THE LINDE GROUP

Central Gas System Inquiry

Check List - Detailed Form

HiQ®

Checklist for Installation

When considering a centralized gas supply system there are a variety of areas to be consider. This checklist will assist our engineers when assisting you in designing your system.

Piping

Total Length of tubing from central gas supply to point of use for each gas

Total number of lines/gases

Minimum Flow requirement

Expansion considerations

Section shut off valves

Point-of-use

Type of regulator (wall or bench)

Outlet connection (6, 8, 10 mm tube or other)

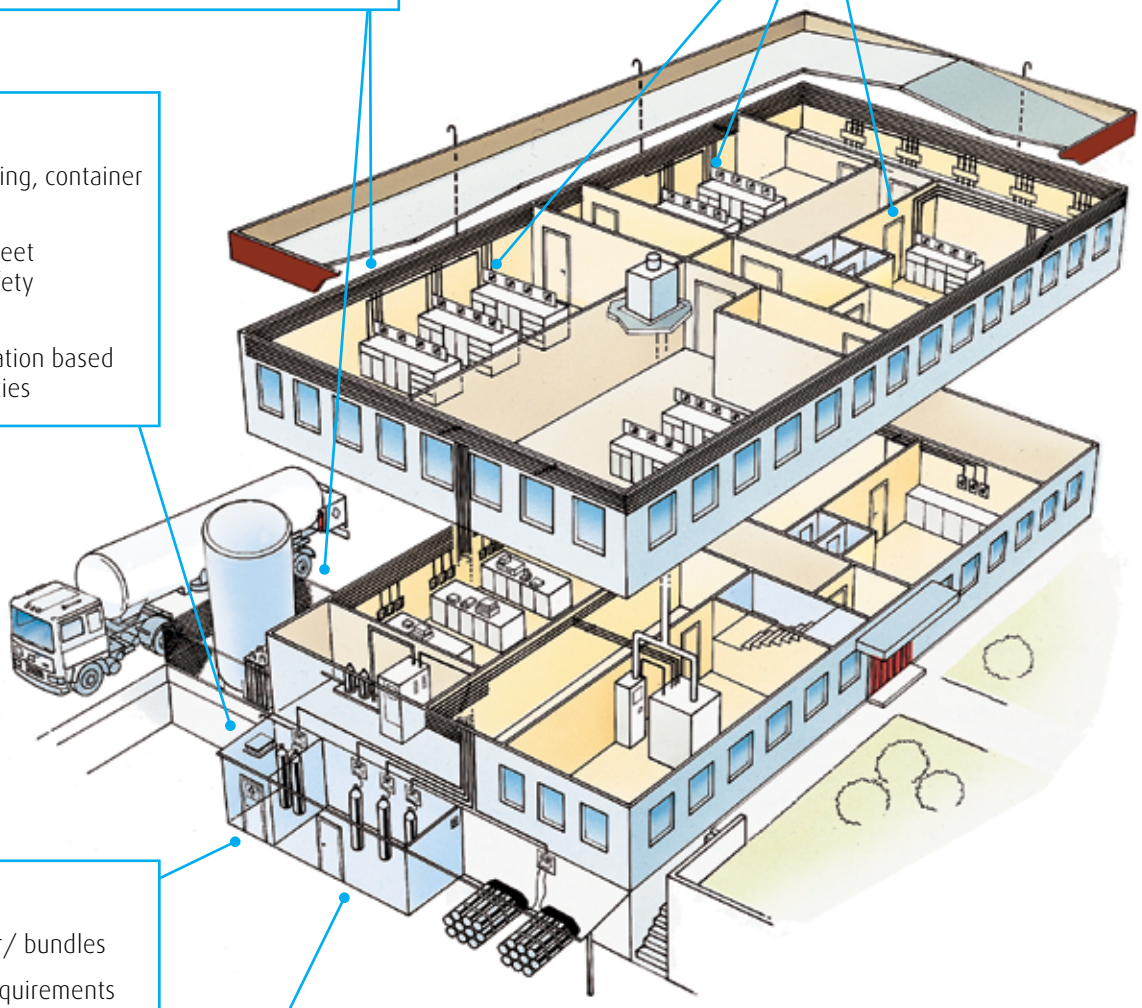
Outlet pressure and flow

Storage

Separate building, container or laboratory

Designed to meet legislative/safety requirements

Storage separation based on gas properties



Gas panels

Single cylinder/ bundles

Purge/vent requirements

Auto change system

Compatible Material of construction (Brass or SS)

Contact gauges for monitoring

Safety outlet

Gases

Gas name, quality/purity requirements

Other information

Layout drawing and digital photos if available

Central Gas System Enquiry

Installation Quick Check List - Gas Supply

Customer Name: _____ Contact Person: _____

Contact Email: _____ Phone: _____

1. Quality/Grades for system gases.

☐ - Industrial Gases (purity < 4.0)

☐ - High Purity Specialty Gases (purity 4.6 – 6.0)

☐ - Chemical Gases (purity 2.0 – 5.0)

☐ - Semiconductor Grade gases (purity >6.0)

☐ - Electronic gases-non semiconductor applications (glass fibre production, solar) (purity < 4.0)

2. Process/Instrument applications

To assist in a proper design, please list the name of the process/application, the instrumentation used, and additional remarks of value for design purposes

Application Name	Instrumentation	Remarks/Additional Details

3. Gas requirements:

List all gases and mixtures, with appropriate purity levels for each building/supply floor.
(If required, use separate sheet for additional gas requirements.)

Gas and Purity Level Required (e.g. Nitrogen 5.0)	Total Number of supply points	Total Number of Point of Use	Total Number of Rooms/ Laboratories	Length of tubing* ☐ m ☐ ft	Remarks

* Length of tubing is the total requirement from the central supply room to all instruments/point of use locations.

Central Gas System Enquiry

Gas Data

Sheet _____ of _____

4. Gas withdrawal. Required for each gas supply line.

(Please duplicate this page, and fill out questions 4.1-4.11 for each individual gas supply point requirement, as well as any potential expansions that are currently available for outline.)

4.1. Supply Gas and Purity to be used: _____

Are there critical inline impurities (such as O2, H2O, Hydrocarbons, others?)

☐ Yes ☐ No

If yes, please list specifications (add additional sheet if more detail is required)

_____

_____

4.2 Material of Construction

☐ Stainless Steel ☐ Electro-polished S.S. ☐ Copper ☐ Brass

4.3 Point of Use Pressure Requirements: _____ ☐ bar ☐ psi ☐ kpa

4.4 Total System Flow Requirements: _____ ☐ sccm ☐ slpm ☐ scfm

4.5 Standard Flow Requirements: Minimum: _____ Maximum: _____ Average: _____

4.6 Standard System Usage (gas withdrawal) in hours/day, day/week, hours/day per year.

☐ 8 hours/day ☐ 5 days/week

☐ 24 hours/day ☐ 7 days/week

☐ _____hours/day ☐ _____days/week

☐ 52 weeks/year ☐ _____weeks/year

(used to indicate required cylinder content sizes, and change interval requirements)

4.7 Cylinder manifold connection type (cylinder per side)

☐ Single ☐ 2x1 ☐ 2x2 ☐ 2x3

☐ Specify: _____

4.8 Continuous supply necessary?

☐ Yes ☐ No (requires automatic change-over supply panel)

4.9 Is constant supply pressure required?

☐ Yes ☐ No (if yes, multi-step pressure reduction may be required)

4.10 Are later extensions/expansions planned?

☐ Yes ☐ No If yes, please fill out additional/duplicate sheet with expectations for sizing requirements)

4.11 Inert gas supply (N2) for purging? ☐ Already existing: ☐ Yes ☐ No

☐ Should be offered in addition Purity Required: _____

5 Location of the gas cylinders

(Please attach a lay-out plan/drawing for each laboratory/ location)

5.1 Outside gas supply installation:

- ☐ Safety cabinet, powder coated steel
- ☐ Iron-barred box
- ☐ Movable container to be located on a concrete bed
  - ☐ Check if existing at present.
- ☐ On an out-side wall, under a roof, without additional containment (concrete bed/ground separation required)

Note: If the gas supply is located outside, without a safety cabinet, a minimum safety distance of five (5) meters from other supply systems is recommended.

For toxic and flammable gases, local fire codes and legislated safety instructions must be reviewed.

5.2 Inside gas supply installation:

- ☐ Cylinders are to be located in a dedicated gas storage room that meets local fire codes as well as any other local or state legislated safety restrictions. Cylinders will be stored;
  - ☐ Using standard cylinder restraints in open air
  - ☐ In cylinder safety cabinets
  - ☐ With stand alone exhaust system
  - ☐ Connected to the central exhaust system
- ☐ Cylinders will be located in the laboratory/ workroom. Cylinders will be stored;
  - ☐ Using standard cylinder restraints in open air
  - ☐ In cylinder safety cabinets
  - ☐ With stand alone exhaust system
  - ☐ Connected to the central exhaust system

6. Safety, information and automation

6.1 Gas Detection Requirements

- ☐ Individual Sensors/Monitors
- ☐ Central Control/Monitor Station

Options:

- ☐ Automatic emergency shut down in case of LEL of TLV alarm
- ☐ With solenoid valves (for lower quality and tightness demands)
- ☐ With pneumatic actuated valves (for higher quality and tightness demands)

6.2 Detectors:

- ☐ LEL detection for flammable gases — Number of monitor points _____
- ☐ TLV detection for toxic gases — Number of monitor points _____
- ☐ Oxygen deficiency detection — Number of monitor points _____
- ☐ Manual emergency stop-switch for flammable / toxic gases

6. Safety, information and automation

6.3 Gas Pressure and Flow Indication

☐ Gas level pressure indication

- ☐ For all gases
- ☐ For the following gases only: _____

☐ Measuring and displaying of the gas flow

- ☐ For all gases
- ☐ For the following gases only: _____

☐ With Rotameter/flowmeter

- ☐ With switching contacts
- ☐ Without switching contacts

☐ With mass flow meter

- ☐ For all gases
- ☐ For the following gases only: _____

☐ Gas flow measuring and control with mass flow controller

- ☐ For all gases
- ☐ For the following gases only: _____

6.4 Additional Requirements (Security and/or Minimal Safety Requirement): ☐

_____

_____

_____

_____

6.5 Additional Comments if required

_____

_____

_____

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Getting ahead through innovation.

With its innovative concepts, Linde is playing a pioneering role in the global market. As a technology leader, it is our task to constantly raise the bar. Traditionally driven by entrepreneurship, we are working steadily on new high-quality products and innovative processes.

Linde offers more. We create added value, clearly discernible competitive advantages, and greater profitability.
Each concept is tailored specifically to meet our customers' requirements – offering standardized as well as customized solutions. This applies to all industries and all companies regardless of their size.

If you want to keep pace with tomorrow's competition, you need a partner by your side for whom top quality, process optimization, and enhanced productivity are part of daily business. However, we define partnership not merely as being there for you but being with you. After all, joint activities form the core of commercial success.

Linde – ideas become solutions.

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