



ENGINEERING AND OPERATING STANDARDS

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SCOPE

This section presents requirements for installation of meter banks serving multiple customers in a single building including outside and inside installations, the regulator or regulator station that serves the meter bank, bypass requirements, and ventilation criteria.

CODE REQUIREMENTS

DOT §192.197 provides requirements for control of pressure of gas delivered from high pressure distribution systems.

DOT §192.199 provides requirements for design of pressure relief and limiting devices.

DOT §192.353 provides requirements for the location of customer meters and regulators.

DOT §192.355 requires that customer meters and regulators be protected from damage.

DOT §192.357 provides requirements for the installation of customer meters and regulators.

DOT §192.359 provides requirements for the operating pressure of customer meters.

COMAR 20.55.02.02 requires gas meters to be installed, maintained, and operated in accordance with accepted good engineering practice as set forth in ANSI B109.1, B109.2, and B109.3.

COMAR 20.55.05 establishes general metering requirements for Maryland.

DCMR 2351 establishes general metering requirements for the District of Columbia.

METER BANKS

Each meter bank shall be installed in accordance with a Washington Gas standard drawing or in accordance with a Washington Gas custom design for the specific location. The Washington Gas standard drawings are intended to cover most typical field installations. Contact Corporate Engineering if a custom design is required or if assistance is needed in adapting a standard drawing to a specific situation.

The regulator installation that serves a meter bank is classified as either a service regulator or as a regulator station. See Section 2003, Definitions for the definitions of service regulator and regulator station.

LOCATION AND CLEARANCE

Meter banks shall be installed outside unless there are no practical outside locations. If it is not practical to install the meter bank outside, locate the meter bank as near as practical to the point where the gas line enters the building. If 2 regulators are used in series, locate the first outside if feasible. See Section 5111, Meter Location and Clearance Requirements for additional location and clearance requirements.

Meter banks shall not be installed in below-grade pits or vaults.

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Meter bank installations shall be protected from damage. See Section 5112, Traffic Guards for requirements for protecting meter installations from traffic and other hazards.

METER AND REGULATOR SIZING

Meters and regulators used for meter bank installations shall be sized in accordance with Section 5128, Meter and Regulator Selection. Contact Corporate Engineering for assistance when sizing meters and regulators for circumstances not covered by Section 5128.

SERVICE VALVES

A separate valve for shutting off service shall be provided for each customer meter. Such valve shall be accessible in close proximity to the meter and located upstream of the meter.

BYPASS REQUIREMENTS

A bypass or provision for a bypass is required for all meter bank installations. The bypass or bypass connections shall be installed as indicated on the appropriate meter bank standard drawing. The bypass permits the service regulator or regulator station to be changed or taken out of service for maintenance without shutting off the flow of gas to the meters in the meter bank.

A hard-piped bypass is required for any monitor/operator regulator installation. Install bypass connections for use with a temporary bypass hose when using IRV regulators. For regulator installations using a separate relief valve, either connections for a bypass hose or a hard-piped bypass shall be used in accordance with the appropriate standard drawing.

Provisions to allow the meter to be changed without shutting off the gas to the customer shall be installed on the outlet side of all AL250 and AL425 size meters. Provision for a hose bypass or a hard-piped bypass shall be included for all meters AL425 HC and larger.

PIPE SIZE

Each header pipe shall be sized to serve the combined connected load for all of the meters served by that header. Each riser pipe shall be sized to serve the combined connected load served by that riser. The calculated velocity based on combined connected load in any riser or header pipe shall not exceed 50 feet per second. See Table 5131-1 for the capacity of various header and riser pipe sizes.

OUTSIDE INSTALLATIONS

The meter bank installation shall be located as near as practical to the outside building wall of the building it is serving. The outlet of each meter shall enter the building without going back underground.

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Table 5131-1. Header and Riser Capacity

Pipe Size (in)	Low Pressure Capacity (scfh) ¹	2 psig Capacity (scfh) ²
2	1,300	3,600
3	3,700	9,200
4	7,600	15,900
6	22,200	36,100

¹ Low pressure capacity assumes a 30 feet equivalent length, a permissible pressure drop of 0.2 inches w.c., and a velocity limit of 50 feet per second.

² 2 psig capacity assumes a 30 feet equivalent length, a permissible pressure drop of .04 psi., and a velocity limit of 50 feet per second.

INSIDE INSTALLATIONS

Meter banks shall not be installed inside buildings or other structures unless there are no other practical alternatives.

All regulator and relief valve vents shall be extended to the outside and shall terminate where gas can vent freely away from building openings. See Section 5126, Service Regulator and Relief Valve Vents for requirements for vents and vent lines.

METER ROOMS

Whenever practical, an inside meter bank shall be installed in meter room separate from electrical service equipment. The meter room shall be located as near as practical to the point where the gas line enters the building. Meter banks shall not be installed in locations away from the point the gas line enters the building, except that more than 1 meter bank location is permitted when all of the meters are located on the same garage level in a parking garage. When meters are installed in more than 1 meter bank location, the regulator serving the meter banks shall be located as near as practical to the point where the gas line enters the building. See Section 5132, Meter Bank Regulator Installations for more information on regulators serving meter banks.

VENTILATION REQUIREMENTS

Each meter room shall be ventilated. The vent requirements are

- ▶ The vent shall allow the meter room to communicate either with the outside or with an occupied portion of the building.
- ▶ The effective vent area shall be
 - ▷ A minimum of 3 square inches for a cabinet containing 3 or fewer residential size meters
 - ▷ A minimum of 3 square inches for a meter room with a floor area of 10 square feet or less containing 3 or fewer residential size meters

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- ▷ A minimum of 10 square inches for a meter room or cabinet containing at least 1 commercial size meter 1.5M rotary or larger, or more than 3 meters of any size
- ▷ A minimum of 10 square inches for a meter room with a floor area greater than 10 square feet
- ▶ The vent shall be located a minimum of 1 foot above the floor of the meter room.
- ▶ An undercut door is not considered to be a vent in compliance with this section.

PARKING GARAGE LOCATIONS

If a meter bank is located in a parking garage, the meter bank shall be protected from traffic with appropriate meter guards. See Section 5112, Traffic Guards for requirements for protecting meter installations from traffic and other hazards. Regulator and relief valve vents must be run to the outside in accordance with Section 5126, Service Regulator and Relief Valve Vents.

ROOFTOP INSTALLATIONS

Meter banks shall not be located on rooftops unless there is no other practical alternative and the location is approved by Corporate Engineering. See Section 5111, Meter Location and Clearance Requirements, for additional location and clearance requirements related to rooftop installations.

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SCOPE

R | This section presents requirements for regulator installations serving meter banks or other configurations of multiple meters. Meter bank regulators shall be sized in accordance with this section. Regulator installations that are presented in this section are classified either as service regulators or as regulator stations. The regulators presented in this section are used for reducing pressure from the Washington Gas **medium** pressure distribution system with design inlet pressures up to 60 psig. See Section 5132, Large Load Meter and Regulator Facilities for installation details not included in this section.

CODE REQUIREMENTS

- DOT §192.197 provides requirements for control of pressure of gas delivered from high pressure distribution systems.
- DOT §192.199 provides requirements for design of pressure relief and limiting devices.
- DOT §192.353 provides requirements for the location of customer meters and regulators.
- DOT §192.355 requires that customer meters and regulators be protected from damage.
- DOT §192.357 provides requirements for the installation of customer meters and regulators.
- DOT §192.359 provides requirements for the operating pressure of customer meters.
- DOT §192.739 provides requirements for inspecting regulator stations.

METER BANK REGULATOR INSTALLATIONS

The regulator installation that serves a meter bank is classified as either a service regulator or as a regulator station. See Section 2003, Definitions for the definitions of Service Regulator and Regulator Station.

LOCATION

Regulators shall be installed outside unless there is no practical outside location. If it is not practical to install regulators outside, locate the regulators as near as practical to the point where the gas line enters the building. If 2 regulators are used in series, locate the first outside if feasible. See Section 5111, Meter Location and Clearance Requirements for additional location and clearance requirements.

Regulators shall not be installed in below-grade pits or vaults.

R | Regulator installations shall be protected from damage. See Section 5112, **“Protecting Meter Installations”**, for requirements when protecting regulator installations from traffic and other hazards.

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Table 5132-1. Meter Bank Regulator Capacities in scfh

Regulator	Orifice Size (in)	20 psig System with 10 psig Minimum Inlet Pressure		30 psig System with 12 psig Minimum Inlet Pressure		50 or 55 psig System with 17 psig Minimum Inlet Pressure		Installation Type
		Outlet Pressure		Outlet Pressure		Outlet Pressure		
		7 in w.c.	2 psig ⁴	7 in w.c.	2 psig ⁴	7 in w.c.	2 psig ⁴	
B42R	1/4	850	490	1,200	550	1,300	720	Service Regulator
143-80-2HP	1/4		990		1,150		1,500	
1813C	1/4	1,010		1,160		1,520		
B-34SR	1/4x3/8	1,520		1,650		2,010		
	3/8x1/2 ¹	3,280		3,400				
	1/2x5/8 ²	5,250						
B34R	3/8x1/2	3,500	2,500	3,800	3,300	4,500	5,300	
	3/4x7/8	10,000	6,500	10,000	7,000	10,000	8,200	
	7/8x1 ³	10,000	7,500		8,200		10,000	
CL-34	7/8		13,500		14,900		18,200	
299H (Internal Registration)	1	14,350	15,460	15,800	17,600	19,100	21,500	
	1 ³ /16	17,000	17,710	16,600	18,800			
299H (External Registration)	1	19,600	24,600	22,400	27,100	28,100	32,700	
	1 ³ /16	24,100	30,200	27,500	33,400	34,800	40,500	
RB4020, 2" ⁵	2		23,900		26,900		32,600	
RB4030, 3" ⁵	3		50,900		56,600		72,100	

¹ This orifice size is not rated for inlet pressures above 50 psig.
² This orifice size is not rated for inlet pressures above 25 psig.
³ This orifice size is not rated for low pressure delivery for inlet pressures above 25 psig.
⁴ Capacities in this column are valid for 2 psig fixed factor measurement.
⁵ Capacities in this row are based on monitor/operator configuration.

R

-sizing

Meter bank regulators are sized based on the minimum inlet pressure available from the main system to which the regulator is connected. See Table 5132-1 for sizing meter bank regulators. The minimum inlet pressure for selecting regulators in this section is based on the main pressure. See Section 5128, Selecting Meters and Regulators, when selecting regulators based on service pressure. For multiple housing units, the load may be reduced by application of a diversity factor. See also Section 5128, Table 5128-2.

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For larger loads, 2 or more regulators may be installed in parallel. Parallel regulators are not permitted when the outlet pressure is set to 2 psig for fixed factor metering. Contact the Supervisor of Production Engineering for assistance when sizing or selecting regulators.

VENTS

All regulator and relief valve vents shall be piped to the outside and shall terminate where gas can vent freely away from building openings. See Section 5126, Service Regulator and Relief Valve Vents for requirements for vents and vent lines. All regulator vents and relief valve vents shall comply with the requirements of Section 5126, Regulator and Relief Valve Vents.

METER BANK SERVICE REGULATORS

Meter bank service regulators are typically internal relief valve (IRV) regulators. When there is no standard drawing covering the specific installation, contact the Supervisor of Production Engineering.

BYPASS

A bypass or provision for a bypass is required for all meter bank service regulator installations. The bypass or bypass connections shall be installed as indicated on the appropriate meter bank service regulator standard drawing.

A hard-piped bypass is required for any monitor/operator regulator installation regardless of the number of meters served. Install bypass connections for use with a temporary bypass hose when using IRV regulators. For regulator installations using a separate relief valve, either connections for a bypass hose or a hard-piped bypass shall be used in accordance with the appropriate standard drawing.

OVERPRESSURE PROTECTION

Each meter bank service regulator installation must incorporate appropriate overpressure protection. See Table 5120-1 in Section 5120, Service Regulators for the overpressure protection requirements for common situations. Contact the Supervisor of Production Engineering for conditions not covered in Table 5120-1.

METER BANK REGULATOR STATIONS

Meter bank regulator stations use either relief valves or monitor regulators for overpressure protection. When there is no standard drawing covering the specific installation, contact the Supervisor of Production Engineering.

BYPASS

A bypass or provision for a bypass shall be included with all meter bank regulator station installations. When two or more regulators are installed in parallel, one regulator run may be used to bypass the other run. Bypass connections shall be installed as indicated on the meter bank regulator station standard drawing.

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A hard-piped bypass is required for any monitor/operator regulator installation. When a separate relief valve is used for overpressure protection, either connections for a bypass hose or a hard-piped bypass shall be used.

OVERPRESSURE PROTECTION

Each meter bank regulator station installation must incorporate appropriate overpressure protection. Overpressure protection is provided by relief valves or a monitor regulator. Automatic shutoff valves used for meter bank regulator installations must be approved by the Supervisor of Production Engineering for the specific application.

Relief Valves

Relief valves are used for overpressure protection with pilot-operated regulators unless a monitor regulator is used and with an IRV regulator where the IRV has insufficient relief capacity. Table 5132-2 shows the number, size, and type of relief valves required for common situations. When 2 or more regulators are used in parallel, the relief valves need only be sized based on a single regulator failure and at least 1 relief valve is required for each regulator. Contact the Supervisor of Production Engineering for assistance in sizing relief valves for circumstances not included in Table 5132-2.

Relief valves are located as near as practical to the regulator for which the relief valves are providing protection. A single pair of block valves shall be used to isolate the regulator and relief valve together. Valves are not permitted between the regulator and relief valve.

Monitor Regulators

R | If a monitor regulator provides overpressure protection, install a separate control line for each regulator. Control lines shall be connected to the pipe a minimum of 8 pipe diameters downstream of valves, tees, or other fittings that cause disturbances in the flow. Each stopcock used to connect control lines to the pipe shall be locked in the open position. See Standard Drawing D-[5133-I-048](#) for details of control line connections.

R | A small-capacity relief valve is used with a monitor regulator for additional safety and is located in the downstream piping near the control line connections. A stopcock is used to isolate the relief valve from the piping the relief valve protects to permit maintenance activities. This stopcock shall be locked open when the regulator station is in service. See Standard Drawing D-[8421-I-049](#) for details of small-capacity relief valve installation for use with a monitor regulator.

REGULATOR TESTS

Regulators shall be tested before being placed into operation. See Section 5121, “Testing and Adjusting Service Regulators”, for regulator test requirements. Monitor and operator regulators shall be adjusted and set in accordance with the manufacturer’s procedure.

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Table 5132-2. Pressure Relief Valve Requirements

Regulators	Orifice Size (in)	Service from 20 or 30 psig High Pressure System			Service from 50 or 55 psig High Pressure System		
		Maximum Down Stream Pressure 5 psig	Maximum Down Stream Pressure 10 psig	Maximum Down Stream Pressure 15 psig	Maximum Down Stream Pressure 5 psig	Maximum Down Stream Pressure 10 psig	Maximum Down Stream Pressure 15 psig
CL-34	1/2	2 inches 289H	2 inches 289H	2 inches 289H	2 inches 289H	2 inches 289H	2 inches 289H
	5/8	2 inches 289H	2 inches 289H	2 inches 289H	2 inches 289H	2 inches 289H	2 inches 289H
299H	1	2 inches 289H	2 inches 289H	2 inches 289H	2 each 2 inches 289H	2 each 2 inches 289H	2 inches 289H
	1 ³ / ₁₆	2 each 2 inches 289H	2 inches 289H	2 inches 289H	2 each 2 inches 289H	2 each 2 inches 289H	2 each 2 inches 289H

SUPPORTS

Meter bank regulator installations shall be properly supported to prevent excessive stress on regulators or connecting piping and to permit regulators and relief valves to be changed and serviced. See appropriate standard drawing for specific support requirements.

CONCRETE PAD

A customer-provided concrete pad is required to provide adequate support for large regulator facilities. See appropriate standard drawing to determine if a concrete pad is required.

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