

VELO upgrade: Design updates

Jan Buytaert¹, **Oscar Augusto**², Raphael Dumps¹,
Wiktor byczynski¹ and Wolfgang Funk¹

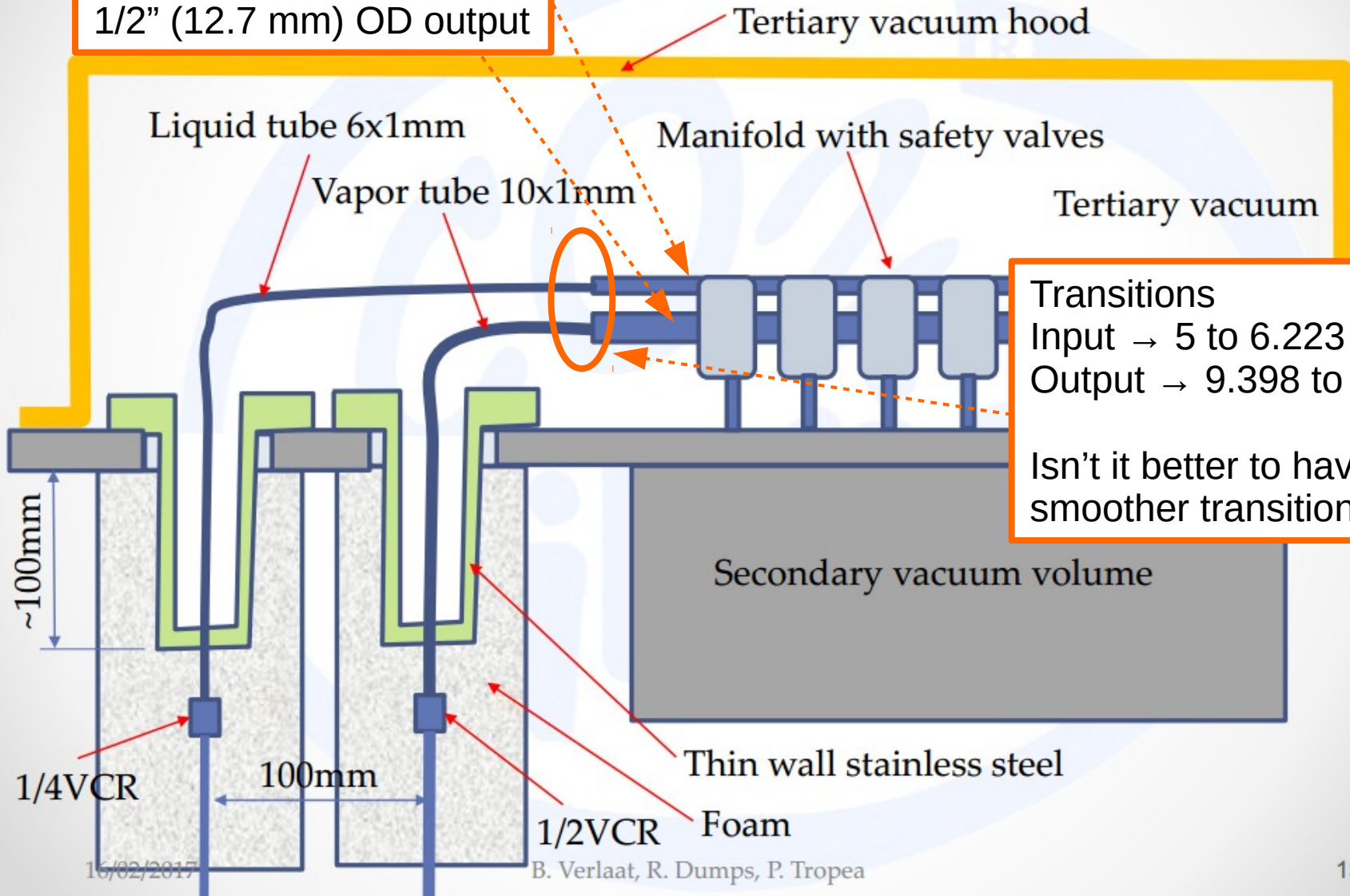
¹CERN, ²CERN attached to Liverpool

23/03/17



Tertiary vacuum feedthrough concept

3/8" (9.5 mm) OD input
1/2" (12.7 mm) OD output



Transitions
 Input → 5 to 6.223 mm ID
 Output → 9.398 to 8 mm ID

Isn't it better to have a smoother transition?

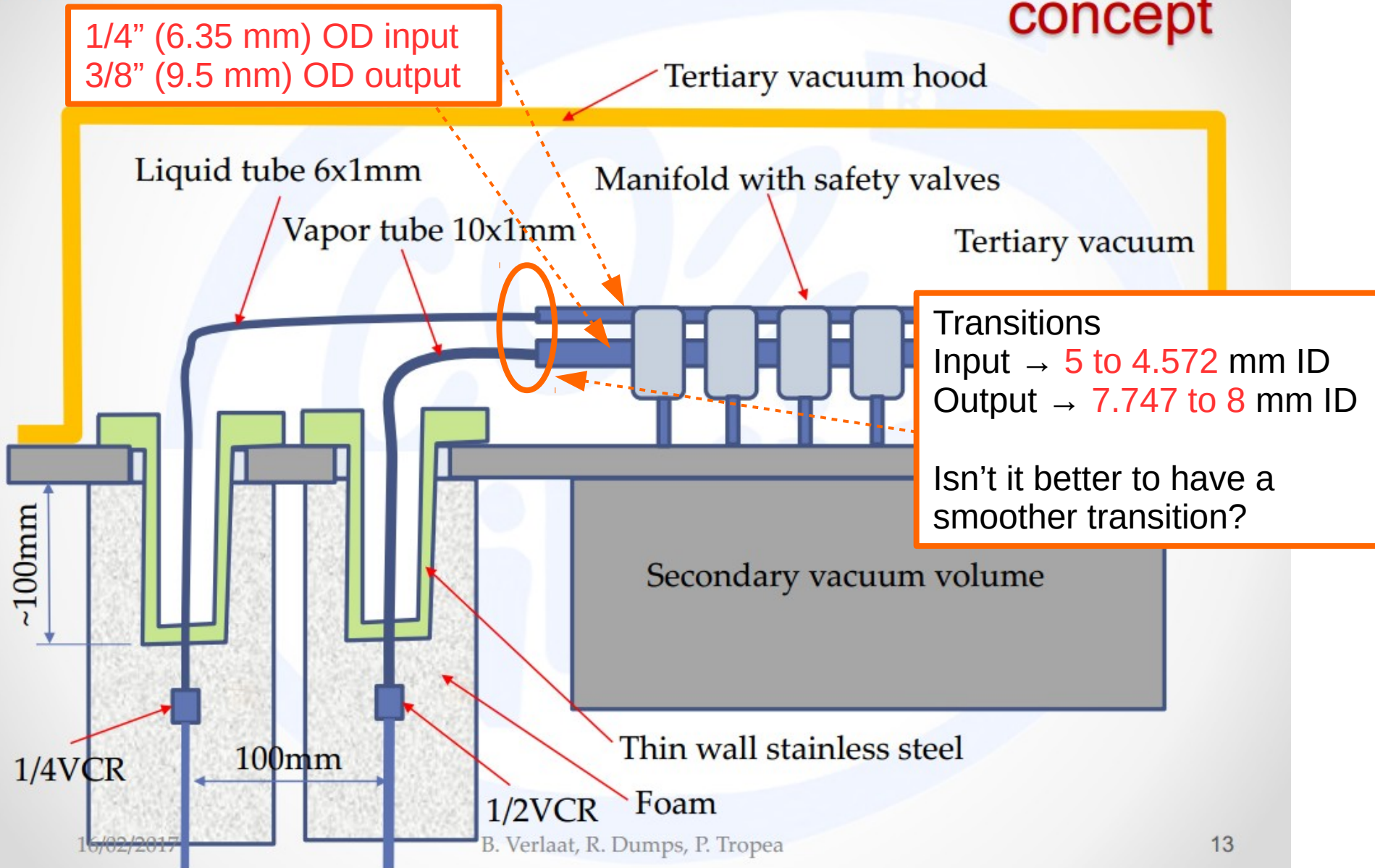
16/02/2017

B. Verlaat, R. Dumps, P. Tropea

13

New proposal

Tertiary vacuum feedthrough concept



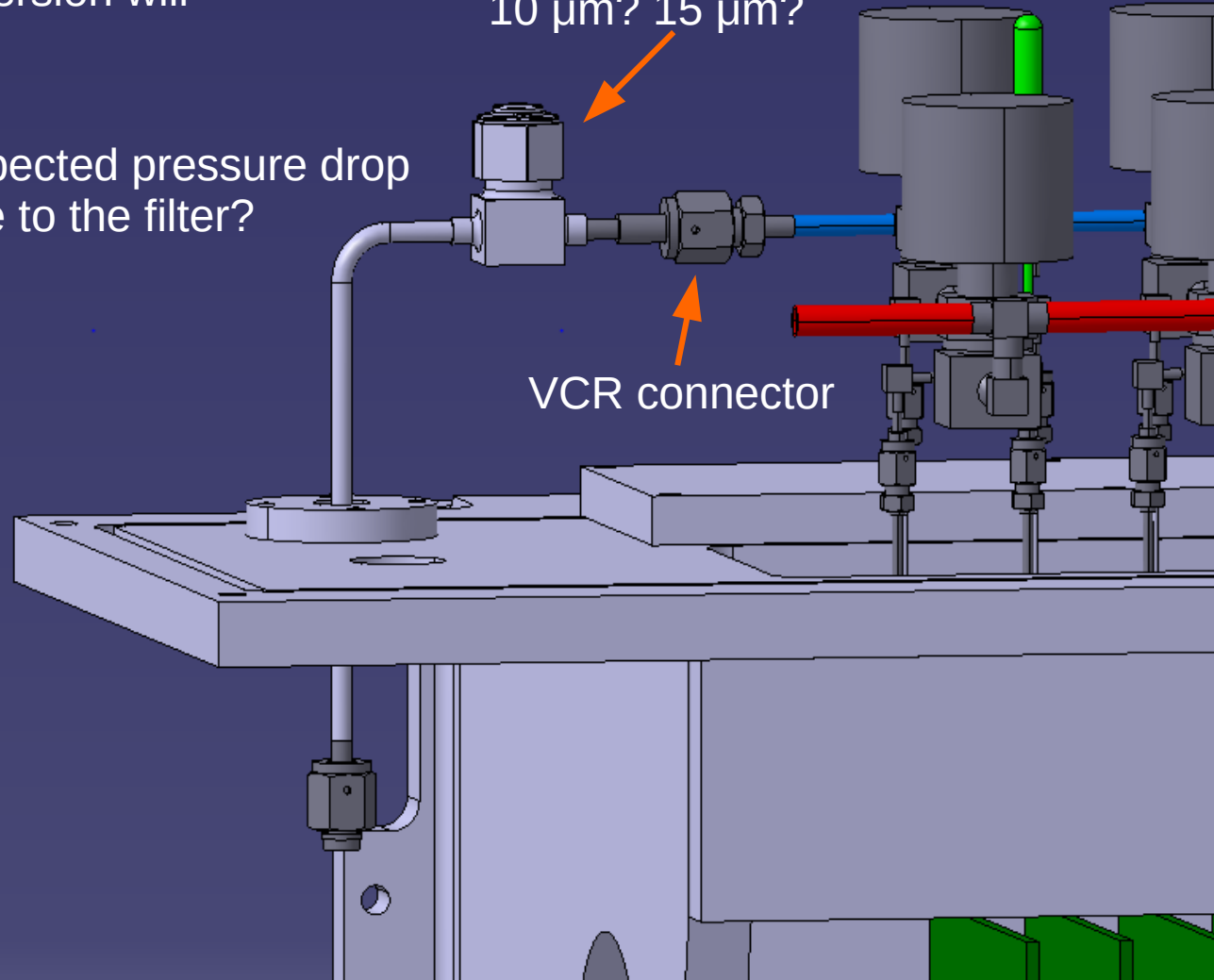
Design

Raphael is currently updating the design. A new version will be available soon!!!

Expected pressure drop due to the filter?

Filter: 5 μm ?
10 μm ? 15 μm ?

VCR connector



VCR gaskets

- Which one to use?
 - Silver plated leak rate:
 - 10^{-9} std cm³/s
 - Unplated leak rate:
 - 10^{-11} std cm³/s
- The unplated one might be a problem on the long term
- Shall we use the silver plated then?



Signs of interaction of CO₂ with the gasket

BACKUP SLIDES

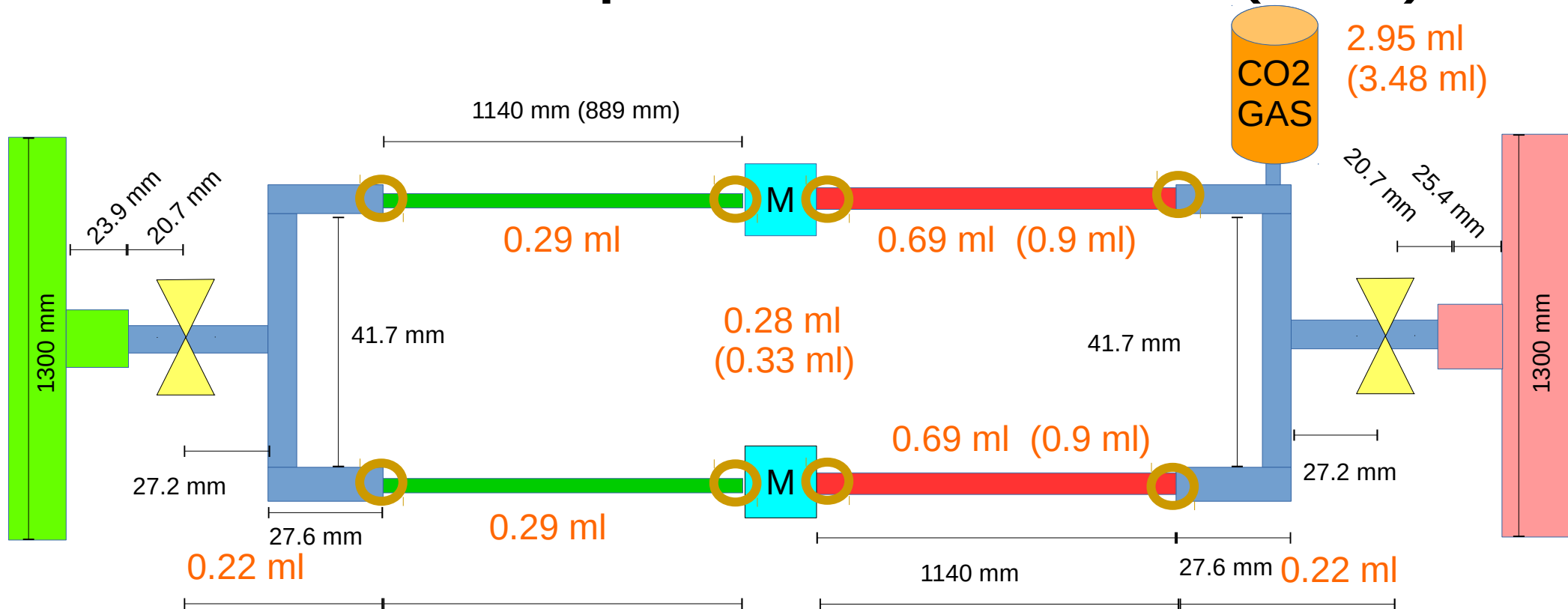
Swagelok references for the new input and output lines

- SS-T4-S-035-6ME
 - 1/4" OD (6.35 mm)
 - 0.035" Wall (0,889 mm)
 - 0.18" ID (4.572 mm)
- SS-T6-S-035-6ME
 - 3/8" OD (9.525 mm)
 - 0.035" Wall (0,889 mm)
 - 0.305" ID (7.747 mm)

Swagelok references for filter

- SS-4TF-TW- ... for 5, 10 or 15 μm

Previous Pipes dimensions (min)



Split Input Output Split

- 1/8" (ID 1.397 mm)
- 1/16" (ID 0.5715 mm)
- 1/16" (ID 0.8763 mm or ID 1 mm)
- 3/8" (ID 6.223 mm)
- VCR connector 1/8" (~5mm)
- 1/2" (ID 9.398 mm)
- Same volume between the valves
- M 2x320 mm 1/16" to the connector in the module (Microchannels – Input + output)