

Automation Solutions / Fluid Control & Pneumatics

# Fluid Control & Pneumatics

Innovative solutions to solve your toughest challenges today and tomorrow.

## Fluid Control & Pneumatics (FLMC)

Product Range & System Solution

Sandy Aprilian Iskandar

Internal Business Development Engineer – Indonesia

Emerson Confidential



## Discussion Agenda

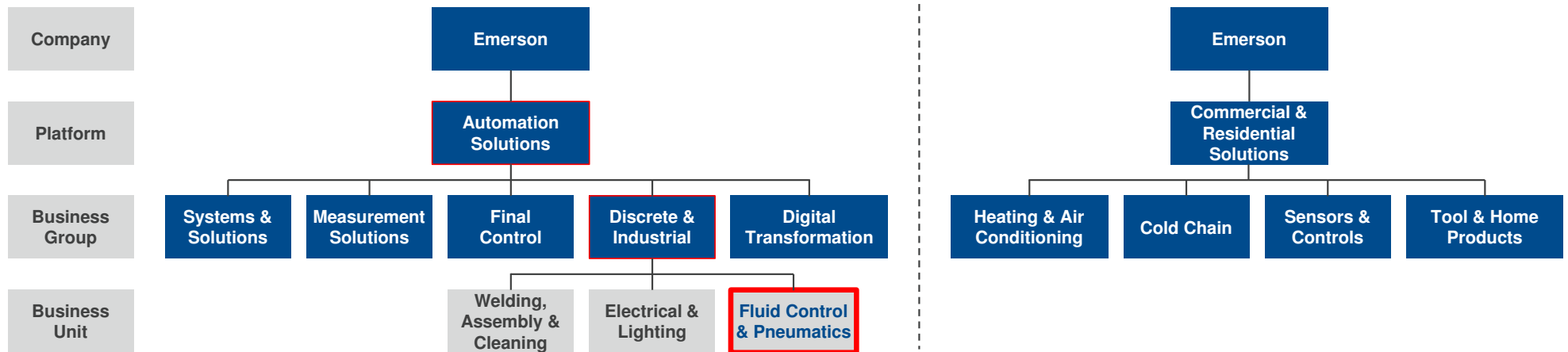
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- 1 Corporate Introduction
  - 2 (a) ASCO Products Portfolio
  - 3 (b) AVENTICS Products Portfolio
  - 4 (c) TOPWORX Products Portfolio
  - 5 (d) MACHINE AUTOMATION SOLUTION Products Portfolio
-

# Corporate Introduction

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## Our Organization Structure





# Our Values

*Guiding How We Operate Internally & Externally*

## INTEGRITY

We are **uncompromising** in our honest and ethical behavior, which creates trusting relationships with one another, customers, suppliers, and communities.

## SAFETY & QUALITY

We are **unwavering** in our commitment to the highest standards of safety and quality for ourselves and our customers.

## SUPPORT OUR PEOPLE

We **attract, develop and retain exceptional people** in an inclusive work environment, where all employees can reach their greatest potential.

## CUSTOMER FOCUS

We **actively listen to our customers** to deeply understand their needs and deliver the unique solutions that ensure their success.

## CONTINUOUS IMPROVEMENT

We **constantly strive** for improvement in all aspects of our business, guided by metrics, feedback, and our disciplined management process.

## COLLABORATION

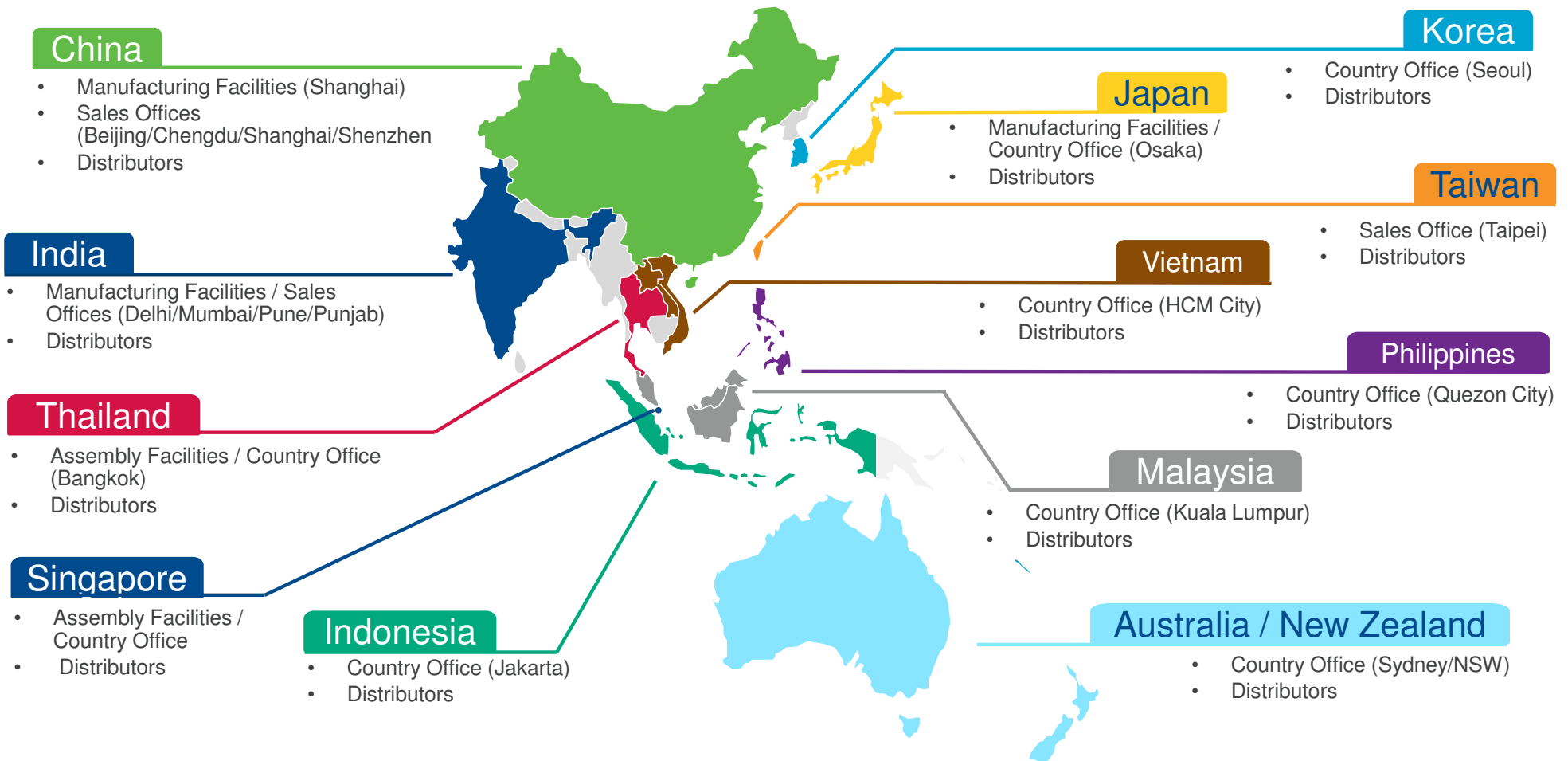
We **work seamlessly** across geographies, platforms, business units, and functions to fully leverage our unmatched breadth and expertise.

## INNOVATION

We **passionately pursue** new technologies, capabilities, and approaches to drive tangible value for our customers.



## FLMC (Asia Pacific) Locations



# Fluid Control & Pneumatic Portfolio



**ASCO™**

## FLUID CONTROL

Controlling the flow of air, gas, water, oil and steam in the most critical applications

- Solenoids
- Air Operated Valves
- Miniature Valves
- Engineering Panel Solutions



**AVENTICS™**

## PNEUMATICS

Transforming pressurized air or gas into energy and motion to power machines

- Valve Systems & Directional Control
- Proportional Valves
- Cylinders & Actuators
- Air Preparation
- Machine Safety
- Pneumatic Systems & Cabinets
- Connectivity and IIoT



**TOPWORX™**

## POSITION SENSING & INDICATION

Sensing, switching and control for the most demanding environments

- Proximity Sensors
- Limit Switches
- Discrete Valve Controllers
- Nuclear Approved Products
- Subsea Products



**Solution**

## Machine Automation Solution

Provide solution for Energy monitoring, Increase OEE & Predictive maintenance

- Dust & Pulse Technology
- Digital Transformation
- MAS

# **(a) ASCO Products Portfolio**

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## ASCO – PRODUCTS PORTFOLIO



**Controlling the flow of air, gas, water, oil and steam in the most critical applications**



# ASCO Solenoid Valves

Please refer to our **Emerson** website for more information



Series 210



Series 238



Series 256



Series 356

2 Way / 3 Way General Purpose Solenoid Valves



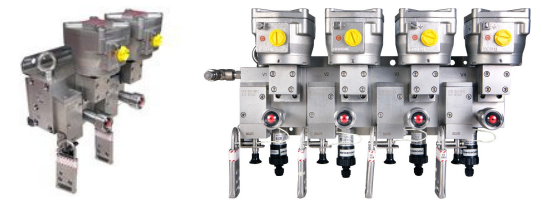
Series 327 Direct operated,  
Balanced Poppet Solenoid Valve



Series 55x/53x Solenoid  
Spool Valves



Series 362/562 Spool Valves



Series 141  
Advanced Redundant  
Control System (ARCS)

## ASCO Angle Seat, Pinch & Diaphragm Valves

Please refer to our ASCO website for more information



Series 290

Series 390

Pressure Operated Piston Valve



Q117 / 217

Q317

High Pressure / High Temp  
Globe Valve



Series X290  
Two Valve Module



Series 290C Motorised &  
Motorised Proportional Valve



290 + Position<sup>D</sup>

Q117 + Position<sup>D</sup>

Proportional Valves



Series 273 pinch valve

# ASCO Combustion Products

Please refer to our ASCO website for more information



P122AFL & P122AFM  
Combustion Controllers



P122AFS  
Flame Scanners & O2 Probe



Series 159 - Actuator

Series 158 - Valve body

Hydramotor / Electric Actuators



Shutoff Valves



Gas Vent Valves



# ASCO Dust Collector Products

Please refer to our ASCO website for more information



Series P150 DPT  
Particle Monitor



Series P151 DPT Controller



Series P152 DPT  
Particle Sensor



Series 353

Series 353K

Pulse Valves



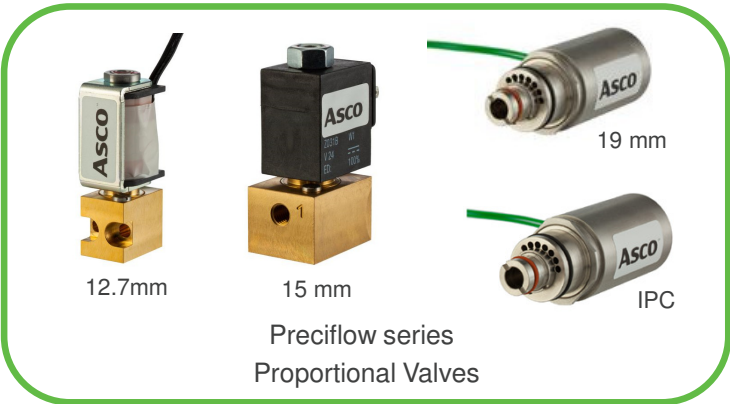
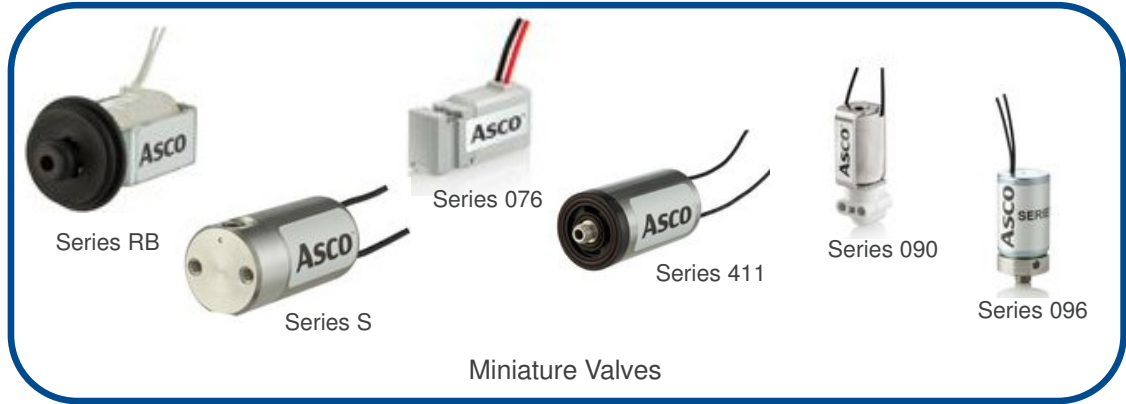
Series 355B / 357 Tank System



Series E909 Electronic  
Valve Controller

# ASCO Miniature Solenoid Products

Please refer to our ASCO website for more information



# ASCO Filter Regulators

Please refer to our ASCO website for more information

## Series 342A SSFR



Compact  
Version

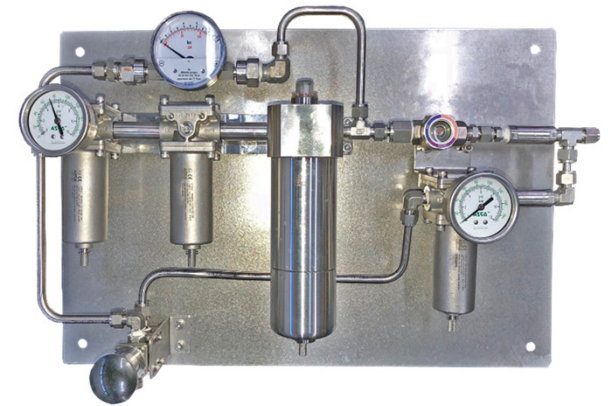
High-Flow Version

## Series 632 AFR



Series 632 / 633 AFR

## Tri-Stage Filter



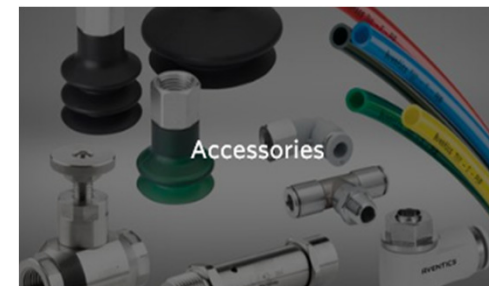
ASCO Tri-Stage Filtration System

# **(b) Aventics Products Portfolio**

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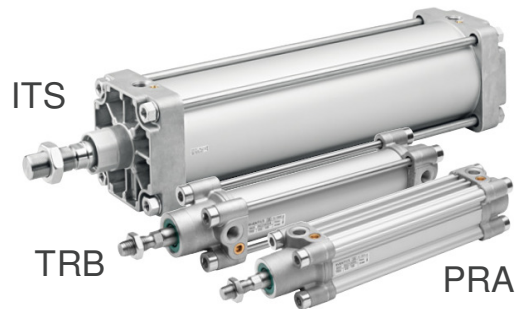
# AVENTICS – PRODUCTS PORTFOLIO

Please refer to our AVENTICS website for more information



**Transforming pressurized air or gas into energy and motion to power machines**

# AVENTICS Pneumatic Cylinders & Actuators



PRA-series Profile & TRB/ITS series Tie-rod Cylinders



RTC series Rodless Cylinders



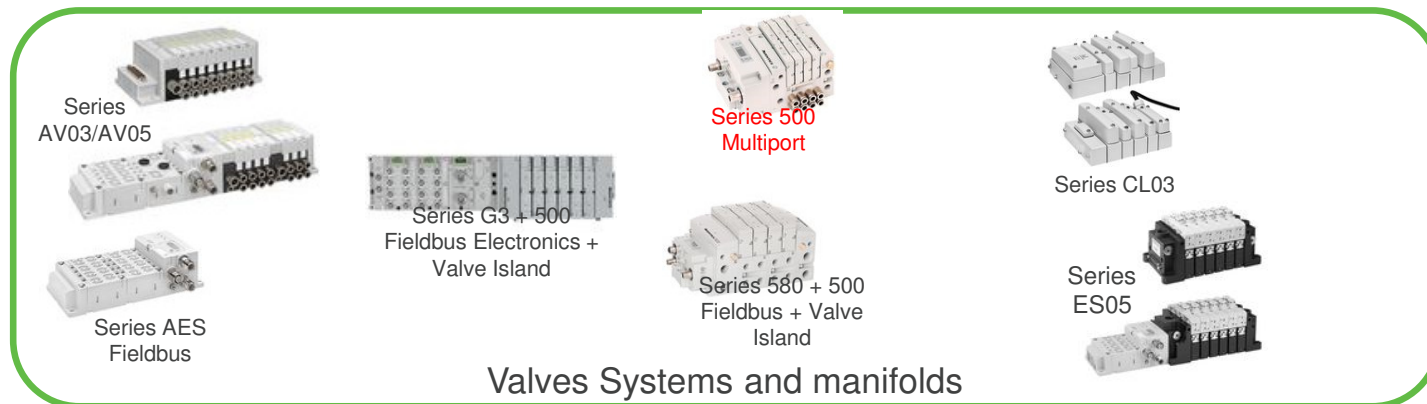
MNI/RPC series Mini & Round Profile Cylinders



CCI series Compact Cylinders ISO

Please refer to our AVENTICS website for more information

# AVENTICS Pneumatic Valves & Valve Systems



Please refer to our AVENTICS website for more information



# AVENTICS Proportional Valves

Please refer to our AVENTICS website for more information



SentronicD (608/9)  
series



SentronicHD series



Sentronic LP (614)  
series



SentronicPLUS series

Sentronic Series



Servotronic Series



Series ED02

Series ED05



Series ED07



Series ED12

ED series E/P Valves



Series EV03



Series EV07



Series EV12



Series EV18

EV series (Valve System) E/P Valves



# AVENTICS Vacuum Technologies

Please refer to our AVENTICS website for more information



Non-Contact Transport System



Bellow Suction Grippers



Vacuum Accessories



Flat Suction Grippers

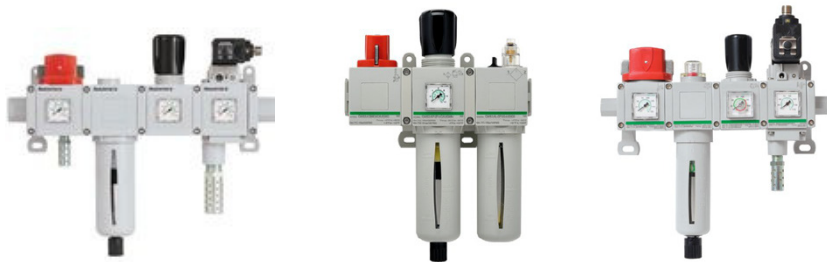


Ejectors

# AVENTICS Air Preparation & Sensors

Please refer to our AVENTICS website for more information

## Air Preparation

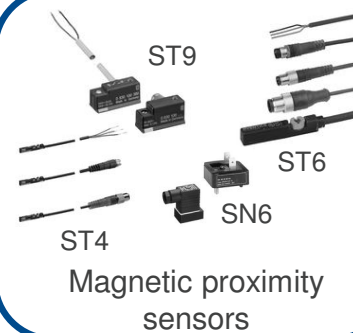


651/2/3 series FRL



AS series Air Maintenance Units

## Sensors



Magnetic proximity sensors



Distance measuring sensors



Pressure sensors



AF2 series Air flow sensor



Meters & Adjustment tools

## AVENTICS Accessories

Please refer to our AVENTICS website for more information



Air Tubing



Silencers



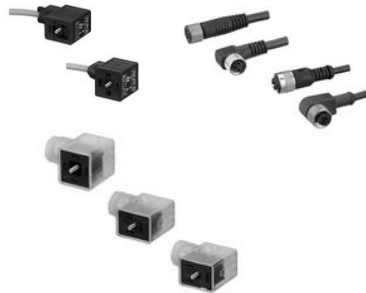
Fittings



Tube accessories



Couplings



Plug connectors



Pressure Gauges



Seals

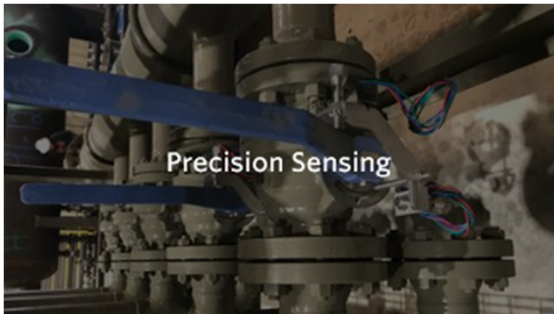
# **(c) TOPWORX Products Portfolio**

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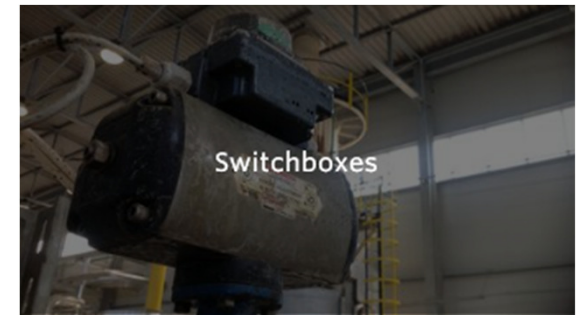
# TOPWORX – PRODUCTS PORTFOLIO

Please refer to our TOPWORX website for more information

## Position Sensing



## Discrete Valve Controllers



**Sensing, switching and control for the most demanding environments Systems**

# TOPWORX – Position Sensing

Please refer to our TOPWORX website for more information

## GO Switch



Model 70 series

7C 7D 7E 7F

Model 7C/7D/7E/7F

**Precision Sensing**



Model 11 Model 21



Model 31 Model 41

**Extended Sensing**



7A Pneumatic Proximity Nuclear Qualified



High Temp 176°C//204°C Subsea

**Specialty Applications**

## Magnetic Target Switch



**Series MTS**

# TOPWORX – Discrete Valve Controllers

Please refer to our TOPWORX website for more information



DXP series

DXS series

DXR series

## D series



TXS series



TXP series

## TX series



TVH series



TVL series



TVF series



TVA series

## TV series



K2P/K2S series



K7L series

## K series

## **(d) Machine Automation Solution Product Portfolio**

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# Fluid Control & Pneumatics

ASCO | AVENTICS | TESCO | TOPWORX

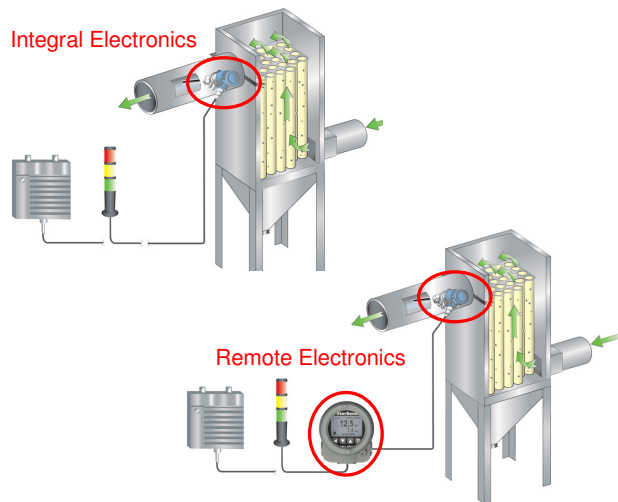
**ASCO™ Dust & Pulse Technology (DPT)**  
for Dust Collector Application



## Dust & Pulse Technology Portfolio

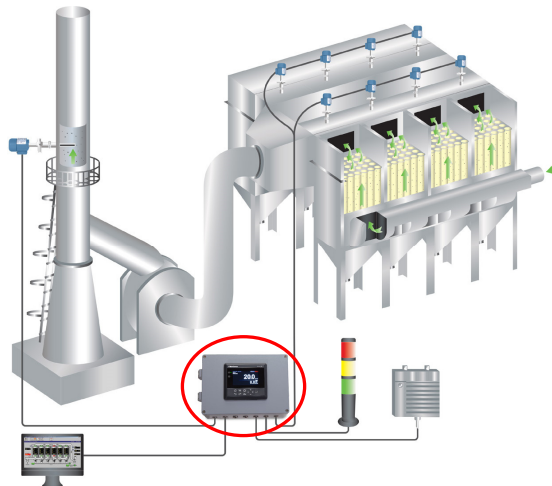
- **ASCO™ SmartPULSE** solutions help prevent excess emissions and process problems by providing reliable low-level particulate monitoring, early warning leak detection, better control, and real-time diagnostics of filtration systems.

### Particle Sensor



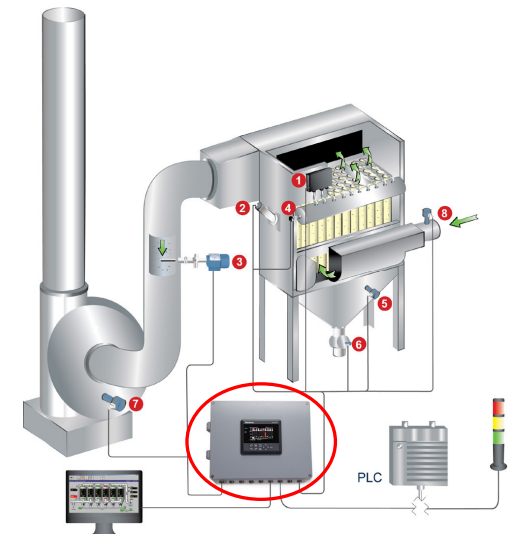
The industry's best value in a basic particle monitor and leak/flow detector. The engineering and quality greatly exceed comparably priced devices.

### Particle Monitor



Provides reliable particulate monitoring and leak/flow detection along with a solid range of basic features, functions, and I/O for customer.

### DPT Controller



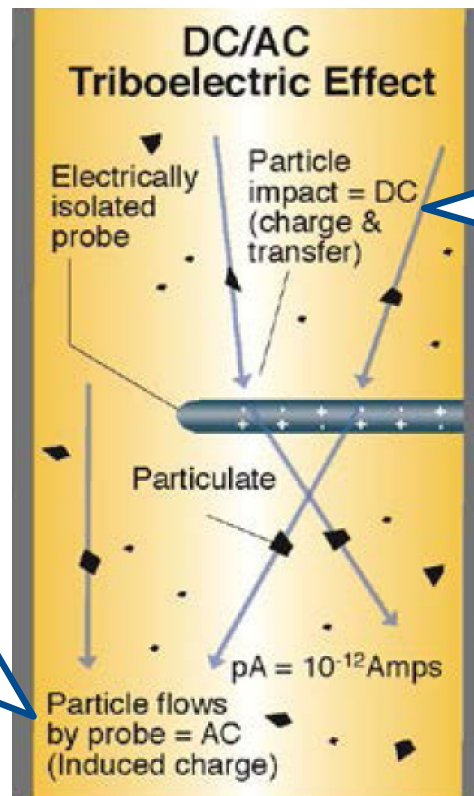
Provides pulse-jet DP/cleaning control, particulate monitoring, basic diagnostics, and a solid range of features, functions, and I/O for general improved operation and maintenance planning.

# AC Triboelectric Sensing

- Non-contact type particle sensing technology

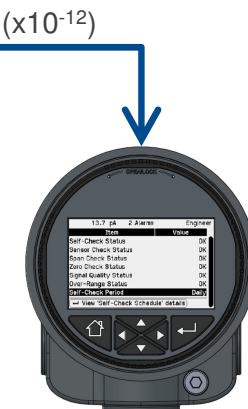
## AC Triboelectric

- **Non-contact type** sensing
  - Particle flows by probe
  - Induced charge
- 
- ✓ Not affected by particle build-up on the probe or low air flow velocity
  - ✓ Eliminates the needs for air purge\*
  - ✓ Extends maintenance interval
  - ✓ Electrically isolated



## DC Triboelectric

- **Contact type** sensing
  - Particle collide with probe
  - Transfer charge
- 
- ✗ Particle build-up
  - ✗ Needs for air purge

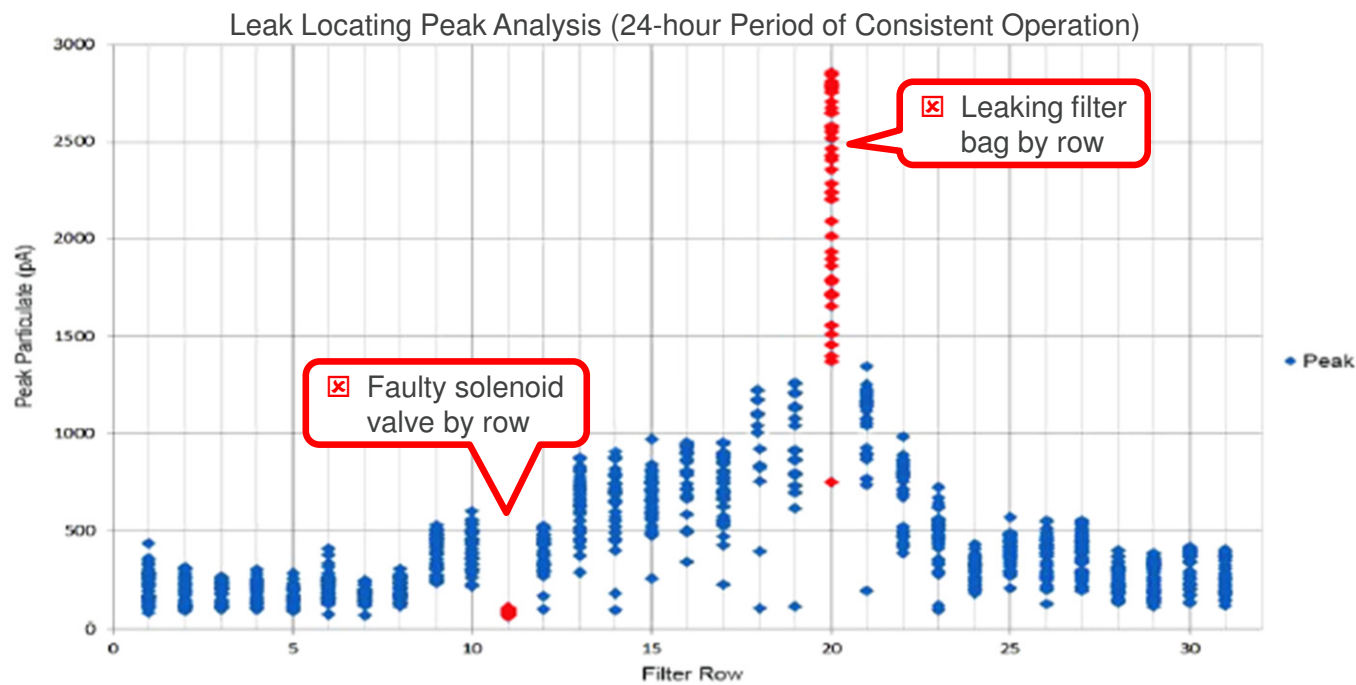


- 4-20mA, &/or
- Relay (x2)

\* Except carbon black applications

## Intelligent Monitoring

- **Real-time monitoring, logging & diagnosis of particle data**
  - ✓ Detects filter leakages & solenoid failures
  - ✓ Locates leaking filter bags & faulty solenoid valves by rows

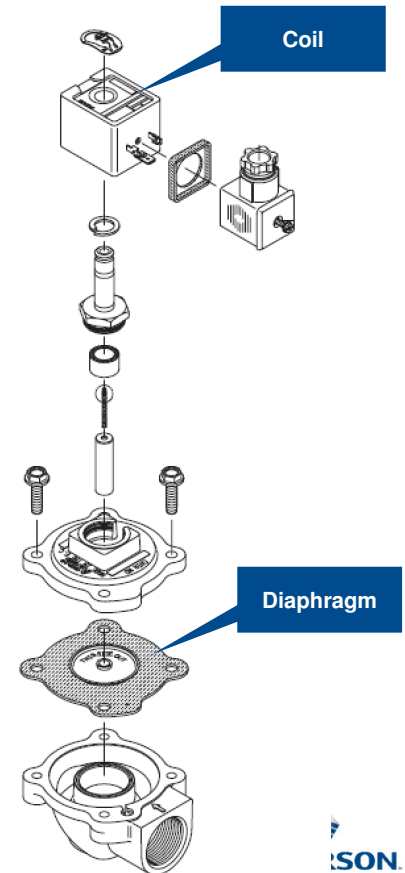
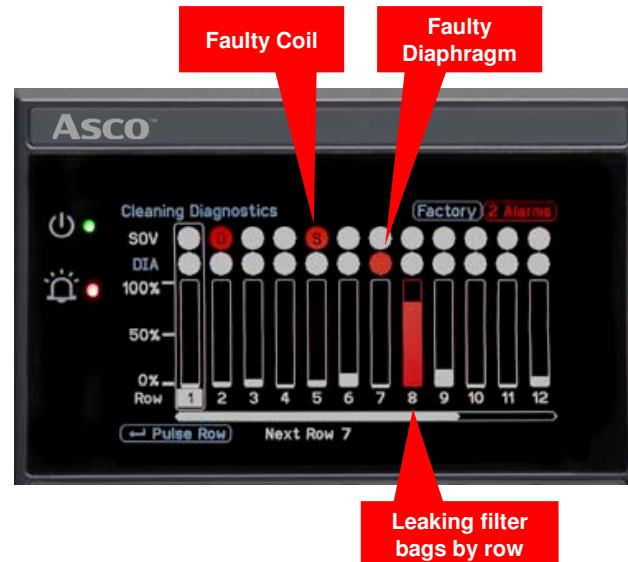


Taken from customer's SCADA system

## Advanced Monitoring & Diagnostic Capabilities

- **Real-time monitoring, logging & actionable diagnosis of system**

- ✓ Detects leakages, minimizes wastages & ensures compliances
- ✓ Detects filter leakage, solenoid coil & diaphragm failure by rows



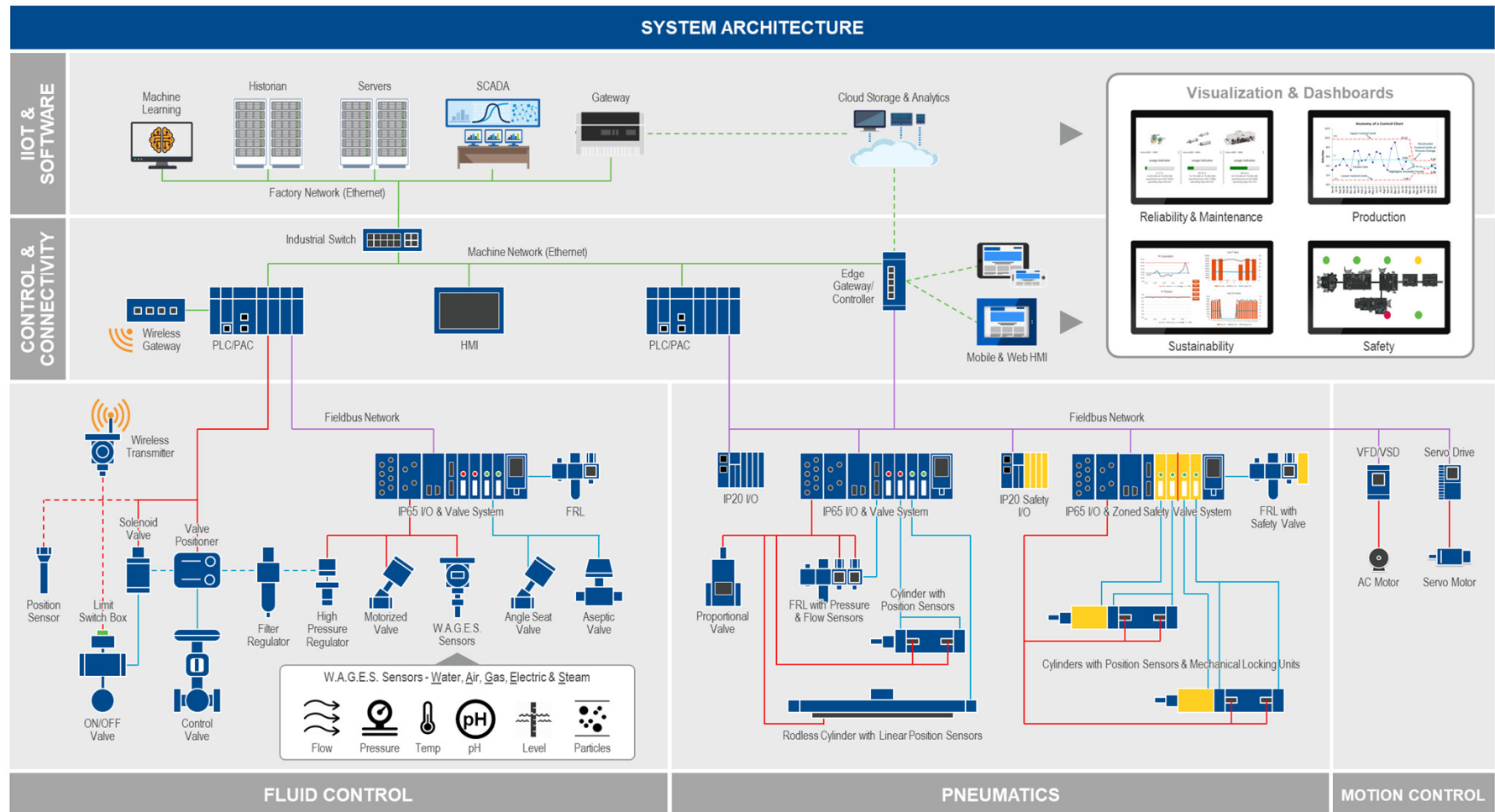
# Fluid Control & Pneumatics

ASCO • AVENTICS • TESCO • TOPWORX

Digital Transformation



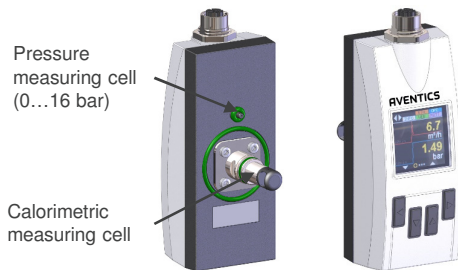
# Digital Transformation Portfolio





# AF2 – The IIoT enabled Flow sensor

## Working Principle



## Process Parameter

Volumetric Flow Rate (L/min)
Pressure (bar)
Temperature (°C)
Mass Flow Rate(kg/h)
Flow Velocity (m/s)
Volume (L)
Mass (kg)
Energy (kWh)

## Variants

- Output : Ethernet & Industrial.
- Protocol : OPC-UA & MQTT.
- Size : G3/8" G1/2" G1"
- Range : 1600 LPM, 2500 LPM, 6,500 LPM.

## Features

- OLED display, CE, UL, RoHS
- Integrated statistics (min, max and mean)
- Integrated counter (Volume, Mass, Energy)
- Integrated logging (7d, 24h, 60min) readable via OPC UA



The IIoT enabled AF2 flow sensor for Air flow & pressure monitoring.

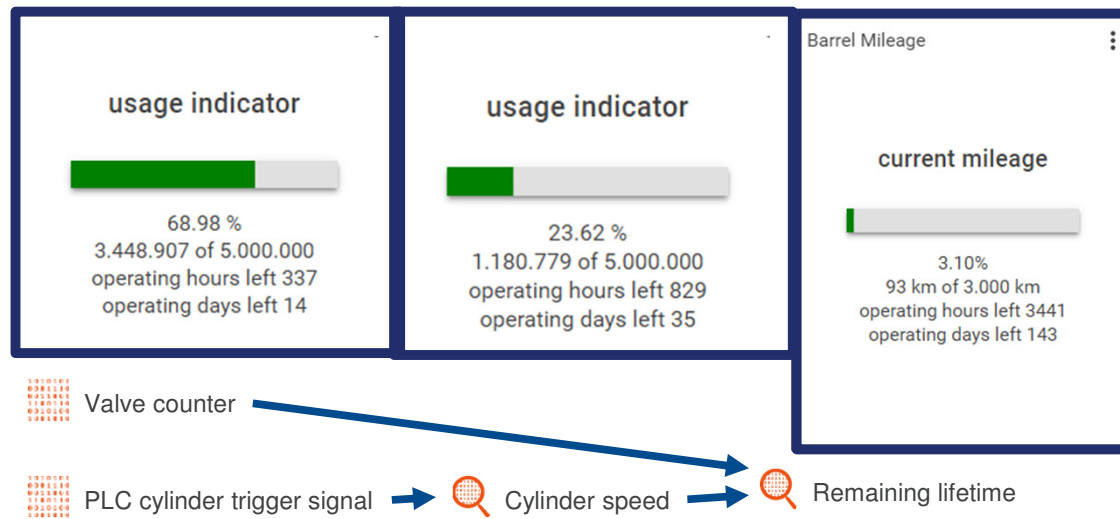


# Overall Equipment Effectiveness

- Example – Lifecycle Management (Cylinder Failures)



Evaluation of cycle counts to determine the travel distance of the cylinder seals



# Energy Efficiency & Sustainability



The background of the slide is a photograph of an industrial manufacturing facility. It shows various pieces of machinery, conveyor belts, and structural elements of a large factory. A semi-transparent blue diagonal overlay covers the left and bottom portions of the image. The text 'Emerson Machine Automation Solutions (MAS)' is written in white, bold, sans-serif font on the blue background. The Emerson logo is located in the bottom right corner of the image.

# Emerson Machine Automation Solutions (MAS)



# MAS Product Portfolio

## 1. Programmable Automation Controllers (PAC)

**An industrial controller that combines the functionality of a PLC with the processing capability of a PC**

- ✓ Multi-Discipline platform
- ✓ High Performance
- ✓ Open & Scalable



## 2. Outcome Optimizing Controller

**A hypervised, multicore Industrial Internet Control System**

- ✓ First IT/OT product
- ✓ Secure connectivity to clouds
- ✓ Capable of optimizing the process



## 3. QuickPanel+



**Operator Interface for the Industrial Internet**

- ✓ Multi-touch
- ✓ All-in-One Automation Panel
- ✓ Connectivity



## 4. Industrial PC

**The Next Generation of Ruggedized Computing System**

- ✓ Patented Cooling technology
- ✓ Rugged design
- ✓ Customized capability



## 5. Variable Frequency Drive (VFD)



**Adjustable-speed drive used to control AC motor speed & torque**

- ✓ Unified configuration tool
- ✓ Easy to configure and Maintain
- ✓ PROFINET supported

## 6. Industrial Ethernet Switches

**Fast, seamless & resilient connectivity for Industrial Ethernet devices**

- ✓ Rugged design
- ✓ Fast ring recovery technology
- ✓ Advanced PROFINET topology support

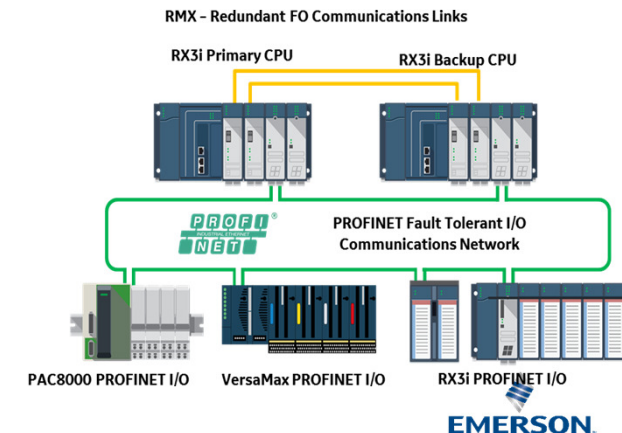
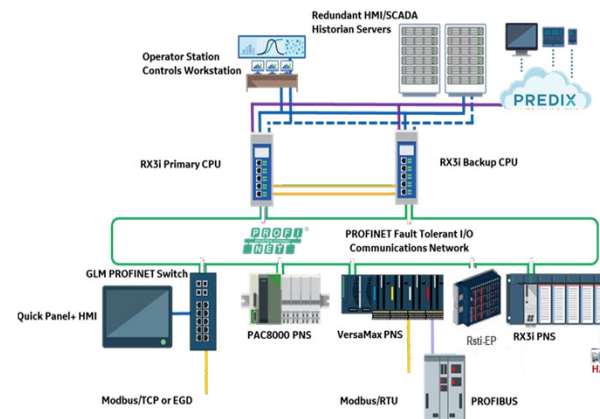




# 1. Programmable Automation Controllers (PAC)

## Benefits & Strength

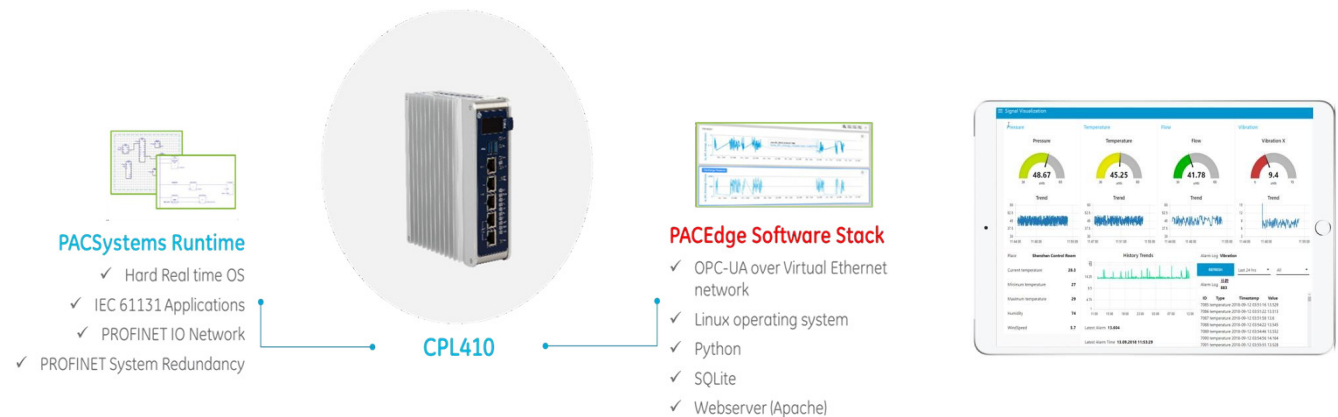
- ✓ **Multidiscipline control**  
(process, discrete, motion, view)  
in one platform
- ✓ **Scalable:** from small Micro applications with a few IO to large redundant systems with up to 32K IO per controller
- ✓ **Open and based on standards:** IEC61131 programming with broad connectivity options
- ✓ **Deterministic High-Speed Control:** Base scan rate as low as 400uS, switchover in 1 scan
- ✓ **Compact Footprint:** IO densities as high as 7 terminals per square inch
- ✓ **Secure** by design: TPM, Secure Boot, Signed Firmware



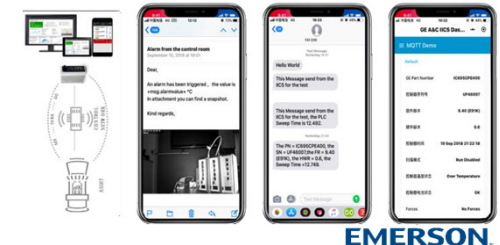
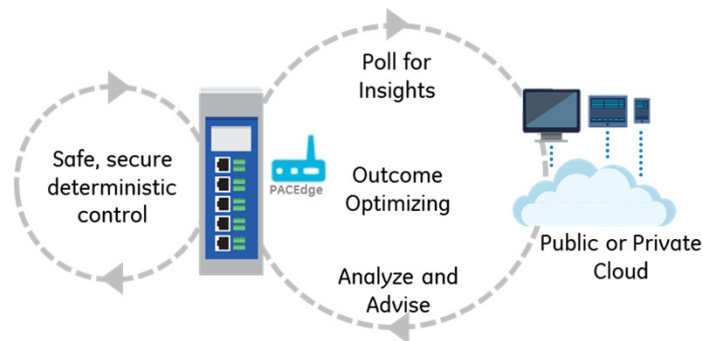
## 2. Outcome Optimizing Controller (OOC)

### Benefits & Strength

- ✓ The world's first Outcoming Optimizing Controller
- ✓ Real IT/OT combination solution
- ✓ Connect to cloud resources via MQTT, HTTPs, VPN...
- ✓ Perform advanced analytics in the cloud or at Edge nodes
- ✓ **Secure** by design: TPM, Secure Boot, Signed Firmware



*Not only supply the data to IT, OT and Cloud Apps but more importantly act on the results from these apps in a safe and cooperative manner to impact business outcomes*



EMERSON

## 3. QuickPanel+

### Benefits and Strength

- ✓ **Multi-touch Wide screen** (6, 7, 10, 12, 15 inch)
- ✓ **Interoperability** Supports 40+ drivers to interface with multi-vendor controllers and I/Os
- ✓ **Embedded Control Engine**
- ✓ **Embedded Data Historian**
- ✓ **Connectivity**, Built-in webserver enables connectivity to outside world
- ✓ **HTML 5 supported**
- ✓ **Multimedia Capability**, instructional and training videos, Audio instructions and customizable audio alarms

### ENHANCED UX

Intuitive, gesture-enabled multi-touch provides a better user experience and allows for more intuitive HMI design.

### INDUSTRIAL GRADE



- UL C1D2, C2D2, C3D1
- UL Type 4X
- DNV
- ABS
- ATEX Zone 2 (12&15")
- RoHS
- IP65f



### REMOTE CONNECTIVITY

Remote interaction and monitoring and web published reports with SNMP, HTML5 Dashboards, VNC

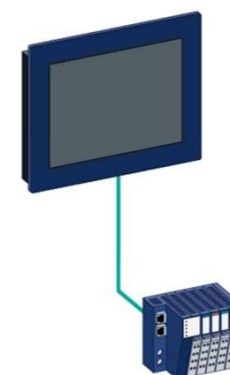
Data logger with built-in Historian; alarm and event server

### SECURITY WITHOUT IT HEADACHES

- Remote diagnostics and security without VPN setup; no public IP address - SECOMEA
- One login for easy maintenance across assets

### ALL-IN-ONE AUTOMATION PANEL

- Easily configured as an **AUTOMATION CONTROLLER** with powerful scripting capabilities and built-in HMI functions
- Built-in data Historian collector



### 3<sup>RD</sup> PARTY COMPATIBILITY

- Designed to work with Emerson and third-party PLCs & I/O, for easy integration into existing solutions



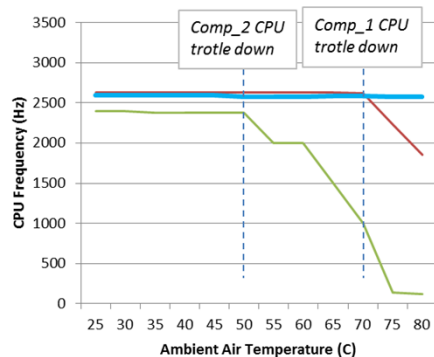


## 4. Industrial PC

### Benefits and Strength

- ✓ Broader operating temperature range (-40 ~70)
- ✓ Patented heat dissipation technology
- ✓ RAID capability within the IPC
- ✓ Connectivity Options
- ✓ Fanless rugged design
- ✓ Marine Certificate

CPU Performance v.s. Ambient Temp



### CONSISTENT FORM-FACTOR

Regardless of performance needs, the footprint of the unit remains same

### CONNECTIVITY OPTIONS

- 0,1,2,4 PCI/PCIe expansion slot options
- 5x1Gbe Ports
- 4xUSB ports

### FANLESS RUGGED DESIGN

- Patented heat dissipation technology
- Reliable performance in harsh environments - -20 to +65C operating temperature
- CE, UL certified

### FLEXIBLE PERFORMANCE

- Options for Latest Intel/AMD processor
- Dual or Quad cores options
- Multiple storage options (HDD, SSD- from 128GB to 512GB)
- ECC DDR3 RAM

### MODULAR DESIGN

COMExpress based design for enhanced product lifecycle

### CUSTOMIZATION

COMExpress based design allows us to customize for various OEMs to meet their computing requirements



# Machine Automation Solutions Portfolio

## Foundation for the Industrial Internet



Equipment Insight



PME/PPS



SCADA & Historian



Industrial PC  
Rugged Edge  
Management



Industrial  
Displays



QuickPanel+  
Operator  
Interface



VersaMax  
Micro/Modular



RSTi EP



Rx3i



PACMotion  
VFDs & Servo



MarkVieS  
Process Safety



VersaSafe  
Machine Safety



VersaMax/IP  
Washdown I/O



Industrial  
Ethernet  
Switches



RSTi I/O  
Compact



RSTi EP  
Advanced  
High-Density



Versamax  
Small simple  
machine apps



RX3i I/O  
Advanced  
Function & High  
Performance



PAC8000  
Rugged  
Process

Any  
questions?







**WE SEE  
THE STRENGTH OF ONE EMERSON**