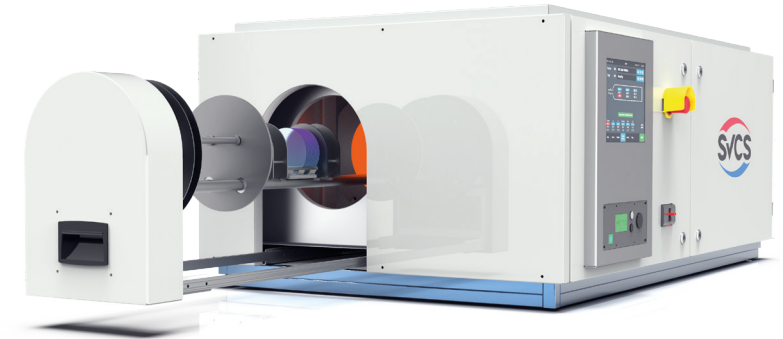




Small Single Tube Furnace for R&D

- | Ideally suited for R&D labs and pilot fabs
- | Small footprint
- | Table or standalone solution (with stands)
- | Stackable desing (e.g. double tabletop variant)
- | Low power consumption
- | Easy operation and maintenance
- | Heating element with 1 or 3 temperature zones and max. temperature up to 1300 °C
- | Modern modular proprietary control system
- | Up to 8 gas lines and 2 liquid sources
- | Independent hardware safety interlocks
- | Integration of vacuum pump systems in cooperation with leading pump manufacturers



Processes

Atmospheric

- | Diffusion (drive-in) high temperature processes
- | Doping from solid, liquid and gaseous dopant sources e.g. BBr_3 , B_2H_6 , POCl_3 , PH_3 , BN
- | Various thermal processing e.g. annealing, curing, sintering
- | Pyrogenic Wet Oxide with External Burning System
- | Wet Oxide with ultra pure steamer
- | Dry Oxide
- | HiPOx (High Pressure Oxide)

LPCVD

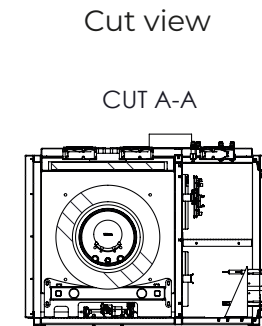
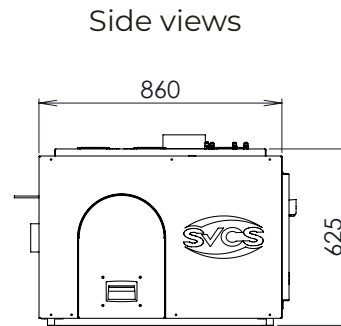
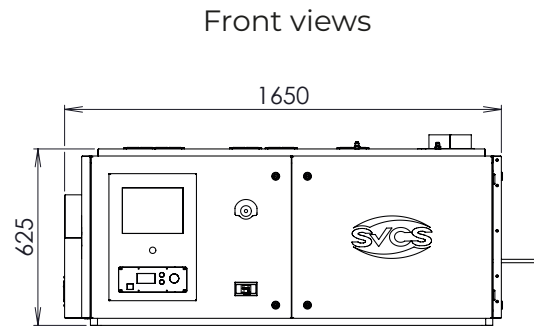
- | Silicon nitride
- | Low temperature oxide (LTO)
- | High temperature oxide (HTO)
- | TEOS oxide
- | Polysilicon, both with tilt and flat temperature profile
- | Doped polysilicon
- | Oxynitride

PECVD

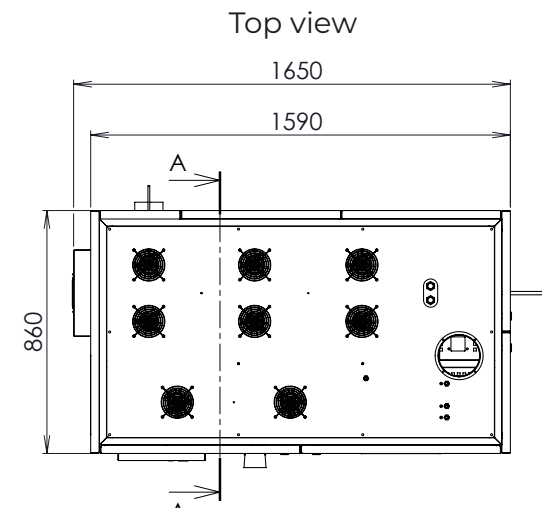
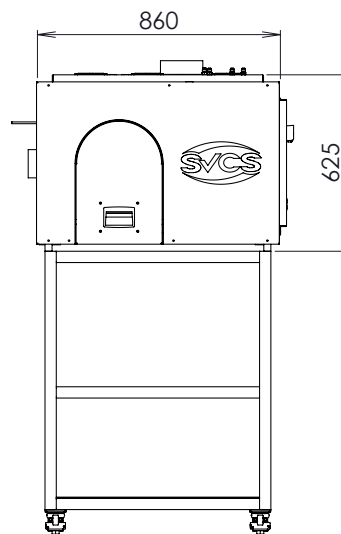
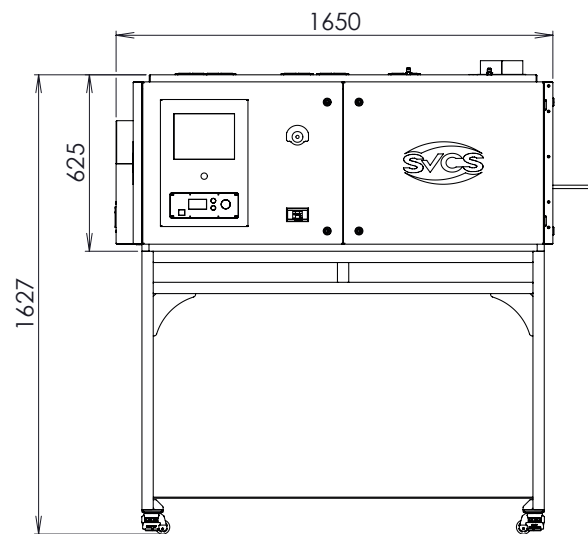
- | Silicon nitride (including anti-reflective SiN solar cell coating)
- | Silicon oxide
- | Oxinitride

DCE or HCl optional for all processes

Drawings (mm)



Drawings with optional stands (mm)



Up to 4-position Furnace for Production

- | Maintenance friendly mechanical design
- | State of the art modular control system, in-house designed and manufactured
- | 10,4" high-res touchscreen for operator interface
- | Up to 4 stacked quartz or SiC tube reactor chambers for various processes
- | No thermal interference between different tubes
- | Contactless fully automated boat-in-tube loading both cantilever or softlanding configurations
- | Independent tube level control system
- | HW safety interlocks independent on main CPU
- | HEPA or ULPA filters installed in load station
- | Boat elevator and wafer handling automation
- | UHP face seal fittings and welds for connections
- | UHP orbital weldings made in 100/10 Cleanroom



Processes

Atmospheric

- | Diffusion (drive-in) high temperature processes
- | Doping from solid, liquid and gaseous dopant sources e.g. BBr₃, B₂H₆, POCL₃, PH₃, BN
- | Various thermal processing e.g. annealing, curing, sintering
- | Pyrogenic Wet Oxide with External Burning System
- | Wet Oxide with ultra pure steamer
- | Dry Oxide
- | HiPOx (High Pressure Oxide)

LPCVD

- | Silicon nitride
- | Low temperature oxide (LTO)
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- | Polysilicon, both with tilt and flat temperature profile
- | Doped polysilicon
- | Oxynitride

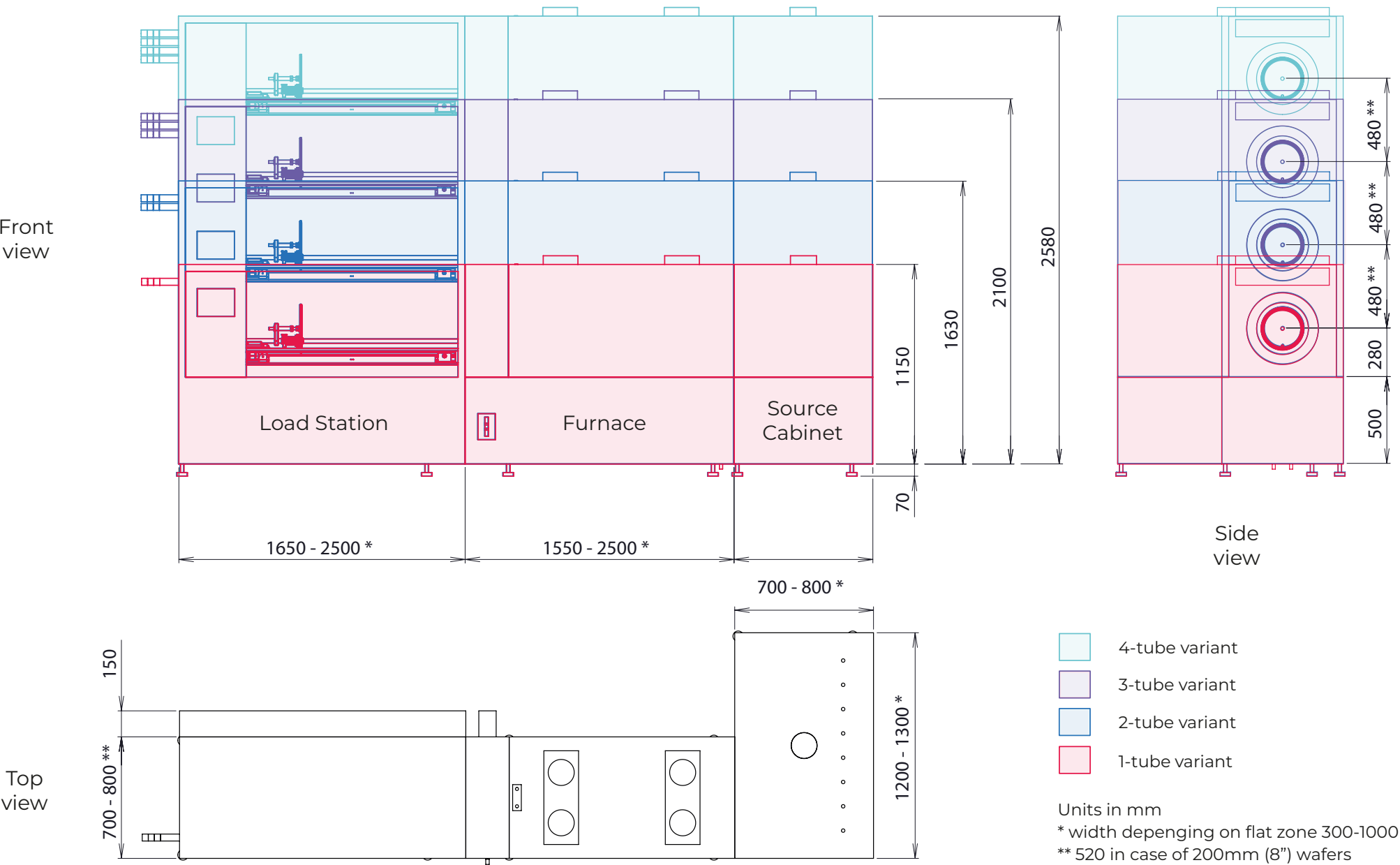
PECVD

- | Silicon nitride
(including anti-reflective SiN solar cell coating)
- | Silicon oxide
- | Oxinitride

DCE or HCl optional for all processes

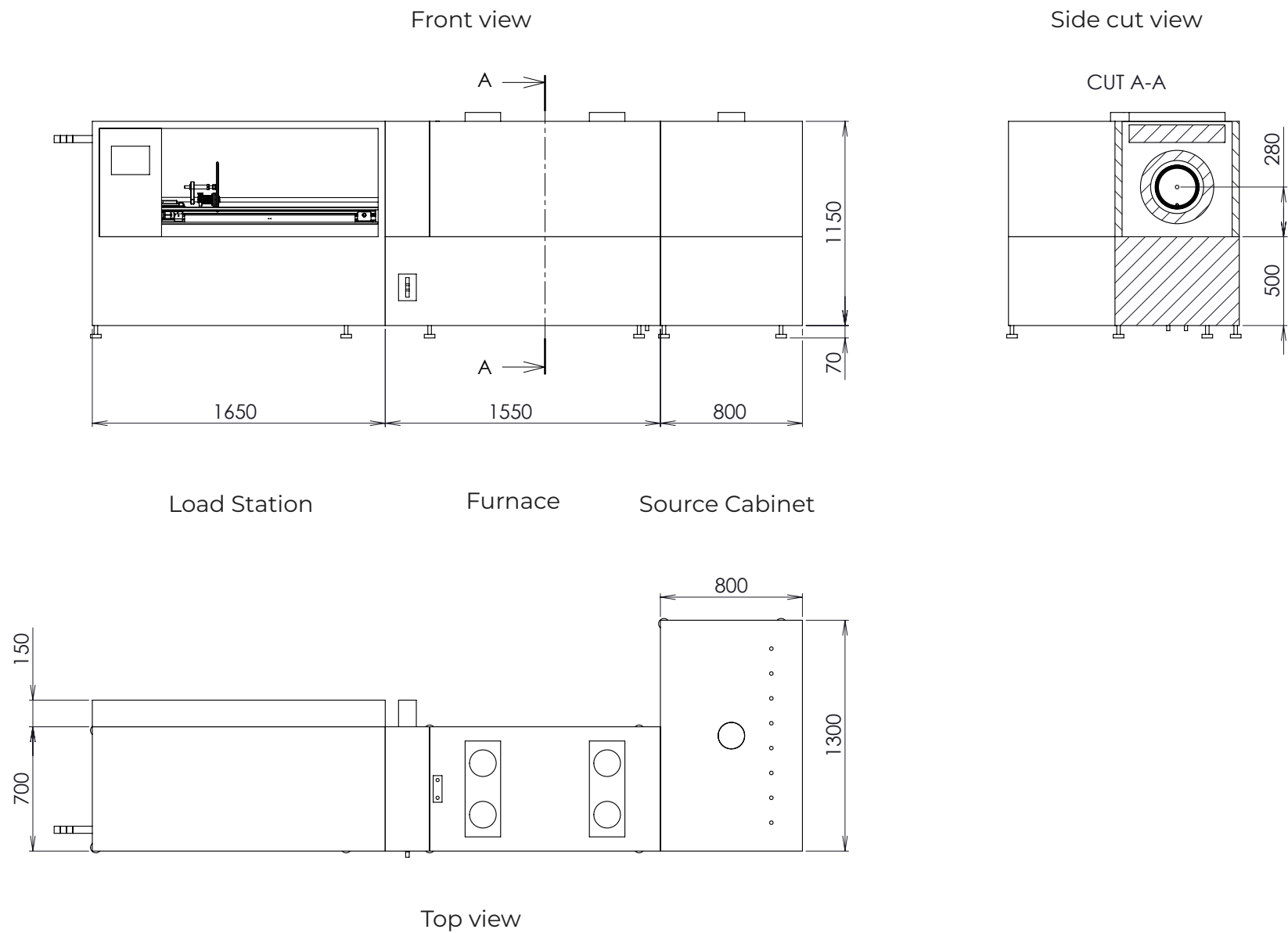
Full Production

Basic size comparison of Horizontal Furnaces



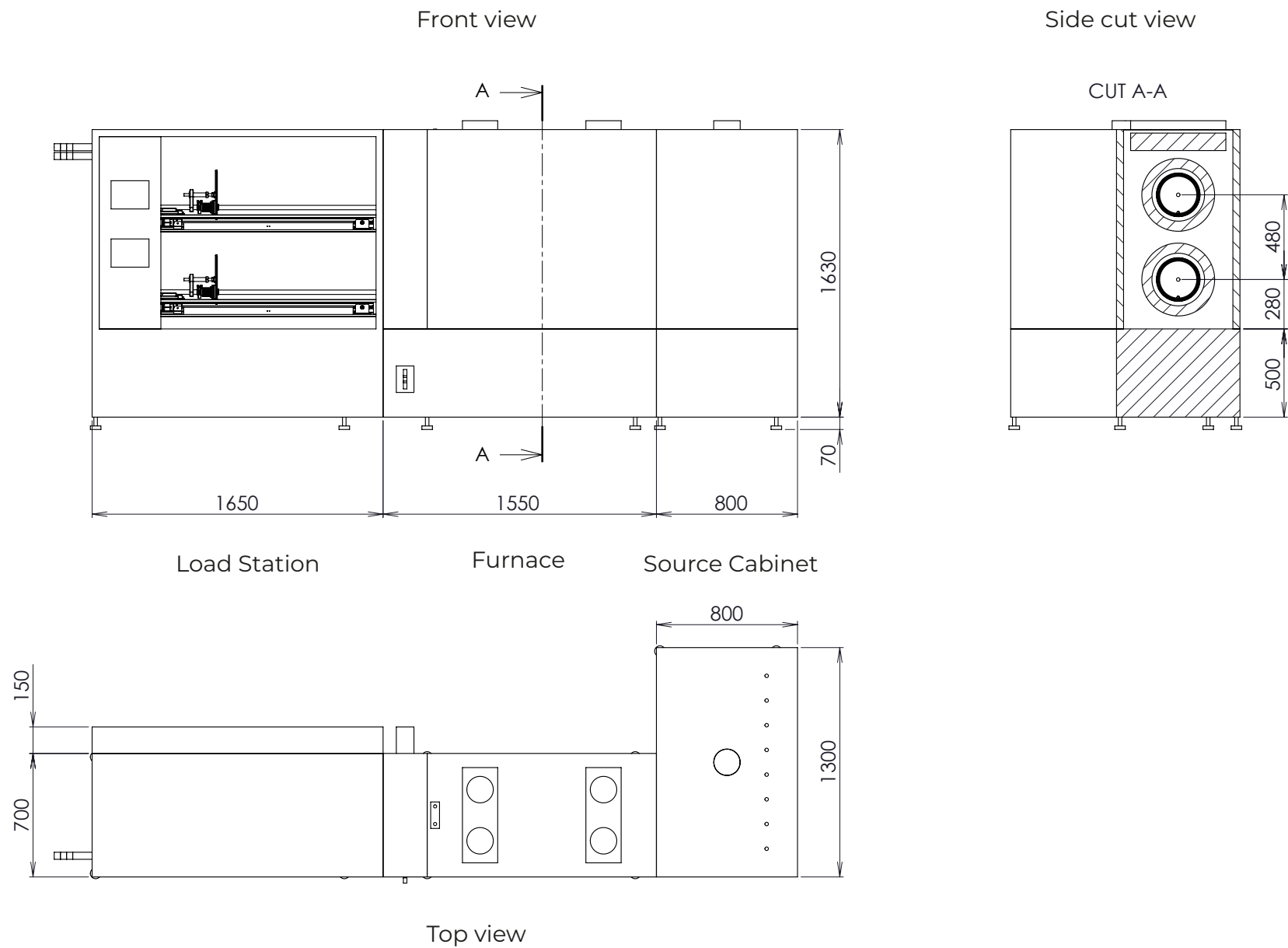
1-tube to 4-tube variants

Drawings (mm)



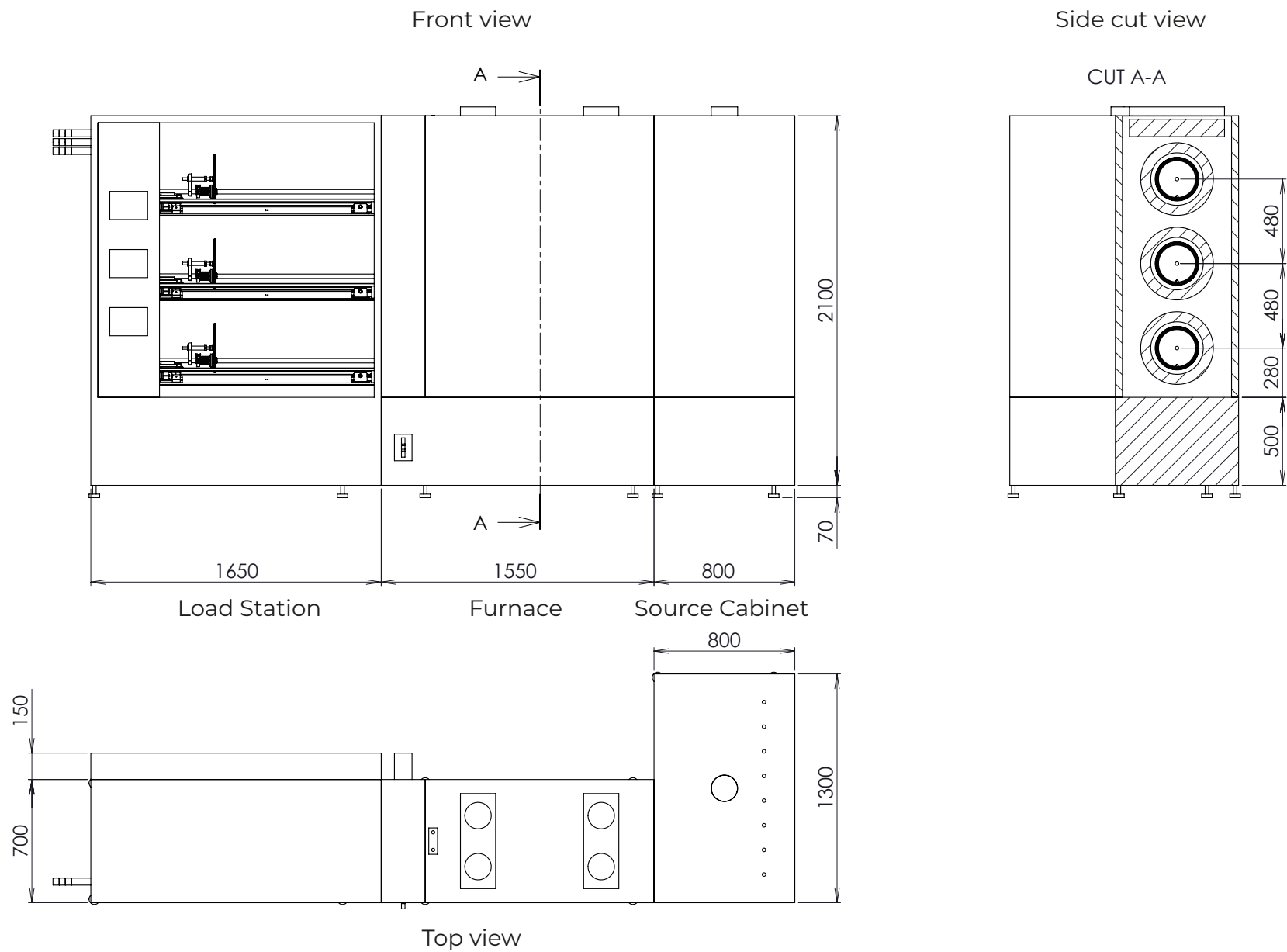
1-Position Horizontal Furnace

Drawings (mm)



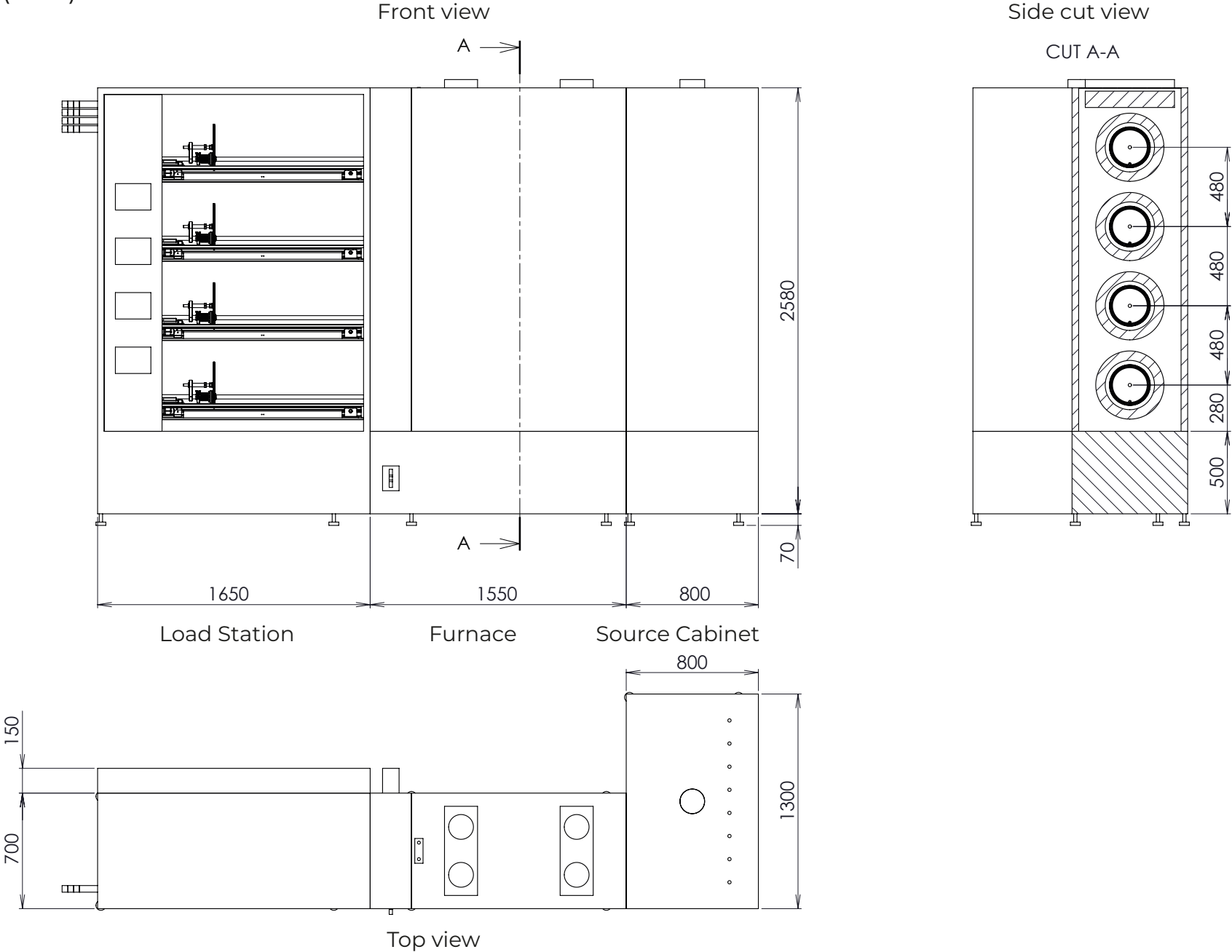
2-Position Horizontal Furnace

Drawings (mm)



3-Position Horizontal Furnace

Drawings (mm)



4-Position Horizontal Furnace

Table of properties

Tabletop

1-4 Position

Weight	ca. 350kg	n/a
Sample dimensions W x H x D (mm)	1650 x 625 x 860 (Without stands)	3900-5800 x 1150-2580 x 1200-1300 (Depending on configuration)
Wafer size	50 - 200 mm	50 - 200 mm
Wafer load	Up to 50 wafers *	Up to 300 per tube *
Heating system	1 or 3 zones	3 or 5 zone
Flat zone	Up to 600 mm	300 - 1000 mm
Process temperature **	200°C to 1230°C	200°C to 1300°C
Power consumption	17kW	18kW - 30kW per tube
3-Phase Power supply ***	400/80VAC, 40 - 100A, 50/60Hz	150 mm: 400/480VAC, 140A, 50/60Hz 200 mm: 400/480VAC, 160A, 50/60Hz
Clean dry air	70 – 110 psig (4,8 to 7,6 bar)	70 – 110 psig (4,8 to 7,6 bar)
Cooling water	10 – 15 LPM	40 – 60 LPM
Exhaust	100m³/h	210m³/h per tube

* in case of reference 150mm (6") variant

** Accuracy $\pm 0.5^{\circ}\text{C}$ across flat zone

*** Adapted to power grid of destination country



- 2-3 Compact Tabletop Single Tube Furnace suitable for R&D sector
- 4-9 Up to 4 position big Horizontal Furnace suitable for mass production
- 10 Table of properties

Horizontal Furnaces

