

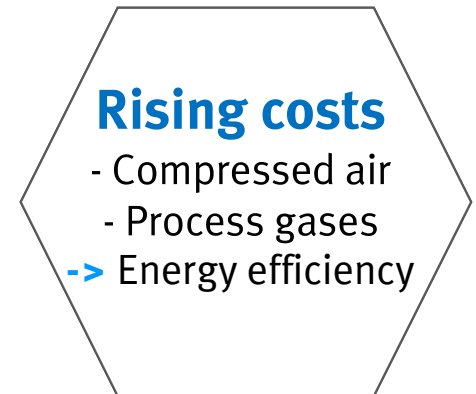
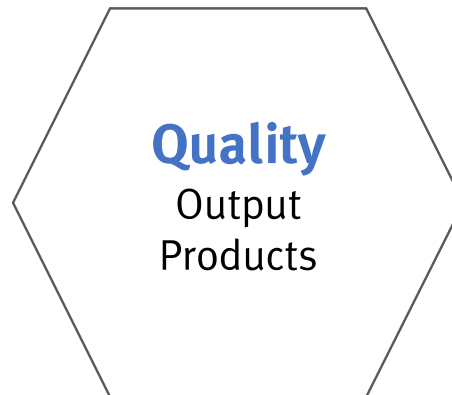
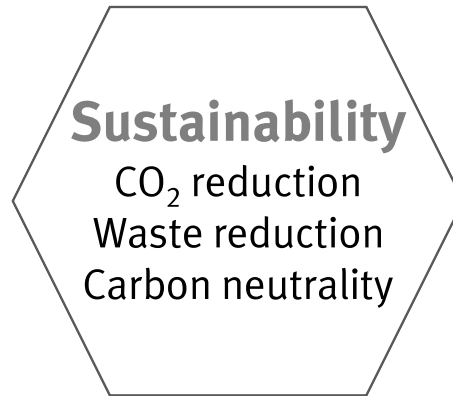
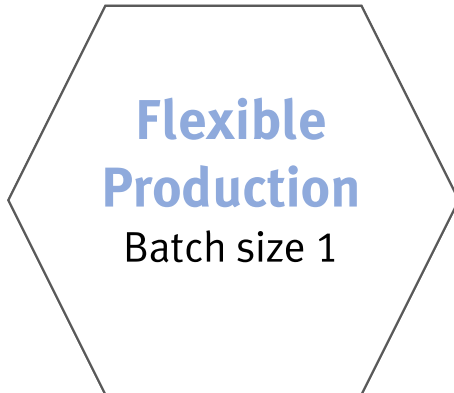
Bespaar energiekosten met slimme ProfiNet luchtverzorging eenheden en proportionele ventielen



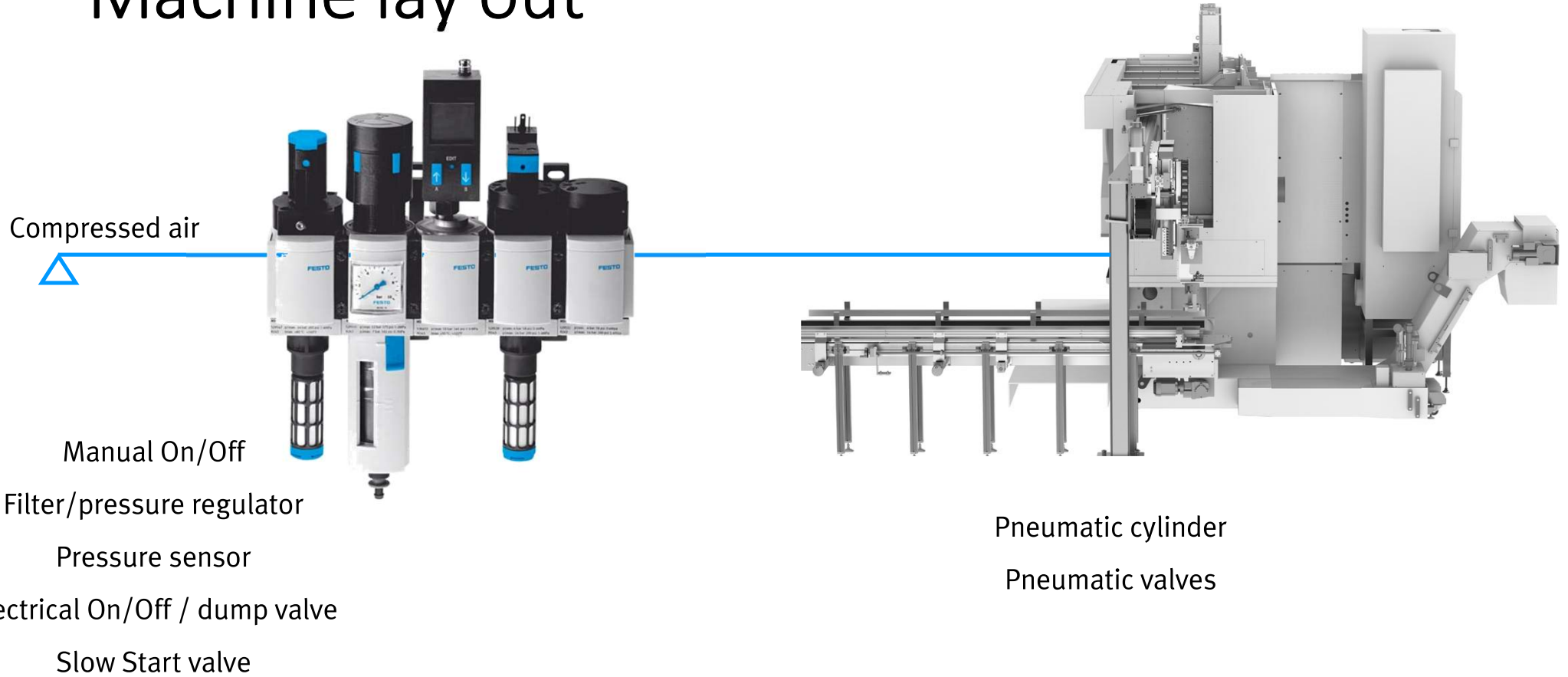
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Why?



Machine lay out



Costs & savings

 Leakage reduction

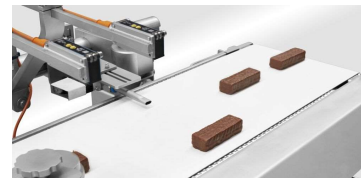
 Reduce unnecessary air loss (eg. blowers)

 Reduce air pressure level 6-4 bar

 Controlled Pneumatics – proportional valves

	€/kWh	€/m ³
Past	0,05	0,01
Currently	0,30-0,50	0,04 - 0,06

1 mm² of leakage costs at 6 bar: **loss of 55 l/min**
 0,04 €/m³ (24/7-365 days) = **1155 euro/year**



6 bar → 4 bar reduction of **14%** in consumption
 Machine: 1000 l/min * 6000 hours = **Yearly 360.000 m³/year**
 Now: 0,04 €/m³ → 14.400 €/yr - savings **2.016 €/yr**

Use the pressure level you need !!
 Differentiate per usage by digitized pneumatics



Energy saving by Digitized Pneumatics



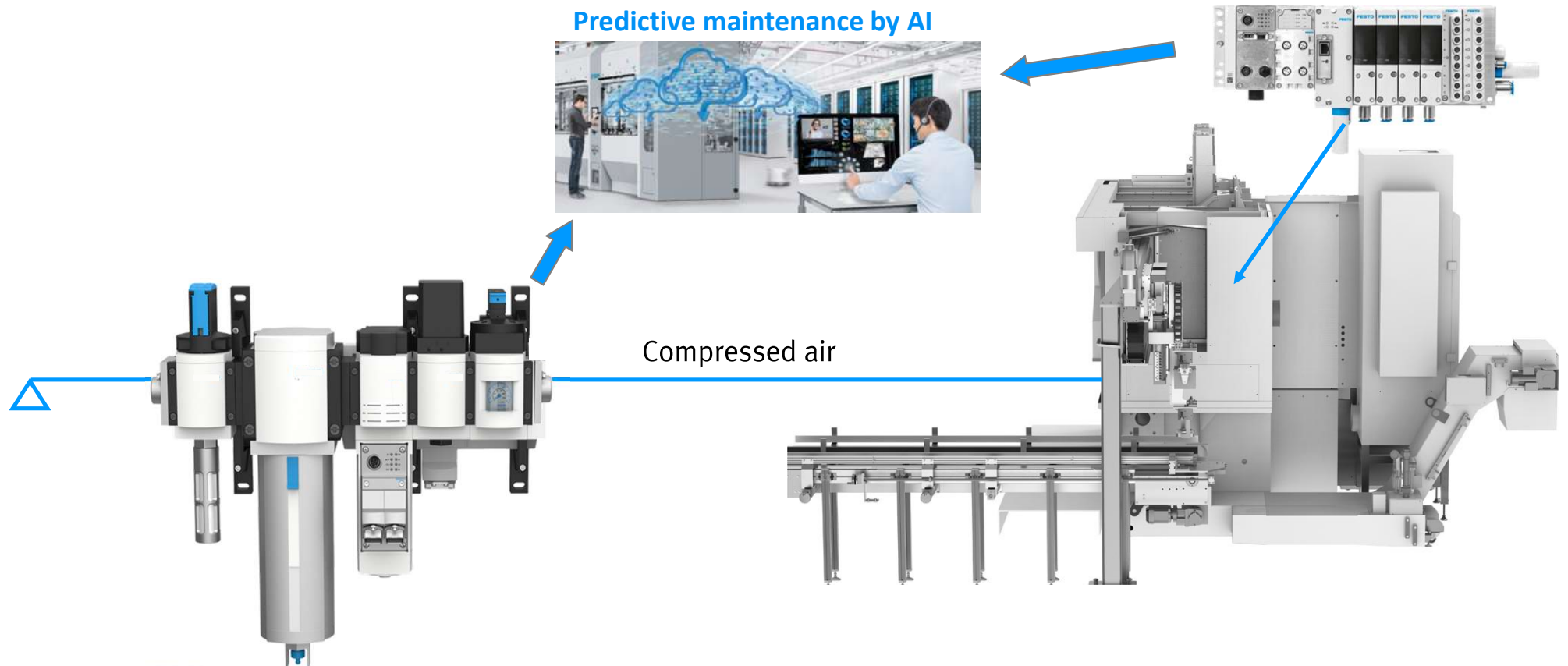
Adapt the pressure level per process step, you need



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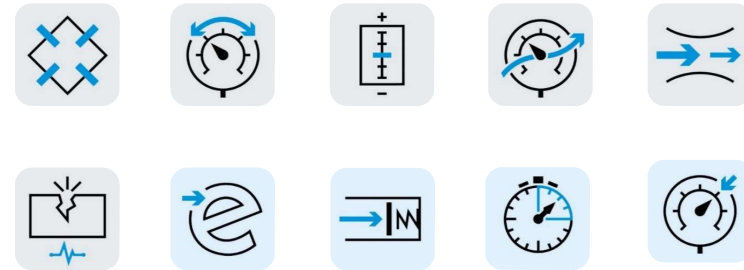
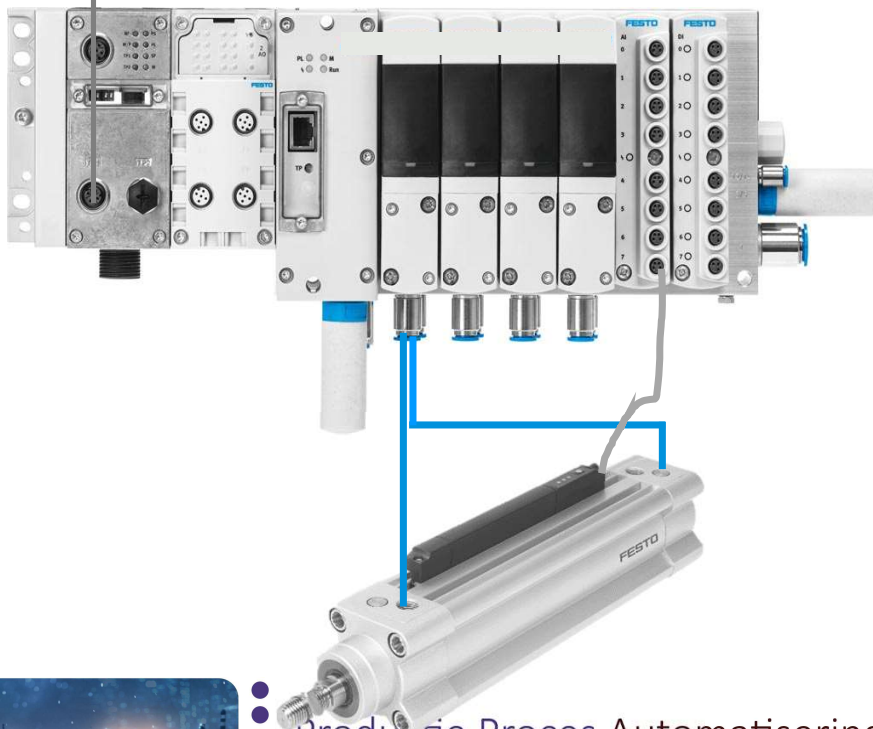
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Machine lay out – energy saving based



Digitized Pneumatics

Fieldbus



Controlled functions:
Regulate **pressure**
Regulate **flow**

- ⇒ Movements and speed [s]
- ⇒ Positioning [mm]
- ⇒ Flow [l/min]

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Condition Control and Monitoring Module

Keep your compressed air consumption under control!

Intelligent combination of **service unit, sensors and fieldbus communication.**

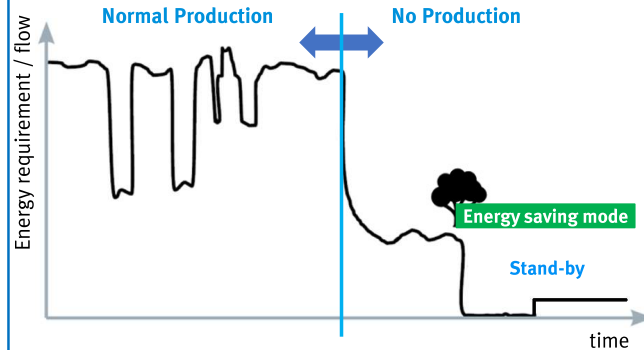
It monitors and regulates the compressed air consumption automatically between **normal pressure and stand-by pressure** in production idle times.



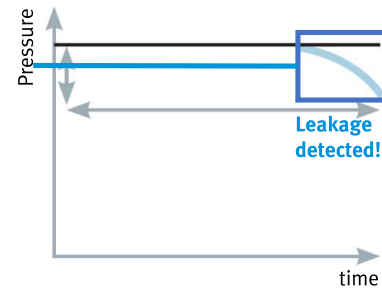
4...10bar ; 50...5.000l/min

3 core functions:

1. Automatic in stand-by mode during production stop.



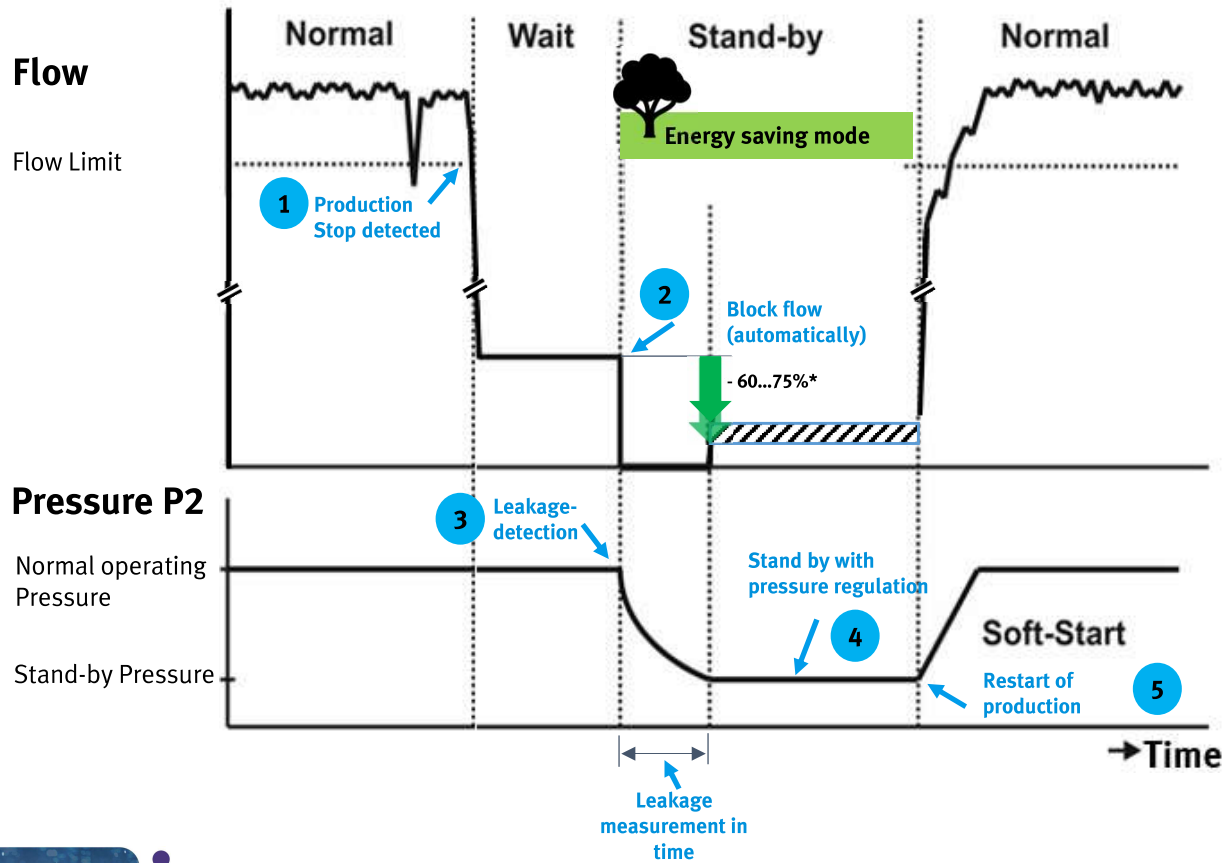
2. Automatic detection of leakage (after switching off)



3. Provides data for controllers and edge, Premises & cloud applications



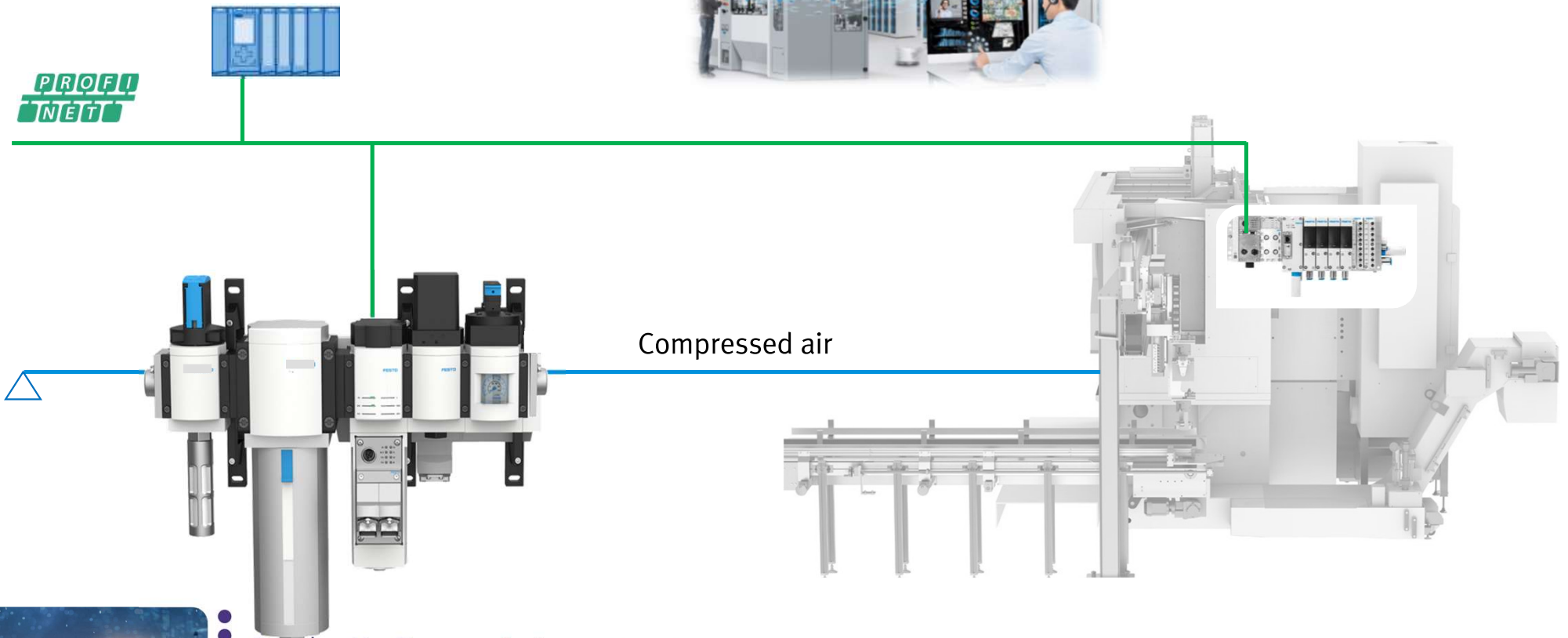
Schematic workflow



Machine connections

OPC-UA
MQTT

Machine learning



Production example



15.000 € savings

maintenance **cost savings**
per year with Machine Learning AX predicting
pneumatic cylinder wear-out of oven doors

in Festo GPC Scharnhausen



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Production example



20% savings

unplanned downtime

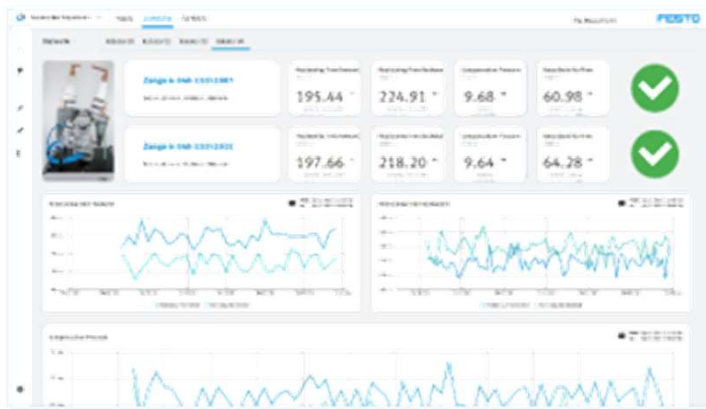
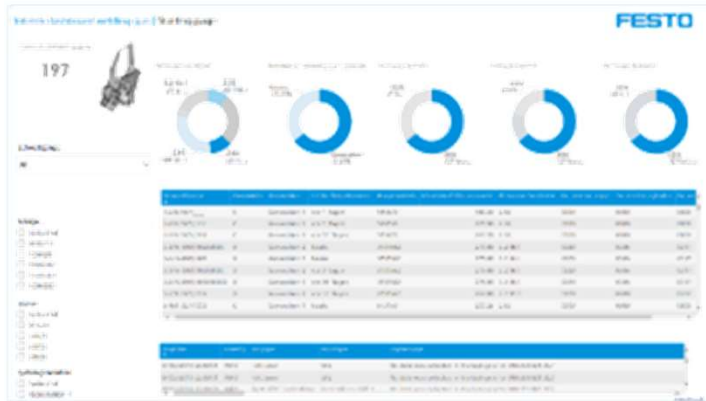
AX monitoring and predicting failure of 3.500+ welding guns in body-in-white for a global car manufacturer



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Condition monitoring & analytics



- In Realtime – World wide
- Status & Error messages
- Providing proprietary data via MQTT
- AI based data models for each w-gun

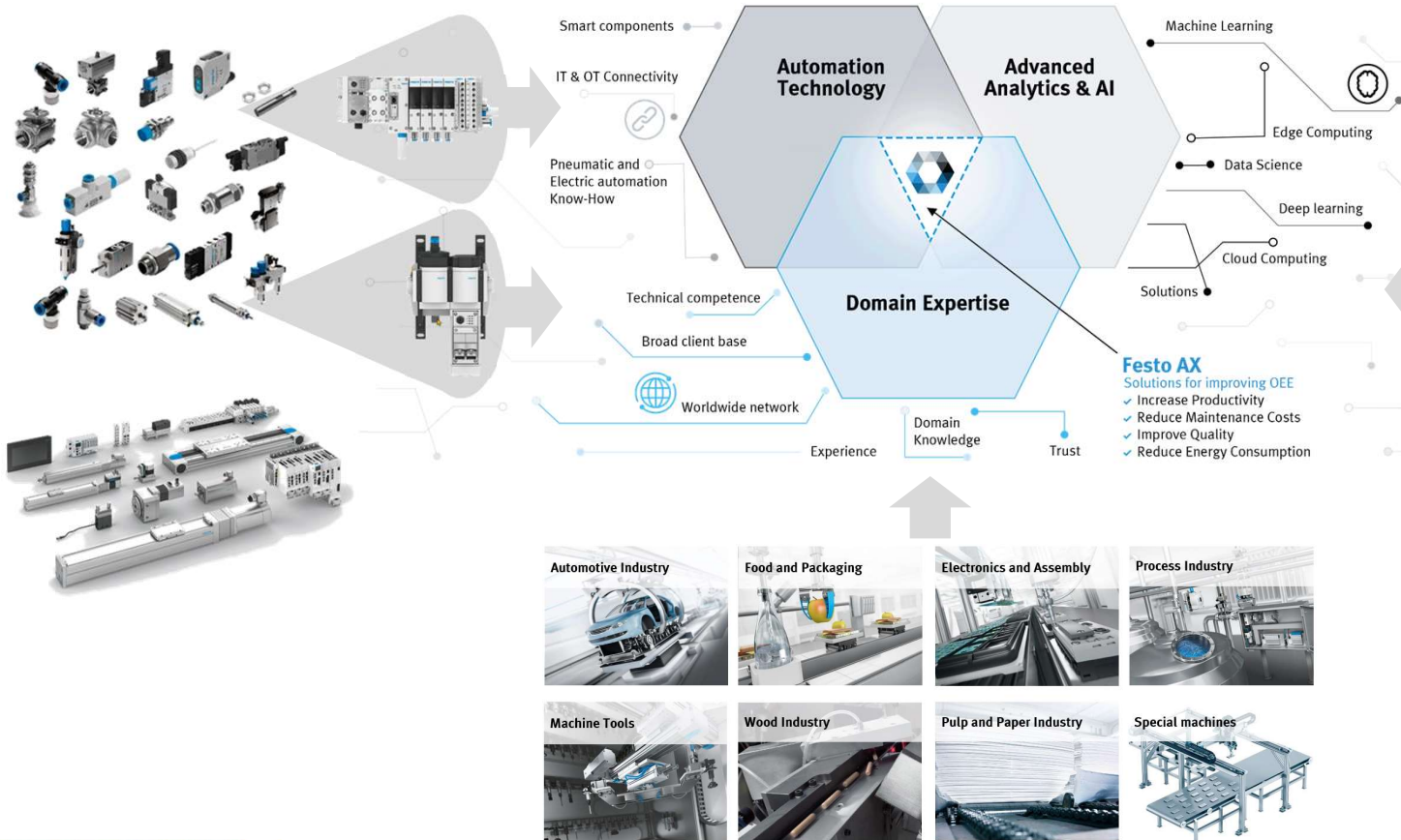
3400 robot welding guns



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The possibilities?

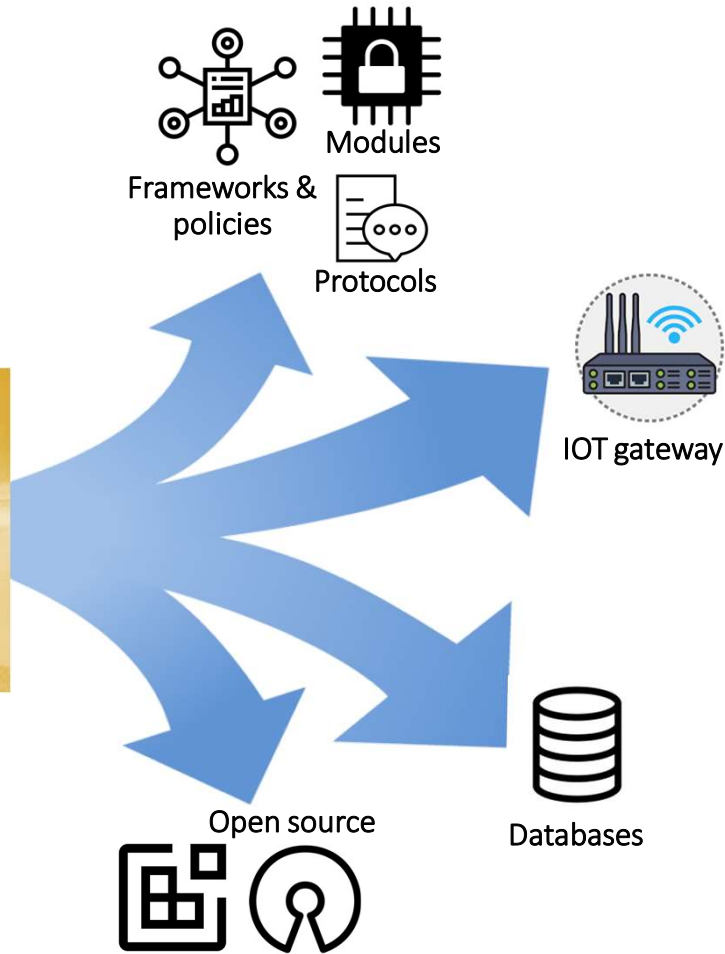
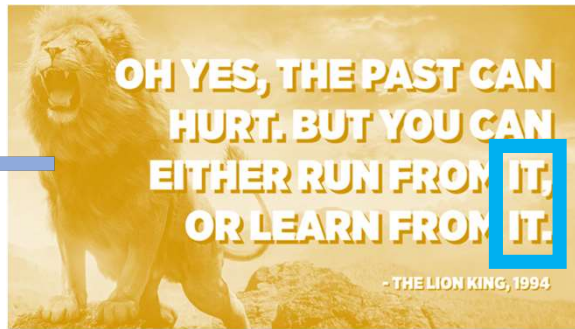


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The challenges

-  Security
-  Connectivity
-  Storage
-  Flexibility



Security

Frameworks & policies



Cyber Security Frameworks
list of Cyber Security Frameworks

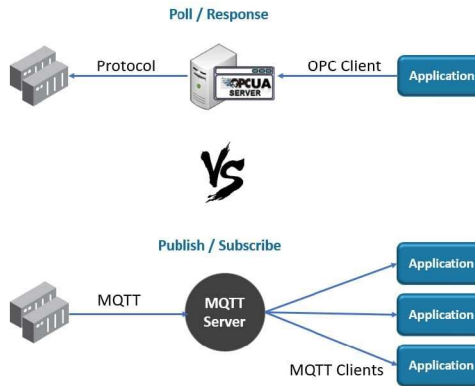
- NIST
- NERC
- COBIT 5
- TY CYBER
- ISO/IEC Standards
- HITRUST CSF
- COSO

When to Update Your CYBERSECURITY Policy

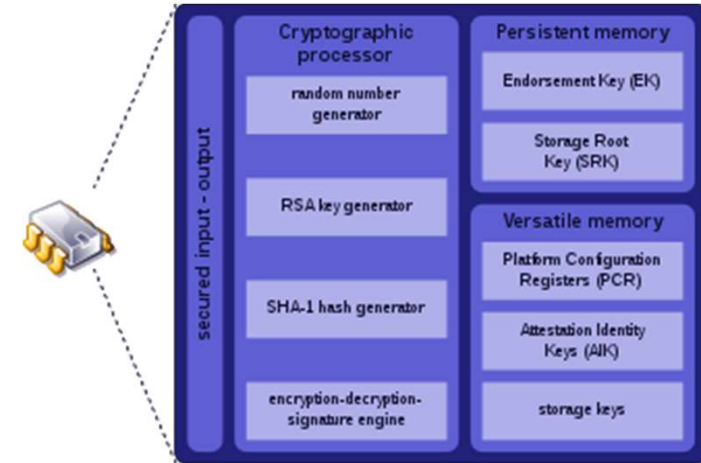
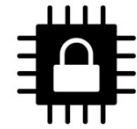
- 1 As Part of a Scheduled Evaluation
- 2 In Response to Regulatory Requirements
- 3 Following Updates in Organizational Structure
- 4 Issues with Employee Compliance
- 5 Following a Cybersecurity Incident

CR-T

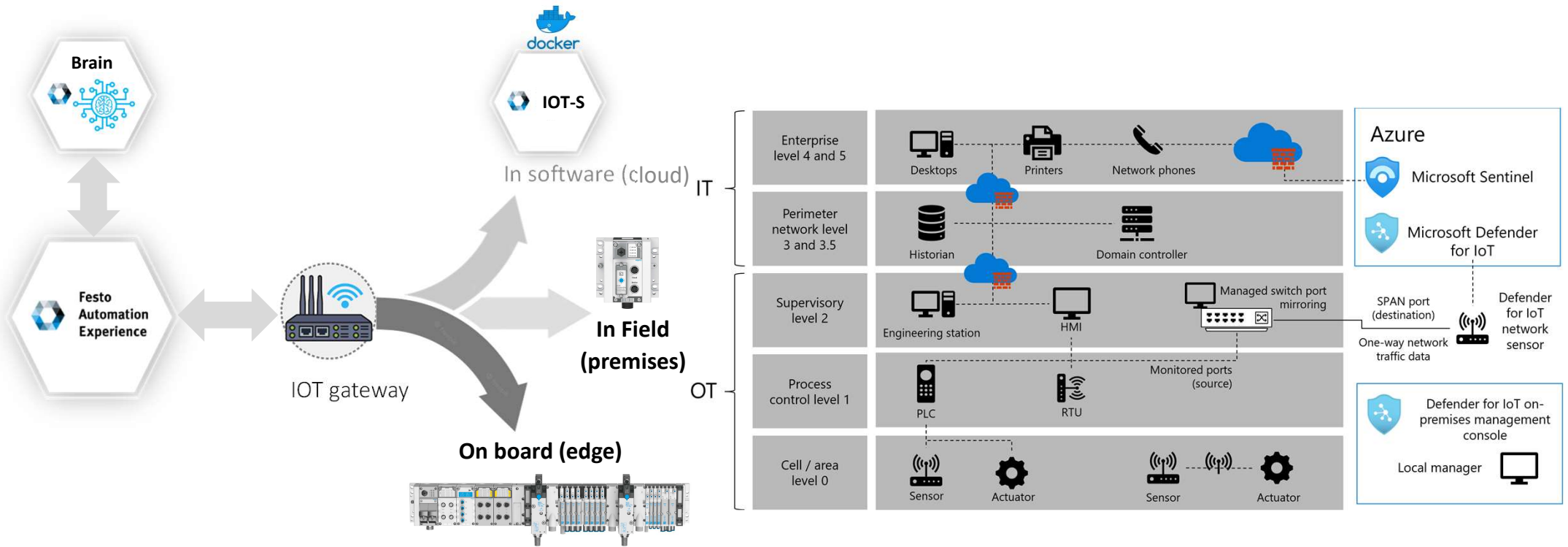
Communication Protocols



Trusted Modules



Connectivity

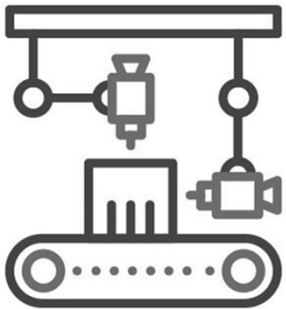


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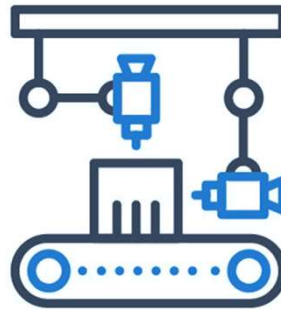
General energy savings






Standard machine



Conversion

Energy Saving
machine



-  Reduce compressor system pressure
-  Ring line concept in machine and in building
-  Intelligent Energy supply
– standby & running mode, monitoring data
-  Use of proportional technologies
- Return stroke - pressure reduction
- 4 bar working pressure
-  Pressure booster for high force movement

