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Approvals



CSA Certified:
File # 2732333
CSA 3.16

Commonwealth of Massachusetts Approved Product Approval code G1-1107-35

Attention



The installation and maintenance of this product must be done under the supervision of an experienced and trained specialist. Never perform work if gas pressure or power is applied, or in the presence of an open flame.

**Safety
first
O.K.**

On completion of installation on the ball valve, perform a leakage and function test.
Note: Leakage test not needed when used as test firing valve.



Please read the instruction before installing or operating. Keep the instruction in a safe place. You find the instruction also at www.dungs.com. If these instructions are not heeded, the result may be personal injury or damage to property.

**IFGC
UL CSA
ANSI
NFPA**

This product is intended for installations covered by, but not limited to, the following codes and standards: NFPA 86, NFPA 85, NFPA 37, CSA B149.3, and CSA B149.1 as an appliance shutoff or test firing valve.



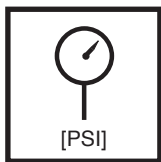
Any adjustment and application-specific adjustment values must be made in accordance with the equipment manufacturers instructions.

Explanation of symbols

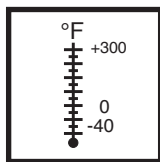
1, 2, 3 ... = Action
• = Instruction

Specification

Z014 Manually operated shutoff valve with locking handle for gas piping carrying natural gas, propane, butane, air and inert gases. Available with NBR or FKM valve seats.



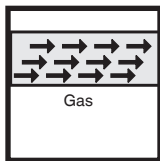
Factory Rated Max. Operating Pressure
125 PSI (8.6 bar) CSA
230 PSI (15.8 bar) Factory



Ambient / Medium Temperature
-40 °F ... +300 °F
(-40 °C ... +150 °C)



Classification of Valve
CSA 3.16



Gases
Natural gas, propane, butane & other noncorrosive gases using NBR
For biogas & corrosive gases using FKM

Materials in contact with Gas

Housing: Cast iron GGG 40
Seals: Viton or NBR
Butterfly: Stainless steel CF8M

Model	Order No.	Size	Flange Type	Bolt Type	Valve Seat
Z014	266100	1 1/2"	ANSI Class 150	Lug	NBR
Z014	266012	1 1/2"	DN 40 PN 16	Lug	NBR
Z014		1 1/2"	ANSI Class 150	Lug	FKM
Z014		1 1/2"	DN 40 PN 16	Lug	FKM
Z014	266101	2"	ANSI Class 150	Lug	NBR
Z014	266013	2"	DN 50 PN 16	Lug	NBR
Z014		2"	ANSI Class 150	Lug	FKM
Z014		2"	DN 50 PN 16	Lug	FKM
Z014	266102	2 1/2"	ANSI Class 150	Lug	NBR
Z014	266014	2 1/2"	DN 65 PN 16	Lug	NBR
Z014		2 1/2"	ANSI Class 150	Lug	FKM
Z014		2 1/2"	DN 65 PN 16	Lug	FKM
Z014	266103	3"	ANSI Class 150	Lug	NBR
Z014	266015	3"	DN 80 PN 16	Lug	NBR
Z014		3"	ANSI Class 150	Lug	FKM
Z014		3"	DN 80 PN 16	Lug	FKM
Z014	266104	4"	ANSI Class 150	Lug	NBR
Z014	266016	4"	DN 100 PN 16	Lug	NBR
Z014		4"	ANSI Class 150	Lug	FKM
Z014		4"	DN 100 PN 16	Lug	FKM
Z014	266105	5"	ANSI Class 150	Lug	NBR
Z014	266017	5"	DN 125 PN 16	Lug	NBR
Z014		5"	ANSI Class 150	Lug	FKM
Z014		5"	DN 125 PN 16	Lug	FKM
Z014	266106	6"	ANSI Class 150	Lug	NBR
Z014	266018	6"	DN 150 PN 16	Lug	NBR
Z014		6"	ANSI Class 150	Lug	FKM
Z014		6"	DN 150 PN 16	Lug	FKM

Flow Capacity

Cv Factor	NPS	DN	
55.2	1 1/2"	DN 40	
94.6	2"	DN 50	
236.6	2 1/2"	DN 65	
473.3	3"	DN 80	
883.5	4"	DN 100	
1104.3	5"	DN 125	
2366.5	6"	DN 150	

$$\left(\frac{Q}{1360 C_v} \right)^2 \frac{GT}{p_o} = \Delta p$$

Q = Flow in CFH
 p_o = Operating pressure in psia
 T = Absolute temperature of gas (°F + 460)
 G = Specific gravity of gas
 Δp = pressure drop in psia

Example of flow rates (CFH) at different pressure drops using natural gas at 70 °F

NPS	DN	Δp 0.5 in W.C.	Δp 1.0 in W.C.	Δp 5.0 in W.C.
1 1/2"	DN 40	1,212	1,715	3,835
2"	DN 50	2,078	2,939	6,572
2 1/2"	DN 65	5,197	7,350	16,437
3"	DN 80	10,404	14,713	32,901
4"	DN 100	19,409	27,448	61,377
5"	DN 125	24,259	34,308	76,716
6"	DN 150	51,988	73,522	164,401

Example of flow rates (CFH) at different pressure drops using propane gas at 70 °F

NPS	DN	Δp 0.5 in W.C.	Δp 1.0 in W.C.	Δp 5.0 in W.C.
1 1/2"	DN 40	800	1,132	2,531
2"	DN 50	1,371	1,939	4,337
2 1/2"	DN 65	3,430	4,851	10,847
3"	DN 80	6,866	9,710	21,712
4"	DN 100	12,808	18,114	40,503
5"	DN 125	16,009	22,640	50,626
6"	DN 150	34,308	48,518	108,490

Mounting

Installation Position

- The valve may be installed in any position.

Preparation for mounting flange

- Examine the valve for shipping damage.
- The inside of the valve must be clean and free of dirt and debris. Failure to remove dirt/debris could result in valve damage or cause improper performance.
- The valve and flange need to be at ambient temperatures and depressurized.
- Do not reuse an old gasket or use multiple gaskets.
- It is best to use new bolts, nuts, and washers.
- Visually examine the flange face and valve sealing ring. Both should be clean and free of surface defects that can create a leak.

Flange Mounting Procedure

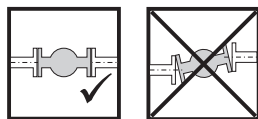
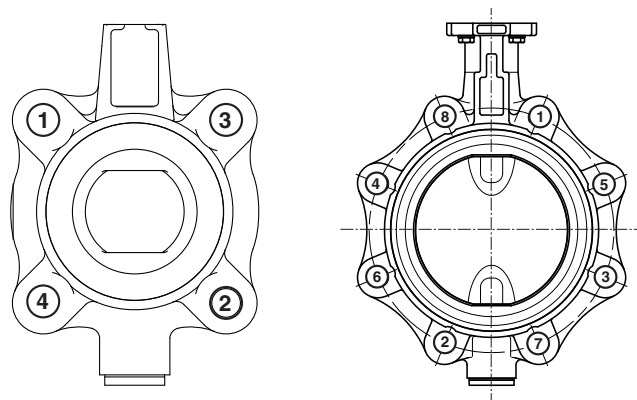
1. Insert studs, washers and nuts. Using the bolting pattern schematic according to the flange size, hand tighten the studs in a crisscross pattern starting with position #1. Hand tighten stud at position #2, then position #3, etc.
2. Next, tighten studs in a crisscross pattern to 30 % of final recommended torque for the gasket used. Check the gap of the gasket at 90° intervals around the flange. The gap shall be reasonably uniform. If not, make the appropriate adjustments of torque at selective studs before proceeding.
3. Tighten studs in a crisscross pattern to 60 % of final recommended torque for the gasket used. Check the gap of the gasket at 90° intervals around the flange. The gap shall be reasonably uniform. If not, make the appropriate adjustments of torque at selective studs before proceeding.
4. Tighten studs in a crisscross pattern to 100 % of final recommended torque, but do not overtighten studs beyond the maximum torque values listed below.

Note: Short-term bolt / stud preload loss can occur between four to twenty-four hours after initial tightening due to bolt relaxation and/or gasket creep. Repeating the step “4” recovers this loss. This is especially important for PTFE gasket.

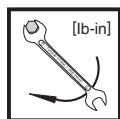
5. After installation is complete, perform a leak test.

(See page 7)

Bolting pattern



Stress free assembling!



Recommended Torque for Studs

Stud Diameter

T_{max}

M16 X 65 mm (DIN 939)
M16 X 75 mm

442 [lb-in] (50 Nm)
884 [lb-in] (100 Nm)

Achieving Gas Tightness on Flanged Connections

The correct torque on the nut is the primary means for achieving tightness for a given gasket, and the gasket manufacturer defines this minimum torque. However, there are variables that effect the torque; here is a list of some variables that effect the minimum torque required for gas tightness.

1. Flange finish (e.g. smooth or ribbed). Ribbed will provide better tightness, and the flange face needs to be free of surface defects for ideal performance.
2. Use of a washer and type of washer (external tooth lock washer or flat washer); Use of washers is recommended. For applications where there is vibration, an external tooth lock washer is recommended however, these washers will require more torque than flat washers.

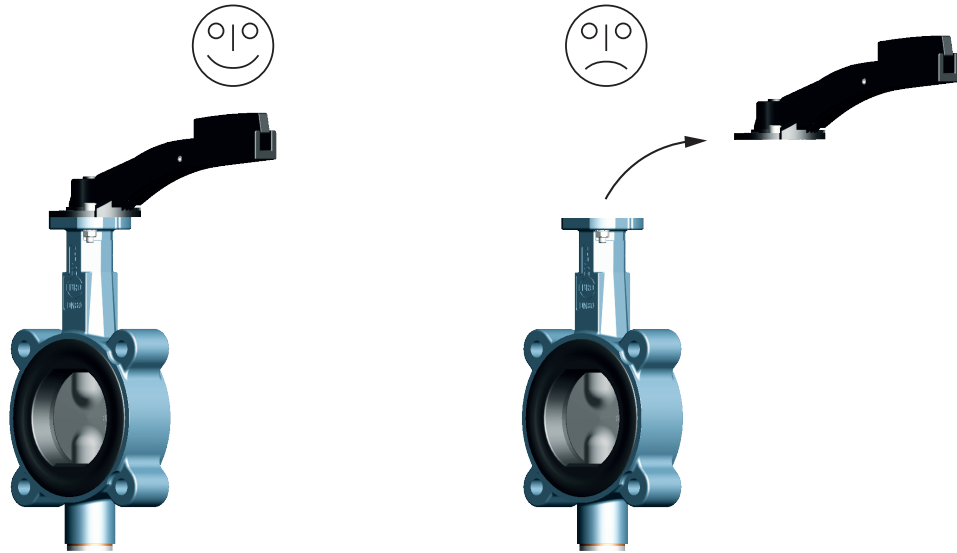
3. Bolting procedure. Following the procedure above to balance the forces on the gasket.

4. Threads (extra fine, fine, or course). Extra fine and fine threads require less torque than course threads.

5. Yield strength of the bolt/stud. Bolts/Studs with higher yield strength can withstand larger torque values, and such bolts/stud can apply more compression force on the gasket for a given torque.

6. Stud vs. bolt: Use of studs is recommended. Studs will have a higher clamp force at the same torque value than bolts.

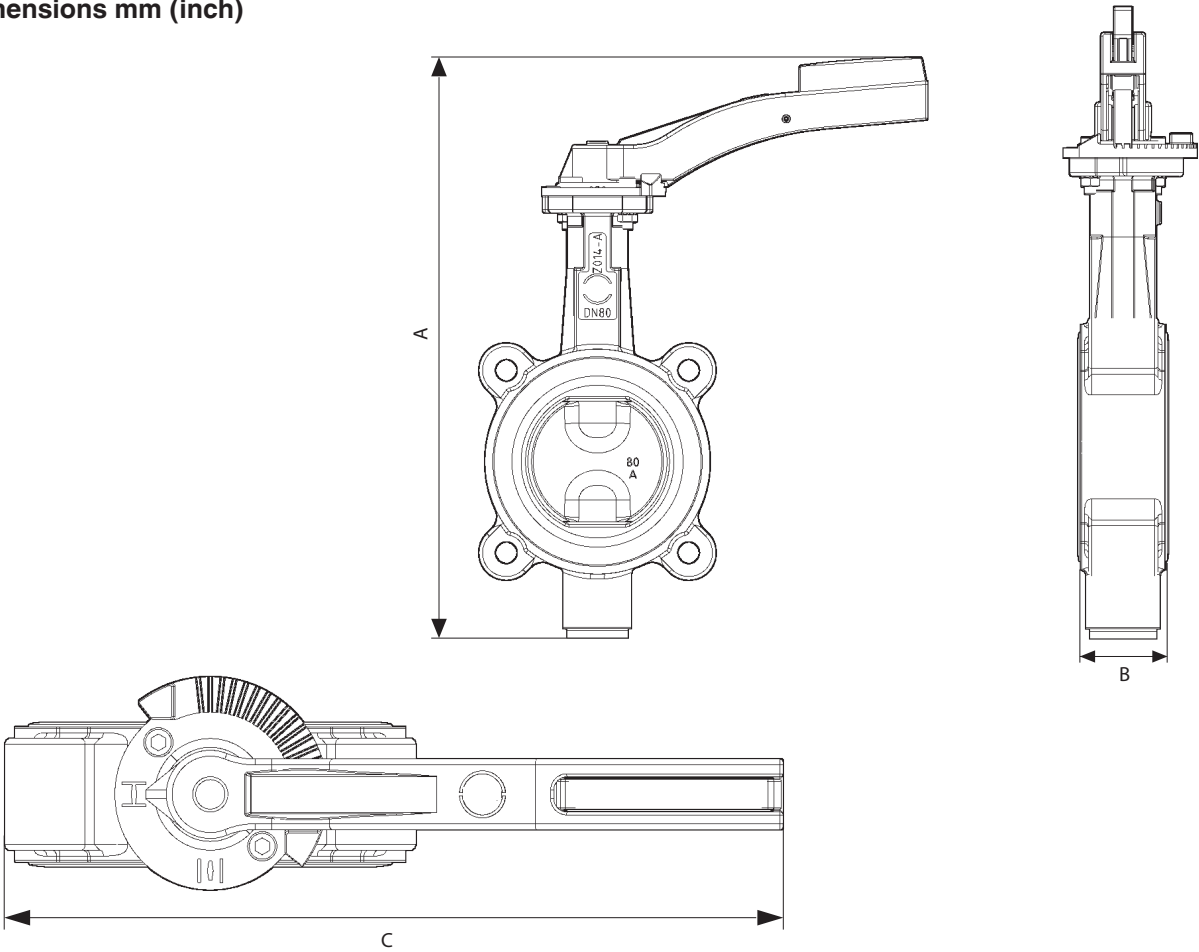
Never Remove Lever



Never permanently remove the handle from the valve.

Dimensions

Dimensions mm (inch)



Type	DN (inch)	Dimensions inch (mm)			Weight [kg]	Weight [lbs]
		A	B	C		
Z014	40 (1 ½)	10.0 (253)	1.4 (35)	8.6 (219)	4.0	8.8
Z014	50 (2)	11.2 (284)	1.8 (46)	8.9 (219)	5.0	11.0
Z014	65 (2 ½)	11.9 (301)	1.9 (49)	9.3 (235)	7.0	15.4
Z014	80 (3)	13.5 (344)	1.9 (49)	11.2 (285)	8.6	18.9
Z014	100 (4)	14.4 (366)	2.2 (55)	11.7 (298)	9.9	21.8
Z014	125 (5)	15.4 (391)	2.3 (59)	12.4 (314)	10.5	23.1
Z014	150 (6)	17.9 (455)	2.3 (59)	16.0 (407)	15.4	33.9

Maintenance and Valve Leakage Test

This requirement applies when used as an appliance shutoff valve. This valve shall be tested for operation and leakage on the initial installation and then repeated at least annually; possibly more often depending on the application, environmental parameters, and the requirements of the authority having jurisdiction.

To test for operation, actuate the valve fully open and fully closed, during which the valve shall freely move continuously without high resistance except near the fully closed position, which will require a higher force to close the valve.

To test for external leakage, apply an all purpose liquid leak detector solution to the inlet and outlet of gaskets of the valve and to the valve handle. The presence of bubbles indicates a leak, which needs to be rectified before proceeding.

To test for valve seat leakage, close a downstream valve. With a test port in between the Z014 and the closed downstream valve, immerse the 1/4 in. tube vertically 1/2 in. (12.7 mm) below the water surface. If bubbles emerge from the 1/4" tube and after the leakage rate has stabilized, count the number of bubbles appearing during a 10 second period. If more than six bubbles appear during the 10 seconds replace the valve.



If the valve fails leak and operation testing, replace the valve.

Accessories & Replacement Parts

Order No.	Description
278748	Replacement Lever (handle) DN 40 - 65 (1 1/2" - 2 1/2")
278751	Replacement Lever (handle) DN 80 - 125 (3" - 5")
278752	Replacement Lever (handle) DN 150 (6")

Flange Type	DN Size	NPS Size	Number of holes	Mating Flange Order No. (4)	Bolt Size (1)	Stud Set (2) (3)
ISO PN 16	40	1 1/2"	4	227137	M16 x 50	260732
ISO PN 16	50	2"	4	227138	M16 x 50	260732
ISO PN 16	65	2 1/2"	4	227139	M16 x 50	260732
ISO PN 16	80	3"	8	243219	M16 x 50	260732
ISO PN 16	100	4"	8	227141	M16 x 50	260732
ISO PN 16	125	5"	8	227142	M16 x 50	260732
ISO PN 16	150	6"	8	227143	M20 x 55	260733
ANSI Class 150	40	1 1/2"	4	302929	UNC 1/2-13 x 2"	297262
ANSI Class 150	50	2"	4	267957	UNC 5/8-11 x 2"	277080
ANSI Class 150	65	2 1/2"	4	272158	UNC 5/8-11 x 2"	277080
ANSI Class 150	80	3"	8	272159	UNC 5/8-11 x 2.5"	277081
ANSI Class 150	100	4"	8	278746	UNC 5/8-11 x 2.5"	277081
ANSI Class 150	125	5"	8	Not created	UNC 3/4-10 x 3"	287254
ANSI Class 150	150	6"	8	267757	UNC 3/4-10 x 3"	287254

1 One size longer stud might also work in applications where space permits.

2 Stud set includes one stud, one lock washer, and one nut.

3 Stud Grade:

For ISO: DIN 939 Zinc Plated Steel

For ANSI: B7 Zinc Plated

4 No gasket needed. Valve comes with integrated gasket on each side.

We reserve the right to make modifications in the course of technical development.

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