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Type C477GFV Modular Foot Valve Assembly for ISO Containers

🚹 WARNING

Failure to follow these instructions or to properly assemble this equipment could result in an explosion, fire and/ or chemical contamination causing property damage and personal injury or death.

Fisher[®] equipment must be installed, operated and maintained in accordance with federal, state and local codes and Emerson Process Management Regulator Technologies, Inc. instructions. The installation in most states must also comply with NFPA No. 58, and ANSI Standard K61.1.

Only personnel trained in the proper procedures, codes, standards and regulations of the applicable industrial service should assemble, install and service this equipment.

The use of non-Fisher actuators will void internal valve warranty and may result in leakage of the gland packing caused by premature wear. In addition to premature wear, the use of non-Fisher actuators may result in lower than expected flow rates and possible leakage across the valve seats.

Introduction

Scope of the Manual

This instruction manual provides instruction for the installation, operation and maintenance of Type C477GFV foot valves for ISO containers.



Figure 1. Type C477GFV Modular Foot Valve Assembly

Reference separate instruction manuals for complete specification, installation, operation, troubleshooting, maintenance and disassembly of each separate component, D450324T012 (N600 Series Ball Valves Instruction Manual) and D450231T012 (C891, C897 and C477G Series Jet Bleed Internal[™] Valves Instruction Manual).

Product Description

Fisher Type C477GFV modular foot valves are installed at the bottom of ISO containers to ensure that the loading and unloading of fluid products are controlled and to prevent leakage from the container connection during transportation. Type C477GFV modular foot valves are available in 2 and 3 in. NPT stainless steel bodies.



0450333T012



Specifications

KEY NUMBER	2 IN. NPT FOOT VALVE		3 IN. NPT FOOT VALVE	
	Part/Assembly Number	Description	Part/Assembly Number	Description
1	C477G-16-25	2 in. Stainless steel internal valve	C477G-24-46	3 in. Stainless steel internal valve
2	ERAA03425A0	2 in. Stainless steel pipe nipple	ERAA03429A0	3 in. Stainless steel pipe nipple
3	N610L-16	2 in. Stainless steel ball valve	N610L-24	3 in. Stainless steel ball valve
4	M263L	Stainless steel adaptor, 2 in. x 3-1/4 ACME	M523L-24	Stainless steel adaptor, 3 in. x 3-1/4 ACME
5	M441	Brass cap, 3-1/4 ACME	M441	Brass cap, 3-1/4 ACME

Maximum Operating Pressure⁽¹⁾: 400 psig / 27.6 bar

Temperature Capabilities⁽¹⁾: -60 to 150°F / -51 to 66°C

1. The pressure/temperature limits in this Instruction Manual, and any applicable standard or code limitation should not be exceeded.



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ORIENT HANDLES OF INTERNAL VALVE AND BALL VALVE SO THAT THEY DO NOT INTERFERE WITH EACH OTHER

Figure 2. Modular Foot Valve Handles Orientation



Figure 3. Type C477GFV Modular Foot Valve Assembly Drawing

Type C477GFV modular foot valve as assembled in the factory is composed of a complete set of valves and accessories listed in Specifications table. This includes an internal valve (Type C477G Jet Bleed Internal[™] Valve) and a hand ball valve (Type N610L Ball Valve) connected together by a pipe nipple and a sealing brass cap which is connected to the end of the assembly through a stainless steel adaptor.

Installation

To avoid any personal injury, make sure to close the internal valve and ball valve before removing the brass cap (key 5) after any leak test procedure or when the foot valve is already installed.

Do not install the modular foot valve assembly with such extreme torque that the ISO container coupling can cut threads into the valve. This could cause valve distortion and affect the internal working parts. Do not use excessive force to remove the brass cap (key 5) during installation, leak testing or while in service. If the cap is difficult to remove, counterhold the adaptor (key 4) while removing the cap to prevent loosening of any joints and to avoid leakage.

Before installing the foot valve into an ISO container, add additional support for the valve assembly if needed. The additional support may be necessary to ensure the foot valve is adequately protected and a secure connection to the container is maintained.

Apply thread sealant appropriate for the installation's service and temperature conditions to the internal valve's (key 1) male NPT threads, and if required, to ISO container's female threads. Install the modular foot valve assembly into the ISO container hand tight, then properly tighten using a wrench on the internal valve wrench flats, but do not over torque. After installation, test the whole unit to ensure leak free operation.

Ensure that the handles of the ball valve and internal valve are oriented so that they don't interfere with each other. The ball valve handle should not be obstructed by the internal valve handle's operating path. See Figure 2 for proper positions of handles to ensure the closing path of the ball valve handle will be directed away from the internal valve handle.

Operation

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The internal valve must be closed except during product transfer. A line break downstream of a pump may not actuate the excess flow valve. If any break occurs in the system or if the excess flow valve closes, the system must be shut down immediately.

- 1. Before a fluid transfer, verify that the Type N610L ball valve (key 3, Figure 3) handle and the internal valve is closed. See ball valve operation below.
- 2. Remove the Type M441 end cap (key 5) slowly and install the connecting hose.
- 3. Open the internal valve (key 1) partially. Once pressure equalization is reached, the internal valve poppet will fully open (refer to Type C477G Instruction Manual).
- 4. Open the ball valve handle (key 3) to begin the fluid transfer.
- 5. Once the tank fluid transfer is completed, close the internal valve (key 1) then perform any necessary downstream bleeding.
- 6. Remove the connecting hose, close the ball valve (key 3) and re-install the end cap (key 5).

Ball Valve Operation (See Figure 2)

- 1. To open valve from the closed position, rotate the handle a quarter turn counter clockwise until it is oriented parallel to valve body.
- 2. To close valve from the open position, rotate the handle a quarter turn clockwise until it is oriented perpendicular to valve body.

Maintenance

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Do not use these internal valves if they leak, fail to work properly, have been damaged or have missing parts. Prompt repairs should be made by a properly trained service person. Continued use without repair can create a hazardous or injurious situation. A simple preventative maintenance program for the valve and its controls will eliminate a lot of potential problems

Fisher[®] recommends these steps be conducted once a month. Also refer to applicable regulations for further specifications. For United States, refer to the Department of Transportation (DOT) CFR 49 Sections 180.416 and 180 Appendix A and B.

- 1. Review and complete the recommended maintenance procedures in the Type C477G Internal Valve Instruction Manual.
- 2. Inspect the ball valve operating lever to see that it operates freely and that there is no leakage around the retainer nut. If there is sticking or leakage, replace the ball valve (key 3). See below for detailed instructions.
- 3. Replace the elastomeric flat seal on adaptor (key 4) as part of preventative maintenance or if it is observed to be damaged or worn.

Replacing Ball Valves

In replacing ball valves, follow the instructions below and reference Figure 3:

- 1. Confirm internal valve (key 1) is closed.
- 2. While firmly holding internal valve (key 1) in place, turn ball valve (key 3) and remove it (with the rest of foot valve).
- 3. Remove adaptor (key 4) from ball valve (key 3). Clean exposed threads.
- 4. Remove pipe nipple (key 2) from ball valve (key 3) (if still attached). Clean exposed threads.
- 5. Apply thread sealant on new ball valve (key 3) and adaptor mating threads. Securely assemble them together. Do not over tighten.
- 6. Apply thread sealant on pipe nipple (key 2) threads, on mating ball valve (key 3) and on internal valve (key 1) threads.
- 7. Loosely insert pipe nipple (key 2) between internal valve (key 1) and ball valve (key 3).
- 8. While firmly holding internal valve (key 1) in place, grab ball valve (key 3) and securely assemble it with pipe nipple (key 2) and internal valve, making sure valve handles will not interfere. Do not over tighten.
- 9. Allow for thread sealant curing time as needed.
- 10. Verify there are no leaks.



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□ APPLY LUBRICANT (L) / SEALANT (S)⁽¹⁾: L = MULTI-PURPOSE POLYTETRAFLUOROETHYLENE (PTFE) LUBRICANT S = SEALANT

1. Lubricant and sealant must be selected such that they meet the temperature requirements.

Figure 4. Type C477G Internal Valve 2 In. Assembly

Parts Ordering

When corresponding with the local Sales Office about this modular foot valve, include the type number and all other pertinent information printed on the label. Specify the eleven-character part number when ordering new parts from the following parts list.

Parts List

Type C477G Internal Valve (Figures 4 and 5)

Key	Description	Part Number
1	Body, Stainless steel	
	2 in.	T40132T0022
	3 in.	T80089T0022
2	Stem assembly, Stainless steel and Tetrafluoroethylene (TFE)	
	2 in.	GE41520T012
	3 in.	GE41522T012
2A	Stem, Stainless steel	
	2 in.	GE35309T012
	3 in.	GE35311T012
2B	Follower Assembly, Stainless steel and TFE	T11880000A2
2C	Groove Pin, Stainless steel (not shown)	1J1560T0012
3	Excess Flow Spring, Stainless steel 2 in.	
	105 GPM / 397 I/min Propane, Green	GE42498X012
	150 GPM / 567 I/min Propane, Yellow	T1153537022
	250 GPM / 946 I/min Propane, Pink	T1200537022
	3 in.	
	160 GPM / 606 I/min Propane, Blue	GE42499X012
	220 GPM / 833 I/min Propane, Orange	T1192437022
	265 GPM / 1003 I/min Propane, Black	GE42500X012
	375 GPM / 1419 I/min Propane, Yellow	GE42851X012
	460 GPM / 1741 I/min Propane, Red	GE42501X012
4	Spring seat, Stainless steel	
	2 in.	GE35317T012
	3 in.	GE35318T012
5	Closing Spring, Stainless steel	T1153737022
6	Main Disc Holder, Stainless steel	
	2 in.	GE35315T012
	3 in.	GE35316T012
7*	Disc, Main, Low Temp Nitrile (NBR)	
	2 in.	T1154003203
	3 in.	T11774T0012
8	Disc Retainer, Stainless steel	
	2 in.	GE35313T012
	3 in.	GE35314T012
9	Screw, Stainless steel	
	(4 required for 2 in. body,	
	6 required for 3 in. body)	13B3513X022
10	Bleed Disc Seat, Stainless steel	ERAA00325A0
11*	Bleed Disc, Low Temp Nitrile (NBR)	ERAA00328A6
12	O-ring retainer, Stainless steel	ERAA00324A0
13*	Nut, Carbon-plated steel	GE04678T012
14*	Cotter Pin, Stainless steel	T1241338992
15	Gland Assembly, Stainless steel/steel	
	2 in.	ERAA03530A0
	3 in.	ERAA03531A0

Key Description

15A	Gland, Stainless steel	T2052033092
15B*	Liner Bushing, PTFE	T1154506992
15C*	Washer, Steel	T1154625072
15D	Spring, Stainless steel	T1154737022
15E*	Washer, (2 required), Steel	T1154825072
15F*	Male Adaptor, PTFE	T1154901012
15G*	Packing Ring, PTFE (3 required)	T1155001012
15H*	Female Adaptor, PTFE	1H941601012
15J	Stub Shaft, Stainless steel	
	2 in.	T2037835072
	3 in.	T2043135072
15K*	Liner Bushing, PTFE	T1155106992
15L*	Rod Wiper, Polyurethane (PU)	T1155206992
15M	Bonnet, Stainless steel	T11553T0022
15P	Cam, Steel	T1155521992
15R	Cap Screw, Steel	1B848024052
15S	Washer, Steel	1C225628982
16*	Gland O-ring, Low Temp Nitrile (NBR)	T11557T0012
18	Lever, Steel	T1155919312
19*	Cotter Pin , Steel	1H837128982
20	Nameplate	
21	Drive Screw (2 required), Stainless steel	ERAA05928A0
22	Pipe plug, Stainless steel	1A767535072
23*	Washer, Steel	T1188228982
24	Instruction Tag (Not shown)	
30	Fusible Link (Not shown)	1J157443992
33	Travel Stop, Stainless steel	T1240838072
34	Washer, Steel	T1221236152
35*	Bushing, Steel	T1221306992
36	Stem Guide	
	2 in., Steel	T12918T0012
	3 in., Steel	T12511T0012
55	Lock Washer, Stainless steel (3 required)	1C2257K0012
57	Stud, Long (2 required)	ERAA02623A0
58	Stud, Short	ERAA02652A0
59	Nut (3 required)	1A309338992
60	Thread Cap (2 required)	ERAA02691A0

Part Number

N600 Series Ball Valve

Key	Description	Part Number
	Ball Valve Assembly	
	2 in.	N610L-16
	3 in.	N610L-24

Types M263L and M523L-24 Adaptor (Figure 6)

Key	Description	Part Number
1	Body, Stainless steel	
	Type M263L	T20110T0015
	Type M523L-24	T20211T0015
2	Washer	1E812803023

Type M441 End Cap (Figure 7)

Key	Description	Part Number
1	Cap, Brass	1N941014012
2	Nut, Brass	2E811413012
3	Retaining ring, Stainless steel	1E821637022

* Recommended spare part.



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1. Lubricant and sealant must be selected such that they meet the temperature requirements.





Figure 6. Type M263L or M523L-24 Adaptor

Figure 7. Type M441 End Cap Assembly

LP-Gas Equipment

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