Installation and Maintenance Guide
NIBCO UL/FM Butterfly Valves
for Closed Fire Protection Service

KEY TO NIBCO BUTTERFLY VALVE FIGURE NUMBER SYSTEM

G	D -	4	7	6	5 -	C -	8N
BODY TYPE	**BODY MATERIAL**	**PRESSURE RATING**	**SEAT MATERIAL**	**DISC MATERIAL**	**STEM MATERIAL**	**MONITOR POSITION**	**MONITOR TYPE**
G-GROOVED **L**-LUG **W**-WAFER	**D**-DUCTILE IRON	**3**-250 PSI **4**-300 PSI **6**-350 PSI	**5**- UL/FM **7**-POLYAMIDE	**1**-DUCTILE IRON **6**-EPDM COATED DUCTILE IRON	**0**-416 SST **5**-416 SST	**C**-CLOSED SERVICE	**8/8N**-DUAL SWITCHES

NIBCO GD-4765-C-8N, LD-3510-C-8, and WD-3510-C-8 Butterfly Valves are UL listed and FM approved for Fire Protection Service. NIBCO GD-6765-C-8N is UL listed. The alarm switches are designed for CLOSED valve position monitoring. The gear operator is painted yellow and the indicator flag is painted red to distinguish that the valve is for CLOSED service.

LD-3510-C-8

WD-3510-C-8

GD-4765-C-8N
GD-6765-C-8N

I. INSTALLATION GUIDELINES

NIBCO Butterfly valves are bi-directional and may be installed with flow in either direction. Lug and Wafer style valves are designed and suitable for installation between ANSI Class 125 and 150 flanges. Because of the unique seat design, NIBCO butterfly valves do not require the use of flange gaskets. Grooved style butterfly valves connect to metallic pipe of IPS per AWWA C606. The butterfly valve can be installed in any horizontal or vertical piping position.

These valves are designed so the disc, when in the OPEN position, will clear the inside diameter of schedule 40 or 80 steel pipe. See Figure 1 and Table 1 for Lug and Wafer style valves, and Figure 4 and Table 3 for Grooved style valves. Inspect to assure that the disc, in the OPEN position, does not interfere with adjacent components. It is best to have six (6) pipe diameters from other line components. Always close the valve before installation to prevent disc damage. Never apply any type of lubricant to the disc, seat, or rubber seal faces as it may not be compatible with the rubber.

For Fire Protection service valves, the gear operator orientation to the valve body piping connections cannot be changed. Determine desired location of the handwheel for best valve operation convenience and install the valve into the piping allowing this.

II. VALVE INSTALLATION PROCEDURE – LUG & WAFER STYLES ONLY

1. Make sure flange faces are clean of any foreign material such as scale, metal shavings or welding slag. Carefully insert the valve between pipe flanges.
2. Line-up, center, and secure valve to flanges using desired bolts or studs (see Figure 3) as listed in Table 2 below. Do not tighten bolts at this time.
3. Carefully OPEN the valve fully to assure there are no obstructions at the disc. After proper operation is verified, tighten the bolts to the minimum recommended bolt torques listed in Table 2 below using cross-over pattern shown below in Fig. 2.
4. Pressurize piping and inspect valve connections for leakage. If leakage is observed, tighten bolts using cross-over pattern, increasing torque until leakage stops. DO NOT EXCEED MAXIMUM TORQUES LISTED IN TABLE 2 BELOW.
5. Recommended torques are made without warranty. Installer must verify proper strength bolts for application. Bolts shall be clean and un-lubricated.

Fig. 2

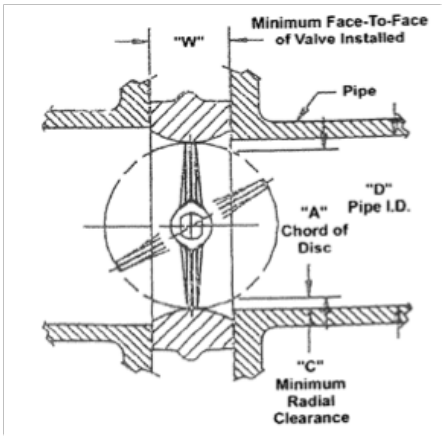
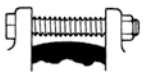


Fig. 1

Table 1

VALVE SIZE	DISC CORD DIMENSION	CLEARANCE MSS SP-67	MINIMUM PIPE ID	MAXIMUM PIPE SCHEDULE	VALVE WIDTH
	A	C	D	40	W
2½"	2.00	0.06	2.37	80	1.81
3"	2.55	0.06	2.67	80	1.81
4"	2.58	0.06	3.75	80	2.06
6"	5.75	0.06	5.87	40	2.19
8"	7.77	0.12	8.02	40	2.38

Suggested Bolting Methods



WAFER STYLE
(Cap Screw & Nut)

LUG STYLE
(Stud & Nuts)

LUG STYLE
(Cap Screws)

Fig. 3

Table 2 **Cap Screw Requirements For Butterfly Valves**

Valve Size	Total Valve Body Width	ANSI B16.1 Class 125 Cast Iron Flange Thickness	ANSI B16.5 Class 150 Steel Flange Thickness	Recommended Cap Screw Length (Lug Style Valves)	Recommended Cap Screw Length (Wafer Style Valves)	Total Quantity of Cap Screws LD Lug / WD Wafer (Mounting 2 Flanges)	Cap Screw Size	Minimum Bolt Torque (Ft·lbs)	Maximum Bolt Torque (Ft·lbs)
2½"	1.81	0.69	■	1.50	5.00	8 / 4	5/8-11 UNC	20	70
		■	0.88	1.75					
3"	1.81	0.75	■	1.50	5.00	8 / 4	5/8-11 UNC	20	70
		■	0.94	1.75					
4"	2.06	0.94	0.94	1.75	5.00	16 / 8	5/8-11 UNC	20	70
6"	2.19	1.00	1.00	2.00	6.00	16 / 8	3/4-10 UNC	30	120
8"	2.38	1.12	1.12	2.25	6.00	16 / 8	3/4-10 UNC	30	120

Note: Do not use flange gaskets when mounting valves to flanges.

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III. VALVE INSTALLATION PROCEDURE – GROOVED STYLE ONLY

1. Each manufacturer has installation instructions depending on the specific grooved coupling fitting being used. Refer to and follow those installation instructions. The general steps are:
2. Lubricate the fitting gasket.
3. Slip the gasket onto the end of the grooved pipe.
4. Match end of valve connection with pipe and partially slip gasket onto valve body. Gasket should be centered between groove on pipe and groove on valve body.
5. Place first half of fitting over gasket, making sure fitting key aligns with groove.
6. Place second half of fitting over gasket, making sure fitting key aligns with groove.
7. Secure fitting halves together by installing and evenly tightening fitting bolts.

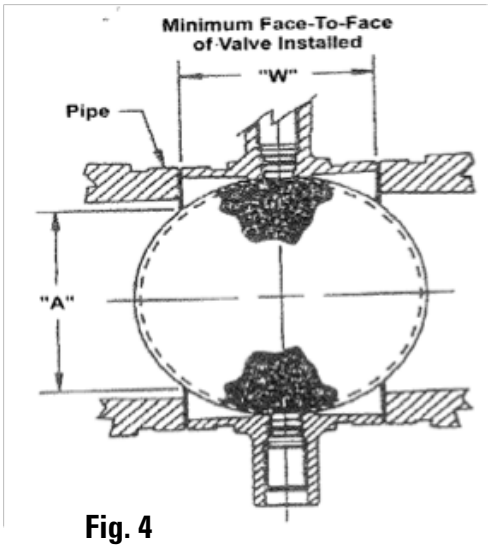

Fig. 4

Table 3 **Grooved End Valves**

VALVE SIZE	DISC CORD DIMENSION	MAXIMUM PIPE SCHEDULE	VALVE WIDTH
	A	D	W
2½"	0.00	160	3.85
3"	0.00	160	3.85
4"	0.00	160	4.56
6"	0.67	160	5.86
8"	5.87	160	5.26

IV. GEAR OPERATOR STOP ADJUSTMENT PROCEDURE

1. Rotate the handwheel clockwise until it stops. Visually check to see that the valve disc is centered in the valve seat for proper seal. Note that the red indicator flag on top of gear operator represents the disc position. If the stop location is not correct, proceed to step 4.
2. Rotate the handwheel counter-clockwise until it stops. Visually check to see that the valve disc is centered in the valve opening. Note that the red indicator flag on top of gear operator represents the disc position. If the stop location is not correct, proceed to step 4.
3. If both stops are set correctly, valve is ready for installation.
4. Stop adjustment – Using a 5mm hex Allen wrench, remove both locking set screws (A) as shown in Figure 5.

- SHUT stop adjustment - Using a 5mm hex Allen wrench, turn set screw (B) counter-clockwise 2 turns. Rotate handwheel until disc is centered in valve seat. Turn set screw (B) clockwise until it stops. Secure set screw "B" by replacing only one locking set screw (A) in same hole and tightening it until it stops.
- OPEN stop adjustment – Using 5mm hex Allen wrench, turn set screw (C) counter-clockwise 2 turns. Rotate handwheel until disc is centered in valve opening. Turn set screw (C) clockwise until it stops. Secure set screw (C) by replacing second locking set screw (A) in same hole and tightening it until it stops.

5. Again verify both OPEN and SHUT stops are correctly set. Repeat step 4 if necessary.

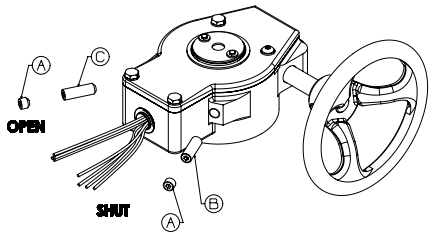

Fig. 5

SWITCH WIRING

1. See Figure 6 for Supervisory Switch wiring schematic.
2. See Figure 7 for Auxiliary Switch wiring schematic.

SWITCH DATA
MANUFACTURER: HONEYWELL MICRO-SWITCH
FIGURE NUMBER: V7-1B17D8-022
RATINGS: 11A 1/3HP 125, 250, 277 vAC
1/2A 125vDC, 1/4A 250vDC, 4A 125vAC "L"

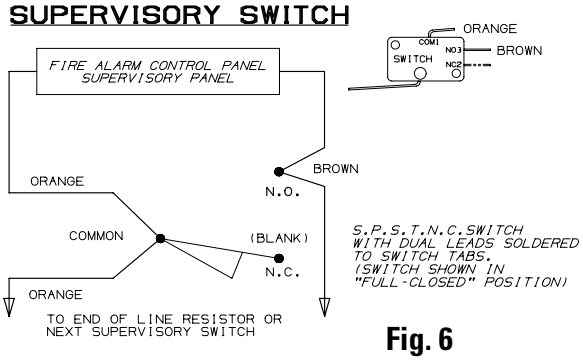

Fig. 6

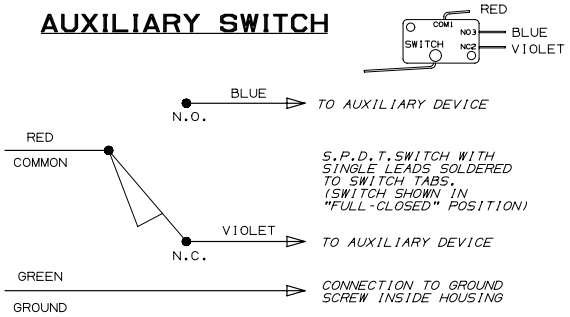

Fig. 7

V. FACTORY INSTALLED SWITCH REPLACEMENT

1. See Figure 8 - Remove Flag (A) by backing out (approximately 2 turns) socket screw (B).
2. Remove one socket pin head screw (C), three hex head bolts (D), and gear operator cover (E). Note that a special wrench is required to remove the "tamper-proof" socket pin head screw (C).
3. Remove two slotted head screws that hold switch assembly (F) into housing, and one slotted head screw that secures ground wire. Remove switch assembly (F).
4. Feed electrical wires on new switch assembly through hole in rear of housing. Place switch assembly (F) into housing with actuating arms against the segment gear. Make sure insulation paper is located under switches.
5. Reinstall two screws to secure switch assembly and one screw to secure ground wire to housing.
6. Conduct a continuity test to assure switches are properly set.
7. Reinstall cover (E) and screws (C) and (D).

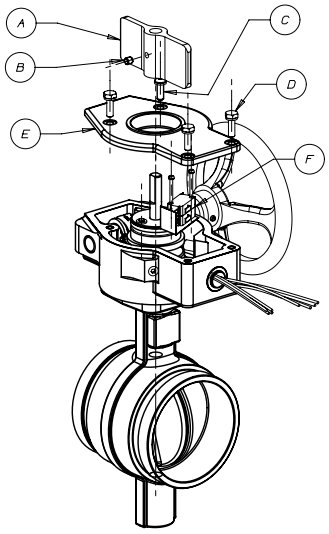

Fig. 8

VI. DRIVE KEY REPLACEMENT INSTRUCTIONS UL/FM

NOTE: All replacement parts must be obtained from your NIBCO Distributor. Drive Key material and size is specifically designed to meet performance requirements of UL and FM. The Drive Key is the designated section of weakness and must fail if excessive torque is applied to the input of the gear operator. Failure to use properly sized replacement parts may void UL and FM listings.

1. See Figure 9 - Remove Flag (A) by backing out (approximately 2 turns) socket screw (B).
2. Remove four hex head cap screws (G) that fasten gear operator (H) to the valve.
3. Lift the gear operator straight up from the valve. In most cases the adapter bushing (K) will stay in the gear operator segment gear because the broken key causes interference with the gear ID and the adapter bushing.
4. Pull the adapter bushing (K) from the gear operator. Some force may be required.
5. Remove the broken key from both the adapter bushing and keyway inside of the segment gear.
6. Place new key (J) into adapter bushing (K) keyway and slide adapter bushing into segment gear while aligning key with segment gear keyway.
7. Carefully slide the gear operator over valve stem until it rests flush on top of valve flange. The gear operator handwheel may need to be rotated in order to align pin in gear operator base with slot in valve mounting flange.
8. Secure gear operator to valve using four hex head cap screws (G). Replace flag (A) on stem and secure by tightening set screw (B).
9. Check operation by cycling valve from fully OPEN position to fully SHUT position.

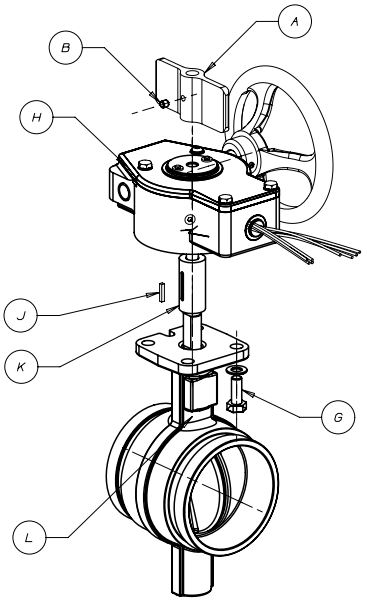

Fig. 9

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