ProMinent®

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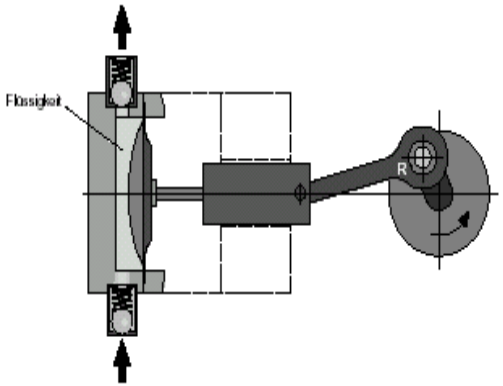
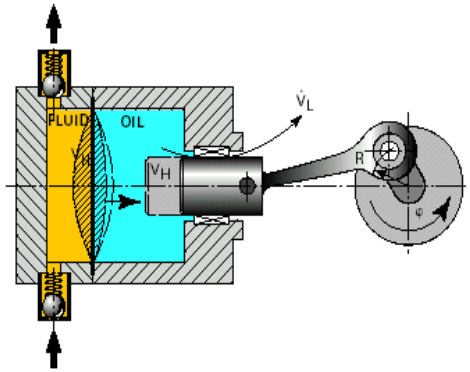
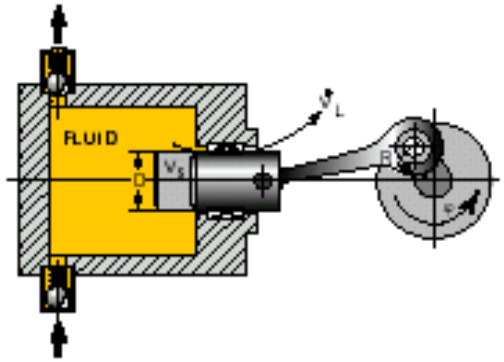
Evolution mikro – Metering micro quantities in high-pressure applications by means of innovative drive technology

Basics







Definition of a metering pump

As per the definition:
Metering pumps (oscillating displacement pumps) provide all 3 functions of a metering process

- **Transfer**
  limits volumetrically, increasing pressure level

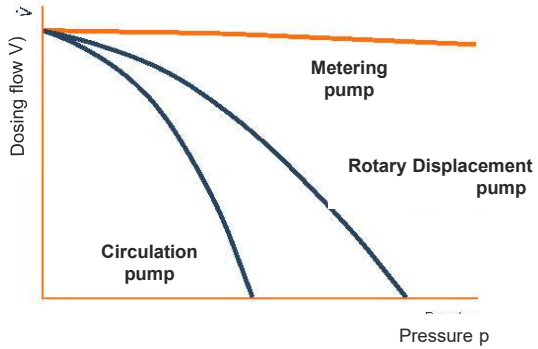
- **Measure**
  reproducibly, pre-set stroke volume

- **Control**
  adjusts the stroke volume from 0 to 100 %

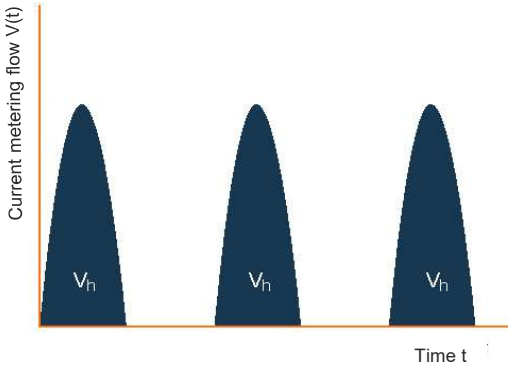
  (adjusts the stroke rate from 0 to 100%)

Characteristics of oscillating displacement pumps

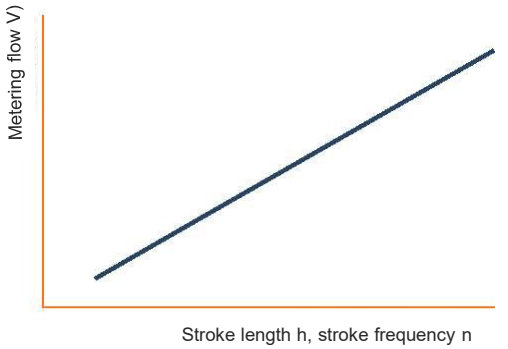
- Characteristic diagram rigid in compression



- Digital transfer mode (oscillating flow)

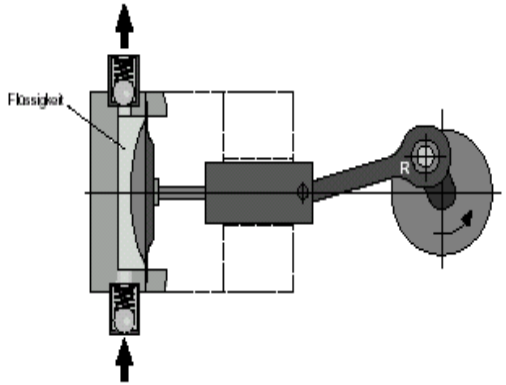


- Linear flow characteristic

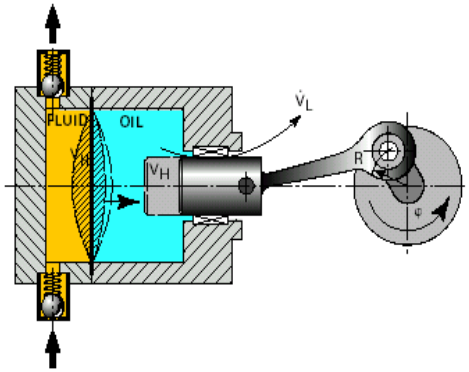


Classic structure of drive unit and liquid end

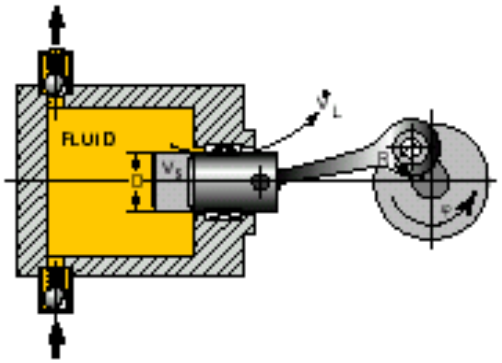
Liquid ends – oscillating displacer



Mechanical liquid end

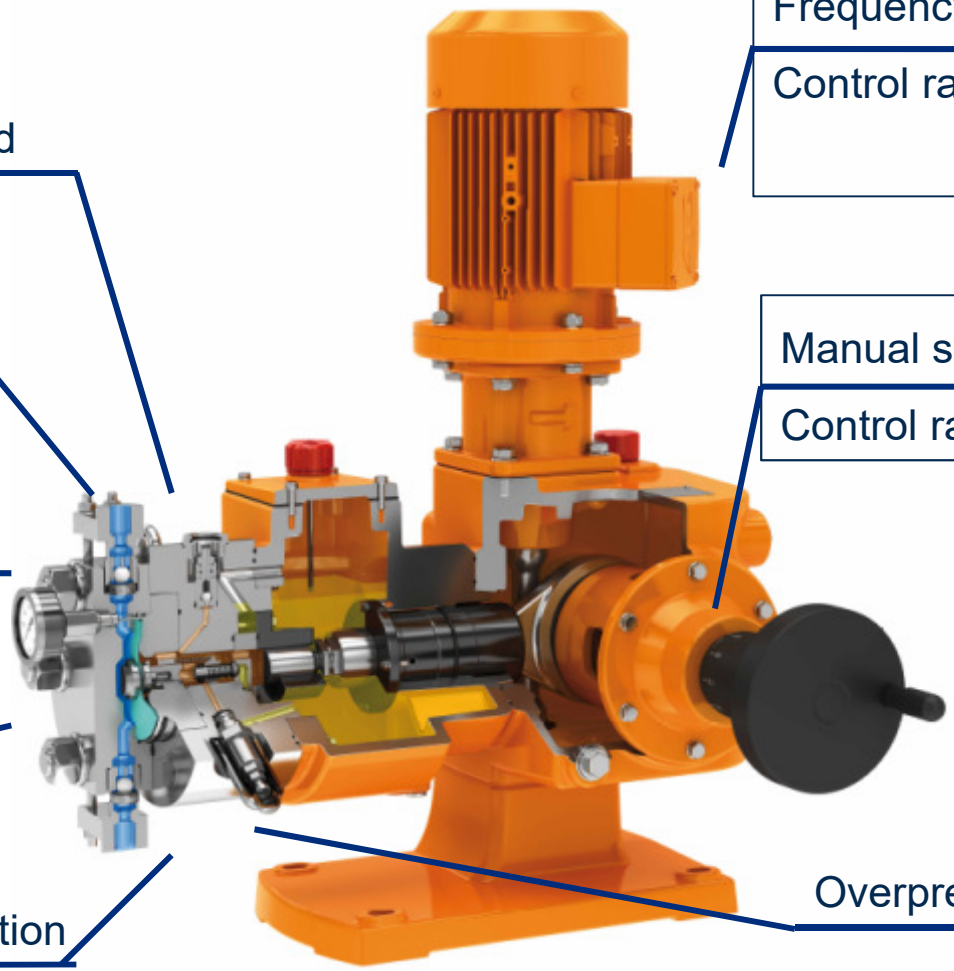


Hydraulic liquid end



Piston-type liquid end

Orlita® Evolution series – Function



Frequency converter - Control

Control range R 1:3

R 1:5

Automatic bleed valve

Diaphragm position control

Manual stroke length adjustment

Control range R 1:10

Diaphragm rupture warning system

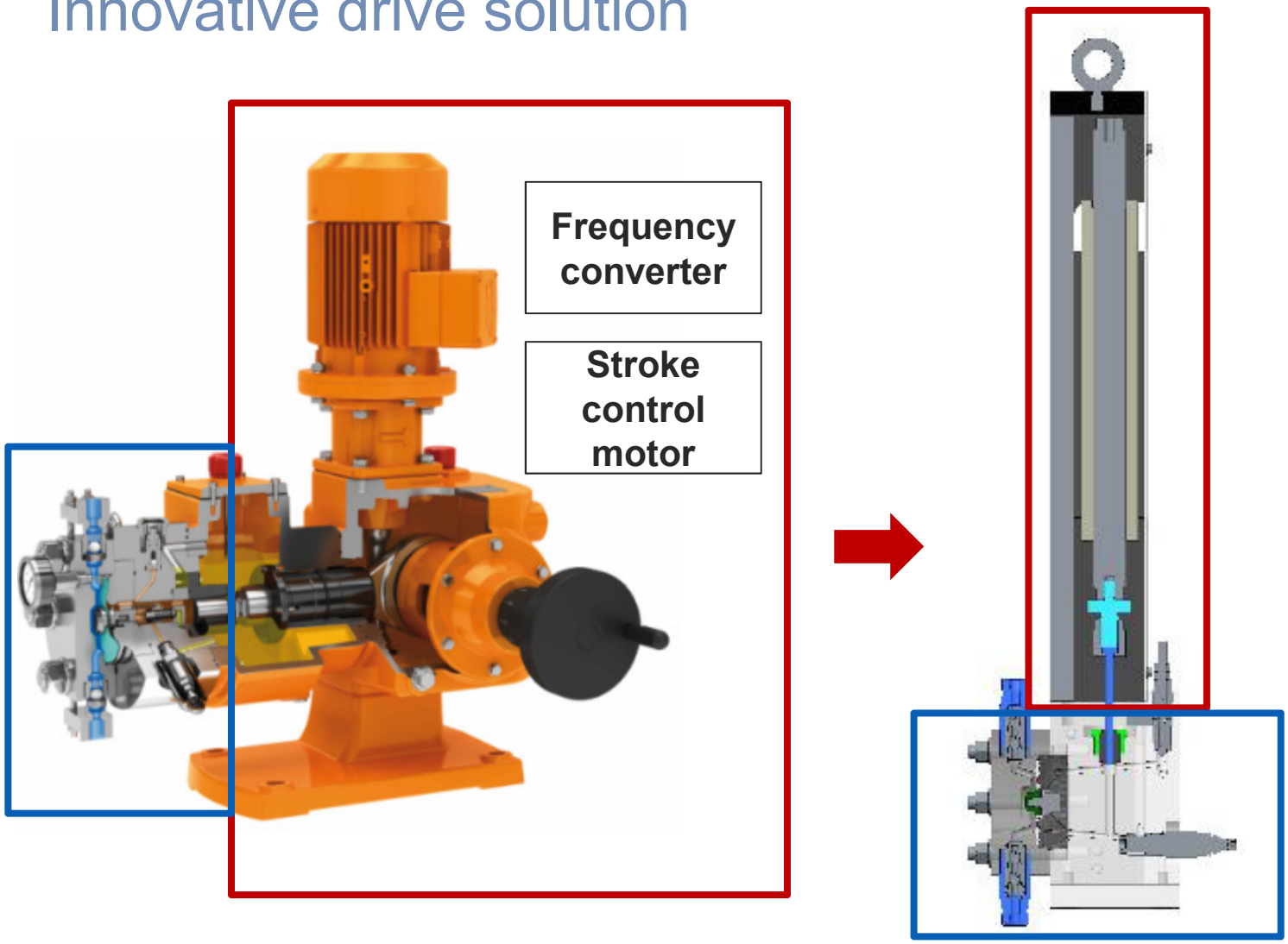
Multi-layer diaphragm

Overpressure protection

Leakage compensation

see also Evolution Films Module 1 – 4

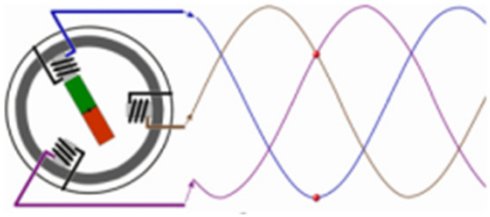
Innovative drive solution



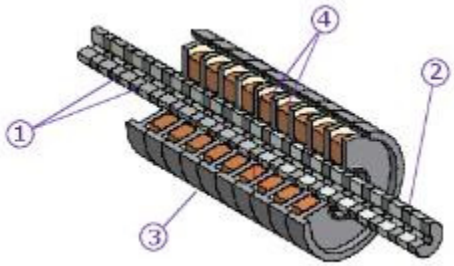
Innovative structure of drive unit and liquid end

Characteristics of a linear motor

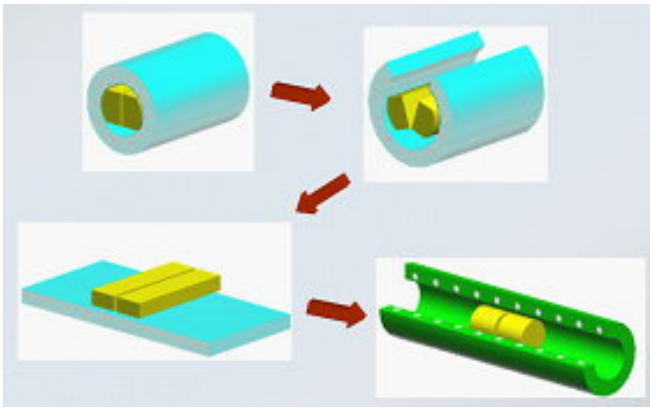
Rotating synchronous motor:
- Solenoid. **Rotating field** generated by shifted coils
- Rotor with permanent coil follows the rotating field



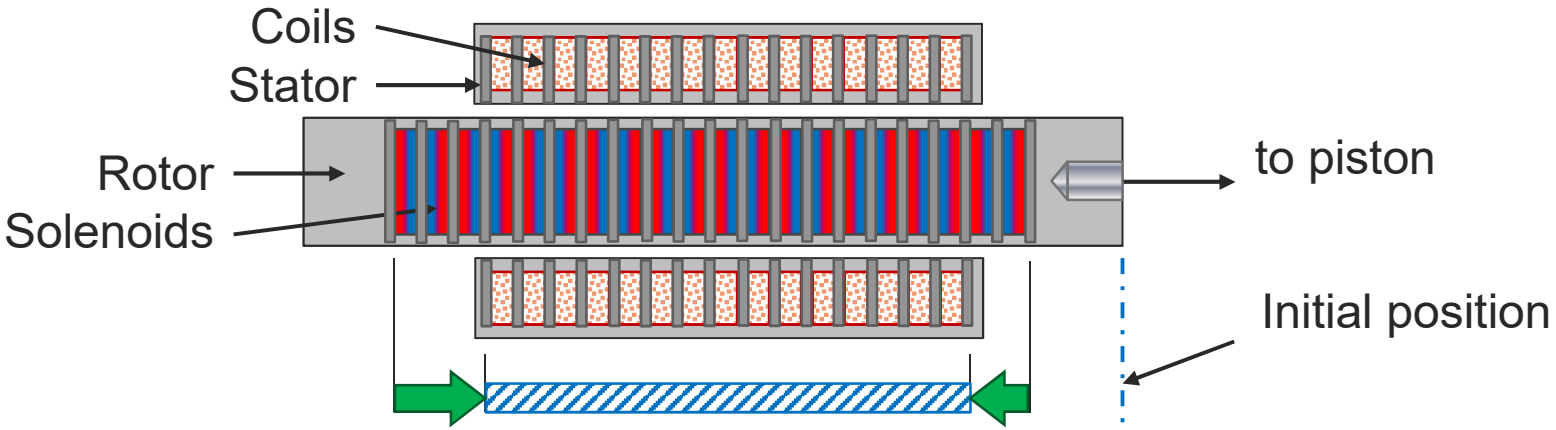
Linear synchronous motor:
- Solenoid. **Travelling field** generated by shifted coils
- Rotor with permanent coil follows the rotating field



Transition to linear motor
´ by uncoiling:



Characteristics of a linear motor – force / path



- Stator length = number of coil-solenoid pairs → force
- Additional length of solenoid package →

  possible traversing range for constant force
- Exceeding this range means linear decrease of force

Characteristics of a linear motor – Advantages

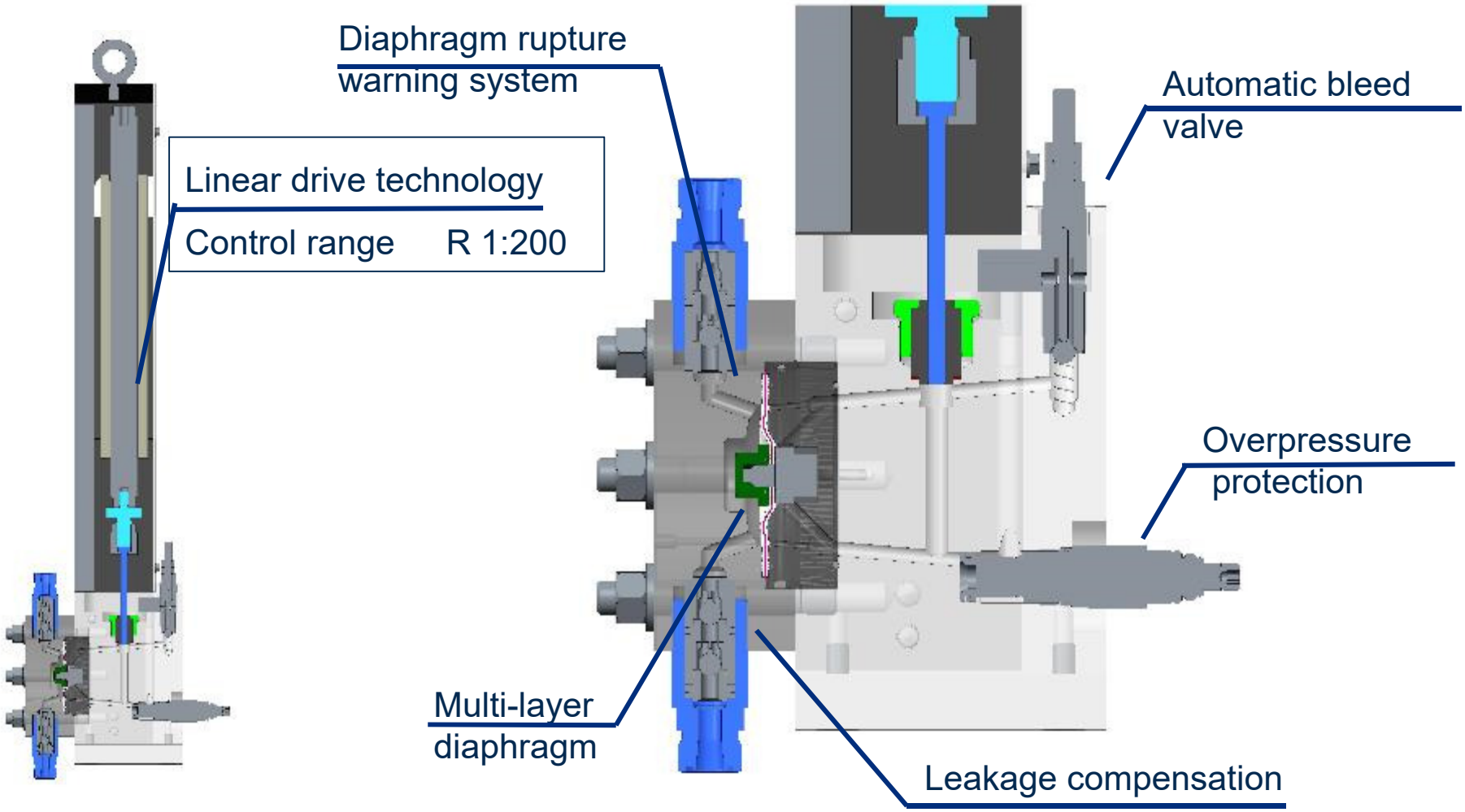
Advantages of a linear motor?

- No deflection necessary → gearless construction, which means:
  - Space and cost saving from a mechanical point of view
  - Less wear and tear due to fewer components
  - Direct measurement of force without friction
- Very high dynamics: special functions may activelycompensate for hydraulic/valves indequacies
- „Step motor characteristic“ with integrated path detection:
  - Works well with profile control / electronic stroke length adjustment
- Difference to stroke solenoid:
  - Force is independent of location and proportional to current
  - Force works in both directions

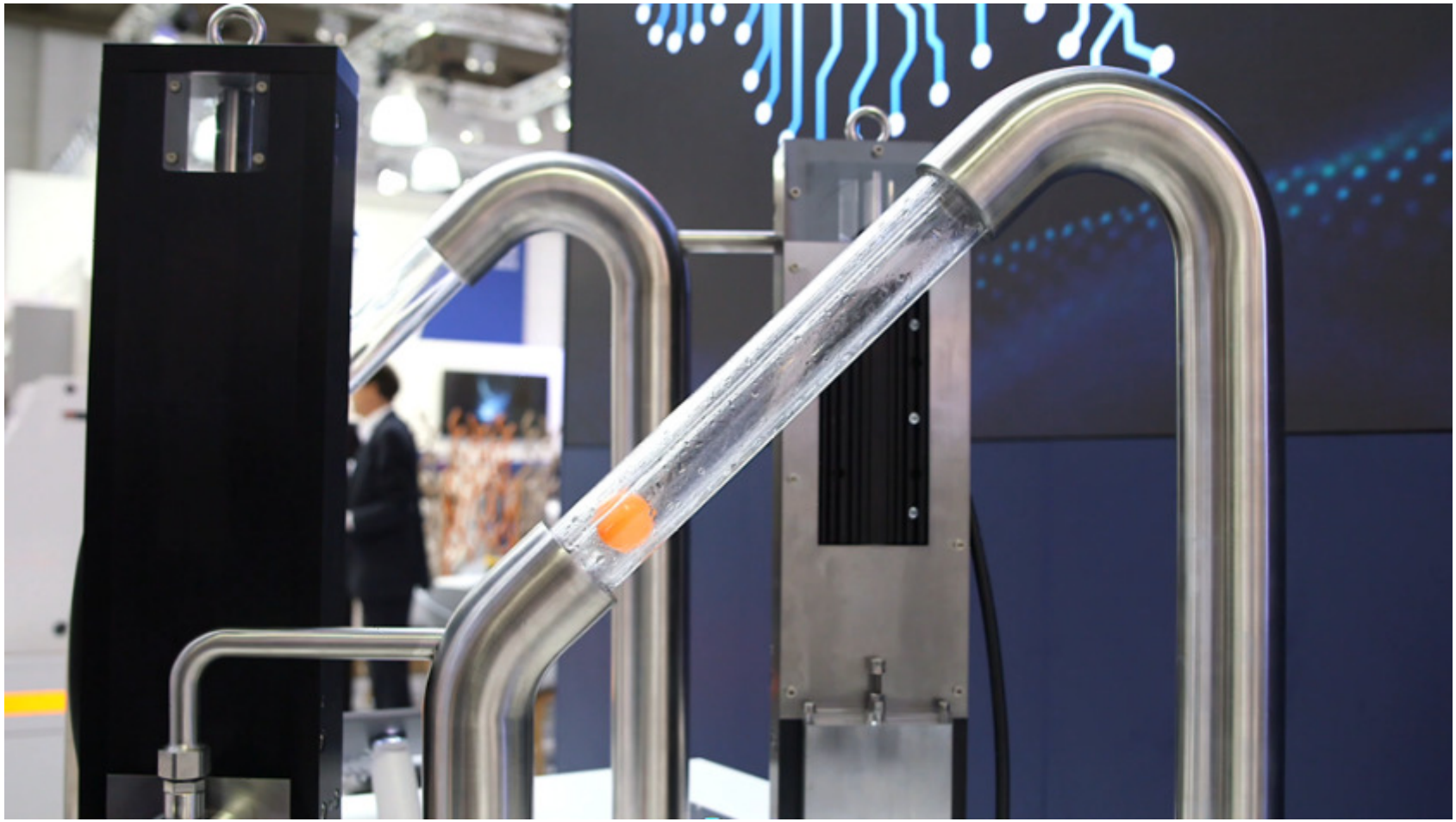
Linear motor-driven metering pumps
Evolution mikro

Vertical and horizontal versions possible

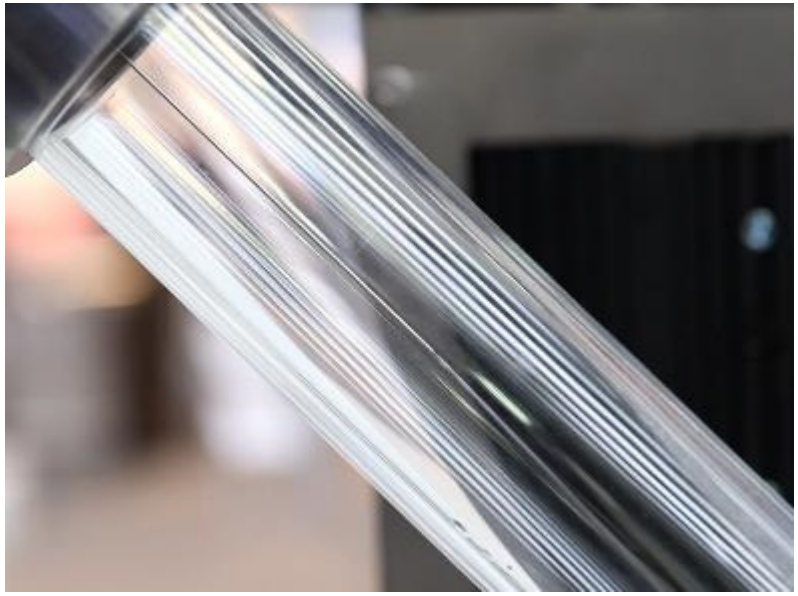
Function of the linear motor-driven metering pump Evolution mikro

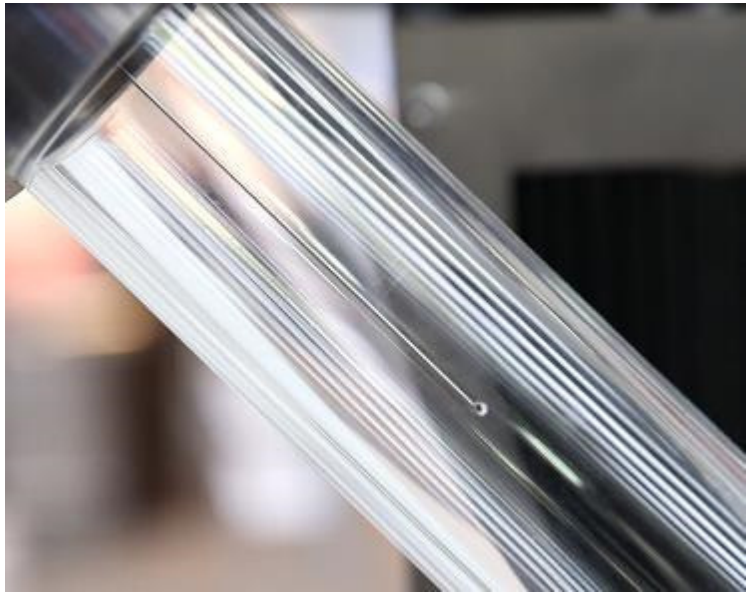


Presentation at ACHEMA 2018 – high dynamics



Presentation at ACHEMA 2018 - dripping





Orlita Evolution mikro – linear motor technology

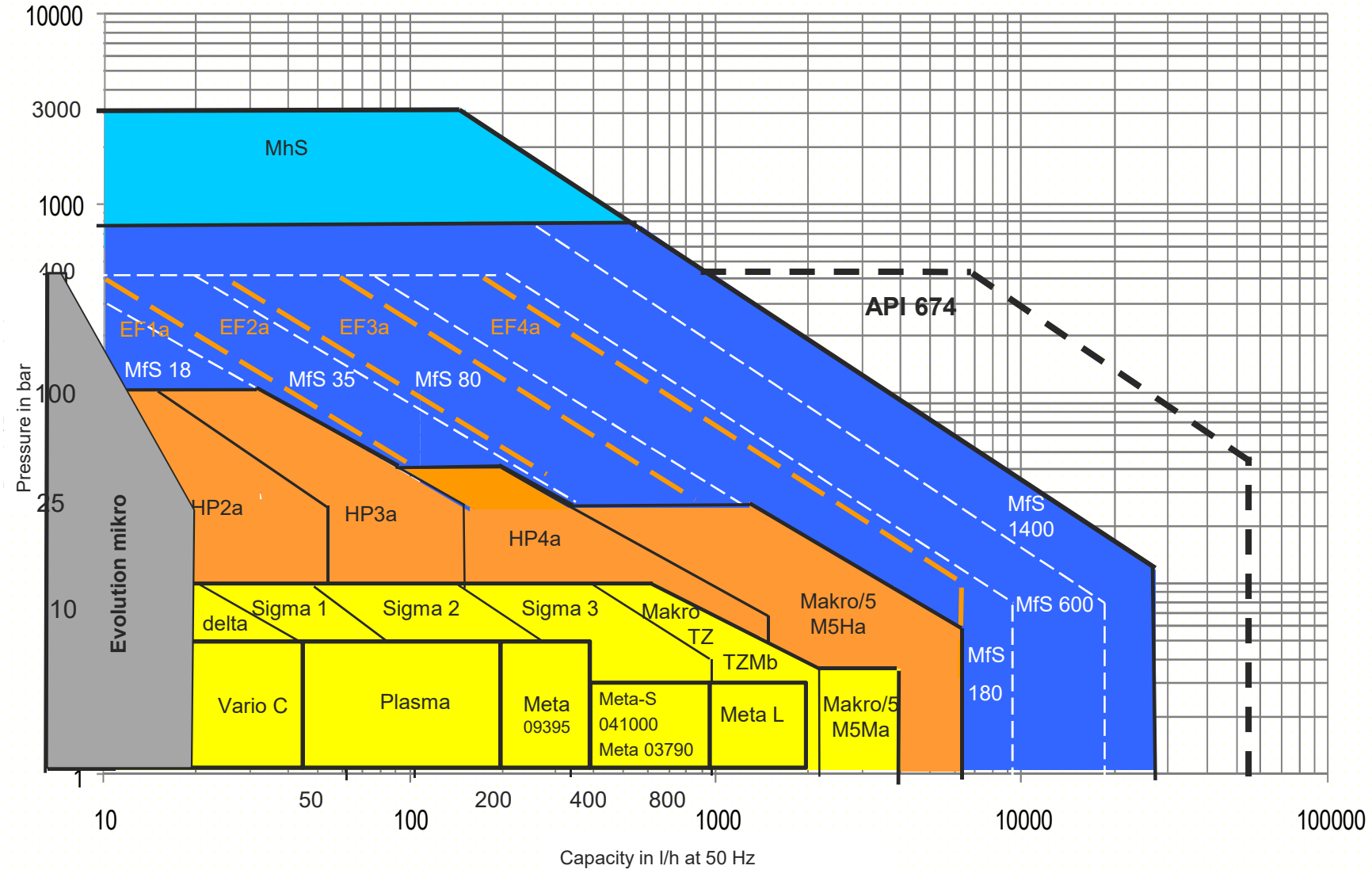
Product details:

- Orlita Evolution mikro 3.3 l/h @ 400 bar
  19.5 l/h @ 100 bar

Product benefits:

- Micro metering at high pressure
- High control range: 1 : 200
- Automatic 2 parameter control
- Full motion
- Good accuracy due to direct control of stroke movement
- Wear-free drive unit, therefore no annual service necessary
- API 675 / ATEX

ProMinent – Product Overview



Orlita Evolution mikro – Technical data

Type EFMa EHMa	Capacity at 200 strokes / min.				Capacity at 260 strokes / min.				Standard valve size
	bar	l/h	ml / stroke (theor.)	strokes / min.	bar	l/h	ml / stroke (theor.)	strokes / min.	DN
02518	25	18.0	1.50	0 – 200	25	23.4	1.50	0 – 260	DN 6
06416	64	16.0	1.33	0 – 200	64	20.8	1.33	0 – 260	DN 6
10015	100	15.0	1.25	0 – 200	100	19.5	1.25	0 – 260	DN 6
16004	160	4.0	0.33	0 – 200	160	5.2	0.33	0 – 260	DN 3
32003	320	3.2	0.26	0 – 200	320	4.2	0.26	0 – 260	DN 3
40002	400	2.5	0.20	0 – 200	400	3.3	0.20	0 – 260	DN 3

Two types available:

EFMa – **E**volution **F**lexible **m**ikro Version a – with PTFE diaphragm

EHMa – **E**volution **H**ard **m**ikro Version a – with metal diaphragm

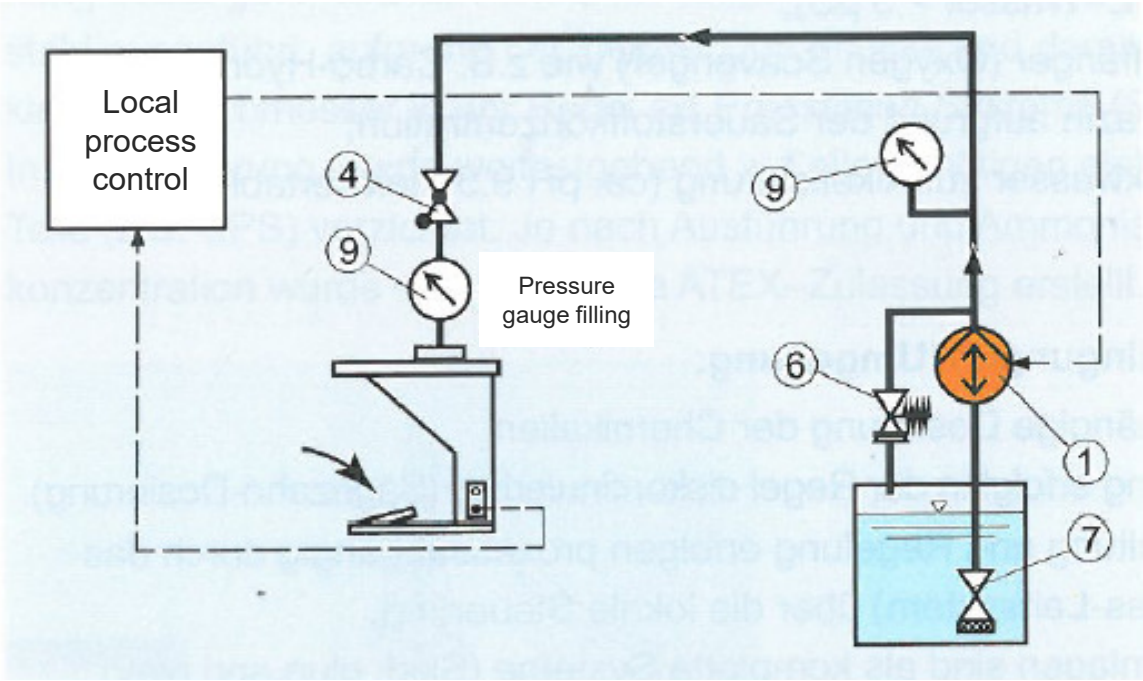
Applications of the linear motor-driven metering pump Evolution mikro

General applications for linear motor-driven metering pumps

Metering of additives in the oil, gas, chemical and pharmaceutical sector

- Pressure range of 25 – 400 bar
- Capacity 0.01 – 23 l/h
- Control range: 1: 200

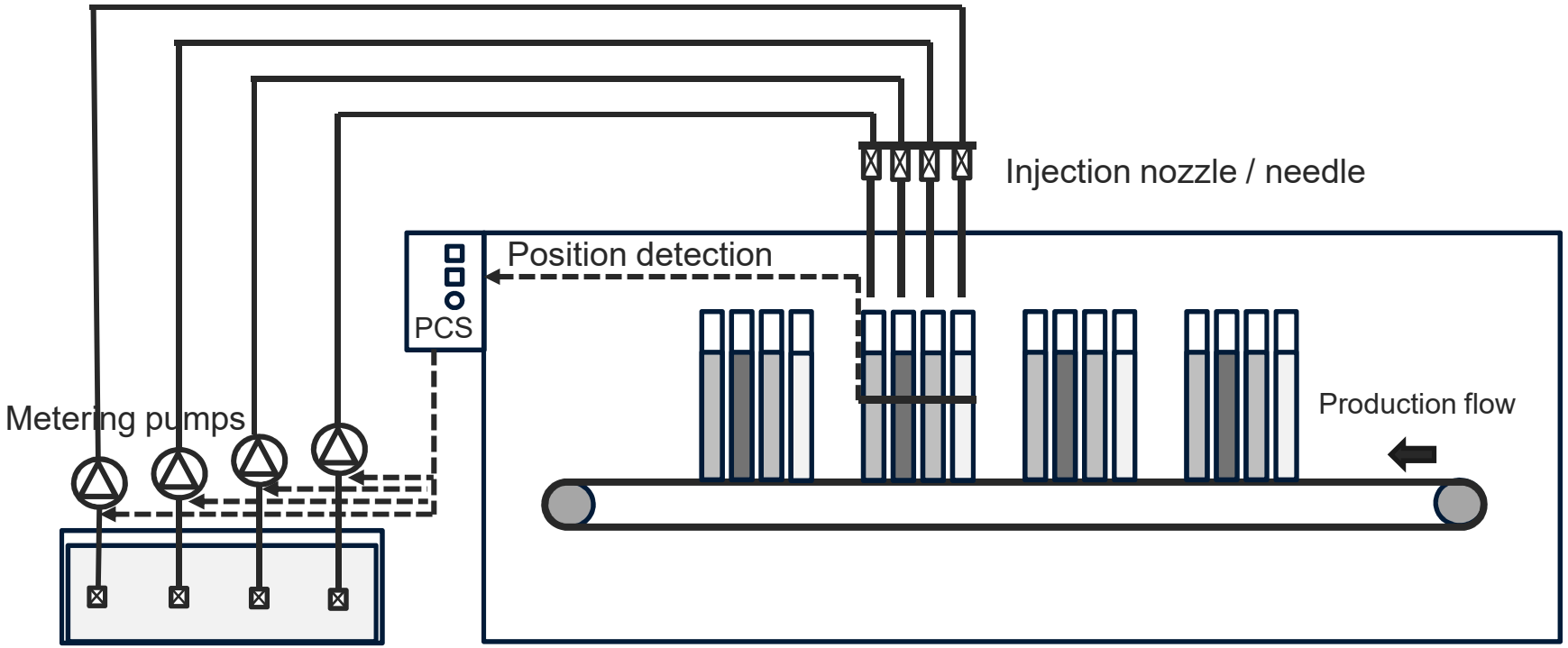
Application – Filling process



Important for filling processes

Individual adjustment of the speed curve / metering profile depending on the application parameters

Application – Filling process



Application – gas odorisation

Innovative drive system - Interview

Follow the whole interview on youtube:
German: https://www.youtube.com/watch?v=Mz3L0bkOCq0
English: https://youtu.be/dN136UCMIRM

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