ifm electronic

Building system automation

How to use

How to use

- Select the requested subject by mouse click on the buttons on the left side of the screen
- Simply click to page forward within a subject
- Product names are displayed when moving the cursor over the product
- Detailed information on the products can be viewed on the internet by clicking on the individual products (active internet connection required)

- **You will find this file in the internet under: www.ifm.com/gb/planning_tools**

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- Special sales engineering offices
- Seestr. 5/1
- D-74232 Abstatt
- Tel.: +49 (0) 70 62 / 95 95 - 0

Back

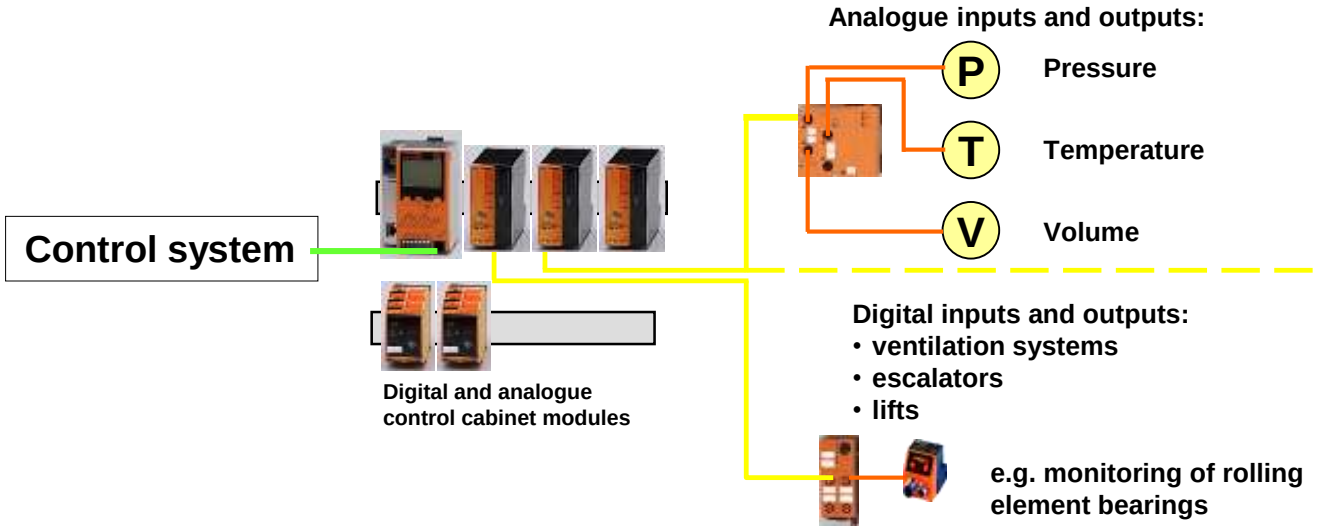
General overview by taking the example of a building

Automation of technical installations via AS-i

- **Open, decentralised and intelligent wiring system**
- **Manufacturer-independent fieldbus as a sensible extension of higher-level systems such as PLC, Profibus DP, Ethernet, BACnet etc.**
- **Relieves higher-level systems including considerable cost savings – see also: "Calculation help.xls"**
- **Also available as fail-safe Smart SPS for safety applications up to SIL 3, PL e**

Technical key data:

Topology:	flexible tree structure
Bus cable:	unscreened two-wire cable for data and energy
Cable length:	100 m - 600 m possible through extension via AS-i repeater
Number of slaves:	31 single slaves or 62 A/B slaves per AS-i line
Number of binary I/Os:	248 binary sensors and 186 actuators per AS-i line
Number of analogue I/Os:	31 x 4 channels (in- or outputs) per AS-i line
Error detection:	identification and repetition of corrupted messages

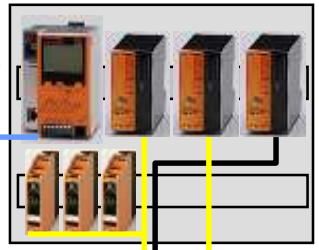


Connection options of diagnostic data via Ethernet

Control system and other connections via Ethernet:
- operational data logging
- long-term trend records
- SAP / PM
- teleservice

AS-i ControllerE replaces machine PLC

Ethernet interface:
- Modbus TCP
- OPC server



Binary signals:
- pre-alarm
- main alarm

Maximum length of the sensor cable: 30 m

Further signals

Ethernet interface:
- OPC server
- octavis software

Direct 24 V DC supply

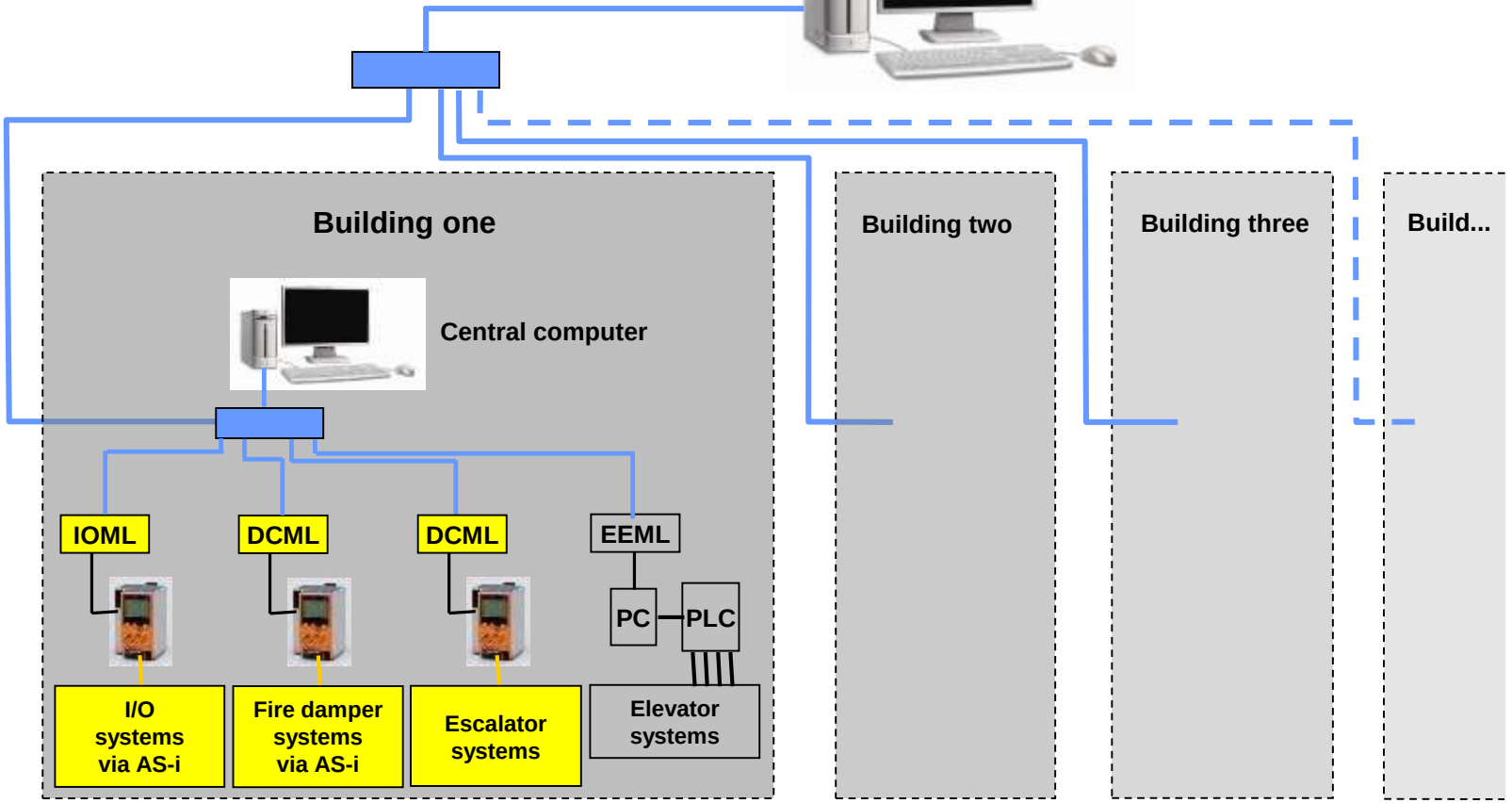
Black cable: 24 V DC

Further signals

Building-spanning management and visualisation

Manufacturer-independent control system on Ethernet basis with data exchange via different protocols

Control system



Building management concept
SHEVS
Fire damper systems
Sprinkler systems
General concept escalators
Ventilation systems
Sanitary systems
Refrigeration systems
Heating systems
Compressed air systems
Industrial energy towers
Energy monitoring

Cost comparison intelligent wiring system AS-Interface

As of 2011 - please ensure up-to-dateness -		
Number of actuators	29,00	Push the button to modify values
Total AS-i cable length	100,00	
Average cable length (conventional):	15,00	
Hourly wage in euros:	29,11	

Services	AS-i	Conventional
Laying of cables: cable with PVC sheath DIN VDE 0250 supplied and laid incl. fixing:		
Time required per metre of cable		
AS-i cable	2,90 min	-
End position detection	-	2,90 min
Costs per metre of cable		
AS-i cable	1,25 euros	-
End position detection	-	0,70 euros
Calculation of time expenditure for project:	2,9 min/m x 100 m	2.9 min/m x 15m x 29 pieces =
Time expenditure for the project	**5 h**	**21 h**
Calculation of costs for the project:	1,25 € /m x 100m =	0,70 € /m x 15m x 29 pieces =
Costs for project	**125,00 euros**	**304,50 euros**
Terminal connection: stripping of the cable, insertion and connection according to wiring plan:		
Time expenditure per actuator		
AS-i cable	5,00 min	-
End position detection	-	13,30 min
Costs per actuator		
AS-i cable	2,43 euros	-
End position detection	-	6,45 euros
End position detection	5 min/piece x 29 pieces =	13,30 min/piece x 29 pieces =
Time for project	**2 h**	**6 h**
Calculation of costs for project:	2,43 euros/piece x 29 pieces =	6,45 euros/piece x 29 pieces =
Costs for project	**70,47 euros**	**187,05 euros**
Connection in the control cabinet: stripping of the cable, insertion and connection according to wiring plan:		
Time expenditure		
AS-i cable	10,00 min	-
End position detection	-	13,30 min (per actuator)
Costs		
(AS-i cable)	4,85 euros	-
End position detection	-	6,45 euros (per actuator)
Calculation of time expenditure for project:	10min =	13,3 min/piece x 29 pieces =
Time for project	**10 min**	**6 h**
Calculation of costs for project:	4,85 euros =	6,45 euros/piece x 29 pieces =
Costs for project	**4,85 euros**	**187,05 euros**
Total time services	**7 h**	**34 h**
Total costs services	**200,32 euros**	**678,60 euros**
Cable material	**AS-i**	**Conventional**
AS-i cable per metre	1,25 euros	-
End position detection per metre	-	0,70 euros
Total costs cable material	**125,00 €**	**304,50 €**
Total costs laying of cables	**325,32 €**	**983,10 €**

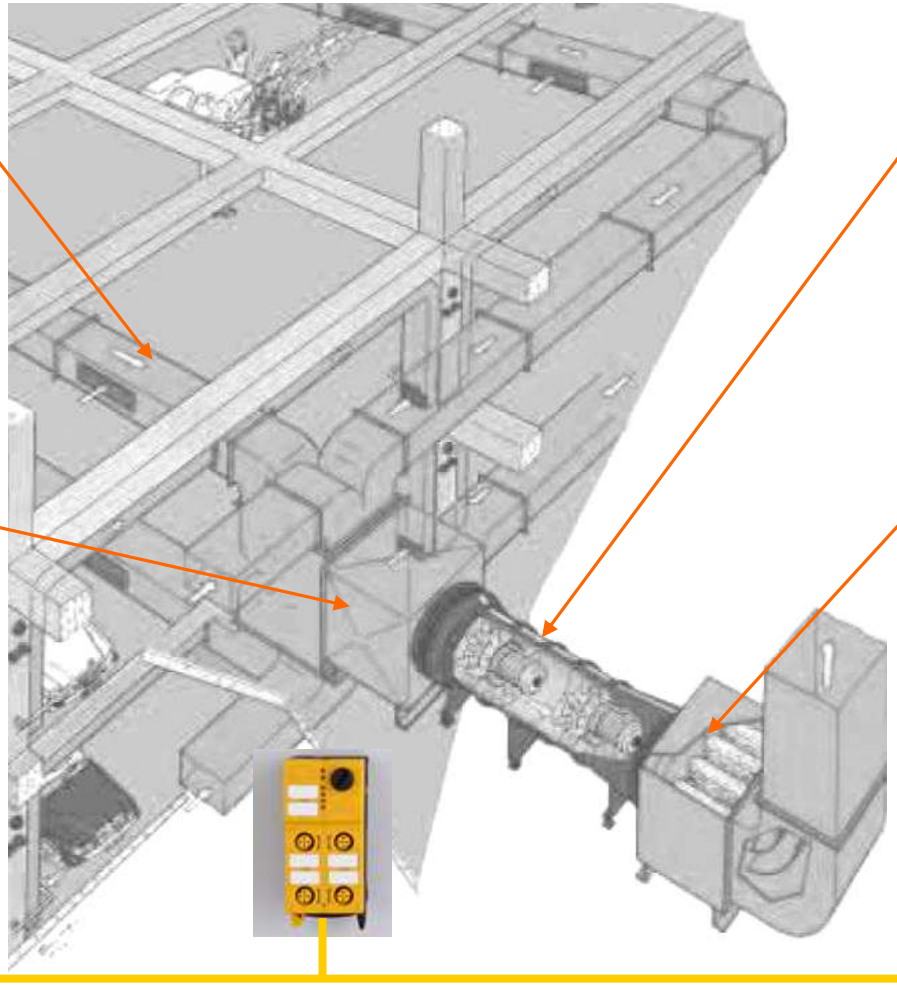
Explanation of the calculation:
The pure "wiring times" and the resulting costs are compared (figures from the association Zentralverband der Deutschen Elektro- und Informationstechnischen Handwerke).

Time & costs for troubleshooting, wiring diagrams, components and commissioning times have not yet been included !!!

Smoke and heat exhaust ventilation systems (SHEVS)

Airflow sensor
e. g. SL5101

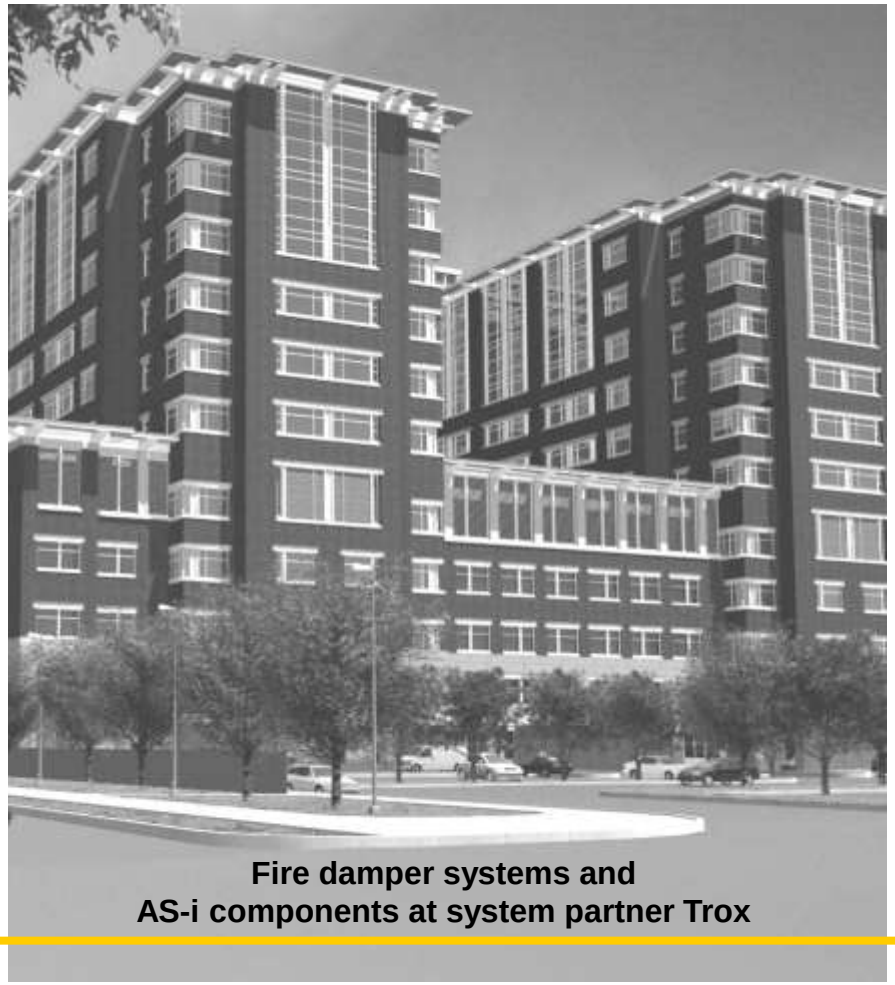
Measured signal converter with temperature sensor
e. g. TP3237 with TT1050



Vibration diagnosis
e. g. VSE002 + VSA001

Speed monitor
Compact e. g. DI6001

Fire damper systems



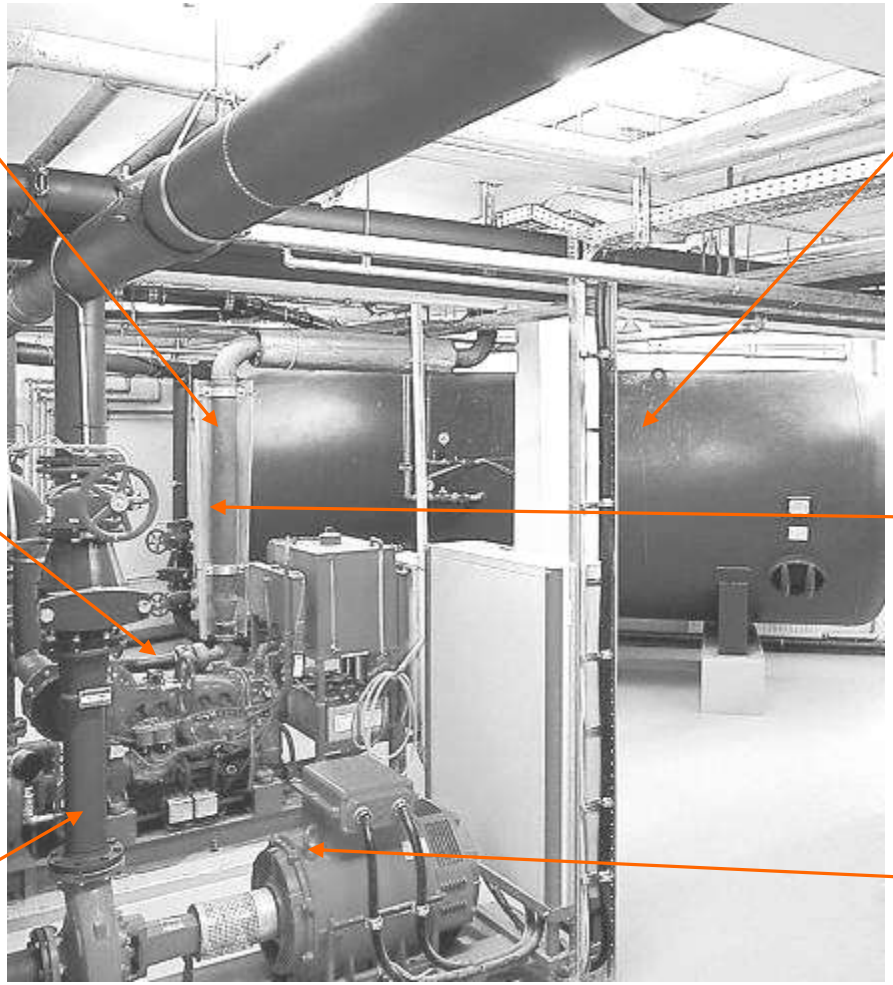
Fire damper systems and
AS-i components at system partner Trox

Sprinkler systems

Pressure measurement with electronic manometer e. g. PG2457

Flow monitor with non-return valve e. g. SBY334

Flow rate measurement Magnetic-inductive flow meter e.g. SM6000



Capacitive level sensor e. g. KQ6001

Flow sensor e. g. SI5000

Vibration diagnosis e. g. VSE002 + VSA001

General concept escalators

AS-i as an intelligent wiring system including AS-i Safety at Work

Data exchange with control systems:
- Ethernet via customer-specific XML data structure
- Modbus on IP
- Ethernet via OPC
- Profibus DP
- Ethernet IP (Allen-Bradley)

AS-i ControllerE + AS-i safety monitor with safety function

Visualisation via CoDeSys

Monitoring of ice build-up via temperature sensor

Temperature monitoring of motor via bolt-on sensor

Analogue control of frequency converter

Rotational speed monitoring, synchronous operation of handrail + staircase

Monitoring of chain tightener and step position

Missing step detection

Emergency-stop functions

Monitoring of pit cover

Ventilation systems

Pressure measurement with electronic manometer
e. g. PG2457

Flow monitor
with non-return valve
e. g. SBY334

Flow rate measurement
Magnetic-inductive flow meter
e.g. SM6000

Vibration diagnosis
e. g. VSE002 + VSA001

AS-i field module
4 inputs
4..20 mA
e. g. AC2916

Intelligent wiring system

Airflow sensor
e. g. SL5101

Analogue pressure sensor
e. g. PTxxxx

Measured signal converter
with temperature sensor
e. g. TP3237 with TT1050

Speed monitor
Compact e. g. DI6001

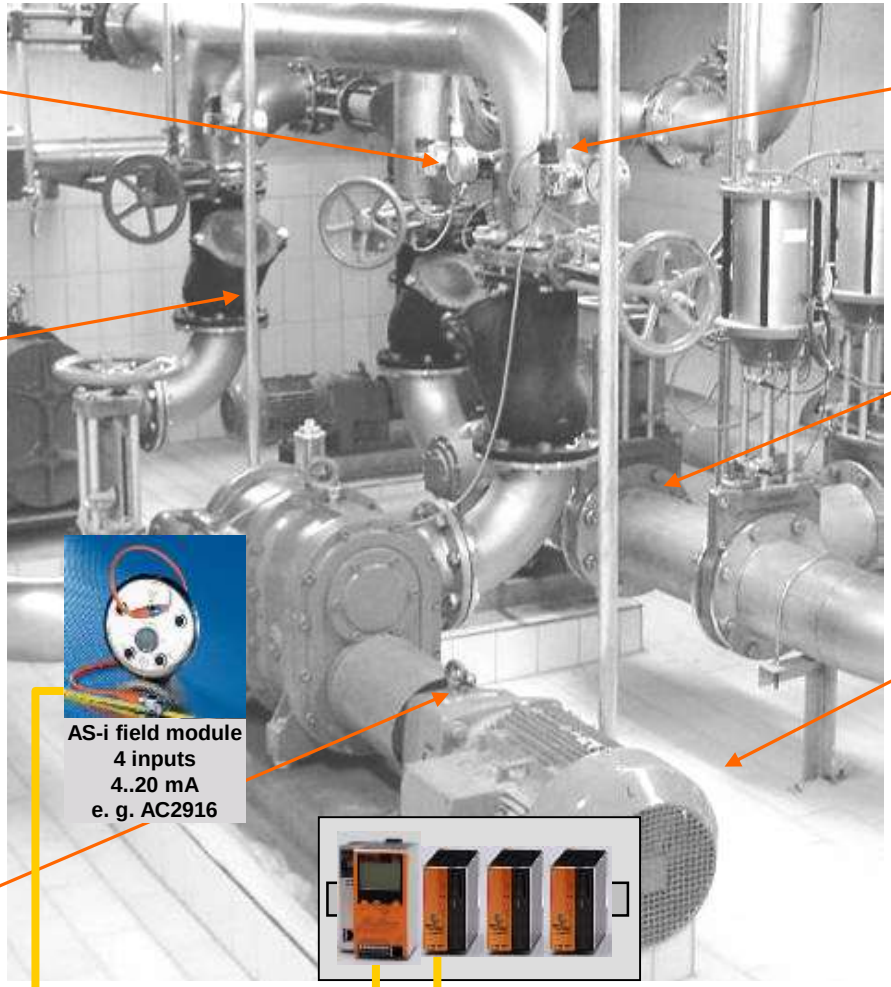
Sanitary systems

Pressure measurement with electronic manometer
e. g. PG2457

Flow monitor
with non-return valve
e. g. SBY334

Flow rate measurement
Magnetic-inductive flow meter
e.g. SM6000

Vibration diagnosis
e. g. VSE002 + VSA001



AS-i field module
4 inputs
4..20 mA
e. g. AC2916

Intelligent wiring system

Flow sensor
e. g. SI5000

Analogue pressure sensor
e. g. PTxxxx

Capacitive
Level sensor
e. g. KQ6001

AS-i field module
4 x input 4..20mA
e. g. AC2916

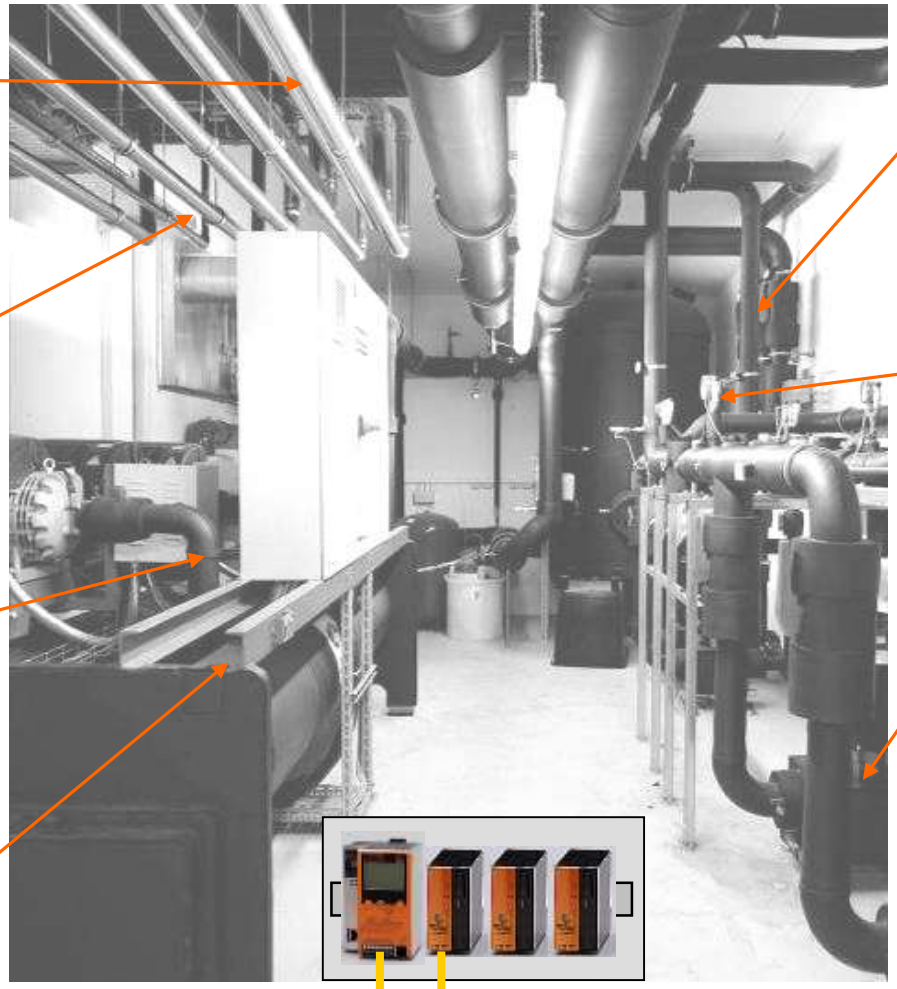
Refrigeration systems

Analogue pressure sensor
e. g. PTxxxx

Flow monitor
with non-return valve
e. g. SBY334

Flow rate measurement
Magnetic-inductive flow meter
e. g. SM6000

Measured signal converter
with temperature sensor
e. g. TP3237 with TT1050



Intelligent wiring system

Volumetric flow quantity
and temperature
e. g. KSB BOATRONIC M-2

Pressure measurement with
electronic manometer
e. g. PG2457

Vibration diagnosis
e. g. VSE002 + VSA001

AS-i field module
4 x input 4..20mA
e. g. AC2916

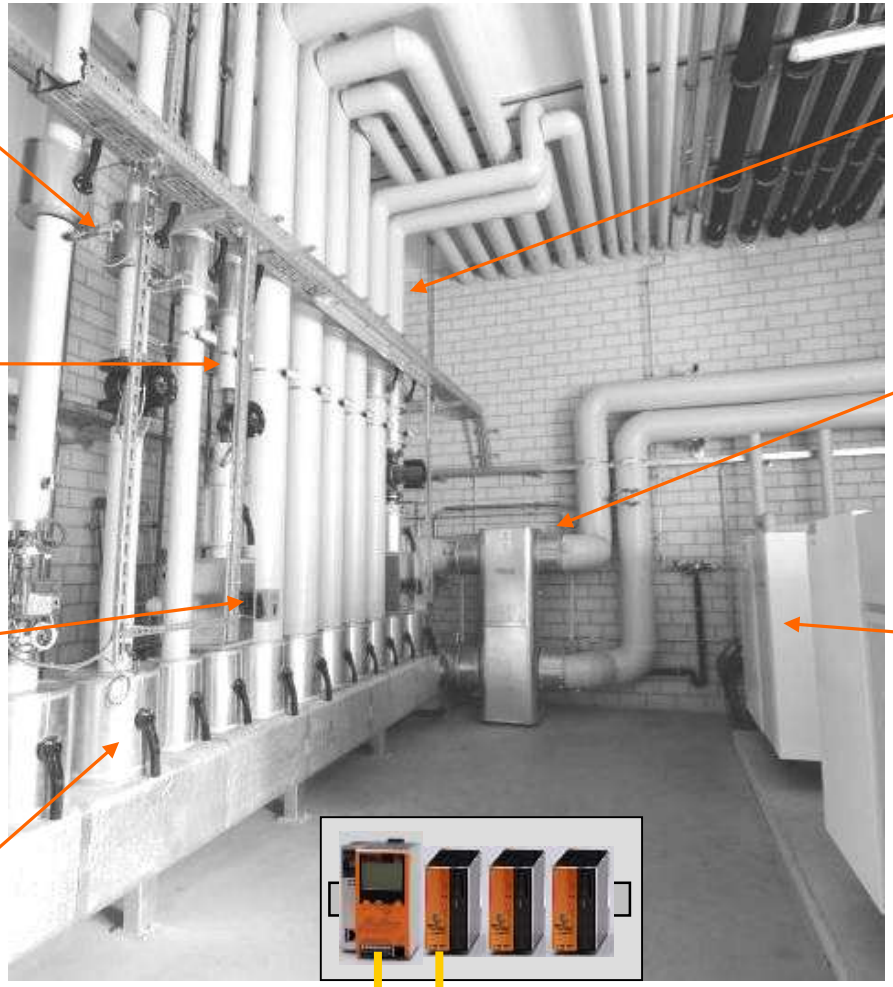
Heating systems

Analogue pressure sensor
e. g. PTxxxx

Flow sensor with evaluation unit
e. g. SF6200 + SR5900

Flow monitor with non-return valve
e. g. SBY334

Volumetric flow quantity and temperature
e. g. KSB BOATRONIC M-2



Intelligent wiring system

Measured signal converter with temperature sensor
e. g. TP3237 with TT1050

Pressure measurement with electronic manometer
e. g. PG2457

Vibration diagnosis
e. g. VSE002 + VSA001

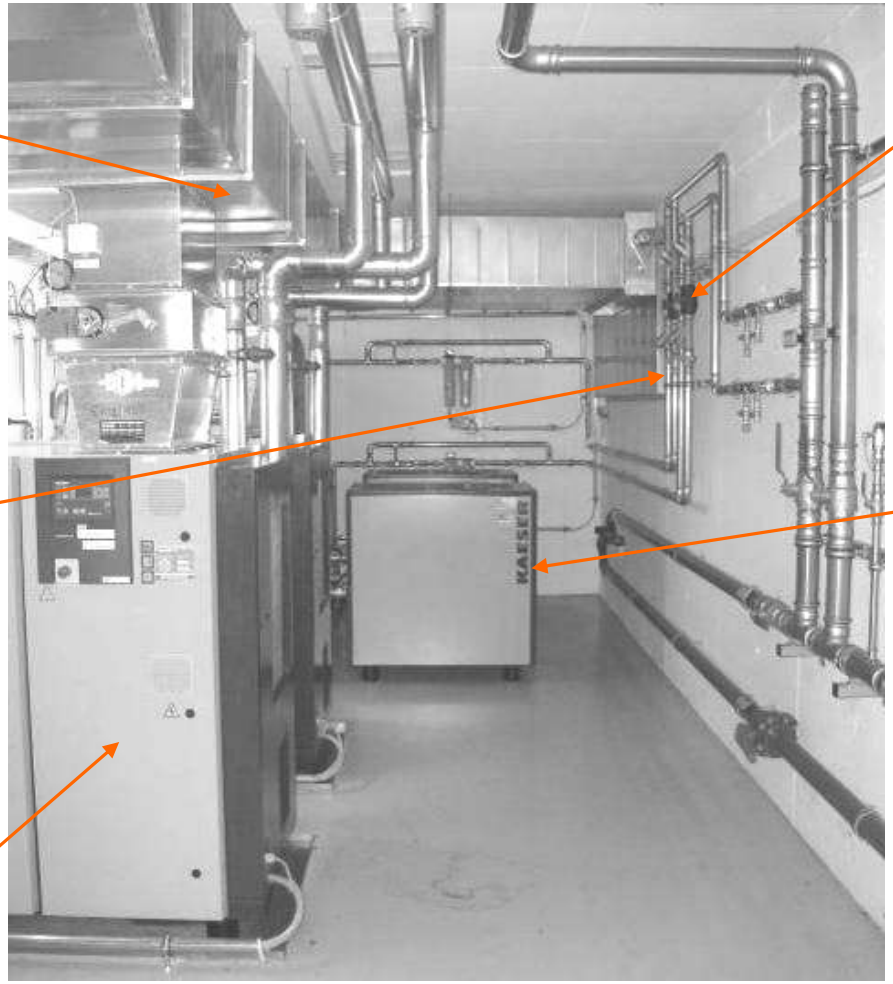
AS-i field module
4 x input 4..20mA
e. g. AC2916

Compressed air systems

Air flow sensor
e. g. SL5101

Pressure measurement with electronic manometer
e. g. PG2457

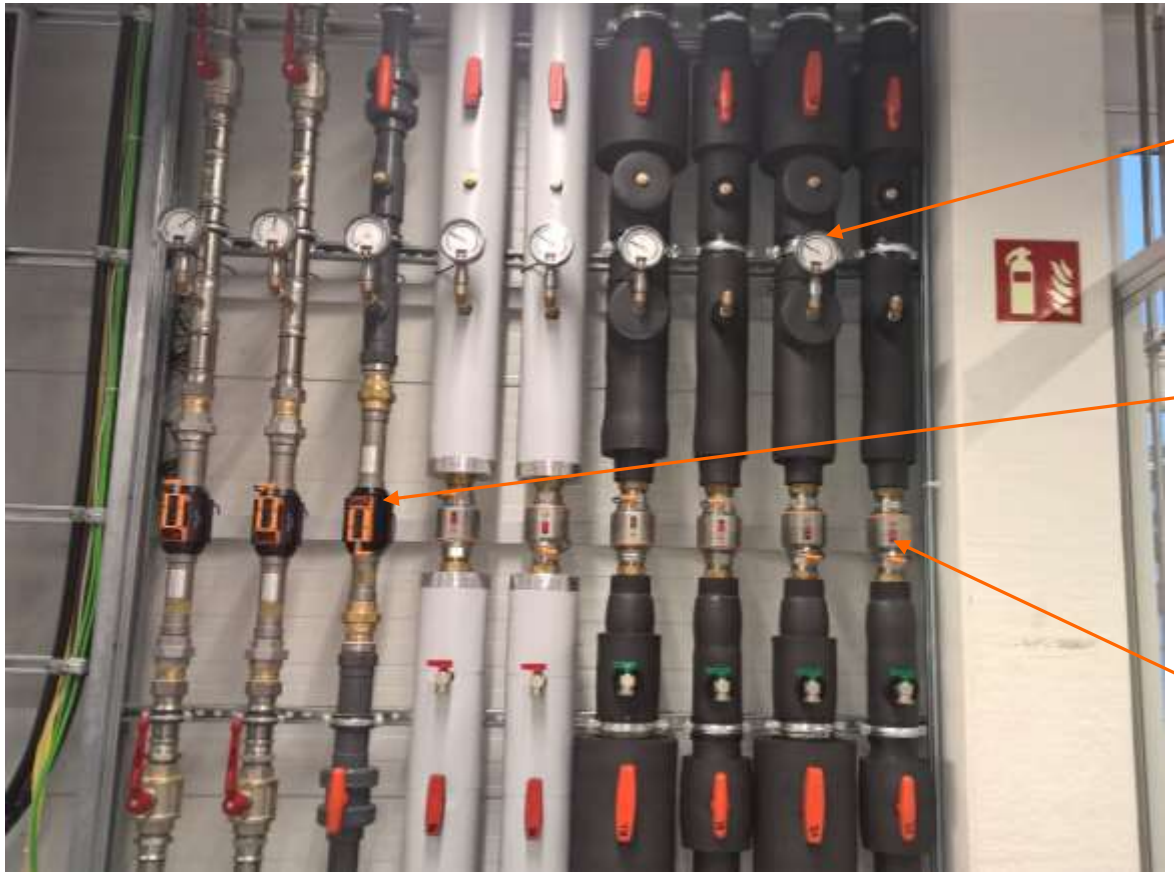
Vibration diagnosis
e. g. VSE002 + VSA001



Compressed air meter
e. g. SD2000

Capacitive
Level sensor
e. g. KQ6001

Industrial energy towers



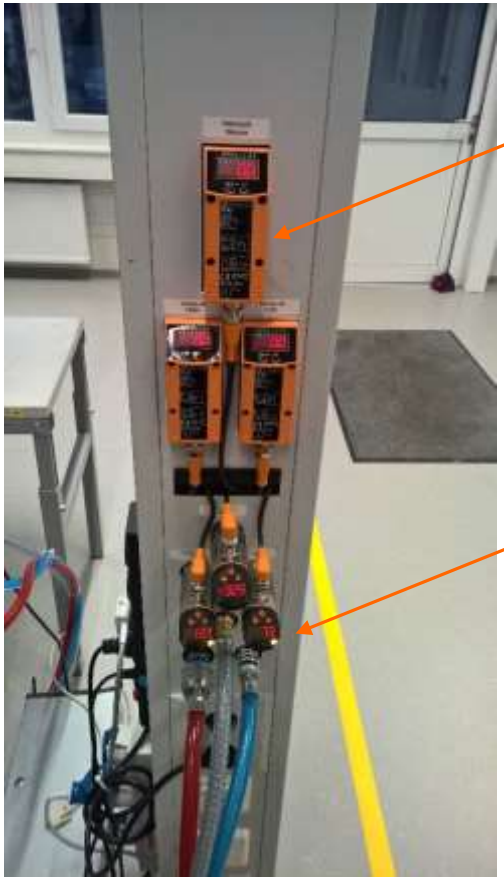
Pressure measurement with electronic manometer
e. g. PG2457

Compressed air meter
e. g. SD2000

Flow rate measurement
Magnetic-inductive flow meter
e. g. SM9000

Centralised continuous monitoring (pressure, flow rate and leakage) of all important process media (from left to right):
Pressurised air 7bar, pressurised air 14bar, vacuum, return heating, forward heating, return process water (cold) building, return coldwater ventilation system, forward process water (cold) building, forward coldwater ventilation system

Industrial energy towers



Compressed air meter
e. g. SD6000

Electronic pressure sensor
e. g. PN7xxx

Underpressure monitoring with electronic pressure sensor e. g. PN3129

Provision and monitoring of process media (7bar, 14bar, vacuum, process water cold) at workplace via energy towers.
Further components on the energy tower: Ethernet/IO-Link, fuses, electricity meter, 220V/380V-connection
IO-Link data transfer can be realised via Ethernet (fast) or AS-i (approx. 1min cycle) according to speed requirements.

Energy monitoring

IO-Link input modules

PROFIBUS PROFINET EtherCAT EtherNet/IP AS-i INTERFACE

AC2625 / AL1010 | AL1000 | AL1030 | AL1020 | AC5225

Field bus

IO-Link

Energy monitoring

Target

- Energy monitoring
- Quality management
- Realtime maintenance