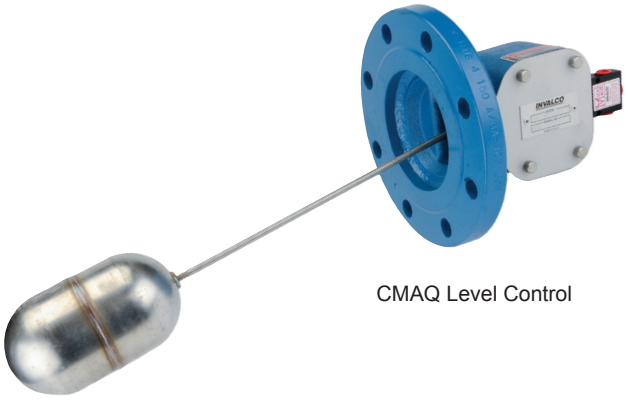
Models CMAQ and CMAF Liquid Level Controls

Bulletin SSIN007 Issue/Rev. 0.1 (8/17)

The **INVALCO Models CMAQ and CMAF** are snap-action, float-operated level controls, equipped with a three-way Micro Valve® unit, actuated by two adjustable arms. Adjustable pusher arms permit the control range to be adjusted easily and accurately to the range desired.



CMAQ Level Control

Features and Benefits

- Adjustable span to desired level detection point
- No external power is required
- Standard gear stem assembly is 303 stainless steel
- Standard 14" long float rod

Options

- NACE model is available
- Steel or ductile iron models are NACE adaptable for use in harsh, corrosive service
- 316 Stainless Steel optional (Consult factory)
- Other float sizes available (Consult factory)
- Optional 1/32" (250 psi max line pressure)

Specifications

Float Size
3-1/2" diameter x 6" long
Working Pressure
300 psig (limited by collapse pressure of float and process connection).
Temperature Limits
-20°F to 250°F
Micro Valve®
• Model: 316F1, three-way • Ports: Three 1/4" FNPT • Body: Anodized aluminum • Orifice: Standard 1/16" (100 psi maximum line pressure). • Optional 1/32" (250 psi maximum line pressure).

Ordering information

Specify part number and catalog model number. Below model /part numbers include standard 14" long Float Rod.

See next page for optional Float Rod lengths.

Ordering Information

Catalog Model Number	Nominal Connection Size, Type, Max. W.P. psi	Materials		Part Number
		Body	Float	
CMAQ-403	4" Grooved, 300	Ductile Iron	316 S.S.	80002101
CMAF-402S	4" 150 lb Flange, 275*	Cast Steel	316 S.S.	80002002

Notes:

*At 100°F - For higher temperatures, consult factory.

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Installation

The Models CMAQ and CMAF are equipped with a grooved coupling adapter or 150# ANSI flange for mounting to the vessel wall. The 3-1/2" diameter ball float is designed to pass through a 4" tank nozzle.

The Models CMAQ and CMAF are equipped with a three way Micro Valves® with three 1/4" NPT ports. Connection to the ports depends on the control action desired.

With Float Level at Low Level	With Float Level at High Level
Port 1 Closed to 2	Port 1 Open to 2
Port 2 Common	Port 2 Common
Port 3 Open to 2	Port 3 Closed to 2

Level Adjustment

The Models CMAQ and CMAF are provided with two adjustments permitting the setting of both the high and low level set points. To change this span the following procedure should be used (see Figure 1 below).

Low Level Set Point

1. Loosen Locknut “C”
2. Turn Adjust Screw “D” until the Micro Valve® operates at the desired position
3. Tighten Locknut “C” holding Adjust Screw “D” in position

High Level Set Point

1. Loosen Locknut “A”
2. Turn Adjust Screw “B” until Micro Valve® operates at the desired position
3. Tighten Locknut “A” holding Adjust Screw “B” in position

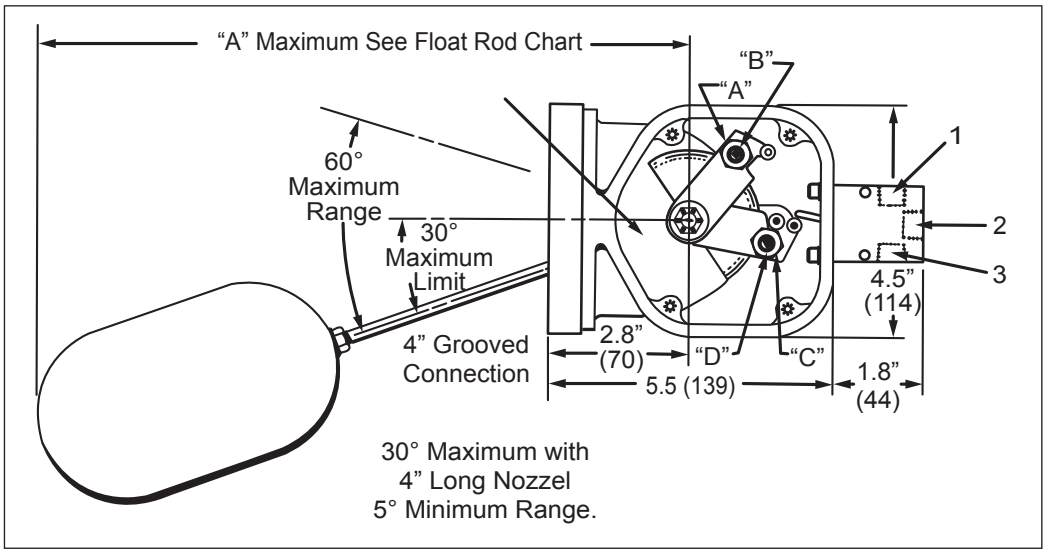
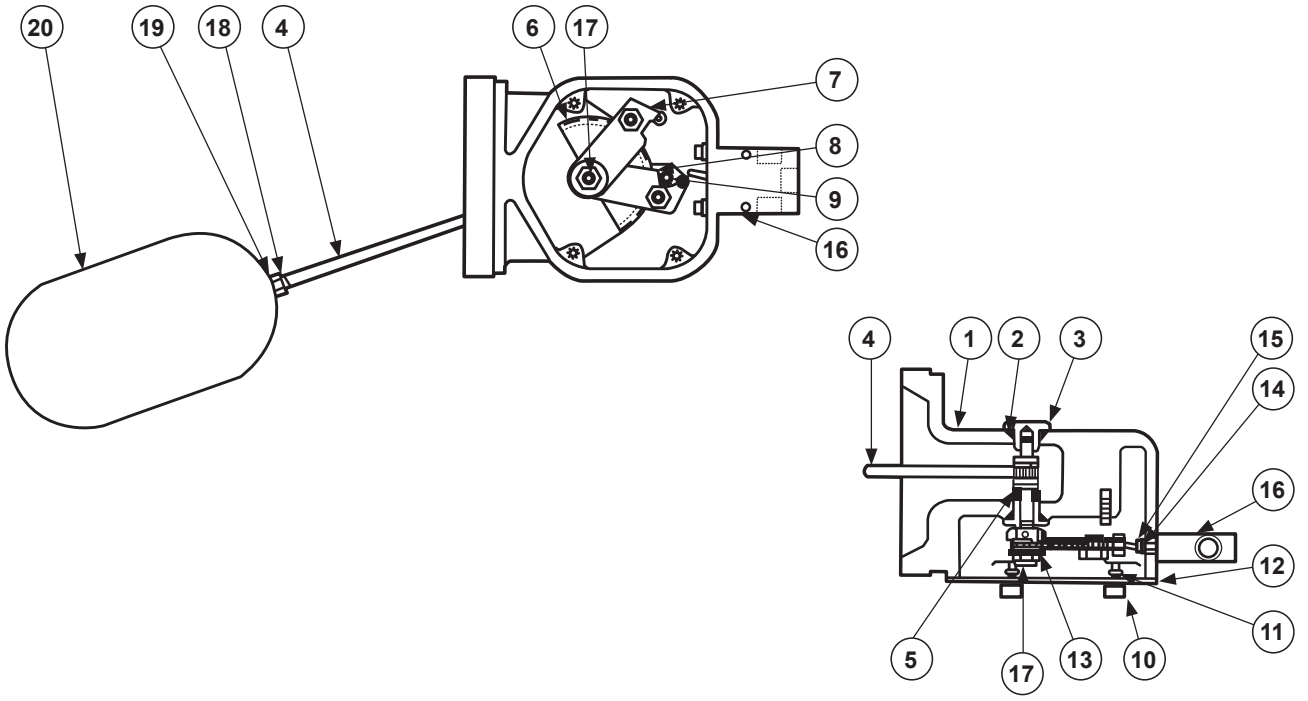


Figure 1.

Notes:
Consult factory for dimensions.
*Please consult factory for Part Number and additional information.

Float Rod Chart			
Rod Length	Part Numbers		Dim A.
	303 S.S.	316 S.S.	
8" (203)	45231080	45233081	13.3" (336)
14" Std. (355)	45231140	45233140	19.3" (488)
20" (507)	45231200	45233202	25.3" (640)
26" (659)	45231260	*	31.3" (793)
32" (811)	45231320	*	37.3" (945)

Dimensions – Inches to the nearest tenth (millimeters to the nearest whole mm), each independently dimensioned from engineering drawings.



Parts			
Item	**Description**	**Qty.**	**Part No.**
1	Case for CMAQ-403	1	45012179
	Case for CMAF-402-S	1	48016379
2	O-Ring BUN-112-90	2	67101408
3	Guide Bushing	1	45002016
4	Float Rod	1	Pg.2 Chart
5	Gear Stem Assembly, 303 S.S. (Std.)	1	48007301
	Gear Stem Assembly, 316 S.S. (Optional)	1	48006592
6	Gear	1	45002144
7	Left Actuating Arm Assembly	1	49002713
8	Right Actuating Arm Assembly	1	49002716
9	Stop Pin	1	79007418
10	Cover Screw	4	45002307
11	O-Ring BUN-007-90	4	67102309
12	Cover	1	45002390
13	Washer	1	45002228
14	Washer #10 Lock	2	65007700
15	Screw 10-32 x 1/2 HHCS	2	65011172
16	Micro Valve, 316 F1-B	1	87000214
17	Nut, 5/16-24 Flexloc	1	65002230
18	Nut, 1/4-20, Hex 303 S.S. (Std.)	1	65002175
	Nut, 1/4-20, Hex 316 S.S. (Optional)	1	65006385
19	Washer 1/4 Lock	1	65006386
20	Float Ball	1	45005655

The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

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