	Englisch	Französisch	Italienisch
B 1	Thermoelement intern	internal thermocouple	thermocouple interne	termocoppia interna
F 1	Thermorelais Pumpe 1	overload relay pump 1	relais thermique pompe 1	interruttore a soccorritore termico pompa 1
F 7	Feinsicherung 1A primär T1	fuse 1A prim. T1	fusible verre 1A prim. T1	fusibile fino 1A primario T1
F7/1	Leitungsschutzschalter 2A	automatic cut-off 2A	disjoncteur 2A	interruttore 2A
F 8	Feinsicherung 1A sekundär T1	fuse 1A sec. T1	fusible verre 1A sec. T1	fusibile fino 1A secondario T1
F 10	einstellbarer Sicherheitsthermostat	safety thermostat adjustable	thermostat de sécurité ajustable	termostato di sicurezza regolabile
F 15	Niveaukontrolle (Gerät aus)	level control (unit off)	contrôle de niveau (appareil arrêt)	controllo livello (spegne centralina)
F 15/2	Niveaukontrolle (auto.Auffüllung)	level control (automatic filling)	contrôle de niveau (remplissage automatique)	controllo livello (riempimento automatico)
H 1	Lampe Gerät EIN/AUS	unit ON/OFF lamp	lampe MARCHE/ARRET	lampada centralina ACCESO/SPENTO
H 2	Lampe Heizung 1	heater 1 lamp	lampe chauffage 1	lampada riscaldamento 1
H 4/1	Lampe Niveaukontrolle (Gerät aus)	level control lamp (unit off)	lampe contrôle du niveau (appareil arrêt)	lampada controllo livello (centralina spento)
H 4/2	Lampe Niveaukontrolle (auto. Auffüllung)	level control lamp (automatic filling)	lampe contrôle du niveau (remplissage automatique)	lampada controllo livello (riempimento automatico)
H 6	Lampe Motorschutzrelais	overload relay lamp	lampe relais thermique	lampada termocoppia motore
H 7	Lampe Sicherheitsthermostat	safety thermostat lamp	lampe thermostat de sécurité	lampada termostato di sicurezza
K 1	Schütz Pumpenmotor 1 (Hauptschütz)	contactor pump motor 1 (main contactor)	contacteur moteur pompe 1 (relais générale)	relais motore pompa 1 (relais generale)
K 3	Schütz Heizung 1	contactor heater 1	contacteur chauffage 1	relais riscaldamento 1
M 1	Motor Pumpe 1	motor pump 1	moteur pompe 1	motore pompa 1
N 1	Temperaturregler	electronic temperature controller	régulateur électronique de température	regolatore temperatura
Q 1	Hauptschalter	main switch	interrupteur générale	interruttore generale
R 1	Heizung 1	heater 1	chauffage 1	riscaldamento 1
S 1	Schalter Gerät "EIN-AUS"	switch unit "on/off"	interrupteur appareil "marche/arrêt"	interruttore centralina "acceso/spento"
S 2	Schalter Heizung 1	switch for heater 1	interrupteur chauffage 1	interruttore riscaldamento 1
T 1	Trafo Steuerung	transformer for electric control	transformateur de commande	trasformatore di comando
Y 1	Magnetventil Wasserkühlung	solenoid valve for water cooling	électrovanne eau de refroidissement	valvola magnetica raffreddamento acqua
Y 3	Magnetventil Auffüllung	solenoid valve for automatic filling	électrovanne remplissage automatique	valvola magnetica riempimento automatico

Date	Prepared	Approved
21.12.20	A.Bieri	22.12.2020

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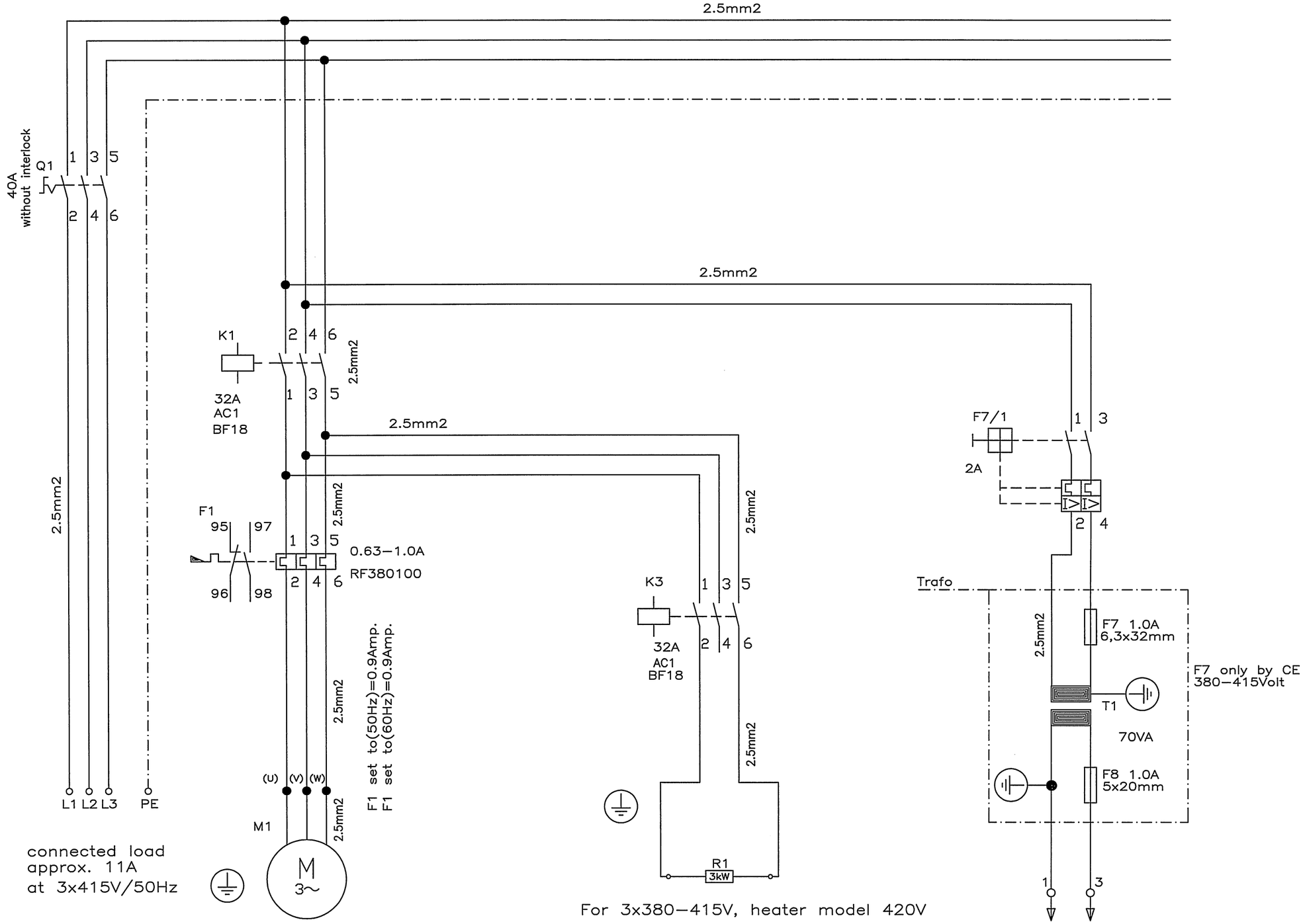
Legend

VERSION 1

EL-1709
3x380-415V/50Hz
3x440-480V/60Hz;3x380V/60Hz
3x200-230V/50Hz
3x200-240V/60Hz

TT-170 L
MP-888
3kW

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connected load
approx. 11A
at 3x415V/50Hz

For 3x380–415V, heater model 420V
For 3x440–480V, heater model 480V

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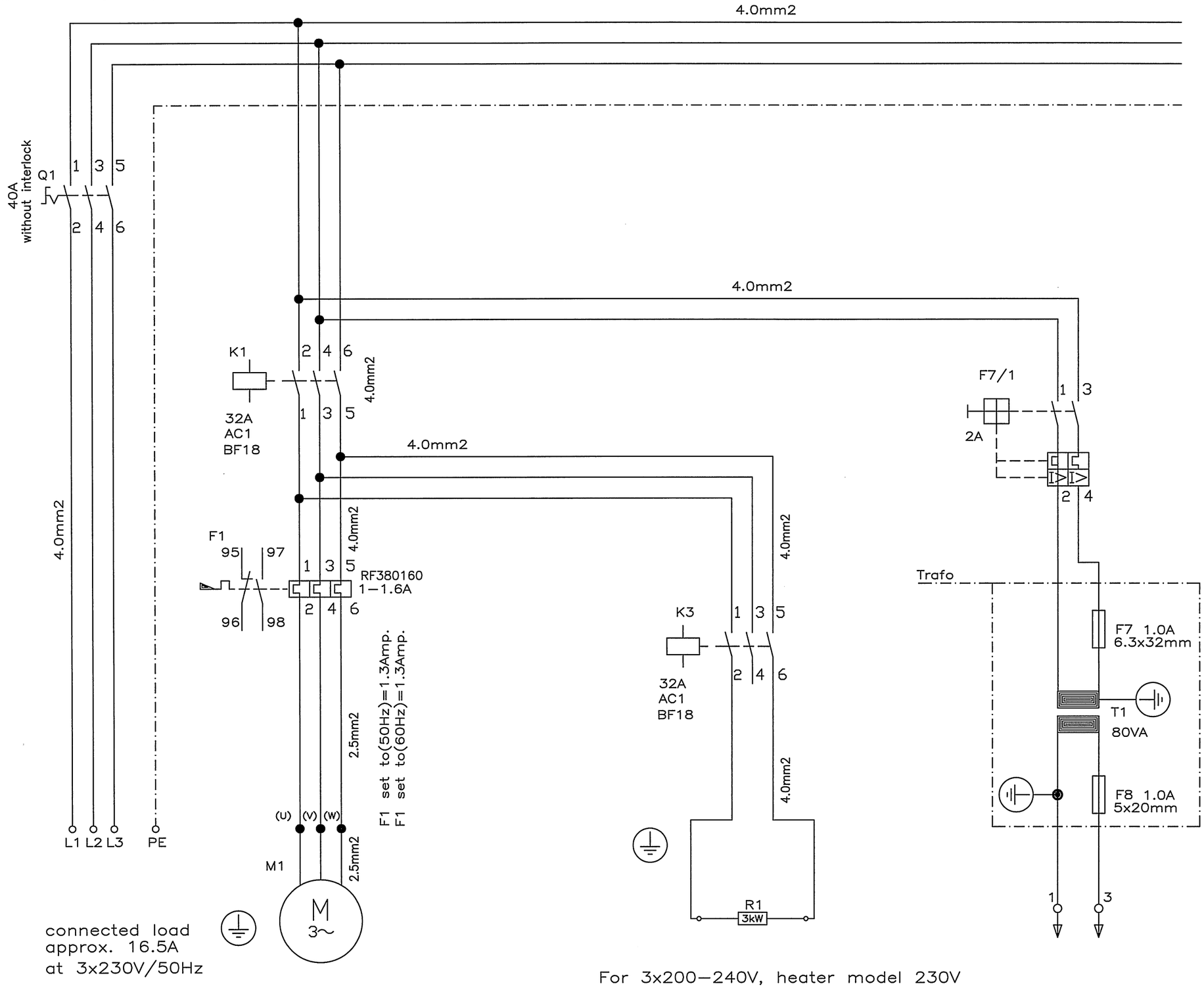
Wiring diagram

VERSION
1

EL–1709
3x380–415V/50Hz
3x440–480V/60Hz
3x380/60Hz

TT–170 L
MP–888
3kW

Page	
No.	Total
2	4



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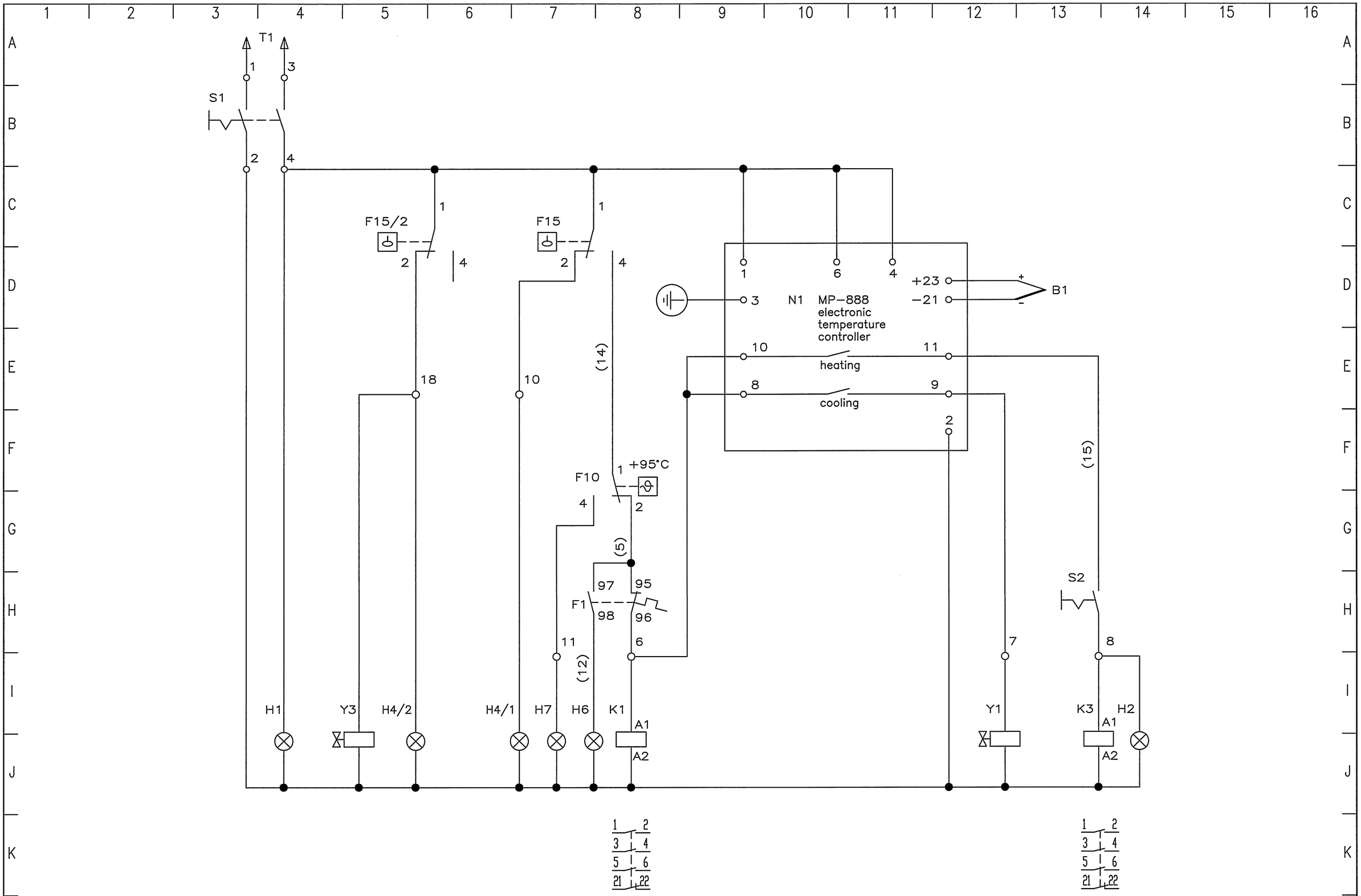
Wiring diagram

VERSION
1

EL–1709
3x200–230V/50Hz
3x200–240V/60Hz

TT–170 L
MP–888
3kW

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No.	Total
3	4



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Control

VERSION
1

EL–1709
3x380–415V/50Hz
3x440–480V/60Hz;3x380V/60Hz
3x200–230V/50Hz
3x200–240V/60Hz

TT–170 L
MP–888
3kW

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