

OPERATING INSTRUCTION MANUAL

WATER RECOOLER

AKW 3000/S

Brief operating instructions A U T O T H E R M temperature controller See operating instruction manual and safety instructions	
Commissioning:	
Local operating	Remote operating
1.	Turn on the three main switches
2.	Operating switch
	Position "ON" Position "AUTO"
3.	Set temperature on controller
	The external set point input and start/stop-order are given via profibus from the superior control
Operating and error signals:	
Start	Unit ready for operation, no water flow in the circuit
Operating	Pumps running, all motor protection switches OK
Shutdown	Unit is shutting down, unit is switched off by operation switch or via profibus from the superior control
Error light:	<ul style="list-style-type: none"> - water flow monitor has tripped - refrigerant pressure monitor has tripped - motor protection switches have tripped - see also chapter troubleshooting
Shutting down:	
Local operating	Remote operating
1.	Operating switch on position "Off"
	The temperature controller is switched off via profibus from the superior control
Unit shutdown	
Turn off the three main switches	
The safety equipment has been set at the factory and should not be adjusted or disabled.	

Unit No.: 08 627

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Enclosure: Description temperature controller KS90-1
Controller configuration
Description temperature controller
ST710-PNUVR.102
Controller configuration
Description digital thermostat ecoTRON T
Controller configuration

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2. OPERATING CONDITIONS

2.1 Technical data AKW 3000/S:

Cooling capacity by 35°C cooling water temperature, 36 m ³ /h cooling water and 15°C feed temperature: 303 kW			
Controlled cooling water outlet temperature 45°C			
Electrical data:			
<u>Load current circuit 1</u>			
Rated voltage:	3/PE AC 50Hz	400V	
Rated power output:		51	kW
Rated current:		89	A
Max. Operating current:		119,5	A
Fuse on supply cable: max.		C125	A
<u>Load current circuit 2</u>			
Rated voltage:	3/PE AC 50Hz	400V	
Rated power output:		53	kW
Rated current:		94	A
Max. Operating current:		120,5	A
Fuse on supply cable: max.		C125	A
<u>control current circuit</u>			
Rated voltage:	1/PE AC 50Hz	230V	
Rated power output:		250	W
Rated current:		1	A
Fuse on supply cable: max.		C10	A
Mechanical data:			
Dimensions:	Width:	5000	mm
	Depth:	1400	mm
	Height:	1850	mm
Weight:		3000	kg
Feed:		R 2 1/2"	IG
Return:		R 2 1/2"	IG
Water inlet/water outlet (Cooling water circuit):		R 3"	IG
Filling:	manual		
Pressurised air:		R ¼"	IG
Water circuit:			
Heat carrier:	demineralised water		
Forward pressure: max.		5,9	bar
Tank volume:		980	l
Temperature range:		+5...+26	°C
Evaporator circuit:	(internal Water circuit)		
Pump type:	2 x CRN10-3		
Delivery head: max.		2,9	bar
Delivery rate: max.		29	m ³ /h

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Consumer circuit:	(external Water circuit)		
Pump type:	CRN20-4		
Delivery head:	max.	5,9	bar
Delivery rate:	max.	29	m ³ /h
Cooling circuit:			
Refrigeration:	R407c		
Filling capacity:		4 x 14	kg
Pressure:	max.	28	bar
Circuit diagram number:	2.027 3000.00	dated 14 February	2008
Media diagram number:	1.027.88	dated 01 December	2007

2.2 Notes:

The unit has, also by transporting, to be protected by ambient freezing, if the water circuit is not empty.

The safety equipment is set at the factory and must not be adjusted.

2.3 Notes:

When installing and operating the unit the relevant and local regulations are to be observed, e.g. Accident Prevention Regulations VBG 20, TAB of the Electricity Supply Companies, VDE 0100, VDE 0113.

The unit is designed for recooling using demineralised water as the medium in sealed water circuits for industrial use.

The water recoler uses HFKW as its refrigerant, the refrigeration circuit must not be opened. Work on the refrigeration circuit may only be carried out by specialists.

The unit works with an open water tank. For consumers which allow the water to flow backwards when the water recoler is switched off, suitable measures must be taken to prevent the tank overflowing (installing the tank at a higher level or installing a return flow block in the feed line and a solenoid valve in the return line).

The water recoler in its standard version is designed for installation in a frost-free environment. If a water recoler is to be installed in the open air, the water circuit is to be protected from freezing and the compressor is to be fitted with a crank tank heating system.

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Water coolers of type AKL dissipate the heat extracted from the water circuit to the ambient air via a condenser. Water coolers of type AKW dissipate the heat to a cooling water circuit.

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3. COMMISSIONING

3.1 Electrical connection:

When making the electrical connection, the local regulations, the details of the model plate and the circuit diagram are to be observed. The unit is to be connected to a three-phase current with a clockwise phase sequence (direction of rotation of the pump). The pump should not be allowed to run dry. If a clockwise phase sequence cannot be guaranteed, the direction of rotation of the pump is to be checked. Pressing the compressor contactor by hand may damage the unit.

3.2 Water connection (Cooling water circuit):

Connect the cooling water inlet to the supply and the cooling water outlet to the return of the site cooling water system. Open the globe valves.

3.3 Water connection (Consumer circuit):

To achieve good venting in the system, the feed is to be connected to the lowest point and the return to the highest point of the consumer. The connections from the unit to the consumer, as well as the consumer and the seals, must be heat-resistant, pressure-resistant and sealed. For consumers with ventilation equipment it should be ensured that when the unit is switched off the tank does not overflow. For consumers with shut-off or control valves which may be closed during operation, an overflow valve should be fitted at the end of the supply line, to ensure that water circulates in the evaporator and thus, even when the consumer is shut off, a constant water temperature can be ensured in the tank. If several consumer circuits are supplied by a single water re cooler, they should be connected in parallel to keep the temperature difference on the consumer low.

3.4 Fill the unit with water:

The unit's water tank is to be filled with clean water. The water level in the tank is to be checked at regular intervals and more added if necessary. Open the shut-off valves in the feed and return lines.

3.5 Note:

If the unit has been subjected to low ambient temperatures for some time (storage or transport), the unit should not be switched on immediately (oil in the unit).

3.6 Commissioning:

	Local operating	Remote operating
1.	Turn on the three main switches	
2.	Operating switch	
	Position "ON"	Position "AUTO"
3.	Set temperature on controller	The external set point input and start/stop-order are given via profibus from the superior control

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4. OPERATING AND SWITCHING OFF

4.1 Operating:

Whilst the unit is operating all pumps will be running and the operating light will be lit. If the return temperature set on the temperature controller is exceeded, the refrigeration valve will be opened. After the pressure compensated in the cooling circuit, the compressor will cut in. When the temperature falls below the set level, the refrigeration valve will be closed. After the refrigeration is pumped down (oil return circuit), the compressor will be switched off, too.

4.2 Switching off:

Switching off	
Local operating	Remote operating
1.	Operating switch on position "OFF" The temperature controller is switched off via profibus from the superior control
Unit shutdown	
Turn off the three main switches	

4.3 EMERGENCY STOP switch

The system may be switched off using the EMERGENCY STOP switch at any time.

5. MAINTENANCE

5.1 Check water level:

The water level in the tank is to be checked at regular intervals and more water added if and when necessary. If large quantities of water are lost, the unit (tank, pipe connections and the slide ring seal on the pumps), and the consumers are to be checked for leaks. If there is too little water in the circulation, the machine will be shut down by the flow monitor and the error light lit.

5.2 Check water condition:

If the water is very dirty the cooling capacity of the unit will fall. Drain the dirty water through the drain connection on the tank, rinse out the tank with water and then fill the tank with clean water. Switch on the pump to rinse the evaporator and the system, and then change the water again after allowing the system to run for a brief period.

As a rule it is not necessary to clean the system with chemical solutions as a result of the low quantity of water circulating inside it. If, however, the system must be cleaned with chemical solutions, they must be neutral with the following materials:

-Stainless steel-, -Copper-, -Brass-, -Chromium

After using the solvents, the cleaned systems are to be neutralized immediately.

5.3 Pump:

The pumps are sealed with a slide ring seal. In the event of leaks, the slide ring seal or the pump is to be changed. The pump motor is to be cleaned if it becomes dirty.

5.4 Cooling water circuit:

A dirty condenser surface will reduce the efficiency of the unit, if it is very dirty the unit will be shut off by the high pressure controller.

5.5 Note:

Before working on the unit, turn off the three main switches (Load current circuit 1, Load current circuit 2, control current circuit) and secure it to prevent its being turned on again. To clean the condenser it is to be rinsed with a chemical solution which must be neutral to the following materials.

-Stainless steel-, -Copper-, -Brass

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6. TROUBLESHOOTING

6.1 Before carrying out any work on the unit:

The electric cable ((Load current circuit 1, Load current circuit 2, control current circuit) must be disconnected from the mains supply.

The safety organs are set at the factory and must not be reset.

6.2 Troubleshooting guide:

Display:	Possible cause:	Remedy:
All displays off	No mains supply	Check all the wires on the mains cable, check main switch, check matching transformer
	Control transformer fuse has been tripped	Check short circuit, over-charge and isolation damage in control circuit and control transformer. Eliminate fault and switch on control transformer fuse
	Control fuse has been tripped	Check short circuit, over-charge and isolation damage in control circuit
Error light water flow 1 lit	No flow in the evaporator circuit 1	Rinse pumps, evaporator and system with water, see also 5.2 If necessary clean rotors on the pumps
	Flow monitor 1 defective or maladjusted	Check flow monitor and adjust it or replace it

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Error light water flow 2 lit	No flow in the evaporator circuit 2	Rinse pumps, evaporator and system with water, see also 5.2 If necessary clean rotors on the pumps
	Flow monitor 2 defective or maladjusted	Check flow monitor and adjust it or replace it
Error light low pressure 1 lit	Water flow in the evaporator 1 too low, refrigerant safety pressure monitor low pressure has been tripped	Rinse evaporator circuit, check pumps, see also 5.2
	Insufficient coolant or system error, refrigerant safety pressure monitor 1 low pressure has been tripped	Have the refrigeration circuit checked by a specialist
Error light high pressure 1 lit	Refrigerant safety pressure monitor high pressure 1 has been tripped	Condenser dirty, see also 5.4
		The maximum admissible water temperature of +26°C has been exceeded, drain the water and fill the system with cold water or add cold water
		Have the refrigeration circuit checked by a specialist

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Display:	Possible cause:	Remedy:
<p>Error light low pressure 2 lit</p>	<p>Water flow in the evaporator 2 too low, refrigerant safety pressure monitor low pressure 2 has been tripped</p> <hr/> <p>Insufficient coolant or system error, refrigerant safety pressure monitor 2 low pressure has been tripped</p>	<p>Rinse evaporator circuit, check pumps, see also 5.2</p> <hr/> <p>Have the refrigeration circuit checked by a specialist</p>
<p>Error light high pressure 2 lit</p>	<p>Refrigerant safety pressure monitor high pressure 2 has been tripped</p>	<p>Condenser dirty, see also 5.4</p> <hr/> <p>The maximum admissible water temperature of +26°C has been exceeded, drain the water and fill the system with cold water or add cold water</p> <hr/> <p>Have the refrigeration circuit checked by a specialist</p>

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Display:	Possible cause:	Remedy:
Error light low pressure 3 lit	<p>Water flow in the evaporator 3 too low, refrigerant safety pressure monitor low pressure 3 has been tripped</p> <hr/> <p>Insufficient coolant or system error, refrigerant safety pressure monitor 3 low pressure has been tripped</p>	<p>Rinse evaporator circuit, check pumps, see also 5.2</p> <hr/> <p>Have the refrigeration circuit checked by a specialist</p>
Error light high pressure 3 lit	Refrigerant safety pressure monitor high pressure 3 has been tripped	<p>Condenser dirty, see also 5.4</p> <hr/> <p>The maximum admissible water temperature of +26°C has been exceeded, drain the water and fill the system with cold water or add cold water</p> <hr/> <p>Have the refrigeration circuit checked by a specialist</p>

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Display:	Possible cause:	Remedy:
Error light low pressure 4 lit	<p>Water flow in the evaporator 4 too low, refrigerant safety pressure monitor low pressure 4 has been tripped</p> <hr/> <p>Insufficient coolant or system error, refrigerant safety pressure monitor 4 low pressure has been tripped</p>	<p>Rinse evaporator circuit, check pumps, see also 5.2</p> <hr/> <p>Have the refrigeration circuit checked by a specialist</p>
Error light high pressure 4 lit	<p>Refrigerant safety pressure monitor high pressure 4 has been tripped</p>	<p>Condenser dirty, see also 5.4</p> <hr/> <p>The maximum admissible water temperature of +26°C has been exceeded, drain the water and fill the system with cold water or add cold water</p> <hr/> <p>Have the refrigeration circuit checked by a specialist</p>
Error light alarm water level lit	<p>The water level in the tank is below the admissible level</p>	<p>Check tank and system for leaks. Eliminate fault and refill until alarm light water level comes off</p>

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Display:	Possible cause:	Remedy:
Error light fault water level lit	The water level in the tank is too small. The unit cannot start	Check tank and system for leaks. Eliminate fault and refill until alarm light water level comes off
Error light motor protection switch / motor protection compressor lit (MSS/MVS)	The motor protection switch for the evaporator pumps, consumer pump, compressor or motor protection compressor has been tripped	Eliminate the fault on the motor, motor cable or pump. The tripped motor protection switch must be reset manually, the tripped motor protection compressor resets automatically after a while

6.3 Note:

If safety equipment, such as fuses and motors protection switches, monitors, limiter and limits for flow, pressure, temperature and filling level, overcurrent and short circuit protection equipment, safety valves or pressure seals are tripped, the cause is to be located and remedied and the system is then to be checked to ensure it is working properly.

Only have faults eliminated by specialists. When troubleshooting always use the circuit diagram and media diagram.

In the event of any inquiries or order for spare parts, also quote the model and unit number.

These details are shown on the model plate.

7. SAFETY INSTRUCTIONS

Instrument safety:

This instrument was built and tested according to VDE 0100 and VDE 0113/EN 60 204 and was shipped in safe condition.

In order to maintain this condition and to ensure safe operation, the user must follow the hints and warnings given in these safety notes.

The instrument must be operated only by trained persons. Maintenance and repair should be carried out only by trained, qualified personnel familiar with the relevant hazards.

Unpacking the instrument:

Remove instrument and accessories from the packing. Enclosed standard accessories: Operating notes or operating instructions for the instruments.

Check, if the shipment is correct and complete and if the instrument was damaged by improper handling during transport and storage.

If the instrument is so heavily damaged that safe operation seems impossible, the instrument must not be taken into operation.

We recommend to keep the original packing for shipment in case of maintenance or repair.

Mounting:

The instruments may be mounted only inside closed rooms or outside the explosion-hazard area.

Electrical connection:

The electrical connection must conform to local standards and to the wiring diagram. It should be done only by qualified persons. Pay attention to the external assurance. Output leads must be kept separate from signal and main leads.

Commissioning:

Before instrument switch-on, ensure that the rules given below were followed:

- The supply voltage corresponds to the specification on the type label.
- All covers required for contact safety are fitted.
- The effects in case of connection with other instruments.
- Media connections are mounted and open.
- Covers are mounted.

Operation:

If the instrument is damaged to an extent that the safe operation seems impossible, shut it down and protect it against accidental operation.

Troubleshooting:

Before checking the instrument, all possibilities of error in connections should be checked.

When working at the instrument, pay attention to the relevant regulations.

Shut-Down:

For permanent shut-down, disconnect the instrument from all voltage. The media connections must be ensured, an accidental operation must be shut out.

Before instrument switch-off, check that other equipment and/or facilities connected in the same signal loop is/are not affected. If necessary, appropriate measures must be taken.

Maintenance, Repair and Modification:

When opening the instruments or equipment, or when removing covers and components, live parts or terminals can be exposed. Pay attention, that the protection against temperature, vapour, pressure and moved components is abolished when removing covers or opening the system.

Before carrying out such work, the instruments must be disconnected from all voltage sources. The system must possibly be cooled and made pressureless.

After completing such work, re-shut the instrument and re-fit all covers and components. Check, if the specification on the type label are still correct, and change them, if necessary.

Modifications, maintenance and repair may be carried out only by trained authorised persons.

If a trouble was found to be due to a blown fuse, the cause must be determined and removed. For replacement, only fuses of the same type and current rating as the original fuse must be used.

Using repaired fuses, or short-circuiting the fuse socket is inadmissible.

Explosion protection:

As this instrument is not intrinsically safe, it must not be operated in explosion-hazarded areas. Moreover, the circuits from and to the instrument must not be taken into explosion-hazarded areas. No particular regulations for the intrinsically safe area are applicable.

!!! W A R N I N G !!!

Commissioning and maintenance, by qualified personnel only.
Follow the safety instructions

Disconnect power before proceeding with any work on this equipment!

During operation of the electrical switchgear:

- hazardous voltages are present on specific parts and can cause electrical shock and burns
- hot and ionised arc gas can escape, especially during short circuit
- protection covers and arc chambers must not be removed
- do not operate contactors by pushing the position indicator while device is under voltage.

Non-observance of this warning can result in death, severe personal injury or substantial property damage.

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8. P R Ü F B L A T T Kom.- Nr.: 08 627

8.1 Prüfung der elektrischen Ausrüstung
nach EN 60 204-1:1992 / VDE 0113 Teil 1

8.1.1.a Sichtprüfung des Schutzleitersystems
nach Abs. 8 und 20.2

Ausführung und Kennzeichnung

8.1.1.b Kontrolle auf festen Anschluß
der Schutzleiter nach Abs. 20.2

8.1.1.c Prüfung des Schutzleitersystems
nach Abs. 20.2 $\Delta U \leq 1 \text{ V}$
I = 10A, t \geq 10s, f = 50Hz

8.1.2 Isolationsprüfung der Leistungskreise
nach Abs. 20.3 $R_{iso} > 1 \text{ M}\Omega$
U = 500V DC

8.1.3 Spannungsprüfung nach Abs. 20.4
 $P_s = 500 \text{ VA}$, U = 1000V, t \geq 1s

8.1.4 Schutz gegen Restspannung
nach Abs. 20.5 und Abs. 6.2.3
Bei C > 60 μ F \rightarrow U in 5s \leq 60V

8.1.5 Sichtprüfung auf elektromagnetische
Verträglichkeit nach Abs. 20.6
Verdrahtung, Abschirmung, Schutzbeschaltungen, Kennzeichnung

8.1.6 Funktionsprüfung nach Abs. 20.7
Haupt- u. Not-Aus-Schalter, Schutzschalter, Begrenzer, Drehfeld...

8.2 Mechanische Prüfungen

8.2.1 Funktionsprüfung bestanden

8.2.2 Sicherheitsprüfung bestanden

8.3 Schalldruckpegel
Nach DIN 45 635 Teil 1 $\leq 70 \text{ dB(A)}$
 $> 70 \text{ dB(A)}$ dB(A)

Elektrische Prüfungen durchgeführt:

Mechanische Prüfungen durchgeführt:

Für die Richtigkeit:..... Stempel

Bad Königshofen, den:.....

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9. P A R T S L I S T M E C H A N I C A L

for media diagram no. 1.027.88

Piece	Description	Manufacturer no.
0060	Stainless steel tank	AUTOTHERM, 980 l V4A
0061	Temperature sensor Pt100	Rosemount Widerstandsthermometer Pt100, Kl. B1, 0065 L2 1 Z 0065 Y 0050 G20 XA V11
0064	Level monitor pump protection	Kübler, ERV3/8-VS-L100/12-VE44A- 1sil./Schu
0065	Level monitor water level	Kübler, ERV3/8-VS-L270/12-VE44A- 2Sil./Schu
0068	Globe valve DN80	Amri Boax-S DN80
0069	Dirt trap	6312011
0070	Consumer pump	Grundfos, CRN20-4 96802241
0071	Globe valve DN65	Amri Boax-S DN65
0072	Nonreturn valve	Gestra RK86 A DN65 PN6-40
0073	Globe valve DN65	Amri Boax-S DN50
0080	Forward DN65	Schwer, DN65 101214-7 1.4571
0081	Return DN65	Schwer, DN65 101214-7 1.4571
0082	Overflow valve	Leser, external
0083	Cooling water inlet DN80	Schwer, DN80 1013-7 1.4571
0084	Cooling water outlet DN80	Schwer, DN80 1013-7 1.4571
0085	Pressurised air inlet DN8	Schwer, DN8 10114-7 1.4571
0086	Globe valve DN15	Schwer, 360G12-5i 1.4408
0087	Globe valve 6mm	3803728
0088	Thermometer	Ashcroft, 0 - 120°C 100=S5500=8=100=2000=R=0/120=C=FX
0089	Globe valve DN15	Schwer, 360G12-5i 1.4408
0090	Thermometer	Ashcroft, 0 - 60°C 100=S5500=8=100=2000=R=0/60=C=FX
0091	Globe valve	3803728
0092	Globe valve	3803728
0095	Globe valve DN15	Schwer, 360G12-5i 1.4408
0096	Overflow	Schwer, DN40 101112-7 1.4571
0097	Globe valve DN10	Schwer, 360G38 -5i 1.4408
0098	Manometer	Ashcroft, 0 - 10 bar 100=T5500=S=D=15=0/10bar=FX=LL
0099	Thermometer	Ashcroft, 0 - 60°C 100=S5500=8=100=2000=R=0/60=C=FX
1010	Scroll-Compressor	Copeland, ZR380KCE-TWD

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1020	Stainless steel plate condenser	Alfa Laval, AlfaNovaHP 76-80H
1030	Stainless steel plate evaporator	Alfa Laval, AlfaNova 76-40H
1040	Expansion valve	Alco, TJRE-17NW bestehend aus: Winkelflansch 10331 Ventilkopf XB1019NW-1B Düse X11873-B5B
1045	Control valve	Metso, 6BJ71, 7ND91H70
1050	Collector	Bitzer, F152H
1051	Filter	Alco, ADK 307s
1052	Solenoid valve „Pump down“	Danfoss EVR20; 32F224331
1053	Sight glass	Alco, AMI-1 TT7
1054	Pressure monitor low pressure	Alco, PS3AF1-HNS1/2,5
1055	Low pressure switch „Pump down“	Alco, PS3-AF1-HNS2,7/4,2
1056	Pressure monitor high pressure	Alco, PS3-W5S21/28
1057	Low pressure manometer	Wika, 2033.049.007
1058	High pressure manometer	Wika, 2033.851.007
1059	Pressure switch high pressure	Alco, PS3-W5S21/28
1062	Temperature sensor Pt100	Rosemount Widerstandsthermometer Pt100, Kl. B1, 0065 L2 1 Z 0065 Y 0050 G20 XA
1091	Globe valve DN32	Schwer, 360G114-5i 1.4408
1092	Globe valve DN32	Schwer, 360G114-5i 1.4408
1102	Temperature sensor Pt100	Rosemount Widerstandsthermometer Pt100, Kl. B1, 0065 L2 1 Z 0065 Y 0050 G20 XA V11
1115	Globe valve DN15	Schwer, 360G12-5i 1.4408
1116	Solenoid valve DN15	8273200.91.230.50
2010	Scroll-Compressor	Copeland, ZR380KCE-TWD
2020	Stainless steel plate condenser	Alfa Laval, AlfaNovaHP 76-80H
2030	Stainless steel plate evaporator	Alfa Laval, AlfaNova 76-40H

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2040	Expansion valve	Alco, TJRE-17NW bestehend aus: Winkelflansch 10331 Ventilkopf XB1019NW-1B Düse X11873-B5B
2045	Control valve	Metso, 6BJ71, 7ND91H70
2050	Collector	Bitzer, F152H
2051	Filter	Alco, ADK 307s
2052	Solenoid valve „Pump down“	Danfoss EVR20; 32E224331
2053	Sight glass	Alco, AMI-1 TT7
2054	Pressure monitor low pressure	Alco, PS3AF1-HNS1/2,5
2055	Low pressure switch „Pump down“	Alco, PS3-AF1-HNS2,7/4,2
2056	Pressure monitor high pressure	Alco, PS3-W5S21/28
2057	Low pressure manometer	Wika, 2033.049.007
2058	High pressure manometer	Wika, 2033.851.007
2059	Pressure switch high pressure	Alco, PS3-W5S21/28
2062	Temperature sensor Pt100	Rosemount Widerstandsthermometer Pt100, Kl. B1, 0065 L2 1 Z 0065 Y 0050 G20 XA
2091	Globe valve DN32	Schwer, 360G114-5i 1.4408
2092	Globe valve DN32	Schwer, 360G114-5i 1.4408
2102	Temperature sensor Pt100	Rosemount Widerstandsthermometer Pt100, Kl. B1, 0065 L2 1 Z 0065 Y 0050 G20 XA
2115	Globe valve DN15	Schwer, 360G12-5i 1.4408
2116	Solenoid valve DN15	8273200.91.230.50
3010	Scroll-Compressor	Copeland, ZR380KCE-TWD
3020	Stainless steel plate condenser	Alfa Laval, AlfaNovaHP 76-80H
3030	Stainless steel plate evaporator	Alfa Laval, AlfaNova 76-40H

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3040	Expansion valve	Alco, TJRE-17NW bestehend aus: Winkelanschluss 10331 Ventilkopf XB1019NW-1B Düse X11873-B5B
3045	Control valve	Metso, 6BJ71, 7ND91H70
3050	Collector	Bitzer, F152H
3051	Filter	Alco, ADK 307s
3052	Solenoid valve „Pump down“	Danfoss EVR20; 32E224331
3053	Sight glass	Alco, AMI-1 TT7
3054	Pressure monitor low pressure	Alco, PS3AF1-HNS1/2,5
3055	Low pressure switch „Pump down“	Alco, PS3-AF1-HNS2,7/4,2
3056	Pressure monitor high pressure	Alco, PS3-W5S21/28
3057	Low pressure manometer	Wika, 2033.049.007
3058	High pressure manometer	Wika, 2033.851.007
3059	Pressure switch high pressure	Alco, PS3-W5S21/28
3062	Temperature sensor Pt100	Rosemount Widerstandsthermometer Pt100, Kl. B1, 0065 L2 1 Z 0065 Y 0050 G20 XA
3091	Globe valve DN32	Schwer, 360G114-5i 1.4408
3092	Globe valve DN32	Schwer, 360G114-5i 1.4408
3102	Temperature sensor Pt100	Rosemount Widerstandsthermometer Pt100, Kl. B1, 0065 L2 1 Z 0065 Y 0050 G20 XA
3115	Globe valve DN15	Schwer, 360G12-5i 1.4408
3116	Solenoid valve DN15	8273200.91.230.50
4010	Scroll-Compressor	Copeland, ZR310KCE-TWD
3020	Stainless steel plate condenser	Alfa Laval, AlfaNovaHP 76-60H
3030	Stainless steel plate evaporator	Alfa Laval, AlfaNova 76-30H
4040	Expansion valve	Alco, TJRE-17NW bestehend aus: Winkelanschluss 10331 Ventilkopf XB1019NW-1B Düse X11873-B5B
4045	Control valve	Metso, 6BJ71, 7ND91H70
4050	Collector	Bitzer, F152H
4051	Filter	Alco, ADK 307s

A U T O T H E R M - W A T E R R E C O O L E R

4052	Solenoid valve „Pump down“	Danfoss EVR20; 32F224331
4053	Sight glass	Alco, AMI-1 TT7
4054	Pressure monitor low pressure	Alco, PS3AF1-HNS1/2,5
4055	Low pressure switch „Pump down“	Alco, PS3-AF1-HNS2,7/4,2
4056	Pressure monitor high pressure	Alco, PS3-W5S21/28
4057	Low pressure manometer	Wika, 2033.049.007
4058	High pressure manometer	Wika, 2033.851.007
4059	Pressure switch high pressure	Alco, PS3-W5S21/28
4062	Temperature sensor Pt100	Rosemount Widerstandsthermometer Pt100, Kl. B1, 0065 L2 1 Z 0065 Y 0050 G20 XA
4091	Globe valve DN32	Schwer, 360G114-5i 1.4408
4092	Globe valve DN32	Schwer, 360G114-5i 1.4408
4102	Temperature sensor Pt100	Rosemount Widerstandsthermometer Pt100, Kl. B1, 0065 L2 1 Z 0065 Y 0050 G20 XA
4115	Globe valve DN15	Schwer, 360G12-5i 1.4408
4116	Solenoid valve DN15	8273200.91.230.50
5063	Flow monitor	DB-Industrietechnik, SW2 1" 1.4401 AUTOTHERM, Padel V4A
5078	Globe valve DN80	Amri Boax-S DN80
5079	Dirt trap	6312011
5080	Evaporator pump	Grundfos CRN20-2; 96778712
5081	Globe valve DN65	Amri Boax-S DN65
5111	Manometer	Ashcroft, 0 - 2,5 bar 100=T5500=S=D=15=0/2,5bar=FX=LL
5112	Globe valve DN10	Schwer, 360G38-5i 1.4408
6063	Flow monitor	DB-Industrietechnik, SW2 1" 1.4401 AUTOTHERM, Padel V4A
6078	Globe valve DN80	Amri Boax-S DN80
6079	Dirt trap	6312011
6080	Evaporator pump	Grundfos CRN20-2; 96778712
6081	Globe valve DN65	Amri Boax-S DN65
6111	Manometer	Ashcroft, 0 - 2,5 bar 100=T5500=S=D=15=0/2,5bar=FX=LL
6112	Globe valve DN10	Schwer, 360G38-5i 1.4408

In case of spare parts order or inquiry please always indicate the type and the serial number of the unit.

A U T O T H E R M - W A T E R R E C O O L E R

10. PARTS LIST ELECTRICAL

for circuit diagram no. 2.027 3000.00

Piece	Description	Manufacturer no.
B11	Temperature sensor PT100	Rosemount Widerstandsthermometer Pt100, Kl. B1, 0065 L2 1 Z 0065 Y 0050 G20 XA V11
B12	Temperature sensor PT100	Rosemount Widerstandsthermometer Pt100, Kl. B1, 0065 L2 1 Z 0065 Y 0050 G20 XA
B13	Temperature sensor PT100	Rosemount Widerstandsthermometer Pt100, Kl. B1, 0065 L2 1 Z 0065 Y 0050 G20 XA
B14	Temperature sensor PT100	Rosemount Widerstandsthermometer Pt100, Kl. B1, 0065 L2 1 Z 0065 Y 0050 G20 XA
B15	Temperature sensor PT100	Rosemount Widerstandsthermometer Pt100, Kl. B1, 0065 L2 1 Z 0065 Y 0050 G20 XA
B16	Temperature sensor PT100	Rosemount Widerstandsthermometer Pt100, Kl. B1, 0065 L2 1 Z 0065 Y 0050 G20 XA
B17	Temperature sensor PT100	Rosemount Widerstandsthermometer Pt100, Kl. B1, 0065 L2 1 Z 0065 Y 0050 G20 XA
B18	Temperature sensor PT100	Rosemount Widerstandsthermometer Pt100, Kl. B1, 0065 L2 1 Z 0065 Y 0050 G20 XA
B19	Temperature sensor PT100	Rosemount Widerstandsthermometer Pt100, Kl. B1, 0065 L2 1 Z 0065 Y 0050 G20 XA
D1	Programmable logic control PLC "Easy" Netzteil/CPU Anzeigeeinheit EA-Modul Adapter	Moeller, 0722515 0758474 0722516 0722408
D1.1	Controlrelais "Easy"	Moeller, 0726366
F10	Subfuse/Main switch control current circuit 230V AC doublepole	Siemens, 5SX2201-7

A U T O T H E R M - W A T E R R E C O O L E R

F11	Control fuse 230V AC double-pole	Siemens, 5SX2201-7
F13	Subfuse power supply Control fuse	Conta-Clip, 1078.2 ESK, 196325
F14	Control fuse 24V DC Control fuse	Conta-Clip, 1078.2 ESK, 196325
F15	Subfuse filter fan Control fuse	Conta -Clip, 1078.2 ESK, 196322
F16	Flow monitor	DB-Industrietechnik, SW2 1" 1.4401 AUTOTHERM, Padel V4A
F17	Flow monitor	DB-Industrietechnik, SW2 1" 1.4401 AUTOTHERM, Padel V4A
F18	Forward temperature monitor 1	Jumo, ecoTron T, 70/00409972
F19	Forward temperature monitor 2	Jumo, ecoTron T, 70/00409972
F20	Forward temperature monitor 3	Jumo, ecoTron T, 70/00409972
F21	Forward temperature monitor 4	Jumo, ecoTron T, 70/00409972
F22	Pressure monitor low pressure 1	Alco, PS3-AF1-HNS1/2,5
F23	Pressure monitor low pressure 2	Alco, PS3-AF1-HNS1/2,5
F24	Pressure monitor low pressure 3	Alco, PS3-AF1-HNS1/2,5
F25	Pressure monitor low pressure 4	Alco, PS3-AF1-HNS1/2,5
F26	Low pressure switch „Pump down“ 1	Alco, PS3-AF1-HNS2,7/4,2
F27	Low pressure switch „Pump down“ 2	Alco, PS3-AF1-HNS2,7/4,2
F28	Low pressure switch „Pump down“ 3	Alco, PS3-AF1-HNS2,7/4,2
F29	Low pressure switch „Pump down“ 4	Alco, PS3-AF1-HNS2,7/4,2
F30	Pressure monitor high pressure 1	Alco, PS3-W5S21/28
F31	Pressure monitor high pressure 2	Alco, PS3-W5S21/28
F32	Pressure monitor high pressure 3	Alco, PS3-W5S21/28
F33	Pressure monitor high pressure 4	Alco, PS3-W5S21/28
F34	Motor protection compressor 1	Kriwan, INT69
F35	Motor protection compressor 2	Kriwan, INT69
F36	Motor protection compressor 3	Kriwan, INT69
F37	Motor protection compressor 4	Kriwan, INT69

A U T O T H E R M - W A T E R R E C O O L E R

F38	Level monitor water level	Kübler, ERV3/8-VS-L270/12-VE44A-2Sil./Schu
F39	Level monitor pump protection	Kübler, ERV3/8-VU-L100/12-VE44A-
F40	Pressure switch high pressure	Alco, PS3-W5S21/28 Set point: ca. 22 bar
F41	Pressure switch high pressure	Alco, PS3-W5S21/28 Set point: ca. 22 bar
F42	Pressure switch high pressure	Alco, PS3-W5S21/28 Set point: ca. 22 bar
F43	Pressure switch high pressure	Alco, PS3-W5S21/28 Set point: ca. 22 bar
K0	Auxiliary contactor "Emergency Stop" RC-Network	Siemens, 3RH1131-1AP00 21202
K0.1	Auxiliary contactor "Emergency Stop" RC-Network	Siemens, 3RH1122-1AP00 21202
K0.2	Auxiliary contactor "Emergency Stop" RC-Network	Siemens, 3RH1122-1AP00 21202
1K2	Motor contactor compressor motor 1 Auxiliary contactor block RC-Network	Siemens, 3RT1045-1AP00 Siemens, 3RH1921-1CA10 Murr, 21217
2K3	Motor contactor compressor motor 2 Auxiliary contactor block RC-Network	Siemens, 3RT1045-1AP00 Siemens, 3RH1921-1CA10 Murr, 21217
1K4	Motor contactor evaporator pump 1 Auxiliary contactor block RC-Network	Siemens, 3RT1015-1AP01 Siemens, 3RH1911-1FA40 Murr, 21202
1K6	Motor contactor compressor motor 3 Auxiliary contactor block RC-Network	Siemens, 3RT1045-1AP00 Siemens, 3RH1921-1CA10 Murr, 21217
2K7	Motor contactor compressor motor 4 Auxiliary contactor block RC-Network	Siemens, 3RT1044-1AP00 Siemens, 3RH1921-1CA10 Murr, 21217

A U T O T H E R M - W A T E R R E C O O L E R

2K8	Motor contactor evaporator pump 2	Siemens, 3RT1015-1AP01
	Auxiliary contactor block	Siemens, 3RH1911-1FA40
	RC-Network	Murr, 21202
K9	Motor contactor consumer pump	Siemens, 3RT1017-1AP01
	Auxiliary contactor block	Siemens, 3RH1911-1HA22
	RC-Network	Murr, 21202
1K4.1	Output relay evaporator pump	Finder, 385102400060
1K8.1	Output relay evaporator pump	Finder, 385102400060
K9.1	Output relay consumer pump	Finder, 485282300060
K10	Output relay stop	Finder, 583482300060
K11	Output relay start	Finder, 583482300060
K11.1	Output relay start	Finder, 585282300060
K12	Output relay cooling circuit 1	Finder, 485282300060
K13	Output relay cooling circuit 2	Finder, 485282300060
K14	Output relay cooling circuit 3	Finder, 485282300060
K15	Output relay cooling circuit 4	Finder, 485282300060
K16	Output relay motor protection compressor motor 1	Finder, 485282300060
K17	Output relay motor protection compressor motor 2	Finder, 485282300060
K18	Output relay motor protection compressor motor 3	Finder, 485282300060
K19	Output relay motor protection compressor motor 4	Finder, 485282300060
K20	Output relay fault water level	Finder, 485282300060
K21	Output relay control valve circuit 1	Finder, 485282300060
K22	Output relay control valve circuit 1	Finder, 485282300060
K23	Output relay control valve circuit 2	Finder, 485282300060
K24	Output relay control valve circuit 2	Finder, 485282300060
K25	Output relay control valve circuit 3	Finder, 485282300060
K26	Output relay control valve circuit 3	Finder, 485282300060
K27	Output relay control valve circuit 4	Finder, 485282300060
K28	Output relay control valve circuit 4	Finder, 485282300060
K30	Time relay	Tele, P6SE
K31	Time relay	Tele, D6DQ

A U T O T H E R M - W A T E R R E C O O L E R

K32	Time relay	Tele, D6DQ
K33	Time relay	Tele, D6DQ
K100	Output relay	
	ON/OFF Profibus	Finder, 38.51.0.024.0060
M1	Compressor 1	Copeland, ZR380KCE-TWD
M2	Compressor 2	Copeland, ZR380KCE-TWD
M3	Evaporator pump 1	Grundfos CRN20-2; 96778712
M4	Compressor 3	Copeland, ZR380KCE-TWD
M5	Compressor 4	Copeland, ZR310KCE-TWD
M6	Evaporator pump 1	Grundfos CRN20-2; 96778712
M7	Consumer pump	Grundfos, CRN20-4 96802241
M10	Control valve circuit 1	Metso, 6BJ71, 7ND91H70
M11	Control valve circuit 2	Metso, 6BJ71, 7ND91H70
M12	Control valve circuit 3	Metso, 6BJ71, 7ND91H70
M13	Control valve circuit 4	Metso, 6BJ71, 7ND91H70
M14	Filter fan	Rittal, 7035
	Exhaust filter	Rittal, 7035
M15	Filter fan	Rittal, 7035
	Exhaust filter	Rittal, 7035
N11	Temperature controller	PMA, KS90-100-20000-052
	Adapter	PMA, 940799807001
	Connection plug	Helmholz, 700-972-0BA12
N12	Temperature controller	Störk-Tronic, ST710-PNUVR.102,
	cooling water circuit 1	9000310.013
N13	Temperature controller	Störk-Tronic, ST710-PNUVR.102,
	cooling water circuit 2	9000310.013
N14	Temperature controller	Störk-Tronic, ST710-PNUVR.102,
	cooling water circuit 3	9000310.013
N15	Temperature controller	Störk-Tronic, ST710-PNUVR.102,
	cooling water circuit 4	9000310.013
1Q1	Main switch	
	Load current circuit 1	Siemens, 3NP4070-0CH01,3NG1002
1Q2	Motor protection switch	
	compressor motor 1	Siemens, 3RV1041-4JA10
	Auxiliary contactor 1NO+1NC	Siemens, 3RV1901-1E
2Q3	Motor protection switch	
	compressor motor 2	Siemens, 3RV1041-4JA10
	Auxiliary contactor 1NO+1NC	Siemens, 3RV1901-1E
1Q4	Motor protection switch	
	evaporator pump 1	Siemens, 3RV1021-1GA10
	Auxiliary contactor 1NO+1NC	Siemens, 3RV1901-1E
2Q5	Main switch	
	Load current circuit 2	Siemens, 3NP4070-0CH01,3NG1002

A U T O T H E R M - W A T E R R E C O O L E R

1Q6	Motor protection switch compressor motor 3	Siemens, 3RV1041-4JA10
	Auxiliary contactor 1NO+1NC	Siemens, 3RV1901-1E
2Q7	Motor protection switch compressor motor 4	Siemens, 3RV1041-4JA10
	Auxiliary contactor 1NO+1NC	Siemens, 3RV1901-1E
2Q8	Motor protection switch evaporator pump 1	Siemens, 3RV1021-1GA10
	Auxiliary contactor 1NO+1NC	Siemens, 3RV1901-1E
Q9	Motor protection switch consumer pump	Siemens, 3RV1021-4AA10
	Auxiliary contactor 1NO+1NC	Siemens, 3RV1901-1E
R1	Potentiometer	Conrad, 250 Ohm
R2	Potentiometer	Conrad, 250 Ohm
R3	Potentiometer	Conrad, 250 Ohm
R4	Potentiometer	Conrad, 250 Ohm
S10	Pushbutton Emergency Stop	Siemens, 3SB3000 1AA20
	Contact block 1NC	Siemens, 3SB3400-0C
	sign	Siemens, 3SP3921-0BW
S11	Hand-Aus-Auto switch	Siemens, 3SB3000-2DA11
	Handle switch	Siemens, 3SB3400-0B
	Contact block 1NO	Siemens, 3SB3400-0B
T11	Control transformer	Häger, 230//230V 250VA 70252007
T12	Power supply	Schukat, S-25-24
XPE	Connector protector ground	Conta -Clip, 77.700.0/1199.2/ 1197.2/3203.2
X2	Connector compressor motor 1	Conta -Clip, 1050.2/1197.2
X3	Connector compressor motor 2	Conta -Clip, 1050.2/1197.2
X4	Connector evaporator pump 1	Conta -Clip, 3200.2/3203.2
X5	Connector compressor motor 3	Conta -Clip, 1050.2/1197.2
X6	Connector compressor motor 4	Conta -Clip, 1050.2/1197.2
X7	Connector evaporator pump 2	Conta -Clip, 3200.2/3203.2
X8	Connector consumer pump	Conta -Clip, 3200.2/3203.2
X10	Connector flow monitor 1	Conta -Clip, 3200.2/3203.2
X11	Connector flow monitor 2	Conta -Clip, 3200.2/3203.2
X12	Connector solenoid valve pump down 1	Conta -Clip, 3200.2/3203.2
X13	Connector solenoid valve pump down 2	Conta -Clip, 3200.2/3203.2
X14	Connector solenoid valve cooling water 2	Conta -Clip, 3200.2/3203.2
X15	Connector solenoid valve pump down 3	Conta -Clip, 3200.2/3203.2

A U T O T H E R M - W A T E R R E C O O L E R

X16	Connector solenoid valve cooling water 3	Conta -Clip, 3200.2/3203.2
X17	Connector solenoid valve pump down 4	Conta -Clip, 3200.2/3203.2
X18	Connector solenoid valve cooling water 4	
X19	Connector pressure monitor low pressure 1	Conta -Clip, 3200.2
X20	Connector low pressure switch „Pump down“ 1	Conta -Clip, 3200.2
X21	Connector pressure monitor high pressure 1	Conta -Clip, 3200.2
X22	Connector motor protection compressor 1	Conta -Clip, 3200.2/3203.2
X23	Connector pressure monitor low pressure 2	Conta -Clip, 3200.2
X24	Connector low pressure switch „Pump down“ 2	Conta -Clip, 3200.2
X25	Connector pressure monitor high pressure 2	Conta -Clip, 3200.2
X26	Connector motor protection compressor 2	Conta -Clip, 3200.2/3203.2
X27	Connector pressure monitor low pressure 3	Conta -Clip, 3200.2
X28	Connector low pressure switch „Pump down“ 3	Conta -Clip, 3200.2
X29	Connector pressure monitor high pressure 3	Conta -Clip, 3200.2
X30	Connector motor protection compressor 3	Conta -Clip, 3200.2/3203.2
X31	Connector pressure monitor low pressure 4	Conta -Clip, 3200.2
X32	Connector low pressure switch „Pump down“ 4	Conta -Clip, 3200.2
X33	Connector pressure monitor high pressure 4	Conta -Clip, 3200.2
X34	Connector motor protection compressor 4	Conta -Clip, 3200.2/3203.2
X35	Connector sensor 0-20mA	Conta -Clip, 3200.2/3203.
X36	Connector level monitor water level	Conta -Clip, 3200.2/3203.
X37	Connector level monitor pump protection	Conta -Clip, 3200.2/3203.

A U T O T H E R M - W A T E R R E C O O L E R

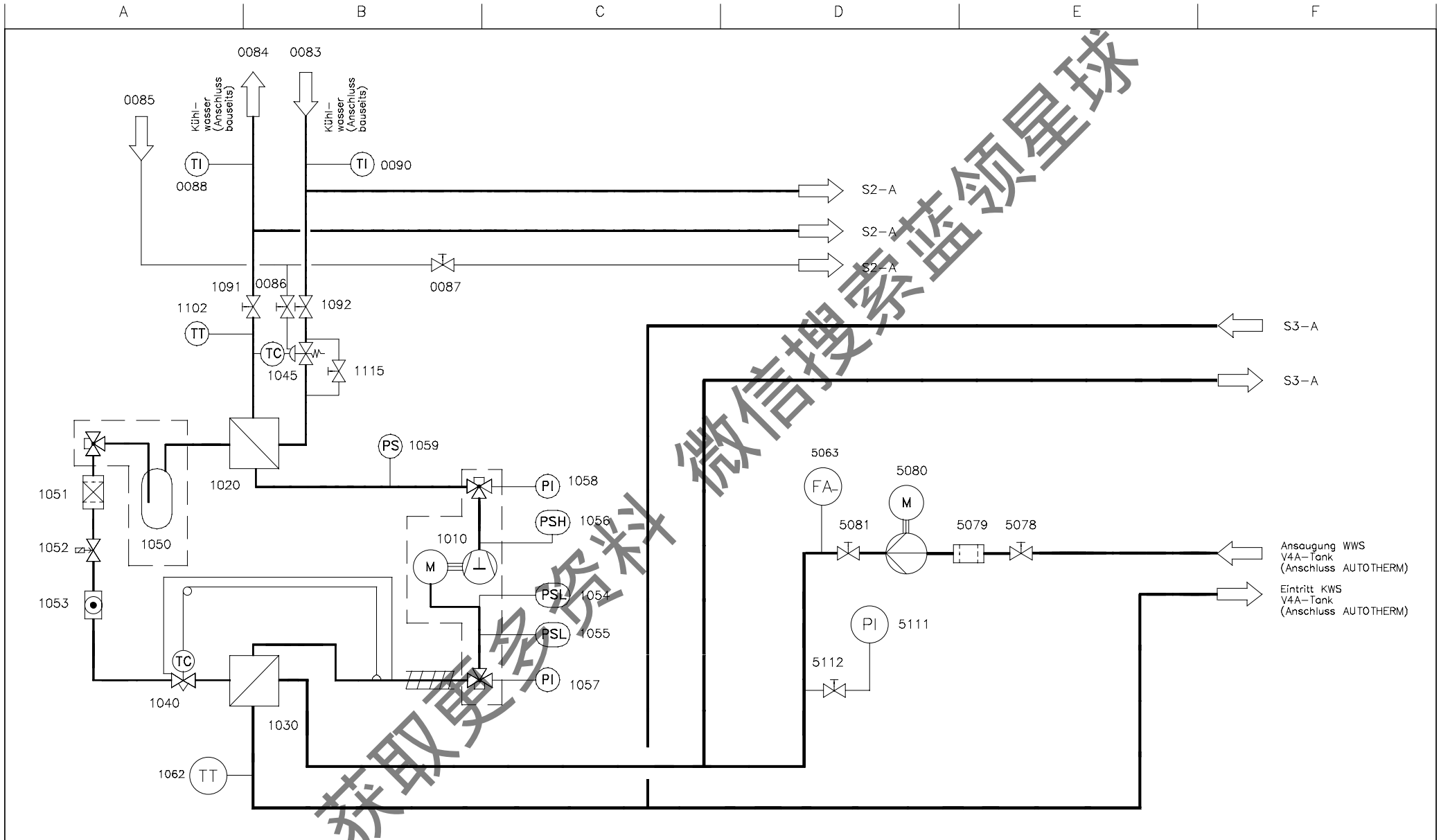
X38	Connector pressure switch high pressure circuit 1	Conta -Clip, 3200.2
X39	Connector pressure switch high pressure circuit 2	Conta -Clip, 3200.2
X40	Connector pressure switch high pressure circuit 2	Conta -Clip, 3200.2
X41	Connector pressure switch high pressure circuit 2	Conta -Clip, 3200.2
X42	Connector temperature sensor PT100	Conta -Clip, 3200.2/3203.
X43	Connector external process value	Conta -Clip, 3200.2/3203.
X44	Adapter	PMA, 940799807001
X45	Connection plug	Helmholtz, 700-972-0BA12
X50	Plug connection solenoid valve	Hirschmann, 934426002
X51	Plug connection solenoid valve	Hirschmann, 934426002
X52	Plug connection solenoid valve	Hirschmann, 934426002
X53	Plug connection solenoid valve	Hirschmann, 934426002
X54	Plug connection solenoid valve	Hirschmann, 934426002
X55	Plug connection solenoid valve	Hirschmann, 934426002
X56	Plug connection solenoid valve	Hirschmann, 934426002
X57	Plug connection	Hirschmann, 931969-100
X58	Plug connection	Hirschmann, 931969-100
X59	Plug connection	Hirschmann, 931969-100
X60	Plug connection	Hirschmann, 931969-100
X61	Plug connection	Hirschmann, 931969-100
X62	Plug connection	Hirschmann, 931969-100
X63	Plug connection	Hirschmann, 931969-100
X64	Plug connection	Hirschmann, 931969-100
X65	Plug connection	Hirschmann, 931969-100
X66	Plug connection	Hirschmann, 931969-100
X67	Plug connection	Hirschmann, 931969-100
X68	Plug connection	Hirschmann, 931969-100
X69	Plug connection	Hirschmann, 931969-100
X70	Plug connection	Hirschmann, 931969-100
X71	Plug connection	Hirschmann, 931969-100
X72	Plug connection	Hirschmann, 931969-100
X91	Connector L91AC 230V	Conta -Clip, 3200.2
X92	Connector N92AC 0V	Conta -Clip, 3200.2
Y11	Solenoid valve pump down circuit 1	Danfoss EVR20; 32F224331
Y12	Solenoid valve pump down circuit 2	Danfoss EVR20; 32F224331

A U T O T H E R M - W A T E R R E C O O L E R

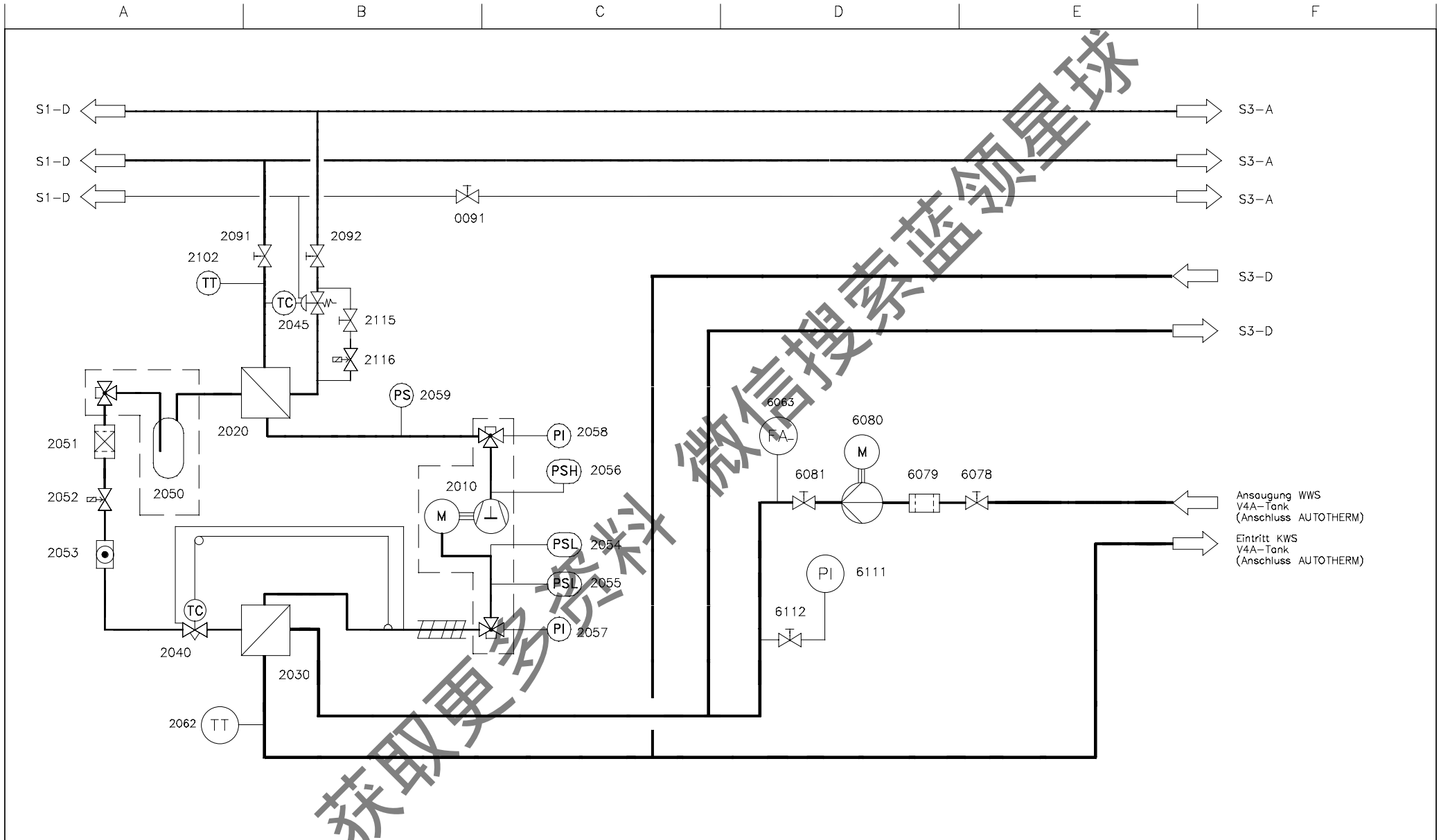
Y13	Solenoid valve cooling water 2	Buschjost, 8273200.9101
Y14	Solenoid valve pump down circuit 3	Danfoss EVR20; 32F224331
Y15	Solenoid valve cooling water 3	
Y16	Solenoid valve pump down circuit 4	Danfoss EVR20; 32F224331
Y17	Solenoid valve cooling water 4	Buschjost, 8273200.9101

In case of spare parts order or inquiry please always indicate the type and the serial number of the unit.

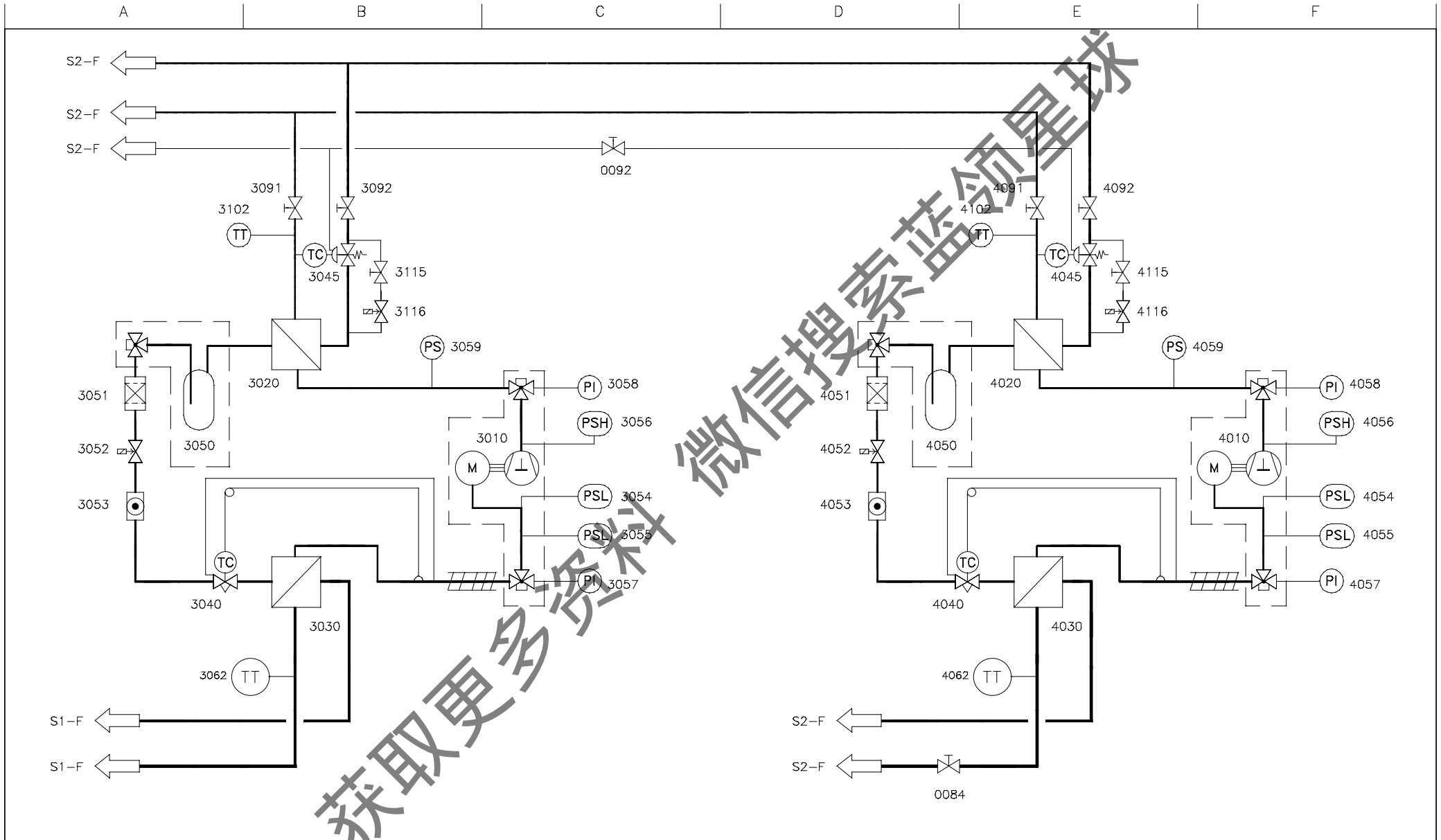
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	Bearb.	M.König		Medienplan:	1.27.88-1		von 4
	Gepr.	GK					
	Norm						



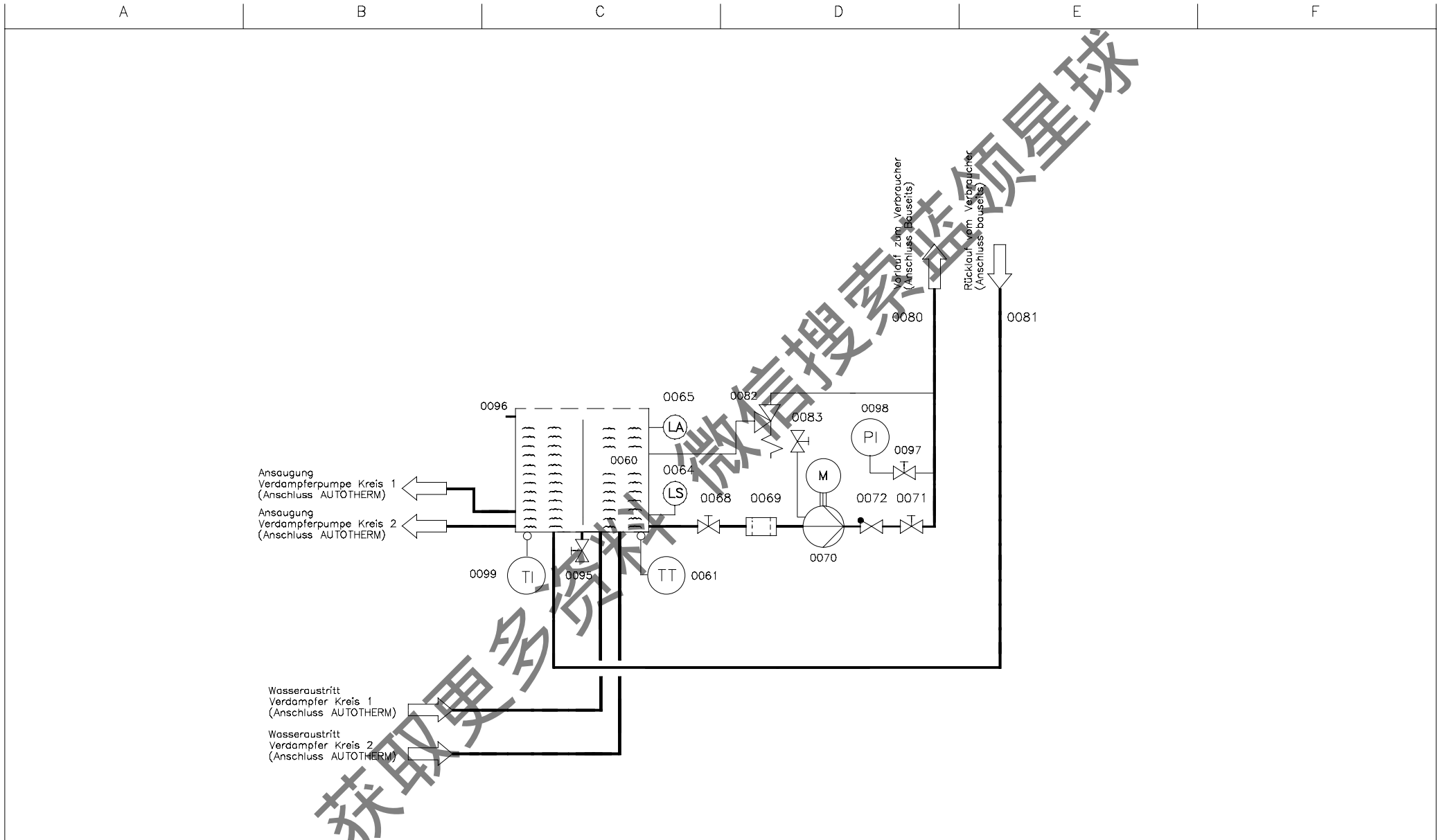
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	Bearb.	M.König		Medienplan:	1.27.88-2		von 4
	Gepr.	GK					
	Norm						



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	Bearb.	M.König		Medienplan: 1.27.88-3	von 4		
	Gepr.	GK					
	Norm						



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	Bearb.	M.König		Medienplan Nr.:	1.27.88-4		von 4
	Gepr.	GK					
	Norm						

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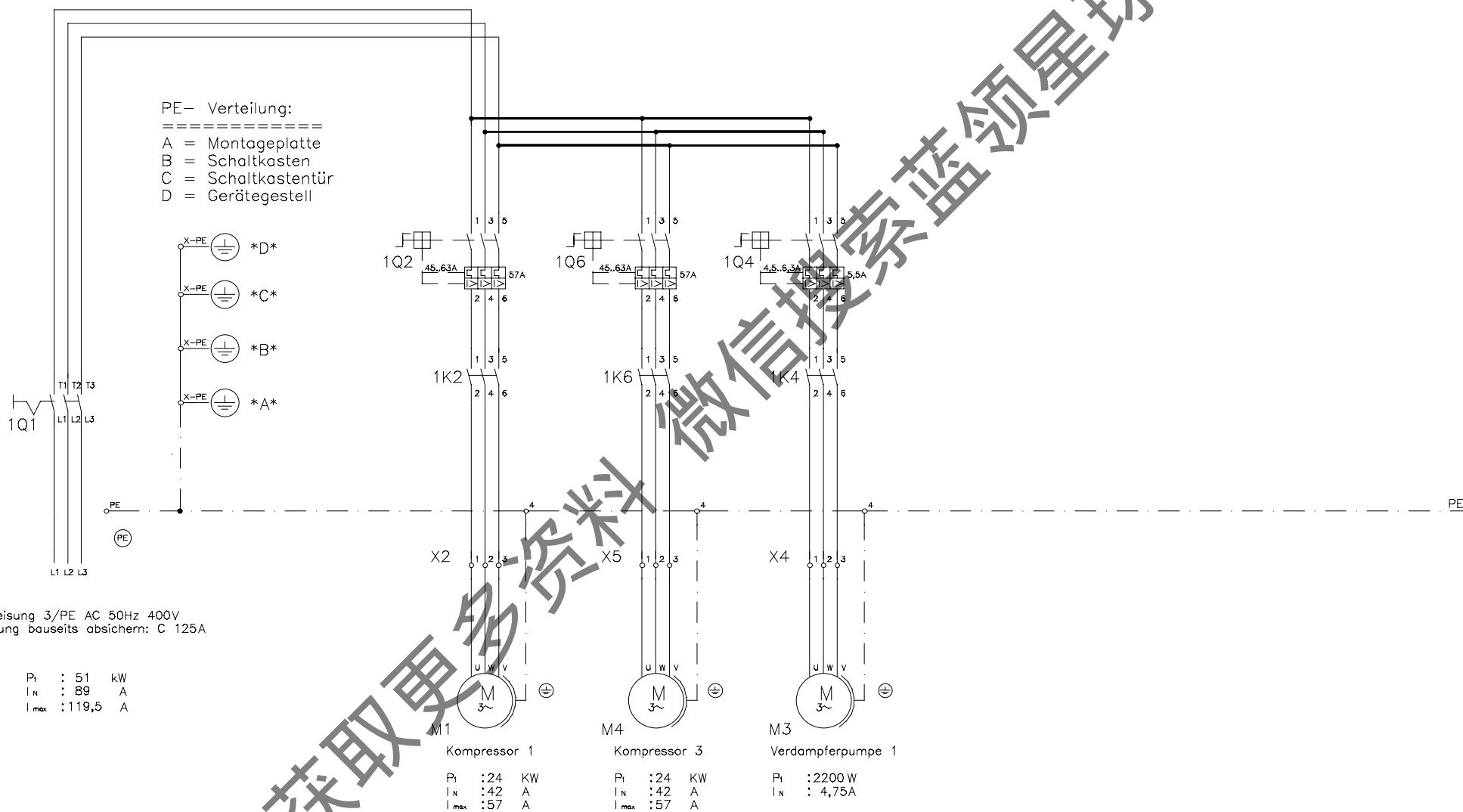
B

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E

F



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Bearb.	Weis
Gepr.	MK
Norm	

AUTOTHERM
 Wärme-Klima-Kälte
 Nenninger Nachf. GmbH
 97631 Bad Königshofen

Gerätetyp:	AKW 3000
Schaltplan Nr.:	2.027 3000.00

Laststromkreis 1
 Load current circuit 1

Blatt 1
 von 17

A

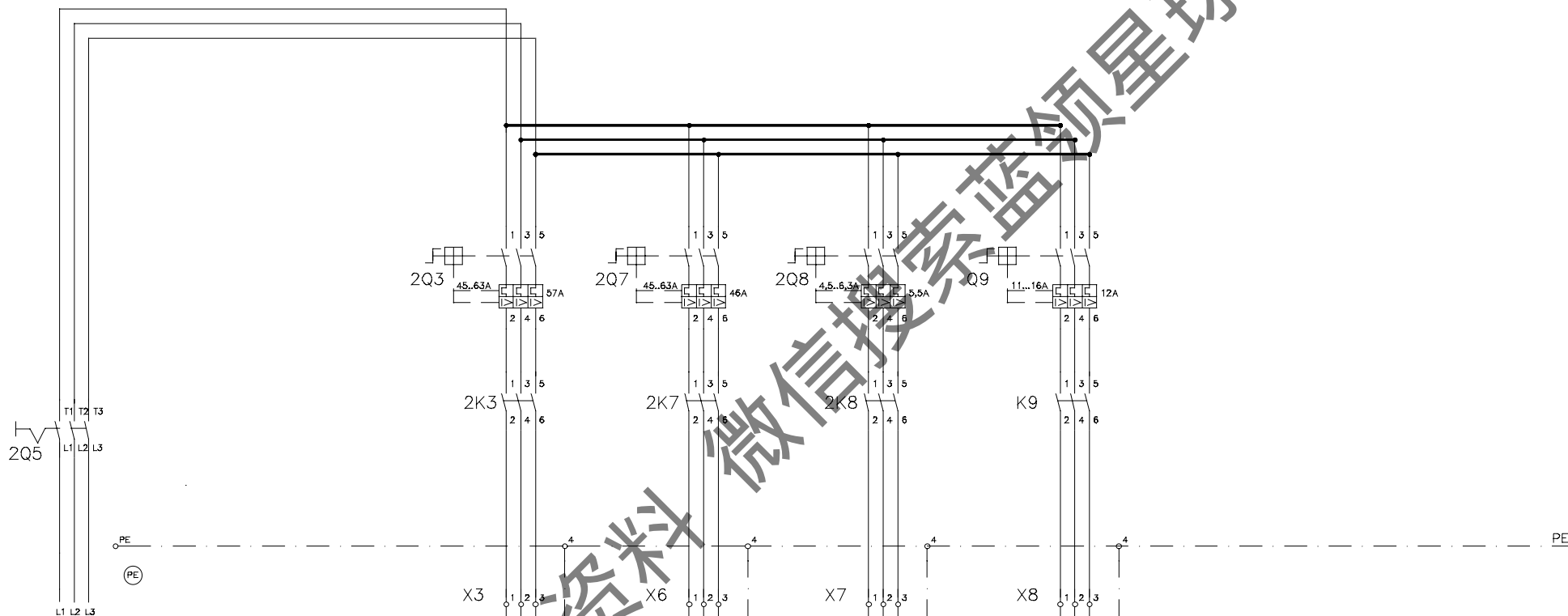
B

C

D

E

F



Einspeisung 3/PE AC 50Hz 400V
Zuleitung bauseits absichern: C 125A

P_i : 53 kW
 I_N : 94 A
 I_{max} : 120,5 A

P_i : 24 kW
 I_N : 42 A
 I_{max} : 57 A

P_i : 21 kW
 I_N : 36 A
 I_{max} : 46 A

P_i : 2200 W
 I_N : 4,75A

P_i : 5500 W
 I_N : 11 A

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Schaltplan Nr.:	2.027 3000.00

Laststromkreis 2
Load current circuit 2

Blatt 2
von 17

A

B

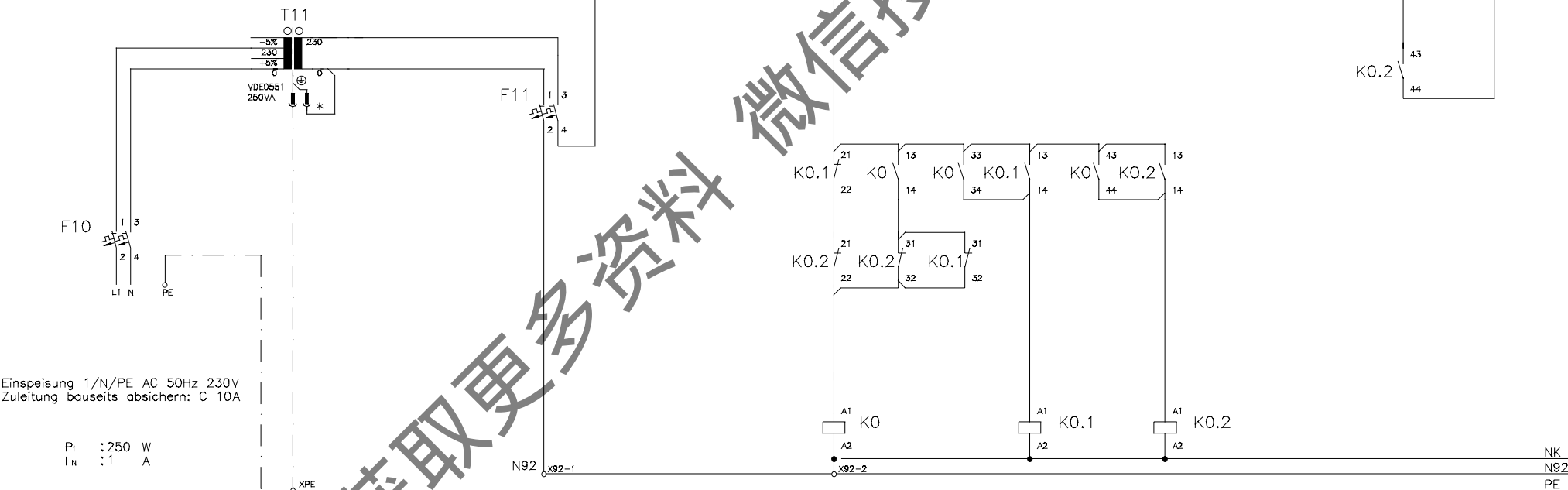
C

D

E

F

* Geerdet betriebener Stromkreis für ungeerdet betriebenen Steuerstromkreis Brücke entfernen und Isolationsüberwachung vorsehen ! (VDE 0100, VDE 0113)



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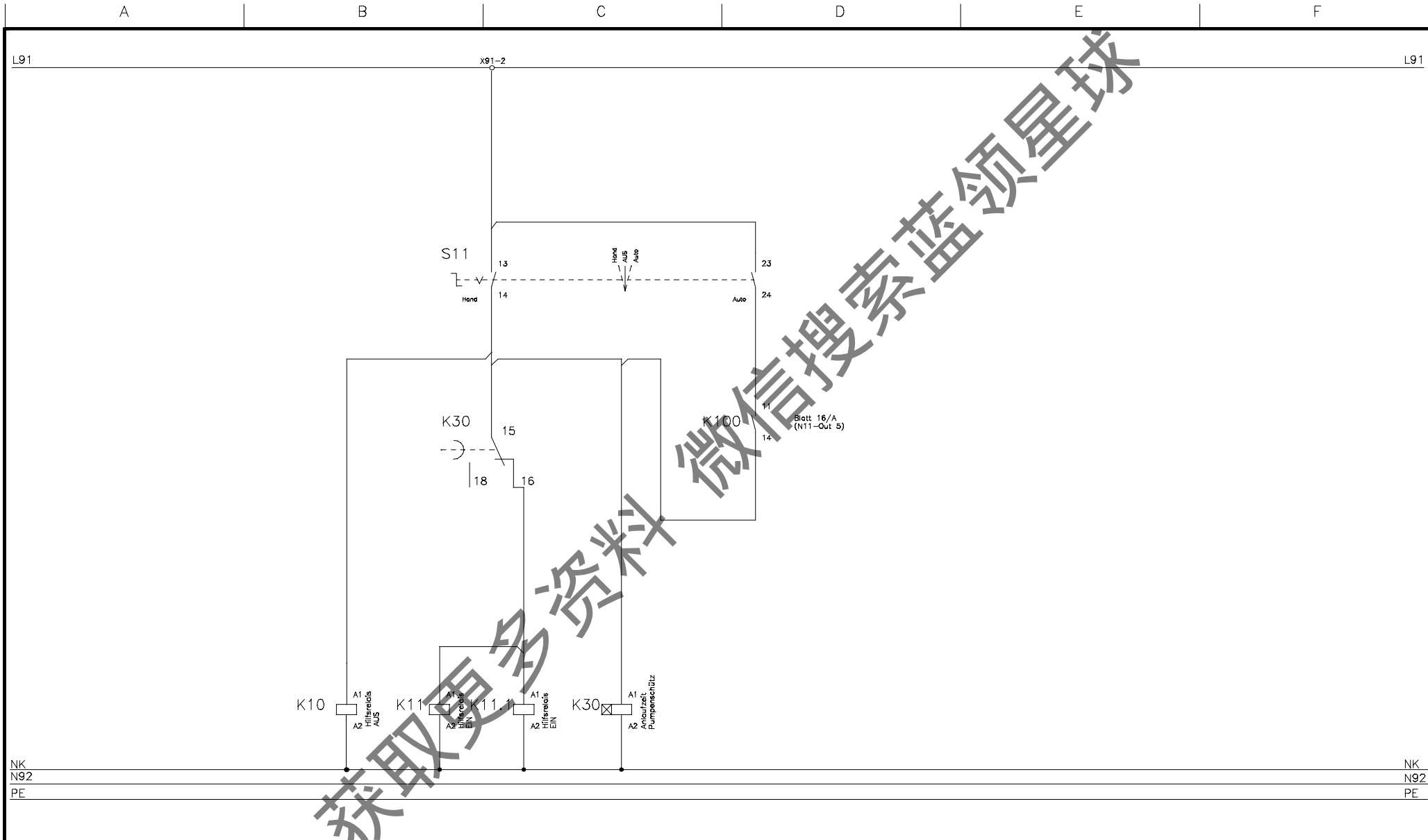
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Bearb.	Weis
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Gerätetyp:	AKW 3000
Schaltplan Nr.:	2.027 3000.00

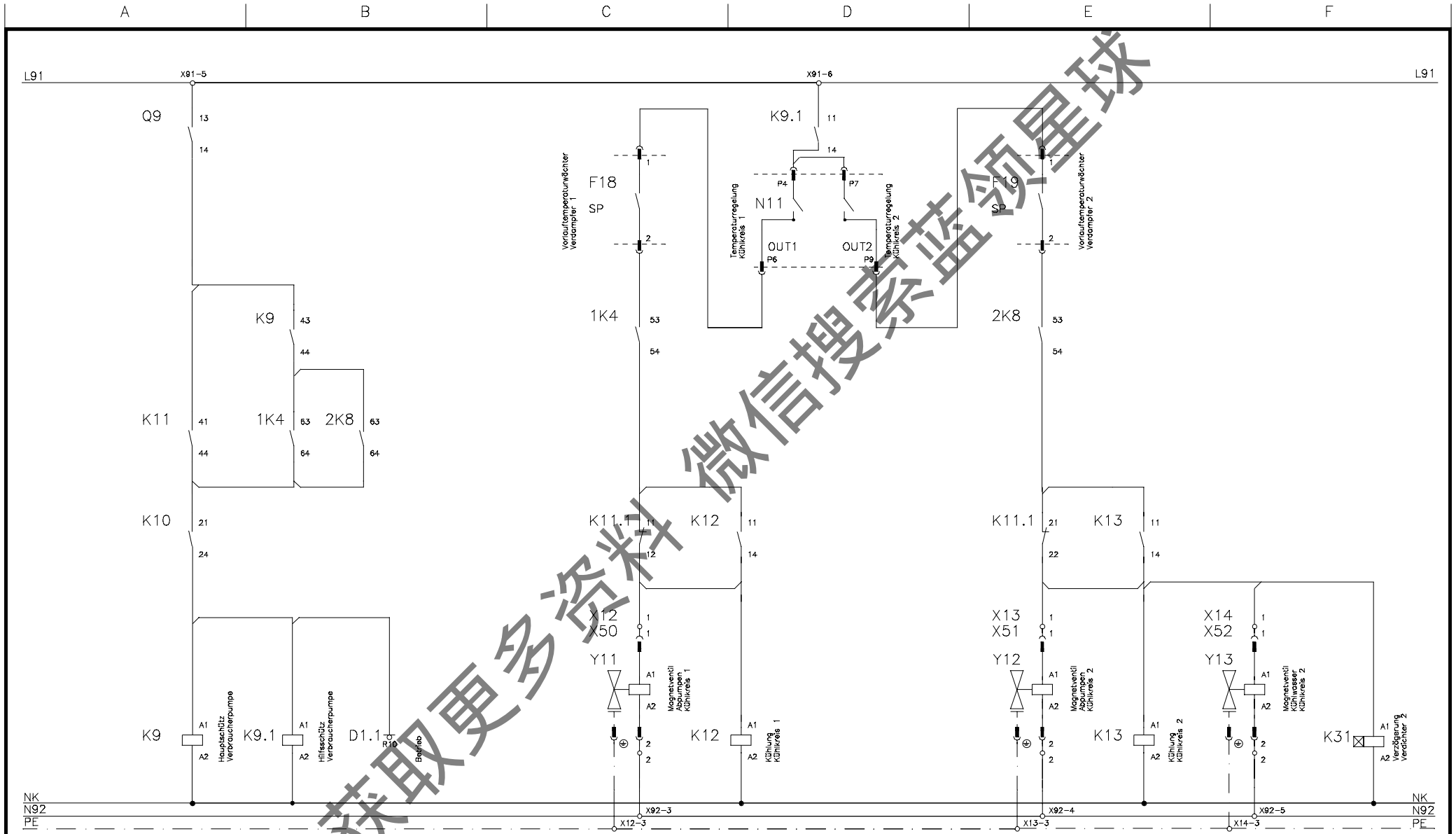
Steuerstromkreis
Control current circuit

Blatt	3
von	17



NK
N92
PE

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	Bearb.	Weis		Schaltplan Nr.:	2.027 3000.00	
	Gepr.	MK				
	Norm					



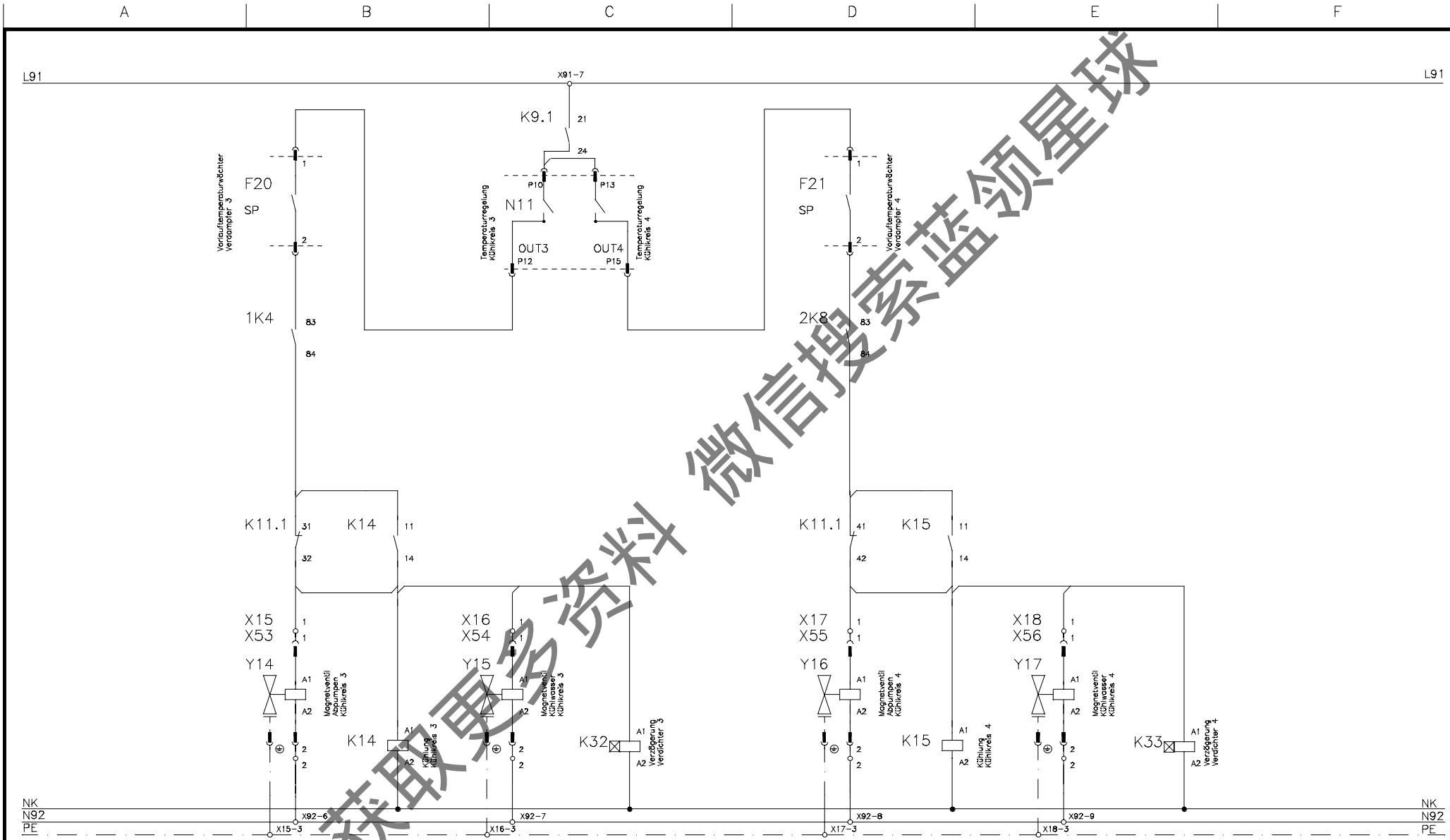
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Blatt 6
von 17



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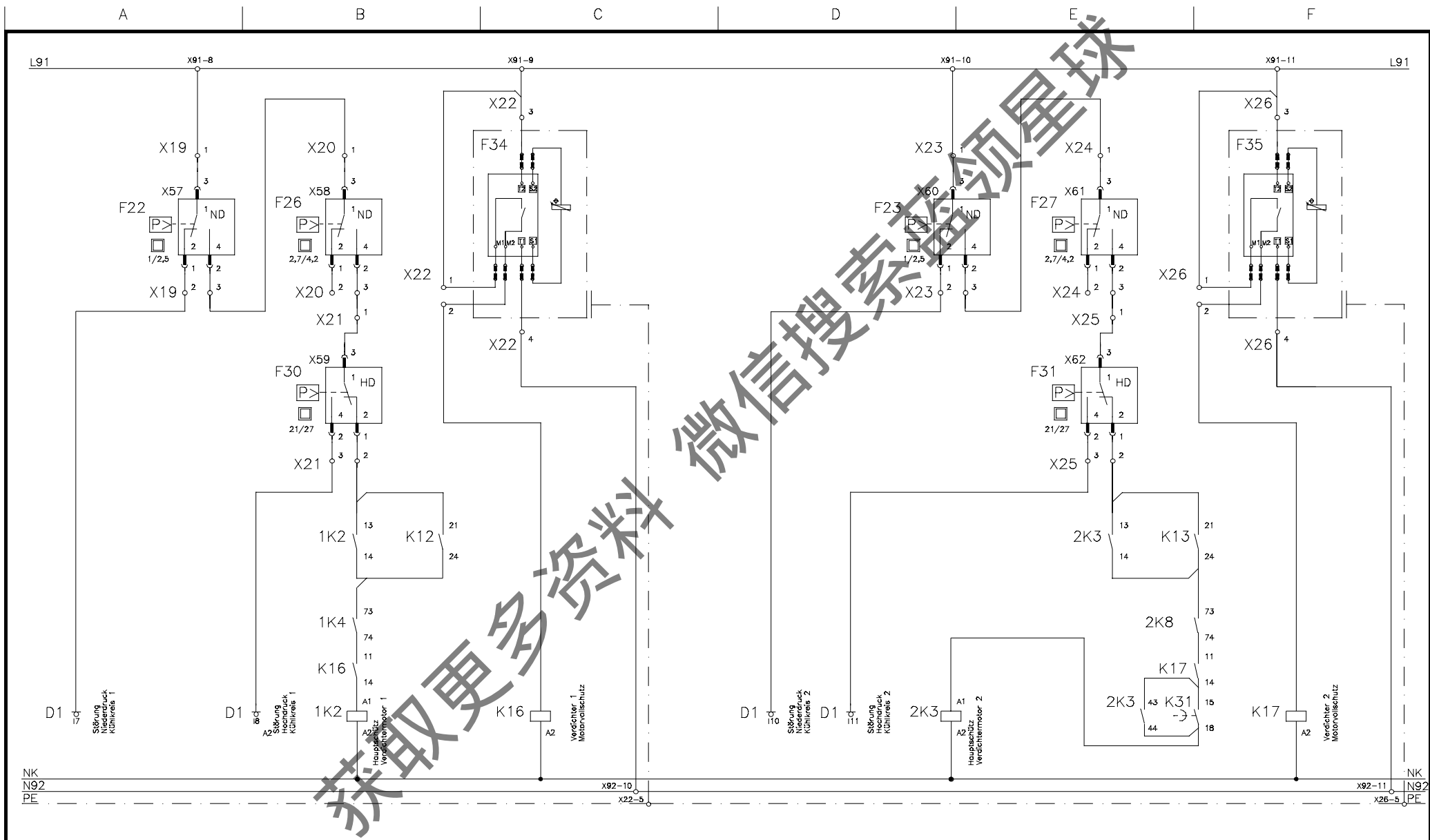
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Norm	

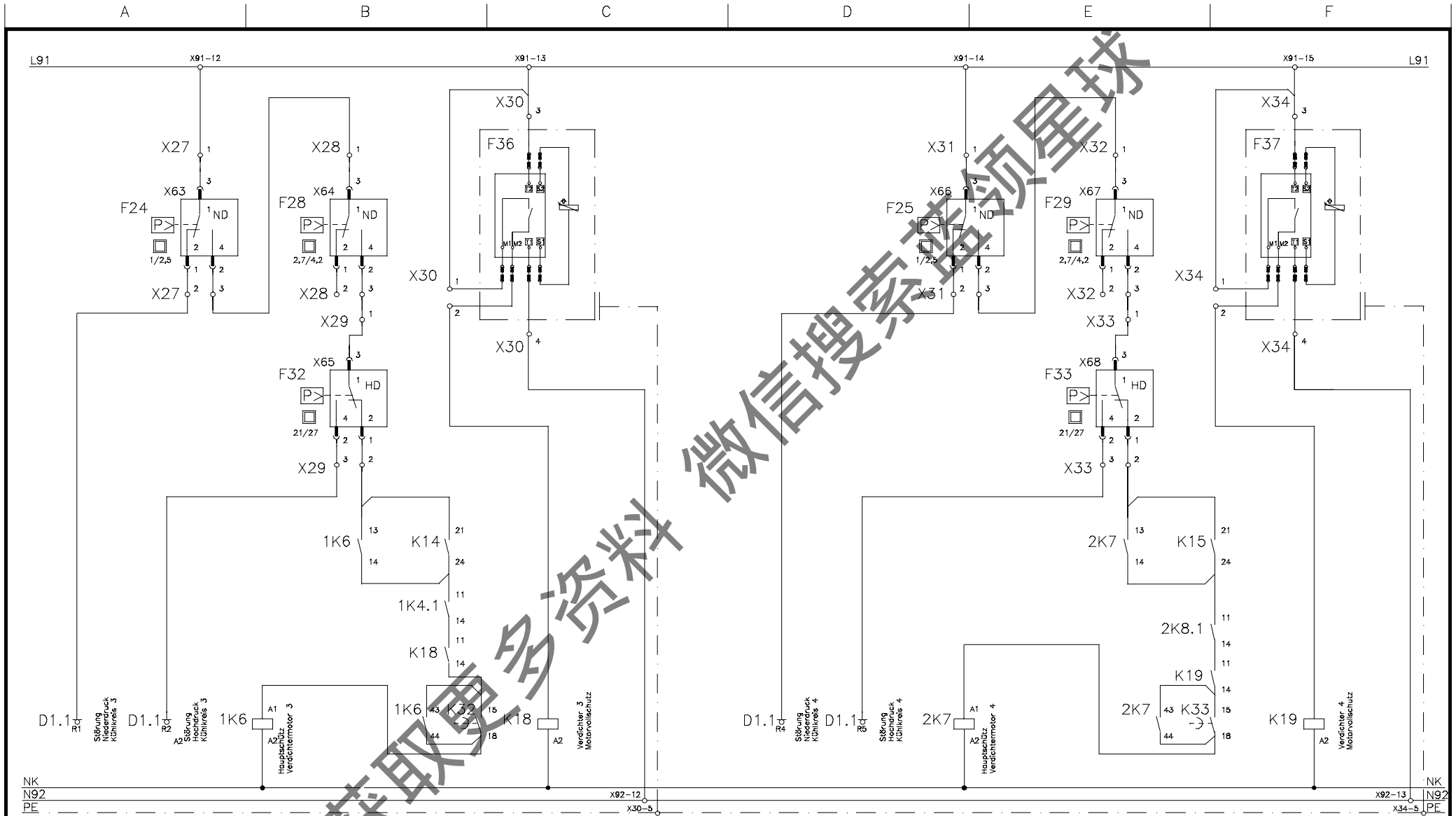
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Blatt	7
von	17



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	Bearb.	Weis		Schaltplan Nr.:	2.027 3000.00	
	Gepr.	MK				
	Norm					



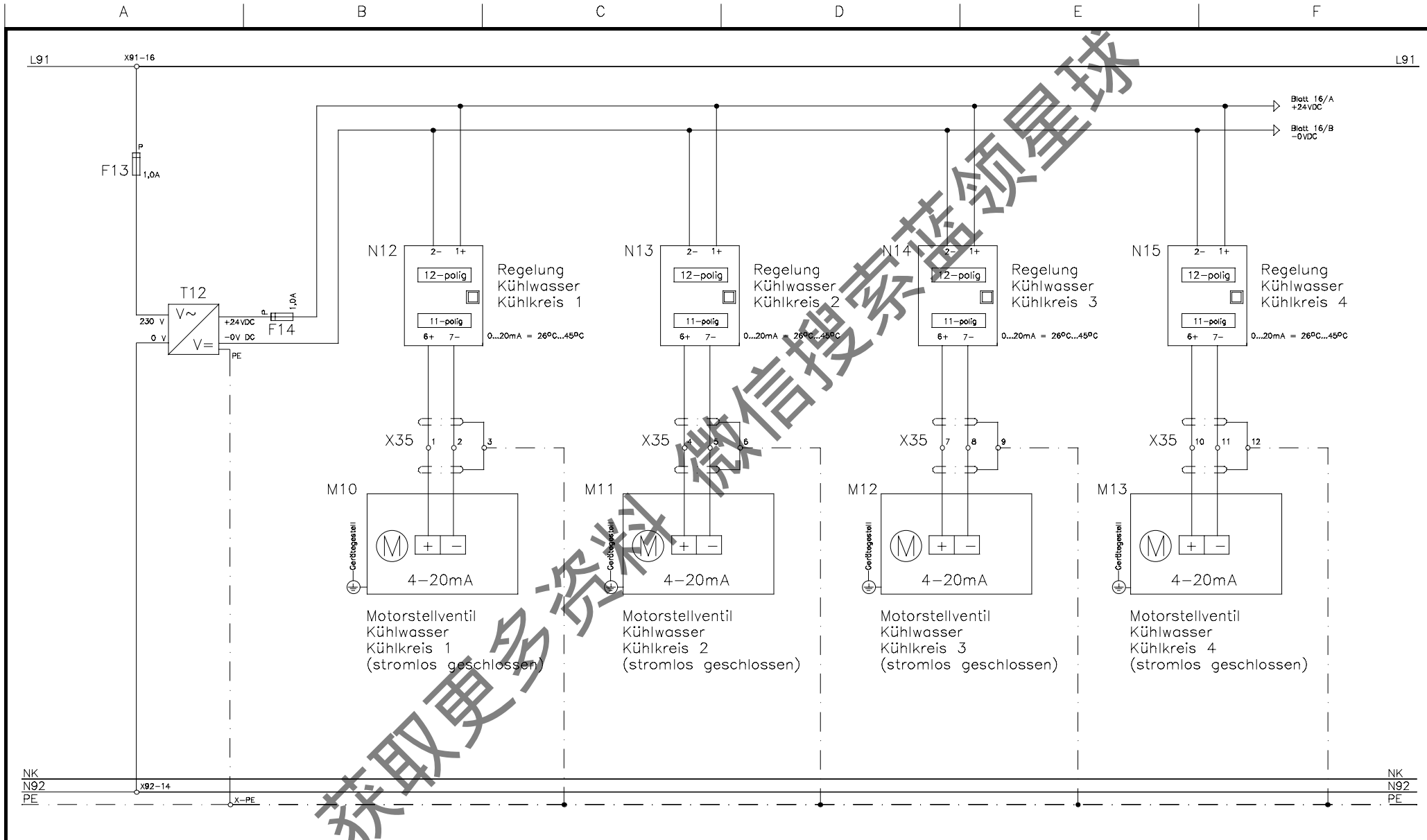
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Gerätetyp:	AKW 3000
Schaltplan Nr.:	2.027 3000.00

Blatt 9
von 17



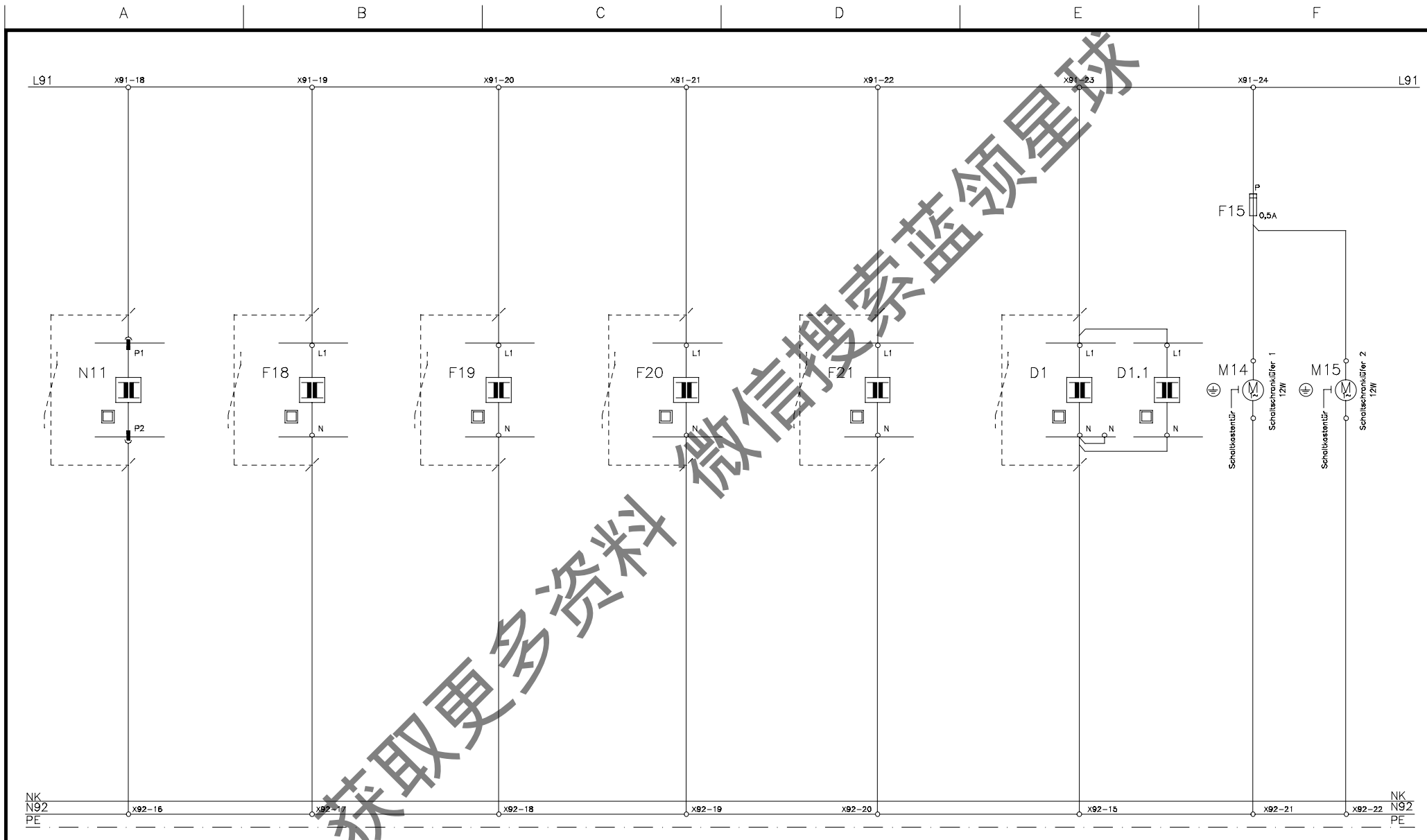
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Blatt 10
von 17



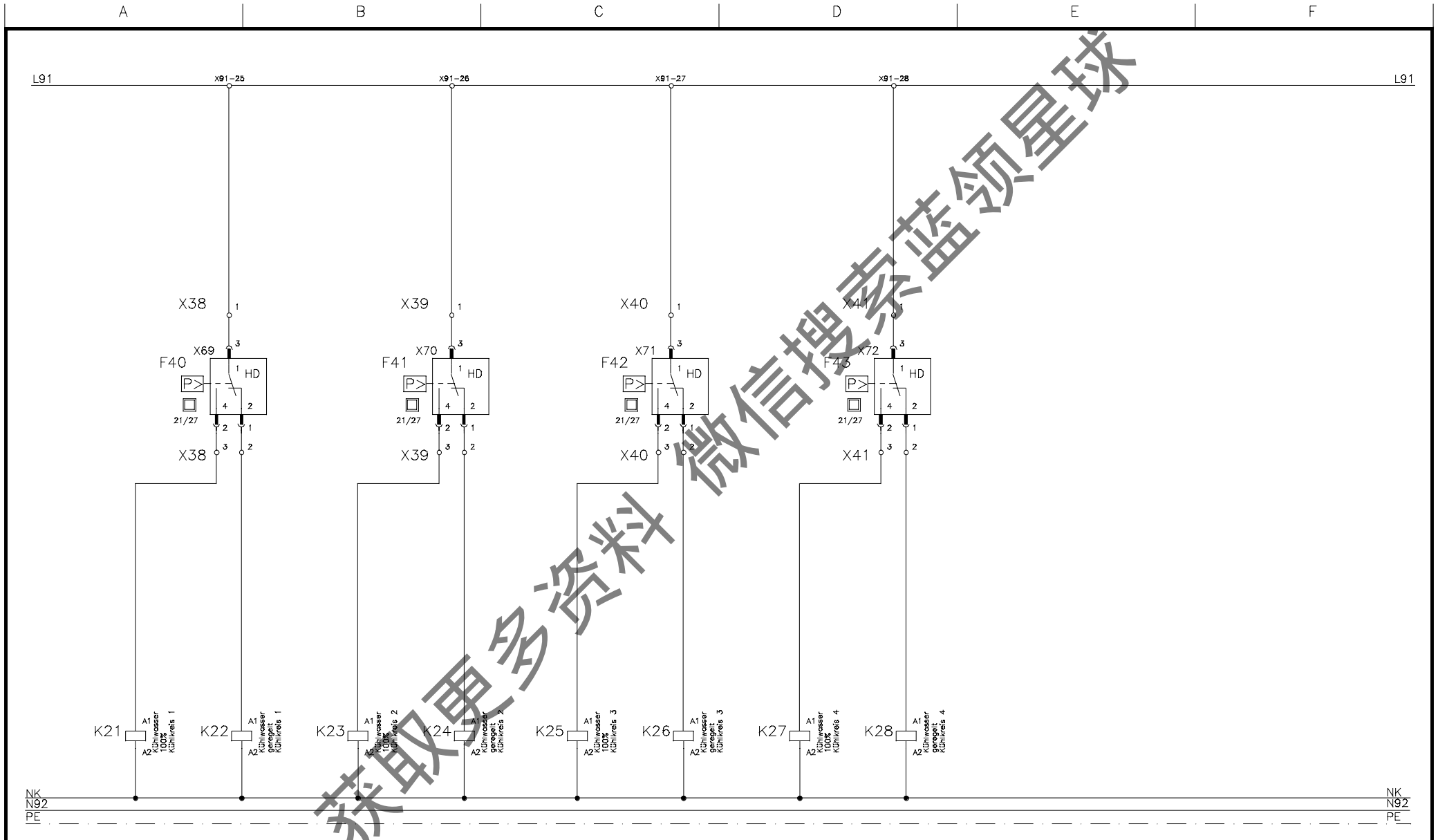
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Blatt	12
von	17



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Blatt	13
von	17

A

B

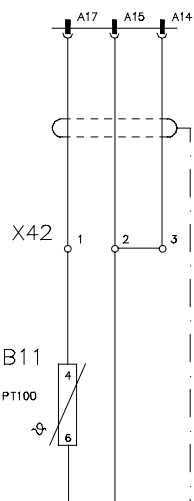
C

D

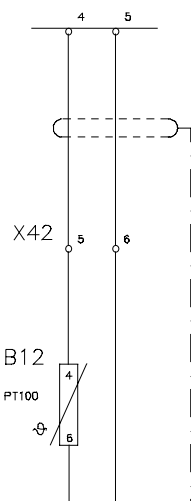
E

F

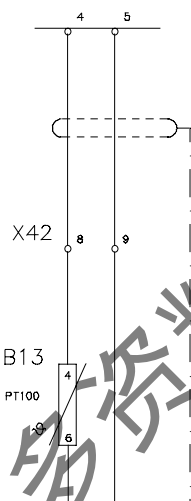
N11



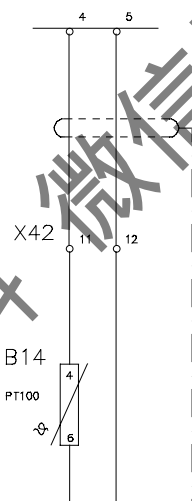
F18



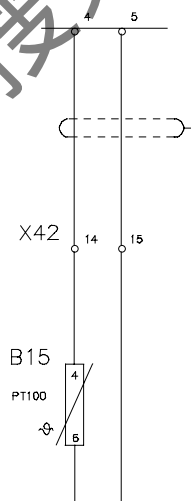
F19



F20



F21



PE

X42-4

X42-7

X42-10


X42-13

X42-16

PE

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Gerätetyp:	AKW 3000
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Blatt	14
von	17

A

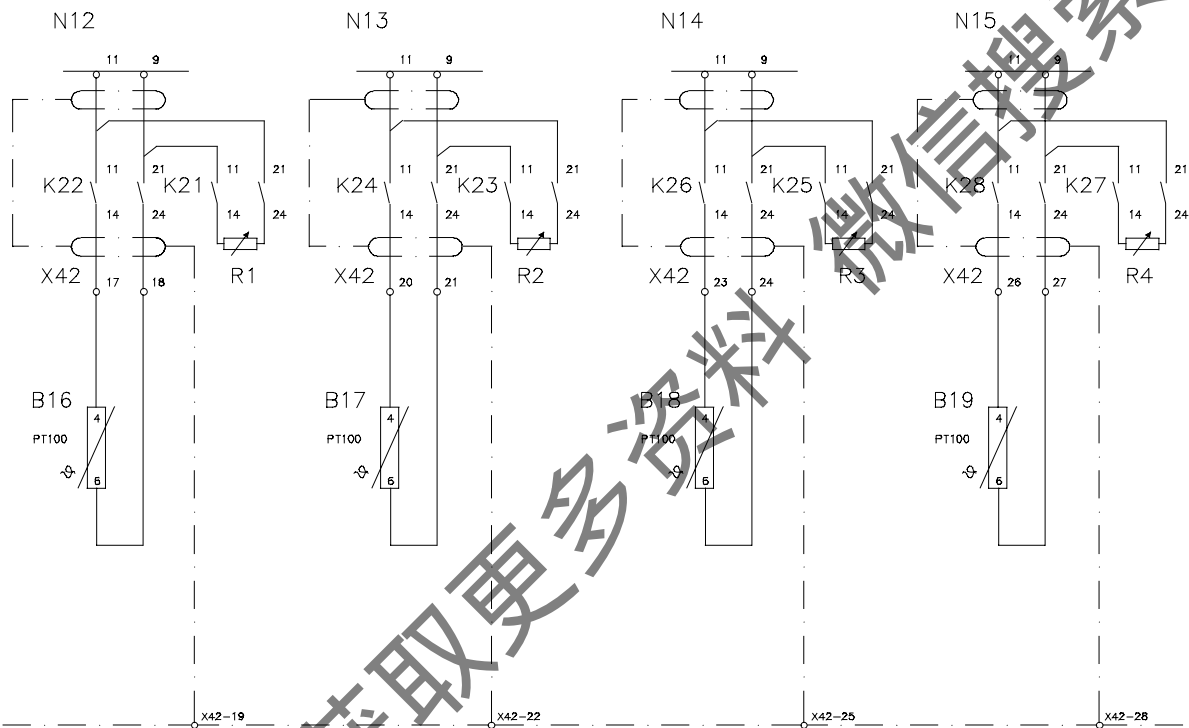
B

C

D

E

F



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Blatt 15

von 17

A

B

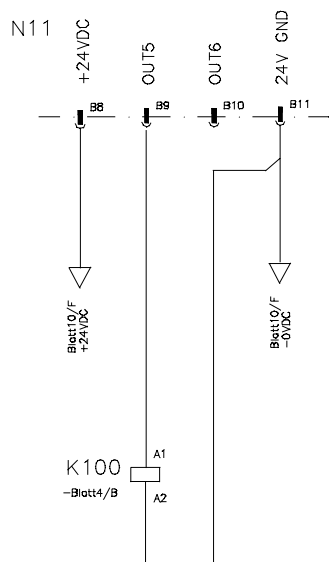
C

D

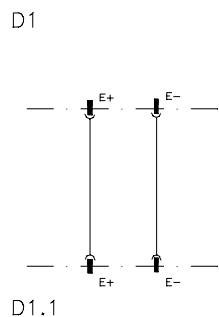
E

F

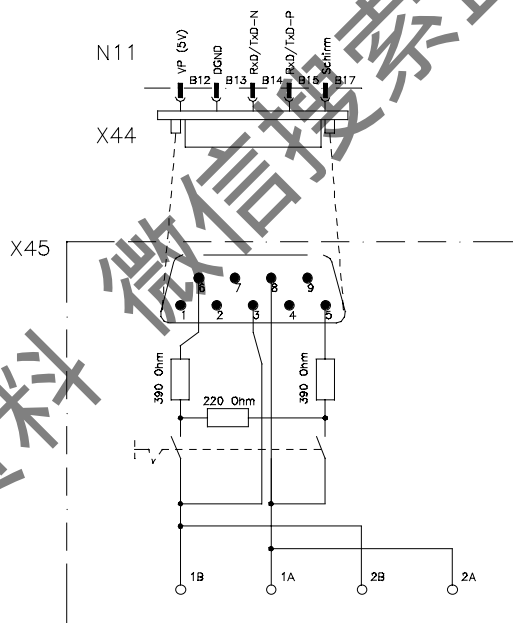
AUTO(Profibus)
EIN/AUS



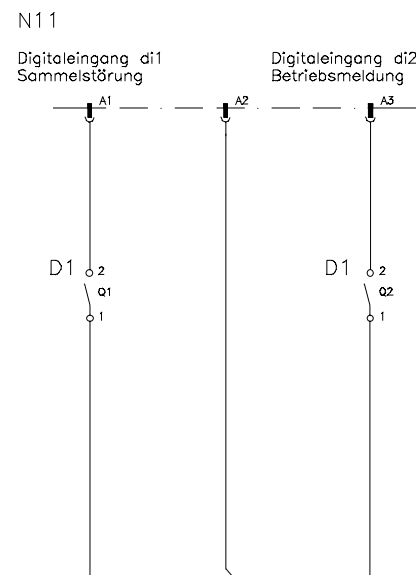
Automatisierungsgerät
Steuerrelais



PMA-Anschlußadapter
für 9-pol. Sub-D



Allgemeine Betriebs- und
Sammelstörmeldung



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Blatt 16
von 17

A

B

C

D

E

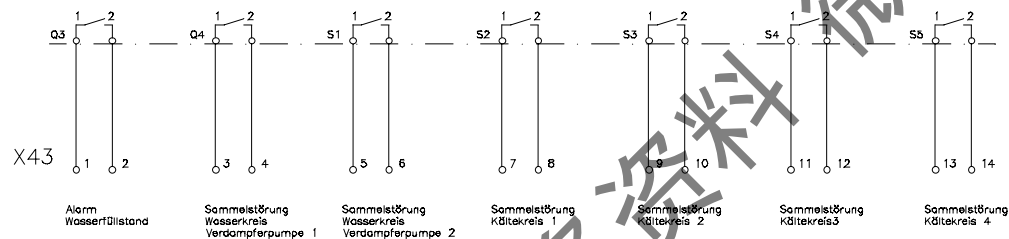
F

pot. freie
Betriebs- u. Sammelstörmeldungen/Alarm

Ruhestromprinzip:
Relais fallen bei Störung/Alarm ab

D1

D1.1



PE

X43-15

PE

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Blatt 17

von 17