



The built in VAV units consists of the basic unit (damper) and the mounted electronic controllers. The different built in VAV types consisting of basic units (damper) and mounted electronic controller kits are summarized in following product codes:

For example: TVLK 250-110 / 00 / TMA / FH -200-480



The controller kit can be mounted on different VAV basic units.(e.g. TVR, TVRK, TVJ, TVLK, etc.). Which unit is necessary depends on the function type. The wiring depends only on the controller kit.

All electronic control kits are based on the TCU-LON II circuit board. The particular function type is being realized by a specific factory programmed software type.

controller kit	controller	actuator	function
TMA-FH	TCU-LON II+FCC-E-transducer+operator terminal (incl. monitoring)	Gruner 277	fume hood controller incl monitoring (rapid actuator)
TMA -RS	TCU-LON II	Gruner 277	room supply controller (rapid actuator)
TMA -RE	TCU-LON II	Gruner 277	room exhaust controller (rapid actuator)
TMA -PS/PE	TCU-LON II +diaphragm pressure transducer (MDT +/- 50 Pa)	Gruner 277	room supply with room pressure cascade control

The enclosed technical documentation should support the electrical planner during the project realization. The described procedure and the forms can be used to simplify and quicken project realization but they do not represent any regulation.

Additional notes:

The wiring plans have to be checked by the principal before starting assembling.

The wiring schemes have been created by the documentations which have been given by the consultant.

Trox excludes any liability.

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Labcontrol: Wiring basics



The electrical installations must be implemented in compliance with the current valid local electrical regulations.

Wiring of communication system: LON-bus system

For the LON-wiring we recommend the cable-type UTB-flex 4PR AWG 26/7 Cat 5.
Even following cable types can be used (recommendation of the LONMARK):

Typ	Manufacturer	max. length with free topology	(total length after router)
- TIA 568A Category 5		250 m	
- 8471 or 85102	Belden	500 m	
- Level IV cable		500 m	
- JY(St)Y 2x2x0,8		500 m	only use twisted pair type

Use the appropriated network terminators to avoid data reflections at the end of the LON communication system.

LON-Network with free topology: Every network segment must be terminated with one bus termination element.

LON-Network with bus-/line structure: Bus systems must be terminated with bus termination elements on both end of line.

Wiring of analog signals:

To avoid bad interference influences on analog wirings, use only shielded cable types for analog signals.

Wiring of power supply: 24 V AC

The Labcontrol system requires a power supply with 24 V AC \pm 10%. During installation a suitable dimensioning of the power supply wires has to be regarded. Especially wiring length and dimension as well as transition-resistors may generate a power loss. Furthermore the electrical load of the special control kit has to be considered.

Choice and dimensioning of cable types have to be done by local authorized electricians.

For calculation of cable dimensions, you will find the connected loads of different control components within following list:

Connected load of different controller types:

Fume hood control with control kit TMA-FH	25	VA
Room supply control with control kit TMA-RS or TMA-PS ..	25	VA
Room exhaust control with control kit TMA-RE	25	VA
Belimo controller VRP, VRD2, NMV-2	8	VA
Siemens GLB 181	6	VA
LON-coupler WA5	7,5	VA

Cable color abbreviations:

sw = black ws = white bl = blue br = brown grü = green

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The application of a router within a LON-FT network is optional.

Possible router applications are:

- Physical segmentation of the network
- Coupling of multiple network bus segments to a building management system (BMS)

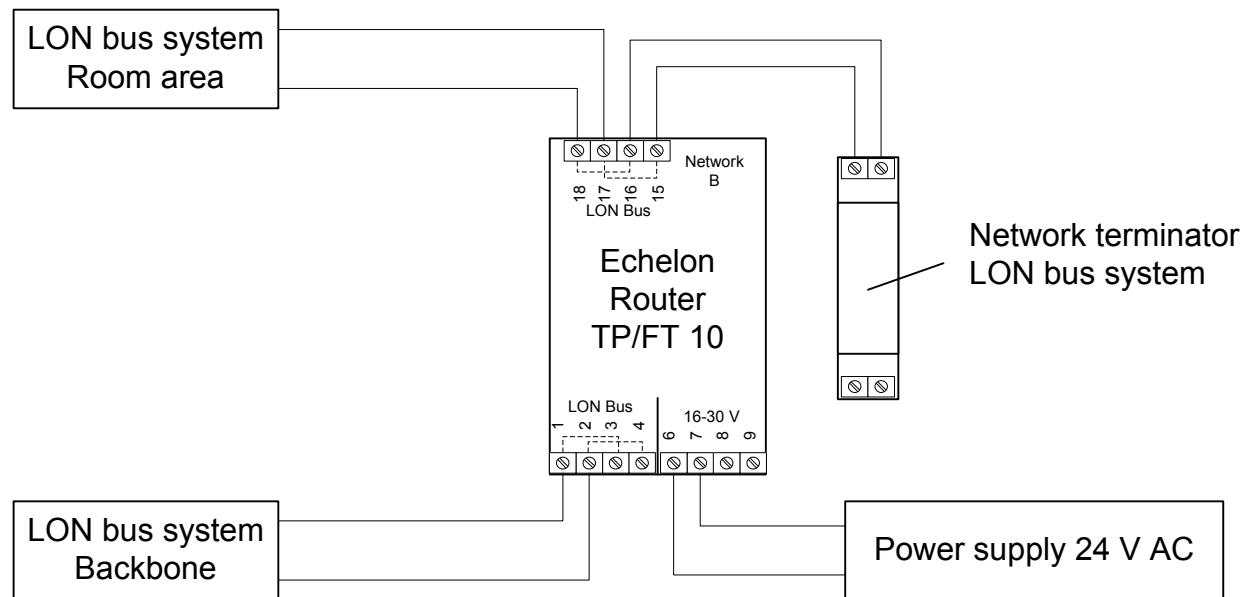
Advantages of router usage:

- Logical structuring of the network to gain the possibility of reducing the bus traffic load within the complete system
- Signal amplification

Standard value given by TROX:

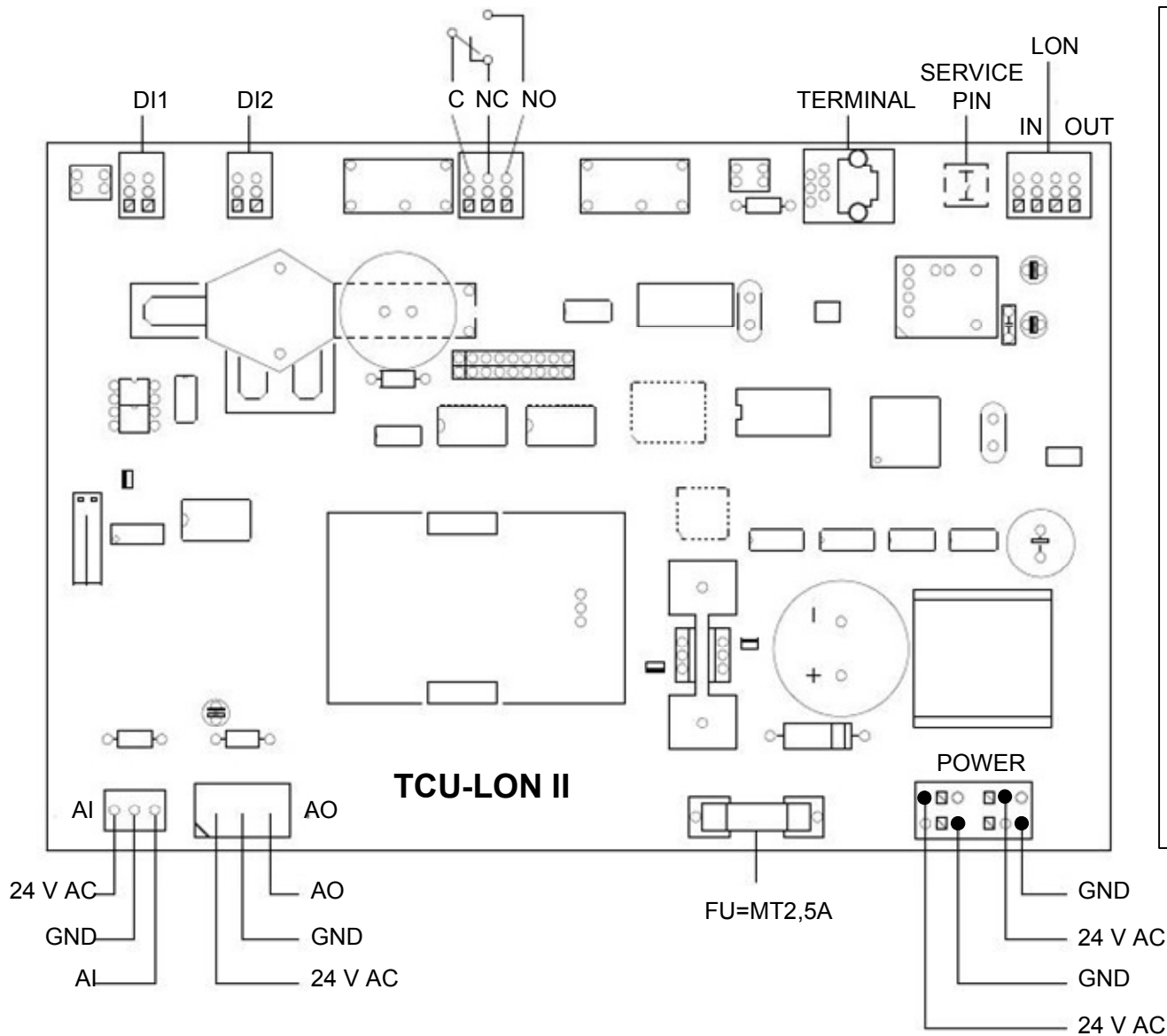
Max. 16 fume hoods plus associated room controllers (supply-/exhaust air) within one network segment (router).

Planning and assignment of routers has to be done by the MEI (mechanical, electrical and instrumentation) company. The assignment has to be communicated to TROX after clarification, at latest one week before initial operation.



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Connector / Assignment:

- DI1 (BI1) Digital input 1
full shut-off switch (room supply controller)
- DI2 (BI2) Digital input 2
day/night switch (room supply controller)
- C (G) Relay contacts for alarm output to
NO (S) Building Management System (BMS)
NC (Ö)
- TERMINAL Operator terminal at fume cupboard
- LON IN/OUT LON bus system
- POWER Power supply 24 V AC ±3%
- AO Analog output for damper actuator
- AI Analog input
for the face velocity transducer at fume hoods
or
at optional pressure control unit
for pressure transducer at room controllers

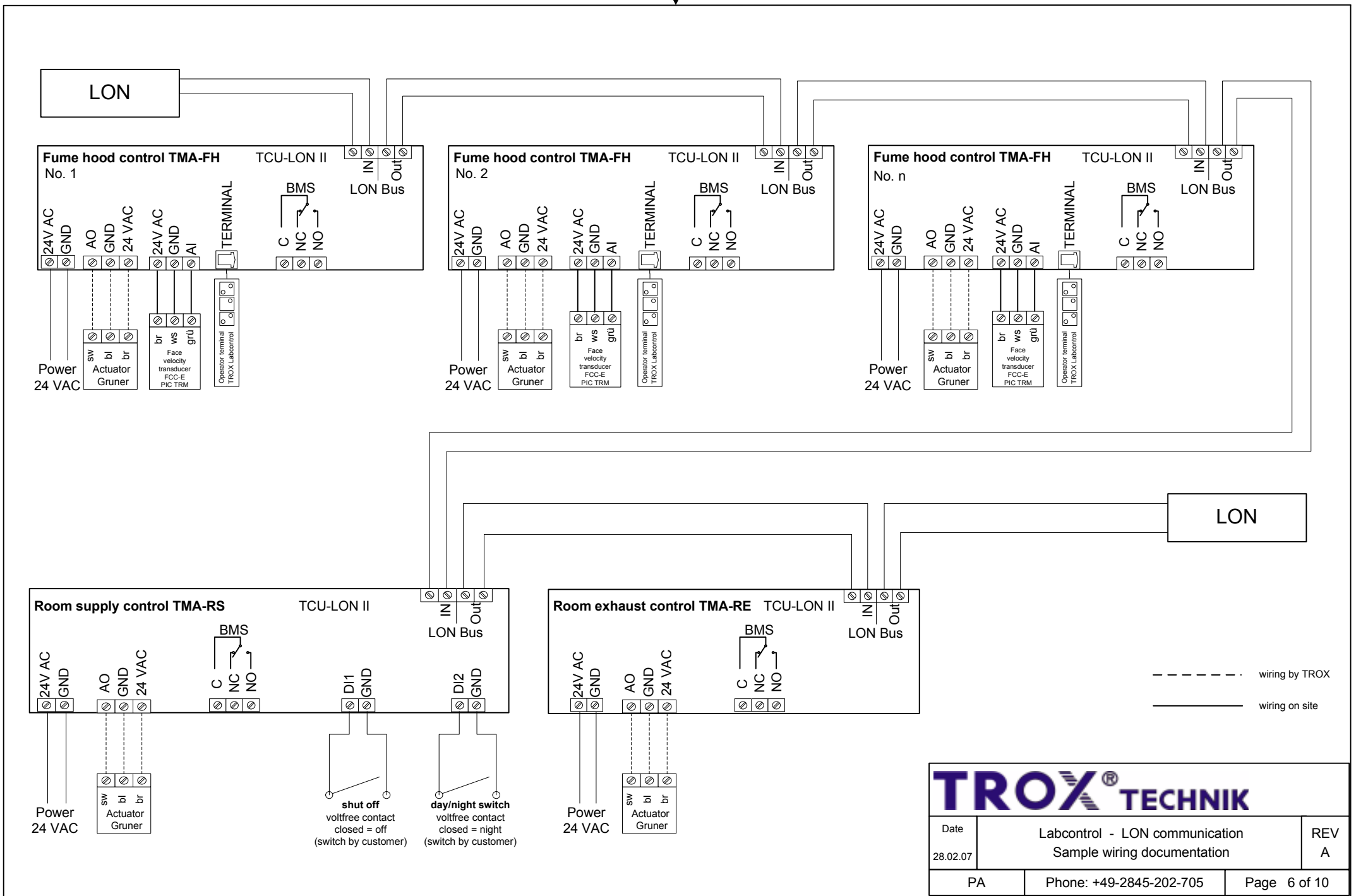
(Former connector notations in brackets)



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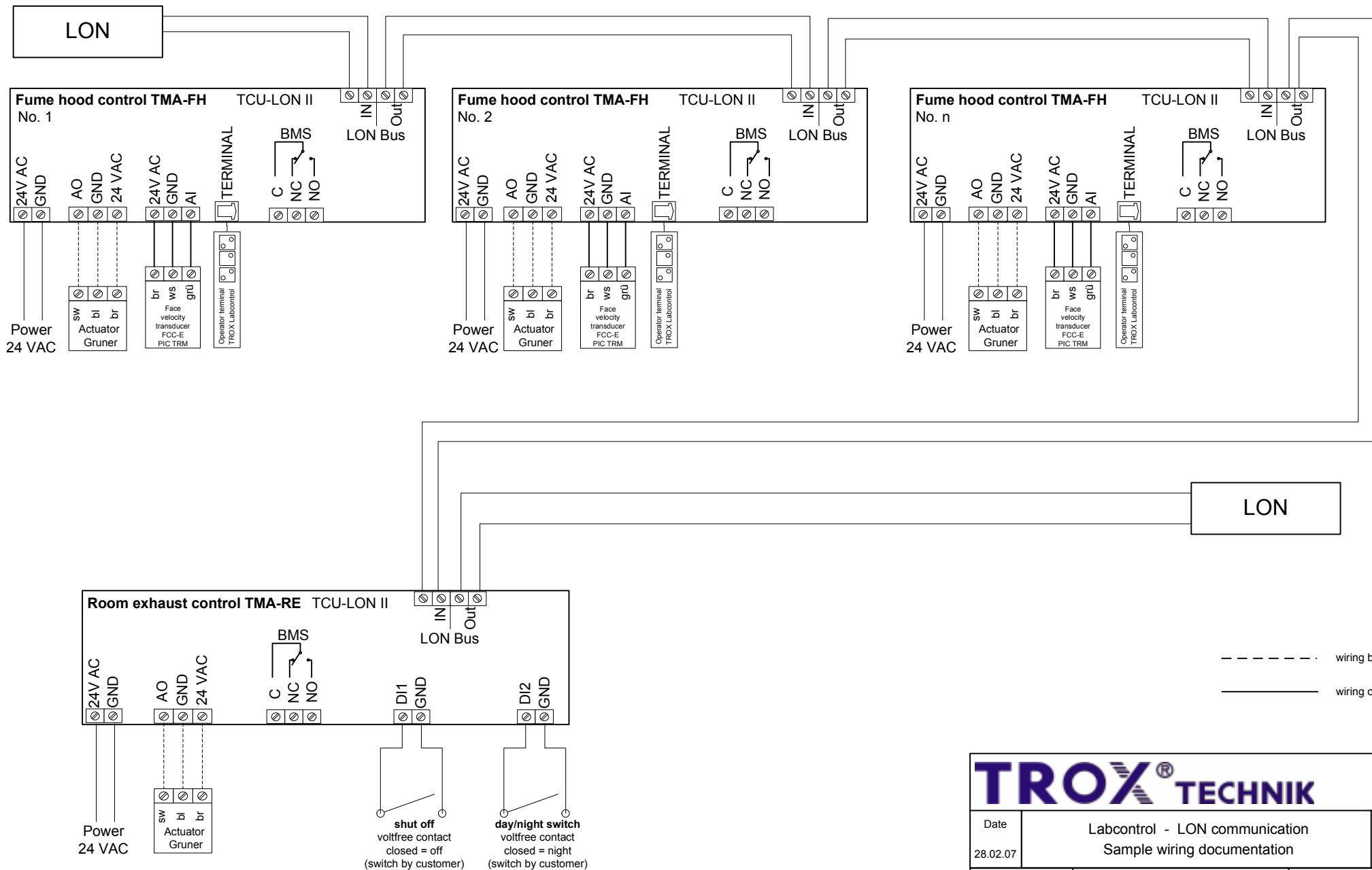
Labcontrol: Sample wiring

Fume hoods (1..n) with room supply and exhaust control



Labcontrol: Sample wiring

Fume hoods (1..n) with room exhaust control

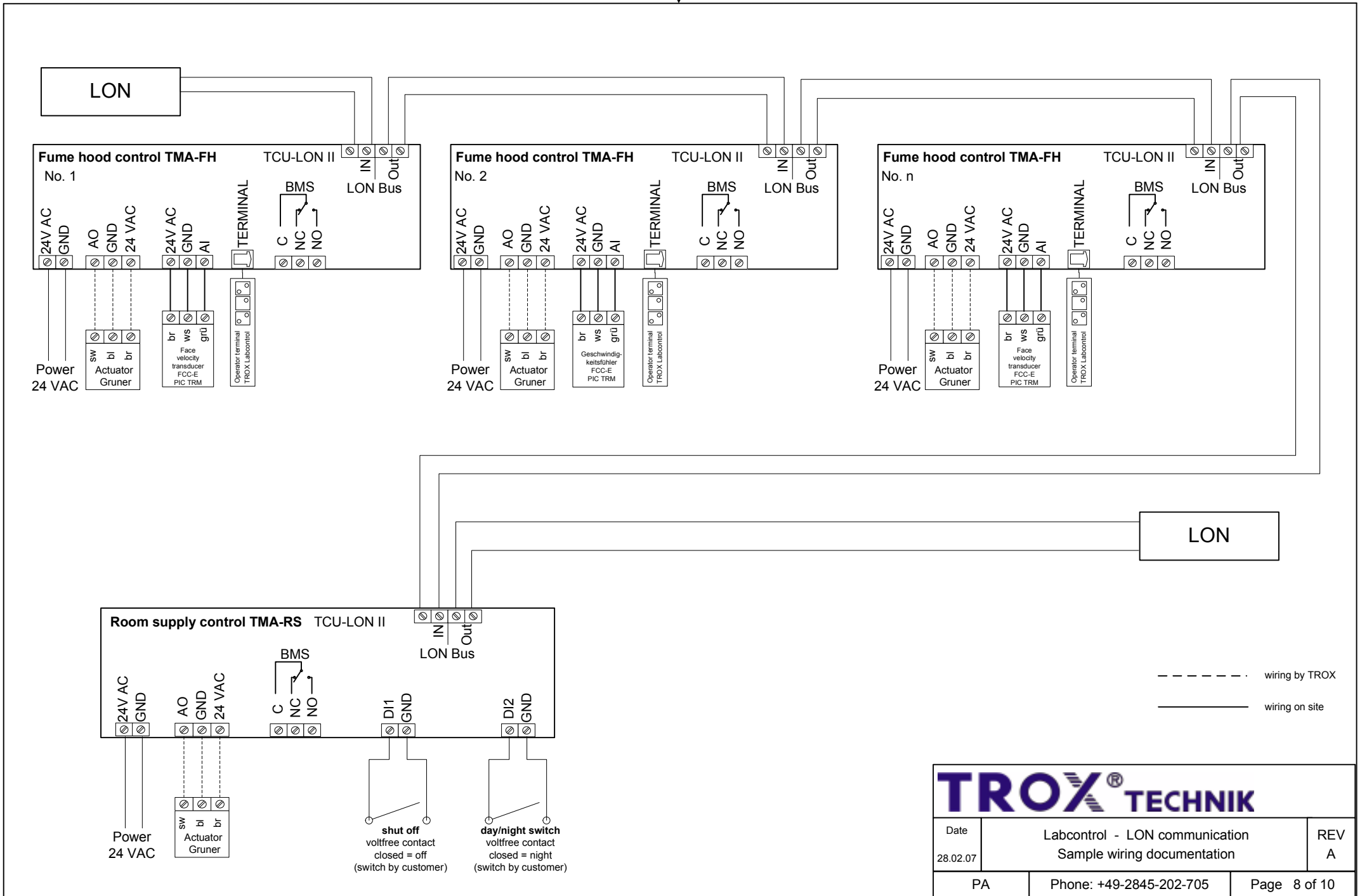


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Labcontrol: Sample wiring

Fume hoods (1..n) with room supply control



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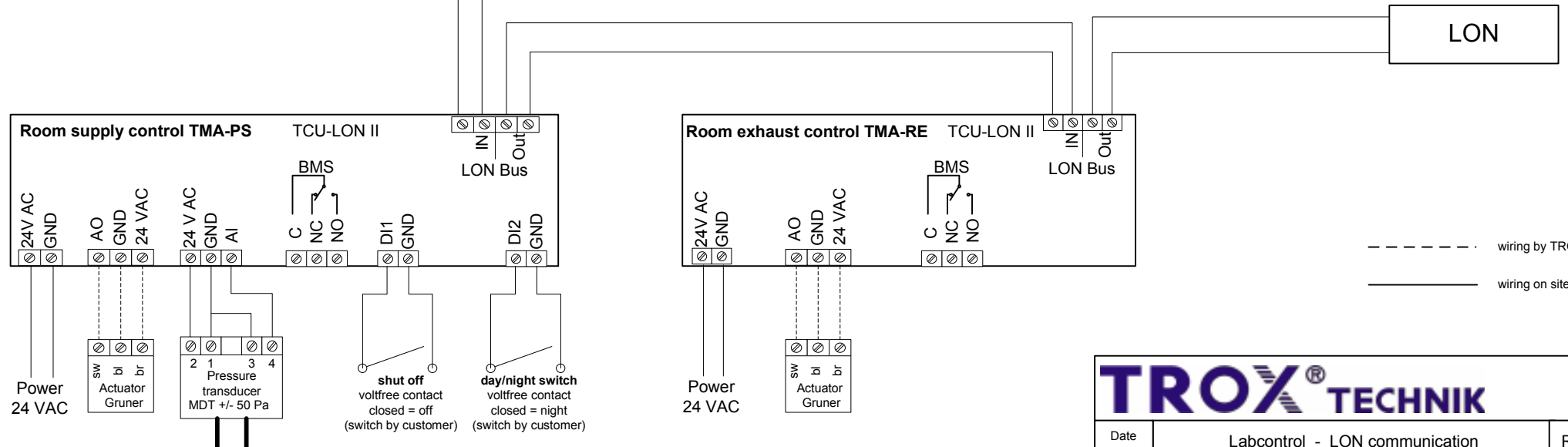
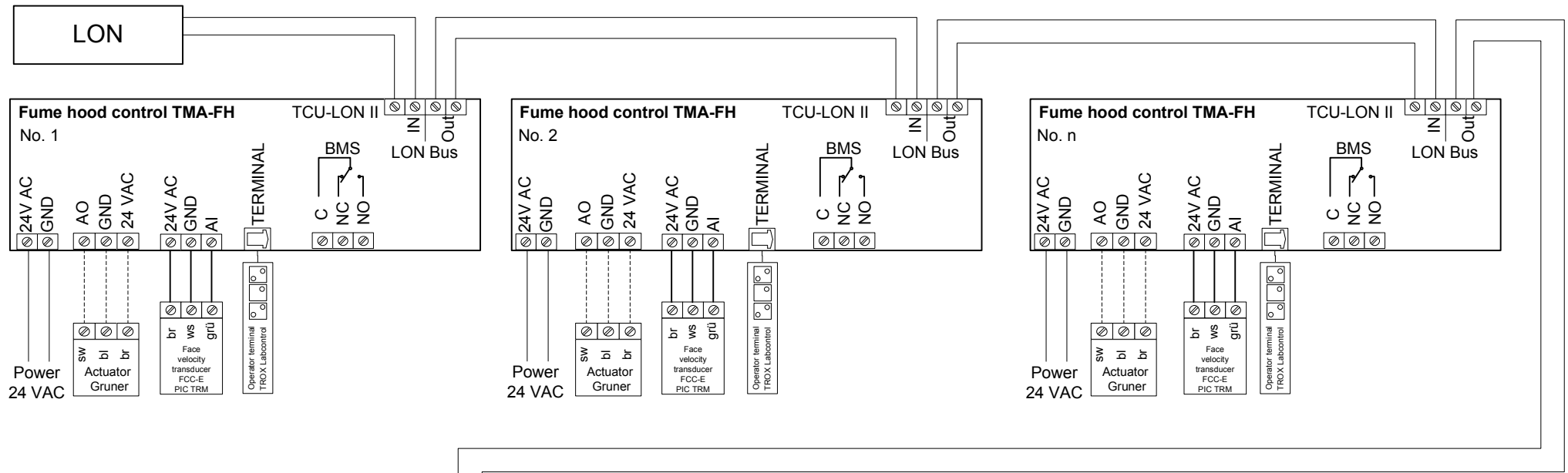
For an implementation of a pressure control with a volumeflow-pressure cascade controller TMA-PS / PE the following premises have to be fulfilled:

- The air pressure of every controlled room must be measured against a stable reference room with constant atmospheric pressure.
- Pay attention to sufficient dimension of the reference pipeline during usage of a ring-pipeline for the reference pressure.
- The density of pressure controlled rooms has to be as sufficient as to built up the desired room pressure.
- Pressure controlled rooms must allow an overstreaming potential. Only in this case here described control units may regulate the room pressure. The overstreaming potential should be minimum 10 % of total room air exhaust.
- Before commissioning the room pressure control all doors and gaskets have to be assembled, as well as wall holes must have been closed.

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Labcontrol: Sample wiring

Fume hoods with room supply/exhaust control plus pressure control



----- wiring by TROX
 _____ wiring on site

+ for reference room
 - for room to be controlled

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