



Gas Cylinder Connections & Adaptors Guide

A Practical Technical Buyer's Guide for Calibration Gas, Specialty Gas and Gas Control Applications

Website: www.oxfordvalves.com

Email: info@oxfordvalves.com

Gas Cylinder Connections & Adaptors Guide

How to select gas adaptors, cylinder connections and regulator interfaces for calibration gas and specialty gas applications

Oxford Valves

Precision gas valves, regulators, adaptors and gas control components

About This Guide

Gas cylinder connections and adaptors are small components, but they play a critical role in gas control systems. A valve, regulator or cylinder may appear suitable, but if the connection type, thread direction, pressure rating, material or seal is incorrect, the component should not be used.

This guide explains how gas cylinder adaptors and connection components are used in calibration gas, specialty gas, gas detection, laboratory gas sampling, filling and portable gas testing applications.

It is written for calibration gas manufacturers, gas fillers, specialty gas suppliers, gas detection companies, cylinder package suppliers, laboratories, technical distributors, field service teams and procurement teams.

Oxford Valves supplies precision gas valves, regulators, adaptors and gas control components. Oxford Valves does not supply gases, gas mixtures, gas generators, calibrators, outlet panels, manifolds or complete gas distribution systems.

Oxford Valves products are manufactured under ISO 9001 quality processes and should be selected according to the specific gas, pressure, cylinder, connection, material, seal and application requirements.

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1. Why Gas Connection Selection Matters

Gas control applications depend on secure, compatible and correctly rated connections.

A gas cylinder, regulator, valve or adaptor should never be selected by thread name alone. The full connection arrangement must be reviewed because gas connection components are pressure-containing parts.

Incorrect selection can lead to:

- incompatible cylinder and regulator connections
- incorrect male or female connection direction
- unsuitable pressure rating
- incorrect sealing method
- gas leakage risk
- regulator mismatch
- tubing or outlet incompatibility
- unsuitable material for the gas mixture
- seal or seat incompatibility
- unsafe filling or dispensing setup
- confusion between similar-looking adaptor types

A correct connection strategy helps ensure the gas path is suitable from cylinder to regulator, adaptor, valve, tubing, calibration cap, instrument or filling equipment.

2. What Is a Gas Cylinder Adaptor?

A gas cylinder adaptor is a connection component used to join two different gas connection types.

It may be used between:

- a cylinder valve and regulator
- a cylinder valve and filling line
- a regulator and tubing arrangement
- a gas source and downstream equipment
- a C10 valve and CGA connection
- an aerosol gas package and adaptor
- an NPT fitting and gas control component
- a portable calibration gas cylinder and gas detector accessory

Some adaptors are simple connection converters. Others include added functions such as manual on/off control, press-to-check operation or filling support.

Because adaptors are used in pressurised gas systems, they must be selected carefully.

3. Where Gas Adaptors Are Used

Gas adaptors are used across many Oxford Valves application areas.

Typical applications include:

- calibration gas cylinder packages
- gas detector calibration
- gas detector bump testing
- portable gas detection service kits
- refillable calibration gas cylinder systems
- non-refillable calibration gas cylinder systems
- specialty gas cylinder applications
- gas filling applications
- laboratory gas sampling setups
- C10 cylinder connection conversion
- CGA600 regulator connection conversion
- CGA165 connection requirements
- aerosol test gas applications

- NPT gas control assemblies
- on/off gas release setups
- press-to-check gas release setups

A gas adaptor should always be selected according to the cylinder, gas, pressure, material, seal and intended use.

4. Common Gas Connection Types

Oxford Valves adaptor and product ranges may involve several connection types depending on model and application.

Common connection families include:

- C10
- CGA600
- CGA165
- aerosol
- NPT
- filling connections
- hose barb outlets
- FNPT outlets
- MNPT outlets
- regulator inlet connections
- regulator outlet connections
- cylinder valve outlets

The connection name alone is not enough. The buyer must confirm whether the connection is male or female, inlet or outlet, cylinder-side or equipment-side, filling or dispensing, and whether the pressure and sealing method are suitable.

5. C10 Adaptors

What Is a C10 Adaptor?

A C10 adaptor is used with C10 male or C10 female connections. C10 connections are commonly used in portable calibration gas cylinder systems, C10 valves, compatible regulators and calibration gas equipment.

C10 adaptors may convert between C10 and other connection types such as:

- C10 to CGA600
- C10 to CGA165
- C10 to NPT
- C10 to aerosol
- C10 male to C10 female
- C10 to filling connection
- C10 to press-to-check connection

Where C10 Adaptors Are Used

C10 adaptors are commonly used in:

- portable calibration gas cylinders
- C10 valve cylinder packages
- gas detector calibration kits
- regulator connection conversion
- calibration gas filling support
- portable gas testing systems
- specialty gas cylinder applications

Selection Factors

Before selecting a C10 adaptor, confirm:

- whether the C10 side is male or female
- the connection on the opposite side
- working pressure
- body material
- seal or seat material
- gas compatibility
- whether the adaptor is for filling, dispensing, conversion, on/off control or press-to-check use

C10 male and C10 female connections are not interchangeable.

6. CGA600 Adaptors

What Is a CGA600 Adaptor?

A CGA600 adaptor is used where a compatible CGA600 connection is required. CGA600 connections are commonly found in portable or disposable calibration gas systems, depending on the cylinder and regulator type.

CGA600 adaptors may be used to interface between:

- CGA600 and C10
- CGA600 and NPT
- CGA600 male and female interfaces
- CGA600 cylinder valve and regulator connections
- CGA600 connection and gas delivery equipment

Where CGA600 Adaptors Are Used

CGA600 adaptors are used in:

- calibration gas cylinder applications
- portable gas testing kits
- disposable gas cylinder packages
- regulator connection conversion
- gas detector calibration equipment
- field service gas control setups

Selection Factors

Before selecting a CGA600 adaptor, confirm:

- CGA600 male or female direction
- cylinder or regulator side
- opposite connection type
- working pressure
- material
- seal material
- gas compatibility
- intended use

A CGA600 adaptor should not be forced onto an incompatible cylinder or regulator connection.

7. CGA165 Adaptors

What Is a CGA165 Adaptor?

A CGA165 adaptor is used where a CGA165 interface is required. This may be relevant in selected calibration gas, specialty gas or cylinder connection applications.

Where CGA165 Adaptors Are Used

CGA165 adaptors may be used for:

- C10 to CGA165 conversion
- regulator compatibility
- specialty gas cylinder connection requirements
- calibration gas package connection conversion
- technical buyer connection matching

Selection Factors

Before selecting a CGA165 adaptor, confirm:

- CGA165 male or female requirement
- the connection on the other side
- working pressure
- gas compatibility
- material
- seal or seat material
- regulator or downstream equipment compatibility

CGA165 should not be treated as interchangeable with CGA600 or C10.

8. Aerosol Adaptors

What Is an Aerosol Adaptor?

An aerosol adaptor is designed for aerosol-style gas packages and test gas systems. Aerosol adaptors may be used where an aerosol inlet or aerosol female outlet is required.

Aerosol adaptors are often used in lower-pressure portable gas testing applications, depending on the product design and gas package.

Where Aerosol Adaptors Are Used

Aerosol adaptors may be used in:

- aerosol calibration gas packages
- portable gas testing systems
- laboratory test gas applications
- aerosol to C10 conversion
- gas sampling setups
- compact field testing kits

Selection Factors

Before selecting an aerosol adaptor, confirm:

- aerosol connection type
- inlet and outlet direction
- working pressure
- gas mixture
- seal material
- whether the adaptor includes a valve
- application procedure

Aerosol adaptor pressure ratings may be lower than C10 or NPT adaptor configurations, so pressure suitability must be checked carefully.

9. NPT Adaptors

What Is an NPT Adaptor?

An NPT adaptor is used where a National Pipe Thread connection is required. NPT connections are common in gas control assemblies, filling lines, regulators, test setups and technical equipment.

Oxford Valves adaptor applications may involve:

- 1/4" NPT male
- 1/4" NPT female
- NPT to C10
- NPT to CGA600
- NPT to filling connection

- NPT to regulator connection

Where NPT Adaptors Are Used

NPT adaptors are used in:

- filling applications
- regulator connection conversion
- test gas assemblies
- gas control panels supplied by others
- gas delivery setups
- laboratory and technical gas control arrangements
- calibration gas connection assemblies

Selection Factors

Before selecting an NPT adaptor, confirm:

- NPT male or female direction
- inlet or outlet role
- thread size
- sealing method
- working pressure
- gas compatibility
- material
- seal or seat requirements
- connection on the opposite side

NPT adaptors must be selected carefully because they are used in pressure-containing gas systems.

10. Filling Adaptors

What Is a Filling Adaptor?

A filling adaptor is used to connect filling equipment to a cylinder valve or gas connection during filling operations.

Filling adaptors should only be used in suitable filling systems by trained personnel.

Where Filling Adaptors Are Used

Filling adaptors may be used in:

- calibration gas filling operations
- specialty gas filling systems
- refillable cylinder programmes
- cylinder valve filling connections
- technical gas package preparation
- gas supplier filling environments

Selection Factors

Before selecting a filling adaptor, confirm:

- filling connection type
- cylinder valve connection
- inlet and outlet direction
- working pressure
- body material
- seal material
- gas compatibility
- filling process
- safety requirements
- operator procedure

A filling adaptor should not be used as a general dispensing adaptor unless the design and application are confirmed as suitable.

11. On/Off Adaptors

What Is an On/Off Adaptor?

An on/off adaptor includes a manual control function that allows the operator to open or close the gas path.

This may be useful where the user needs simple manual control at the adaptor connection.

Where On/Off Adaptors Are Used

On/off adaptors may be used in:

- portable gas testing setups
- calibration gas applications
- compact gas control arrangements
- manual gas release applications
- connection conversion with added gas control

Selection Factors

Before selecting an on/off adaptor, confirm:

- inlet connection
- outlet connection
- working pressure
- material
- seal compatibility
- gas compatibility
- operating method
- whether the adaptor is suitable for the intended gas release function

The on/off feature does not remove the need for correct regulator or pressure control where required.

12. Press-to-Check Adaptors

What Is a Press-to-Check Adaptor?

A press-to-check adaptor is used where a manual press action is required to check or release gas through the adaptor.

These adaptors are often used in compact gas testing setups where controlled manual gas release or connection checking is required.

Where Press-to-Check Adaptors Are Used

Press-to-check adaptors may be used in:

- compact gas testing kits
- calibration gas packages
- gas detector response checks
- portable field testing
- manual gas release setups

- C10 or related adaptor applications

Selection Factors

Before selecting a press-to-check adaptor, confirm:

- inlet connection
- outlet connection
- pressure rating
- gas compatibility
- material
- seal material
- operating method
- intended test procedure

A press-to-check adaptor should be selected only where the manual press operation matches the intended application.

13. Male and Female Connection Direction

Male and female connection direction is one of the most common sources of adaptor selection errors.

A male connection usually has external threads or a protruding interface. A female connection usually has internal threads or a receiving interface.

However, buyers should not rely only on visual appearance. Connection standards, sealing methods and mating components must be confirmed.

Examples of Directional Differences

The following are not the same:

- C10 male to CGA600 male
- CGA600 female to C10 female
- C10 female to NPT male
- NPT female to C10 male
- aerosol inlet to C10 outlet
- filling connection to dispensing connection

The same connection names in a different direction can describe a completely different adaptor.

Direction Checklist

Confirm:

- what the adaptor connects from
 - what the adaptor connects to
 - which side is the gas source
 - which side is the receiving component
 - whether each side is male or female
 - whether the adaptor is inlet-to-outlet or outlet-to-inlet
 - whether the adaptor is for filling or dispensing
 - whether pressure is applied in the intended direction
-

14. Working Pressure Considerations

Every gas adaptor must be suitable for the pressure of the gas system.

Working pressure depends on:

- cylinder pressure
- upstream regulator pressure
- filling pressure
- gas source pressure
- pressure rating of the adaptor
- pressure rating of the connected valve or regulator
- pressure rating of downstream tubing or equipment

Oxford Valves adaptor configurations may include different working pressure options depending on model. The correct rating must be confirmed before use.

Important Pressure Rules

- Do not use an adaptor above its rated pressure.
 - Do not assume similar-looking adaptors have the same pressure rating.
 - Do not assume an aerosol adaptor is suitable for higher-pressure C10 or NPT applications.
 - Do not use a filling adaptor unless the pressure and procedure are suitable.
 - Check pressure ratings for both the adaptor and connected components.
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15. Material Selection

Material selection is important because the adaptor body is in contact with the gas and must operate under pressure.

Oxford Valves adaptor configurations may include:

- stainless steel
- brass
- brass nickel plated

Stainless Steel Adaptors

Stainless steel is often selected where stronger material compatibility is required. It may be considered for more demanding gas compatibility requirements, higher-pressure applications or selected filling and C10/NPT configurations.

Final suitability depends on the complete gas mixture and operating conditions.

Brass Adaptors

Brass adaptors are generally used for compatible non-reactive gas applications. Brass should not be assumed suitable for every gas mixture.

Brass Nickel Plated Adaptors

Brass nickel plated adaptors are used in selected adaptor configurations where nickel plated brass construction is suitable for the gas and application.

Material Selection Checklist

Before selecting adaptor material, confirm:

- complete gas mixture
 - concentration
 - balance gas
 - moisture content
 - pressure
 - temperature
 - application type
 - exposure conditions
 - seal material
 - compatibility requirements
-

16. Seal and Seat Selection

Adaptor performance depends not only on body material but also on seal or seat material.

Oxford Valves adaptor configurations may include materials such as:

- Buna-N
- Viton
- HNBR

Other Oxford Valves gas control products may include additional seat or seal materials depending on product range.

Buna-N

Buna-N is used in selected adaptor configurations. It should be checked against the gas mixture, pressure and operating conditions.

Viton

Viton is used in selected adaptor configurations. It should be reviewed for compatibility with the gas mixture and service conditions.

HNBR

HNBR is used in selected adaptor configurations and should be checked against gas compatibility, pressure and application requirements.

Seal Compatibility Checklist

Confirm:

- gas mixture
- concentration
- balance gas
- moisture content
- pressure
- temperature
- exposure time
- body material
- seal material
- seat material
- cleaning or filling procedure
- operating environment

No seal material should be assumed suitable for every gas.

17. Adaptor Selection Matrix

Requirement	Possible Adaptor Type
C10 cylinder to another connection	C10 adaptor
CGA600 cylinder or regulator connection	CGA600 adaptor
CGA165 interface requirement	CGA165 adaptor
Aerosol gas package connection	Aerosol adaptor
Pipe-thread connection requirement	NPT adaptor
Cylinder filling connection	Filling adaptor
Manual gas shut-off at connection	On/off adaptor
Manual press action for gas check or release	Press-to-check adaptor
Connection conversion with valve function	Valve-assisted adaptor
Cylinder-to-regulator mismatch	Connection conversion adaptor
Portable gas testing setup	C10, CGA600, aerosol or press-to-check adaptor depending on setup

18. Common Selection Mistakes

Choosing Only by Thread Name

Thread name alone is not enough. The buyer must confirm connection direction, male or female type, pressure rating, material, seal type and application.

Confusing Male and Female Connections

Male and female connections are not interchangeable. Both sides of the adaptor must be confirmed.

Treating Adaptors as Universal

Gas adaptors are not universal. Each adaptor has a specific pressure rating, material, direction and intended function.

Ignoring Working Pressure

An adaptor should never be used above its rated working pressure.

Using Brass for Incompatible Gas Mixtures

Brass and brass nickel plated adaptors are generally used for compatible gas applications. Some gas mixtures may require different material selection.

Overlooking Seal Compatibility

Seal materials such as Buna-N, Viton and HNBR must be suitable for the gas mixture and operating conditions.

Using Filling Adaptors Without Proper Procedure

Filling adaptors should only be used by trained personnel in suitable filling systems.

Confusing Filling and Dispensing Use

A filling adaptor may not be suitable for the same use as a dispensing or regulator conversion adaptor.

Ignoring the Opposite Side of the Adaptor

Many selection errors happen because only one side of the adaptor is checked. Both inlet and outlet must be confirmed.

19. Technical Buyer Checklist

Before requesting an adaptor quote, collect the following information.

Application

- calibration gas delivery
- gas detector calibration
- bump testing
- cylinder filling
- regulator connection conversion
- portable gas testing
- laboratory gas sampling
- specialty gas connection
- on/off gas release
- press-to-check gas release

Gas Information

- gas mixture
- concentration
- balance gas
- moisture content
- reactive or non-reactive classification
- compatibility concern
- operating environment

Pressure Information

- cylinder pressure
- filling pressure where relevant
- regulator inlet pressure
- regulator outlet pressure
- adaptor working pressure requirement
- downstream pressure limit

Connection Information

- inlet connection
- outlet connection
- male or female direction
- source side
- receiving side
- cylinder valve connection
- regulator connection
- tubing or equipment connection
- thread standard
- sealing method

Adaptor Function

- simple conversion
- filling
- dispensing
- on/off control
- press-to-check
- valve-assisted release
- regulator connection conversion
- cylinder-to-equipment interface

Material and Seal Information

- stainless steel requirement
- brass requirement
- brass nickel plated requirement
- seal material requirement
- seat material requirement
- compatibility notes

Commercial Information

- quantity
 - destination country or region
 - existing part reference
 - drawings or samples
 - product photos if available
 - required documentation
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20. Oxford Valves Product Mapping

Adaptors — OV-A-800 Series

The OV-A-800 Series includes adaptor configurations for calibration gas, C10, CGA600, CGA165, aerosol, NPT, filling, on/off and press-to-check applications.

C10 Valves — OV-C10-200 Series

C10 valves are commonly used on compact calibration gas cylinders and may require adaptors or regulators depending on the gas delivery setup.

Integrated C10 Valves — OV-IC10-900 Series

Integrated C10 valves combine a C10 valve function with pressure reducing capability and may require correct outlet or tubing connection selection.

Flow Control Valves — OV-FCV-1000 Series

Flow control valves may use aerosol, C10 or CGA600 inlet connections and outlet options such as hose barb or threaded connections depending on model.

Fixed Flow Regulators — OV-FFR-300 Series

Fixed flow regulators must be matched to the cylinder connection, outlet connection and gas delivery arrangement.

Demand Flow Regulators — OV-DFR-400 Series

Demand flow regulators must be matched to the cylinder connection, pumped instrument requirement and outlet tubing.

Pressure Reducing Regulators — OV-PRR-1500 Series

Pressure reducing regulators require correct inlet and outlet connection selection for controlled pressure delivery.

21. Frequently Asked Questions

What is a gas cylinder adaptor?

A gas cylinder adaptor is a connection component used to join two different gas connection types, such as C10, CGA600, CGA165, aerosol or NPT connections.

What is a calibration gas adaptor used for?

A calibration gas adaptor is used to connect cylinders, regulators, filling lines, gas delivery equipment or test systems where the connection types do not directly match.

What is a C10 adaptor?

A C10 adaptor is used with C10 male or female connections, commonly found in portable calibration gas cylinder applications.

What is a CGA600 adaptor?

A CGA600 adaptor is used with compatible CGA600 calibration gas cylinder or regulator connections.

Can I use any adaptor with any gas?

No. The adaptor must be selected based on gas compatibility, material, seal type, pressure rating, connection direction and application.

What is the difference between male and female gas connections?

A male connection usually has external threads or a protruding interface. A female connection usually has internal threads or a receiving interface. The correct mating connection must be used.

Are adaptors universal?

No. Gas adaptors are not universal. Each adaptor has a specific connection direction, pressure rating, material configuration and intended use.

What is a filling adaptor?

A filling adaptor connects filling equipment to a cylinder valve or gas connection during filling operations. It should only be used by trained personnel in suitable filling systems.

What is an on/off adaptor?

An on/off adaptor includes a manual control function that allows the operator to open or close the gas path.

What is a press-to-check adaptor?

A press-to-check adaptor uses a manual press action to check or release gas through the adaptor.

What materials are used in Oxford Valves adaptors?

Oxford Valves adaptor configurations may include stainless steel, brass and brass nickel plated materials depending on model.

What seal materials are used in Oxford Valves adaptors?

Seal and seat materials may include Buna-N, Viton and HNBR depending on the adaptor model.

Does Oxford Valves supply calibration gas?

No. Oxford Valves supplies gas valves, regulators, adaptors and gas control components. Oxford Valves does not supply gases, gas mixtures, gas generators, calibrators or complete gas distribution systems.

22. Request Technical Support

For support selecting a gas cylinder adaptor or connection component, please provide:

- application
- gas type or mixture
- cylinder type
- cylinder pressure
- inlet connection
- outlet connection
- male or female direction
- source side connection
- receiving side connection
- adaptor function required
- working pressure
- material preference
- seal or seat requirement
- quantity
- destination country or region
- photos, drawings, samples or existing references if available

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Email: info@oxfordvalves.com



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Final product suitability should always be confirmed against the specific gas, pressure, cylinder, connection, material, seal and application requirements.