AccuSteam™

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General

There are two main applications for AccuSteam Steamboxes

Installation at the wet end of a paper machine

- AccuSteam installed on the wire to support and control the de-watering process of the vacuum boxes or Couch.
- AccuSteam installed in the Press Section in front of the First or Second Press to support and control the de-watering process of the Press nip.

Installation at the dry end, Calender or converting machines

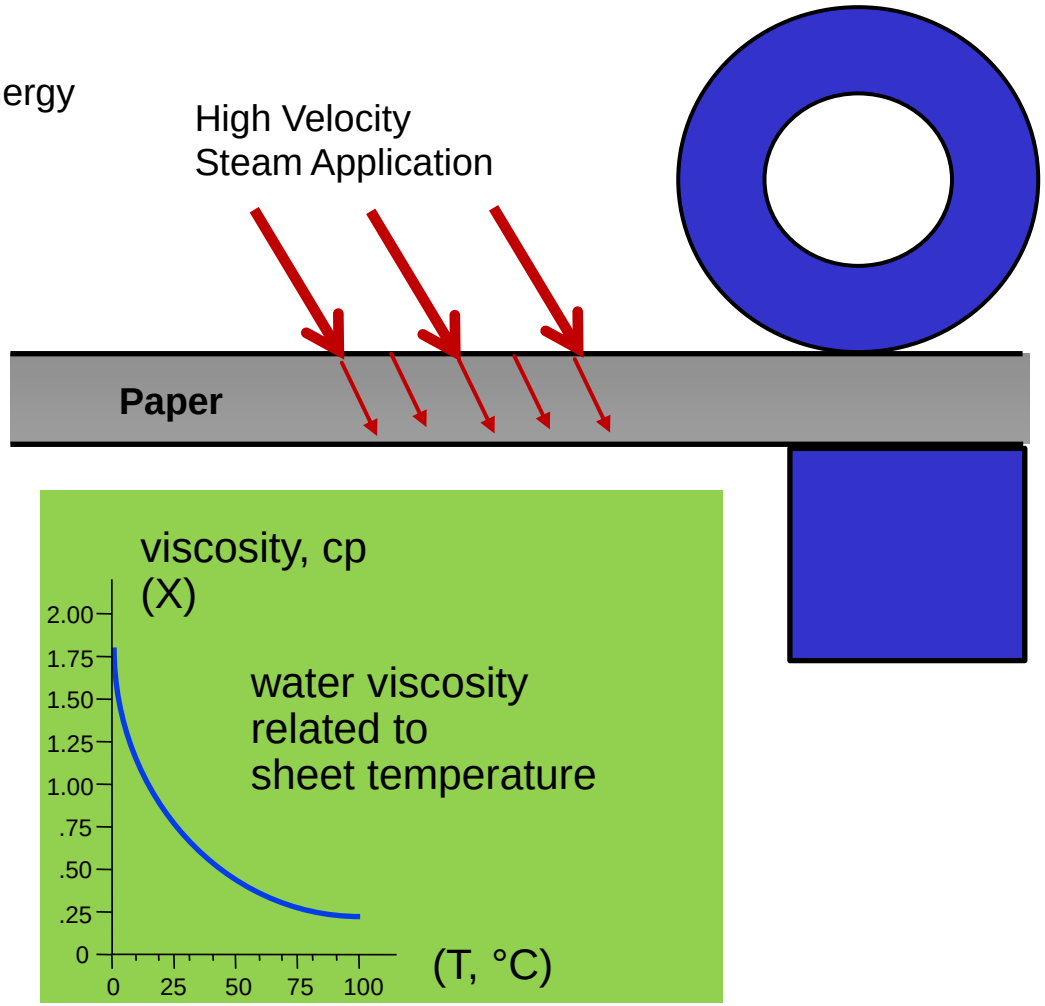
- AccuSteam installed directly in front of a Calender nip to improve and control the gloss or smoothness.
- AccuSteam installed in front of a winder or after a coater unit to raise and control the sheet moisture to control the de-curling by re-moisturizing the sheet.
- The steam application can be compared with the “steam iron“ procedure.

Steam Application Wet End

- The paper web has an open surface of 80% water, 20 % fibre.
- Steam condenses in the paper web.
- The condensation process causes heat and energy transfer **into** the paper with a temperature increase of 10 - 25 °C.

  Raising the web temperature lowers the fluid viscosity and surface tension.

  The dewatering process done by vacuum box(es) or Press nip is easier and more effective.

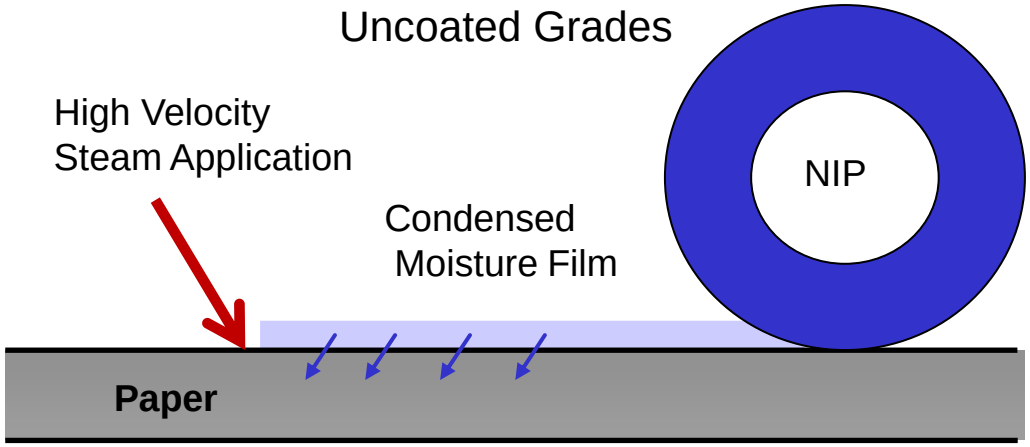


Benefit and Results Wet End

- Increasing sheet temperature of 10 – 15 °C will improve sheet dryness by approx. 1% for a stock temperature of ≤ 45°C before the AccuSteam unit.
- Installations before the 1st Press nip will result in dryness increase of up to 1.5 - 3% after the Press Section.
- 1% dryness yields a 3 – 5% increase in production or a comparable saving in energy consumption in drying.
- Improvement of the dewatering process by zones in CD direction ⇒ moisture profile control.
- CD moisture 2-sigma improvement up to 50 %.
- Reduction of Press nip loads.

Steam Application Dry End

- Steam condenses on the surface.
- The condensation process causes a heat and energy transfer to the paper with a temperature increase of 15-25°C.
- A moisture film on the surface occurs.
- Condensed moisture film stays on the sheet surface and re-moisturizes the surface layer.
- Comparable to “hot iron“ procedure.

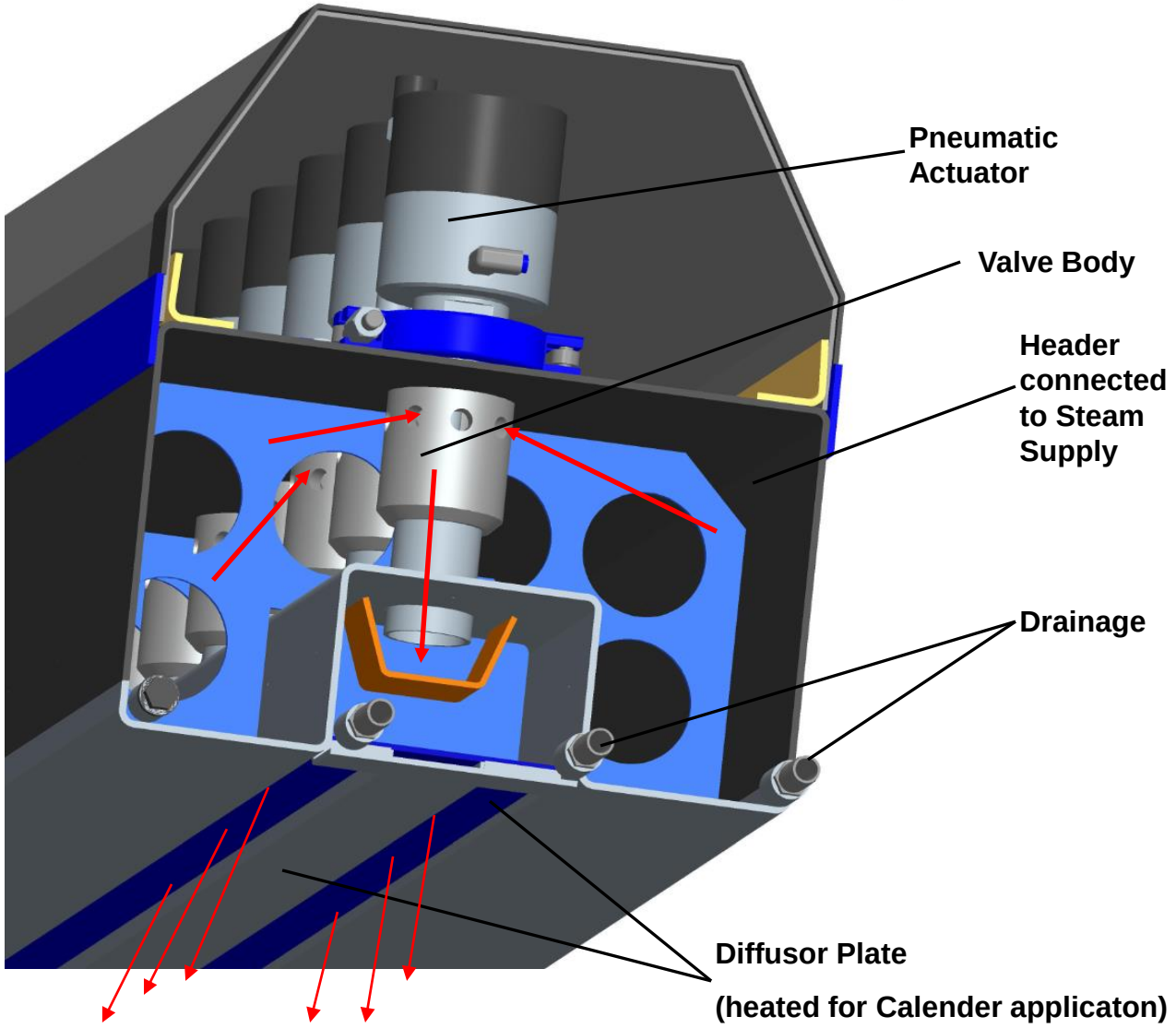


Benefit and Results Dry End

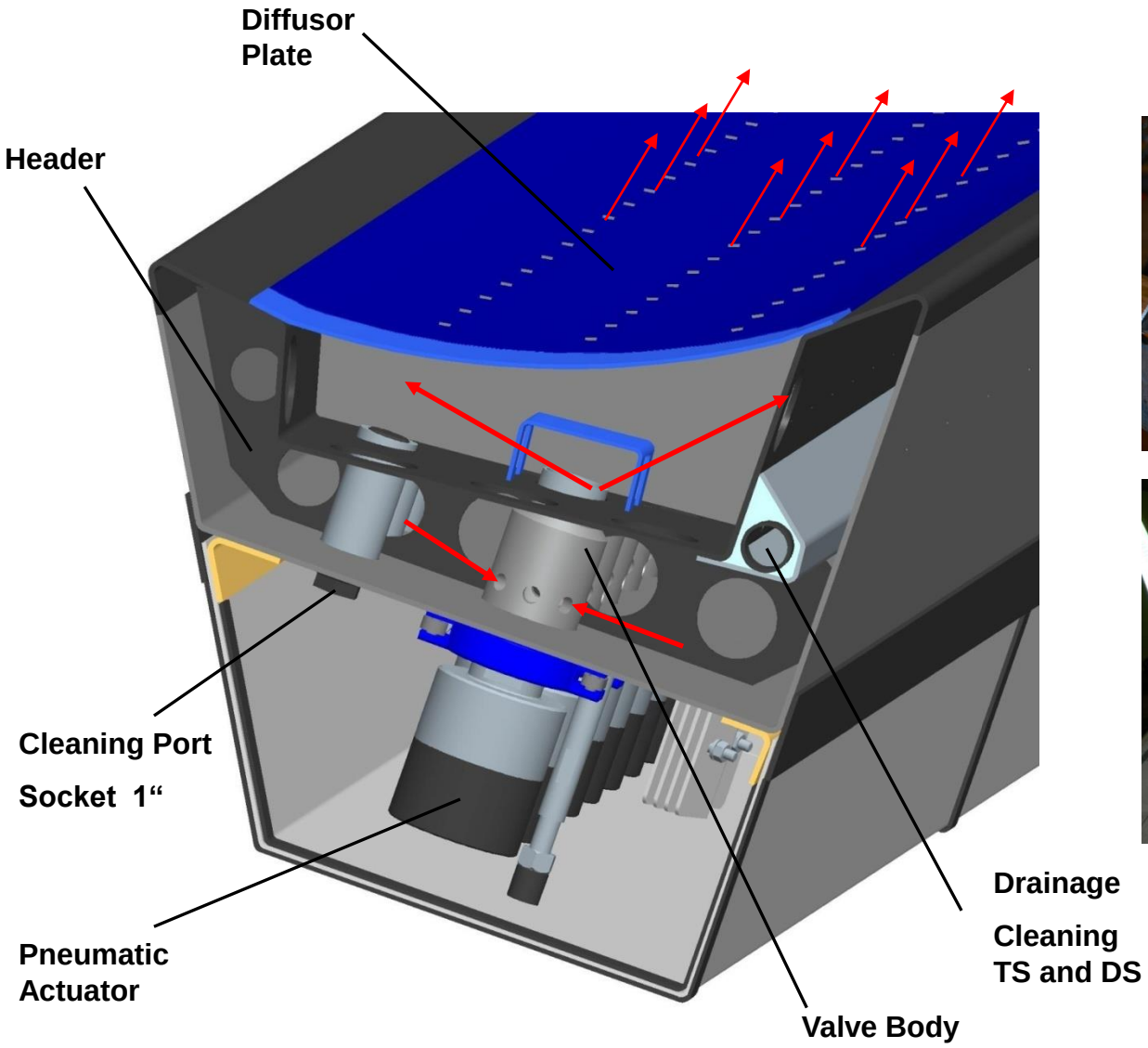
- Smoothness improvement of up to 15-20 %
- Gloss improvement of up to 10-15 % on newsprint
- Reduction of two sideness
- Increase of printability
- CD Control 2-sigma (Gloss/Smoothness) improvement of up to 50 %
- Reduction of Calender nip loads
- Re-moisturizing of the paper per Position by 2-3 %
- Curl Control
- Surface improvement for coating and converting processes
- Smoothness, Gloss, Moisture and Curl Control by zones in CD direction

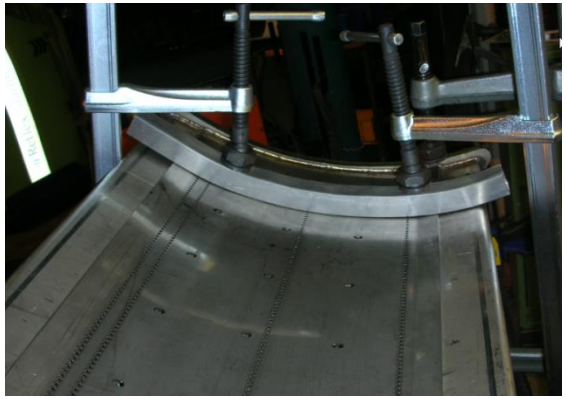
Cross Section AccuSteam

WOOLLARD & HENRY

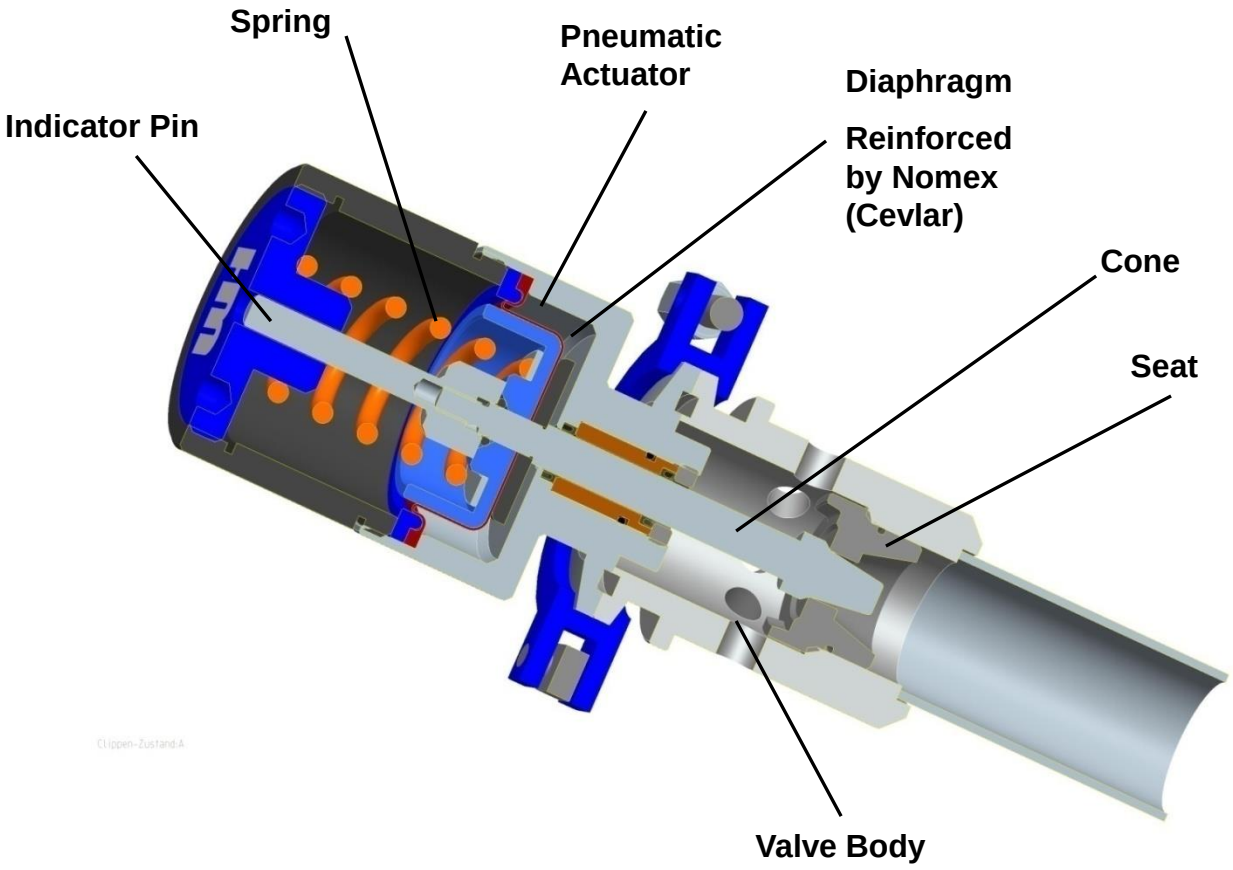


Cross Section AccuSteam Press





Zone Control Valve

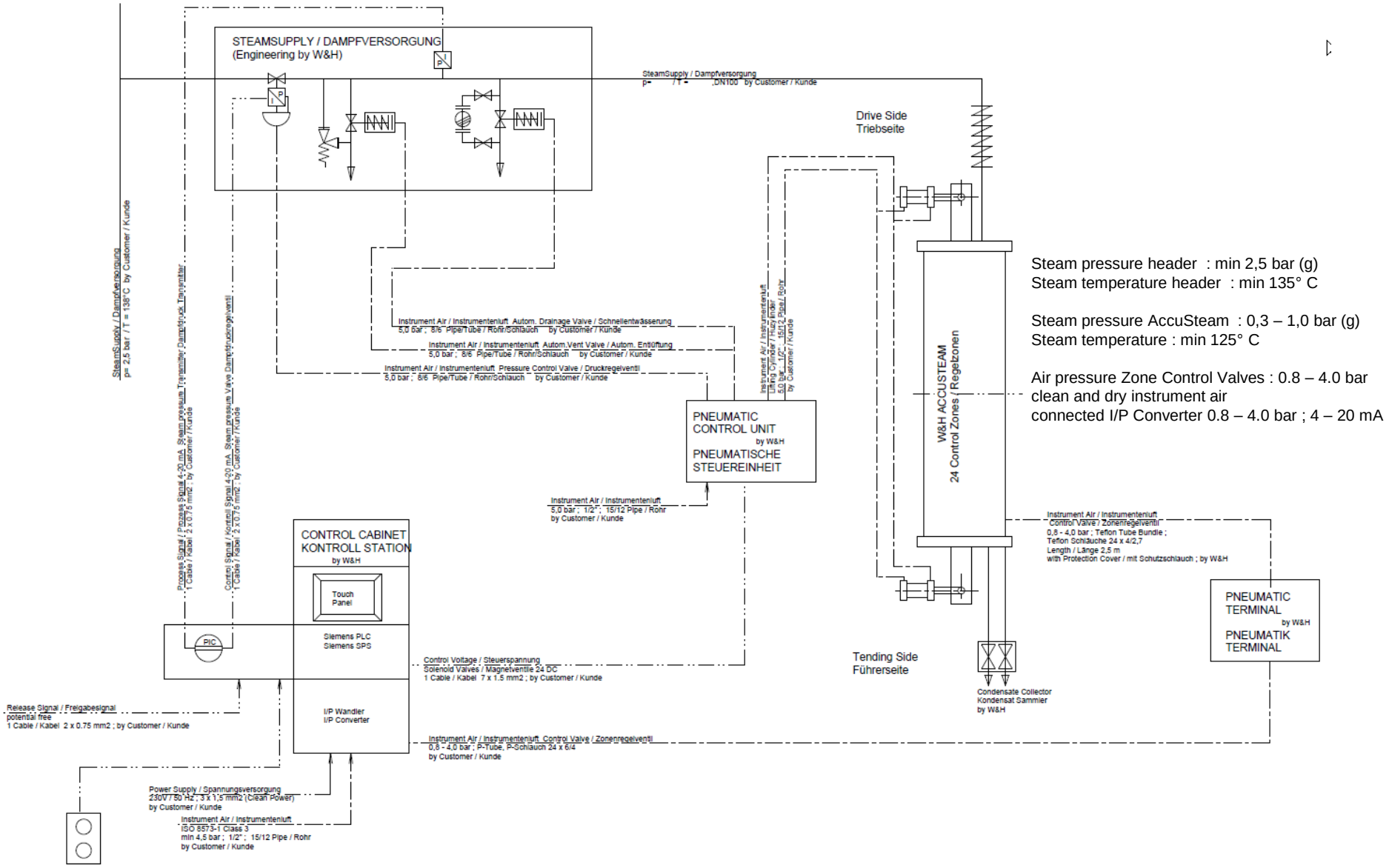


Material for all parts

Stainless Steel 316L /1.4404

Air pressure Zone Control Valve: 0.8 – 4.0 bar
clean and dry instrument air
connected I/P Converter 0.8 – 4.0 bar; 4 – 20 mA

System Layout



Steam pressure header : min 2,5 bar (g)
Steam temperature header : min 135° C

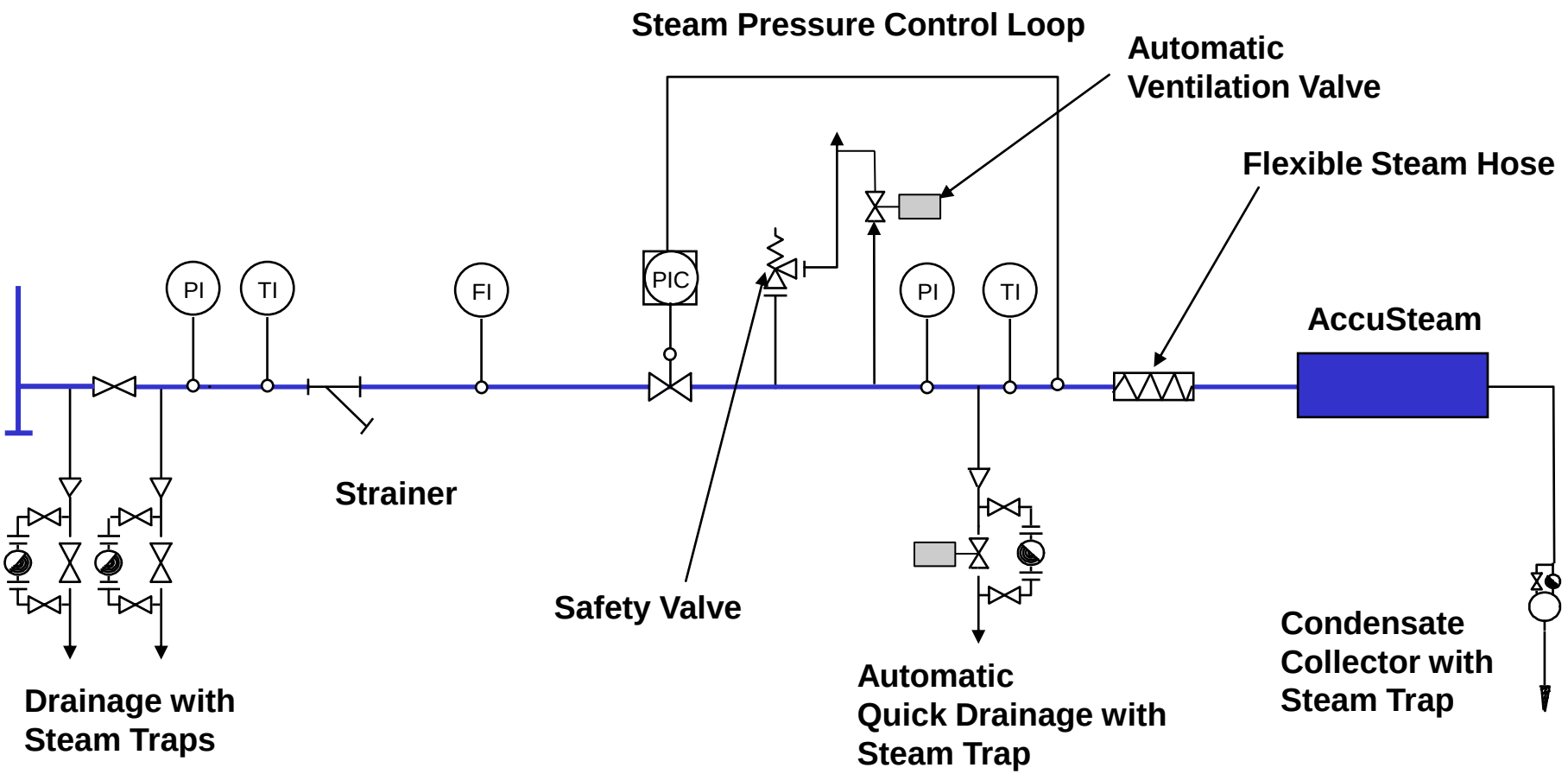
Steam pressure AccuSteam : 0,3 – 1,0 bar (g)
Steam temperature : min 125° C

Air pressure Zone Control Valves : 0.8 – 4.0 bar
clean and dry instrument air
connected I/P Converter 0.8 – 4.0 bar ; 4 – 20 mA

Typical Steam Supply

Steam pressure header: min 2,5 bar (g)
Steam temperature header: min 135° C

Steam pressure AccuSteam: 0,3 – 1,0 bar (g)
Steam temperature: min 125° C



Control Options

- NON PROFILING
  Uniform steam application in cross machine direction;
  The design allows to the system to be upgraded with pneumatic Actuators

- MANUAL LOADING
  Manual operation of the pneumatic control valves by pneumatic pressure regulators;
  CD Profile can be adjusted

- ELECTRONIC CONTROL and PROFILING

  Operation of the pneumatic control valves by I/P converters;
  Complete system controlled by Siemens Hard- and Software;
  The setpoints of a CD Profile can be transmitted from the QCS to the I/P converters

Advantages W&H Control Cabinet

- Standard industry components (Siemens)

  → Quick and easy maintenance, can be done by papermill/customer
  Spare parts available all over the world

- No special parts, no “black boxes“

  → Simple spare part handling, customer/papermill can order the parts directly from the suppliers, such as Siemens
  Competitors have their own hardware parts

- Software based on WinCC Runtime and WINAC Soft SPS

  → Quick and easy software maintenance, easy to operate
  Can be carried out by papermill/customer
  Competitors have their own software and editor programs

- No multiplexer solution, competitors uses 1 x I/P Converter for up to

  → 8 x pneumatic zone control valves → <u>If 1 x I/P Converter fails 8 x zones are out of control</u>

- W&H uses 1 x I/P Converter for 1 x pneumatic zone control valve.

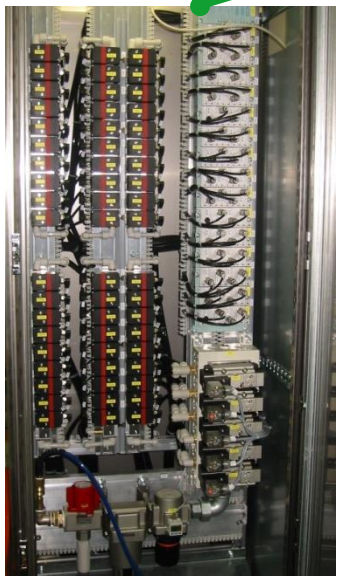
  → If 1 x I/P Converter fails only 1 x zone is effected

- W&H Control Cabinet has an open interface and can be connected to every QCS and DCS

W&H Cabinet

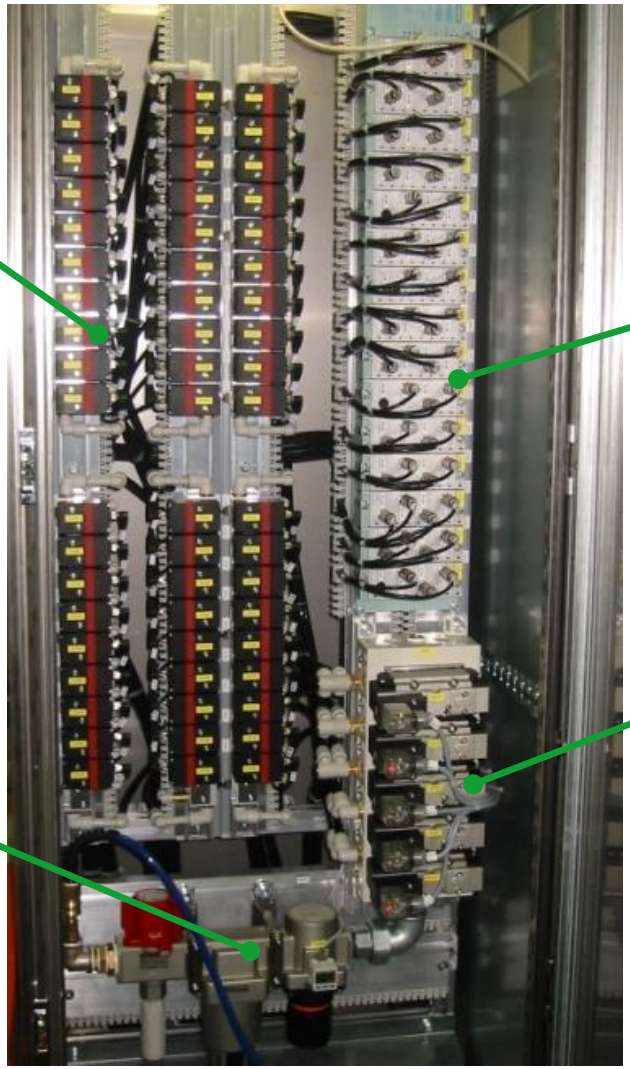
Standard Rittal
Cabinet

Left Side
Pneumatic Section



Right Side
Electronic Section

W&H Cabinet Pneumatic Part



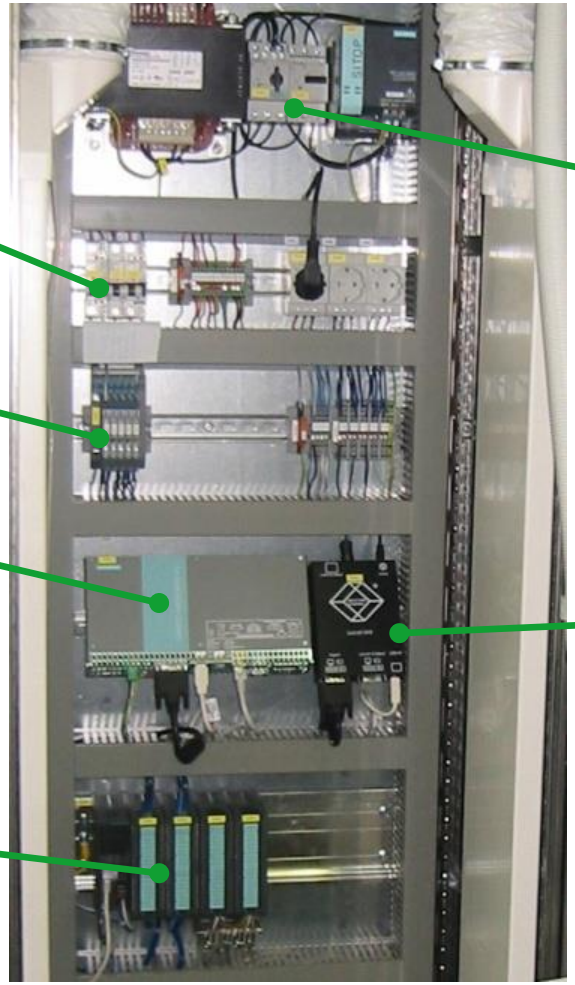
I/P Converter
0,8 – 4.0 bar
4 - 20 mA
mounted on
quick connection
plates

Siemens
Analog Output
Modules

Supply
Instrument Air

Solenoid
Valves for
pneumatic
Retraction
Units

W&H Cabinet Electronic Part



Fuses

Electronic Fuses

Siemens Embedded Industrial PC; no turning parts, no fan, memory card technology

Siemens I/O`s

Universal Power Supply
110 - 500 V Input
220 and 24 V Output

KVM Extender

W&H Software

Overview : Operating System Components