

An Installer's  
Pocket Guide for

# VCR<sup>®</sup> Metal Gasket Face Seal Fittings



and

# Micro-Fit<sup>®</sup> Weld Fittings



Swagelok<sup>®</sup>



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# VCR Metal Gasket Face Seal Fittings

## Technical Data

For product technical data, including pressure-temperature ratings and materials of construction, see the Swagelok *VCR Metal Gasket Face Seal Fittings* catalog, MS-01-24.

## Testing

The VCR fitting design has been helium leak tested to a maximum leak rate of  $4 \times 10^{-9}$  std cm<sup>3</sup>/s with silver-plated and copper gaskets and to a maximum leak rate of  $4 \times 10^{-11}$  std cm<sup>3</sup>/s with unplated gaskets.

## Cleaning

Components are cleaned to remove oil, grease, and loose particles. For more information, see Swagelok *Standard Cleaning and Packaging (SC-10)*, MS-06-62.

## Ultrahigh-Purity Processing

A variety of VCR face seal glands and bodies is available with controlled surface finishes, electropolished, and specially cleaned to meet ultrahigh-purity system requirements. For more information, see Swagelok *Ultrahigh-Purity Process Specification (SC-01)*, MS-06-61.

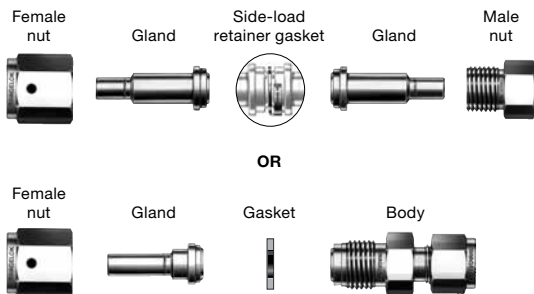
## Plating

VCR female nuts are silver plated. Avoid chemical processes used for cleaning, electropolishing, and passivation that will remove plating. If the plating is damaged or removed, thread galling will occur, damaging fitting components and preventing a proper seal.

# VCR Metal Gasket Face Seal Fittings

## Typical VCR Assemblies

VCR assemblies are made up of four or five basic components.



## Ordering Information and Dimensions

- Dimensions are for reference only and are subject to change.
- To order fittings manufactured in accordance with Swagelok *Ultrahigh-Purity Process Specification (SC-01)*, MS-06-61, add **P** to the ordering number.

Example: 6LV-4-VCR-3-4TB7**P**

# Glands



## Short Tube Butt Weld

Tube Size	VCR Size in.	Ordering Number	Length
<b>Dimensions, in. (mm)</b>			
1/8	1/8	6LV-2-VCR-3S-2TB7 <sup>①</sup>	1.08 (27.4)
	1/4	6LV-4-VCR-3S-2TB7	1.10 (27.9)
1/4	1/4	6LV-4-VCR-3S-4TB2	0.60 (15.2)
		6LV-4-VCR-3S-4TB3	0.72 (18.3)
		6LV-4-VCR-3S-4TB7	1.10 (27.9)
	1/2	6LV-8-VCR-3S-4TB7	1.12 (28.4)
3/8	1/2	6LV-8-VCR-3S-6TB2	0.62 (15.7)
		6LV-8-VCR-3S-6TB7	1.12 (28.4)
1/2	1/2	6LV-8-VCR-3S-8TB2	0.62 (15.7)
		6LV-8-VCR-3S-8TB3	0.74 (18.8)
		6LV-8-VCR-3S-8TB7	1.12 (28.4)
<b>Dimensions, mm (in.)</b>			
6	1/4	6LV-4-VCR-3S-6MTB7	29.5 (1.16)
8	1/4	6LV-4-VCR-3S-8MTB7	29.5 (1.16)
10	1/2	6LV-8-VCR-3S-10MTB7	29.5 (1.16)
12	1/2	6LV-8-VCR-3S-12MTB7	29.5 (1.16)
18	3/4	6LV-12-VCR-3S-18MTB7	31.0 (1.22)

① Not designed for gasket retainer assembly.

## Glands



### Long Tube Butt Weld

Tube Size	VCR Size in.	Ordering Number	Length
<b>Dimensions, in. (mm)</b>			
1/8	1/8	6LV-2-VCR-3-2TB7 <sup>①</sup>	1.42 (36.1)
1/4	1/4	6LV-4-VCR-3-4TB2	1.20 (30.5)
		6LV-4-VCR-3-02205	1.31 (33.3)
		6LV-4-VCR-3-4TB3	1.32 (33.5)
		6LV-4-VCR-3-4TB7	1.70 (43.2)
	1/2	6LV-8-VCR-3-4TB7	1.80 (45.7)
3/8	1/2	6LV-8-VCR-3-6TB2	1.29 (32.8)
		6LV-8-VCR-3-6TB7	1.79 (45.5)
1/2	1/2	6LV-8-VCR-3-8TB2	1.29 (32.8)
		6LV-8-VCR-3-8TB3	1.41 (35.8)
		6LV-8-VCR-3-8TB7	1.79 (45.5)
3/4	3/4	6LV-12-VCR-3-12TB7	2.03 (51.6)
1	1	6LV-16-VCR-3-16TB7	2.32 (58.9)
<b>Dimensions, mm (in.)</b>			
6	1/4	6LV-4-VCR-3-6MTB7	43.2 (1.70)
8	1/4	6LV-4-VCR-3-8MTB7	43.2 (1.70)
10	1/2	6LV-8-VCR-3-10MTB7	45.5 (1.79)
12	1/2	6LV-8-VCR-3-12MTB7	45.5 (1.79)
18	3/4	6LV-12-VCR-3-18MTB7	51.6 (2.03)

① Not designed for gasket retainer assembly.

## Glands



### Short Automatic Tube Butt Weld

Tube Size	VCR Size in.	Ordering Number	Length
<b>Dimensions, in. (mm)</b>			
1/4	1/4	316L-4-VCR-3AS	1.12 (28.4)
3/8	1/2	316L-8-VCR-3AS6	1.15 (29.2)
1/2	1/2	316L-8-VCR-3AS	1.16 (29.5)
<b>Dimensions, mm (in.)</b>			
6	1/4	316L-4-VCR-3-6MAS	30.0 (1.18)
8	1/4	316L-4-VCR-3-8MAS	30.2 (1.19)
10	1/2	316L-8-VCR-3-10MAS	31.0 (1.22)
12	1/2	316L-8-VCR-3-12MAS	30.5 (1.20)



### Long Automatic Tube Butt Weld

Tube Size	VCR Size in.	Ordering Number	Length
<b>Dimensions, in. (mm)</b>			
1/4	1/4	316L-4-VCR-3A	1.72 (43.7)
	1/2	316L-8-VCR-3A4	1.82 (46.2)
3/8	1/2	316L-8-VCR-3A6	1.82 (46.2)
1/2	1/2	316L-8-VCR-3A	1.83 (46.5)
3/4	3/4	316L-12-VCR-3A	2.07 (52.6)
1	1	316L-16-VCR-3A	2.57 (65.3)
<b>Dimensions, mm (in.)</b>			
6	1/4	316L-4-VCR-3-6MA	43.7 (1.72)
12	1/2	316L-8-VCR-3-12MA	46.5 (1.83)
18	3/4	316L-12-VCR-3-18MA	52.6 (2.07)



## Glands



### Socket Weld

Tube Socket Size	VCR Size	Ordering Number	Length
<b>Dimensions, in. (mm)</b>			
1/16	1/8	SS-1-VCR-3 <sup>①②</sup>	0.70 (17.8)
1/8	1/8	SS-2-VCR-3 <sup>②</sup>	0.70 (17.8)
1/4	1/4	SS-4-VCR-3	1.31 (33.3)
3/8	1/2	SS-6-VCR-3 <sup>③</sup>	1.50 (38.1)
1/2	1/2	SS-8-VCR-3	1.50 (38.1)
5/8	5/8	SS-10-VCR-3	1.56 (39.6)
3/4	3/4	SS-12-VCR-3	2.00 (50.8)
1	1	SS-16-VCR-3	2.22 (56.4)

① Uses 1/8 in. gasket and nut.

② Not designed for gasket retainer assembly.

③ Uses 1/2 in. gasket and nut.

### Reducing Socket Weld

Tube Socket Size	VCR Size	Ordering Number	Length
<b>Dimensions, in. (mm)</b>			
1/8	1/4	SS-4-VCR-3-2TSW	1.31 (33.3)
1/4	1/2	SS-8-VCR-3-4TSW	1.50 (38.1)



### Short Socket Weld

Tube Socket Size	VCR Size	Ordering Number	Length
<b>Dimensions, in. (mm)</b>			
1/4	1/4	SS-4-VCR-3-.50LG	0.50 (12.7)
		SS-4-VCR-3-.75LG	0.75 (19.1)

## Glands



### Male Weld

Tube Size	VCR Size	Ordering Number	Length
<b>Dimensions, in. (mm)</b>			
1/8	1/8	SS-2-VCR-3-2MTW <sup>①</sup>	0.70 (17.8)
	1/4	SS-4-VCR-3-2MTW	1.31 (33.3)
1/4	1/4	SS-4-VCR-3-4MTW	1.31 (33.3)
	1/2	SS-8-VCR-3-4MTW	1.50 (38.1)
3/8	1/2	SS-8-VCR-3-6MTW	1.50 (38.1)
1/2	1/2	SS-8-VCR-3-8MTW	1.50 (38.1)
3/4	3/4	SS-12-VCR-3-12MTW	2.00 (50.8)
1	1	SS-16-VCR-3-16MTW	2.22 (56.4)

① Not designed for gasket retainer assembly.



### Tube Adapter

Tube Size	VCR Size	Ordering Number	Length
<b>Dimensions, in. (mm)</b>			
1/4	1/4	SS-4-VCR-3-4TA	1.62 (41.0)
3/8	1/2	SS-8-VCR-3-6TA	1.81 (46.0)
1/2	1/2	SS-8-VCR-3-8TA	1.94 (49.3)



### Blind (Undrilled)

VCR Size	Ordering Number	Length
<b>Dimensions, in. (mm)</b>		
1/8	SS-2-VCR-3-BL <sup>①</sup>	0.70 (17.8)
1/4	SS-4-VCR-3-BL	1.31 (33.3)
1/2	SS-8-VCR-3-BL	1.50 (38.1)
3/4	SS-12-VCR-3-BL	2.00 (50.8)
1	SS-16-VCR-3-BL	2.22 (56.4)

① Not designed for gasket retainer assembly.

## Bodies

### Male NPT Connector<sup>①</sup>



NPT Size in.	VCR Size in.	Ordering Number
1/16	1/8	SS-2-VCR-1-1 <sup>②</sup>
1/8	1/8	SS-2-VCR-1-2 <sup>②</sup>
	1/4	SS-4-VCR-1-2
1/4	1/4	SS-4-VCR-1-4
	1/2	SS-8-VCR-1-4
3/8	1/2	SS-8-VCR-1-6
1/2	1/2	SS-8-VCR-1-8
3/4	3/4	SS-12-VCR-1-12
1	1	SS-16-VCR-1-16

Select male connectors are available with ISO/BSP tapered thread (RT) ends. Contact your authorized Swagelok representative.

- ① VCR components with fixed threads must remain stationary during installation. These fitting connections should be assembled only to glands with rotating male or female threaded nuts.
- ② Not designed for gasket retainer assembly.

### Male NPT Bulkhead Connector<sup>①</sup>



NPT Size in.	VCR Size in.	Ordering Number
1/4	1/4	SS-4-VCR-A1-4M
	1/2	SS-8-VCR-A1-4M

- ① VCR components with fixed threads must remain stationary during installation. These fitting connections should be assembled only to glands with rotating male or female threaded nuts.

### Straight Thread O-Ring Seal Male Connector<sup>①</sup>



Straight Thread Size	VCR Size in.	Ordering Number
9/16-18	1/4	SS-4-VCR-1-00032
7/8-14	1/2	SS-8-VCR-1-00176
9/16-18	1/2	SS-8-VCR-1-01081

- ① VCR components with fixed threads must remain stationary during installation. These fitting connections should be assembled only to glands with rotating male or female threaded nuts.

## Bodies

### Female NPT Connector<sup>①</sup>



NPT Size in.	VCR Size in.	Ordering Number
1/16	1/8	SS-2-VCR-7-1 <sup>②</sup>
1/8	1/8	SS-2-VCR-7-2 <sup>②</sup>
	1/4	SS-4-VCR-7-2
1/4	1/4	SS-4-VCR-7-4
3/8	1/2	SS-8-VCR-7-6
1/2	1/2	SS-8-VCR-7-8
3/4	3/4	SS-12-VCR-7-12
1	1	SS-16-VCR-7-16

- ① VCR components with fixed threads must remain stationary during installation. These fitting connections should be assembled only to glands with rotating male or female threaded nuts.
- ② Not designed for gasket retainer assembly.

### Swagelok Tube Fitting Connector<sup>①</sup>



Tube Size in.	VCR Size in.	Ordering Number
1/8	1/4	SS-4-VCR-6-200
1/4	1/4	SS-4-VCR-6-400
3/8	1/2	SS-8-VCR-6-600
1/2	1/2	SS-8-VCR-6-810

- ① VCR components with fixed threads must remain stationary during installation. These fitting connections should be assembled only to glands with rotating male or female threaded nuts.

### Swagelok Tube Fitting Bulkhead Connector<sup>①</sup>



Tube Size in.	VCR Size in.	Ordering Number
1/4	1/4	SS-4-VCR-A1-400
		SS-4-VCR-A1S-400
3/8	1/2	SS-8-VCR-A1-600
1/2	1/2	SS-8-VCR-A1-810

- ① VCR components with fixed threads must remain stationary during installation. These fitting connections should be assembled only to glands with rotating male or female threaded nuts.

## Bodies

### Male Union<sup>①</sup>



VCR Size in.	Ordering Number
1/8	SS-2-VCR-6-DM <sup>②</sup>
1/4	SS-4-VCR-6-DM
1/2	SS-8-VCR-6-DM
3/4	SS-12-VCR-6-DM
1	SS-16-VCR-6-DM

① VCR components with fixed threads must remain stationary during installation. These fitting connections should be assembled only to glands with rotating male or female threaded nuts.

② Not designed for gasket retainer assembly.

### Male Reducing Union<sup>①</sup>



VCR Size in.	VCR Size in.	Ordering Number
1/4	1/8	SS-4-VCR-6-DM-2 <sup>②</sup>
1/2	1/4	SS-8-VCR-6-DM-4

① VCR components with fixed threads must remain stationary during installation. These fitting connections should be assembled only to glands with rotating male or female threaded nuts.

② Not designed for gasket retainer assembly.

### Male Bulkhead Union<sup>①</sup>



VCR Size in.	Ordering Number
1/4	SS-4-VCR-61
	SS-4-VCR-61S
1/2	SS-8-VCR-61
	SS-8-VCR-61S

① VCR components with fixed threads must remain stationary during installation. These fitting connections should be assembled only to glands with rotating male or female threaded nuts.

## Bodies

### Tube Butt Weld Bulkhead Connector<sup>①</sup>



Tube Size in.	VCR Size in.	Ordering Number
1/4	1/4	6LV-4-VCR-61-4TB7
		6LV-4-VCR-61S-4TB7

- ① VCR components with fixed threads must remain stationary during installation. These fitting connections should be assembled only to glands with rotating male or female threaded nuts.

### Coupling



VCR Size in.	Ordering Number
1/8	SS-2-VCR-CG
1/4	SS-4-VCR-CG
1/2	SS-8-VCR-CG
3/4	SS-12-VCR-CG
1	SS-16-VCR-CG

### Female Reducing Union<sup>①</sup>



VCR Size in.	VCR Size in.	Ordering Number
1/4	1/8	SS-4-VCR-6-DF-2
1/2	1/4	SS-8-VCR-6-DF-4

- ① VCR components with fixed threads must remain stationary during installation. These fitting connections should be assembled only to glands with rotating male or female threaded nuts.

## Bodies

### Reducing Adapter<sup>①</sup>



VCR Size in.	VCR Size in.	Ordering Number
1/8	1/4	SS-2-VCR-7-4VCRF <sup>②</sup>
1/4	1/2	SS-4-VCR-7-8VCRF

- ① VCR components with fixed threads must remain stationary during installation. These fitting connections should be assembled only to glands with rotating male or female threaded nuts.
- ② Not designed for gasket retainer assembly.

### Reducing Bushing<sup>①</sup>



VCR Size in.	VCR Size in.	Ordering Number
1/4	1/8	SS-4-VCR-7-2VCRF
1/2	1/4	SS-8-VCR-7-4VCRF

- ① VCR components with fixed threads must remain stationary during installation. These fitting connections should be assembled only to glands with rotating male or female threaded nuts.

### Male NPT Elbow<sup>①</sup>



NPT Size in.	VCR Size in.	Ordering Number
1/8	1/4	SS-4-VCR-2-2
1/4	1/4	SS-4-VCR-2-4
3/8	1/2	SS-8-VCR-2-6
1/2	1/2	SS-8-VCR-2-8

- ① VCR components with fixed threads must remain stationary during installation. These fitting connections should be assembled only to glands with rotating male or female threaded nuts.

## Bodies

### Union Elbow<sup>①</sup>



VCR Size in.	Ordering Number
1/8	SS-2-VCR-9 <sup>②</sup>
1/4	SS-4-VCR-9
1/2	SS-8-VCR-9
3/4	SS-12-VCR-9
1	SS-16-VCR-9

① VCR components with fixed threads must remain stationary during normal installation. These fitting connections should be assembled only to glands with rotating male or female threaded nuts.

② Not designed for gasket retainer assembly.

### Union Tee<sup>①</sup>



VCR Size in.	Ordering Number
1/8	SS-2-VCR-T <sup>②</sup>
1/4	SS-4-VCR-T
1/2	SS-8-VCR-T
3/4	SS-12-VCR-T
1	SS-16-VCR-T

① VCR components with fixed threads must remain stationary during normal installation. These fitting connections should be assembled only to glands with rotating male or female threaded nuts.

② Not designed for gasket retainer assembly.

### Union Cross<sup>①</sup>



VCR Size in.	Ordering Number
1/8	SS-2-VCR-CS <sup>②</sup>
1/4	SS-4-VCR-CS
1/2	SS-8-VCR-CS
3/4	SS-12-VCR-CS
1	SS-16-VCR-CS

① VCR components with fixed threads must remain stationary during normal installation. These fitting connections should be assembled only to glands with rotating male or female threaded nuts.

② Not designed for gasket retainer assembly.



## Welded Assemblies

### Male NPT Connector



NPT Size in.	VCR Size in.	Ordering Number
1/8	1/4	SS-4-WVCR-1-2
1/4	1/4	SS-4-WVCR-1-4
3/8	1/2	SS-8-WVCR-1-6
1/2	1/2	SS-8-WVCR-1-8

### Female NPT Connector



NPT Size in.	VCR Size in.	Ordering Number
1/4	1/4	SS-4-WVCR-7-4
3/8	1/2	SS-8-WVCR-7-6
1/2	1/2	SS-8-WVCR-7-8

### Swagelok Tube Fitting Connector



Tube Size in.	VCR Size in.	Ordering Number
1/4	1/4	SS-4-WVCR-6-400
3/8	1/4	SS-4-WVCR-6-600
1/2	1/2	SS-8-WVCR-6-810

### Rotating Female Union



VCR Size in.	Ordering Number
1/4	SS-4-WVCR-6-DF
1/2	SS-8-WVCR-6-DF

## Nuts, Caps, and Plugs

### Female Nut



VCR Size in.	Ordering Number
1/8	SS-2-VCR-1
1/4	SS-4-VCR-1
1/2	SS-8-VCR-1
5/8	SS-10-VCR-1
3/4	SS-12-VCR-1
1	SS-16-VCR-1

### Male Nut



VCR Size in.	Ordering Number
1/8	SS-2-VCR-4
1/4	SS-4-VCR-4 <sup>①</sup>
1/2	SS-8-VCR-4
5/8	SS-10-VCR-4
3/4	SS-12-VCR-4
1	SS-16-VCR-4

① A taper at the hex end allows the nut to move around 90° tube bends.

### Short Male Nut



VCR Size in.	Ordering Number	Length in. (mm)
1/4	SS-4-VCR-4-.54NC	0.54 (13.7)
	SS-4-VCR-4-.65NC	0.65 (16.5)

### Split-Nut Assemblies



VCR Size in.	Split Nut Type	Ordering Number
1/4	Female	SS-4-VCR-1-SN
	Male	SS-4-VCR-4-SN

# Nuts, Caps, and Plugs

## Cap



VCR Size in.	Ordering Number
1/8	SS-2-VCR-CP
1/4	SS-4-VCR-CP
1/2	SS-8-VCR-CP
3/4	SS-12-VCR-CP
1	SS-16-VCR-CP

## Cap with Lanyard



VCR Size in.	Ordering Number
1/4	SS-4-VCR-CP-BP
1/2	SS-8-VCR-CP-BP

## Plug



VCR Size in.	Ordering Number
1/8	SS-2-VCR-P <sup>①</sup>
1/4	SS-4-VCR-P <sup>②</sup>
1/2	SS-8-VCR-P
3/4	SS-12-VCR-P
1	SS-16-VCR-P

## Plug with Lanyard



VCR Size in.	Ordering Number
1/4	SS-4-VCR-BP
1/2	SS-8-VCR-BP

① Not designed for gasket retainer assembly.

② Also available as a rotatable plug.

Ordering number:  
**SS-4-VCR-RP**

## High-Flow Connections “H” Type VCR Face Seal Fittings

- Compatible with 1/4 in. VCR connections
- Designed for use with Swagelok high-flow diaphragm valves and gas regulators
- Use 1/4 in. side-load retainer style gasket for uniform flow. See page 23.

### Glands

#### *Tube Butt Weld*



Tube Size in.	VCR Size in.	Ordering Number
3/8	1/4	6LV-4-HVCR-3-.60SR
		6LV-4-HVCR-3-1.19SR
		6LV-4-HVCR-3-1.31SR

### Bodies

#### *Tube Butt Weld*



Tube Size in.	VCR Size in.	Ordering Number
3/8	1/4	6LV-4-HVCR-1-6TB7

#### *Automatic Tube Weld*



Tube Size in.	VCR Size in.	Ordering Number
3/8	1/4	316L-4-HVCR-1A6

# High-Flow Connections

## "H" Type VCR Face Seal Fittings

### Bodies

#### *Bulkhead Connector*



Tube Size in.	VCR Size in.	Ordering Number
3/8	1/4	316L-4-HVCR-61-6TB7

#### *Union Elbow*



VCR Size in.	Ordering Number
1/4	SS-4-HVCR-9

#### *Union Tee*



VCR Size in.	Ordering Number
1/4	SS-4-HVCR-T

### Nuts

#### *Female Nut*



VCR Size in.	Ordering Number
1/4	SS-4-HVCR-1SR
	SS-4-HVCR-1

#### *Male Nut*



VCR Size in.	Ordering Number
1/4	SS-4-HVCR-4SR

## Gaskets

Specify gasket material by adding a material designator to the basic ordering number.

Material	Designator	Example
Nickel	NI	NI-4-VCR-2-VS
316L stainless steel	SS	SS-4-VCR-2-VS
Copper	CU <sup>①</sup>	CU-4-VCR-2

Nickel and copper gasket retainer assemblies use a 316 stainless steel retainer.

- ① Copper gaskets are unplated. However, to order, add **CU** to a basic ordering number for silver-plated gaskets. Example: **CU-4-VCR-2**. Side-load retainer style gaskets are not available in copper.

### Nonretained



VCR Size in.	Basic Ordering Number	
	Silver-Plated	Unplated
1/8	-2-VCR-2	-2-VCR-2-VS
1/4	-4-VCR-2	-4-VCR-2-VS
1/2	-8-VCR-2	-8-VCR-2-VS
5/8	-10-VCR-2	-10-VCR-2-VS
3/4	-12-VCR-2	-12-VCR-2-VS
1	-16-VCR-2	-16-VCR-2-VS

### Gasket Retainer Assembly



VCR Size in.	Basic Ordering Number	
	Silver-Plated	Unplated
1/4	-4-VCR-2-GR	-4-VCR-2-GR-VS
1/2	-8-VCR-2-GR	-8-VCR-2-GR-VS
3/4	-12-VCR-2-GR	-12-VCR-2-GR-VS
1	-16-VCR-2-GR	-16-VCR-2-GR-VS

## Gaskets

### Side-Load Retainer



VCR Size in.	Basic Ordering Number
1/4	-4-VCR-2-ZC-VS
1/2	-8-VCR-2-ZC-VS

### Side-Load Installation Tool and Tray

#### Tool

- Makes gasket handling easy, preserves cleanliness
- Enables gasket installation where space is limited
- Is used to easily remove gaskets from storage tray

#### Tray (includes 30 gaskets)

- Keeps gaskets secure
- Keeps gaskets aligned for easy removal with side-load gasket tool
- Cleaned and packaged in accordance with Swagelok *Ultrapurity Process Specification* (SC-01), MS-06-61



Description	Ordering Number
Installation tool	MS-4-VCR-ZC-TL
Tray (nickel gaskets)	NI-4-VCR-2-ZCT-VS
Tray (SS gaskets)	SS-4-VCR-2-ZCT-VS

## Flow Restrictors

This product can be used in liquid or gas delivery systems where repeatable flow reduction or limiting is required.



- Electropolished, cleaned, and packaged in accordance with Swagelok *Ultrahigh-Purity Process Specification (SC-01)*, MS-06-61
- Working pressure 10 000 psig (689 bar)

Orifice in. (mm)	Ordering Number
0.010 (0.254)	6LV-4-VCR-6-DM-010P
0.012 (0.305)	6LV-4-VCR-6-DM-012P
0.015 (0.381)	6LV-4-VCR-6-DM-015P
0.017 (0.432)	6LV-4-VCR-6-DM-017P
0.020 (0.508)	6LV-4-VCR-6-DM-020P
0.023 (0.584)	6LV-4-VCR-6-DM-023P
0.025 (0.635)	6LV-4-VCR-6-DM-025P
0.026 (0.660)	6LV-4-VCR-6-DM-026P
0.027 (0.686)	6LV-4-VCR-6-DM-027P
0.030 (0.762)	6LV-4-VCR-6-DM-030P
0.035 (0.889)	6LV-4-VCR-6-DM-035P
0.040 (1.016)	6LV-4-VCR-6-DM-040P
0.045 (1.143)	6LV-4-VCR-6-DM-045P
0.050 (1.270)	6LV-4-VCR-6-DM-050P
0.055 (1.397)	6LV-4-VCR-6-DM-055P
0.060 (1.529)	6LV-4-VCR-6-DM-060P
0.065 (1.651)	6LV-4-VCR-6-DM-065P
0.070 (1.778)	6LV-4-VCR-6-DM-070P
0.075 (1.905)	6LV-4-VCR-6-DM-075P
0.080 (2.032)	6LV-4-VCR-6-DM-080P
0.085 (2.159)	6LV-4-VCR-6-DM-085P
0.090 (2.286)	6LV-4-VCR-6-DM-090P
0.093 (2.362)	6LV-4-VCR-6-DM-093P
0.095 (2.413)	6LV-4-VCR-6-DM-095P
0.100 (2.540)	6LV-4-VCR-6-DM-100P



## Lock and Tag Devices

These devices help prevent unintentional disassembly of VCR connections. Additionally, both devices include a wire hole to allow for a tag to support identification and quality verification programs.

### Fitting Lock Device

This device is intended for use on Swagelok VCR metal gasket face seal assemblies with standard male and female nuts.



VCR Size in.	Ordering Number
1/4	SS-4-VCR-FLC
1/2	SS-8-VCR-FLC

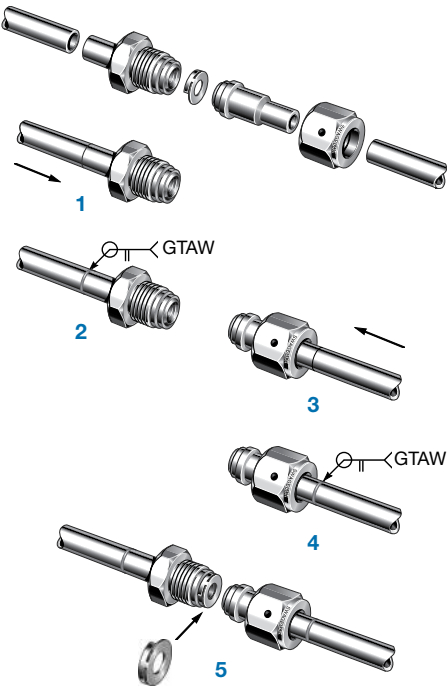
### Fitting Lock Device for Valves

This device is intended for use on Swagelok valves with integrally machined male VCR metal gasket face seal end connections.

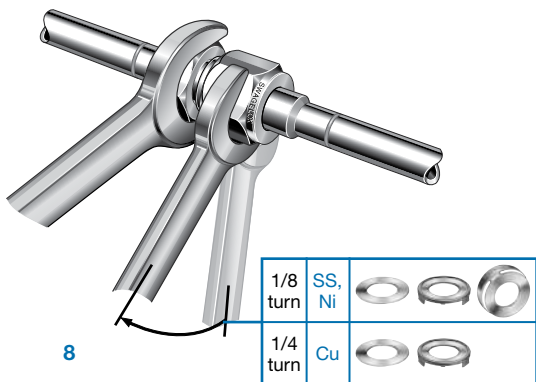
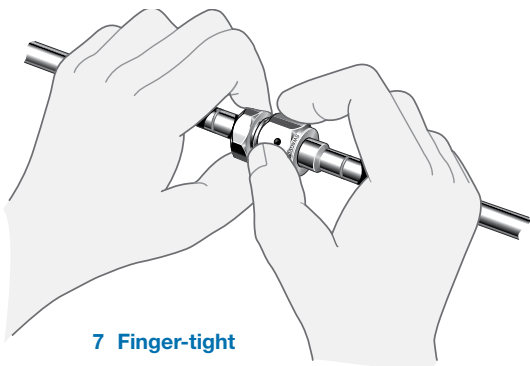
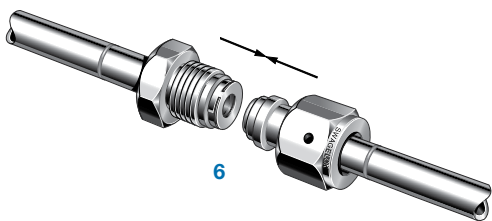


VCR Size in.	Ordering Number
1/4	SS-4-VCR-VLC
1/2	SS-8-VCR-VLC

# VCR Fitting Installation Instructions

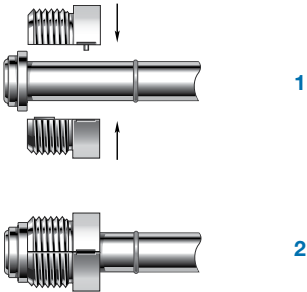


# VCR Fitting Installation Instructions

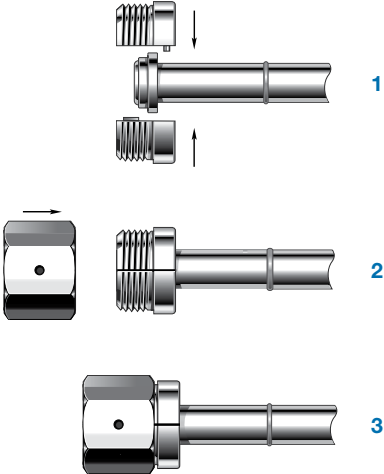


# VCR Split-Nut Installation Instructions

## Male



## Female



# Micro-Fit (Miniature Tube Butt Weld) Fittings

## Compact Design

- Accommodates tubing systems requiring miniaturization
- Allows close component spacing
- Provides flow and service ratings equal to larger weld fittings.

## Technical Data

For product technical data, including pressure-temperature ratings and materials of construction, see the Swagelok *Weld Fittings* catalog, MS-01-149.

## Cleaning and Packaging

### ***Standard***

Micro-Fit weld fittings are cleaned in accordance with Swagelok *Standard Cleaning and Packaging (SC-10)*, MS-06-62.

### ***Special***

Micro-Fit weld fittings are available specially cleaned and packaged to ensure compliance with product cleanliness requirements as stated in ASTM G93 Level C.

To order, add **-SC11** to the ordering number.

Example: 6LV-4MW-6-2-**SC11**

## Micro-Fit (Miniature Tube Butt Weld) Fittings

### **Photovoltaic (SC-06)**

Micro-Fit weld fittings are available cleaned and packaged in accordance with Swagelok *Photovoltaic Process Specification (SC-06)*, MS-06-64, to meet the process requirements of solar cell production.

To order, add **-SC06** to the ordering number.

Example: 6LV-4MW-6-2-**SC06**

SC-06–cleaned weld fittings are available with controlled surface finishes and electropolishing.

Wetted surfaces are finished to 5  $\mu\text{in.}$  (0.13  $\mu\text{m}$ )  $R_a$ .

To order, add **-P6** to the ordering number.

Example: 6LV-4MW-6-2-**P6**

### **Ultrahigh-Purity**

Micro-Fit weld fittings are available manufactured in accordance with Swagelok *Ultrahigh-Purity Process Specification (SC-01)*, MS-06-61. Wetted surfaces are finished to 5  $\mu\text{in.}$  (0.13  $\mu\text{m}$ )  $R_a$ . To order, add **-P** to the ordering number.

Example: 6LV-4MW-6-2-**P**

## **Oxygen Service Hazards**

For more information about hazards and risks of oxygen-enriched systems, see the Swagelok *Oxygen System Safety* technical report, MS-06-13.

## Micro-Fit (Miniature Tube Butt Weld) Fittings

### Ordering Information and Dimensions

Dimensions are for reference only and are subject to change.

#### Reducing Union



Large Tube OD in.	Small Tube OD in.	Ordering Number
1/4	1/8	6LV-4MW-6-2
3/8	1/4	6LV-6MW-6-4
1/2	1/4	6LV-8MW-6-4
1/2	3/8	6LV-8MW-6-6

#### 90° Union Elbow



Tube OD	Ordering Number
<b>Dimensions, in.</b>	
1/8	6LV-2MW-9
1/4	6LV-4MW-9
3/8	6LV-6MW-9
1/2	6LV-8MW-9
<b>Dimensions, mm</b>	
6	6LV-6MMW-9
8	6LV-8MMW-9
10	6LV-10MMW-9
12	6LV-12MMW-9

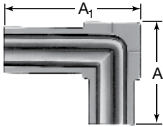
#### Reducing 90° Union Elbow



Large Tube OD	Small Tube OD	Ordering Number
<b>Dimensions, in.</b>		
3/8	1/4	6LV-6MW-9-4
1/2	1/4	6LV-8MW-9-4
1/2	3/8	6LV-8MW-9-6
<b>Dimensions, mm</b>		
8	6	6LV-8MMW-9-6M
10	6	6LV-10MMW-9-6M
12	6	6LV-12MMW-9-6M
12	8	6LV-12MMW-9-8M

# Micro-Fit (Miniature Tube Butt Weld) Fittings

**Extended Leg 90° Union Elbow**



Tube OD in.	Ordering Number	Leg Length, in. (mm)	
		A	A <sub>1</sub>
1/4	6LV-4MW-9-03442	0.56 (14.2)	0.76 (19.3)
	6LV-4MW-9-03443		0.81 (20.6)
	6LV-4MW-9-03444	0.76 (19.3)	
	6LV-4MW-9-03445	0.81 (20.6)	

**45° Union Elbow**



Tube OD in.	Ordering Number
1/4	6LV-4MW-5
3/8	6LV-6MW-5
1/2	6LV-8MW-5

**Union Tee**



Tube OD	Ordering Number
<b>Dimensions, in.</b>	
1/8	6LV-2MW-3
1/4	6LV-4MW-3
3/8	6LV-6MW-3
1/2	6LV-8MW-3
<b>Dimensions, mm</b>	
6	6LV-6MMW-3
8	6LV-8MMW-3
10	6LV-10MMW-3
12	6LV-12MMW-3



## Micro-Fit (Miniature Tube Butt Weld) Fittings

### Extended Branch Leg Union Tee



Tube OD in.	Ordering Number
1/4	6LV-4MW-3-03446

### Extended Run Leg Union Tee



Tube OD in.	Ordering Number
1/4	6LV-4MW-3-03921

### Reducing Tee



Large Tube OD	Small Tube OD	Ordering Number
<b>Dimensions, in.</b>		
3/8	1/4	6LV-6MW-3-6-4
1/2	1/4	6LV-8MW-3-8-4
1/2	3/8	6LV-8MW-3-8-6
<b>Dimensions, mm</b>		
10	6	6LV-10MMW-3-10M-6M
12	6	6LV-12MMW-3-12M-6M
12	8	6LV-12MMW-3-12M-8M

## Micro-Fit (Miniature Tube Butt Weld) Fittings

### Union Cross



Tube OD	Ordering Number
<b>Dimensions, in.</b>	
1/8	6LV-2MW-4
1/4	6LV-4MW-4
3/8	6LV-6MW-4
1/2	6LV-8MW-4
<b>Dimensions, mm</b>	
6	6LV-6MMW-4
8	6LV-8MMW-4
10	6LV-10MMW-4
12	6LV-12MMW-4

### Tribow



Tube OD	Ordering Number
<b>Dimensions, in.</b>	
1/4	6LV-4MW-91
3/8	6LV-6MW-91
1/2	6LV-8MW-91
<b>Dimensions, mm</b>	
6	6LV-6MMW-91

This unique design has weld ends in three planes at 90° to each other. It permits greater flexibility in designing systems, especially where space is limited.

## Tube Fittings

See the Swagelok *Gaugeable Tube Fittings and Adapter Fittings* catalog, MS-01-140, for information.



## Tubing Products



Swagelok offers a wide variety of tubing products.

Contact your authorized Swagelok representative or see these Swagelok catalogs for more information:

- *Stainless Steel Seamless Tubing, Fractional Sizes*, MS-01-153-SCS
- *Stainless Steel Tubing, Imperial Sizes*, MS-01-159-SCS

## Swagelok Welding System

The Swagelok orbital welding system provides precise gas tungsten arc welds (GTAW) for use with VCR metal gasket face seal fittings and Micro-Fit weld fittings, as well as a variety of other valves and fittings manufactured by Swagelok Company. This autogenous orbital welding system can reduce weld cycle time, improve weld consistency and quality, and help manage the total welding process. The Swagelok welding system is supported by a comprehensive package of equipment, training, accessories, and technical service. For information on the Swagelok welding system, see the *Swagelok M200 Power Supply* catalog, MS-02-342.

### **Safe Product Selection**

**When selecting a product, the total system design must be considered to ensure safe, trouble-free performance. Function, material compatibility, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system designer and user. The complete catalog contents must be reviewed to ensure that the system designer and user make a safe product selection.**

**Caution: Do not mix or interchange components with those of other manufacturers.**

## **Warranty Information**

Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit [swagelok.com](http://swagelok.com) or contact your authorized Swagelok representative.