



Welcome to the HORA world

-

Control valves Made in Germany for the energy-efficient climatization of buildings

HORA - Holter Regelarmaturen GmbH & Co. KG

Jens Lang

Energy-efficiency in buildings

1. Thermal Insulation and shadowing:
 - of external walls
 - of windows
 - of pipes for hot and cold water

2. Energy-efficient production of chillness or heat

3. Energy-efficient and intelligent distribution and control of chillness and heat:

HORA



Energy-efficiency in buildings

Decentralized AC:



Characteristics	Decentralized Systems	Unitary packaged systems	Centralized systems
Area served	Small	Medium to large	Large
Capacity of refrigeration system (ton of refriger. TR)	Mostly < 2 TR	3-220 TR	Often greater than 100 TR
Amount of outdoor air supply	Influenced by wind direction and velocity	Positive outdoor air supply Providing modulation of volume low	Positive and guaranteed outdoor air supply
Space temperature control	Greater temperature fluctuation	Temperature may fluctuate as a result of step control of DX control	Better control quality
Air cleanliness	Not satisfactory owing to low-efficiency air filters installed	Satisfactory because of installation of medium-efficiency air filters	Meet any requirement because of the possibility of installing medium- or high-efficiency air filters
Space sound level	Higher space noise criteria NC curve	Lower space NC curve	Lower space NC curve because of better sound attenuation
Load diversity	No diversity	Lower diversity	Lower diversity
System component efficiency	Low	Medium	Higher
Equipment life	Shorter	Longer	Longest
Maintenance	More maintenance work Maintenance at conditioned space	Less maintenance work Maintenance at the packaged unit	Less maintenance work Maintenance at fan room and plant room
Heat rejection	Easier for premier zone	Easier for low-rise building	Easy for any building
Smoke control	Cannot coordinate with smoke control system	May be integrated as part of smoke control system	Can be integrated as part of smoke control system
Operator	No operator	Operator may be required	Operator is required
Characteristics	Individual DX room air conditioner	DX packaged system	Central hydronic system
Initial cost	Lower	Medium	Higher
Operating cost	Lower	Medium	Higher
Plant room	No equipment room is required	Separate equipment room is required	Fan room and central plant room
Flexibility of operation	More flexible	Comparatively flexible	Less flexible
Installation	Simple and fast	Simpler compared with central hydronic systems	More complex
Energy metering for individual tenants	Simple	Simpler compared with central hydronic systems	Difficult
Future expansion	Flexible	Less flexible compared with individual room systems	Less flexibility
System characteristic	Individual	Central	Central
Cooling	Direct expansion DX control	Direct expansion DX control	Water cooling coil

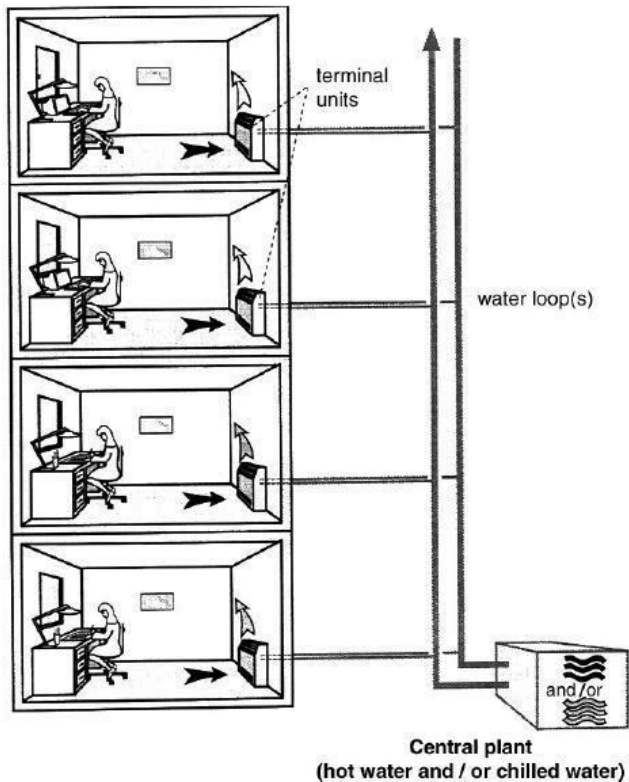
Centralized AC:



Energy-efficiency in buildings

A central chilling saves energy and money:

Energy Efficiency Ratio EER: $\epsilon_{KA} = \frac{\dot{Q}_0}{P_{el}}$



A central chilling needs control:



Our company...



founded 1967

by Georg Dresselhaus
(1928 - 1995)

Shareholder: Prof. Dieter Dresselhaus
(100%)

Workforce: ~ 300 + about 20...40
temporary workers

Export rate: > 65%
in 54 countries

Turnover: 52 Mio €



All activities at one location



Holter Regelarmaturen GmbH & Co. KG
www.hora.de

All activities at one location



All activities at one location



All activities at one location

Everything what we do is 100%

“Made in Germany”

Numerous attributes make us different (1)



Independence

Family owned enterprise



Competence

Competent engineers are available to assist you in your product selection.



Reliability

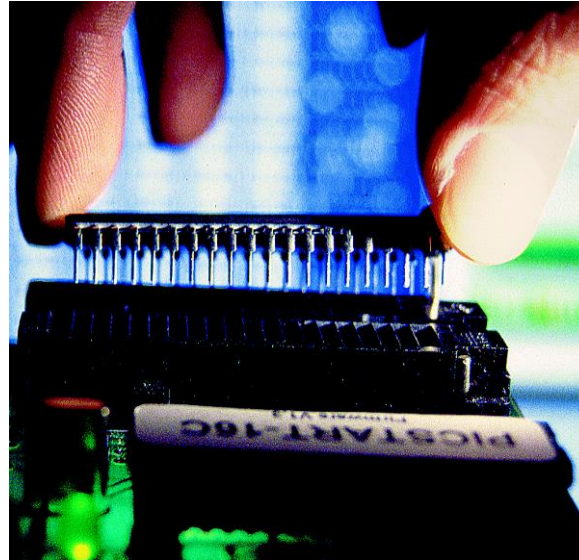
Customer oriented organization ensures high product availability

Numerous attributes make us different (2)



Product range

Large range of valves and actuators from one supplier



Innovation

Innovative products are developed in-house by our own R&D experts.



Partnership

People who know each other well can find better solutions to complex tasks.

We know that a partnership based on trust and confidence is an important key for ongoing success to both sides.

One company – two business units

HORA

FC Flow Control



PT Power Technology



HORA Process Innovations:

HORA Process Innovations:

- On Management Level
- On Production Level
- On Infrastructure

HORA Process Innovations:

- ...an ongoing, permanent procedure of improvement !
- ...a core competence of HORA !
- ...unique in the world of control valves !
- ...state of the art !

Processes

APS

5S

5W

MMA

KVP

Poka
Yoke

MTM

Value-
stream-
mapping

Kanban

BSC

Process-
map

1-piece-
flow

Ruled
communi-
cation

SMED

Sanky-
diagram

Lean

Process-
center

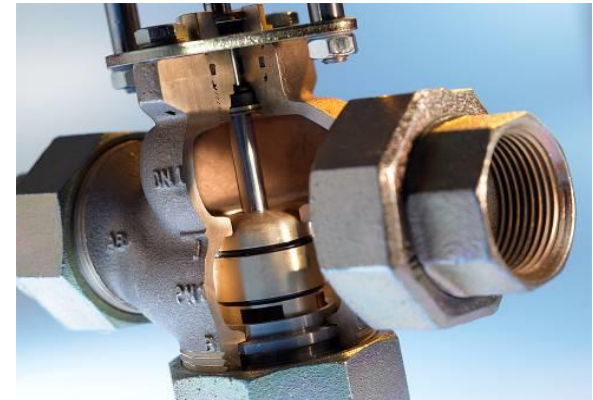
Milkrun

Processes

Best quality and product availability:

Reduction of lead time ...

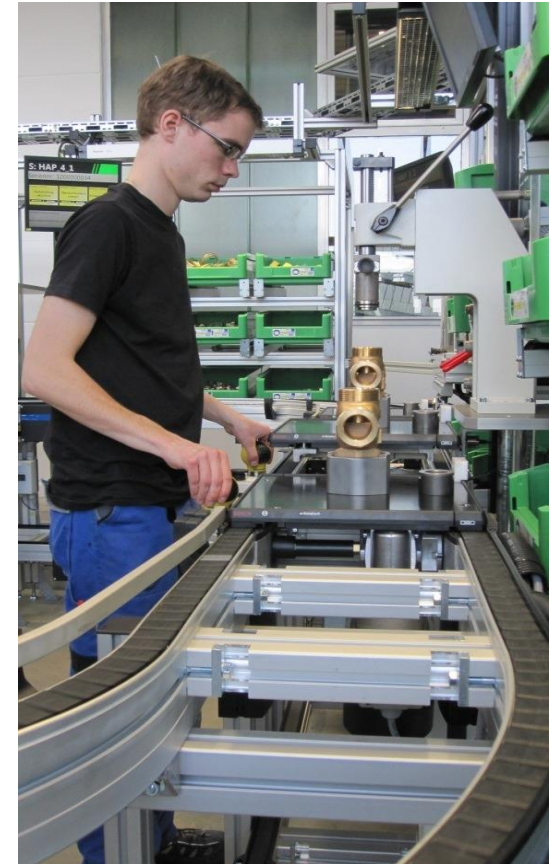
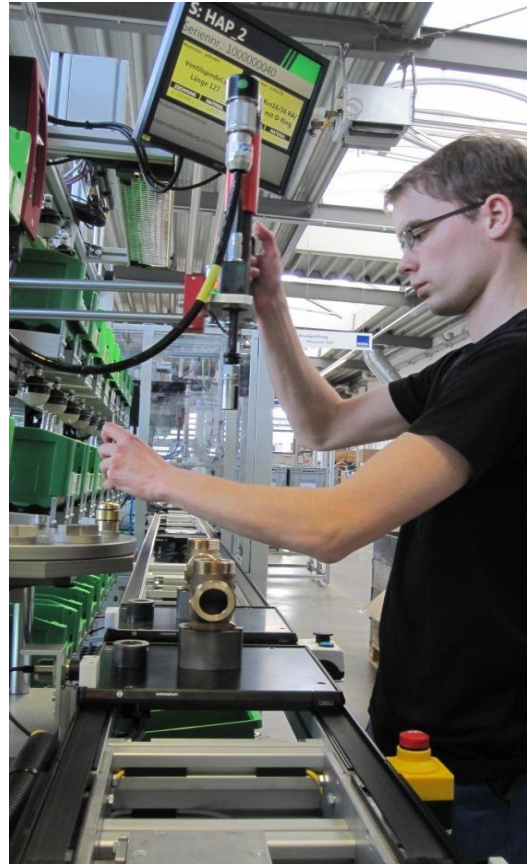
... for simple variant products
from 2 weeks to 4 hours



... for more complex variant products
from 8 weeks to 8 days



U-shaped production line for standard valves



U-shaped production line for standard valves

Capacity:

More than **50,000** valves of the RA and GF series per year

Winner of MX Award



Products....

Control valves for building automation / HVAC



BR 216/316MZ

DN 15 – DN25
PN 16



BR 216/316RA

DN 15 - DN 50
PN 16



BR 216/316GF

DN 15 - DN 150
PN 6 & PN 16

Two-way and three-way control valves

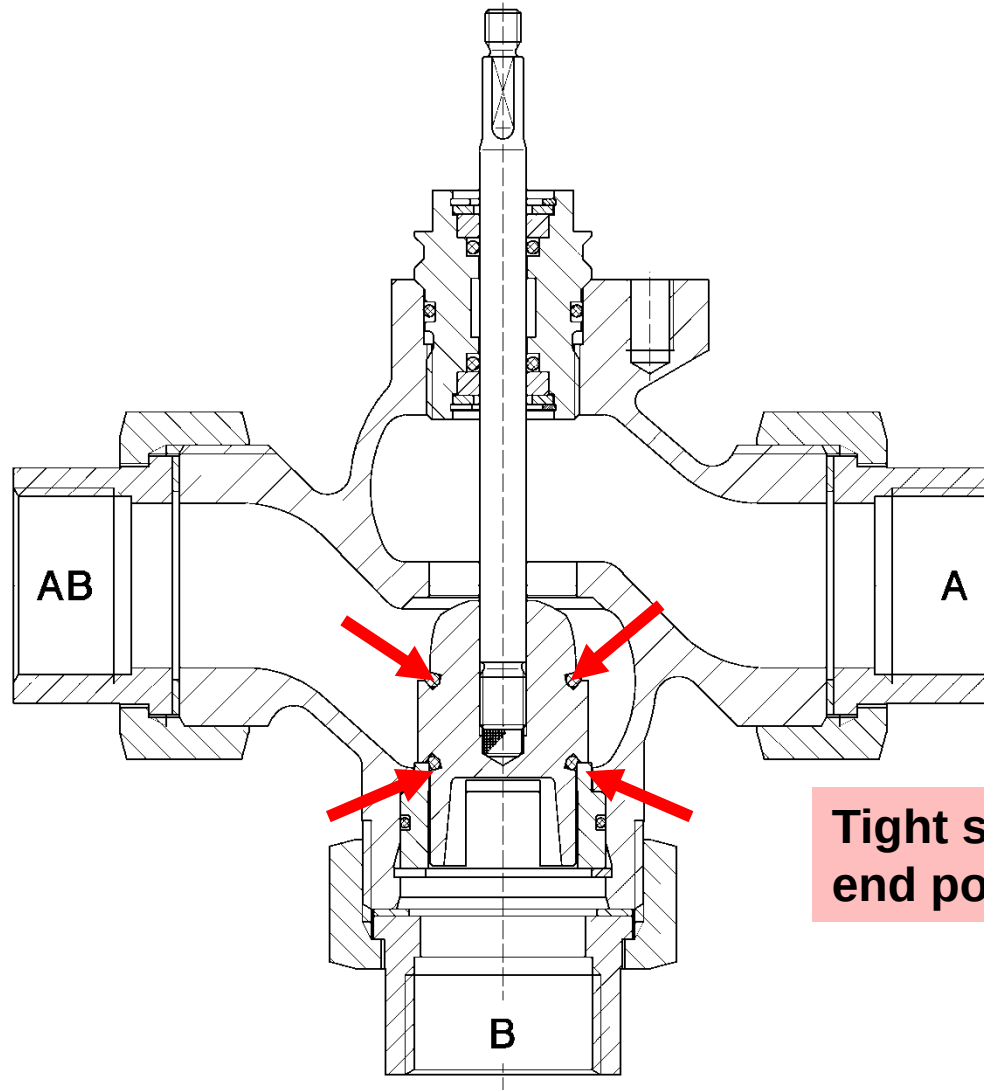
External thread with internal thread connection parts (RA) , flanges

Operating temperature: -20°C ... +150°C (temperature of medium, MZ 0°C... +120°C)

Leakage rate: tight-sealing (RA)

Body: bronze Rg-5 / C491K (RA), brass (MZ), Cast iron GG-25 BR216/316GF

Bronze - control valves PN 16



**Tight sealing in both
end position**

Bronze - drinking water control valves PN 16

Valves with certified safety



HORA control valves with DVGW test mark offer:

- safety and hygiene in drinking water systems,
- suitable for drinking water by a special design and tailor made manufacturing method
- and meet the latest German Drinking Water Ordinance (TrinkwV 2001).



Control valves PN 16/25/40 & class 150/300



**BR 216 / 225 / 240S / 240E
316 / 325 / 340S / 340E**

PA-N160

PA-N 300

PA-N540

PA-N 1080

PA-N 2160

DN

15 – 40

15 – 65

50 – 100

125 – 300

125 - 600

Pressure class

DIN-EN PN16 / PN25 / PN40 & ANSI class 150 / class 300 (DN25 – >DN200)

kvs- Wert :

0.01 – ~6000 m³/h

Two-way and three-way control valves

Operating temperature: -10°C ... +400°C (temperature of medium. For steel and stainless steel down to -60°C)

Leakage rate: ≤ 0.01% of kvs-value

Body: cast iron GG-25 (PN16), ductile iron GGG-40.3 (PN16, PN25, PN40)
cast steel GS-C25N / CS216 / WCB (PN, ANSI), stainless steel 1.4408 / SS316 (PN, ANSI)

Example...



Production plant

Gas- Brennwertsystem Weishaupt Thermo Condens

Power: 6 units, each 60 kW

References in energy-efficient building automation....

Our customers

Building Automation



Automation Equipment



Industry and Gas



Taiwan Process Control International



Mercedes Benz



BMW, Climate wind channel



Audi AG



Volkswagen AG, Wolfsburg



Produkt
BR216GF, BR316GF
DN15 – DN100
MC55, MC250

European Central Bank, Frankfurt



Products:

BR206/306GF,

BR216/316GF

DN50 – DN200

MC100 – MC500

Deutsche Bank Green Towers, Frankfurt



Products:

BR216GF, BR216-240S
DN100 – DN250
MC55Y – M300Y,
BR216MZ MC15/24

Canary Wharf London

District heating

Heating

Cooling





Product

BR216MZ, BR316MZ
DN15 – DN25
MC15/24

New Trade Fair Center, Stuttgart



Football Arena: Munich, Schalke



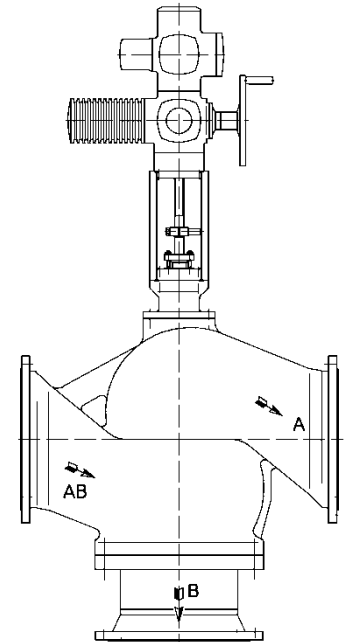
New Airport Willy Brandt, Berlin-Brandenburg



Products:

BR225-240S,
DN25-250
MC163, MC1503

Airport Frankfurt Main



Products:

BR340S

DN400

SAR14.1

Airbus Group



Rolls Royce Mechanical Test Operations Centre Dahlewitz, Germany



Products:

BR216GF

DN200 – 300

MC1503/230

Hotel Atlantis The Palm, Dubai



Products:

BR216

DN200 with balanced plug

MC1503



Hotel Atlantis The Palm, Dubai

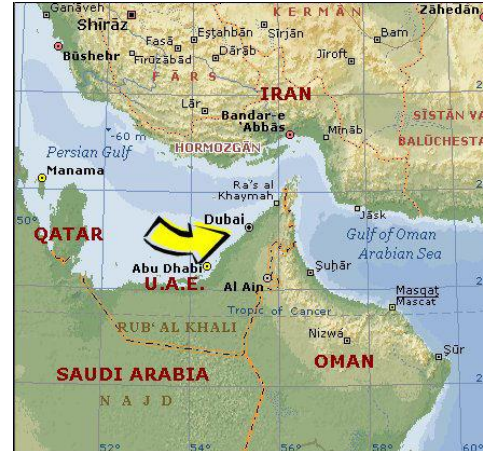


Replacement of existing “butterfly valves”
by HORA globe control valves...



...to increase
energy efficiency & comfort !

Burj Khalifa, Dubai



Products:

BR216

DN200 with balanced plug

MC503

OEMs

OEM customers:

TA HYDRONICS

COFELY
GDF SVEZ

SIEMENS

Honeywell

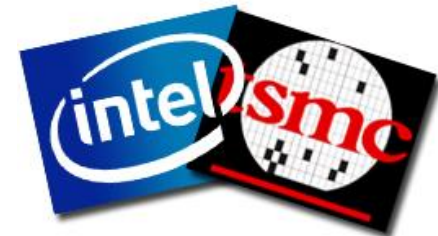
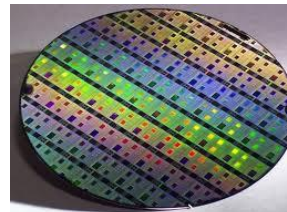
kieback&peter
Technologie für Gebäude-Automation

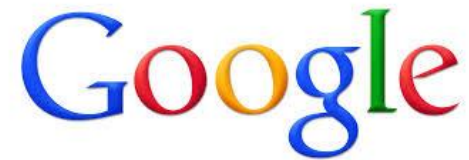
**Johnson
Controls**



Industrial applications

TSMC, Taiwan ROC





Project:

Google Cloud Data Center
Taiwan

Products:

BR1313.01 DN500
with electric actuator
AUMA SAR 14.2

Solar plant Agua Prieta II



product

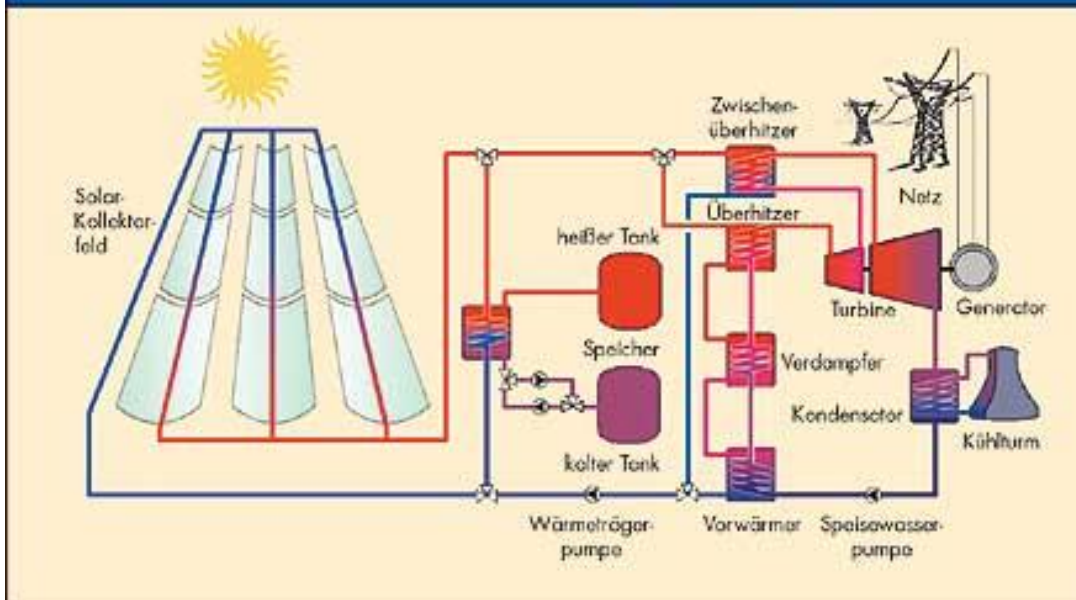
BR240S, SE

3" – 6"

HV, PA-N540-PA-N2160

Solar plants Andasol I, II, III in Spain

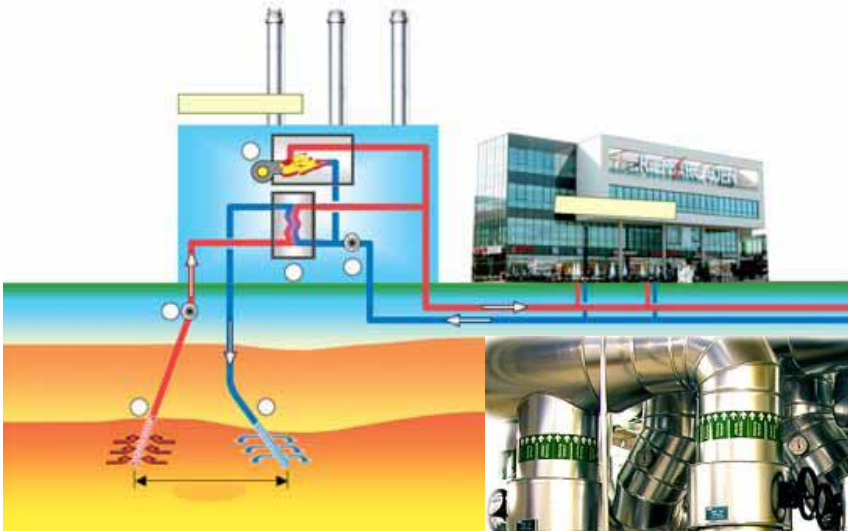
Abb 2: Schema Parabolrinnenkraftwerk (Quelle: DLR)



Size appr. 210 football fields

Geothermal Energy

District heating Munich, Germany



BR240E
DN100
MC1503

References industry in Thailand...

Medical gloves:



Food industry:



Sugar industry:



What we offer...



- Versatile products of exceptional high quality
- Wide range of products for very different markets
- Strong supplier in the energy-efficient building automation
- Best processes which lead to shortest lead times and a very reliable level of quality
- Focus on long term partnerships, based on confidence, continuity and reliability
- Active in markets with strongly growing needs

What we search in Thailand...



- Partnership with key players in building automation
- Partnership with EPC companies
- Partnership with the Thai OEM-customers or the Thai branches of international OEM-customers
- Long term partnerships, based on confidence, continuity and reliability
- Growth in business in Thailand, to the benefit of all parties - our partner, the building contractor, the people in the building – by saving energy and money, by getting a better, cleaner and more comfortable indoor climate

Excellence is our standard.

Thank you ...



... for your attention.

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