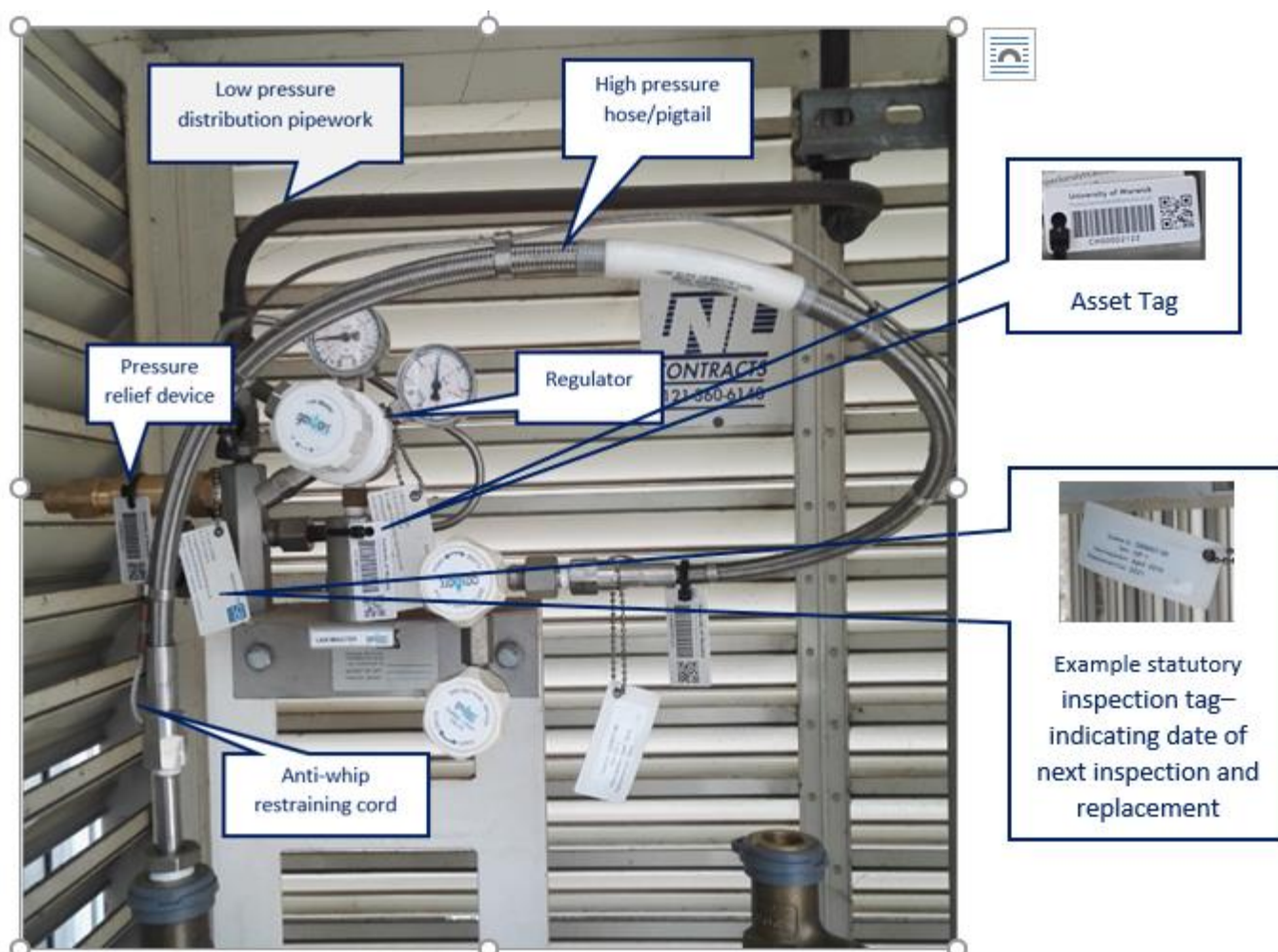


Guidance – Safety Requirements for Lab and Workshop gas delivery systems

Piped compressed gas systems attached to gas cylinders - typical system layout



Written Scheme of Examination for piped gas pressure systems attached to compressed gas cylinders

In common with other pressure systems, which fall within the scope of the Pressure Systems Safety Regulations 2000 (PSSR) (SI 2000/128) requires a competent person to write / underwrite the Written Scheme of Examination for these systems. However, given the difficulty in carrying out a meaningful examination of key components of this type of system, the management of piped compressed gas systems attached to pressure vessels is based on routine inspection, testing and exchange of high pressure components.

Inspection Requirements for Items associated with the gas delivery. Please note – gas regulators are dealt with separately.

Plant/equipment	Inspection Interval	Activity / Action	Replacement Cycle	Activity / Action
Copper alloy pigtail (For high-pressure gas cylinders)	1-year	a) Visual, external examination of condition.	N/A	

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Plant/equipment	Inspection Interval	Activity / Action	Replacement Cycle	Activity / Action
		<ul style="list-style-type: none"> b) Anneal if work-hardened, or replace. c) Fit new seals where applicable. d) Record all details of examination. 		
Hoses (Non-metallic lined for high-pressure gas cylinders)	1-year	<ul style="list-style-type: none"> a) Visual examination of condition. b) Restraining wire is in place. c) Record all details of examination. 	5-years	<ul style="list-style-type: none"> a) Replace with new item. b) Record replacement.
Hoses Stainless steel (for high-pressure cylinders)	1-year	<ul style="list-style-type: none"> a) Visual examination of condition. b) Restraining wire is in place. c) Record all details of examination. 	5-years	<ul style="list-style-type: none"> a) Replace with new item. b) Record replacement.
Hoses Other types and corrosive duties.	Some systems carrying toxic, or other harmful products, may require specific maintenance inspections to prevent danger. In these cases examination intervals should be determined by local operating conditions and manufacturer's recommendations.			
Pipe work – low pressure	1-year	<ul style="list-style-type: none"> a) Visual, external examination of condition. b) Pressure drop test. c) Record all details of examination. 	N/A	
Hoses – low pressure	1-year	<ul style="list-style-type: none"> a) Hoses are compatible with gas in use; reactivity and pressure. b) Hoses in good condition e.g. no kinking twisting or cracking. c) Hoses are secured by non reusable „O“ type crimp clamps (note - worm type, clamps are not recommended) 	N/A	

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Plant/equipment	Inspection Interval	Activity / Action	Replacement Cycle	Activity / Action
Process relief valves	1-year	a) Visual, external examination of condition. b) Lift test c) Record all details of examination	6-years	a) Replace valves with new or refurbished units.
Busting discs	In clean non-corrosive service there is no need to replace or examine bursting discs. However, in corrosive service conditions there may be a need to replace on a frequency, which should be determined from the manufacturer's recommendations.			
Flame arrestors	1-year	a) Visual, external examination of condition. b) Record all details of examination.	5-years (Or supplier's recommendation)	a) Replace with new or refurbished unit. b) Record details of replacement.
Isolation valves	1-year	a) Visual, external examination of condition. b) Functional test. c) Record all details of examination.	N/A	
Inspection (by the user)	Each time the equipment is used	a) Equipment is visually in good order. b) Valves shut off and open correctly. c) Hoses are compatible with gas in use; reactivity and pressure. d) Hoses in good condition e.g. no kinking twisting or cracking. e) Check hoses are secured by non-reusable „O“ type crimp clamps (note - worm type, clamps are not recommended) f) No oil or grease contamination to hoses or fittings. g) System is operating normally		

Guidance – Safety Requirements for Lab and Workshop gas delivery systems

Competencies associated with the use, inspection, testing maintenance and installation of piped compressed gas systems attached to gas cylinders.

Level 1

Before use checks, carried out by persons who have received sufficient instruction to;

- Operate system safely.
- Changing and handling cylinders

Anticipated competency / training requirement – Successful completion of approved ‘Gas Safety Awareness’ course which includes practical session on changing of gas

- Gas safety – Changing of gas cylinders practical
- Manual handling training

E.g. Technical staff, research staff, PhD, Academic staff and visitors.

Level 2

- Annual Checks (PSR)
- Regulator creep test
- System low-pressure leak test at normal operating pressures
- Visual and functions check of all system components

Anticipated competency / training requirement - Specialist contractors who are registered to BS EN ISO 9001/BS EN ISO 13485, with scope of registration defined to cover maintenance.

This should be undertaken by Specialist contractor who are registered to BS EN ISO 13485 with scope of registration defined to cover maintenance appointed by EFM in line with the CDM2007 Regulations.(appendix2)

Level 3

System design, Installation, modification and component replacement should ONLY be undertaken by a person who has undertaken relevant training by a suitably approved provider.

Typically, a person undertaking this training should possess relevant engineering experience and should only be considered competent once a level of practical experience in gas system design and installation has been gained.

Anticipated competency / training requirement — Specialist contractors who are registered to BS EN ISO 9001/BS EN ISO 13485.

Most stand-alone pressure cylinder installation systems will consist only of a cylinder, regulator and low pressure flexible hose feeding the output of the regulator to the process equipment and it is not required to have a Written Scheme of Examination.