

# Solutions for Valve Process automation

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WIEFP2016

3rd Workshop on Innovative Engineering for Fluid Power

Florianopolis/SC – Brazil

October/2016

# Agenda

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**Process market**

What is?

**Compressed Air**

Source of energy

**Monitoring**

Valve Monitoring system

**Directional  
Solenoid Valve**

Controlling the operation

**Safety**

Redundant operation

**Communication**

Digital networks

**Application**

Success cases

# Fluid Automation

## Process Automation Market



Power



Chemicals



Water / Wastewater



Oil and Gas



Refining

## Hybrid Market



Metals & Mining



Pulp & Paper



Cement & Glass



Life Science



Food / Bev

## Discrete Automation Market



Printing



Electronics / Electrical



Handling



Textiles



Packaging



Auto / Tire

# Process market

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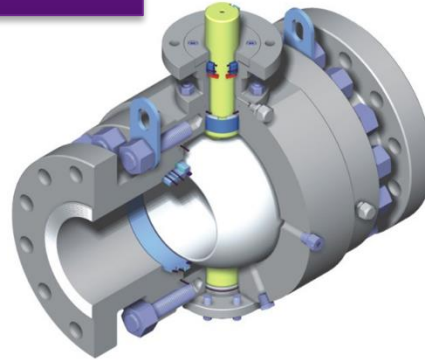
# Process automation market





# Process Valves

Different constructions  
according to the application



# Valve automation

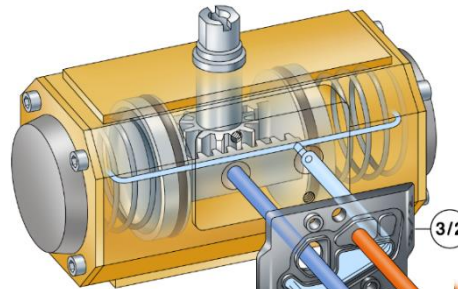
Monitoring



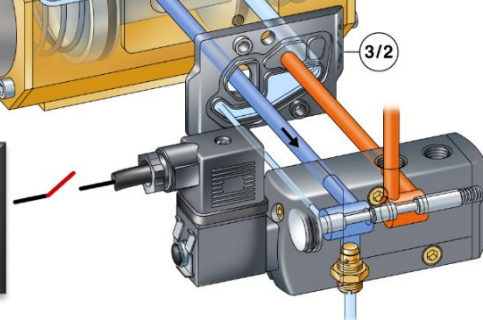
Air preparation



Pneumatic actuators



Directional Solenoid valve



Valve automation



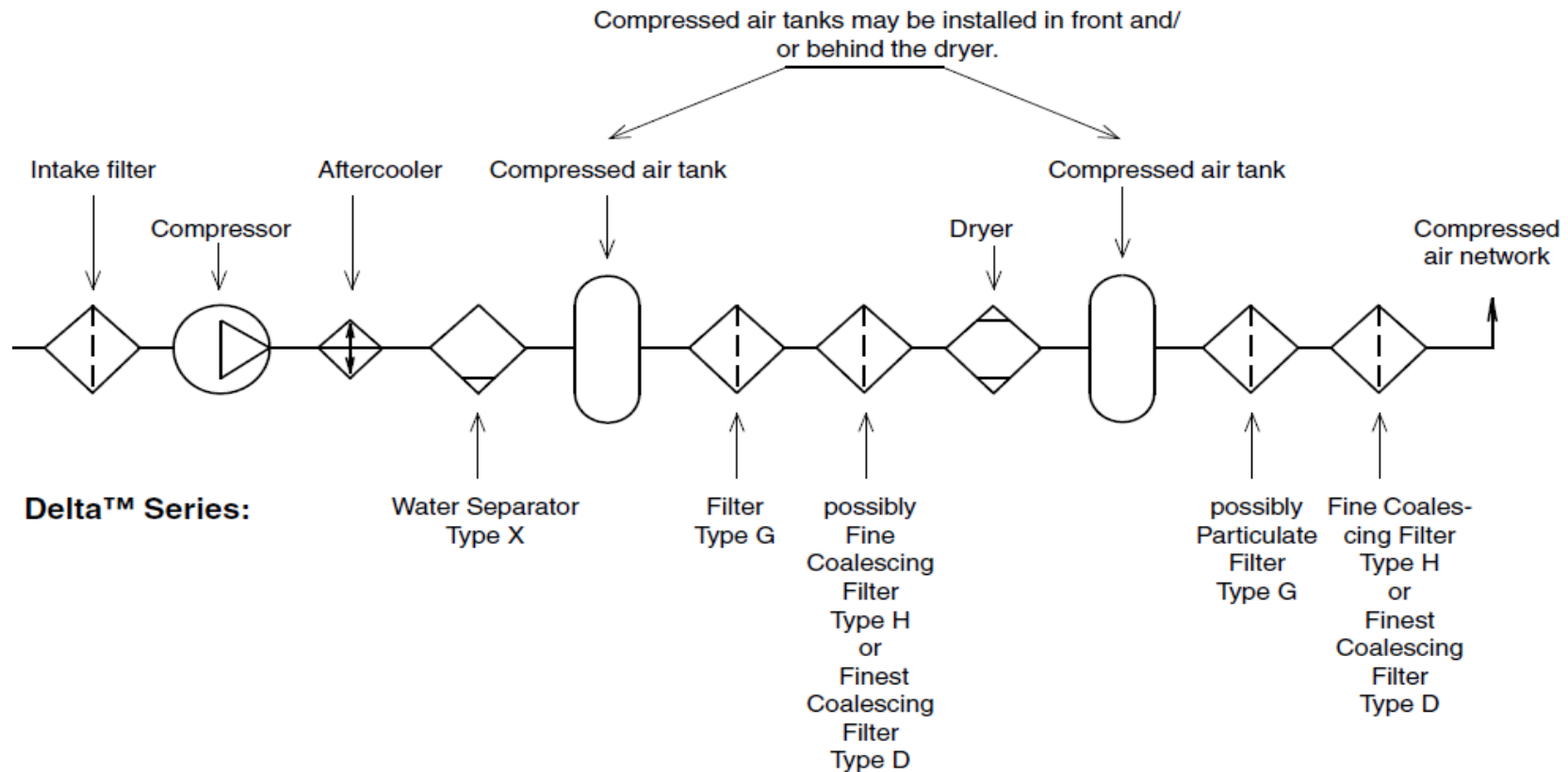
# Compressed Air

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# Compressed air – source of energy

## Generation – Treatment – Storage - Use



# Air Treatment

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## Types of filters:

Filter Water separator;

Particle filter 40  $\mu\text{m}$ , 25  $\mu\text{m}$  and 3  $\mu\text{m}$ ;

Coalescent filter of 0.01  $\mu\text{m}$  and 1  $\mu\text{m}$  (fine and Ultrafine);

Adsorption (carbon element) filter.



# Filter & Regulator

- ✓ Air or inert gas
  - ✓ No water
  - ✓ No particules
  - ✓ Regulated pressure
- 
- ✓ Remote pressure monitoring
  - ✓ Alarms
  - ✓ Material compability



# Monitoring

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# Monitoring – open or close?

## Valve Monitoring System - VMS



# Rotary & linear actuators



- ✓ Visual indication
- ✓ Electrical switch
- ✓ Bus communication

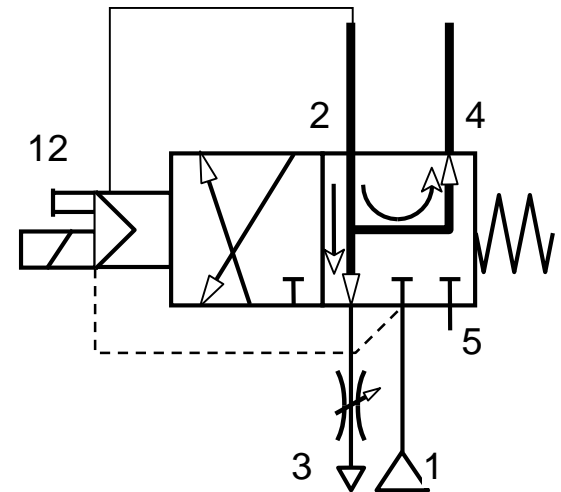
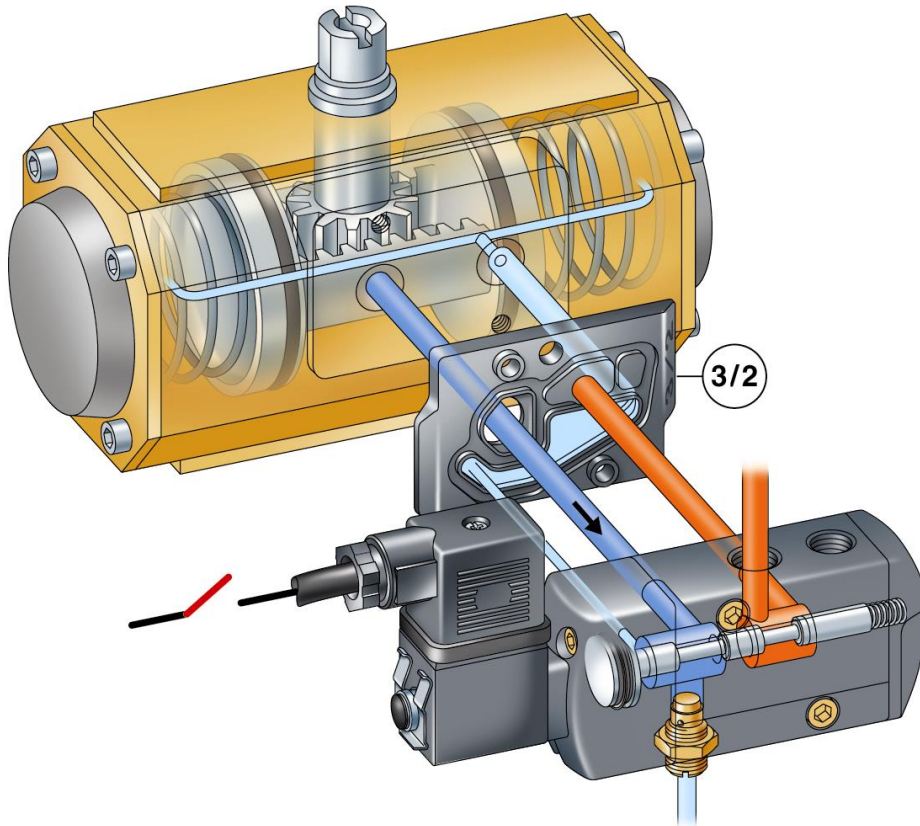




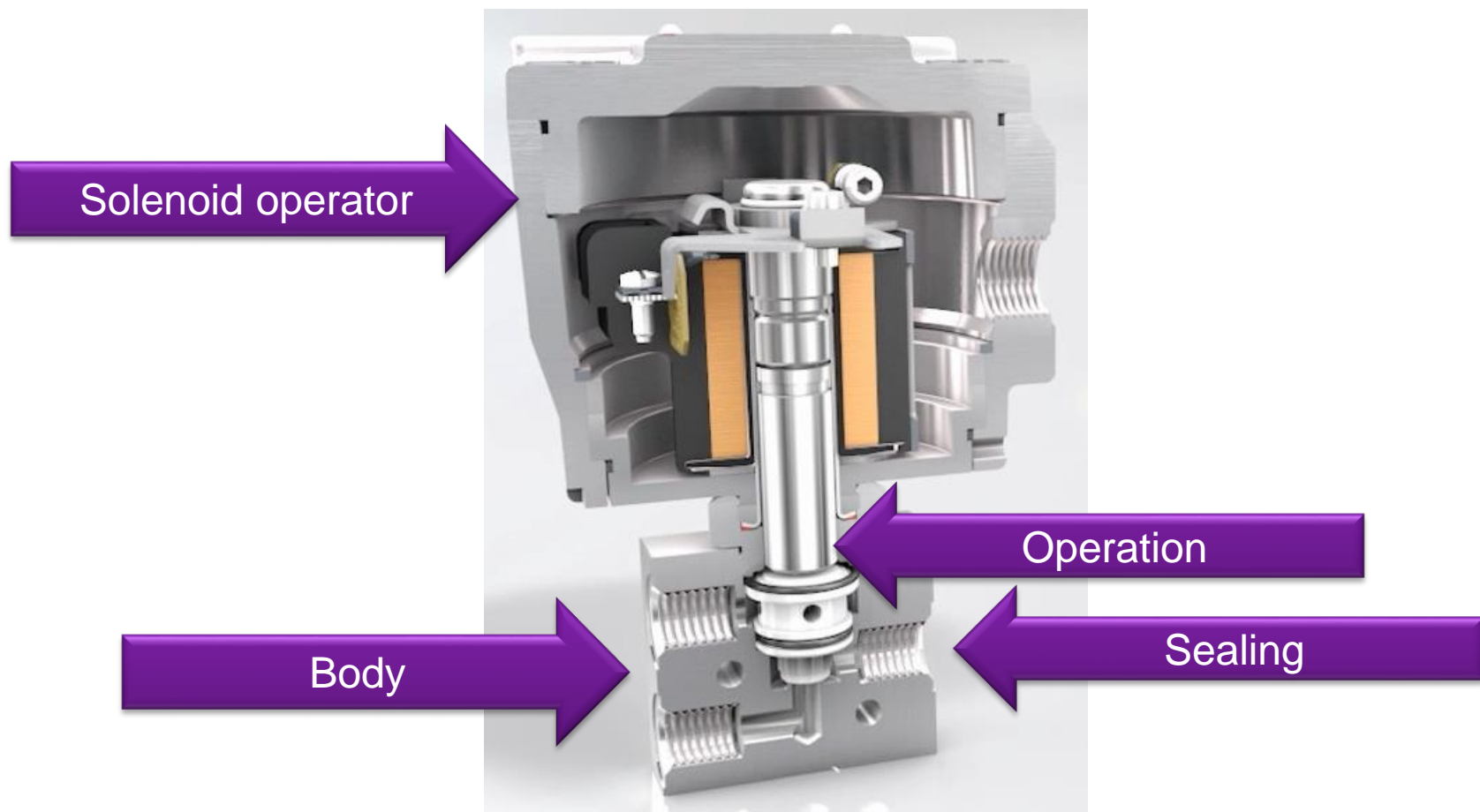
# Directional Solenoid Valve

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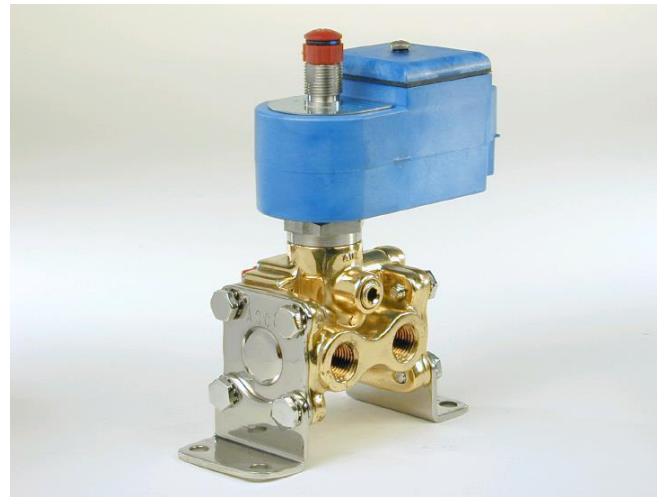
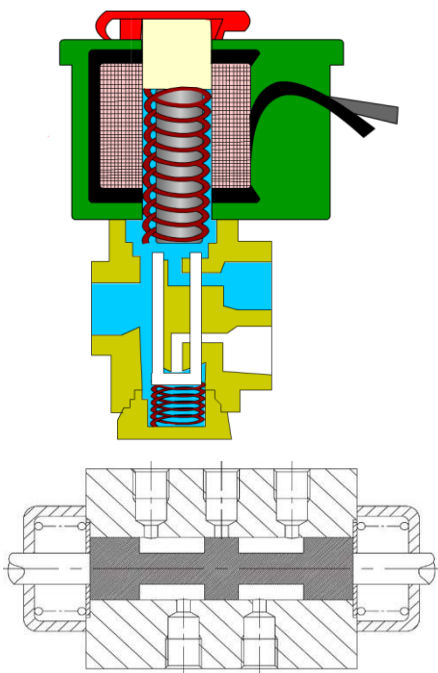
# Single or Double actuators



# Solenoid Valve operated



# Flow – Material - Construction



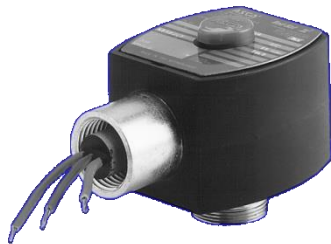
- ✓ 1/8" up to 1"
- ✓ Nitrile, FPM, metal
- ✓ Aluminum, Brass, Stainless Steel
- ✓ Direct operated
- ✓ Internal piloted



# Hazards location – solenoid enclosures



PVA



EF  
EV



EM  
WSEM



NF  
WSNF



JPIS



SC



WBIS

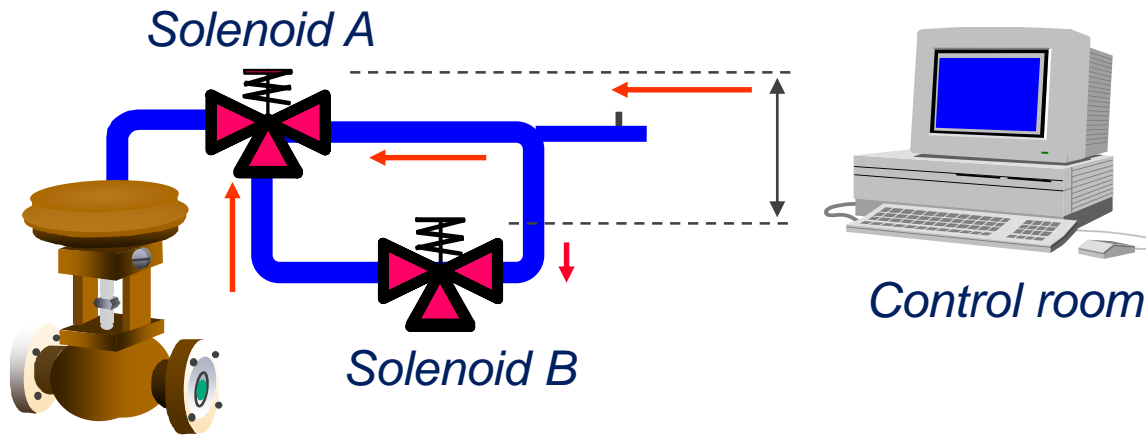
Ultra low power Nozzle e Piezoelétrico

# Safety

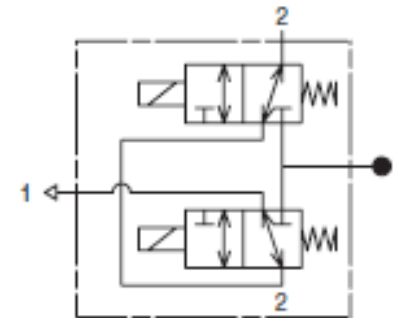
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# Redundant system



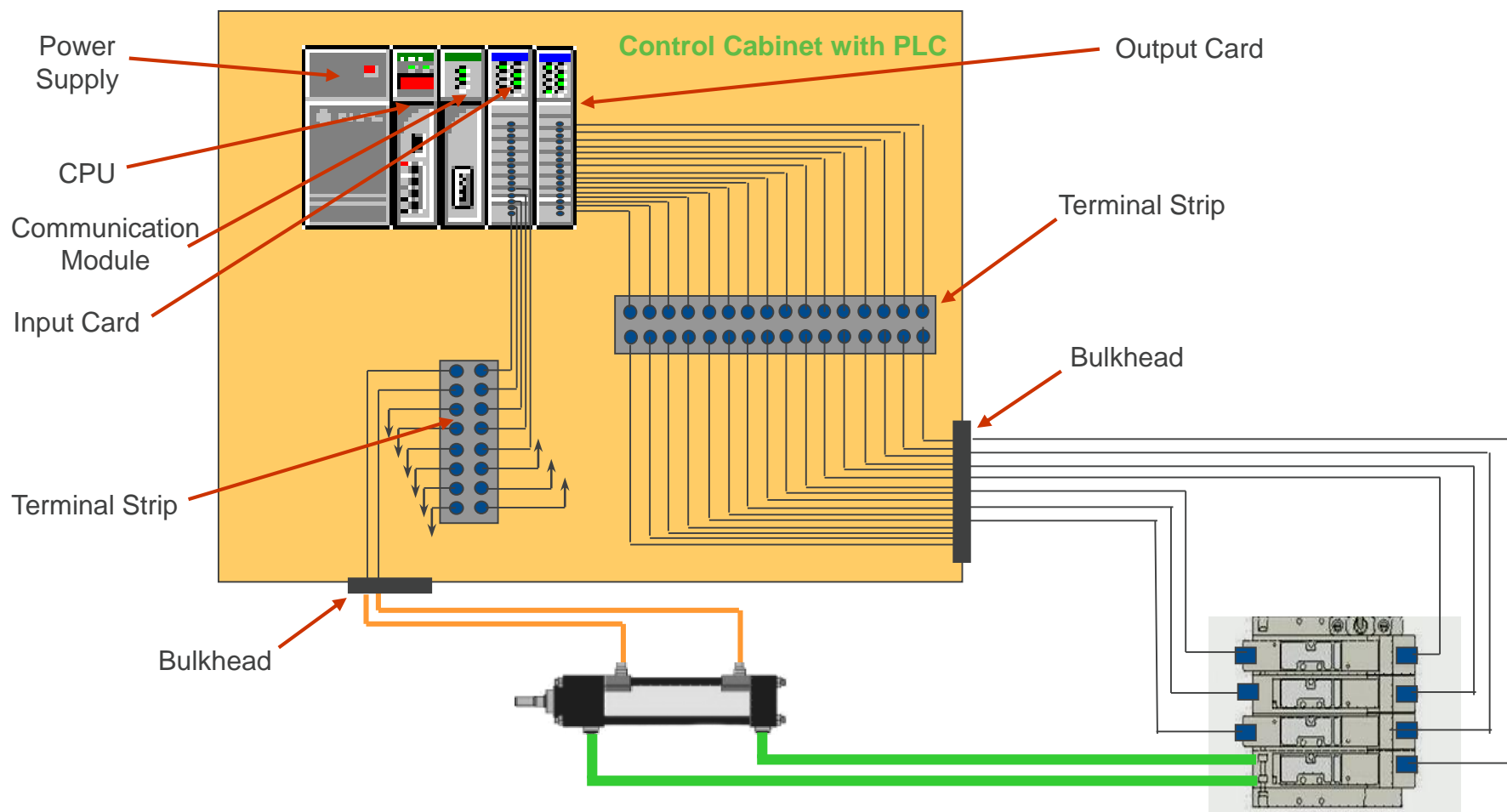
**Safety Integrity Level**  
**SIL**  
**IEC 61508/61511**



# Digital communication

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# Simplify our life....



# Digital communication



## ***Discrete I/O Side***

- 16 Module Capability
- Digital I/O
- Analog I/O
- Up to 1200 I/O

## ***Pneumatic Valve Side***

- 32 Solenoid Output Capability
- Including Valve side Sub-D

## ***Communication Module (Node)***

- |                |                       |
|----------------|-----------------------|
| - CANopen      | - Ethernet/IP*        |
| - DeviceNet*   | - Ethernet Modbus TCP |
| - DeviceLogix  | - PROFINET            |
| - Profibus-DP* | and more...           |

\* primary release

# Success cases

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# Petrobras – REPLAN (Paulínea) combustion gas line - burners





# UTE Thermoelectric (Rio de Janeiro) combustion gas pipeline – main control valve



# Petrobras – REVAP (São José dos Campos)

## ETA - water treatment station





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