

PG-SERIES TRAINING

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Software & System design

$$F = m \cdot a = \frac{E_2}{\Delta t} = \frac{E_2 \Delta t}{m} = \frac{2,75 \cdot 10^3 \cdot 1,602 \cdot 10^{-19} \cdot 10^{-3}}{1,67 \cdot 10^{-27}} \approx 2,6 \cdot 10^8 \text{ m/s}$$

$$E_2 = -\frac{13,6 \text{ eV}}{4} = -3,4 \text{ eV}$$

$$F = m \cdot a \Rightarrow a = \frac{F}{m} = \frac{E_2}{m \Delta t} = \frac{E_2 \Delta t}{m} = \frac{2,75 \cdot 10^3 \cdot 1,602 \cdot 10^{-19} \cdot 10^{-3}}{1,67 \cdot 10^{-27}} \approx 2,6 \cdot 10^8 \text{ m/s}^2$$
$$a = \frac{\Delta v}{\Delta t} \Rightarrow \Delta v = a \cdot \Delta t = \frac{E_2 \Delta t}{m} = \frac{2,75 \cdot 10^3 \cdot 1,602 \cdot 10^{-19} \cdot 10^{-3}}{1,67 \cdot 10^{-27}} \approx 2,6 \cdot 10^8 \text{ m/s}$$

PG-SERIES \ On the outside

RUGGED CABINET

- Stainless steel
- IP55 (IP68/IP65)



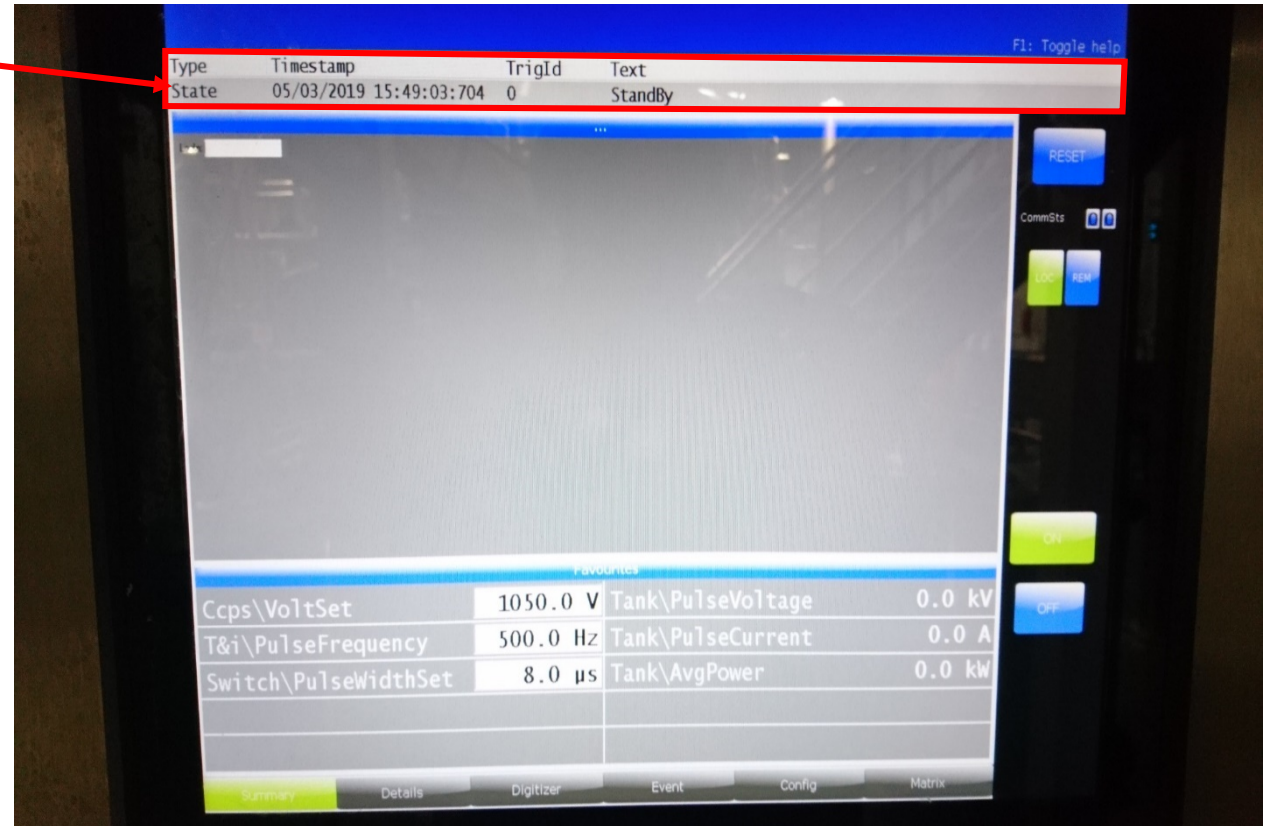
GRAPHICAL USER INTERFACE

- Main
- Digitizer
- Details
- Event



MAIN PAGE

- Status bar (always visible)
- Main set&read values



DETAILS PAGE

- Many parameters



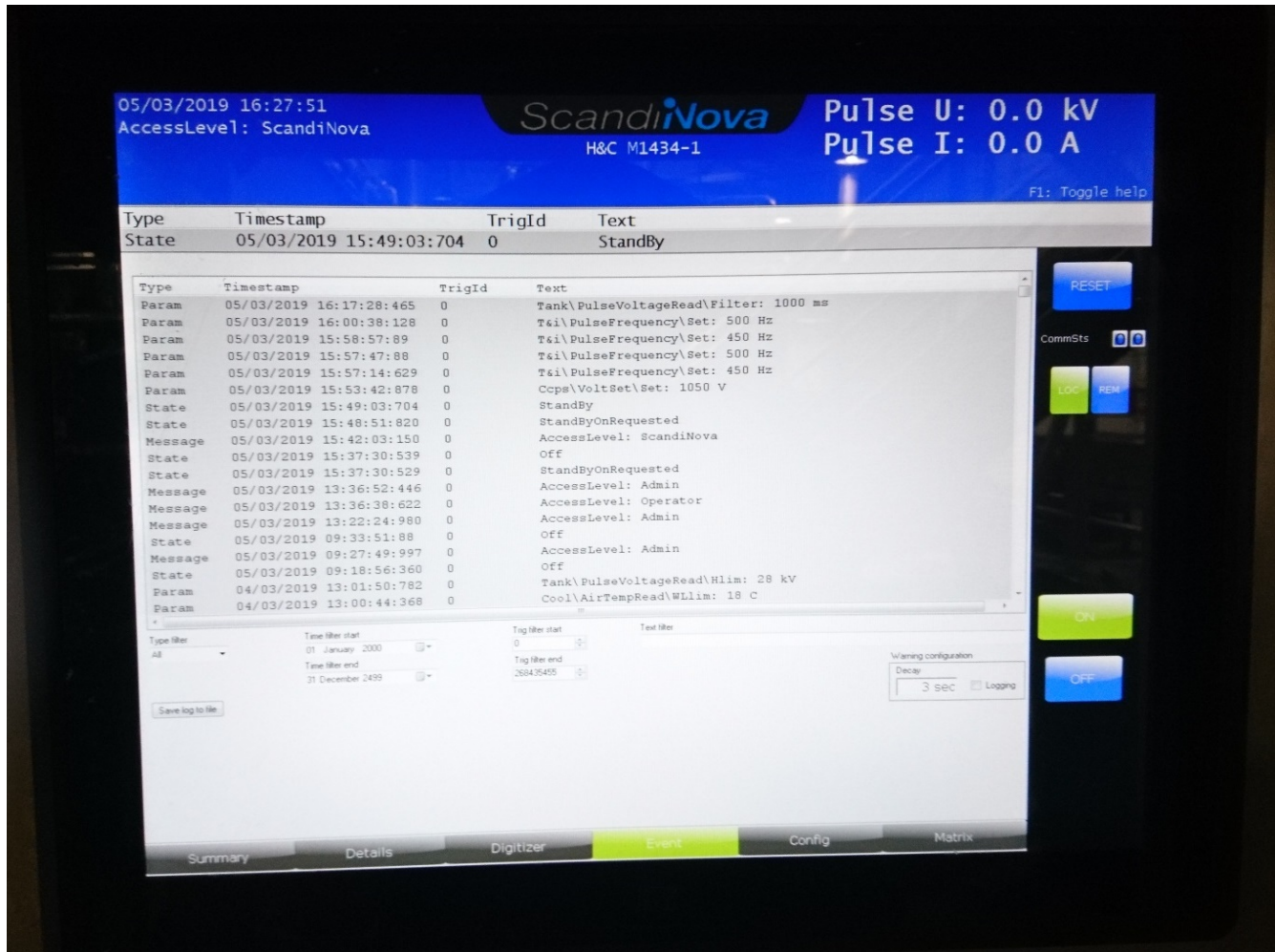
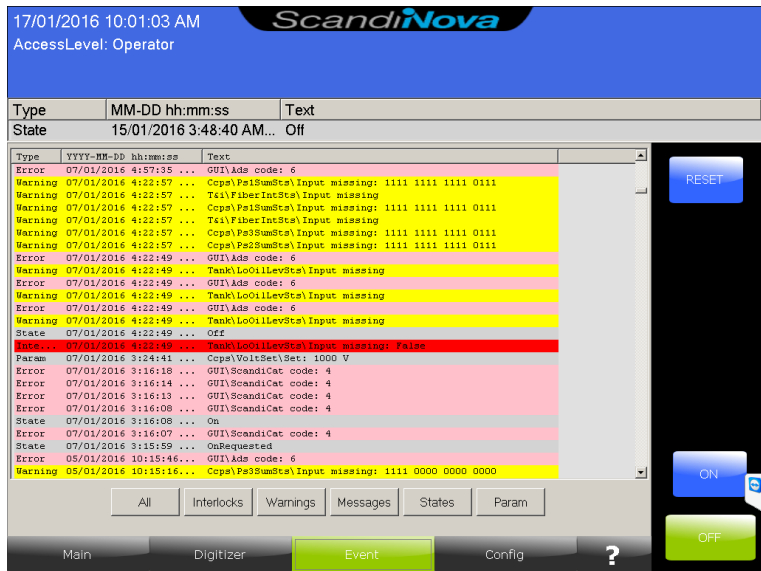
DIGITIZER PAGE

- **Current** waveform
- **Voltage** waveform
- Measurement are dependant on cursor position



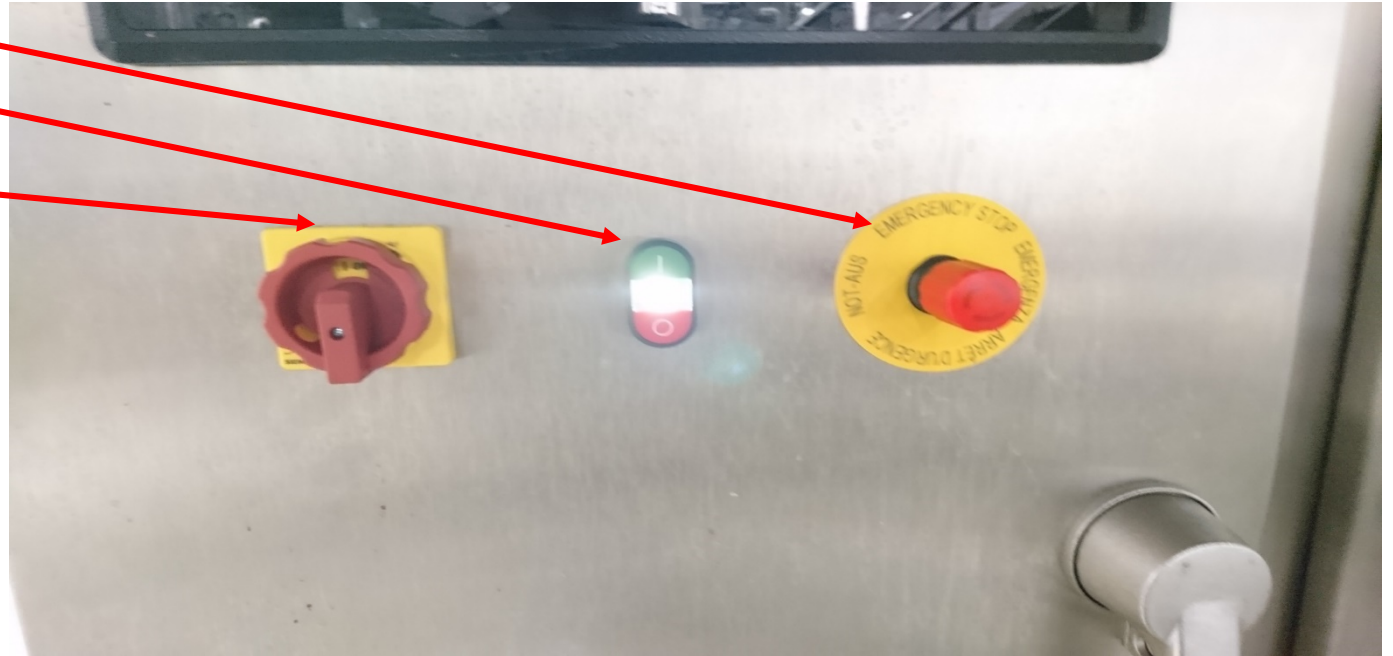
EVENTS PAGE

- Displays interlocks and important events



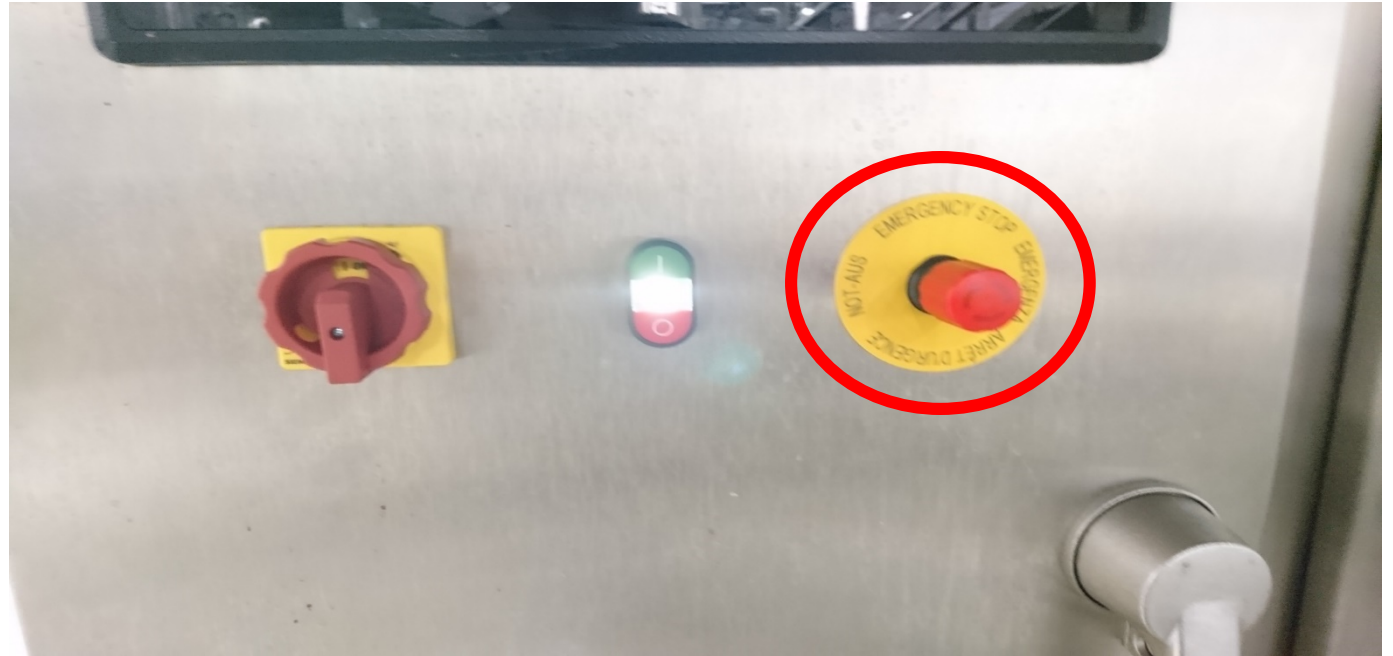
SAFETY

- Emergency stop
- Main 3-Phase breaker
- Service Breaker



EMERGENCY STOP

- Does not turn off incoming 1-Phase
- Makes the main 3-Phase breaker turn off



AC & SIGNALS

- 3-Phase inlet
- 1-Phase inlet
- EM-STOP wiring
- HwCtrl wiring

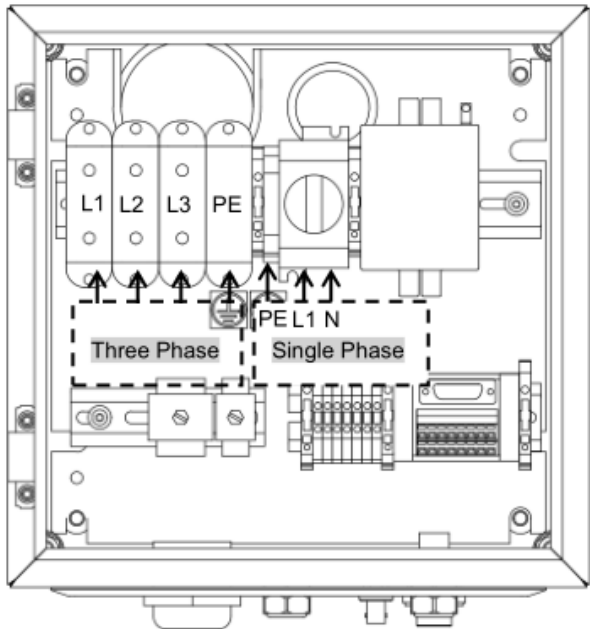
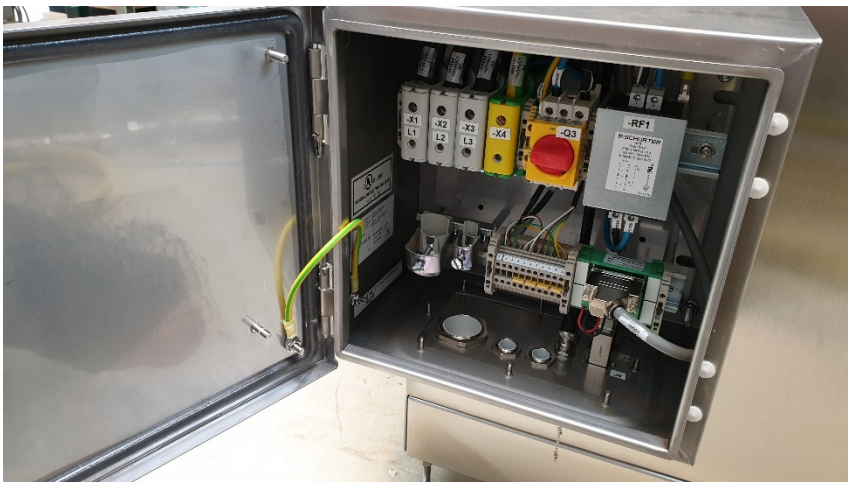


Figure 7: Power connection.

Verify the input voltage configuration on the machine plate before applying any voltage to the system. Applying incorrect voltage will immediately cause major damage and void the warranty.

Power	Cable type	Rating	Standard	Note
Single phase	Example: H05BQ-F 3G1,0mm	250V 10A	VDE, HAR or other equal that fulfill national regulations.	<VDE> <HAR>
3-phase EU	Example: H07VV-F alt H07RN-F alt H07BQ-F	450/750 Vac, F2 400V 100A	VDE, HAR or other equal that fulfill national regulations.	<VDE> <HAR>

Table 6: Power – Single phase / 3-Phase

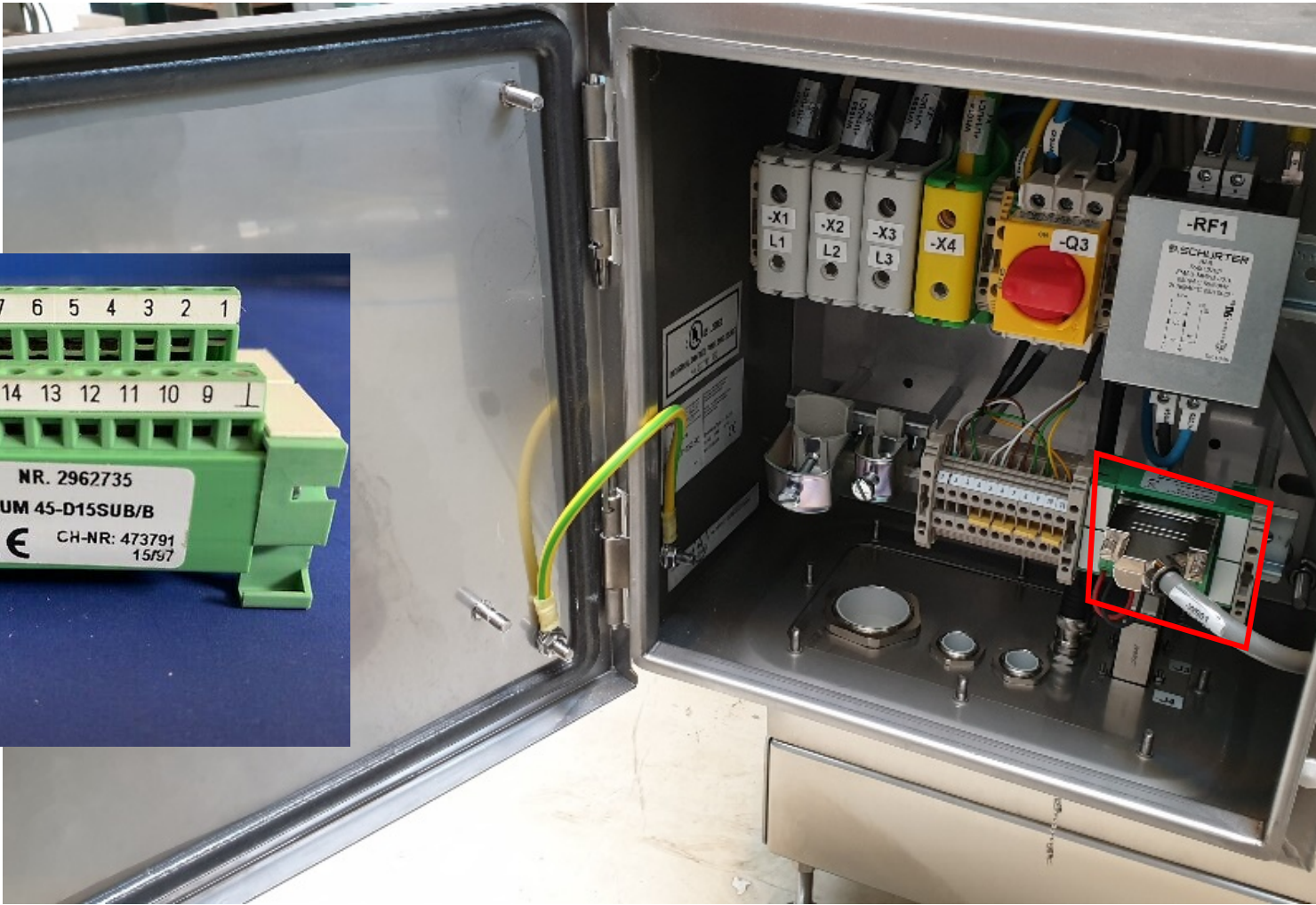


HWCTRL

24VDC & Referense GND	
Terminal Number	Comment
1	24VDC (Internal)
2	GND (Internal)
3	24VDC (Customer Input)
4	GND (Customer Input)

DIGITAL INPUTS	
Terminal Number	Comment
5	External Interlock
6	RESET_STS
7	ON_STS
8	HV_CMD_ENABLE
9	Trig inhibit

DIGITAL OUTPUTS	
Terminal Number	Comment
10	TRIG_STS
11	SUM_INT_CMD
12	HV_ON_CMD
13	TRIG_CMD
14	Spare
15	Spare
S	Sheild



PG-SERIES \ On the outside \ Right side

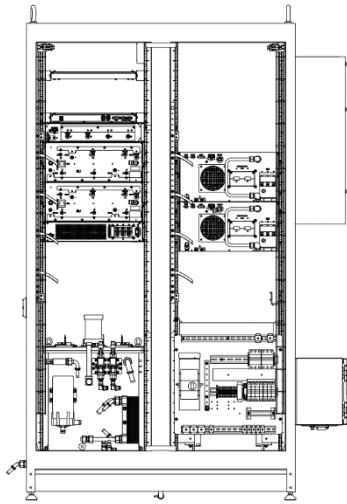
HV-CABLE

- IP68
- Flexible



PG-SERIES \ On the inside

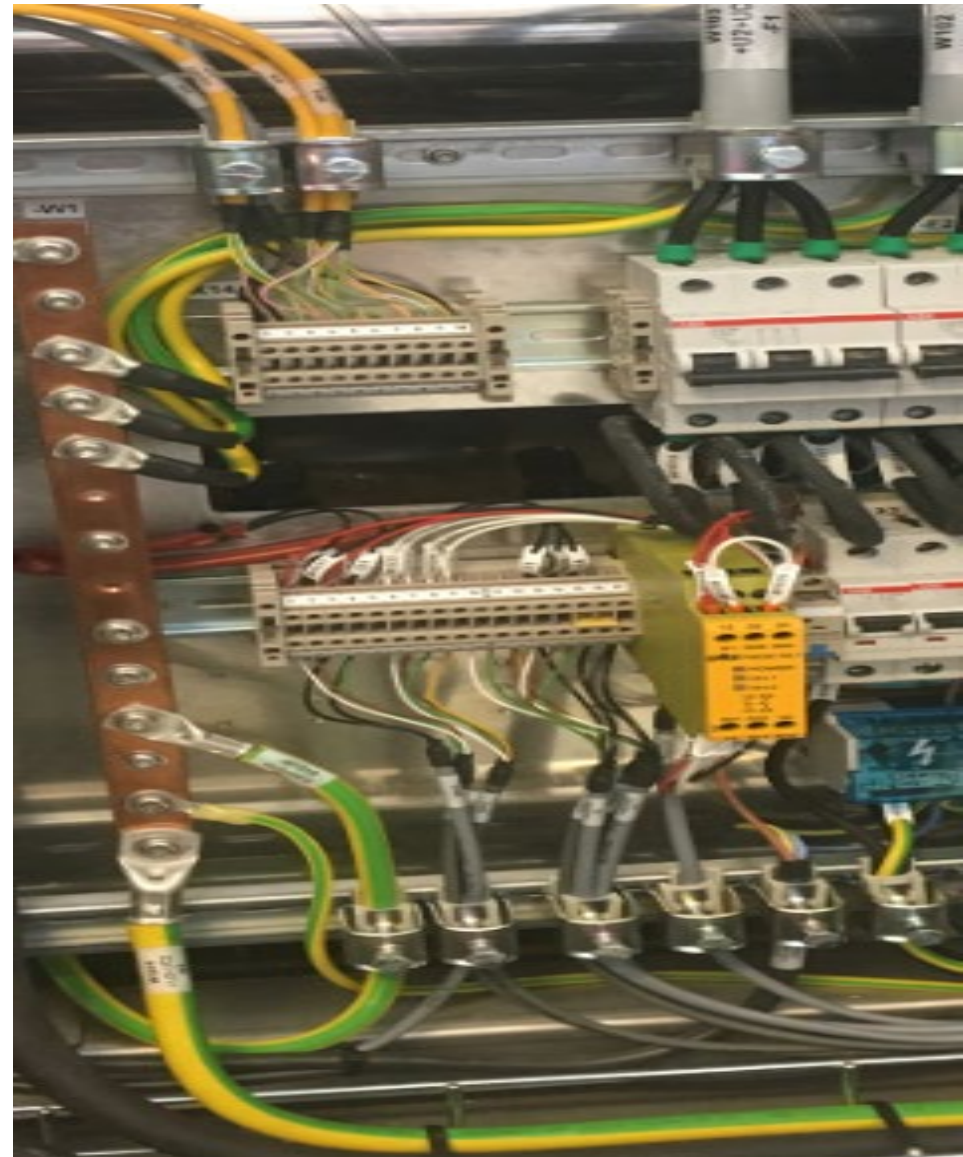
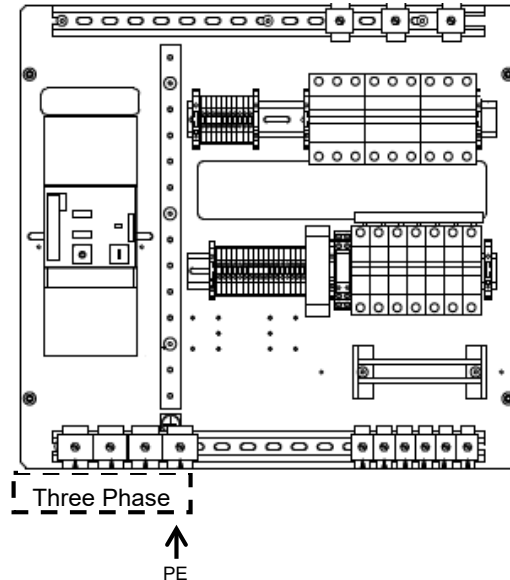
- IP2x on all voltages
- Power Distribution Unit
- CCPS
- SU
- Pulse Transformer
- Main Control Unit



PG-SERIES \ On the inside \ PDU

POWER DISTRIBUTION UNIT

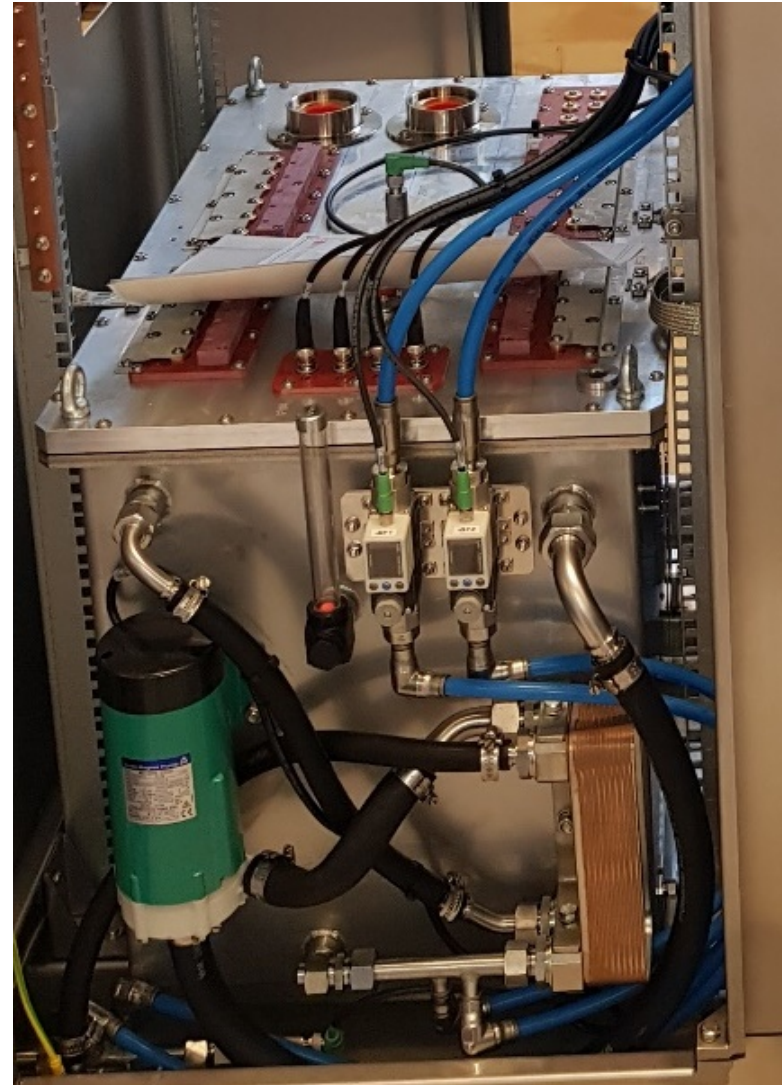
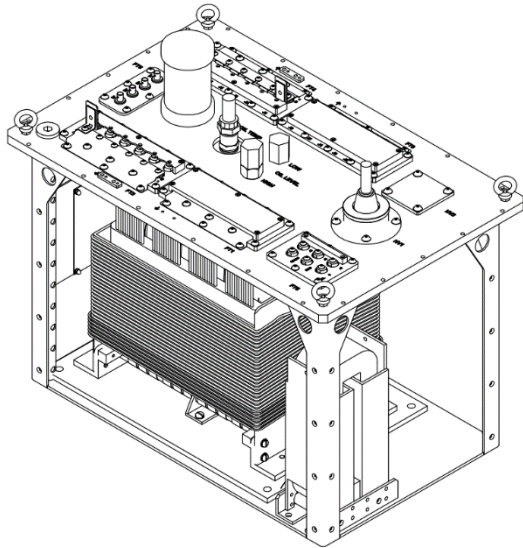
- Mains breaker
- Circuit breakers
- Power distribution



PG-SERIES \ On the inside \ TU

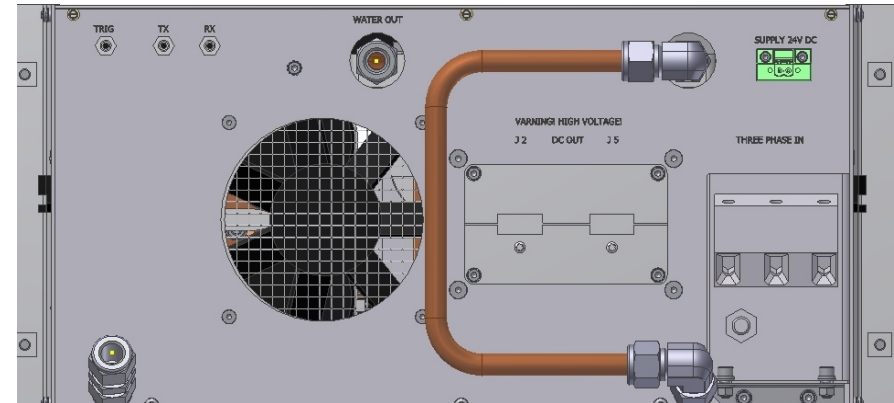
PULSE TRANSFORMER TANK UNIT

- Transform low voltage pulses to high voltage



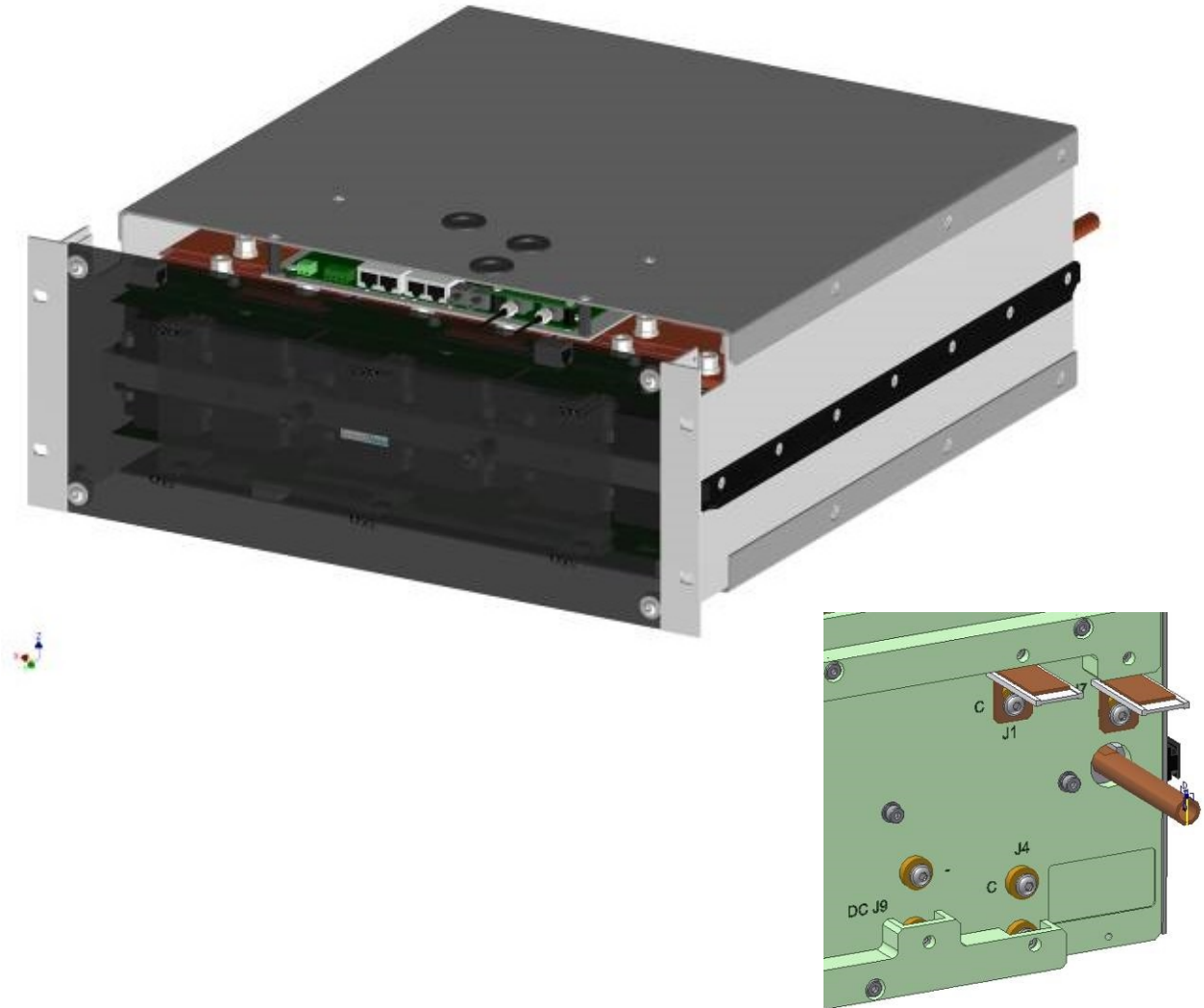
CAPACITOR CHARGING POWER SUPPLY

- Charges the switch units
- Converts three-phase mains to PWM modulated DC



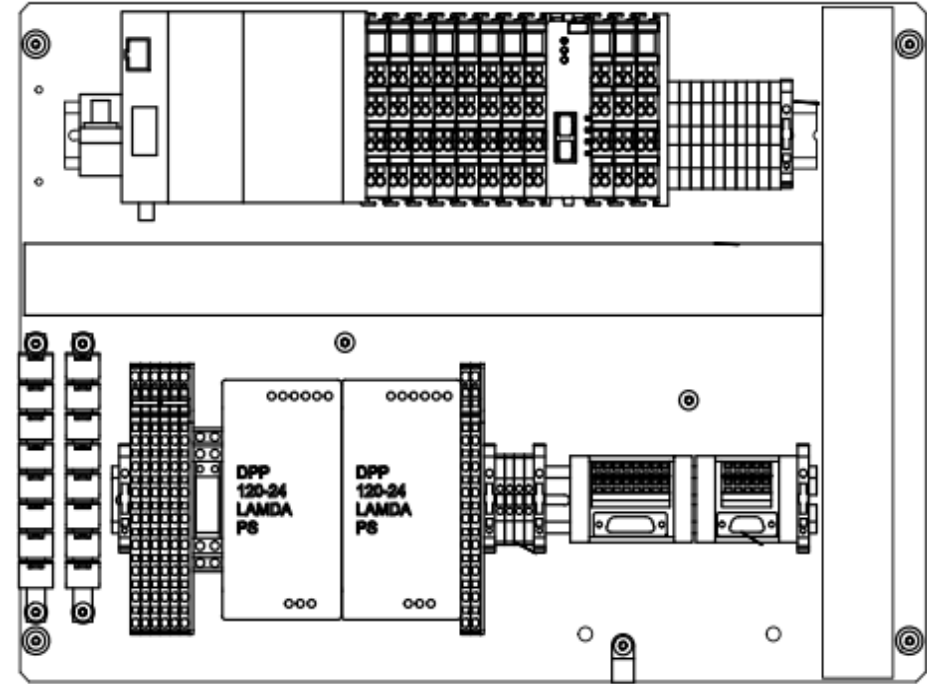
SWITCH UNIT

- Low voltage pulses to transformer
- Defines pulse width and repetition rate



MAIN CONTROL UNIT

- Controls voltage, pulsewidth and frequency
- Communication
- 24V Supply
- PLC
- I/O
- HWCTRL

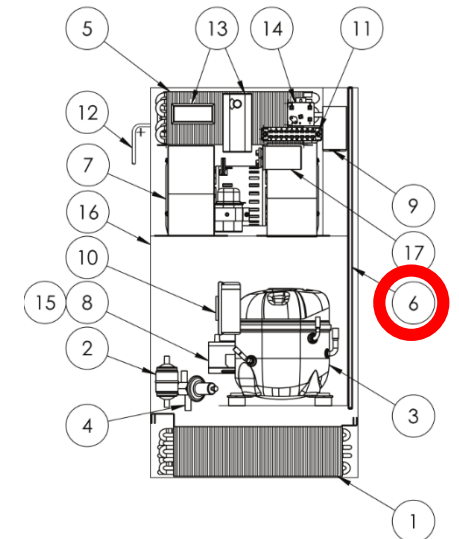


TwinCAT – PLC and Motion Control



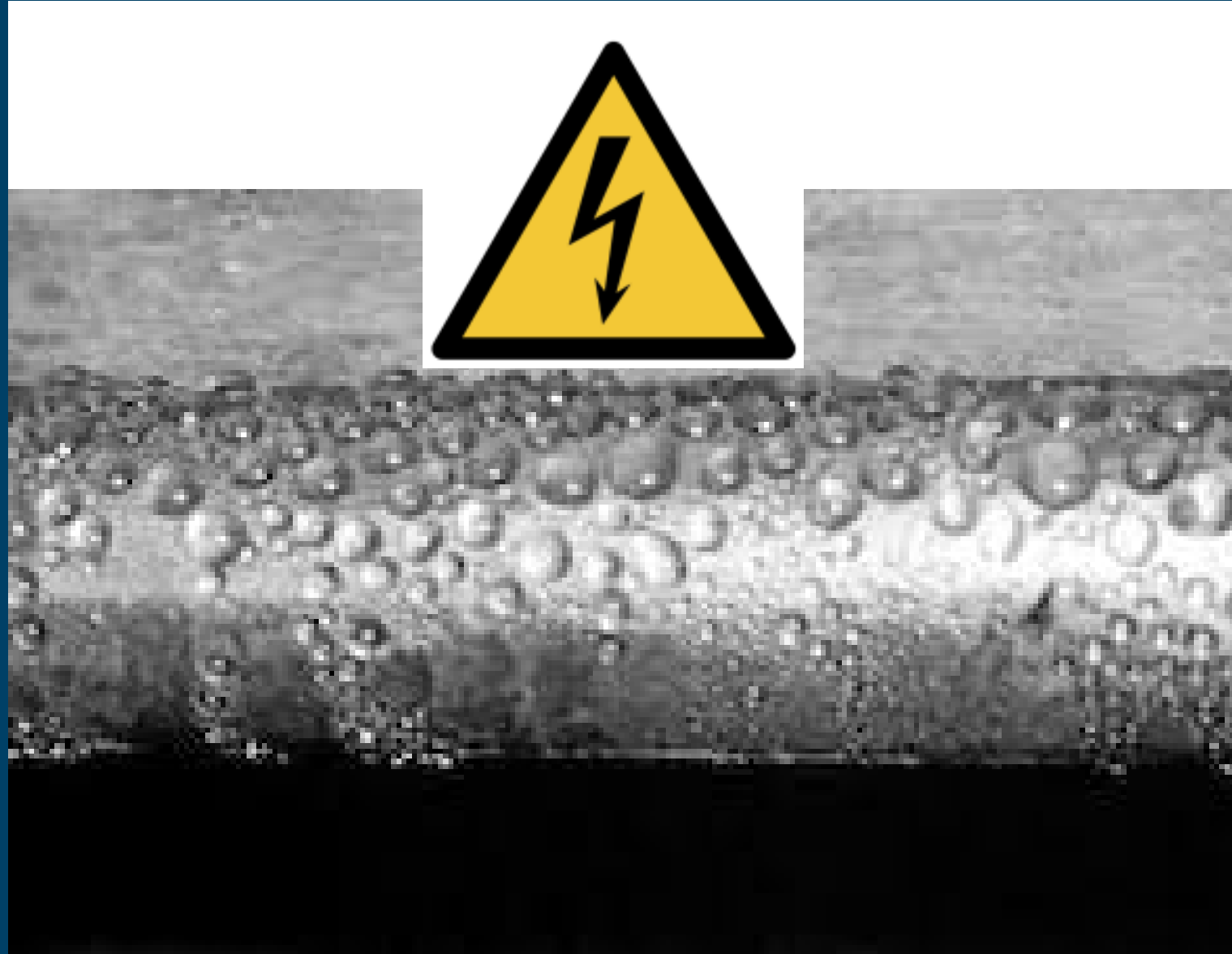
PREVENTIVE MAINTENANCE

- Measure moisture content of transformer oil
- Verify Read Values
- Exchange Air Dryer
- Tighten Connector Screws
- Clean AC filter



PREVENTIVE MAINTENANCE

- Avoid condensation by following the specification regarding inlet-water temperature...



MESUREMENTS TOOLS

- Pulse Voltage
- Pulse Current
- Primary DC Voltage



RECOMENDED TOOLS AND FACILITIES

- Lifter
- Oil Pump
- Compressed Air System
- Allen key Set
- Torx Screwdriver Set
- Metric Wrench Set



SERVICE ORGANIZATION

- Remote Support
- On site Service
- Sub Unit replacement programme
- Service Contracts
- Offers
- Training





THANK YOU!