ALS-Profi-sxYY/AZS-ecs-xYY – Serie

(YY stands for st, bs or xp)

Technical manual

Symbolic image for ALS-Profi-sxYY energy controller; the AZS-ecs-xYY series is equipped with a blue front overlay:

PREPARED		STATUS	SECURITY LEVEL		
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APPROVED		DOCUMENT KIND			
Click or tap to enter a date.		Manual			
OWNING ORGANIZATION		DOCUMENT ID.	REV.	LANG.	PAGE
ABB Electrification Smart Power		9AKK108471A5046	B	EN	1/53

Notes on this manual

In the manual, instructions and warnings are indicated by symbols which have the following meaning:

WARNING!
Means that death or serious bodily injury can occur if the corresponding precautions are not taken.
CAUTION!
Means that property damage or minor personal injury can occur if the appropriate precautions are not taken.
ATTENTION
Means that material damage can occur if the appropriate precautions are not taken.

The device bears the CE mark.

The corresponding declarations of conformity are available at ASKI Industrie Elektronik GmbH.

The device complies with the ROHS Directive (Directive 2011/65/EU).

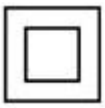
The corresponding confirmation of conformity is available at ASKI Industrie Elektronik GmbH.

Disposal instructions:

The device can be recycled as electronic waste in accordance with legal regulations.

The technical manual can be downloaded from the Internet at www.aski-energy.at.

The latest ASKI firmware can be downloaded from the Internet at www.aski-energy.com (download area). New firmware can, for example, include new functions and improvements.



Protection class II

Contact address:

ABB AG
Irrseeblick 47
4893 Zell am Moos, Austria

aski-office@at.abb.com
www.aski-energy.com

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ABB AG, Irrseeblick 47, 4893 Zell am Moos, Austriawww.aski-energy.com

Contact details

ABB AG
Irrseeblick 47
4893 Zell am Moos
Austria

T +43 6234 200 10-0
F +43 6234 200 10-50

aski-office@at.abb.com
www.aski-energy.com

Contents

Important information

1.1. Safety instructions

WARNING!

Failure to observe the safety instructions can result in danger to life, injury and damage to the device! ASKI Industrie Elektronik GmbH accepts no liability for any resulting claims!

- Electrical hazard!
  The appliance must only be installed by qualified personnel in accordance with the safety regulations and instructions! Depending on the application, additional legal and safety regulations must be observed when using the device.
- Qualified personnel are persons who are familiar with the installation, assembly, commissioning and operation of the product and have the appropriate qualifications for their work, e.g:
  - training or similar authorization to switch circuits and devices on and off, disconnect, ground and label them in accordance with safety engineering standards.
  - training or similar authorization in relation to the standards of safety engineering in the care and use of the relevant safety equipment.

- In the upper section (inputs and outputs, control lines, bus connections, and Ethernet), only voltages that are safely isolated from hazardous voltages may be connected.

- All screw connections must be checked for tightness before commissioning!

- Unauthorized repair work, conversions, modifications, etc. are not permitted. Repair and adjustment work can only be carried out at the manufacturer's factory

- Do not remove any markings such as: identification signs or cable labels!

- The controller does not have its own power switch! The mains isolating device is the RCD and circuit breaker of the building installation. The switch must be easily accessible and labeled as the disconnection point for the device.

- The protective earth must be connected for safe operation

- Make sure that the controller does not come into contact with heat sources, dirt or water.

CAUTION!

5 safety rules:

- Disconnect the equipment from all power sources!
- Secure the disconnection against being switched on again!
- Check that there is no voltage!
- Ground and short-circuit!
- Cover adjacent live parts and cordon off danger zones!

ATTENTION!

Risk of damage!

Take care not to damage the controller through improper handling.

ESD

Instructions for specialists who are authorized to open the device:
Risk of damage! Electronic components can be destroyed by touching them!

Before handling assemblies, carry out an electrical discharge by touching a metallic, grounded object!

1.2. Intended use

The modern ALS/AZS controller is much more than just a simple data logger for recording meter data. Rather, it is part of ASKI's sustainable concept for the efficient, economical and cost-effective use of energy.
The installation is carried out on a DIN rail, whereby the respective national regulations must be observed here. The same applies to the connection of the controller. The specified ambient conditions are complied with when the appliance is used as intended.
The relevant safety standards were observed during the development, manufacture, testing and documentation of the device. Therefore, the product itself, when used as intended and in accordance with the safety instructions, does not pose any risk of damage to property or personal health.
If the instructions contained in this manual are not followed, the safety devices may no longer be effective and new sources of danger may arise. In the event of use, the relevant safety and accident prevention regulations must be observed independently of the safety instructions in this manual.

1.3. About this manual

This manual is valid for devices of the type ALS-profi sxst/sxbs/sxxp / AZS-ecs xbs/xxp.

Use of this manual:

The illustrations and explanations contained in this manual refer to a typical version of the device. The design of your device may differ from this.
The controller settings can be made directly on the device or via the ALS-Visual V9 energy management software, which provides an easier and better overview of the settings. You can find this software in the download area of our homepage at www.aski-energy.com/downloads. A manual for this is also listed there. Please note that a paid license key is required for the software after 30 days.

2. Variant overview

Profi Smart Standard Version
"ALS-profi-sxst"

Technical data

- 12 digital inputs/outputs freely parameterizable as outputs 24 V DC / 50 mA for loads, operating, fault or alarm outputs, or as inputs 24 V DC, 8 mA delayed. 10mS (25Hz.) for power supply company working and synchronous pulses, tariff changeover, as S0 pulse inputs for meter reading, for various logical link functions or as operating, fault or alarm messages.
- 4 analog inputs for measurement/recording of measurement, sensor and environmental data, optionally (jumper) 0-10 V, 0(4) - 20 mA or Pt1000/Ni1000
- 2 x RS-232 (1 x with handshake), 1 x RS-485
- 1 x USB 2.0 (for test purposes only)
- 1 x Ethernet LAN - 100BaseT to RJ-45
- Plug-in screw terminals (230 V AC supply bonded)
- Firmware update via remote maintenance
- 2 MB RAM
- 8 MB Flash
- At least 4 GB micro SD card
- 32-bit arm processor 168 MHz clock rate
- Compact plastic housing, ABS for rail mounting (45 mm) on DIN rail
- W x H x D: approx. 210 x 100 x 72 mm (12TE)

Functions

- Watchdog: autom. restart after Mains failure
- Emergency stop curve
- "multi-in/out" (linkable outputs)
- "multi-timer" (timer)
- "multi-control" (regulations)
- Alarm processing (e-mail)
- Eco-controller function (option)
- Self-optimization (progressive maximum)
- Up to 16 load groups
- External bus devices (option with AZS-Mxx)
- E-mobility/storage (option with AZS-LSM)
- Tariff management (4 tariffs)

Profi Smart Basic Version **"ALS-profi-sxbs"**	Functions
	like ALS-Profi-sxst, only additionally with: ▪ KNX/EIB Dupline ▪ Programmable as substation master ▪ Parameter switching ▪ Extended control behavior (Std, Hyp, Lin) ▪ Extended tariff management (12 target values) ▪ Up to 128 load groups
Profi Smart Expert Version **"ALS-profi-sxxp"**	Functions
	like ALS-Profi-sxbs, only additionally with: ▪ multi-link (logical links load groups) ▪ 8 main counters (capable of being totaled) ▪ 8 tariffs (special tariff for emergency power) ▪ Kitchen module function ▪ aWATTar (option) ▪ Run evaluation of the load groups, also with I/Os

EnergyController Basic Version
"AZS-ecs-xbs"

Technical data

- 12 digital inputs freely parameterizable as operating, fault or alarm messages as inputs 24 V DC, 8 mA delayed. 10 mS (25 Hz.) for power supply company working and synchronous pulses, tariff changeover, as S0 pulse inputs for meter reading, for various logical link functions or as operating, fault or alarm messages.
- 4 analog inputs for measurement/recording of measurement, sensor and environmental data, optionally (jumper) 0-10 V, 0(4) - 20 mA or Pt1000/Ni1000
- 2 x RS-232 (1 x with handshake), 1 x RS-485
- 1 x USB 2.0 (for test purposes only)
- 1 x Ethernet LAN - 100BaseT to RJ-45
- Plug-in screw terminals (230 V AC supply bonded)
- Firmware update via remote maintenance
- 2 MB RAM
- 8 MB Flash
- At least 4 GB micro SD card
- 32-bit arm processor 168 MHz clock rate
- Compact plastic housing, ABS for rail mounting (45 mm) on DIN rail
- W x H x D: approx. 210 x 100 x 72 mm (12TE)

Functions

- Watchdog: automatic restart after power failure
- 12 digital inputs
- Tariff management (4 tariffs)
- Alarm processing (e.g. e-mail)
- Substation via Ethernet
- External bus devices (option with AZS-Mxx)

EnergyController Expert Version
"AZS-ecs-xxp"

Functions

like AZS-ecs-xbs, only additionally with:

- 12 digital inputs/outputs
  Outputs parameterizable 24 V DC / 50 mA
- “multi-timer” (annual timer)
- “multi-control” (regulations)
- “multi-in/out” (linkable outputs)
- aWATTar (option)
- Eco-controller function (option)
- E-mobility/storage (option with AZS-LSM)

3. Intelligent load management for energy management/energy data loggers

3.1. Who is ASKI?

A head start through innovation
For over three decades, the name ASKI has stood for first-class solutions in the field of energy management and energy cost reduction. With our intelligent load management systems, we have been the Austrian market and innovation leader for many years and are certainly the provider with the best-selling systems in the entire German-speaking region.
In the rapidly growing field of energy monitoring and controlling, we have built up an exceptional market position in recent years, not least thanks to our extensive experience and accumulated expertise. We have hundreds of installed systems and projects as references. From simple solutions for a few metering or measuring points to industrial applications with cross-border group solutions and store chains with hundreds of locations.

i-energy by ASKI™ is the brand and at the same time the motto under which ASKI is constantly developing new products and improving existing systems. This means concentrated know-how packaged in state-of-the-art technology, for future-oriented energy management, for a secure and economical energy supply.
i-energy by ASKI™ stands above all for intelligence in functionality and system design. This means

- precise, meaningful, comprehensible information about energy use that can be accessed at any time
- fully automatic monitoring and alerting, as well as permanently available live data
- optimized, efficient load profile and, as a result, lower consumption and lower electricity prices

A unique feature of ASKI is the ability to combine high-end energy data management and highly efficient load management in a single system. This makes it a forward-looking tool for the modern, economical and efficient use of energy in times of nuclear power phase-out, the energy transition to renewable energies and constantly rising energy prices.
Whether company owners, plant operators, building technicians or energy officers of companies with ISO 50001 certification, with the ASKI systems both experts and non-experts are able to retrieve meaningful, comprehensible and reliable data at the touch of a button and thus understand procedures, processes and temporal-technical relationships.

4. Instructions for use

The **device must only be installed by qualified personnel** in accordance with the safety regulations and instructions**!** Depending on the application, additional legal and safety regulations must be observed when using the device.

Qualified personnel are people who are familiar with the installation, assembly, commissioning and operation of the product and have the appropriate qualifications for their work, e.g:

- Training or similar authorization to switch circuits and devices on and off, disconnect, ground and label them in accordance with safety engineering standards.

- Training or similar authorization in relation to the standards of safety engineering in the care and use of the relevant safety equipment.

4.1. Maintenance instructions

The device is subjected to various safety checks and labeled before delivery. If a device is opened, all safety checks must be repeated.

Attention! No warranty can be given for devices that have not been opened at the manufacturer's plant.

4.1.1. Repair and adjustment

Repair and adjustment work can only be carried out at the manufacturer's plant.

4.1.2. Front overlay

The front overlay can be cleaned with a soft cloth and a standard household cleaning agent.
Do not use acids or acidic agents.

5. Installation instructions

The ALS/AZS controller is intended for fixed installation in low and medium voltage switchgear. The installation position should be horizontal.

5.1. Measuring and auxiliary voltage

Before the ALS/AZS controller is connected to the auxiliary voltages, a disconnecting device (switch or circuit breaker) and an overcurrent protection device (2-6A) must be installed in the building installation in between.
The switch must be easily accessible and labeled as the disconnection point for the device.
Auxiliary power supply 100 - 240 V AC / 50 - 60 Hz, 22 VA, mains voltage fluctuations: +/- 10%

Note: The protective earth must be connected for safe operation

6. Installation and commissioning

Commissioning and installation should be carried out as follows:

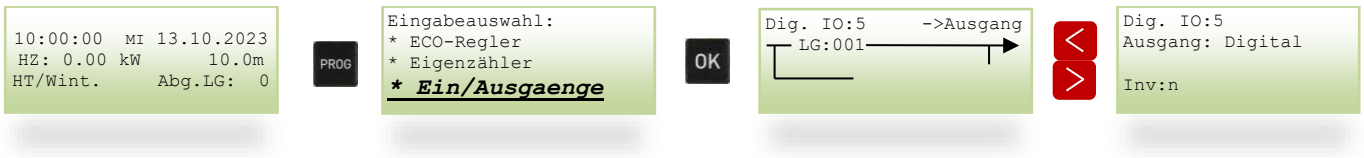
- Install the device
- Apply auxiliary voltage
- Connect the network cable

6.1. Settings directly on the device

The 'PROG' button takes you to the **"Eingabeauswahl" (input selection)**. Use the 'Up'/'Down' cursor keys to select the relevant entry (in this case "Ein/Ausgänge" (Inputs/Outputs)) and confirm with 'OK.'

The field to be changed can be selected in the respective menu using the cursor keys. The parameter or function can be changed using the '+' and '-' buttons. Saving takes place automatically when changing menus or by pressing the 'OK' button. Press the 'PROG' button to end the entry without saving.

6.2. Pulse value for external meters [Ein/Ausgänge] (inputs/outputs)



Dig. IO: Selecting the digital input/output
IO1-4: digital inputs
IO1: 15-minute synchronous pulse
IO2: Main meter pulse

Pulse value: Value of a pulse - is indicated on the meter and must be multiplied by the transformer ratio if necessary.

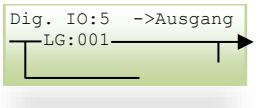
e.g: Meter: 10000 pulse / kWh => 1000 Wh / 10000 pulse = 0.1 Wh per pulse
Transducer: 500/5 => 100

0.1 x 100 = 10 Wh **Pulse value: 10 Wh**

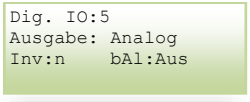
IO5-12: digital outputs - outputs that are linked to the load groups

Output: Digital/Analog: Digital: 0/1 for relay outputs
Analog: 0-100% for electrical load contactors

Example: Link output IO5 with load group 1:

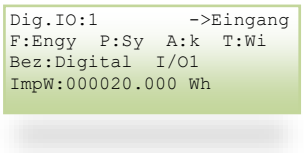


Control of an electronic load contactor



In the basic settings, the 1st load group is switched last and the 8th load group is switched first.

Explanation of the parameter settings for an input and their meaning:

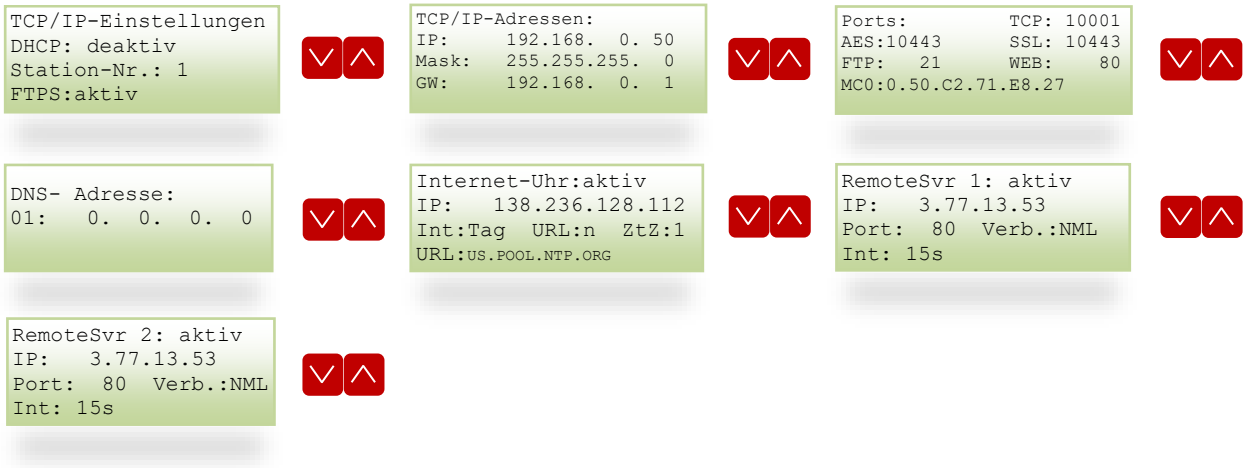


F (type): Engy (energy), Vol. (volume) or BStd (operating hours)
P (period duration): Sy (system) or 1...60 (a value between 1 min. - 60 min.)
A (display factor): M (mega), k (kilo) or _ for no factor
T (tariffs): Al (all tariffs), HT (high tariff only) or Wi (high tariff and low tariff in winter)

The designation Ref: (Digital I/01...12 by default) can be changed in the ALS-Visual V9 software.

6.3. Network settings [Ethernet adapter]

The controller settings relating to the network can be found in the "Ethernet adapter" submenu.

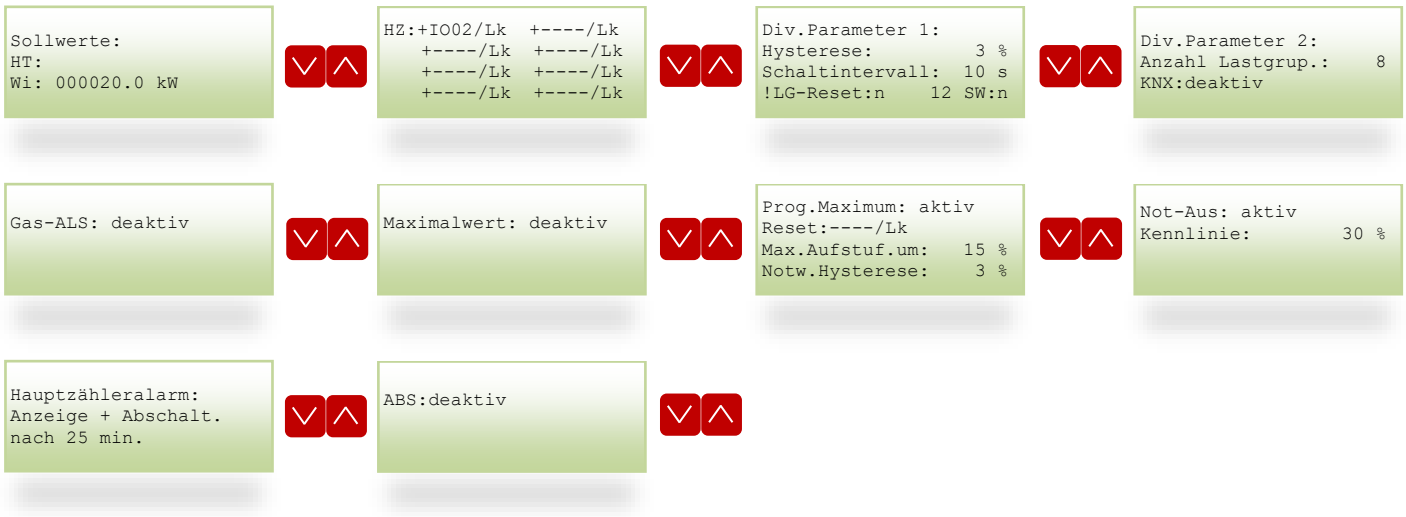


If the IP address has been set correctly and the controller is connected to the network, it can be read out using the ALS-Visual V9 software. The software and the corresponding manual can be found in the download area of our homepage.

To access the controller via the MyAski portal or to enable remote maintenance, the remote server must be activated. You can obtain the current connection settings from ASKI Support.

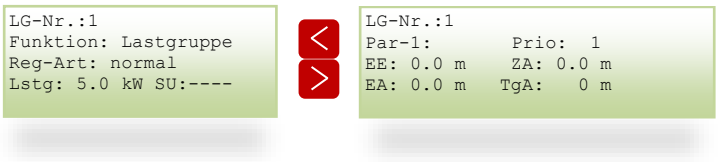
FTPS: ACTIVATION OF UP TO TWO FTP SERVERS ON THE CONTROLLER TO TRANSFER THE DATABASE FILES TO A DESIRED ADDRESS (FTP PULL IF LICENSED).

6.4. Setpoints [Lastkontrolle] (Load control) - (ALS-Profi only)



High tariff/winter setpoints - possible settings: 0.0 - 999,999.9 kW
Selection of up to 8 possible measuring points - possible settings: IO01 - IO12
Various parameters 1: Settings for the control behavior - setting the hysteresis in %, switching interval in seconds and load group reset
Various parameters 2: Set the number of load groups and activate/deactivate KNX.
Activate/deactivate gas load control: Settings for tariffs, meters and hysteresis on activation
Maximum value: activate/deactivate the instantaneous value limit
Prog. maximum: Activate/deactivate progressive maximum - Activate/deactivate reset, maximum increment in % and set hysteresis.
Emergency stop: activate/deactivate, set the characteristic curve in %
Setting the main meter alarm
Activate/deactivate ABS (Aski reactive power system): Setting for Q/U: Activate/deactivate P +/-

6.4.1. Load group settings [Lastgruppen] - (ALS-Profi only)

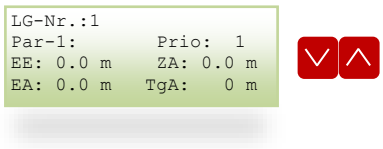


LG no.:1 First load group, preset to I/O 5
LG no.:2 second load group, preset to I/O 6
Etc. up to max. LG no. 128
INFO:

Name	Settings	Description	Standard
Function	Load group, pre-warning, gas LG, EraNet-LG, deactivated	Function of this load group	Load group
Contr. type:	normal, controller	Controller type	Normal
Pwr:	5.0 kW	Power of the load group	5.0 kW
SU:	-----, 1, 2, 3, …, 128	Timer only for this load group	-----

Use the "<" and ">" buttons to select the individual settings and change them if necessary. To change a value, use the "+" or "-" button. If you continue to press one of these buttons, you can access the advanced settings, depending on which controller type (contr. type) you have selected:

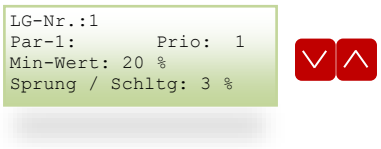
Contr. type: normal (digital -> On/Off e.g.: with relay)



INFO:

Name	Settings	Description	Standard
Par-1:		Parameter 1	
Prio:	1, 2, ... x (x = number of load groups)	Switch-off priority (1 = highest)	1, 2, … x
EE:	0.0 m – 99.9 m	Required switch-on time in minutes	0.0 m
ZA:	0.0 m – 99.9 m	Permissible switch-off time in minutes	0.0 m
EA:	0.0 m – 99.9 m	Required switch-on time in minutes	0.0 m
TgA:	0 m - 1440 m	Maximum daily switch-off time in minutes	0 m

Contr. type: Controller (0-100% with electronic relay)



INFO:

Name	Settings	Description	Standard
Par-1:		Parameter 1	
Prio:	1, 2, ... x (x = number of load groups)	Switch-off priority (1 = highest)	1, 2, ...x
Min Wert:	0 – 99%	The system may be regulated up to this value.	20%
Sprung/ Schltg:	0 - 9%	Jump per recalculation (speed)	3%

6.4.1.1. Descriptions

LG no.: 1: As many consumers can be set as have been defined in the system settings. If the same priority is assigned to 2 or more loads, they are of equal value and the sequence of switch-off is swapped according to a fixed pattern for each switch-off cycle.
Funktion: Selection of normal load group, pre-warning, gas-LG, EraNet-LG or deactivated
Reg-Art: normal (digital) or controller (0-100%)
Lstg: Connected load in kW
SU: Timer selection for this load group only

6.4.1.2. Advanced settings

Prio: The priorities are already preset and correspond to the respective load group number LG-1 = priority 1, LG-2 = priority 2, etc. Priority 1 means the most important load, which is the last to be switched off and the first to be switched on again. If no min/max times have been set for the timer or logic operations influence the switching operations, the load program calculates the switch-off duration of the individual loads.

6.4.1.2.1. Contr. type: normal (digital -> On/Off e.g.: with relay)

EE: Minimum required switch-on time: This time specifies the period for which a load must remain switched on after a restart.
Possible setting time: 0.0 - 99.9 min.

ZA: Maximum permissible switch-off time: This time specifies the maximum period for which a consumer may remain switched off.
Possible setting time: 0.0 - 99.9 min.

EA: Minimum required switch-off time: This time indicates the period for which a load must at least remain switched off in the event of a shutdown.
Possible setting time: 0.0 - 99.9 min.

TgA: Maximum daily switch-off time: This time specifies the maximum period for which a load may be switched off per day.
Possible setting time: 0 - 1440 minutes.

6.4.1.2.2. Contr. type: Controller (0-100% with electronic relay)

Regler: Controller function: Control for electronic load relays (PWM, pulse-pause control)

Min - Wert: This value indicates the minimum value of the load group in %.
Possible setting value: 0 – 99

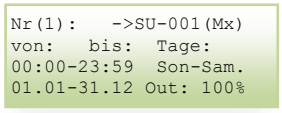
Sprung/Schltg: Jump per circuit: This value specifies the jumps used for control (in the switching interval)
Possible setting: 1 – 9%

6.4.1.3. Pre-warning

Each consumer can be assigned to a pre-warning contact. The pre-warning contact is activated when the respective load needs to be switched off. The switch-off of the respective load (group) is delayed by the time set in this position.
During this pre-warning time, a load group defined as a pre-warning contact is switched on – possibly a warning lamp (setting range 0 - 255 seconds).

In the ALS Visual software, the pre-warning contact can be created after setting up a load group and can then be linked in the desired load group under the "Pre-warning" item.

6.4.2. Timer settings [Schaltuhr]



No.(1):	Up to 128 different timers can be set (selectable with '+' and '-')
->SU-001(Mx)	The following settings are linked to this time switch number
(Mx)	Mx or Mn: For multiple entries, whether the maximum or minimum value applies
00:00-23:59	Time at which this entry should be active
Son-Sam.	Days on which this entry should be active (Sunday-Saturday).
01.01-31.12	Period (date) for which this entry should be active
Out: 100%	This is the effect of this time switch entry when it is active (e.g. 100%)

6.4.3. Serial interfaces [Schnittstellen]

6.4.3.1. RS232 interfaces (SS1 and SS2):

SS1:	inactive	
	Logging	Trace output of current messages
	KNX/EIB	KNX/EIB connection (see description below) (not included with all devices!)
	Dupline	Dupline connection for transferring load groups to Dupline
	Analink	Dupline Analink connection, including transfer of load groups to Dupline
	IR	Connection of an IR sensor for readout directly at the meter
SS2:	MBus	Connection of MBus meters via a level converter
	IR	Connection of an IR sensor for readout directly at the meter
	Logging	Trace output of current messages
	Trace	Trace output of current messages
	IEC-101	Communication via IEC60870-5-101 IEC-104: Communication via IEC60870-5-104 is possible via TCP (can be realized via an additional network switch)

Description of additional input parameters:

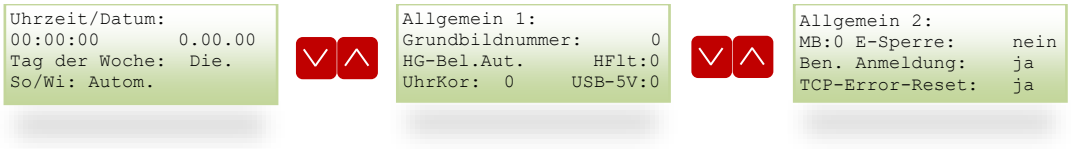
KNX/EIB:	Output of the load group states via the KNX bus B: 9600 Baud rate Transmission interval: 10 s (1-9999 s)

	MnGr.: 10	Main group: 0-15
	MidGr: 0	Middle group 0-7
	Timeout: 0 ms	0-25 ms; 0 = CTS
Dupline:	Output of the load group states	
	Baud rate:	9600 (fixed)
	Type: 3496-05	Dupline master module selection
	Addr: 1	Address 1-15
	LG: A-P	Send load groups to: A-P, C-P, E-P, G-P, I-P, K-P, M-P, O-P
Analink	Dupline with Analink (temperature sensor)	
	B: 115200	Baud rate: 115200, 38400, 19200, 9600, 2400, 300
	Remaining settings as above	
MBus:	Connection of MBus meters	
	B: 9600	Baud rates 300, 2400, 9600
	Send NKE:1	0/1->Release at 1 SND-NKE bit procedure: This procedure starts when a communication is interrupted or at the beginning of a communication. The master (controller) sends this SND_NKE to the slave (e.g.: EM24 meter). As soon as the slave sends a confirmation, a connection can be established. It depends on the slave (meter) whether you have to set this procedure or not.

6.4.3.2. RS485 interface (SS3)

SS3:	Sync-GW	Connection of expansion devices (e.g. Modbus devices)	
		B: 38400	Baud rate: 115200, 38400, 19200, 9600, 2400, 300
	ModbRTU	The station is configured as a Modbus server/slave	
		B: 9600	Baud rates 2400, 9600, 19200, 38400, 115200
		Address: 1	1-255 Address of the controller
		Data: 8/N/1	Data protocol: 8/N/1, 8/even/1, 8/odd/1, 8/N/2, 8/even/2, 8/odd/2
	Bus-Mst	Control unit is configured as bus client/master	
		B: 9600	Baud rates 115200, 38400, 19200, 9600, 2400, 300
		Data: 8/N/1	Data protocol: 8/N/1, 8/even/1, 8/odd/1, 8/N/2, 8/even/2, 8/odd/2
	Poll-GW	Poll gateway (exclusively for internal use for service and development!)	
	IEC-101	Communication via IEC60870-5-101	
		IEC-104: Communication via IEC60870-5-104 is possible via TCP (can be realized via an additional network switch)	

6.4.4. System settings [Systemeinstellungen]



6.4.4.1. Time/date [Uhrzeit/Datum]

The time, date, day of the week and summer/winter changeover can be set here.

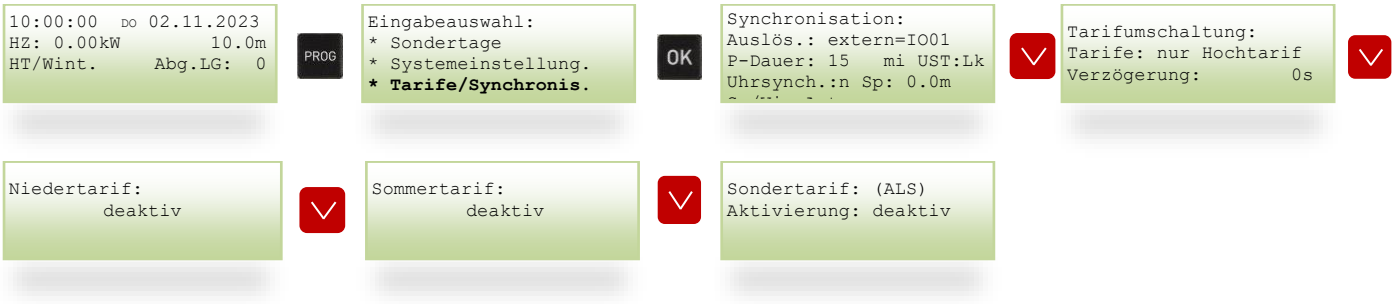
6.4.4.2. General 1 [Allgemein 1]

Grundbildnummer:	Basic screen number: 0-24 - Selection of the display on the start screen
HG-Bel.:	Backlight set to Automatic, On or Off
HFlt:	Hardware error detection 1= On, 0= Off
UhrKor.:	Correction setting of the real-time clock (seconds/day)
USB-5V	Voltage output via the front USB port 1= On, 0= Off

6.4.4.3. General 2 [Allgemein 2]

MB:	Enabling the Modbus server (0 = deactivated, 1 = activated)
E-Sperre:	Activate input lock with yes - no more settings can be changed. To cancel the lock again, you must set the setting back to "no" and immediately press the "PROG" button while the message "Lock activated. Continue with OK" is displayed.
Ben. Anmeldung:	User login via ASKI ALS-Visual yes/no
TCP-Error-Reset:	If the TCP connection is lost for longer than 24 hours, the control unit is restarted

6.4.5. Tariffs and synchronization [Tarife/Synchronis.]



6.4.5.1. Synchronization

Triggering: external= IO01 -> In this case, IO1 is selected

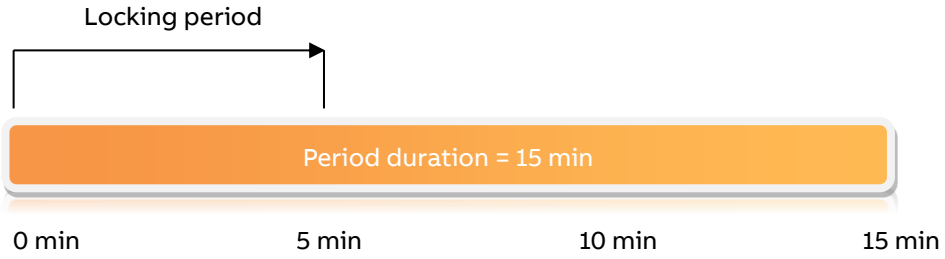
Trigger:

1.) **external:**

Here the synchronization is carried out externally, e.g: IO01, IO02, ...

P-duration: 15 min	1-15 min.
UST: Lk	on which controller the synchronization input was programmed Lk = Local controller or 01, 02, ... substation number
Uhrsynch.: n	The time can be synchronized via the external synchronization input (n = no / j = yes)
Sp: 0.0 m	Locking time: how long the synchronous pulse is locked until a new pulse is accepted.

Example: Locking time = 5 min, i.e. no new period can start in the first 5 minutes of the period. This limits the number of false pulses.

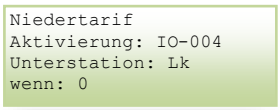


2.) **Time**	It is synchronized via the internal time
P-Dauer:	15 min (1-15 min. possible)
3.) **Master**	The controller receives the synchronization time from the master controller
Uhrsynch.: n	Accept the time from the master controller (n= no / j= yes)
Sp: 0.0 m	Locking time: how long the synchronous pulse is locked until a new pulse is accepted.
4.) **HTx+NTi**	When the high tariff is active, it is synchronized externally and when the low tariff is active, it is synchronized internally
5.) **ext+int**	If the synchronization pulse does not come from an external source, it synchronizes according to internal time

6.4.5.2. Tariff switching

nur Hochtarif	High tariff only
Hoch-& Niedt.	Switching between high and low tariff
Somm. und Win.	Switching between summer and winter tariff
HT, NT, Som+Wi.	Switching between high tariff, low tariff, summer and winter tariff
Verzögerung: 0s	Delay of tariff switching in seconds

6.4.5.3. Low tariff



Aktivierung:	Mst, IO, SU-	Master, input or timer
	001, 002, …	Number of the input or the timer
Unterstation:	Lk, 01,02	Substation number whose input for the special tariff is used; Lc = Local (this) controller
wenn:	0 /1	IO: The tariff is active if the status at the input is 0 or 1

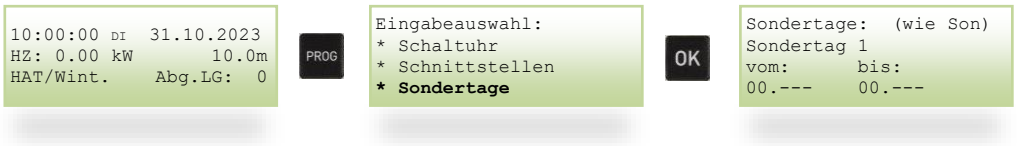
6.4.5.4. Summer tariff

See low tariff

6.4.5.5. Special tariff

This function can be used to change the time programs for the existing tariffs (HT/LT + Wi/Su) for a specific period using a digital input or timer.

6.4.6. Special days



Up to 20 special days can be set up.

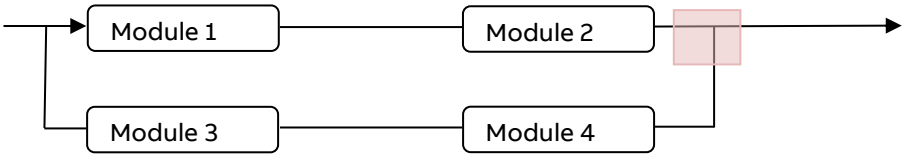
00.--- 00.--- A time period can be entered here, e.g: Dec. 24 to Jan. 1

6.4.7. Function modules [Ein/Ausgänge] (inputs/outputs)

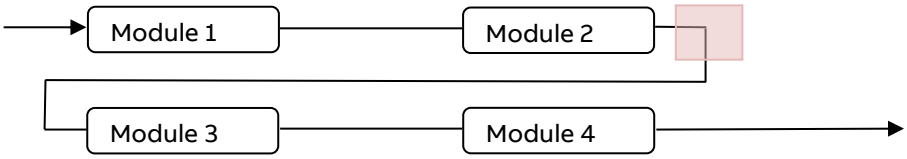
Various function modules are available, which can be linked in series or in parallel with an output. There are 4 modules available per output, which can either all be connected in series or 2 in parallel.

In the default setting, the most important modules are already linked to the outputs.

2 modules in series:

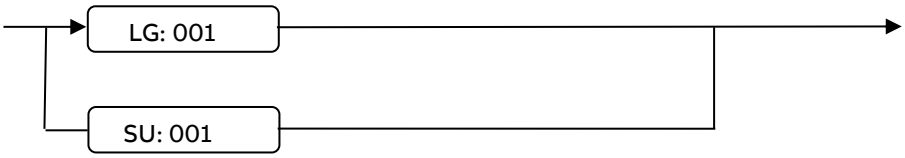


All 4 modules in series:



You can switch between the function modules using the arrow buttons (◄ ►). (+/-) is used to insert a module. To switch between the two variants, the link marked in the red area can be changed.

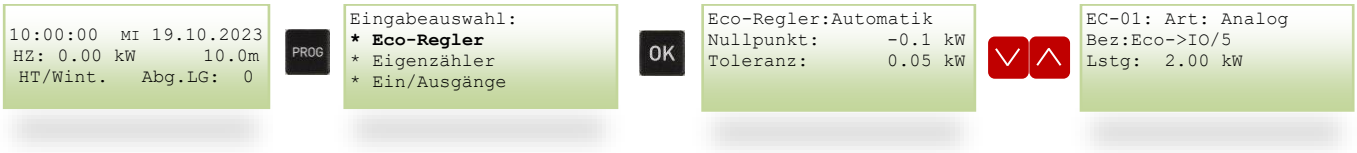
Example 1: Load group 1 with timer function 001:



The output is enabled either by load group 001 or by timer 001.

6.4.8. Eco controller [Eco Regler]

The eco controller ensures that excess energy is not fed into the power grid.
The connected load for the PV system can be found in the "Eco controller" submenu.
The “↓” -button takes you to the first output. Use the”→” button to navigate to the power level, which can be adjusted using the “+/-” buttons. Confirmwith "OK."



Example: An electric heater with an output of 2 kW is controlled via an electronic contactor on the I/O5.

Eco-Regler: Fully automatic, step sequence, deactivated [Vollautomatik, Stufenfolge, deaktiv]

Vollautomatik: Groups are automatically switched depending on the power; the group that matches the power is always switched.

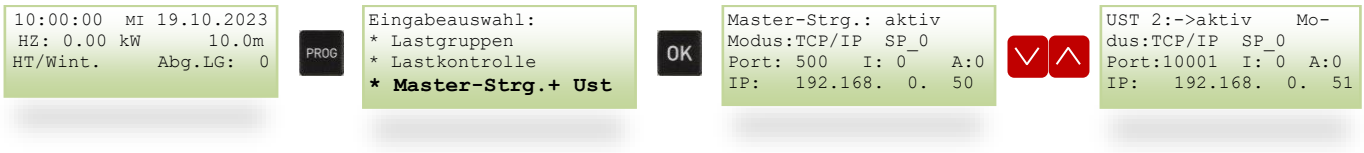
Stufenfolge: Groups are switched from level 1 to level 8.

Nullpunkt: -0.10 kW A zero point can be specified here to which control is applied

Toleranz:	0.05 kW	This is the tolerance of the zero point
Art:	Analog, Digital	
Bez.:	Designation of the eco controller	
Lstg.:	Output power	

The parameterized eco controllers are linked via the outputs.

6.4.9. Master Ctrl. + Subst. [Master-Strg. + Ust.]



In a system with several controllers, it makes sense to define one controller as the master controller.

Name	Settings	Description	Standard
Master-Strg. :/UST 2-31	Activate/deactivate	Activation of the master or substation	Inactive
Port: 10001	500-65535	Port of the master or substation	10001
I: 0	0-255 seconds	Interval that must be maintained between 2 controller queries	5 sec.
A: 0	0, 1, 2	Alarm evaluation: Standard, fast, very fast	0
IP: 192.168.0.50	0.0.0.0 – 255.255.255.255	IP address of the master or substation	192.168.0.50

6.5. AZS-ecs-xxp(z) with AZS-M20/M40/M80: [Ext. Zähler] (external meters): Modbus

M-Bus meters can be read and recorded via Ethernet using an Ethernet/M-Bus converter, but also via RS232 using a level converter.
Meters with a Modbus connection can be recorded and also logged either via the RS485 interface or with the help of a "Modbus/Ethernet" gateway via Ethernet.

Note: The Ethernet variant is particularly suitable for more distant meters that can be connected via the (company) network to the controller.

6.5.1. Creating a new Modbus meter

1.) Selecting a meter and switching to Modbus or MBus
2.) Setting the type of interface
3.) Entering the address of the meter
4.) Selecting the type of meter

6.5.2. Additional Modbus settings

Designation	Settings	Description	Default value
Aktivierung	Deactivate, Modbus, MBus	The meter can be activated here	Inactive
Comm (C)	Ser. interface (1) TCP/IP (2)	Type of interface	Serial interface
Addresse (Adr)	0-255	Address of the Modbus meter	Number of the meter, e.g: 1
Art	WM14, WM14 Adv., EM21, EM24, EM26-96, EMM-54, ESR7000, ESR7000i, Diris A20, Diris A40/41, PAC3100, PAC3200, PAC4200, …	Type of meter connected	WM14
Periodendauer (PD)	Sy=System, 1,2,3,4,5,6,10,12,15,20,30,60 minutes	Period duration of the meter	System
Tarife (T)	High tariff only, all tariffs, HAT+LT	Tariff selection	High tariff only
Baudrate (BD) (1)	System, 300, 2400, 9600, 19200, 38400	Baud rate of the meter	System
Data	System, 8/none/1, 8/even/1, 8/odd/1, 8/none/2, 8/even/2, 8/odd/2	Protocol	System
IP-Adresse (2)	0.0.0.0 – 255.255.255.255	IP address of the gateway	192.168.0.100
Port (2)	1-65535	Port of the gateway	502

6.6. External meters: MBus

With the AZS-ecs-xxp(z) with AZS-M20/M40/M80, up to 80 MBus meters can be read out via TCP/IP or with a level converter via RS232.

6.6.1. Create MBus meter

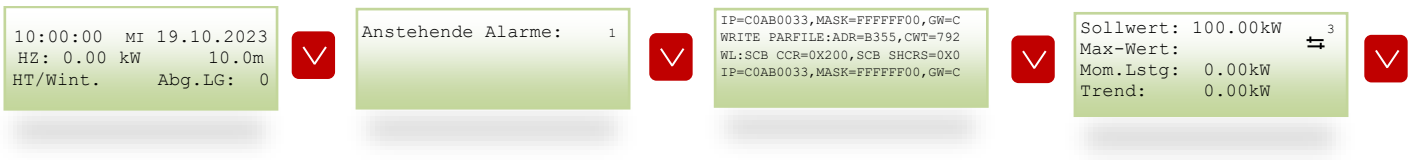
1.) Set meter to MBus
2.) Setting the type of interface
3.) Enter bus address

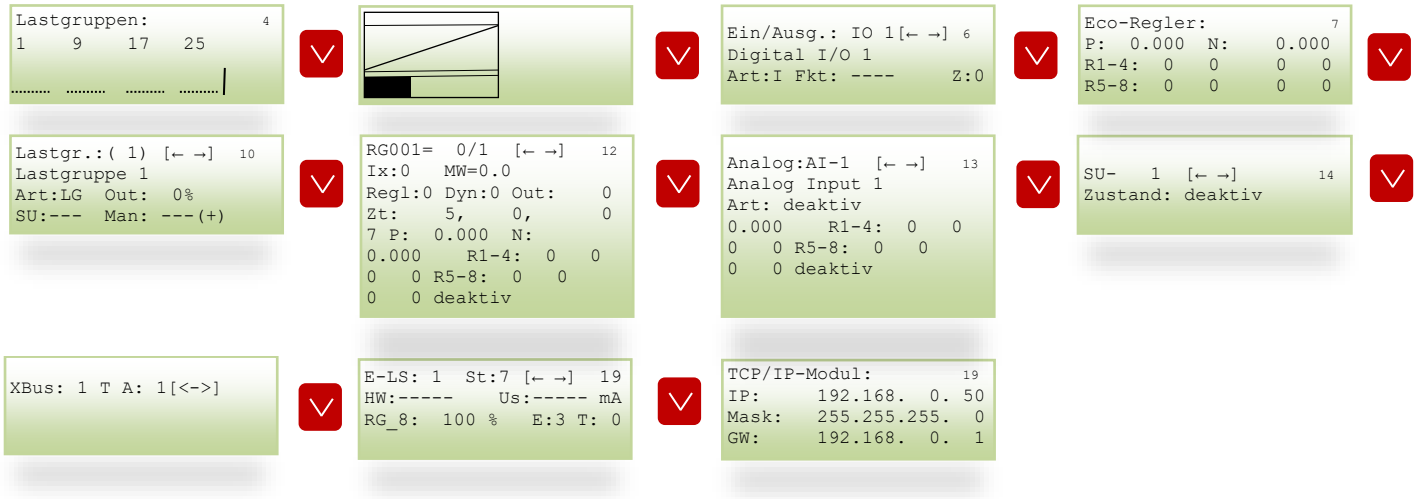
6.6.2. Additional MBus settings:

Designation	Settings	Description	Default value
Aktivierung	Deactivate, Modbus, MBus	The meter can be activated here	Inactive
Comm (C)	Ser. Interface (1), TCP/IP (2)	Type of interface	Serial interface
Adresse (Adr)	0-255	Address of the Modbus meter	Number of the meter, e.g.:1
Identifikationsnummer (ID)		ID of the meter with the specified address	0
Periodendauer (PD)	Sy=System 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60 minutes	Period duration of the meter	System
Tarife (T)	All tariffs, high tariff only, HT+LT	Tariff selection	High tariff only
SND_NKE Bit (SdNk)	y/n	SND_NKE Bit procedure switched on or off	System
IP-Adresse (2)	0.0.0.0 – 255.255.255.255	IP address of the gateway	192.168.0.103
Port (2)	1-65535	Port of the gateway	502
Baud-Rate (Bd) (1)	System (Sys), 300, 2400, 9600, 19200, 38400	Baud rate	Sys

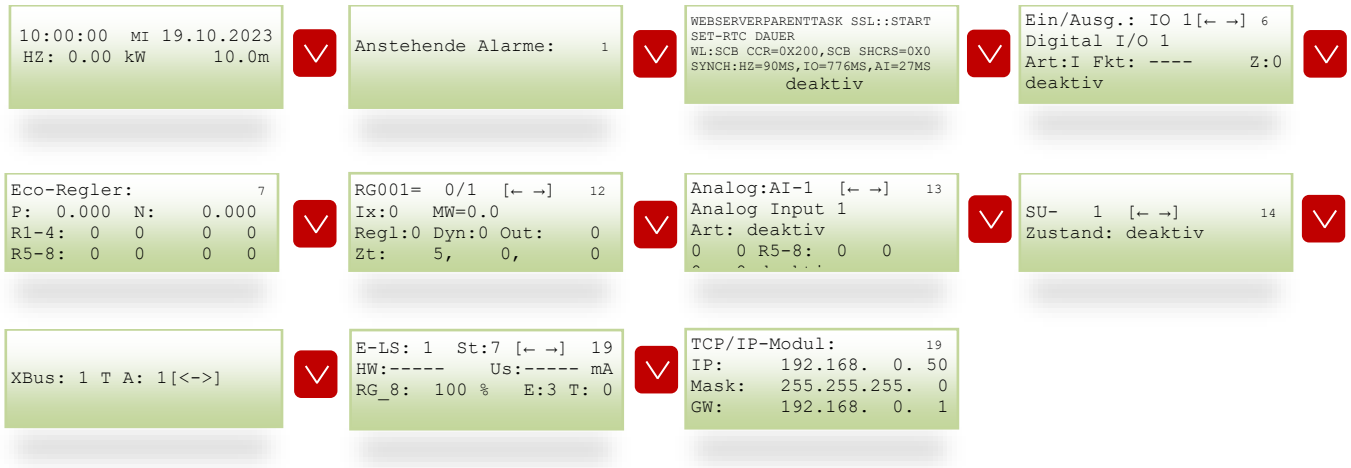
7. Operation

7.1. Overview of displays ALS-profi sxst/sxbs/sxxp



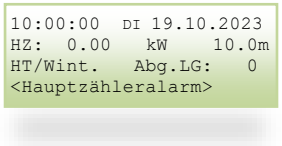


7.2. Overview of displays AZS-ecs xbs/xxp



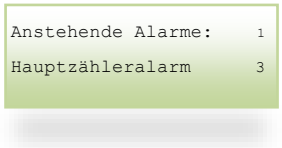
7.3. Controls and instantaneous values

You can use the cursor keys ("↑" and "↓") to switch between the display windows.



Time and date, current power, period time, current tariff, load groups switched off

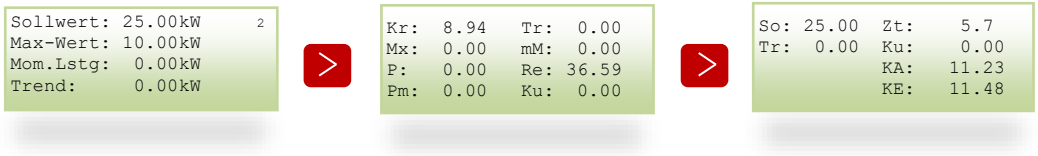
7.3.1. Alarms



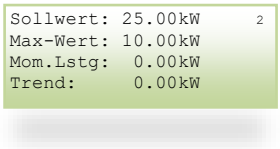
The pending alarms are displayed here.
Meaning of the number on the right:

1: Alarm was active, but has not been acknowledged
2: Alarm is active, but has been acknowledged
3: Alarm is active and has not yet been acknowledged

7.3.2. Instantaneous values

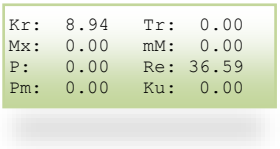


7.3.2.1. Instantaneous values view 1



Sollwert:	Current power setpoint in kW. With automatic tariff switching, the setpoint of the active tariff.
Max-Wert:	A maximum value limit can be entered to protect feed-in fuses or supply cables. If the current power exceeds the specified maximum power, the loads are switched off in the same way as when the setpoint is exceeded. (Always select the max. value higher than the setpoint!!!).
Mom.Lstg:	Instantaneously determined power.
Trend:	The trend value (mean value) shows the average consumption of the current period, calculated over the period duration (e.g. 15 min.)

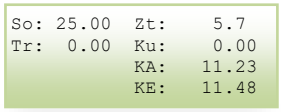
7.3.2.2. Current values view 2



Kr:	Correction value	The value that would be necessary in order not to exceed the target value
Tr:	Trend value	The trend value shows the average consumption for the current period, extrapolated to the period duration (e.g. 15 min.).
Mx:	Maximum power	The measured maximum power of the current period
mM:	Average maximum	The average performance of the current period

P:	Performance	Current performance
Re:	Residual power	The power that can be consumed on average in the remaining time of the current period without exceeding the set target value.
Pm:	Average actual value	The averaged actual value of the power
Ku:	Cumulative power	The cumulative power shows the work consumed in the current period, offset against the period duration.

7.3.2.3. Instantaneous values view 3



So: Current power setpoint in kW. With automatic tariff switching, the current setpoint value.

Tr: The trend value shows the average consumption for the current period, calculated over 15 minutes.

Zt: Elapsed time since last synchronous pulse.

Ku: Accumulated output - work consumed in the current period over the period duration.

KA: Switch-off characteristic; if the trend value rises above this value, the loads are switched off.

KE: If the trend value falls below this value, the loads are switched on.

Curve 2 active:

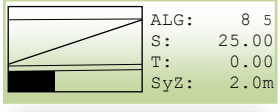
A2: Switch-off characteristic curve 2. If the trend value rises above this value, the K2 loads are switched off.

E2: Switch-on characteristic curve 2. If the trend value falls below this value, the loads are switched on.

7.3.3. Load group status

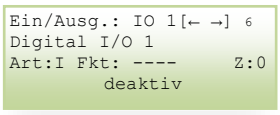
Status display of the individual load groups. If the load group is switched on, a bar is displayed.

7.3.4. Period view



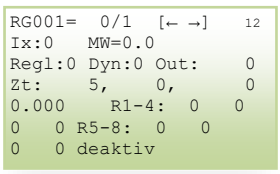
In the upper field you can see the course of the current period. In the lower field, you can see the corresponding circuits. (ALG=Completed load groups, S=setpoint value, T=trend value and SyZ=synchronization time)

7.3.5. I/O: Inputs/outputs



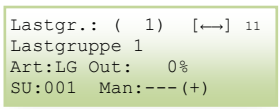
Designation, type, function and status of I/O1 - I/O 12

7.3.6. Regulations



RG001	Regulation number
0/1	Part one: Control output value, second part: Status activate/deactivate
Ix:0	Internal number (index) of the control
IO1=0/MW:0.0	Current measured value of the source
Regl:0	0 = "If: off", 1= "If: on"
Dyn:0	Edge flag (internal state change memory)
Out:0	Initial value
Ti: 5.0.0	Times: Response time(s), reset delay(s), minimum running time(s)

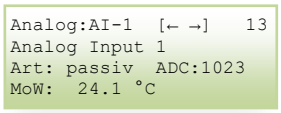
7.3.7. Load groups



Lastgr.:	Number of the load group
Lastgruppe 1:	Designation of the load group
Art:	Function of the load group (LG - load group, VW - pre-warning contact, GG - gas load group, FP - Era Net, deactivated)
Out:	Instantaneous output value

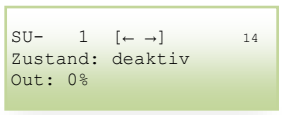
SU:	Linking with a timer
Man:	Manual override of the load group for the current period (with + -> OFF -> ON -> ---)

7.3.8. Analog inputs



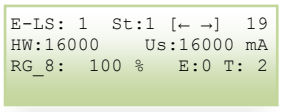
AI-1.:	Number of the analog input
Analog input 1:	Designation
Art:	passive - Temp. sensor, active - 0-10V / (0) 4-20 mA, deactivated.
ADC:	Current A/D converter output value (0-1023)
MoW:	Instantaneous value

7.3.9. Timer



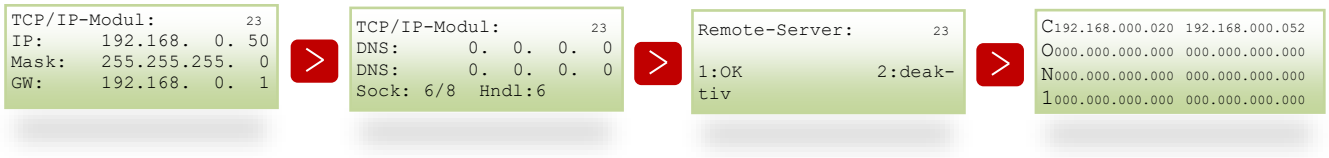
Status display of the respective timer

7.3.10. E-charging station



E-LS:	Number of the respective charging station
St:	Status (depending on the charging station used)
HW:	Possible charging current of the station (mA)
Us:	Charging current specification (mA)
Rg:	Linked control / default value
E:	Error message (depending on the charging station used)
T:	Timer read interval

7.3.11. TCP/IP module



Current TCP settings. If flashing, there is no connection to the network. If 0 is displayed everywhere, DHCP is activated, but the controller has not yet received an IP address.

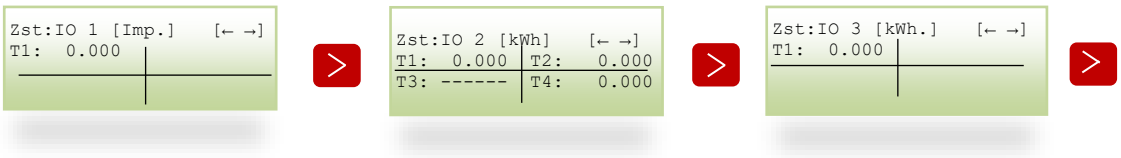
Remote server 1/2: OK - Controller is connected to the remote server
NOK - Controller cannot establish a connection to the remote server
deaktiv - Remote server was not activated in the network settings

CON1: shows the existing IP connections to the controller.

8. Data

Press the DATA button to access the data menu. Use ∨ and ∧ to switch to the next/previous view.

8.1. State



The consumption of the individual inputs is displayed here

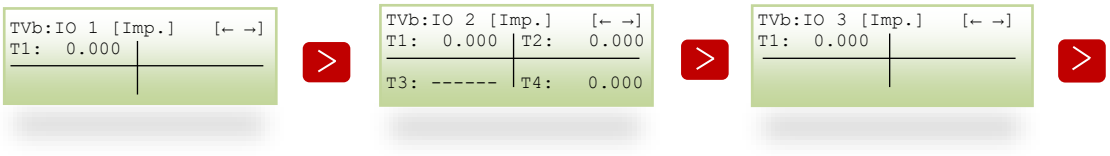
Imp. Pulses

kWh: Kilowatt hours

HrOut: Indication in hours of how long the output is switched on

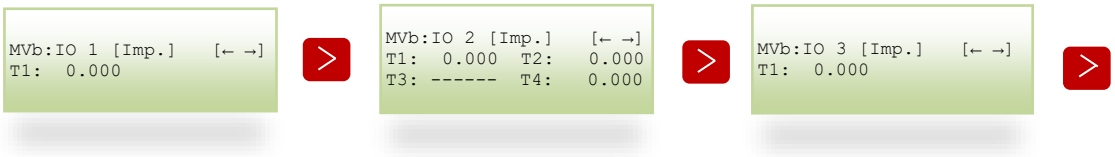
T1, T2, T3, T4: Tariff selection

8.1.1. Daily consumption [TVb]



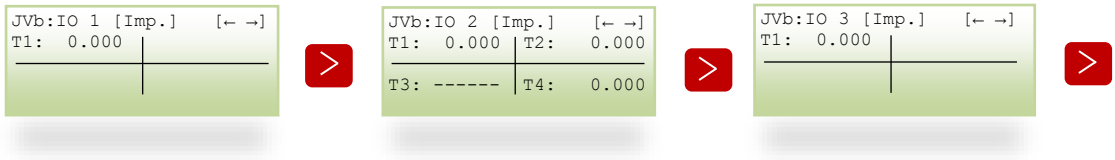
Use the ">" and "<" buttons to navigate between the inputs; the daily consumption is displayed here.

8.1.2. Monthly consumption [MVb]



The monthly consumption shows the consumption for the current month.

8.1.3. Annual consumption [JVb]



The annual consumption shows the consumption for the current year.

9. Procedure in the event of an error

Possible error	Possible cause	Remedy
Display dark or picture frozen.	Power supply missing or processor error	Reset the device (red button below the "Mini-USB" port), disconnect it from the power supply and reconnect it or send the device to the manufacturer for repair.
No s measurement values in the controller	Meter not connected correctly or incorrectly parameterized or communication problem (Modbus)	Check connections and correct if necessary. Send the device to the manufacturer for repair.

Alarms

Synchronous alarm:	Failure of the synchronization pulse: Cable connection interrupted, input or coupling relay defective	Check cable connection and correct if necessary Replace the coupling relay or use another input or send the device to the manufacturer.
Watchdog alarm	Internal error in the controller	Acknowledge alarm, device restarts automatically. For permanent display: Device defective→ Send the device to the manufacturer for repair

Data transmission alarm	The device is configured as a substation and does not receive any data from the main station	Check cable connection and correct if necessary Main station defective: Send to the manufacturer for repair
Bus device alarm = devices connected via serial interfaces and network are not accessible	Device not connected	Check cable connection and correct if necessary Check device and replace if necessary
Dupline/Analink	Communication errors to the devices, bus error	Check cable connections, check bus settings on the controller and on the extension devices
KNX/EIB alarm	KNX/EIB transmission error	Check connection to KNX
FTP client alarm	FTP server not accessible	Check network connection and correct if necessary Contact the system administrator of the server
Maximum value alarm	The set maximum value of the instantaneous power has been exceeded	Reduce load peaks, check load management settings
Emergency stop alarm	The setpoint of the load control has been exceeded by the set emergency stop limit.	Reduce load, check load management settings
Main meter alarm	Failure of the metering pulse: Cable connection interrupted or coupling relay defective, meter defective, input defective	Check cable connection and correct if necessary or replace coupling relay, check meter or use another input or send device to the manufacturer
Substation read error	Cable connection interrupted; Error in the TCP/IP network	Check network connection and correct if necessary Contact the system administrator of the server
File error	Internal SD card defective	Send the device to the manufacturer for repair
Email sending	Mail server not reachable	Check network connection and correct if necessary Contact the system administrator of the server
Internet clock	Time server not available	Check network connection and correct if necessary Contact the system administrator of the server
E-mobility/storage	Communication to the e-charging station/storage facility disrupted,	Check settings, check network connection of the controller and the charging station

Network

No connection to the PC	Network cable not plugged into the controller/PC	Check connection on controller/PC and correct if necessary.

	Incorrect network data (IP address, subnet mask, gateway) set on the controller/PC	Check network data on the controller/PC and correct if necessary
	Controller and PC are not in the same network	Check network data on controller/PC and correct if necessary, otherwise contact network administrator (forwarding)
	DHCP set on the controller	Set DHCP to "deactivated" and assign a fixed IP address; see Network settings [Ethernet adapter].
	Antivirus/firewall blocked	Create exception rule for ALS_Visual.exe

Sub-meter, e.g. from the energy supply company

Meter value is incorrect	Pulse value set incorrectly	Check pulse value on the controller/external counter and correct if necessary; see Pulse value for external counters [Inputs/Outputs].

M-Bus (only with option M8/M20/M32/M40)

M-Bus device is not recognized	M-Bus device not connected or not connected correctly to the level converter	Check the connection of the cable from the M-Bus meter to the level converter and correct if necessary (see connection diagram)
	Level converter not connected or not connected correctly to the device	Check the connection of the level converter and correct if necessary (see connection diagram)
	Level converter not supplied with power	Check the power supply of the level converter
	Incorrect primary address specified	Check the primary address of the M-Bus meter and correct if necessary
	Values are not displayed correctly	Set the SND_NKE bit to active
Despite the above measures, the device does not work	Device defective	Send the device to the manufacturer for inspection with a precise description of the fault

10. Maintenance

The controller is basically maintenance-free, but must be checked regularly by the owner for indicated alarms or defects at the connections and for damage to the housing.

If necessary, clean the housing of the controller with a damp cloth. Stubborn stains can be removed with a mild, solvent-free, non-abrasive cleaning agent.

10.1. Service

If you have any further questions, please contact us directly. We need the following information to process your questions more quickly:

- Device designation (see type plate),
- Serial number (see type plate),
- Firmware release (see type plate),
- Measuring and auxiliary voltage and
- exact error description

You can reach us from: Monday to Thursday between 7:30 am to 4:30 pm
and on Friday between 7:30 am to 12:00 pm

ABB AG
Irrseeblick 47
A-4893 Zell am Moos

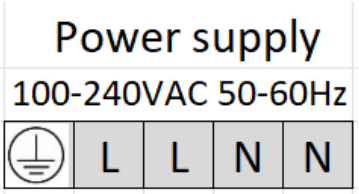
Support: Phone: +43 6234 20010-0
Fax: +43 6234 20010-50
e-mail: aski-office@at.abb.com
www.aski-energy.com

11. Technical data

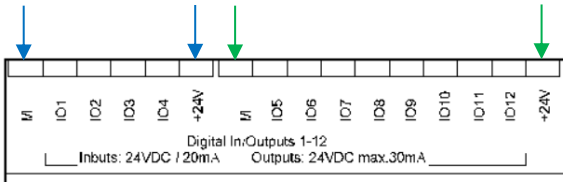
- 12 digital inputs/outputs - freely parameterizable as outputs 24 V DC / 50 mA for loads, operating, fault or alarm outputs, or as inputs 24 V DC, 8 mA delayed 10 mS (25 Hz.) for power supply company working and synchronous pulses, tariff changeover, as S0 pulse inputs for meter reading, for various logical link functions or as operating, fault or alarm messages.
- 4 analog inputs for measurement/recording of measurement, sensor and environmental data, optionally 0-10 V, 0(4) -20 mA or Pt1000/Ni1000 (jumper)
- 2 x RS-232 (1 x with handshake), 1 x RS-485
- 1 x USB 2.0 (for test purposes only)
- 1 x Ethernet LAN - IP 100BaseT on RJ-45
- LCD graphic display, backlit (approx. 40 x 20 mm)
- Compact plastic housing, ABS for series installation (45 mm) on DIN top-hat rail, W x H x D approx. 210 x 100 x 72 mm (12TE)
- Auxiliary power supply 100 - 240 V AC / 50 - 60 Hz, 22 VA, mains voltage fluctuations: +/- 10%
- Optional power supply via 24 V DC possible
- Overvoltage category II
- Protection class IP20, only indoors up to a maximum altitude of 2000 m above sea level
- Weight approx. 550 g
- Degree of contamination PD2
- Operating temperature 0 to +40°C; storage temperature -20 to + 60°C
- Relative humidity for operation: 0-80%
- 2 MB RAM data memory with buffering (Goldcap-Elko - ~14 days)
- At least 4 GB micro SD card for long-term data storage
- Hardware clock with automatic S/W switching
- WatchDog program monitoring; automatic restart after power failure
- Pluggable screw terminals (max. 2.5 mm2)
- Firmware update and system upgrade possible via network
- Optional energy management software with BAFA [Federal Office for Economic Affairs and Export Control] funding approval for ISO 50001 certification

(Errors and technical or functional changes reserved)

11.1. Auxiliary power supply



Optional 24 V DC



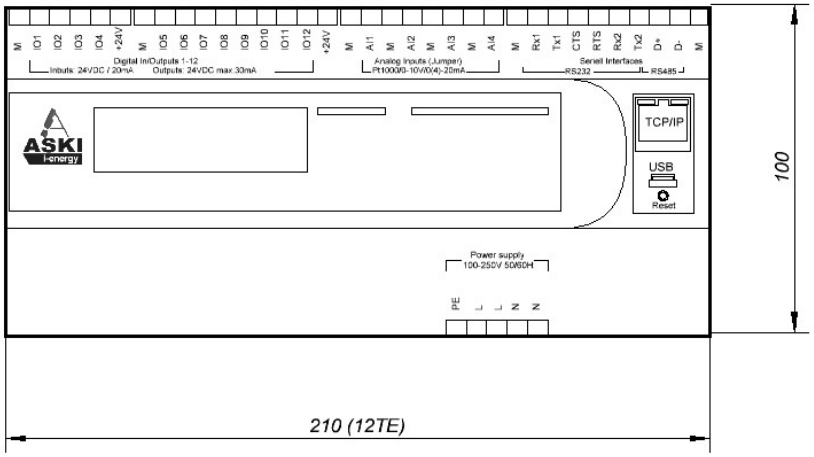
Possible danger due to voltage differences between 24 V supply and input terminal:

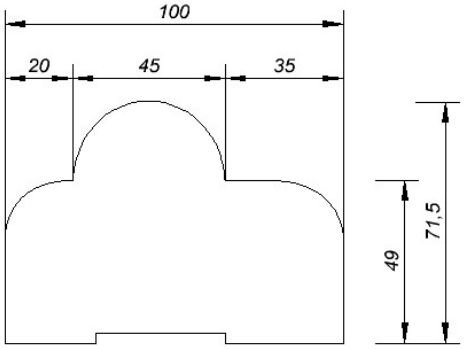
If several 24 V voltage sources are used, the individual 24 V domains can differ significantly from one another (DC voltage difference, influence of load, ripple, etc.).
If devices that are supplied from different sources are connected directly to each other, the voltage differences and resulting equalizing currents can damage the hardware.

It must be ensured that there is no significant voltage difference between the 24 V supply and the 24 V input voltages.

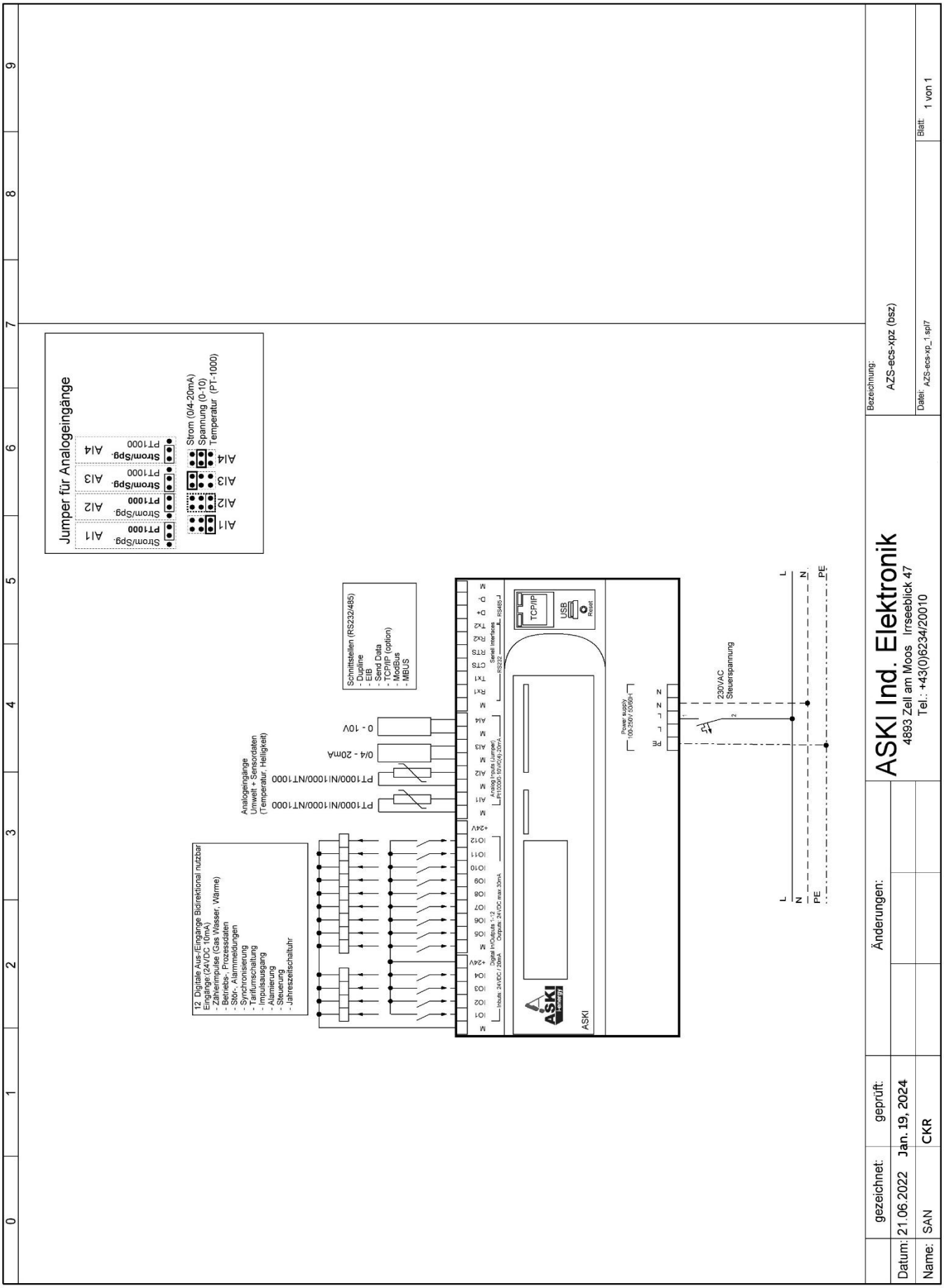
This is achieved either by supplying all devices connected to the ASKI controller via a common power supply unit or by feeding in signals from other 24 V voltage sources in an electrically isolated manner (e.g. via modules with relays or optocouplers).

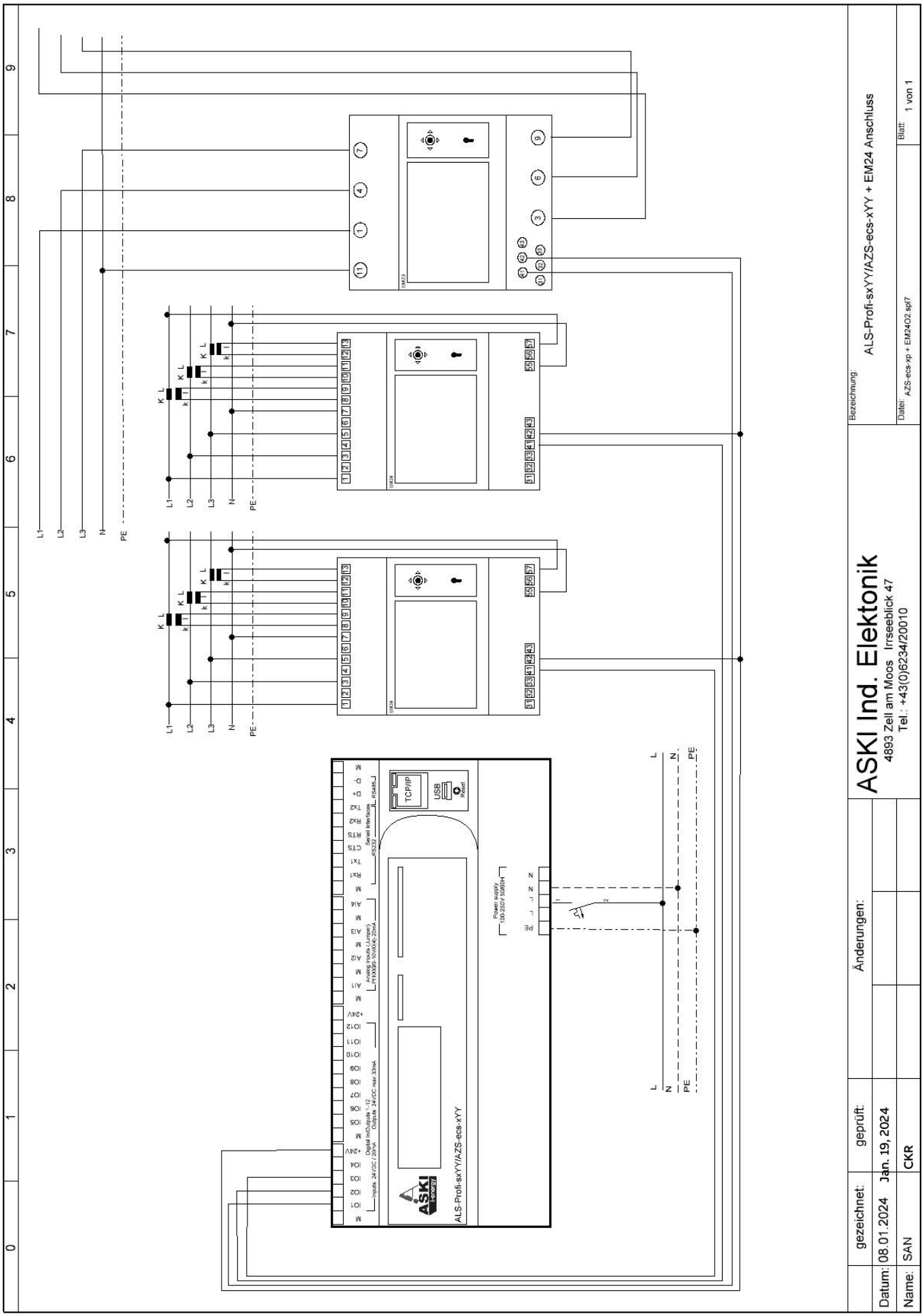
11.2. Dimensions

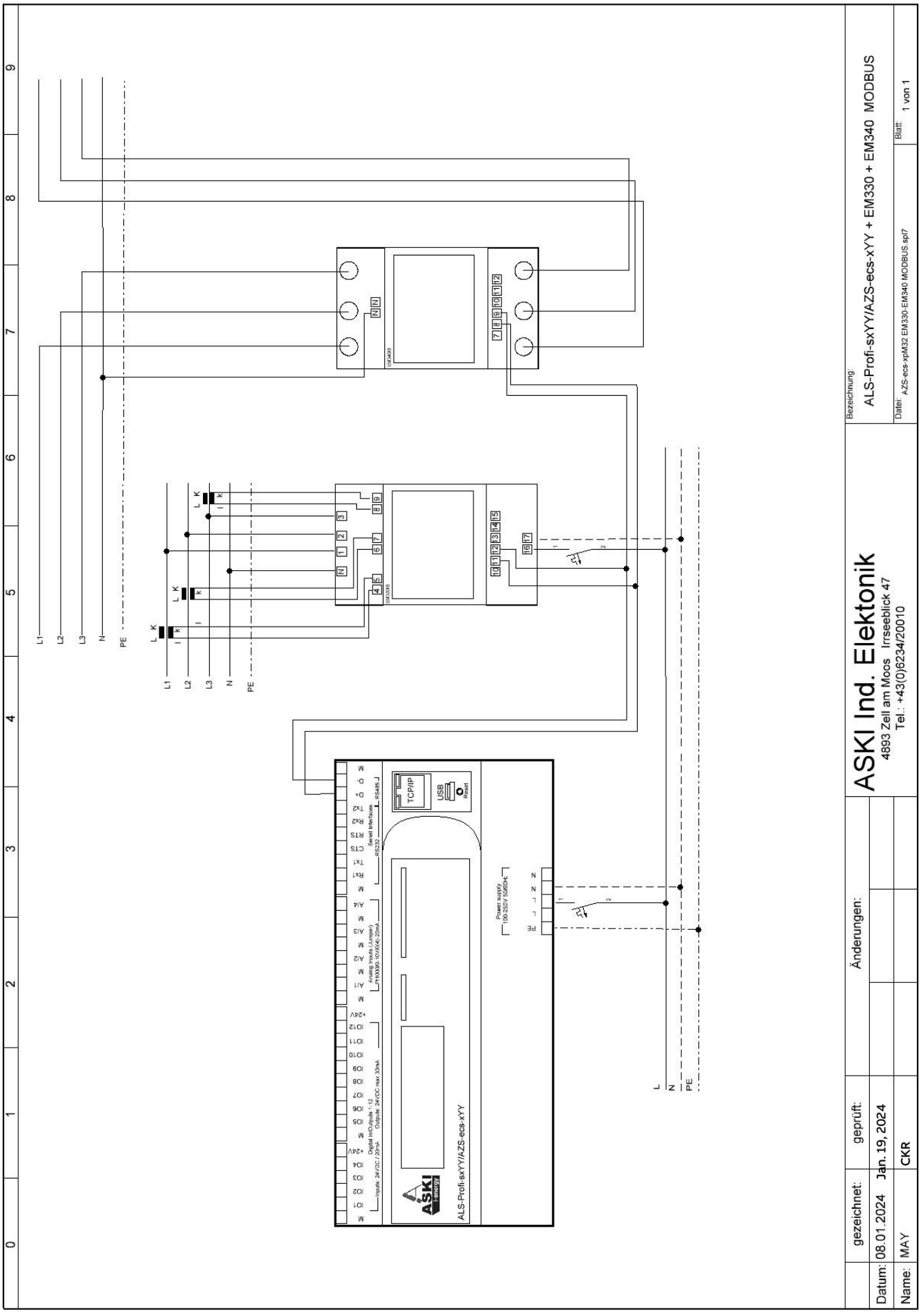


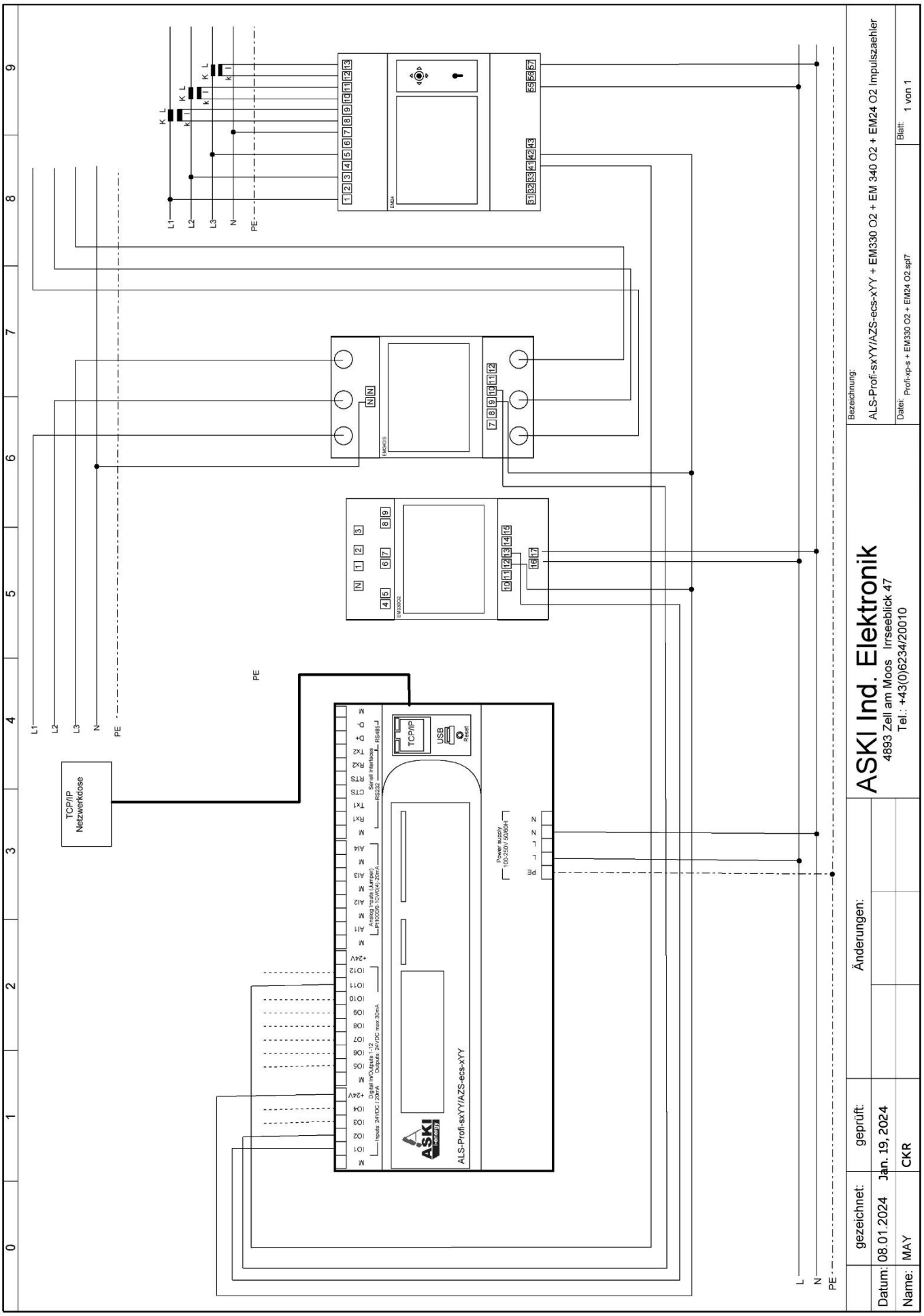


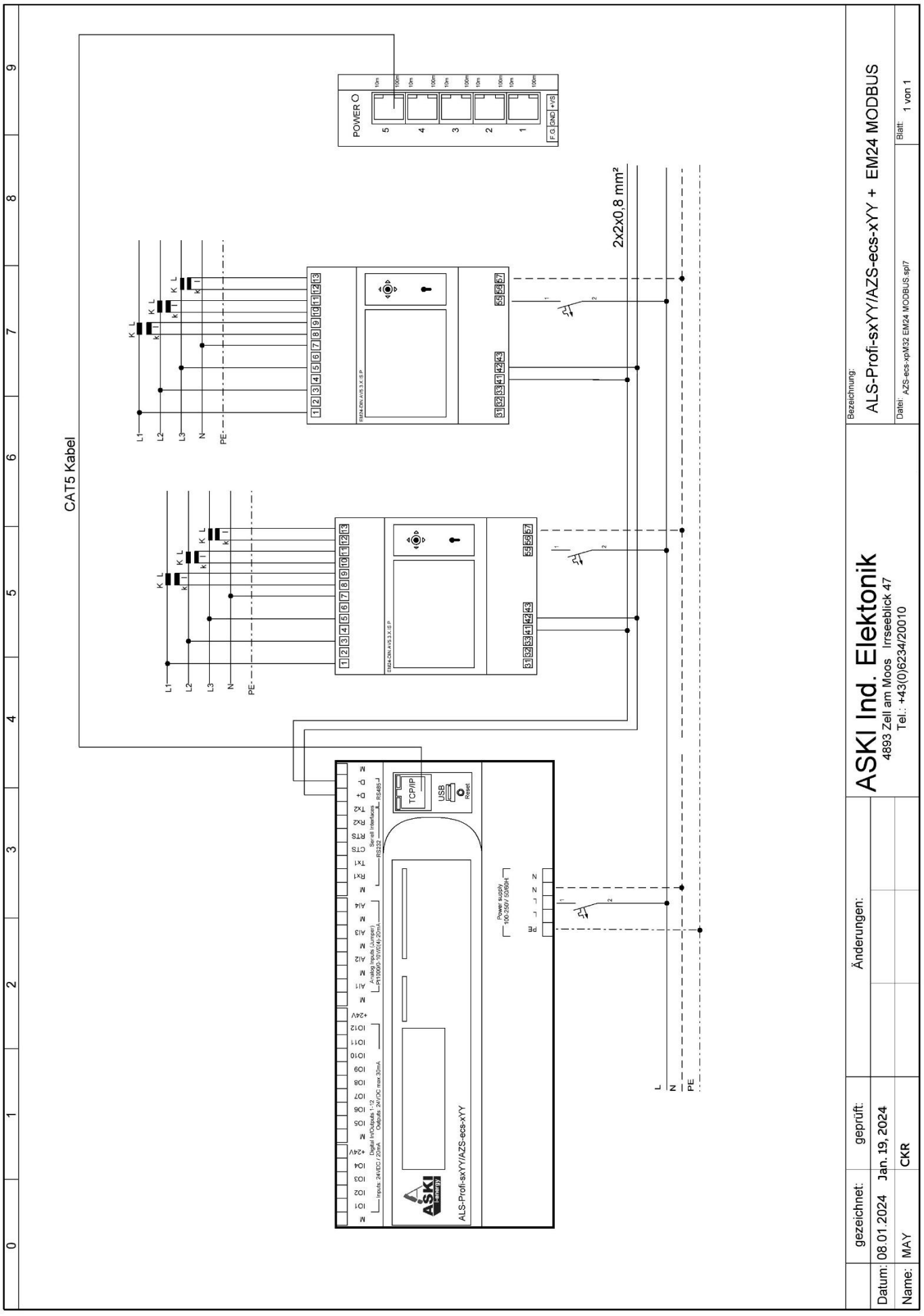
12. Wiring diagrams

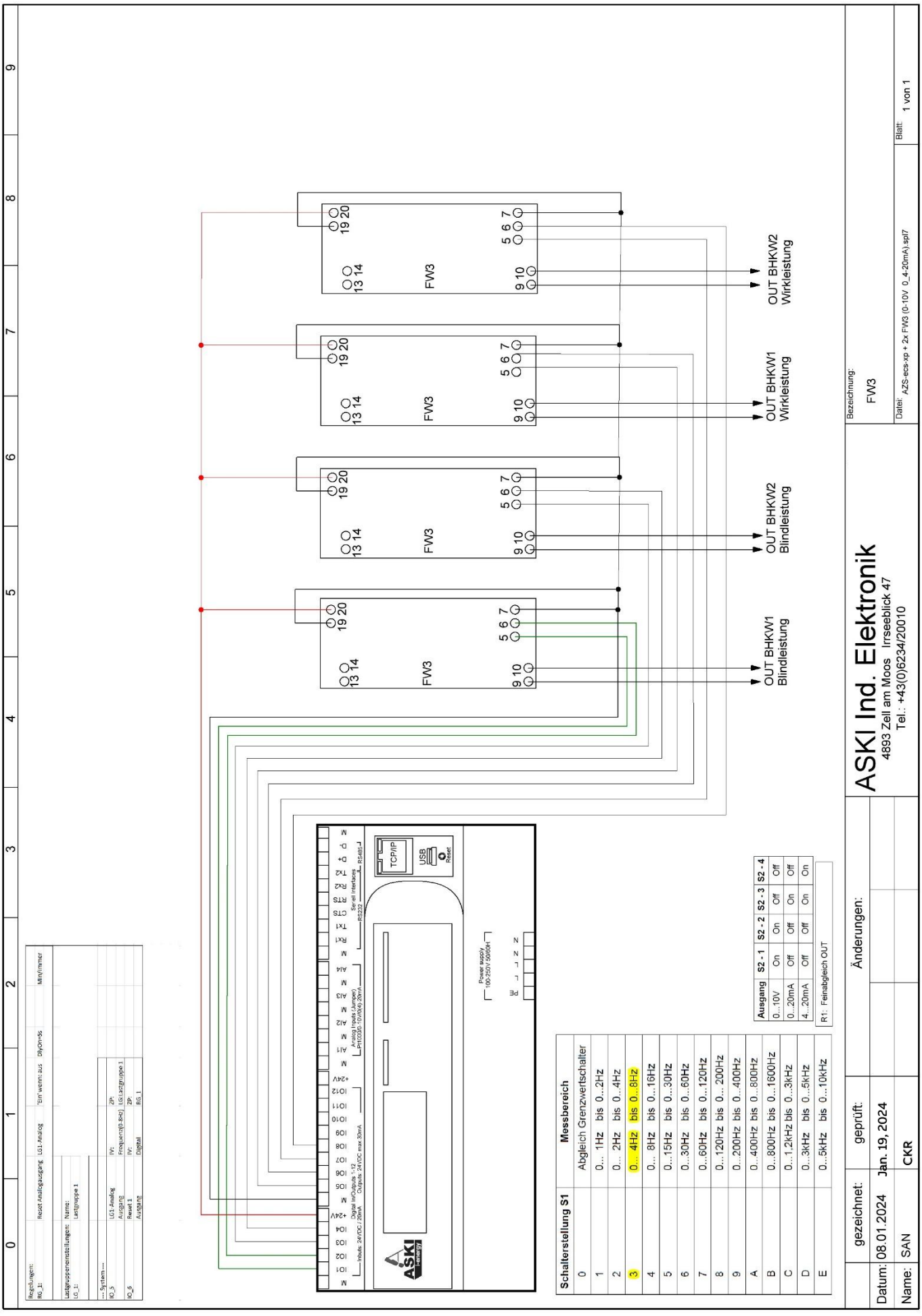


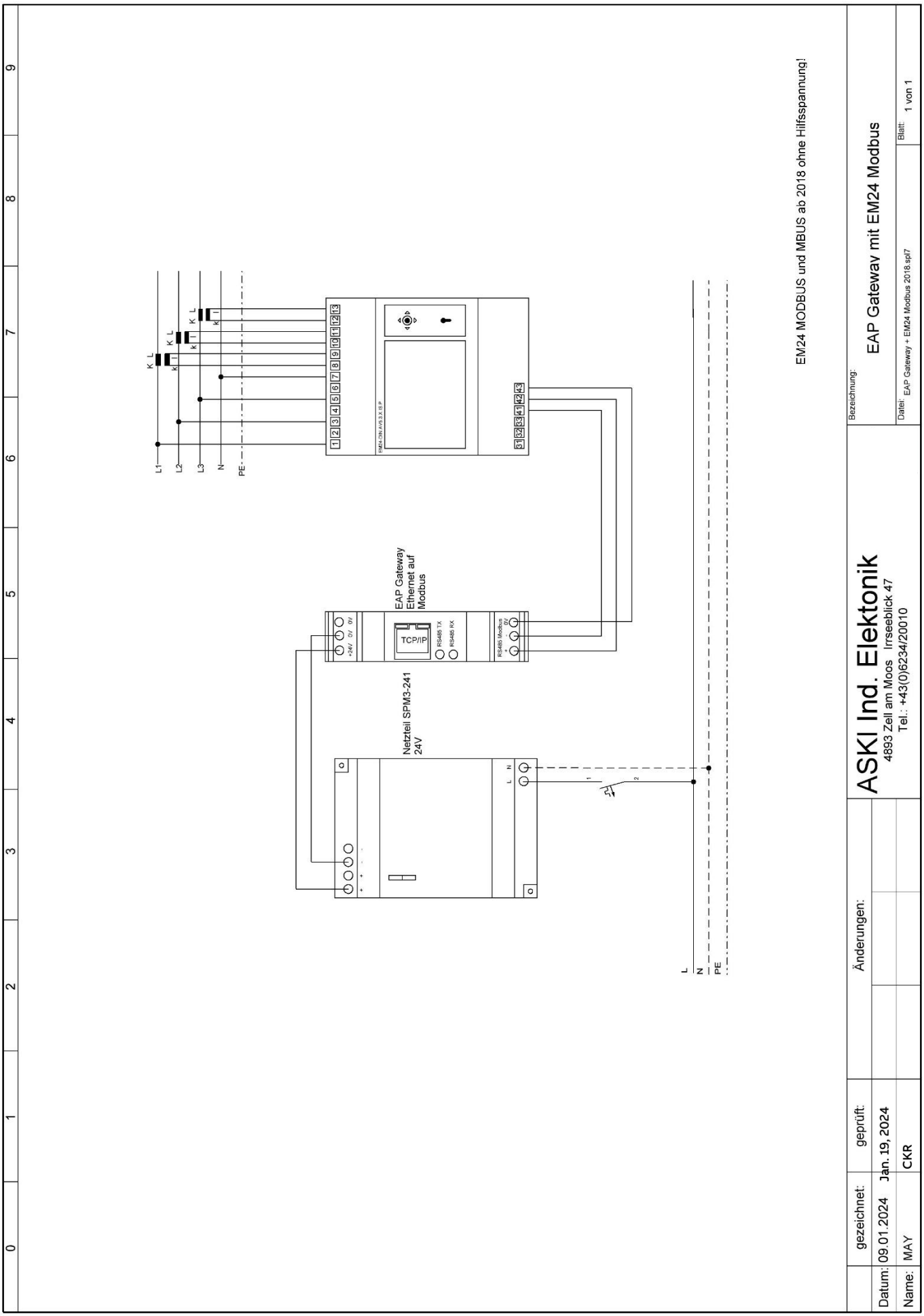


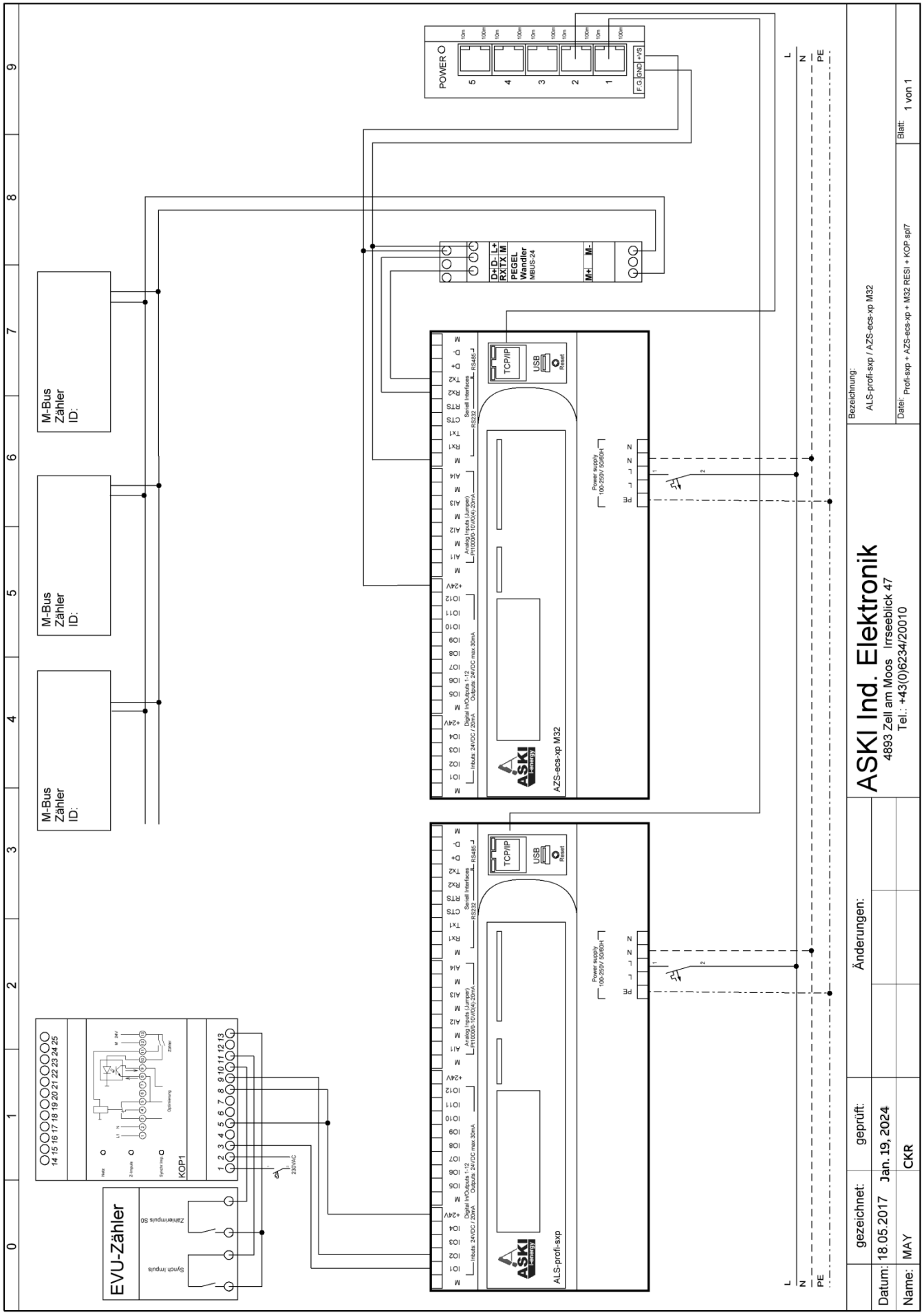




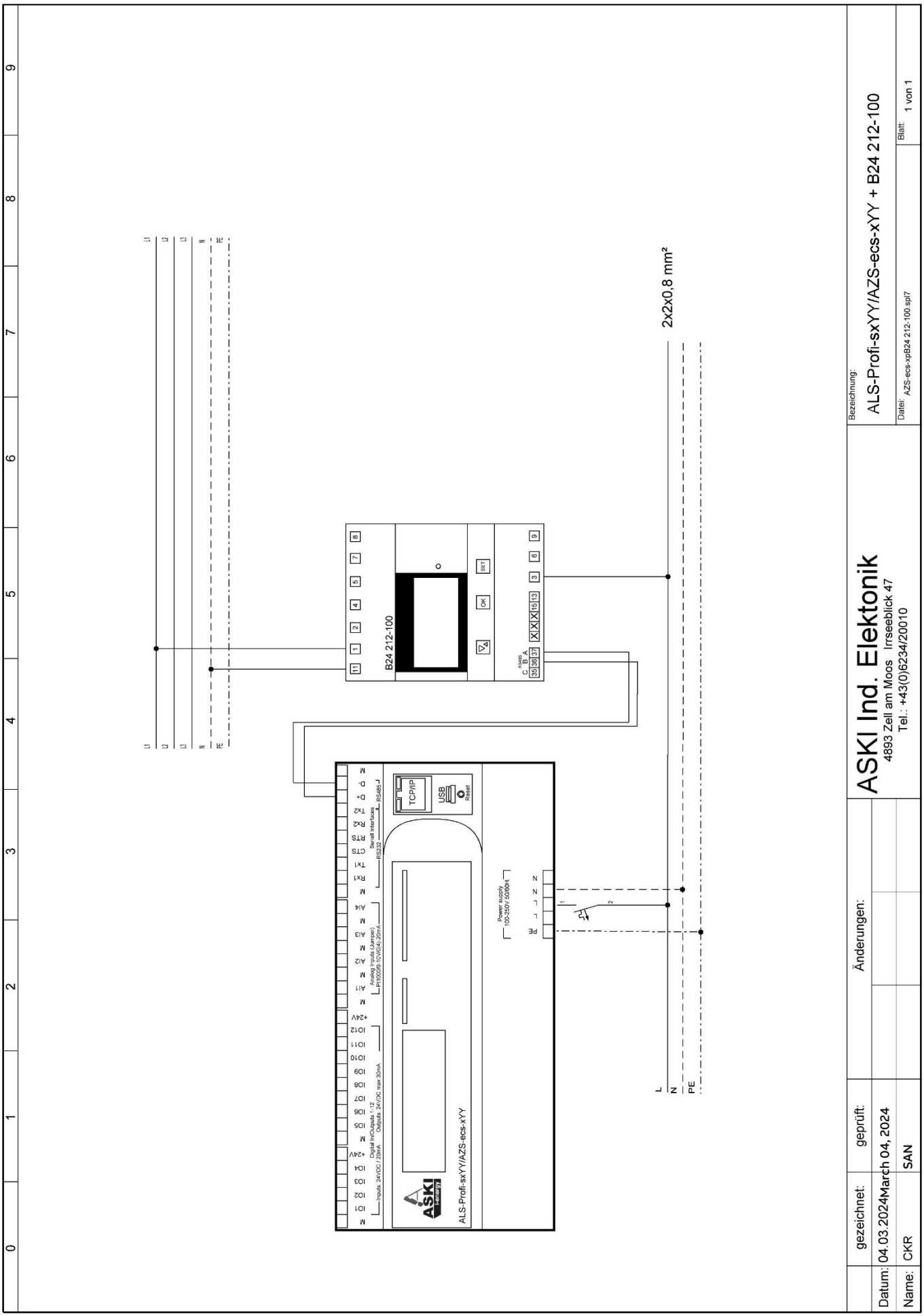


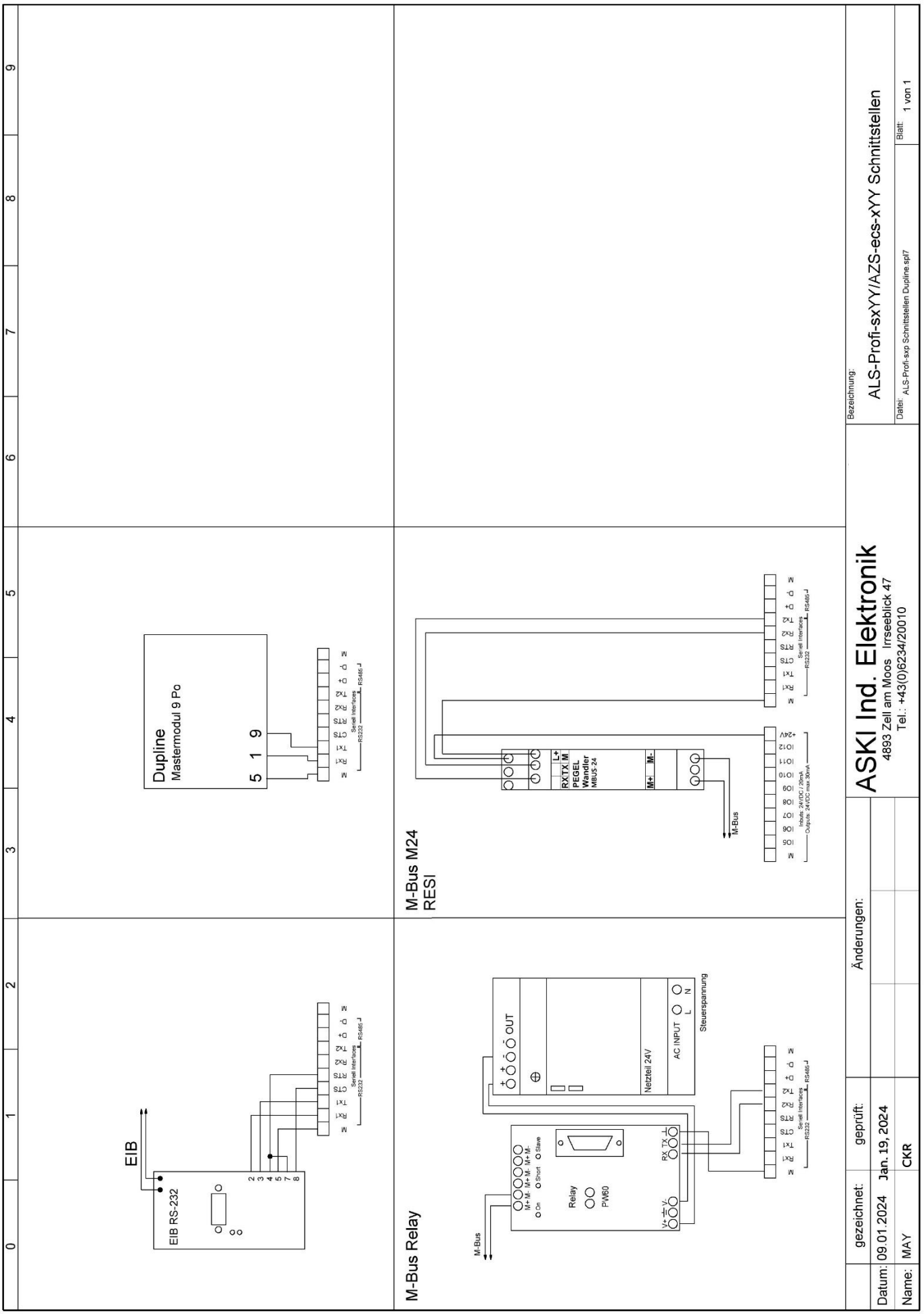


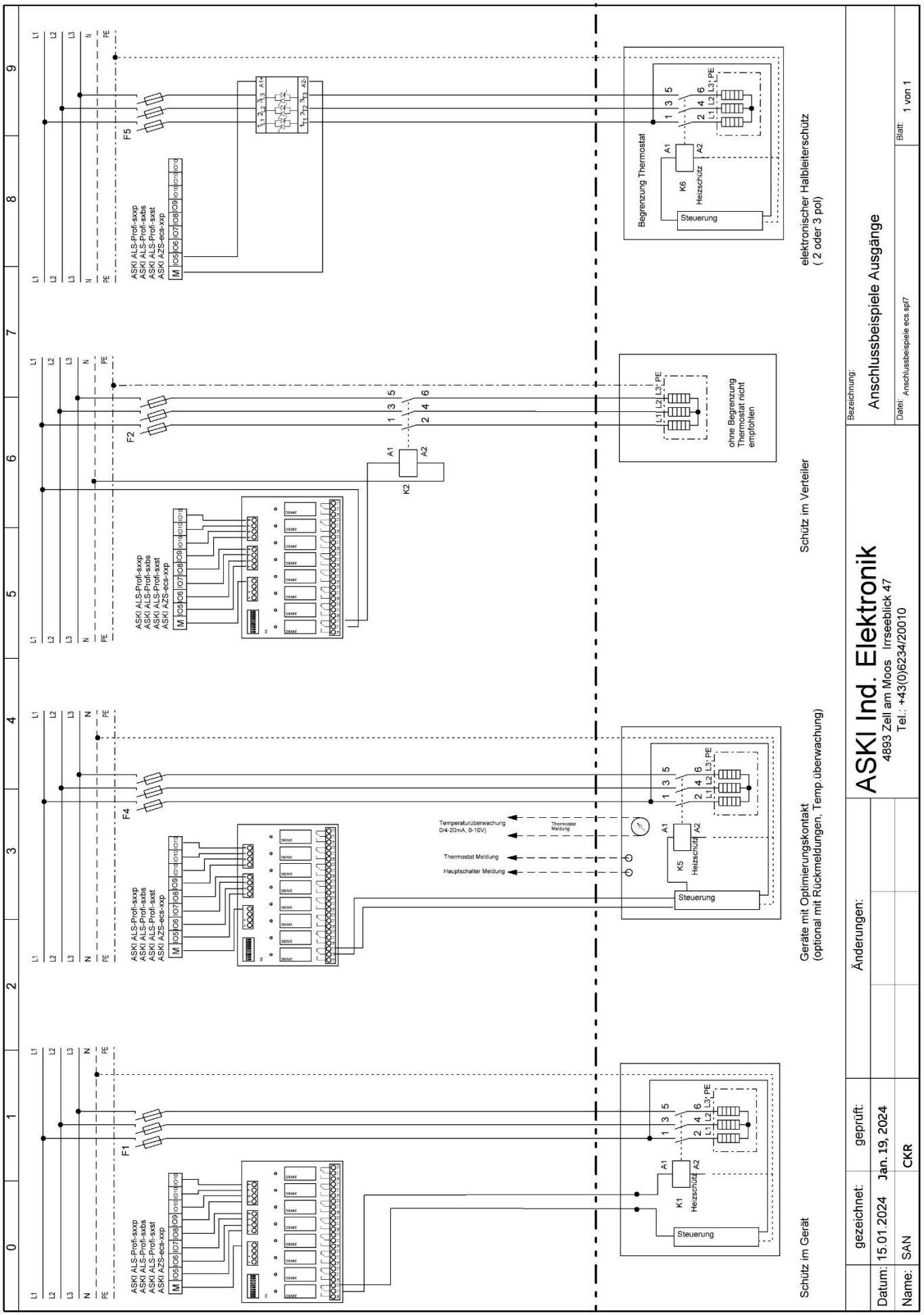


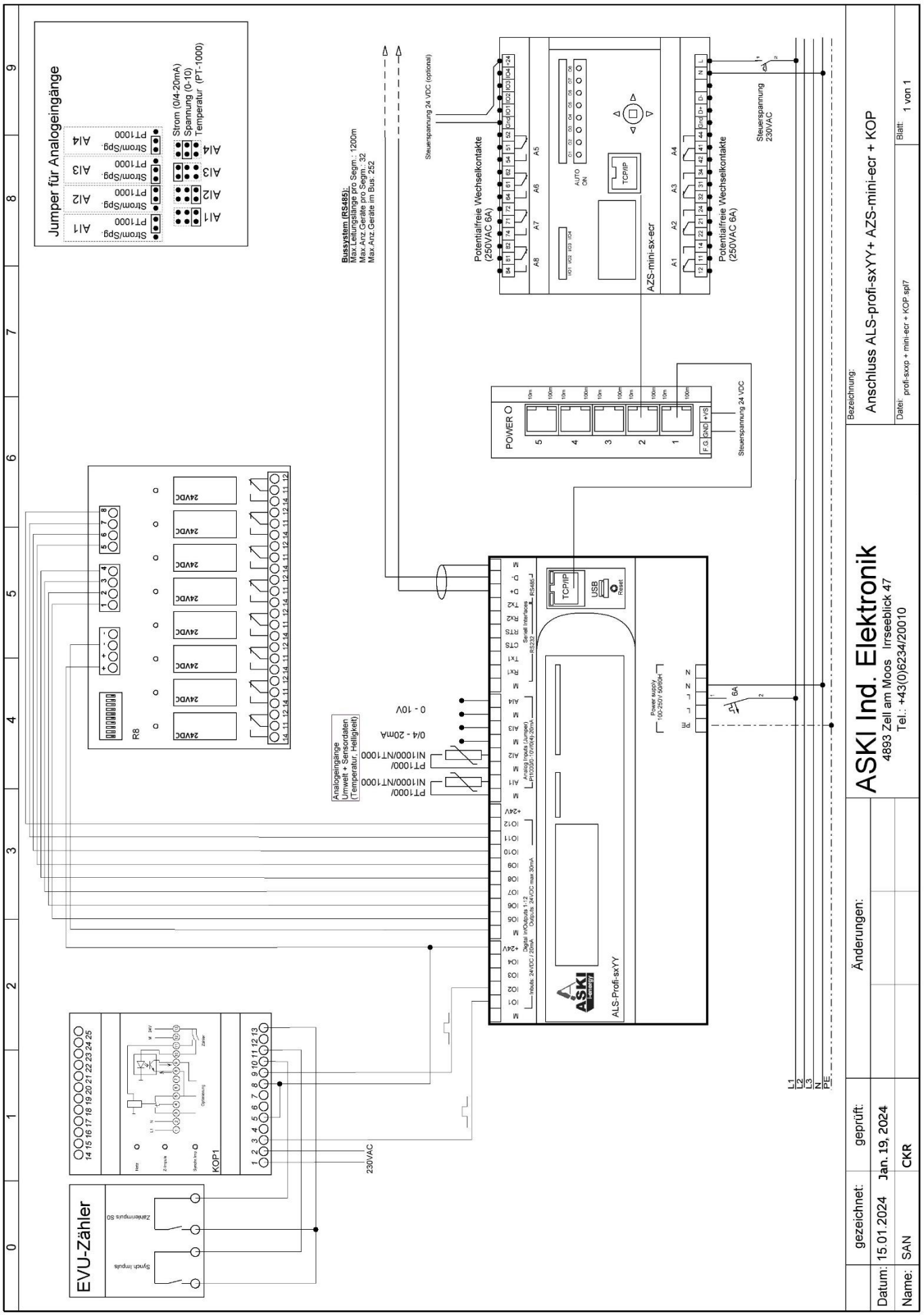


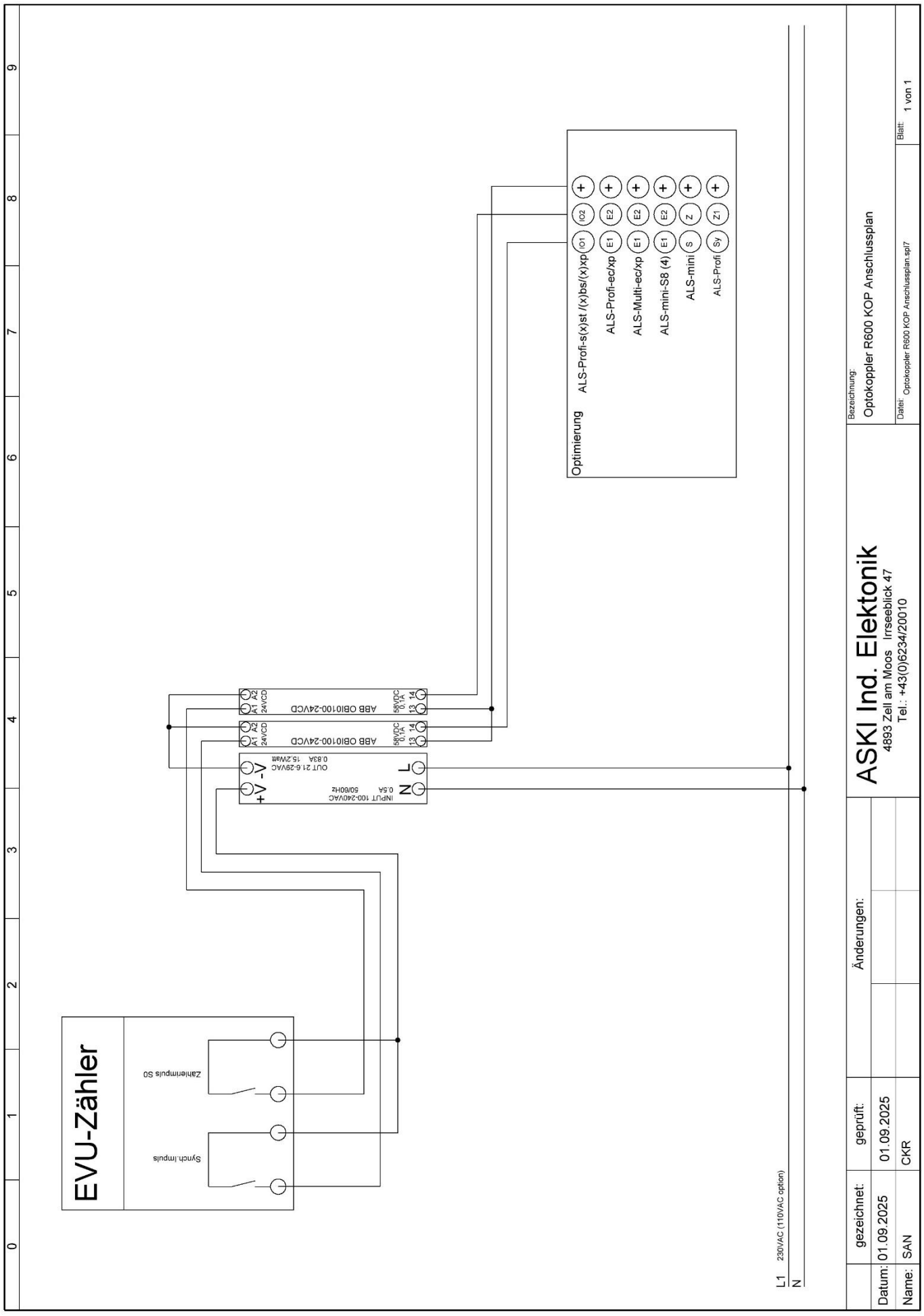
STATUS	SECURITY LEVEL	DOCUMENT ID.	REV.	LANG.	PAGE
Approved	External	9AKK108471A5046	B	EN	46/53

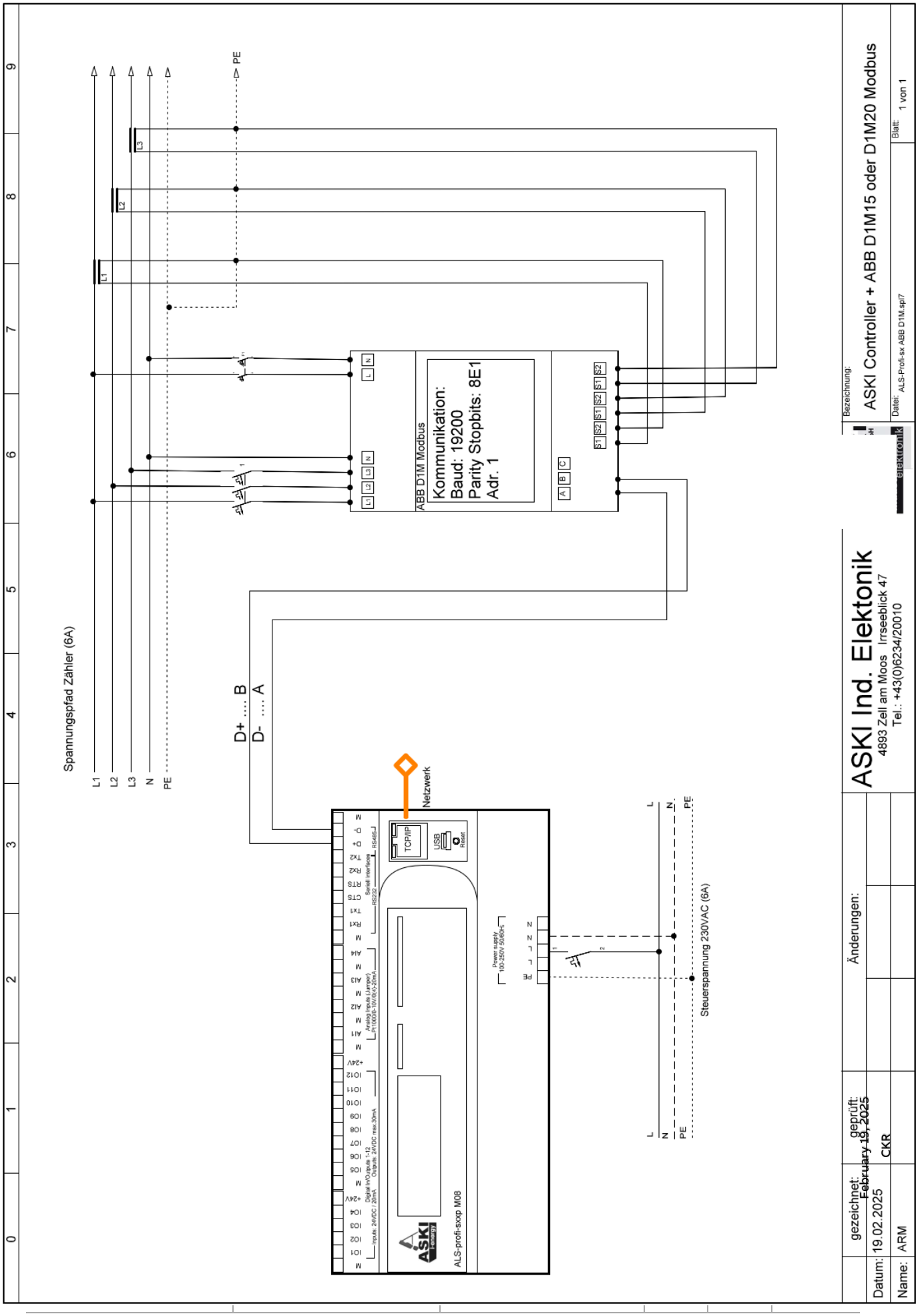












13. Additional Information

13.1. Listing of related documents

Ref #	Document Kind, Title	Document No.

14. Addendum

15. Revisions

Rev.	Page (P) Chapt. (C)	Description	Date Dept./Init.
A		Creation of basic document	Dec. 04, 2023/ CKR
A		Techn. Manual ALS-Profi-sxYY and AZS-ecs-xYY V1.7c	Dec. 13, 2023/ CKR
A		Techn. Manual ALS-Profi-sxYY and AZS-ecs-xYY V1.7d	Jan. 11, 2024/ CKR
A		Techn. Manual ALS-Profi-sxYY and AZS-ecs-xYY V1.7e	Jan. 19, 2024/ CKR
A		Change contact details	Jan. 14, 2025/ CKR
B		Revision and updating	July 28, 2025/ CKR
B		Translation into English	April 01, 2026/ CKR