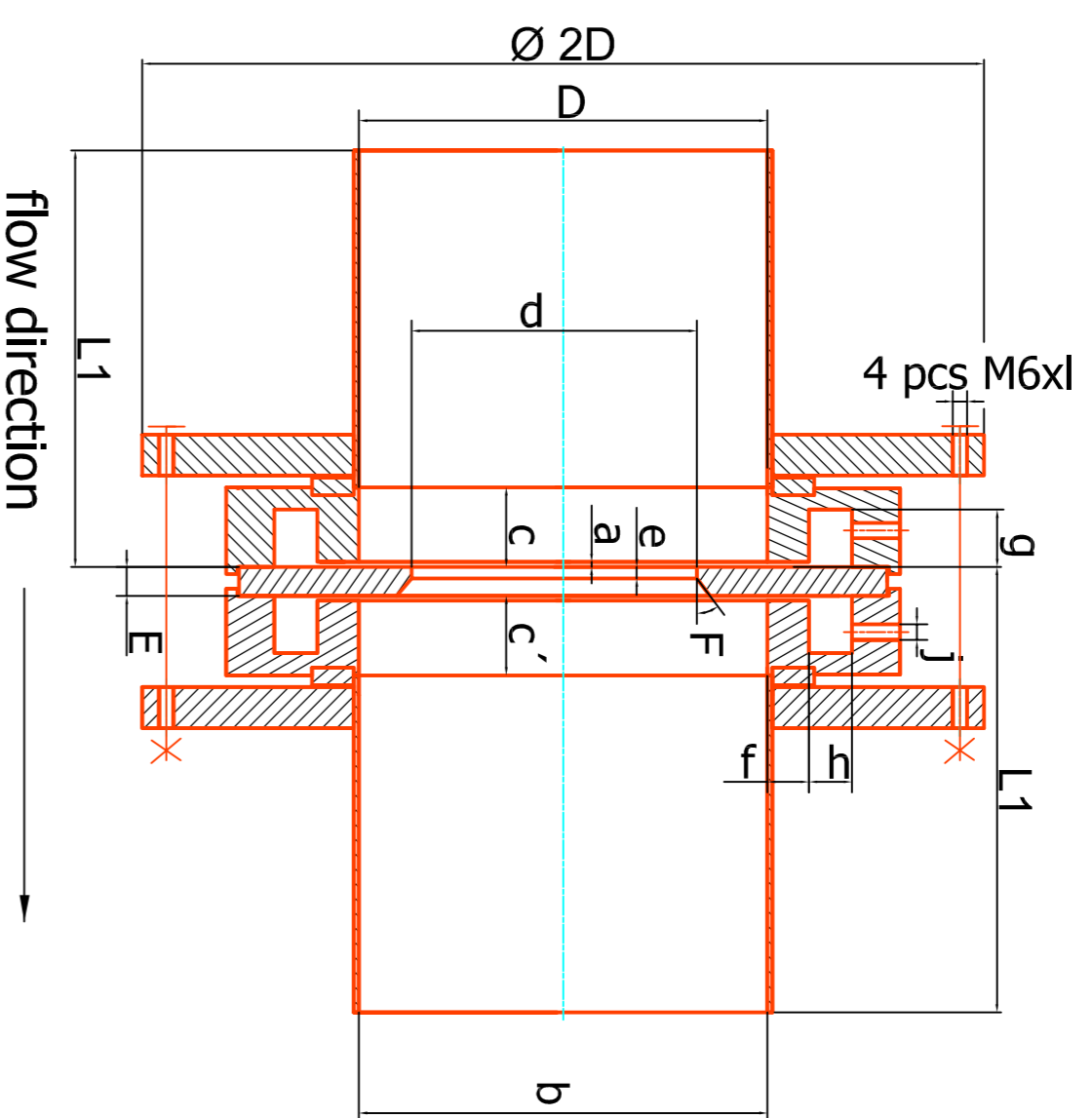


Bleed Air - mass flow measurement

- orifices - OPTION 1



P2.5

- absolute pressure upstream the orifice p2.5_abs=74.5psia
Kulite APTE-6-1000, abs, 0-5V output, range 80psia
- differential pressure drop at the orifice dp2.5_diff=3.6psid at 10lb/min, 480F
Kulite APT_APTE-51HL,diff, 0-5V output, range 5psid
- 148010-01A TIL rows 83-84
- max. flowrate 15lb/min

+

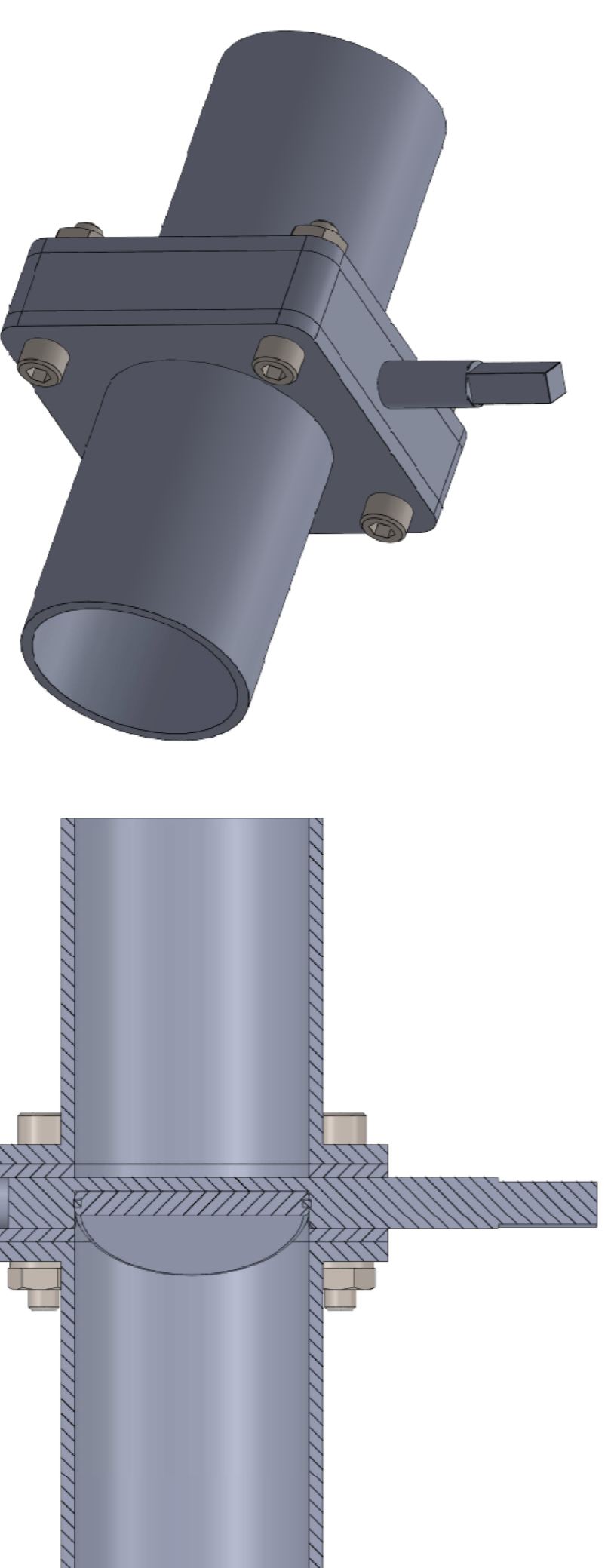
- 1x Tt - thermocouple K, -60F to 900F
- 148010-01A TIL row 82

P3.0

- absolute pressure upstream the orifice p3.0_abs=225psia
Kulite APTE-6-1000, abs, 0-5V output, range 250psia
 - differential pressure drop at the orifice dp3.0_diff=3.6psid to scanivalve at 10lb/min, 480F
Kulite APT_APTE-51HL,diff, 0-5V output, range 5psid
 - 148010-01A TIL rows 92-93
 - max. flowrate 15lb/min
- +
- 1x Tt - thermocouple K, -60F to 900F
 - 148010-01A TIL row 91

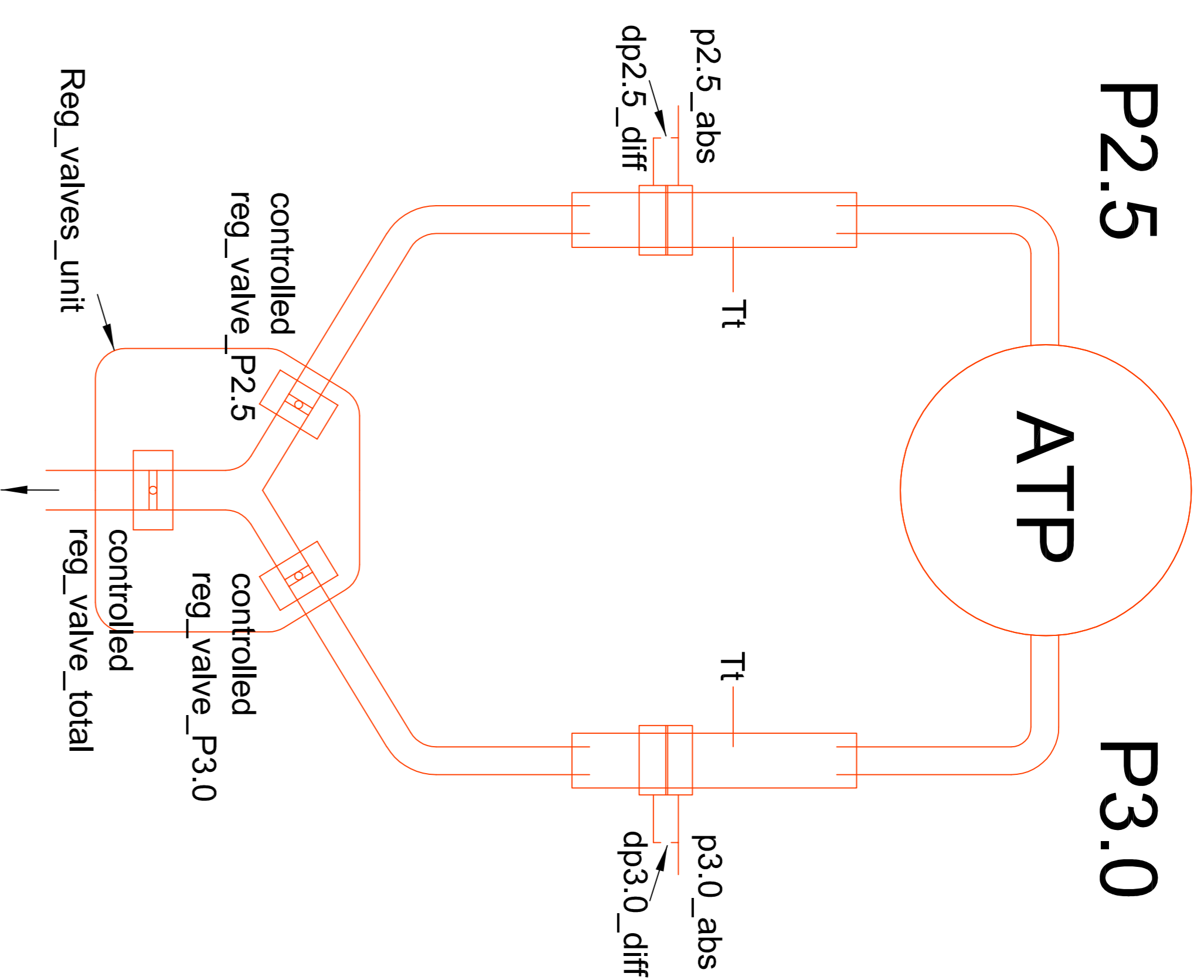
Orifices dimensions according to the technical standard ČSN ISO 5167-2

	D [mm]	d [mm]	beta (d/D)	l ₁ [mm]	l ₂ [mm]	Total Length [mm]	e [mm]	E [mm]	F °	c [mm]	c' [mm]	a [mm]	f [mm]	g [mm]	j [mm]	h [mm]	b [mm]	m [kg]	pipes incl.	Uncertainty total %	Uncertainty total lb/min
P 2.5	36	23	0.64	468	144	612	0.7	1.5	45±15	10	10	1	4.00	5	4	6	36		1.8		
P 3	36	20	0.56	360	144	504	0.5	1.5	45±15	8	8	1	4.00	5	4	6	36		1.3		
** 0.5% of additional uncertainty - no calibration needed																					
	Max q _m [lb/min]	T [F]	T [°C]	PABS [psia]	Pabs [Pa]	Max q _m [kg/s]	Kinem. Viscosity [m ² /s]	ρ ₁ [kg/m ³]	Re _p	v [m/s]	delta P [Pa]	delta P [psi]	delta P / Pabs	Uncertai nty L %	Uncertai nty C %	Uncertai nty add %	Uncertai nty eps %				
P 2.5	17	480	248	74.5	513000	0.129	9.30E-06	3.44	144000	37	30000	3.6	0.06	0.5	0.50	0.138268	0.146199			1.28	0.22
P 3	17	850	455	225	1551000	0.129	7.17E-06	7.45	94000	19	30000	3.6	0.02	0.5	0.43	0.241969	0.048356			1.22	0.21



P2.5

P3.0



- Reg_valves_servo
- f.ex: Siemens GMA 166.1E
 - supply 24V DC
 - analog input 0-10V
 - emergency position
 - weight 1.2kg
 - nominal torque 7Nm

