6GA SERIES
MODELS 610F, 611F, 620F & 621F

IRON GATE VALVE

INSTALLATION
OPERATION
MAINTENANCE
GUIDE

INTRODUCTION

The APOLLO® Iron Gate valves covered in these guidelines are bolted bonnet, outside screw and yoke – rising stem and inside screw – non rising stem valve types. They are used to start or stop the flow of fluid in a piping system. The valve is operated from a handwheel. Gate valves should always be used in the full open or full closed position. Flow through the valve is stopped by forcing a wedge (disc) down between the tapered seat rings.

In OS&Y rising stem valves, the gate is attached to a threaded stem with a handle that connects to the yoke element. As the operator rotates the handle counterclockwise, the stem rises out of the handle, opening the gate. A clockwise rotation of the handle moves the stem back into the gate and closes the valve. When the stem is no longer protruding beyond the handle, the gate valve is closed. The advantage of using an OS&Y gate valve is that you can visually see if the valve is open or closed by the position of stem.

In Non-rising stem valves, the stem is held in place between the bonnet and stuffing box. The stem threads are engaged with the internal threads of the gate. A clockwise rotation of the handle moves the gate down the stem and closes the valve and a counterclockwise rotation opens the valve. The advantage of using a Non-rising stem gate valve is when there is limited space for installation.

The APOLLO® Iron Gate valves have approval to NSF 372 "Drinking Water System Components" and NSF 61 "Drinking Water System Components-Mechanical Devices".

Table 1 APOLLO® Series & Model Numbers

SERIES	MODEL	DESCRIPTION
6GA-10x	**610F**	**Class 125 Flanged Non Rising Stem, Bronze Mount**
6GA-20x	**620F**	**Class 250 Flanged Non Rising Stem, Bronze Mount**
6GA-11x	**611F**	**Class 125 Flanged OS&Y, Bronze Mount**
6GA-21x	**621F**	**Class 250 Flanged OS&Y, Bronze Mount**

x – indicates pipe size. (Reference Table 2 below)

Table 2 APOLLO® Pipe Size (x) Designations

Pipe Size	Apollo code		Pipe Size	Apollo code		Pipe Size	Apollo code		Pipe Size	Apollo code
2"	**8**		**5"**	**B**		**12"**	**H**		**20"**	**N**
2-1/2"	**9**		**6"**	**C**		**14"**	**J**		**24"**	**P**
3"	**0**		**8"**	**E**		**16"**	**K**			
4"	**A**		**10"**	**G**		**18"**	**M**			

Example: 6GA-10x-01

Size Code

Table 3 Apollo® Gate Valve Material Designation

PART	**MATERIAL**
BODY	CAST IRON (ASTM A126 CL B)
SEAT RINGS	CAST BRONZE (ASTM B62)
WEDGE FACE RINGS	CAST BRONZE (ASTM B62)
WEDGE	CAST IRON (ASTM A126 CL B)
WEDGE NUT	CAST BRONZE (ASTM B62)
STEM	BRASS (ASTM B16)
BODY GASKET	GRAPHITE
BOLTS	CARBON STEEL (ASTM A307 B)
NUTS	CARBON STEEL (ASTM A307 B)
BONNET	CAST IRON (ASTM A126 CL B)
GLAND FOLLOWER BOLTS	CARBON STEEL (ASTM A307 B)
STUFFING BOX GASKETS	GRAPHITE
STUFFING BOX	CAST IRON (ASTM A126 CL B)
PACKING	GRAPHITE
PACKING GLAND	CAST BRONZE (ASTM B584)
HANDWHEEL	CAST IRON (ASTM A 126 CL B)
HANDWHEEL NUT	DUCTILE IRON (ASTM A536 65-45-12)
WASHER	CARBON STEEL (ASTM A307 B)
GLAND FOLLOWER NUTS	CARBON STEEL (ASTM A307 B))
GLAND FOLLOWER	DUCTILE IRON (ASTM A536 65-45-12)
YOKE	CAST IRON (ASTM A126 CL B)
YOKE BUSHING	CAST BRONZE (ASTM B62)
YOKE BUSHING NUT	CAST IRON (ASTM A126 CL B)
SCREW	CARBON STEEL (ASTM A307 B)
NAMEPLATE	ALUMINUM

Pressure/Temperature Ratings

Class 125
Saturated Steam: 125 psi (8.6 Bar) to 353°F (178°C) (2”-12”)
100 psi (6.9 Bar) to 338°F (170°C) (14”-24”)
Cold Working Pressure: 200 psi (13.8 Bar) at 100°F (2”-12”)
150 psi (10.3 Bar) at 100°F (14”-24”)

CLASS 250
Saturated Steam: 250 psi (17.2 Bar) to 406°F (207°C)
Cold Working Pressure: 500 psi (34.5 Bar) at 100°F

Note: Also see Table 6 in Operation section

Product Marking
All APOLLO® Gate Valves are equipped with a nameplate attached under handwheel nut (Figure 1). This plate provides the model number, part number, size, max pressure rating, and date of manufacture.

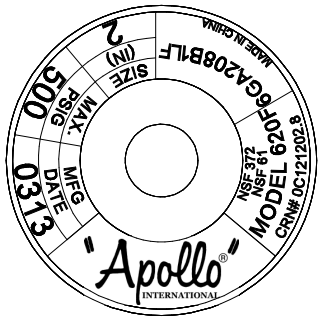

FIGURE 1. APOLLO® IRON GATE VALVE NAMEPLATE EXAMPLE

INSTALLATION

APOLLO® gate valves are designed for use between the faces of ANSI 125 and 250 pound flat flanges. Proper piping alignment prior to the installation should be. Raised faced flanges are not recommended.
Gate valves are normally installed in horizontal pipe with vertical stem.
They can also be installed other than vertical, but this may require special construction depending on valve size, service condition and medium. For a correct operation, Conbraco recommends that the valve stem shall be oriented inclined above horizontal, with vertical being the preferred orientation. Different positions may cause poor valve operation, and/or a quick deterioration of the valve. The valve should be installed with the wedge in the closed position, to ensure that the seat ring in the wedge is not damaged during installation.

Installation Instructions

Step 1. Check to make sure that the pipe flange and valve sealing faces are clean and free from any debris (pipe scale, welding slag, etc.).

Step 2. Check the valve nameplate to ensure that the pressure and valve materials are correct for the application.

WARNING! – APOLLO® gate valves should never be installed where service conditions could exceed the valve ratings. Failure to heed warning may result in personal injury or property damage.

Step 3. Place the valve between the two flanges of the pipe and put the seal gasket between the valve flange and the pipe flange; make sure that it is correctly positioned.

Step 4. Assemble the valve to the pipe using properly sized bolts for application. See Tables 4 and 5 below. Progressively tighten to the torque value recommended by the seal gasket provider. See Figure 2 for recommended method.

After the valve installation on the line and before the line pressurization, the following activities must be performed:
- the packing bolts must be verified for tightness, DO NOT OVERTIGHTEN.
- the torque of the body-bonnet bolts must be verified for tightness
- the valve must be fully stroke operated

Table 4 Stud/Bolt Iron Flange – Class 125

Valve Size		Diameter	Length	Qty
(in)	(mm)			
2	50	5/8”	3-1/2”	4
2.5	65	5/8”	3-3/4”	4
3	80	5/8”	3-3/4”	4
4	100	5/8”	3-3/4”	8
5	125	3/4”	4”	8
6	150	3/4”	4-1/4”	8
8	200	3/4”	4-1/2”	8
10	250	7/8”	4-3/4”	12
12	300	7/8”	5”	12
14	350	1”	5-1/2”	12
16	400	1”	5-1/2”	16
18	450	1-1/8”		16
20	500	1-1/8”		20
24	600	1-1/4”		20

Table 5 Stud/Bolt Iron Flange – Class 250

Valve Size		Diameter	Length	Qty
(in)	(mm)			
2	50	5/8”	3-3/4”	8
2.5	65	5/8”	4-1/4”	8
3	80	5/8”	4-1/2”	8
4	100	5/8”	4-3/4”	8
5	125	5/8”	5”	8
6	150	5/8”	5”	12
8	200	7/8”	5-3/4”	12
10	250	1”	6-1/2”	16
12	300	1-1/8”	7”	16
14	350	1-1/8”	7-1/4”	20
16	400	1-1/4”	7-3/4”	20
18	450	1-1/4”	8”	24
20	500			
24	600			

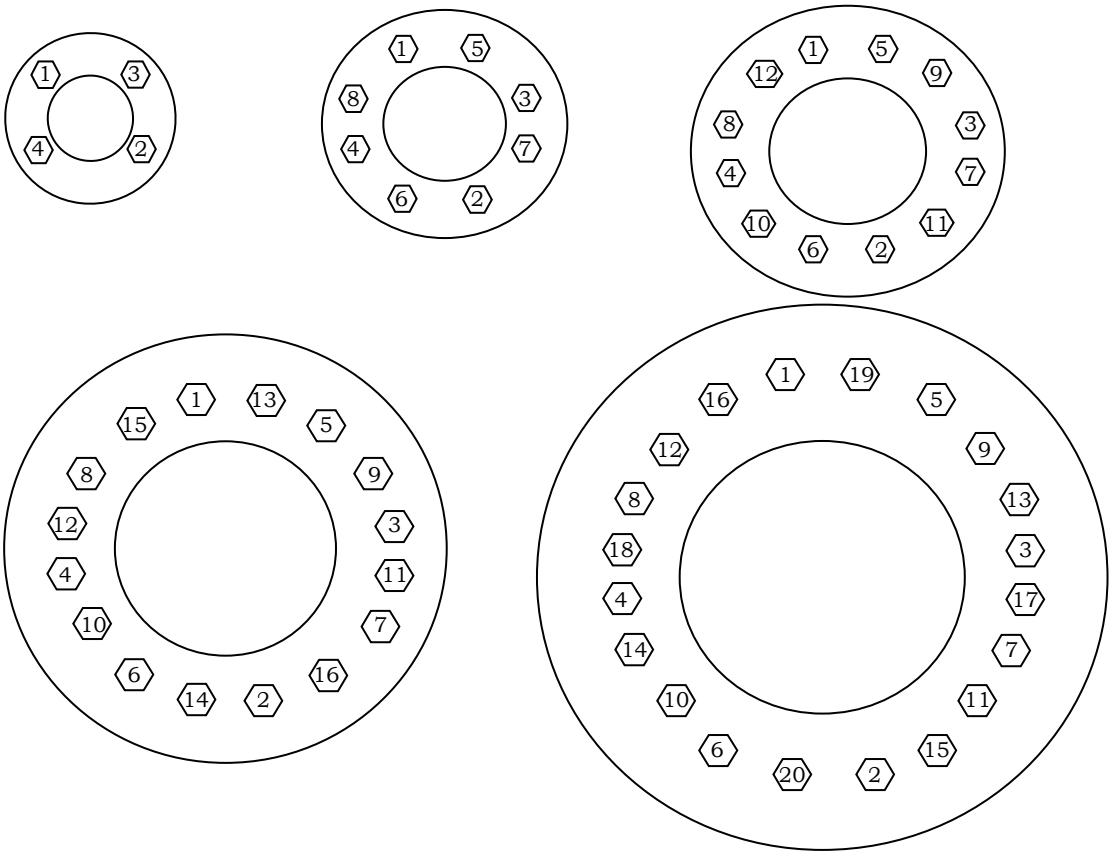

FIGURE 2. Bolt Tightening Sequence

OPERATION

APOLLO® Iron Gate valves are intended to provide years of reliable service in an on/off application. They are used to restrict flow when needed. They should always be operated in a fully open or fully closed position. Gate valves are not to be used for throttling as seat damage may result. Erosion of seats could result if throttling for extended periods of time. Care should be taken when operating in either closed or open position for extended periods of time. Line contamination may cause difficulty in opening or closing. A routine cycling should be implemented depending on fluid condition and usage.

Table 6 Pressure-temperature ratings

Temperature (°F)	Pressure (PSIG)			
	Class 125 Iron		Class 250 Iron	
	Sizes	Sizes	Sizes	Sizes
	2-12	14-24	2-12	14-24
-20 to 100	200	150	500	300
150	200	150	500	300
200	190	135	460	280
250	175	125	415	260
300	165	110	375	240
350	150	100	335	220
400	140		290	200
450	125		250	

MAINTENANCE

APOLLO® Iron gate valves are designed for extended service with minimal wear and servicing. Replacement parts are not available. The pipeline on either side of the valve must be depressurized and drained prior to repair.

Valve Seat

Leakage through the valve is generally caused by foreign matter lodged in the seat seal. This leakage can be overcome by cycling the valve or flushing. If leakage persists, disassemble the valve and examine the seat surface on the wedge and the body. Minor scratches can be corrected by polishing the wedge face with 400 grit sandpaper on a flat plate. It is critical to keep the surface flat.

Bonnet Joint

Leakage through the bonnet joint may be corrected by tightening bonnet bolts. Reference Table 7 below for recommended torque values depending on bolt size. See Figure 2 for recommended tightening sequence. If tightening does not correct leakage, replacement of graphite gasket will be required.

Table 7 Bonnet Bolt Torque

Bolt size	5/8”	¾”	7/8”	1”	1-1/8”	1-1/4”	1-3/8”
Torque (Ft. Lbs.)	90	150	200	300	475	660	885

Stem Packing

Leakage through the hand wheel stem may be corrected by tightening the packing nuts. Excessive tightening may cause difficult operation of the valve. Tightness should be just enough to stop the leak. If the packing gland screw has run out of travel, repacking graphite gasket will be required.

Repacking of valves under pressure is **NOT** recommended. Even if valve is back seated foreign matter may interfere with full closure and injury could occur.