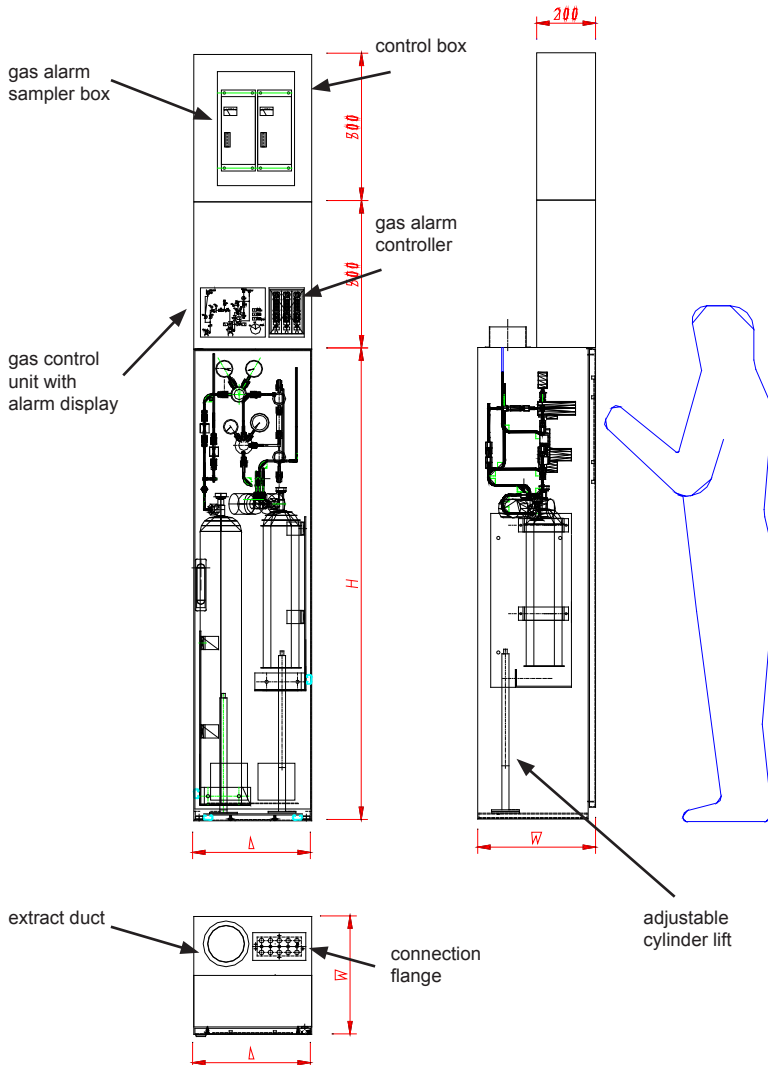


SPGD Safety Process Gas Distribution

for all process gases up to 8.0



Safety Gas Cylinder Cabinets



Features

- Louvered door with drop-in filter
- All welded 2mm steel body construction
- Cylinder support lifts
- Cylinder loading ramp
- Locking door and window
- Conforms to current swiss codes
- Document wallet
- Exhaust failure switch
- Adjustable shelf for cylinder
- Integrated gas alarm system
- Purge cycle
- Emergency shut off valve

Specification

- Material body 2 mm steel
- door 2.5mm steel
- Finish grey epoxy paint
- Window safety glass
- Gaskets Neoprene

Options

- Water sprinkler (68°C)
- Self closing door/window
- Gas line heating system

Dimensions and extraction data

Cabinet Size		Dimension	Window	Duct diameter	Recommended extract rate
2 cylinders	10 l	L400 x W400 x H1500 mm	315 x 315 mm	125 mm	115 m3/h
2 cylinders	20 l	L600 x W400 x H2000 mm	570 x 315 mm	200 mm	180 m3/h
3 cylinders	50 l	L900 x W400 x H2000 mm	800 x 315 mm	200 mm	260 m3/h

Note: The extraction rate should produce a minimum velocity across the open cabinet window of 1 m/s

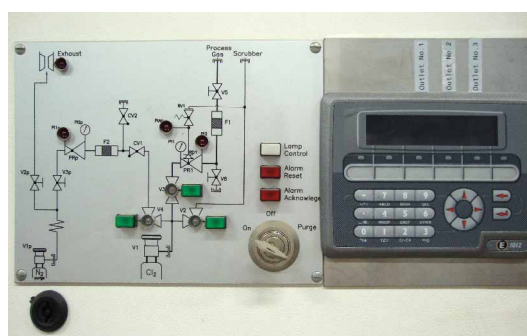


Fig. 1 gas control unit

Process Gas Distribution Panels

The panels for reactive and high-purity gases are built on the building block principle. The design features – no threads or springs in the gas space – provide electro-polishable geometries with minimized dead space for enhanced flow characteristics.

The diaphragm valves series work with a packing-free all-metal seal to atmosphere. The special feature is the patented under-spindle which guarantees maximum gas-tightness even with corrosive gases. The spring has been banished from the gas space, thereby ensuring even lower particle generation.

GDPi

A simple self-purging panel for inert gases e.g

Ar, He, N₂, C₂F₆, CF₄, CHF₃

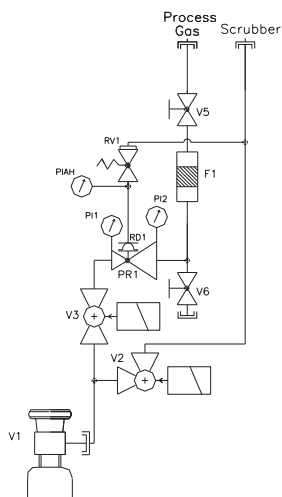


Fig. 2 schematic GDPi

GDPt

Provides the most efficient purging for toxic corrosive and pyrophoric gases e.g.

HCl, SiH₄, PH₃, NH₃, AsH₃, Cl₂, N₂O, GeH₄, C₂F₆, SF₆, H₂S, SiF₄, NF₃, H₂

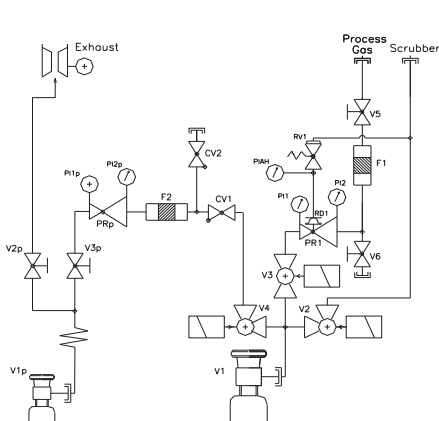


Fig. 3 schematic GDPt

GDP LV

Absolute pressure panels for low vapour pressure sources:

BCl₂, SiH₂, WF₆

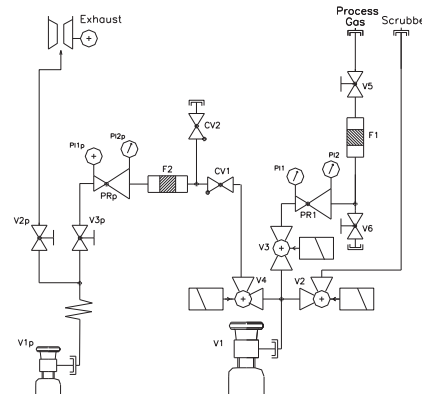


Fig. 4 schematic GDP LV

To prevent cross contamination during cylinder change a separate small cylinder of N₂, Ar or He is installed.

- V1p purge cylinder N₂, Ar or He
- V2p purge vent valve
- V3p main valve
- PRp purge gas regulator
- F2 high purity filter 0.05 μm
- CV1 check valve (prevents back flow by process gas)
- CV2 check valve for additional purge line

- V1 gas cylinder high quality 8.0 (99.9999%)
- V2,V3,V4 purge block pneumatically operated, normally closed
- V2 V2 waste gas valve
- V3 main shut off valve
- V4 purge gas inlet valve
- PR1 process gas regulator
- PI1 cylinder pressure manometer
- PI2 process gas pressure manometer
- RD1 safety rupture disk
- PIAH control manometer for rupture disk
- RVI excess flow valve
- V6 low pressure vent valve
- F1 inline filter 0.003 μm
- V5 low pressure line valve

Other ULPD systems

- Bubbler panels for liquid sources
- Absolute pressure panels for low vapour pressure sources – WF₆, BCl₃, SiH₂, Cl₂, HF
- Point of use panels for all gases
- Automatic systems
- Custom solution



Fig. 5 gas panel



Fig. 6 preparation for orbital weld of gas pipes



Fig. 7 orbital weld of gas pipes

ULPD (Ultra Low Particulate Design) range of gas panels is manufactured specifically to meet the requirements of semiconductor and other high technology industries.

The panels are constructed under class 100 conditions using all electro polished components. Standard surface finish is $0.4\mu\text{m}$ and $0.25\mu\text{m}$ as options. Orbital weld and face seal fittings are used for joints in the gas path.

Components are selected on both performance and purity grounds. All regulators are tied diaphragms to eliminate creep and to ensure shut off under harsh conditions. The manual valves are designed with no gas wetted springs or threads to minimize particle generation. Smooth flow passages, low internal volume and fine surfaces ensure efficient purging and fast clean up.

Following manufacture, all systems undergo the following tests:

- Pressure test to maximum operating pressure
- 24 hours pressure drop test
- Helium leak test to 10^{-9} mbar l/s