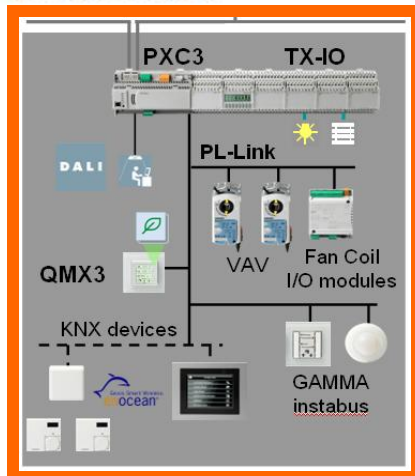




Building Technologies > Deutsch > Contact > Downloads > A-Z Index

- > Building Technologies > Building automation > HVAC products > Room thermostats
- > Autonomous room thermostats
- > Communicating room thermostats
- > Capillary and clamp-on thermostats
- > Fields of use
- > Features and benefits



Programmable thermostats for energy savings and comfort

Room thermostats from Siemens are easy to install and to use. Siemens' patented control technology ensures constant room temperatures. A comfortable room environment means having the right temperature at the right time. This is why the room thermostats feature settable time programs. They enable users to heat or cool rooms only when needed, which is both cost and energy-efficient. Also, the time programs offer a choice of settings. If a room is used differently every day, the heating and cooling phases can be set individually for each weekday. If room usage is always the same, the weekday/weekend program is the perfect choice. With room thermostats from Siemens, you can cover a wide variety of applications:

- Fan coils
- Heat pumps
- VAV
- Domestic hot water
- Floor heating
- Radiators
- Electric heating
- Ventilation systems for heating/cooling
- Chilled ceilings

Termostaatide valik funktsionaalsuse, rakenduste ja võrku ühildatavuse alusel

Ventilatsiooni ja kütte juhtimise lahenduste valik kasutades interaktiivset HIT kataloogi

Aivar Kukk

Ehitusautomaatika müügijuht

CPS BT

Infrastructure and Cities

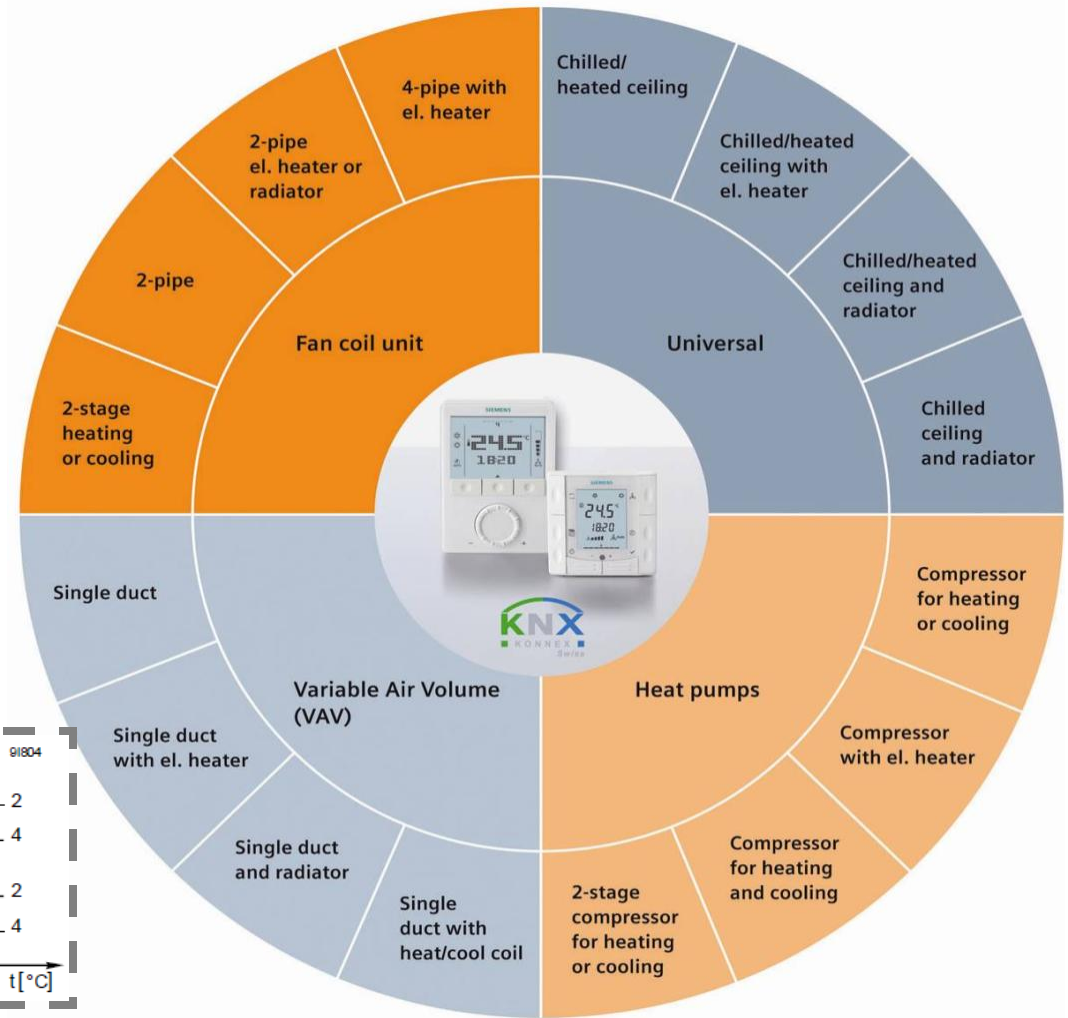
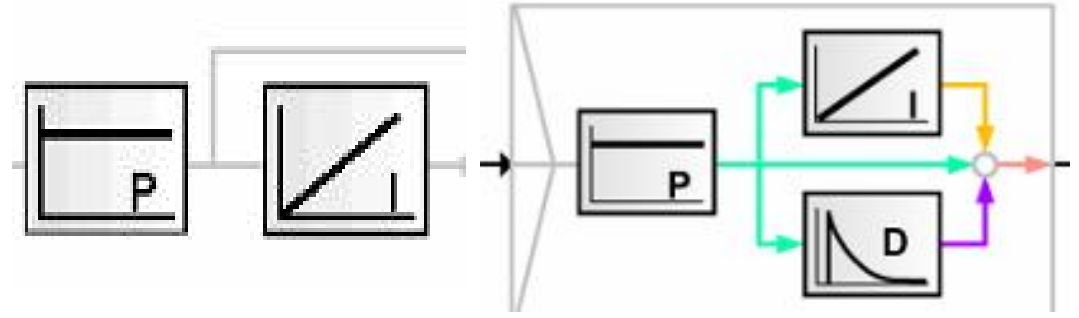
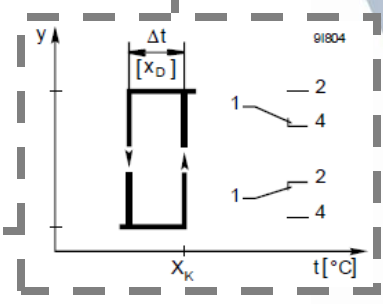
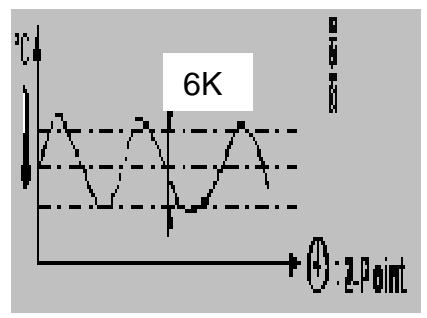
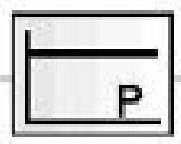
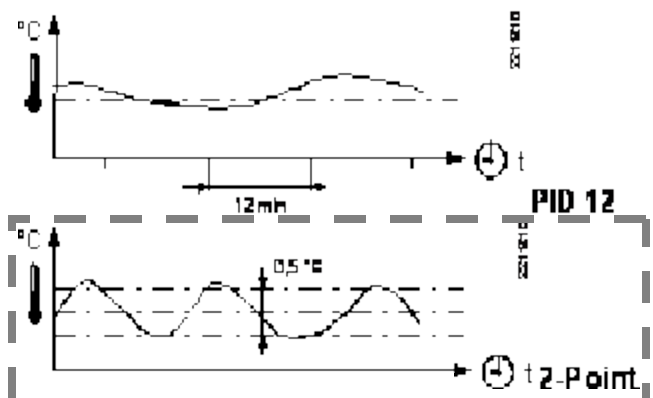
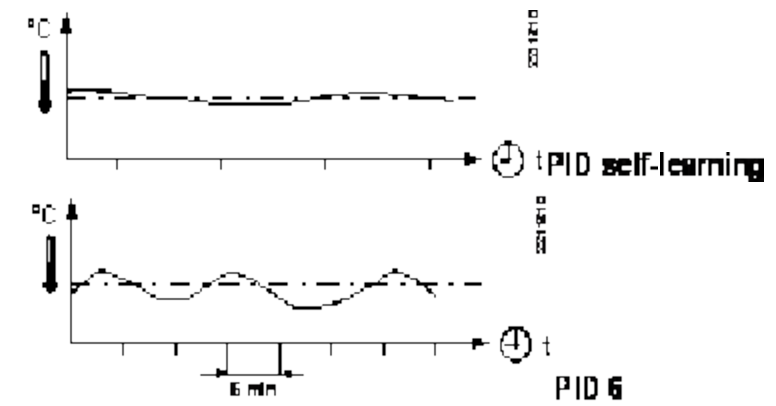
Siemens OY Eesti filiaal

Väike-Paala 1
11415 Tallinn

Tel.: 6305727

Mobiil: 517 9898

aivar.kukk@siemens.com
www.siemens.ee



P-reguleerimine (2P)


PI ja PI(d) (3P, 0-10V, 4-20mA, xxx bus'id)

Standard room thermostats
RAA.. / RCU..




- [RAA..](#)
- [RAA..1..](#)
- [RCU.. Universal](#)

Standard room thermostats:
5TC92..



- [5TC9 200](#)
- [5TC9 201](#)
- [5TC9 202](#)
- [5TC9 203](#)
- [Accessories for 5TC92..](#)

Room thermostats with display
RDD.. and RDH..




- [RDD..](#)
- [RDH..](#)
- [RDD310](#)
- [Accessories for RDD.. / RDH..](#)

Controller / monitor / limiter:
RAK.. / RAZ.. / RYT.. / TKM..



- [RYT182](#)
- [RAK-TR.1..H](#)
- [RAK-TW.1..H](#)
- [RAK-TW.1..H..](#)
- [RAK-TD.1..M](#)
- [RAK-ST..M](#)
- [RAK-ST.1..M..](#)
- [Accessories for RAK-T and RAK-S](#)
- [Protection pockets for RAK-T and RAK-S](#)
- [RAZ-TW.1..J](#)
- [RAZ-ST..J](#)
- [RAM-TR.2000M](#)
- [Accessories for RAZ-T..., RAZ-S., and RAK..](#)
- [RAM-TW.2000M](#)
- [Accessory for TKM2](#)
- [RAG-..](#)

Room thermostats with time clock: REV.. / RDJ.. / RDE.. / RAV.. / REA..



- [REV..](#)
- [REV100/200/303..](#)
- [RDJ..](#)
- [RDE](#)
- [REV26..](#)
- [RAV11..](#)
- [REA](#)
- [REA OpenTherm Plus compatible](#)
- [RDE410](#)

Autonomous room thermostats

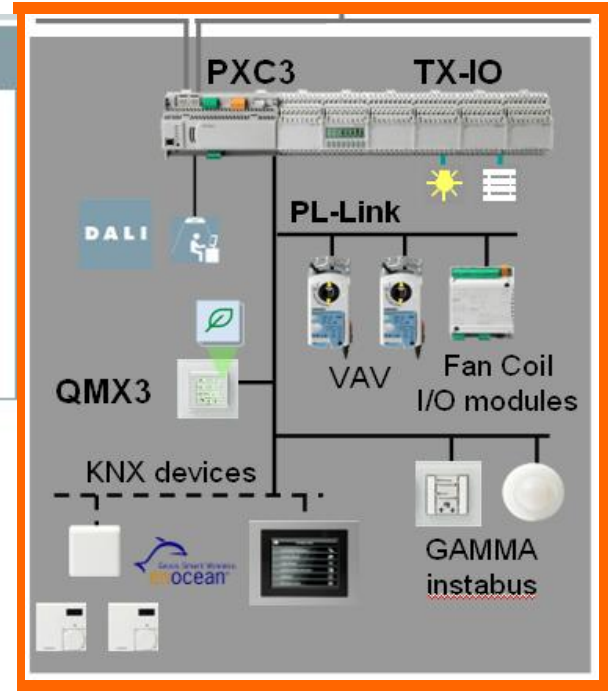


- [Heating and/or cooling](#)
- [Fan coils](#)
- [Variable air volumes \(VAV\)](#)

Communicative room thermostats



- [Fan coils – KNX](#)
- [Variable air volumes \(VAV\) – KNX](#)
- [Fan coils – Modbus](#)



PWD /faasi laiuse moduleerimise/ printsiip vahamootorite juhtimiseks RDF, RDG, RCC, RCU.... REV RDE



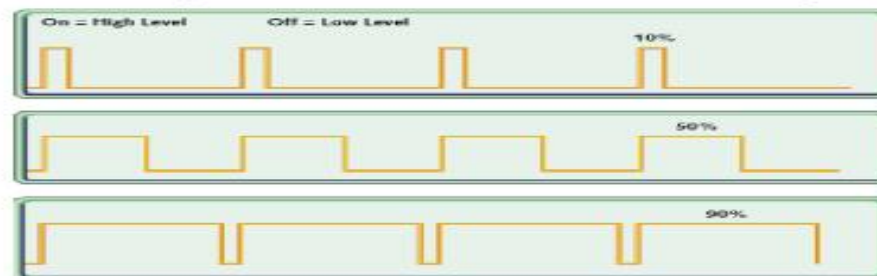
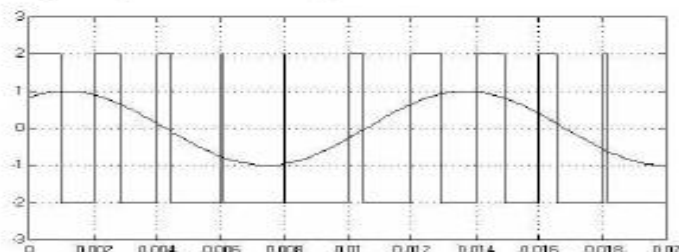
Vastused küsimustele radiaatorite, fancolide ja jahutusventiilide sujuva juhtimise kohta Siemens RXL/B/C regulaatoreid koos termomootoriga.

Täname märkuse eest. Iseenesest on kasutatavad nn vahamootorid elik termomootorid 2-posi täiturid ja kui kasutada mehhaanilisi või elektromehhaanilisi termostaate siis selliselt, ON-OFF n temperatuuri reguleerimine ka toimub.

Siemens kasutab hooneautomaatika süsteemides vaha- elik termomootorite juhtimisel nn PDM (moduleerimisega) signaaliga juhtimist.

Regulaatorites RXL, RXB, RXC on ventiilide juhtimiseks kasutusel nn. PI (proportsionaalne integ, ...), mis tagab sujuva juhtimise iseenesest.

Väljundi poolel on regulaatorites RXL, RXB, RXC läbi türistorväljundite kasutusel AC 24 V PDM/PWM signaal,



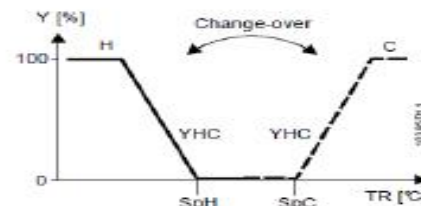
mis vastavalt regulaatori PI programmist lähtuvale etteantud asendile (0-100%) annavad termomootorile sellise sagedusega ja pikkusega impulsse mis tagavad ventiili oleku etteantud asendis. Kuna kasutatakse türistorväljundit, on regulaatori töö vaikne.

Algkäivitusel fikseerib regulaator ventiili-mootori tegeliku asendi – ajakonstandi, see on ka programmiselt etteantav. Olles nn. külmas reservis (puudub vajadus avada ventiili kas kütmiseks või jahutuseks) on regulaatorist mootorisse peal 1...5% nn. valvesignaali, mis hoiab ventiili suletuna ent kindlustab kiire stardi kui tekib vajadus. Lisaks on regulaatoris ventiili-mootori treeningu funktsioon

Thermic actuators are driven with an AC 24 V PDM signal, and motorized actuators with an AC 24 V 3-position signal. Thermic actuators operate at a raised temperature. To ensure a fast response, these actuators are constantly preheated to a slightly higher temperature (5% – 1 s ON /19 s OFF). They therefore continue to receive pulses from the controller even when closed. When the controller is enabled, after parameterizing, and for the valve exercising feature (to prevent seizing), the heating and cooling valve actuators are "opened" for 5 minutes (50% – 1 sec ON/ 1 sec OFF) and then "closed" for 5 minutes (5% – 1 sec ON/ 19 sec OFF). After that the sequence starts operating

Kokkuvõtteks: kasutatav kombinatsioon PI regulaatorist, millel on PDM väljund termomootorile tagab sujuva juhtimise ning andmed ventiili asendi kohta on kasutatavad ka juhtimisprogrammis hiindamiseks teglikku olukorda ruumides. Üldiselt võttes on sellise juhtimisviisi tulemus lisatud skeemil.

Changeover (heating or cooling)



- Y Output signal
- TR Room temperature
- SpH Effective heating setpoint
- SpC Effective cooling setpoint
- H Heating sequence
- C Cooling sequence
- YHC Heating or cooling valve
- B1 Return air sensor



Seadmete ja lahenduste valiku programm HIT TÄIELIKU TOOTEVALIKUGA:

https://hit.sbt.siemens.com/HIT/fs_global.aspx?lang=en&RC=HQUEU&WINX=1259&WINY=828

Seadmete ja lahenduste valiku programm HIT HINNAKIRJAGA 2013 AASTAKS:

https://hit.sbt.siemens.com/hit/fs_global.aspx?&lang=en&RC=Baltics

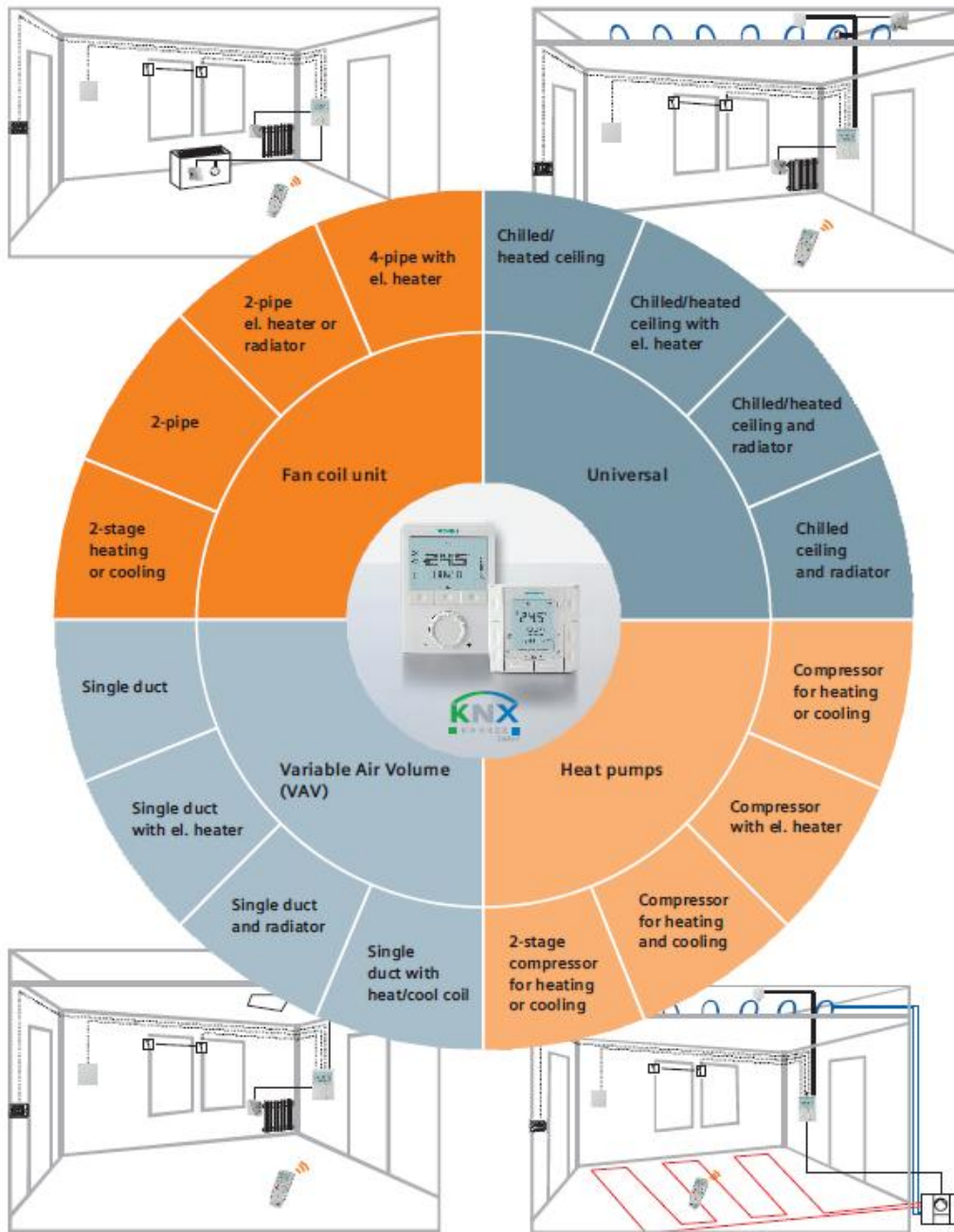
Hooneautomaatikast <http://www.siemens.ee/> > Infrastruktuur & linnad > Hooneautomaatika
> ... leiade juhendid, lühitutvustused ja energiasäästu materialid.

Termostaadid, ÜLD

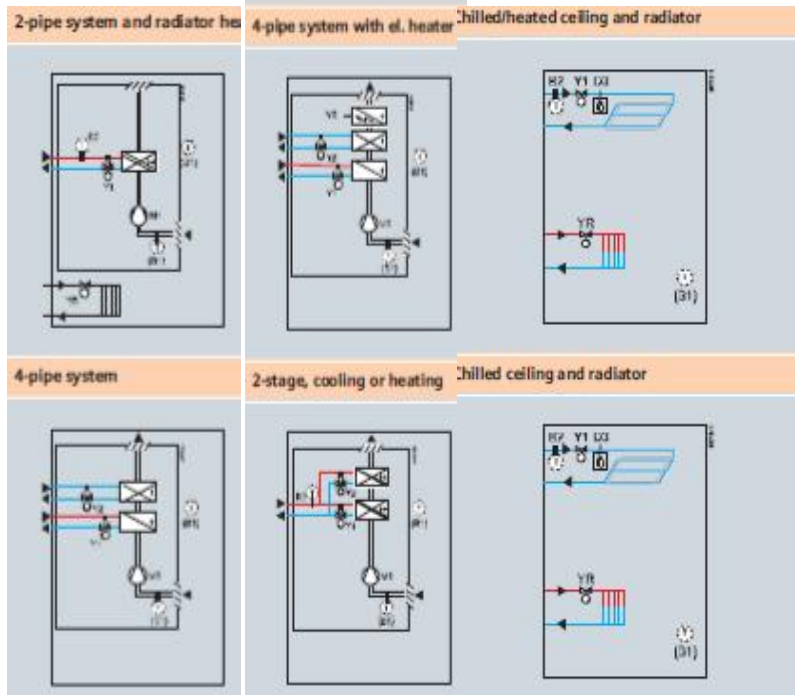
<http://www.buildingtechnologies.siemens.com/bt/global/en/buildingautomation-hvac/hvac-products/room-thermostats/autonomous-room-thermostats/Pages/autonomous-room-thermostats.aspx>

Termostaadid, Kommunikeeruvad (KNX ja MODbus):

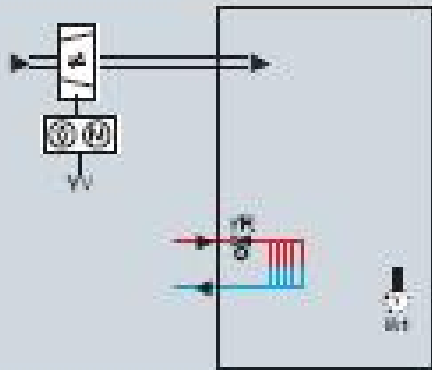
https://hit.sbt.siemens.com/HIT/fs_global.aspx?&MODULE=Catalog&ACTION=Show Group&KEY=374717



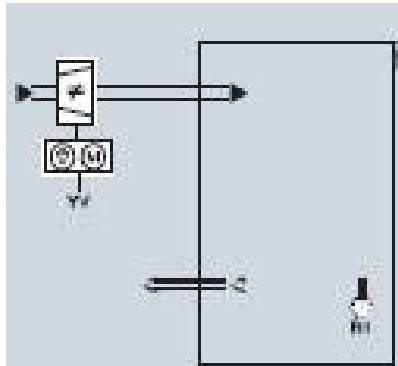
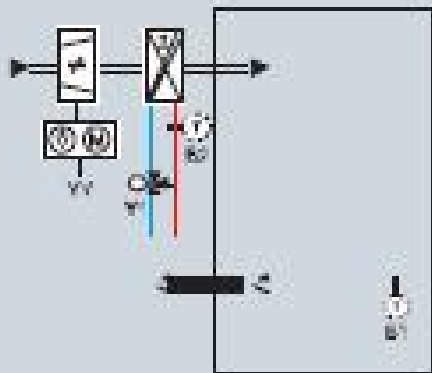
Application	Type of control output	Wired range	Surface-mounted range
2-pipe system	2-wire (ON/OFF) 2-wire (PWM) 2-wire (3-wire) 2-wire (DC0...10 V) 2-wire (DC0...10 V) ECM fan control (DC0...10 V)	R06101 R06110 R06100 R06100 R06142 R06162	R07100 R07110 R07100 R07100 R07100 R07140
2-pipe system with el. heater	2-wire (ON/OFF) with el. heater (PWM) 2-wire (ON/OFF) with el. heater (red PWM or 3-wire) 2-wire (ON/OFF) with el. heater (ON/OFF, PWM or 3-wire) 2-wire (ON/OFF) with el. heater (ON/OFF, PWM or 3-wire) 2-wire (DC0...10 V) with el. heater (DC0...10 V) 2-wire (DC0...10 V) with el. heater (DC0...10 V) 2-wire (DC0...10 V) with el. heater (DC0...10 V) 2-wire (DC0...10 V) with el. heater (DC0...10 V)	R06101 R06110 R06100 R06100 R06100 R06142 R06162	R07100 R07110 R07100 R07100 R07140



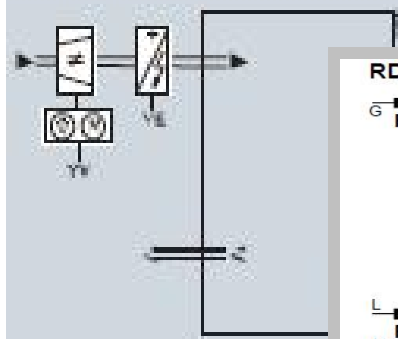
Single duct with radiator



Single duct with heat/cool coil

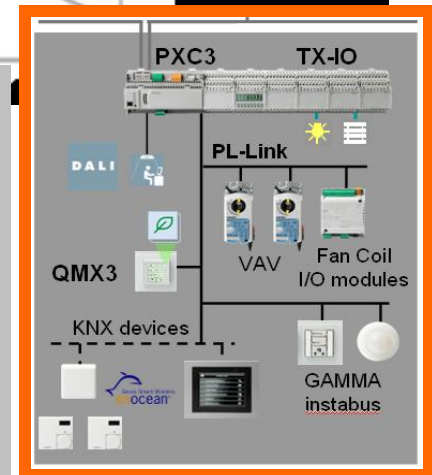
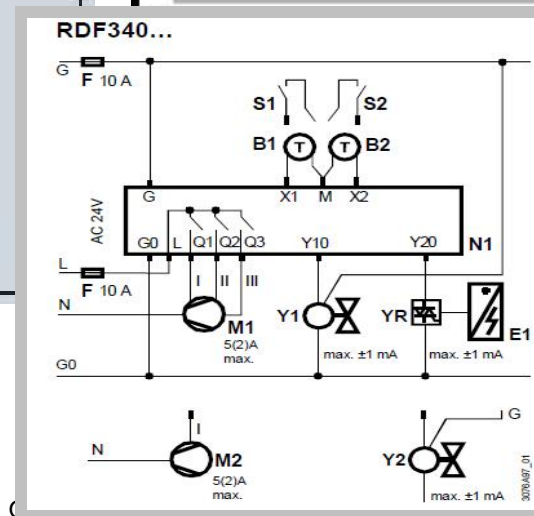
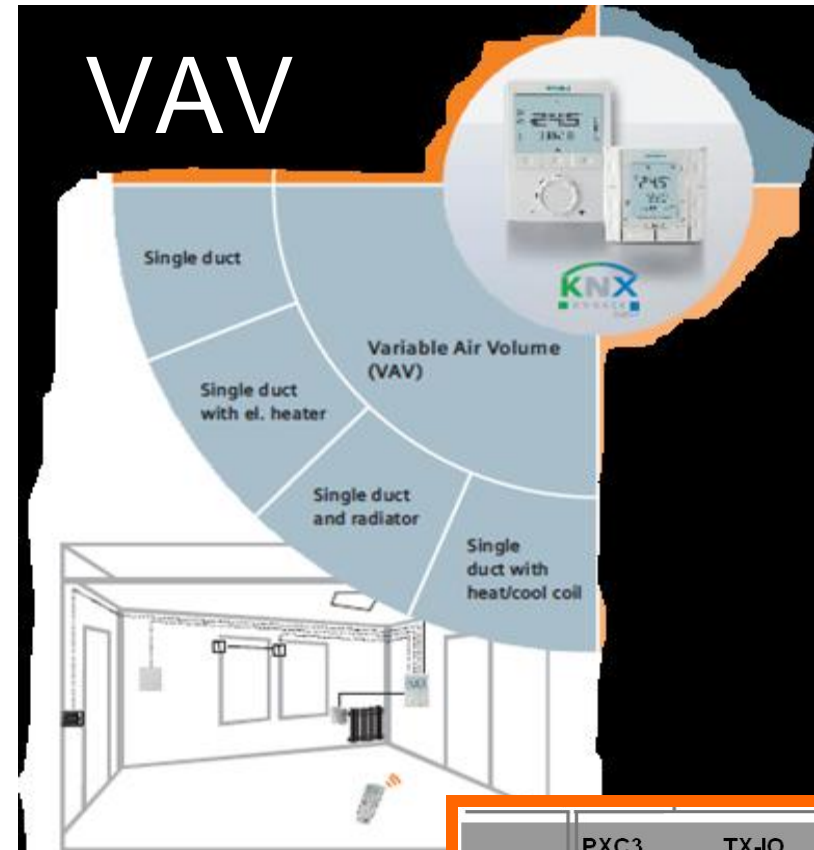


Single duct with el. heater



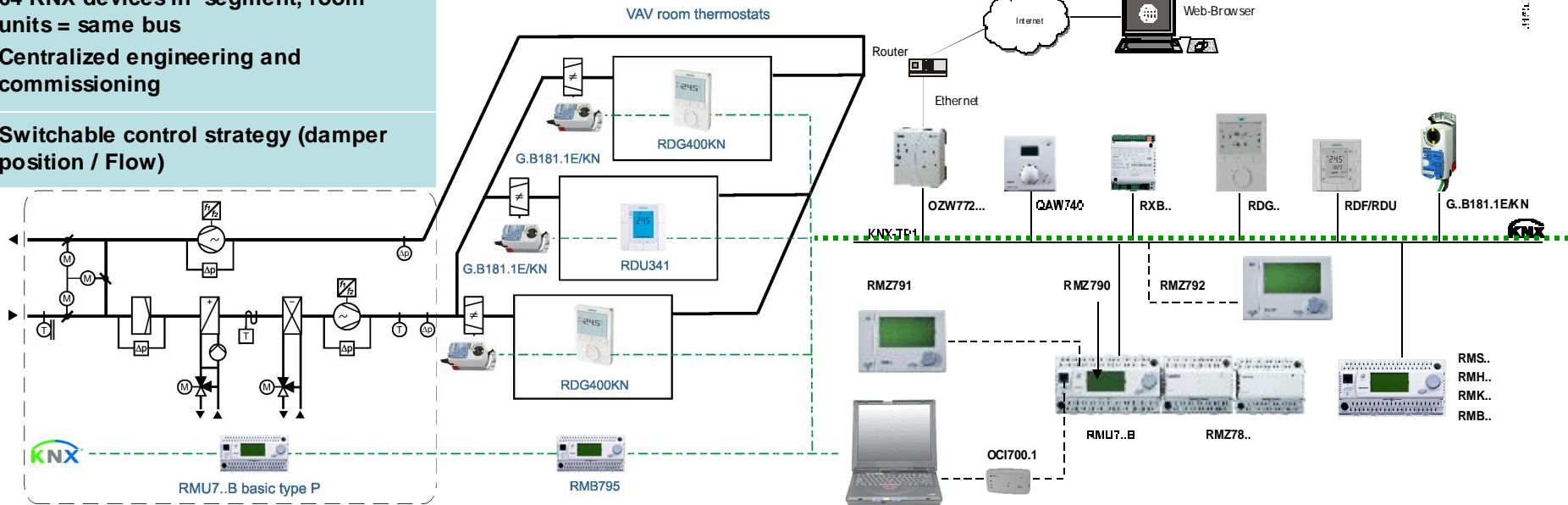
+ EC fan motor applications

VAV



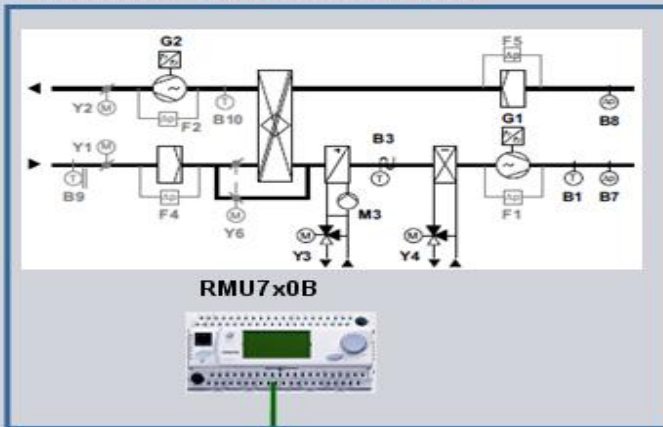
64 KNX devices in segment, room units = same bus
 Centralized engineering and commissioning

Switchable control strategy (damper position / Flow)



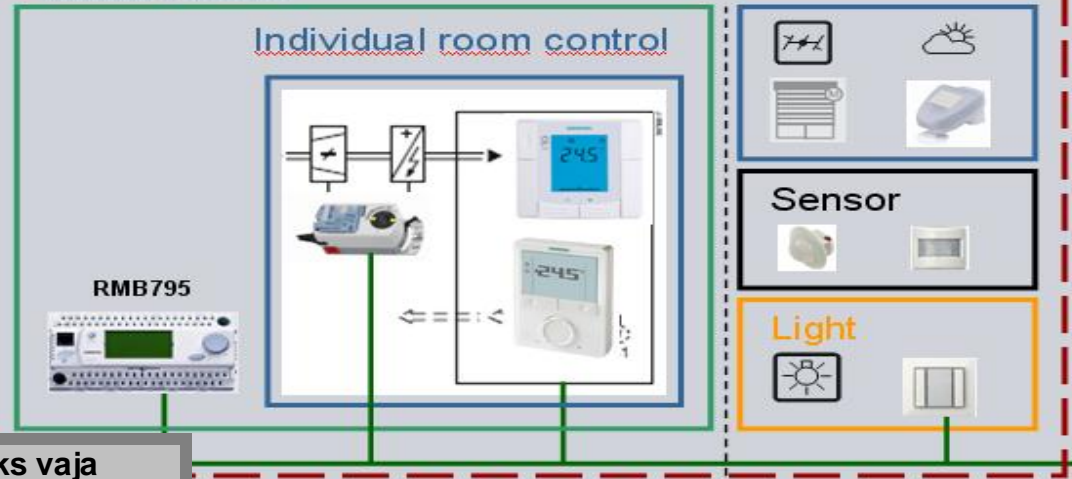
AirOptiControl (Siemens)

Primary air handling unit

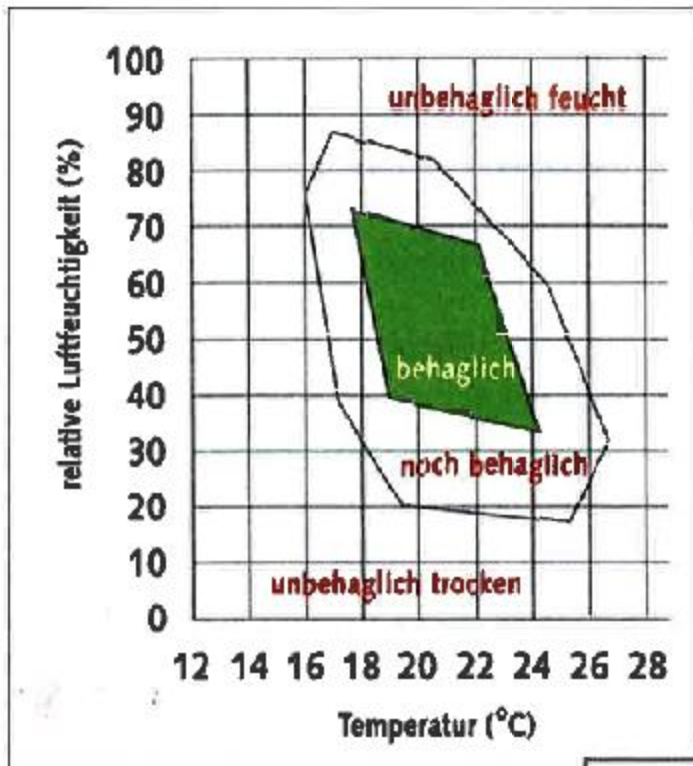


Individual room control HVAC & Electrical

Room groups



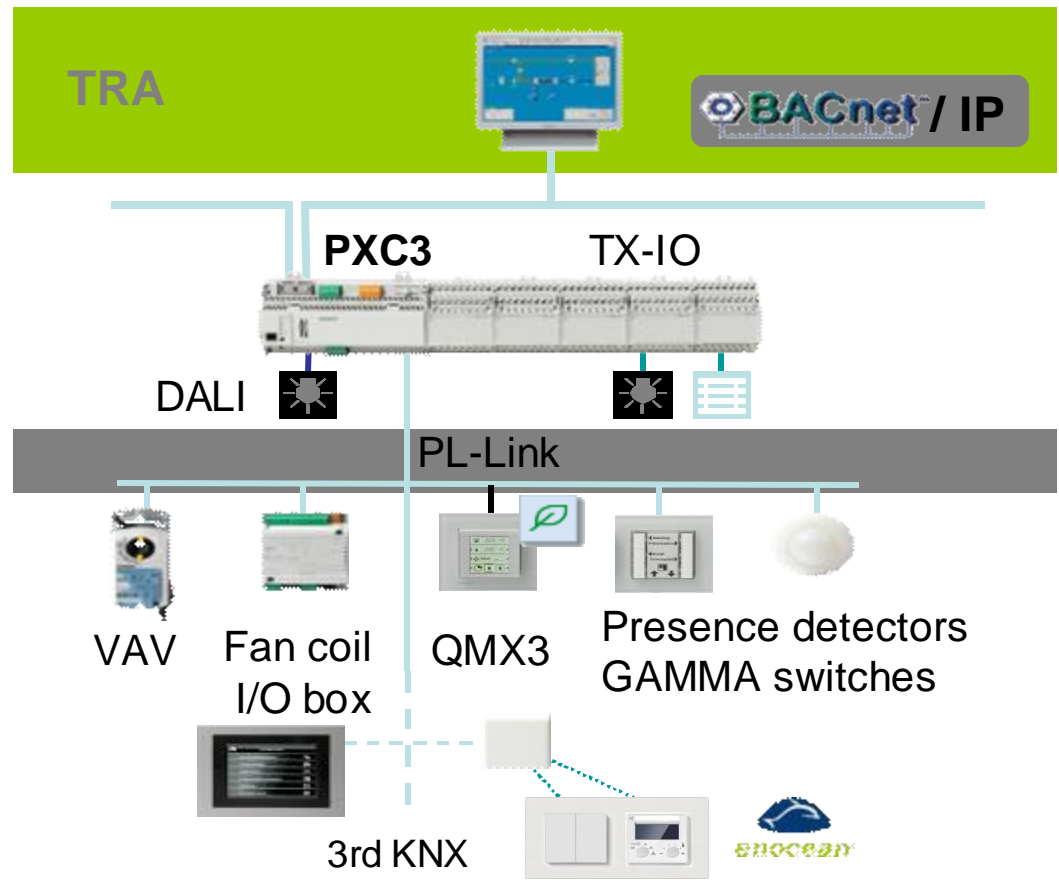
SP ja temperatuuride ruumikohaseks juhtimiseks vaja eraldi automatikaseadmeid ja pelgalt VAV softi, programmeerimise ja käidu hõlpsus on näiline... Regulaator ventseadmele ja 20+ VAV reguleeritavale ruumile ~1 k€



▲ Mollier: Ihmisen mukavuusalue (T, RH)

▲ Apparent temperature. Lähde: National Oceanic and Atmospheric Administration, US.

DI Olavi Tupamäki
talotekniikka 5 / 2012



Sisäilman suhteellinen kosteus - RH								
Mittari-lämpötila	0%	10%	20%	30%	40%	50%	60%	70%
24°C	20	21	22	22	23	24	25	25
23°C	19	20	20	21	22	22	23	24
22°C	18	18	19	20	21	21	22	23
21°C	17	18	18	19	19	20	20	21
20°C	16	17	17	18	18	19	19	20

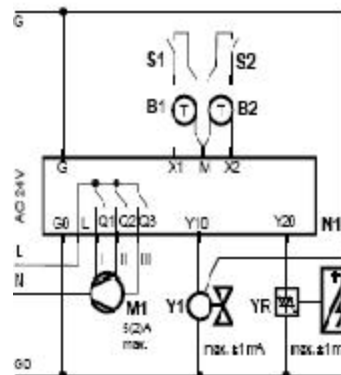
Klass C

Termostaat
elik
Juhtimiskeskus

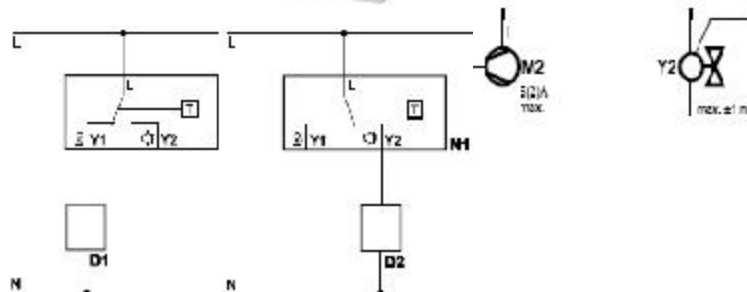
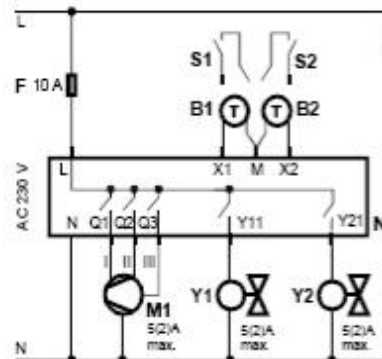
Ruumikohased
juhtimisfunktsioonid



RDF340...



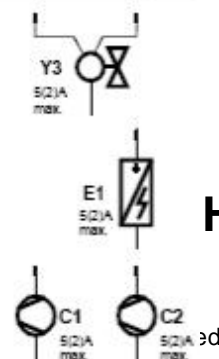
RDF300..., RDF400...



Üldotstarbeline Juhtimispult (HMI)

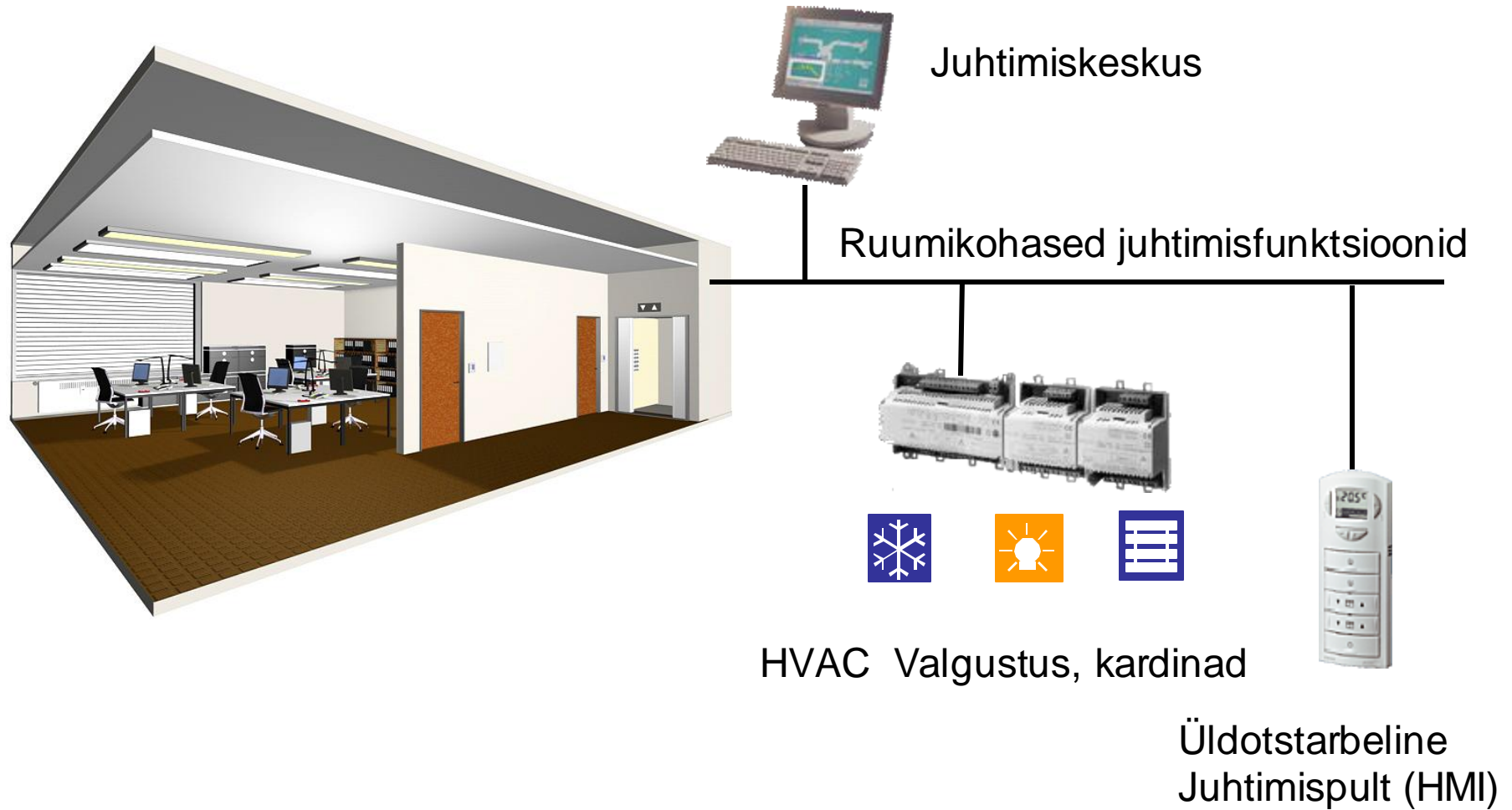
On versioonid, kus otse
või KNXbus kaudu saab nt
4 lisafunktsiooni (valgus,
dimmer, CAV===CO2,
kardinad)

HVAC Valgustus, kardinad



Klass B: Advanced BACS / Room Automation

vastab laiendatud BACSi ja mõnele kindlatele TBM funktsioonidele



EN15232:2012

Uue EN15232:2012 olulisim muudatus BACS klassi määramisel

7.2 Aruanded ja info energiakasutusest, sisekliimast ja võimalustest selle parandamise võimalustest.
... *Parendusmeetmed Keskkonna parandamisvõimaluste analüüs Pidev täiustamine parendused kapitaalremont...*

		Definition of classes							
		Residential				Non-residential			
		D	C	B	A	D	C	B	A
5	LIGHTING CONTROL								
5.1	Occupancy control								
	0 Manual on/off switch								
	1 Manual on/off switch + additional								
	2 Automatic detection								
5.2	Daylight control								
	0 Manual								
	1 Automatic								
6	BLIND CONTROL								
	0 Manual operation								
	1 Motorized operation with manual control								
	2 Motorized operation with automatic control								
	3 Combined light/blind/HVAC control								
7	TECHNICAL HOME AND BUILDING MANAGEMENT								
7.1	Detecting faults of home and building systems and providing support to the diagnosis of these faults								
	0 No								
	1 Yes								
7.2	Reporting information regarding energy consumption, indoor conditions and possibilities for improvement Aruannete esitamine vastavalt tarbitud energiale, sisekliima tingimustele ja võimalused olukorra muutmiseks								
	0 No								
	1 Yes								



C klassist (BACS) edasi ei saa kui puudub:

Reporting information regarding energy consumption, indoor conditions and possibilities for improvement
Aruannete esitamine vastavalt tarbitud energiale, sisekliima tingimustele ja võimalused olukorra muutmiseks

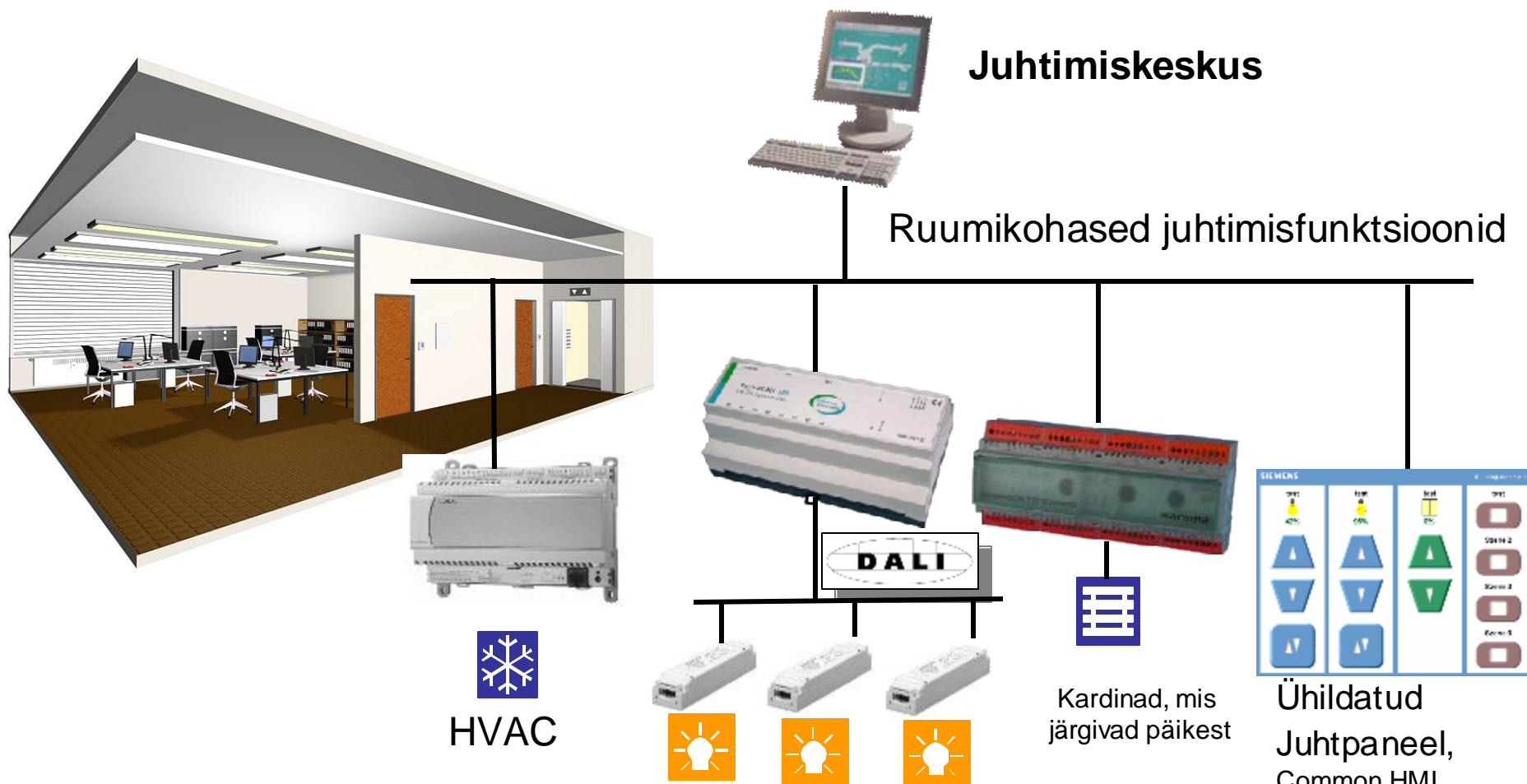
Recording energy consumption and operational data provides the foundation:

- to evaluate the building, plants as well as their operation,
- for issuing an energy pass, to recognize potential improvements and plan measures

http://www.hqs.sbt.siemens.com/gip/general/dlc/data/assets/hq/Building-Automation---Impact-oni-energy-efficiency_A6V10258635_hq-en.pdf

Class A: High Energy Performance BACS / Room Automation

Vastab BACS ja TBM kõrgele energiatõhususele

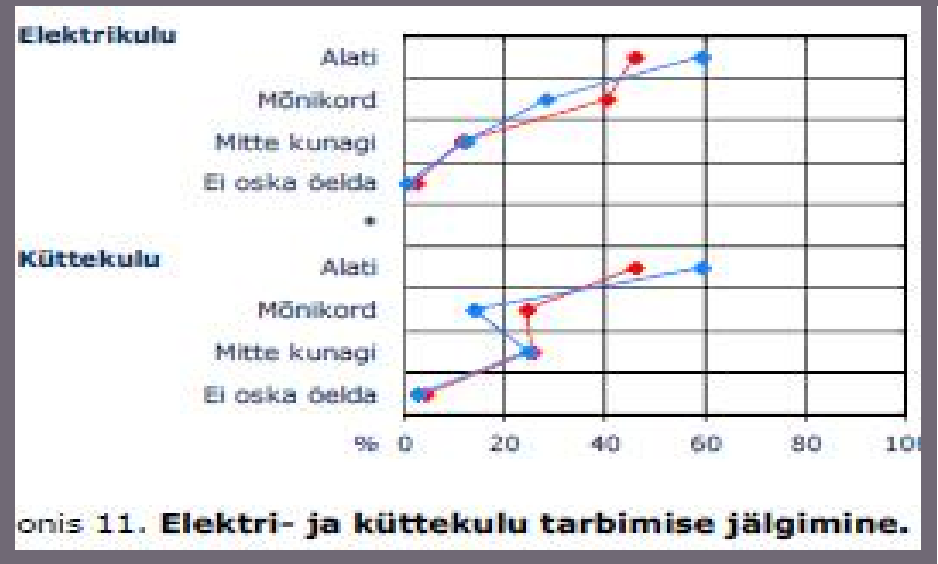


EN15232:2012

Automaatselt lülitatud ja "dimmitud" valgustus

Tarbija poolelt....

...tegelikult



onis 11. Elektri- ja küttekulu tarbimise jälgimine.

Energiasäästlik käitumine elanikkonnas 2012

Tarbija poolel



Mõned põhjused:

- Pole lihtsalt huvi...
- Ei saa lihtsalt aru, mis põhjustab...
- Elu peremeeste energiasäästu suvaotsused on diskrediteerinud...
- Projekti ja tehnika vead, mis ei annagi saavutada tavaoludeski soovitatavat tulemust
- Ekstreemsete ilmastikuolude ja päikesepaiste võimaluse ignoreerimine seadearvude taastamisel
- Halb psühhokliima töökohal, ärapanemine...






























2degrees

**Delivering Building Energy
Efficiency Through Behavior Change**

2degrees Sustainability Essentials

Desigo TRA

Energiakasutus tõhusaks + RoomOptiControl

The light rules		The HVAC rules	
 	Light setpoint shift 	 	Temp setpoint shift 
 	Light on with enough daylight 	 	Fan setpoint shift 
 		 	Change room operating mode 
The blind rules		The room coordination rules	
  	Winter: Blinds down, sunny day and heating 		Ajakava X või pikendati 
  	Summer: Blinds up and cooling 		



Ruumi kasutaja vajutab punase lehe nuppu → ruumi seaded taastatakse optimaalseteks →



BACS Säastupotentsiaalid, ehitusautomaatika kasutamisest (EN 15232)

http://www.hqs.sbt.siemens.com/gip/general/dlc/data/assets/hq/Building-Automation---Impact-on-energy-efficiency_A6V10258635_hq-en.pdf



Hotellid




25%

Education



34%

Hospitals



18%

Restaurants



31%

Shopping

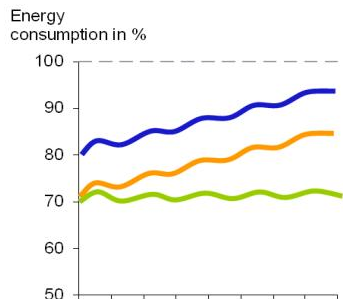


49%

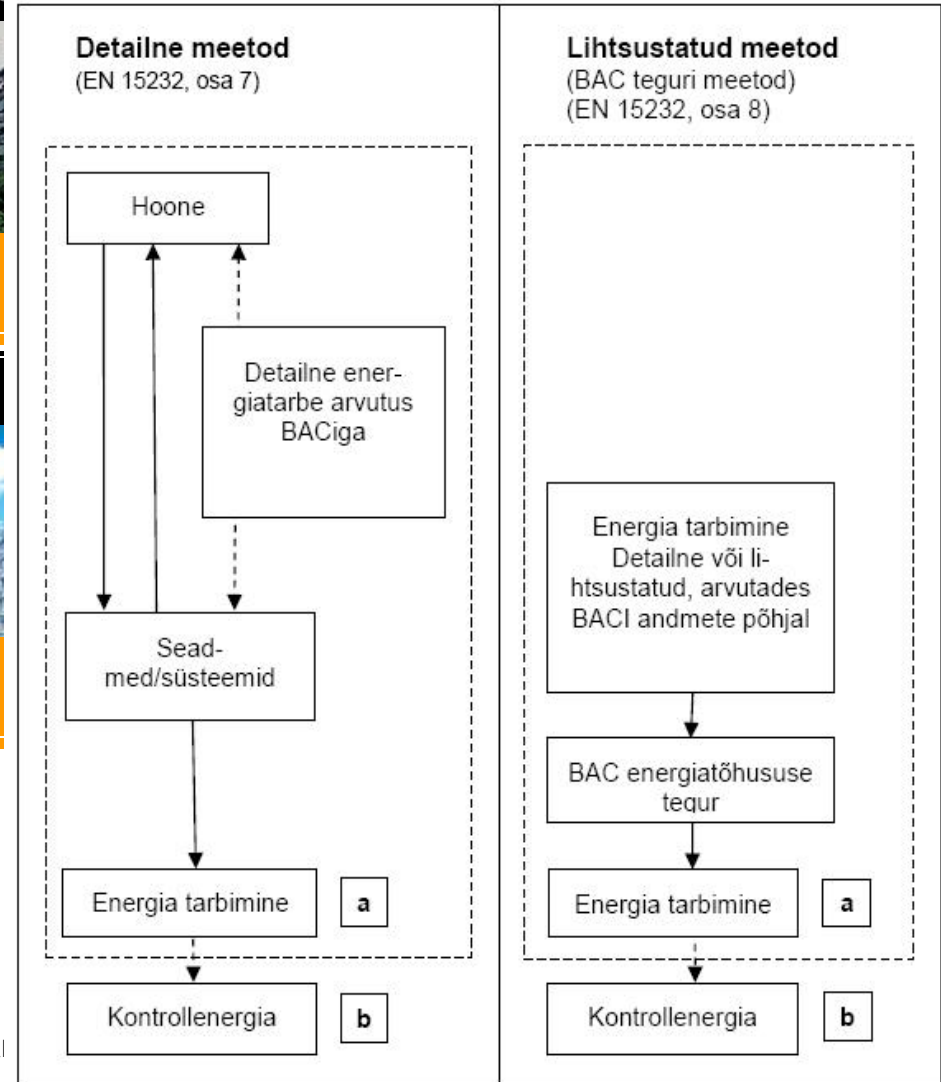
Offices



39%



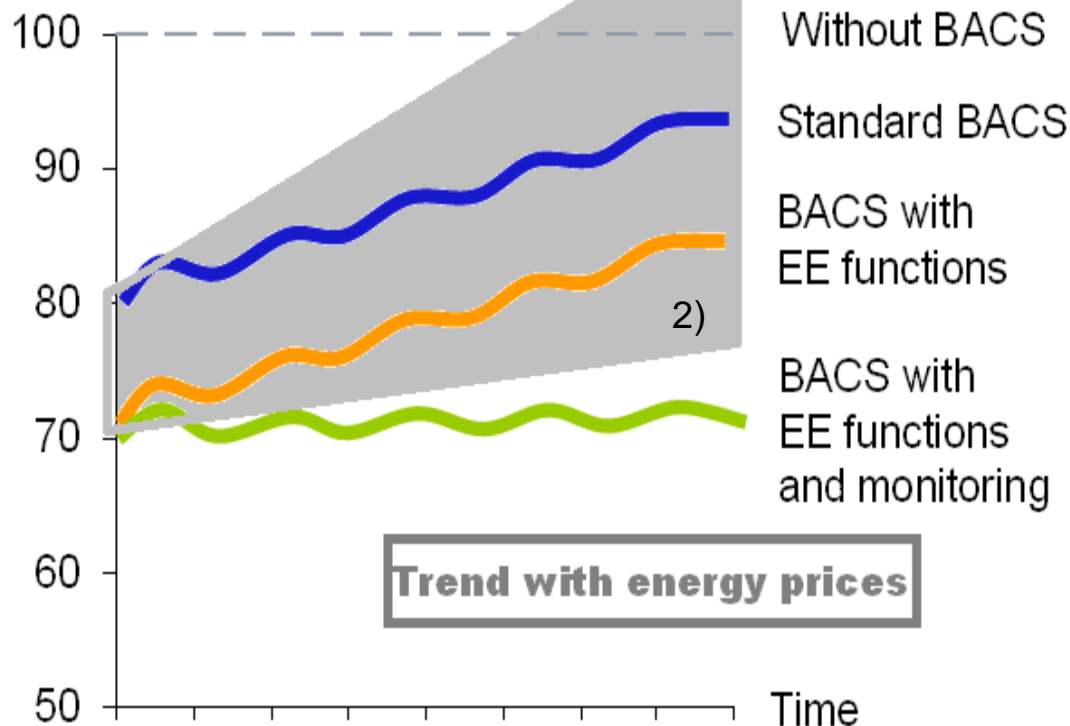
Determined by means of building simulation / FH Aachen DE





Suurendada hõone juhtimissüsteemi
enregiatõhusust ja koostöös hoone
Operaatori, haldajaga

Energy
consumption in %



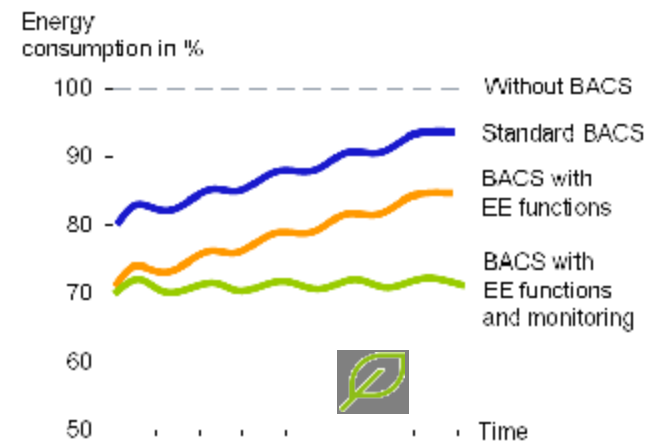
- 1) Lawrence Berkeley National Lab; Monitoring Based Commissioning: Benchmarking Analysis of 24 UC/CSU/IOU Projects; June 2009
- 2) Minister Parts nädala avaüritusel ...me ei tea mis saab Poola kildagaasi tegeliku hinna tõttu...

Top 10 põhjust effektiivuse langusele

- Õhuhulgad tsentraalselt ..., sagedusmuundurid puudu v 100% VSD
- Ajakavad valed või pole neid üldserakendatud
- Küte ja jahutus koos
- Õhukanalite ja torude lekked
- Pumpade, ventilaatorite täiturite vead ja osaline mittetoimine
- Õhuhulgad tarbimiskohtade juures pole seadistatud
- Töörežiimid hoones ja tehn. seadmetel ei haaku eu'i ajas ega ruumis hetkevajadustega
- Software ja programmeerimisvead
- Vead seadmete paigaldamisel, defektid, saastumine, vananemine jne.
- HVAC valesti projekteeritud elik dimensioneeritud



Desigo V5 Eco Monitoring – tehnosüsteemidele Optimeerib ja juhib energeetilist efektiivsust



BACS Effizienzklassen – EN 15232



Hochenergieeffiziente BACS mit EEM **A**
 Energieeffizient BACS mit EEM **B**
 Standard BACS **C**
 Nicht-energieeffiziente BACS **D**

Overall Performance: **70%**

Chiller	8-10°C	87%
Boiler	8-10°C	87%
Transformer	8-10°C	87%

- Avastab ning teavitab kohe energiatõhususest kõrvalekalletest, operatiivne parendamise võimalus
- Kohene mõju energiakulukusele
- Vastavalt uuematele standarditele (e.g. EN 15232:2011, ISO 50001)

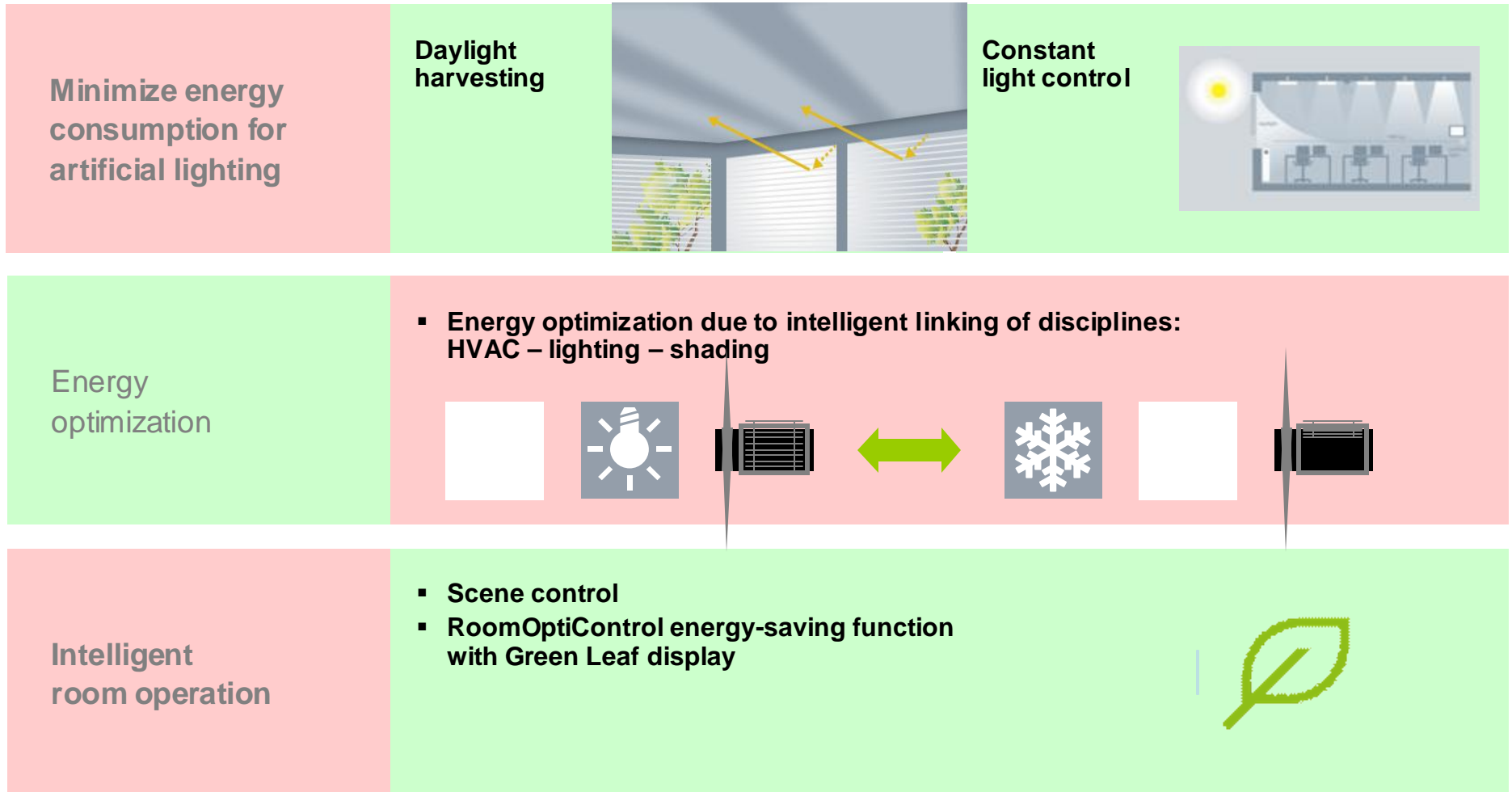
Integratsioon operatori ja kasutajate vahel via Green / Red Leaf

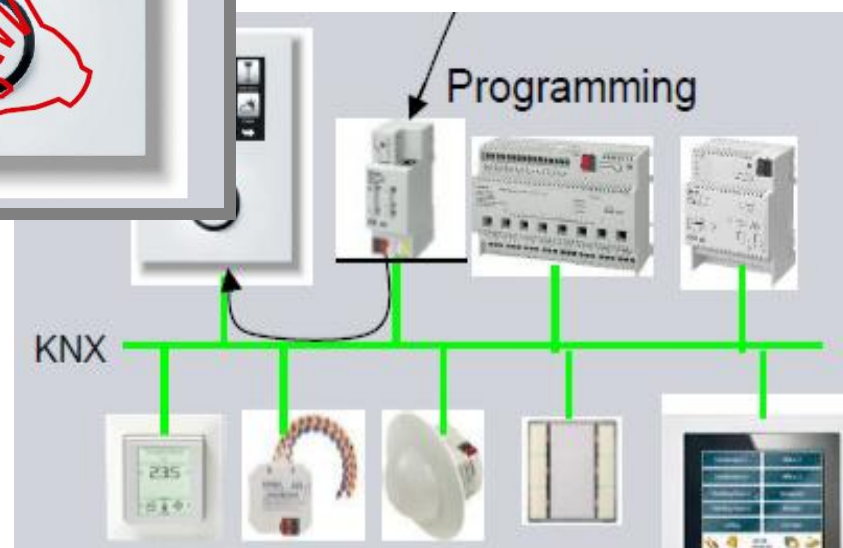
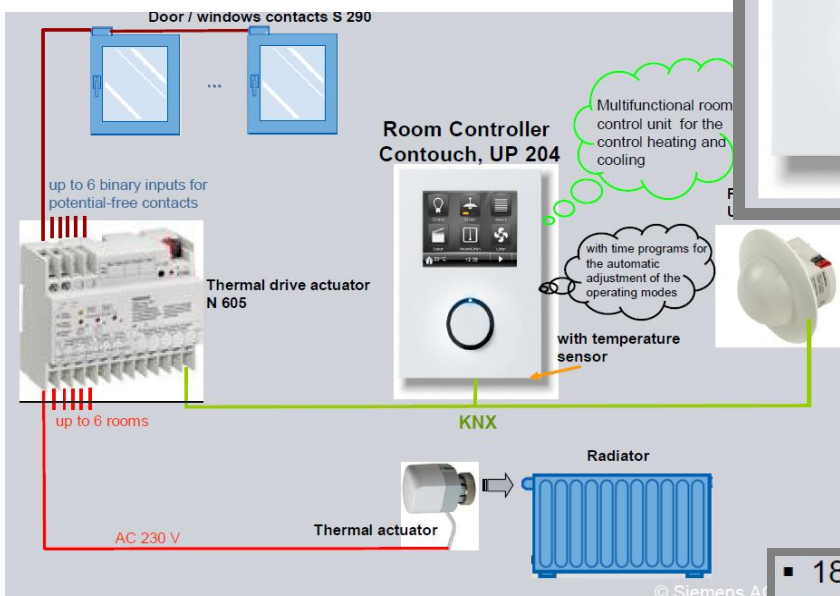
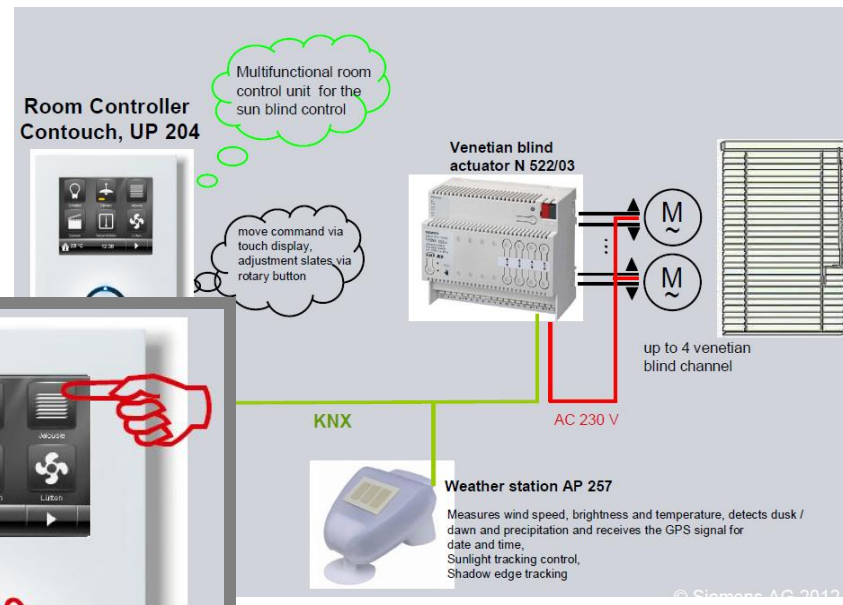
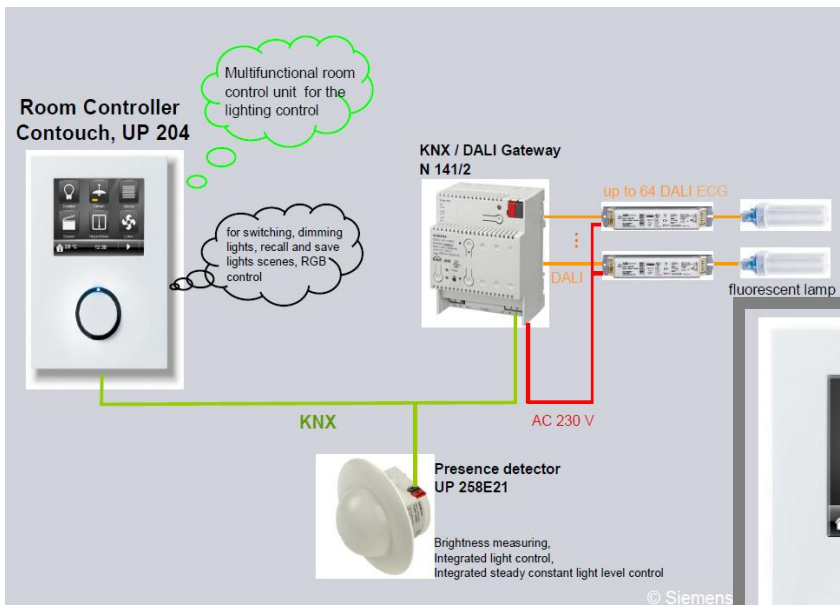
 Seade töötab optimaalselt
 Optimeerimiseks on potentsiaali!
 Let's be positiv!!

Detailed analüüsid kasutades Desigo Insight Eco Viewer

Total Room automation (TRA) makes buildings more efficient

Intelligent linking of room disciplines

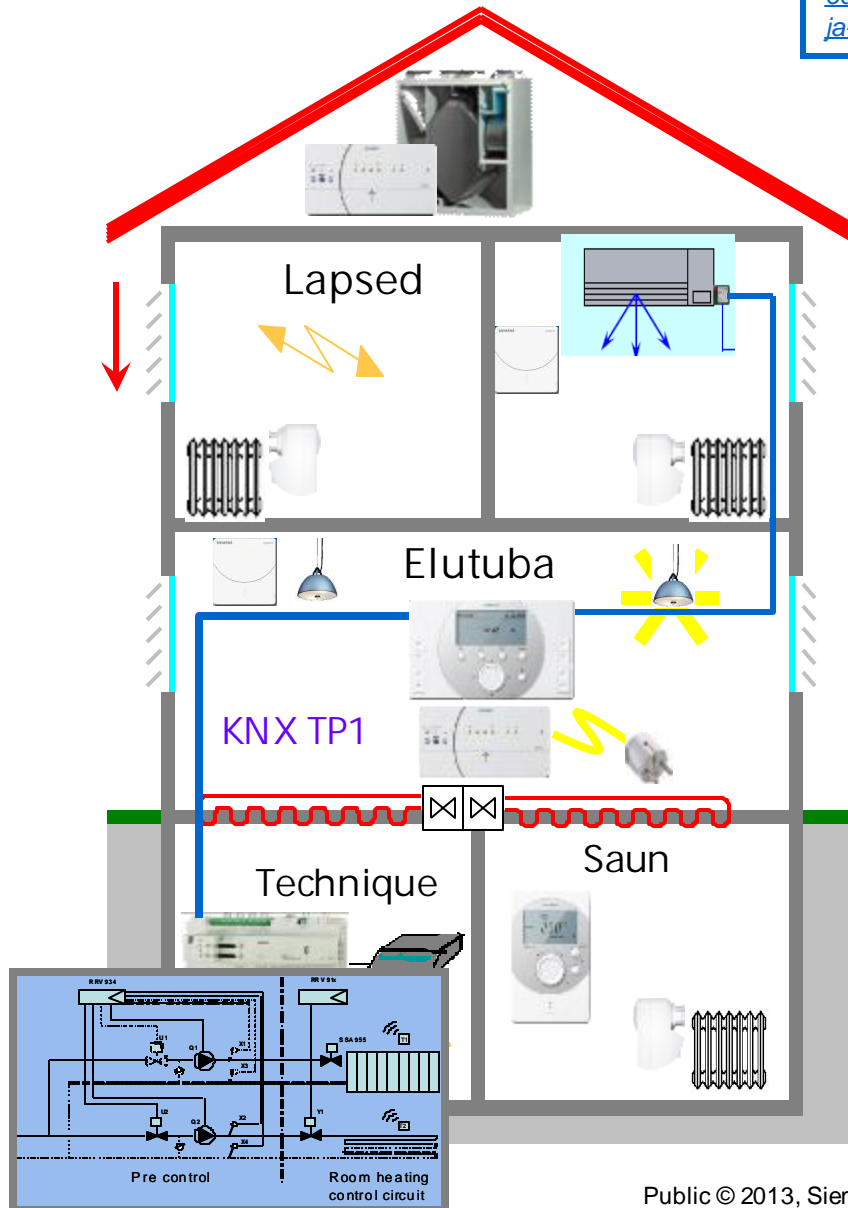




- 18 Room operating functions for switching, dimming lights, forced control, control solar protection, display and send values, recall and save scenes and display text and alarm messages
- Schedules for weekly switching plans

Synco Living

http://www.siemens.ee/pool/estonia/infrastructure_and_cities/hooneautomaatika/tooted/1_synco-living---maja-ja-korteri-kliima-ja-kulude-juht-ee-2011-maerts.pdf



- Juhtimine ja info töö juurest või reisil olles:
 - + Üle koduarvuti ja www, email > SMS
 - + Telefonirobotiga, **iPhone ja Androidi APP**
 - + **Möötjate ühendamine (2012)**
- Suurematele asumitele
- Kommunikatsioon (OZW772 - kuni 250 komplekti):
 - igas 3 juurdepääsu taset. st. Kasutaja, hooldusfirma, admin
- + Via **Ethernet, USB** või **modem**
- + **4 sõnumi saajat:** (SMS), Pager, e-Mail, FAX ,+ spetsial tools, nt ACS



Täna tähelepanu eest

SIEMENS

Aivar Kukk

Ehitusautomaatika müügijuht

CPS BT

Infrastructure and Cities

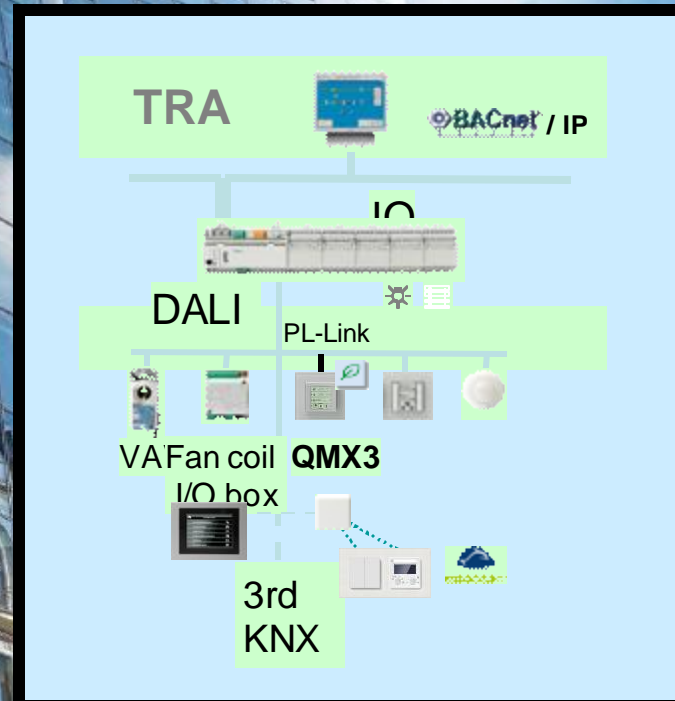
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Väike-Paala 1

11415 Tallinn

Tel.: 6305727

Mobiil: 517 9898



Lahendused hooneautomaatikale

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