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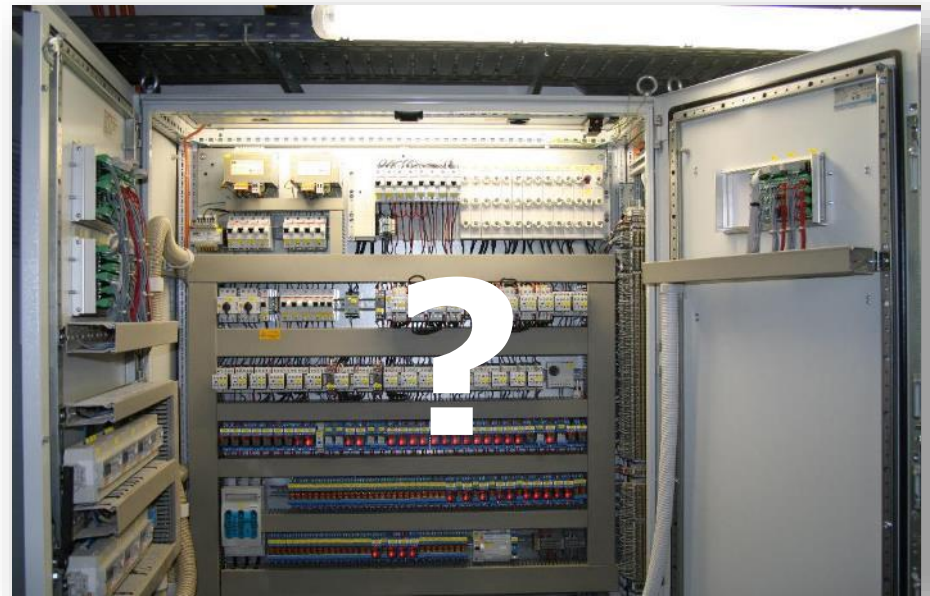


Next: Quality Management – How Digitalisation enables High Performance Buildings

synavision GmbH, Germany
www.synavision.de

Building Performance needs Quality Management

- Today buildings are complex technical systems.
- We have an increasing gap between potential and real building performance.
- For high performance buildings need quality management
- Digitalization make quality management services fast, transparent and cost effective.



Synavision: First Software for Technical Monitoring According to AMEV 2017

• Step 1: Design

- Specification of technical objectives
- Specification of testing procedures

• Step 2: Trial operation

- Run trial operation under specified conditions (1-4 weeks)
- Hand over operation data
- Evaluate operation data and report

• Step 3: Continuous or repeated testing

- Monitoring
- Quarterly or annual testing

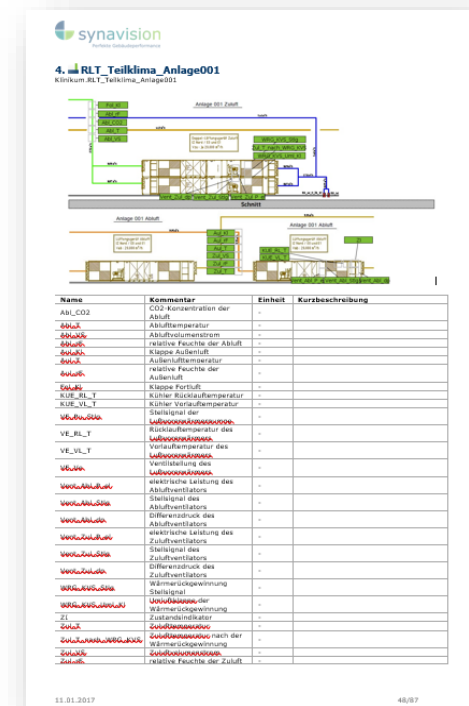


Step 1 (Design): Setpoints & Testing Procedures

- Design review
- Specification of relevant test parameters for the building and the systems
- Specifications for data collection and transfer.
- Specification of testing procedures.

Documents provided by synavision:

- List of Data points for each system to be tested
- Testing Specification for each system to be tested
- Tender document for trial operation
- Tender document for data export



4. RLT Teilklima Anlage001
Klinikum st. Teilklima_Anlage001

Name	Kommentar	Einheit	Kurzbeschreibung
Abf_CO2	CO2 Konzentration der Abluft	-	
..Abf_A	Abflufftemperatur	-	
..Abf_Vb	Abfluffvolumenstrom	-	
..Abf_Wb	relative Feuchte der Abluft	-	
..Abf_Wa	Klappensollwert	-	
..Abf_A	Außentemperatur	-	
..AuLuft	relative Feuchte der Außenluft	-	
..Klapp_A	Klappesollwert	-	
..Klapp_RL_T	Kühler Rücklauftemperatur	-	
..Klapp_VL_T	Kühler Vorlauftemperatur	-	
..Stell_Abfl	Stellsignal der Abfluffventilator	-	
..Stell_Zuluft	Stellsignal der Zuluftventilator	-	
..VE_RL_T	Rücklauftemperatur des Luftwäschegerätes	-	
..VE_VL_T	Vorlauftemperatur des Luftwäschegerätes	-	
..Vent	Ventilstellung des Luftwäschegerätes	-	
..Wb_Abfl	relative Feuchte der Abluft	-	
..Wb_Abfl_Vb	relative Feuchte des Abfluffventilators	-	
..Wb_Abfl_Wa	Differenzdruck des Abfluffventilators	-	
..Wb_Abfl_Wb	elektrische Leistung des Abfluffventilators	-	
..Wb_Zuluft	Stellsignal des Zuluftventilators	-	
..Wb_Zuluft_Vb	Differenzdruck des Zuluftventilators	-	
..Wb_Zuluft_Wa	Wärmerückgewinnung	-	
..Wb_Zuluft_Wb	Stellsignal	-	
..Zuluft	Wärmerückgewinnung	-	
..Zuluft_Vb	Zuluftvolumenstrom	-	
..Zuluft_Wa	Wärmerückgewinnung	-	
..Zuluft_Wb	Wärmerückgewinnung nach der Wärmerückgewinnung	-	
..Zuluft_Wb	Stellsignal	-	
..Zuluft_Wb	Stellsignal	-	
..Zuluft	relative Feuchte der Zuluft	-	

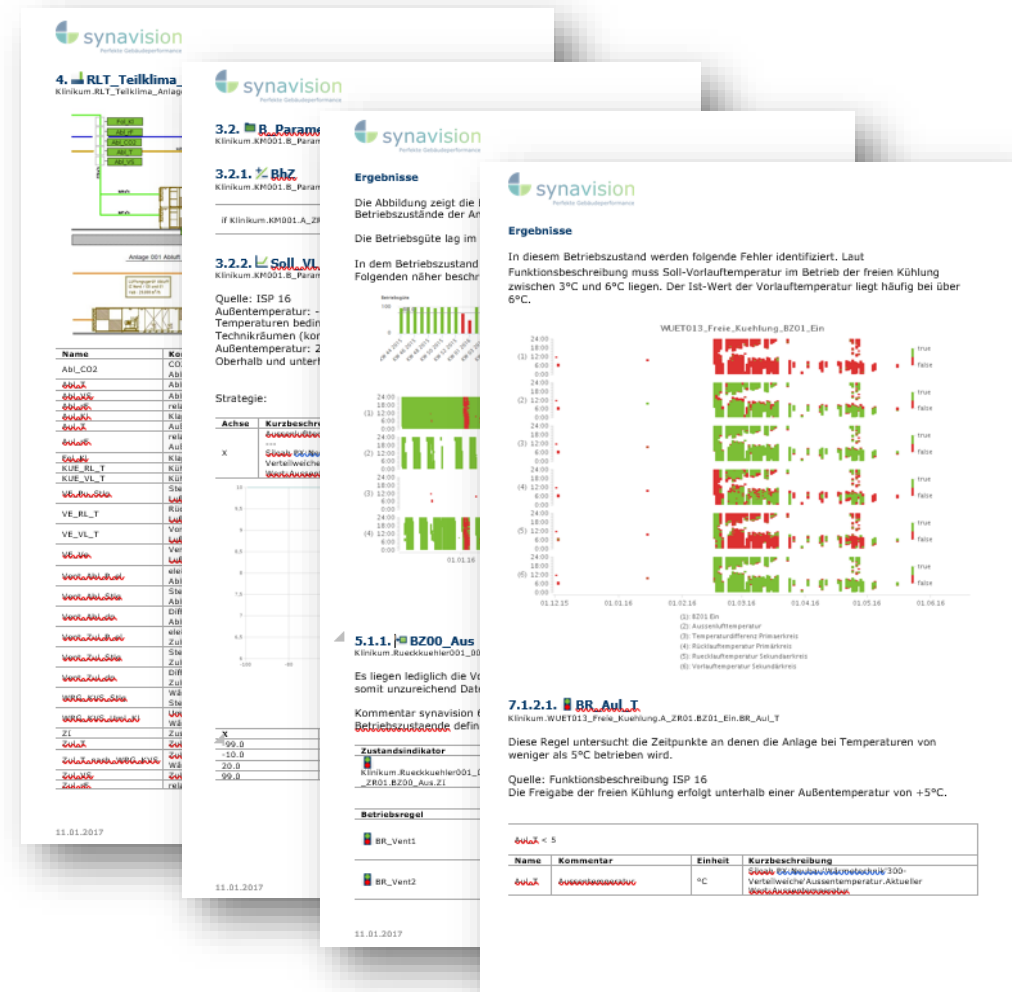
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Step 2: Monitoring in trial operation

- Contractor notifies test readiness
- Contractor hands over data export test data
- **synavision** tests data and notifies test readiness
- Owner notifies ok
- Contractor runs systems as specified (“hands-off operation”, but possibly with special load situations)
- Contractor hands over data as specified
- **synavision** analyses data as specified and reports

Documents provided by synavision:

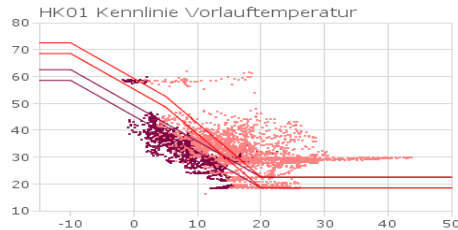
- Testing Report on each system
- Dashboard (optional)



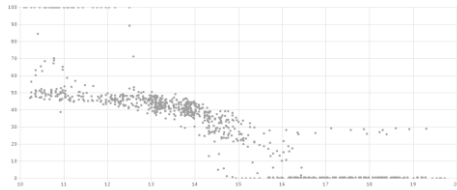
The collage displays several screenshots from the synavision software interface:

- 4. RLT_Teilklima:** A schematic diagram of a climate control system with various components labeled.
- 3.2. B_Param:** A parameter configuration screen for a climate system.
- 3.2.1. BhZ:** A screen showing operational states and quality metrics.
- 3.2.2. Soll_Vl:** A screen displaying a table of setpoints and a bar chart of actual values over time.
- Ergebnisse:** A summary screen with a bar chart and text explaining the operational state and identified errors.
- 5.1.1. BZ00_Aus:** A screen showing a table of operational rules and their status.
- 7.1.2.1. BR_AuLT:** A screen showing a table of control rules and their parameters.

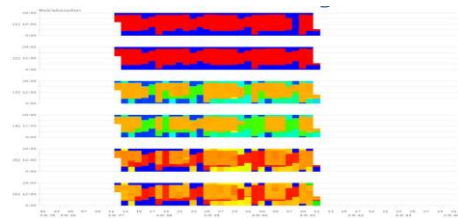
Step 2: Monitoring in trial operation



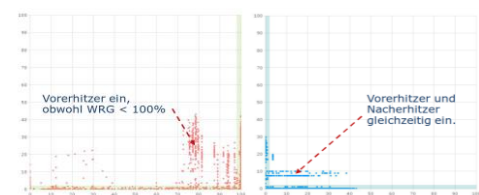
„System temperatures do not comply with target values. Please check setpoints and balancing.“



„Control valve opens continuously up to 50% and then jumps to 100%. Control settings and design should be reviewed.“



„Outdoor air dampers, Fan-Signals and pressure measurements are not consistent. Fans may run with closed dampers. Check immediatly!“



„Heating and cooling coils are not precisely locked. Please check programming of the sequence.“

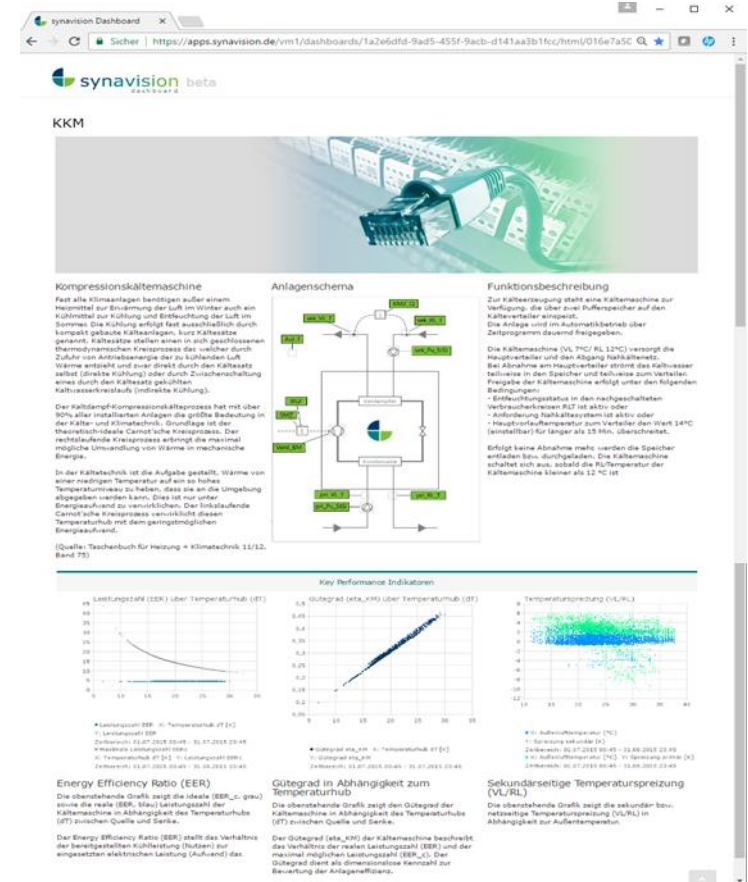


Step 3: Monitoring in regular operation

- Building is in regular operation
- O&M Personnel hands over data regularly (or continuous automated hand over)
- **synavision** analyses and reports on system performance (including O&M services)

Documents provided by synavision:

- Periodic testing reports on each system, e.g. as
 - monthly report in first years of operation
 - routing slip/checklist for inspections
 - O&M service level check
- Dashboard with continuous data import and visualization (optional)



Example: Dashboard-Template for a chiller

More Than 200 Buildings Tested!



Why synavision?

- **synavision** tests and verifies building performance - fast, transparent and cost effective.
- **synavision** accelerates commissioning and improves robustness of system operation.
- **synavision** performance test bench helps you to supervise your building and maintain performance.

