Gas Mass Flow Meter (SUS and SUS316 model) CMS Series

The CMS series of gas mass flow meters employs our proprietary μF (Micro Flow) thermal flow rate sensor as the sensing element.
Through integration of this ultraminiature mass flow sensor, which is manufactured using micromachining technology and advanced ultrafine channel design, an unprecedented level of high accuracy and wide measurement range have been achieved at low cost.
Boasting both ease of use and high reliability, these flowmeters will set the standard for the future.

Specifications

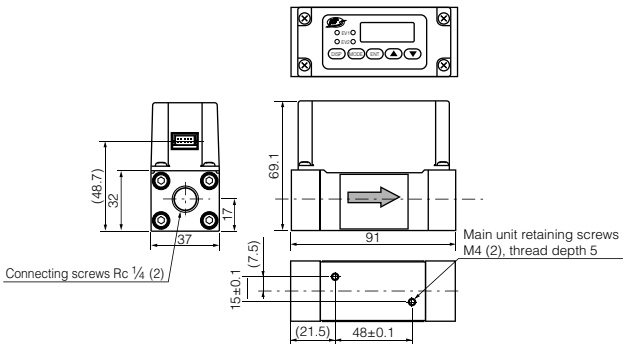
Model No.	CMS9500	CMS0002	CMS0005	CMS0020	CMS0050	CMS0200	CMS0500
Measured gas	Air/nitrogen, argon, carbon dioxide (CO_2), oxygen (models supporting oxygen only), city gas 13 A (LNG base, 45/46 MJ/m³), 100% methane, 100% propane, and 100% butane. Also, for semi-standard gas models only, ammonia*2 and acetylene.						
Flow rate range (for air)	500 mL/min (standard)	2 L/min (standard)	5 L/min (standard)	20 L/min (standard)	50 L/min (standard)	200 L/min (standard)	500 L/min (standard)
	"Standard" indicates a flow rate converted for conditions of 20 °C and 101.325 kPa (1 atmosphere).						
Accuracy*1	1/5 to 1/1 of flow rate range ±3% rdg 1/100 to 1/5 ±1% FS of flow rate range		1/10 to 1/1 of flow rate range ±3% rdg 1/100 to 1/10 ±1% FS of flow rate range				
Operating pressure range	-0.07 to +1.0 MPa						
Sampling time	100±20 ms						
Rated power supply voltage	12 to 24 Vdc						
Power consumption	100 mA or less						
Weight	Approx. 800 g	Approx. 800 g	Approx. 800 g	Approx. 800 g	Approx. 800 g	Approx. 1400 g	Approx. 2000 g

*1. The values indicate the accuracy for air/nitrogen and oxygen (for models supporting oxygen).
*2. Maintain ammonia in a dry state at -20 °C or less.

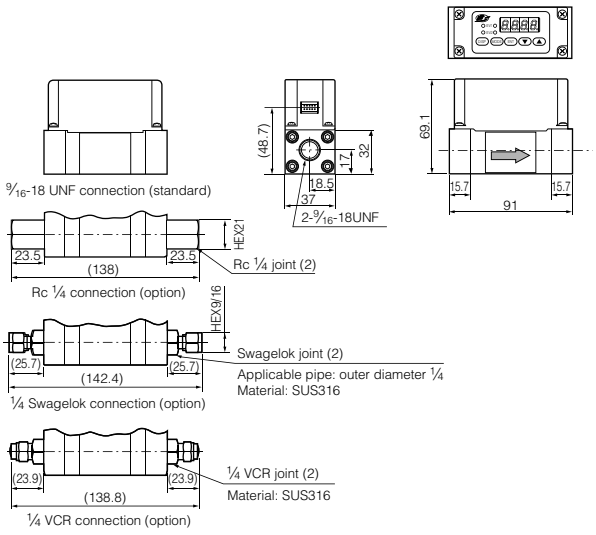
External dimensions

CMS9500/0002/0005/0020/0050 (SUS model, SUS316 model) (Unit: mm)

· SUS model



· SUS316 model



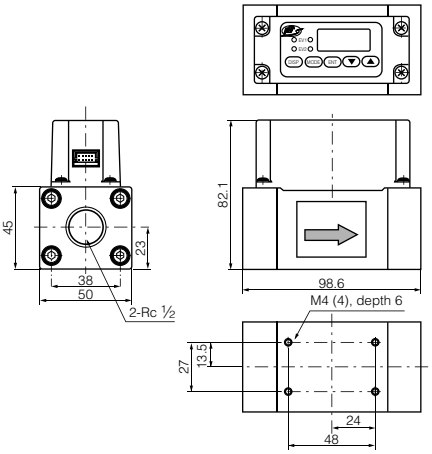
Gas Mass Flow Meter (SUS and SUS316 model) CMS Series

External dimensions

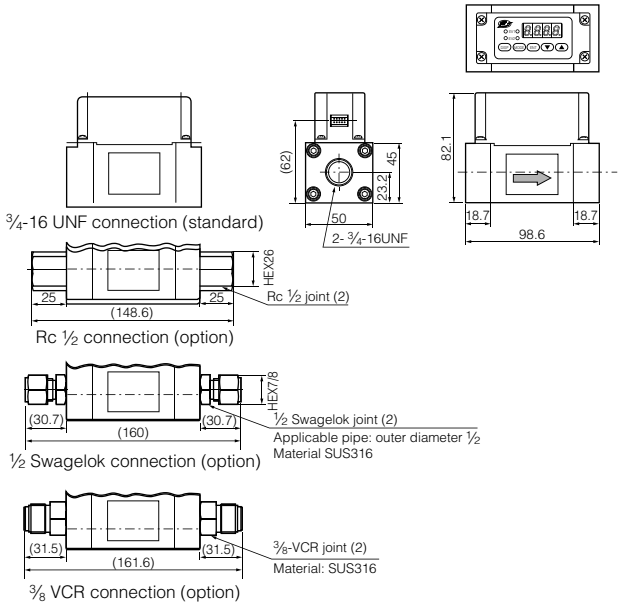
CMS0200 (SUS model, SUS316 model)

(Unit: mm)

· SUS model

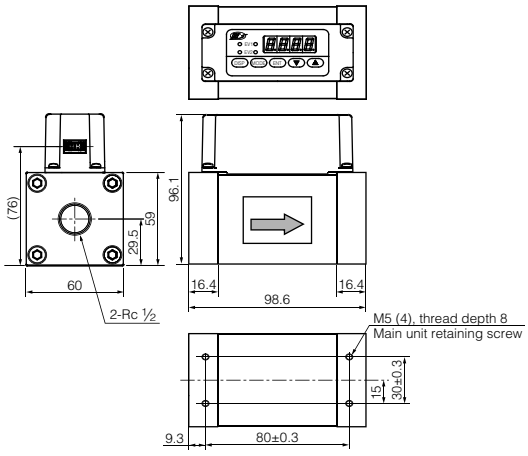


· SUS316 model

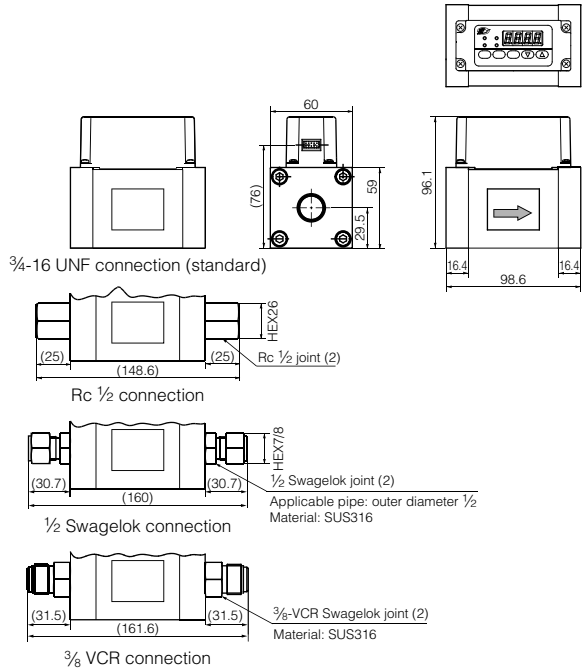


CMS0500 (SUS model, SUS316 model)

· SUS model



· SUS316 model



Gas Mass Flow Meter (SUS and SUS316 model) CMS Series

Model No. configuration

SUS model Ex.: CMS9500BSRN200000

Basic model No.	Flow rate range	Model	Material	Connection	Gas type	Output	Option 1	Option 2	Option 3	Option 4	Appended No.	Description
CMS												Gas mass flow meter
	9500											Flow rate range 0 to 500 mL/min (standard)*1, *3
	0002											Flow rate range 0 to 2 L/min (standard)*1, *3
	0005											Flow rate range 0 to 5 L/min (standard)*1, *3
	0020											Flow rate range 0 to 20 L/min (standard)*1, *3
	0050											Flow rate range 0 to 50 L/min (standard)*1, *3
	0200											Flow rate range 0 to 200 L/min (standard)*1, *3
	0500											Flow rate range 0 to 500 L/min (standard)*1, *3
		B										Model with display and left to right flow direction
		R										Model with display and right to left flow direction
			S									Stainless steel SUS303 and SUS316
				R								Rc connection (short body length) CMS9500/0002/0005/0020/0050: Rc 1/4 CMS0200/0500: Rc 1/2
					N							Air/nitrogen (setting can be changed to other standard gas types)*3
					S							Oxygen*2
						2						Output: 0 to 5 Vdc/1 to 5 Vdc/4 to 20 mA
							0					None
								0				None
									0			None
									1			Degreasing of gas-contacting parts
										0		None
										D		Inspection results
										Y		Traceability certificate
											0	Product version

SUS316 model Ex.: CMS9500BTTN200000

Basic model No.	Flow rate range	Model	Material	Connection	Gas type	Output	Option 1	Option 2	Option 3	Option 4	Appended No.	Description
CMS												Mass flow meter for gas
	9500											Flow rate range 0 to 500 mL/min (standard)*1, *3
	0002											Flow rate range 0 to 2 L/min (standard)*1, *3
	0005											Flow rate range 0 to 5 L/min (standard)*1, *3
	0020											Flow rate range 0 to 20 L/min (standard)*1, *3
	0050											Flow rate range 0 to 50 L/min (standard)*1, *3
	0200											Flow rate range 0 to 200 L/min (standard)*1, *3
	0500											Flow rate range 0 to 500 L/min (standard)*1, *3
		B										Model with display and left to right flow
		R										Model with display and right to left flow
			T									Stainless steel SUS316
				U								UNF connection CMS9500/0002/0005/0020/0050: 9/16-18 UNF CMS0200/0500: 3/4-16 UNF
				T								Rc joint connection CMS9500/0002/0005/0020/0050: Rc 1/4 CMS0200/0500: Rc 1/2
				S								Swl connection CMS9500/0002/0005/0020/0050: 1/4 Swagelok CMS0200/0500: 1/2 Swagelok
				V								VCR connection CMS9500/0002/0005/0020/0050: 1/4 VCR CMS0200/0500: equivalent to 3/8 VCR
					N							Air/nitrogen (setting can be changed to other standard gas types)*3
					S							Oxygen*2
					E							Semi-standard (ammonia, acetylene)
						2						Output: 0 to 5 Vdc/1 to 5 Vdc/4 to 20 mA
							0					None
							1					With RS-485 communication
								0				None
									0			Without degreasing
									1			Degreasing of gas-contacting parts
										0		None
										D		Inspection results
										Y		Traceability certificate
											0	Product version

*1. "Standard" indicates a flow rate converted for conditions of 20 °C and 101.325 kPa (1 atmosphere).
*2. To use oxygen (gas type: S), be sure to select "1" ("Degreasing of gas-contacting parts") for Option 3. Note that oxygen cannot be used in resin models or hydrogen models.
*3. This is factory-set to air/nitrogen.
Using the keys on the main unit, the gas type can be changed to the other types below. Changing the gas type may change the flow rate range. Therefore, when selecting the gas type, refer to "Maximum measurable flow rates for gas types" on the next page.

Gas Mass Flow Meter (SUS and SUS316 model) CMS Series

Maximum measurable flow rates for gas types

Note: The maximum flow rate that is measurable by this product varies depending on the type of gas used. When selecting a model, refer also to this table.

Gas type	CMS9500	CMS0002	CMS0005	CMS0020	CMS0050	CMS0200	CMS0500
	[mL/min (standard)]	[L/min (standard)]					
Air/nitrogen	500	2	5	20	50	200	500
Argon	500	2	5	20	50	200	500
Carbon dioxide (CO_2)	250	1	3.3	10	25	100	250
Oxygen	500	2	5	20	50	200	500
City gas 13 A, 45/46 MJ/m^3	400	1.5	4	15	40	150	400
Methane	500	2	5	20	50	200	500
Propane	140	0.5	1.7	5	14	50	140
Butane	100	0.4	1.25	5	12	50	120
Acetylene	280	1.12	3.05	11.2	28	112	280
Ammonia	380	1.52	3.85	15.2	38	152	380

Optional parts (sold separately)

Note: One harness with a dedicated connector is required per CMS unit. Please order it together with the CMS unit.

Name	Model No.	Description	Harness length
Harness with dedicated connector	81446594-005	For models with display	2 m
	81446594-006		5 m
	81446594-007	For models with RS-485 communication	2 m
	81446594-008		5 m
Harness for AC adapter connection	81446594-030	Compatible with all models	20 cm
AC adapter	81446957-001	A harness is necessary for the AC adapter connection.	1.8 m
Mounting bracket	81446628-001	CMS9500/0002/0005/0020/0050—standard gas model	–
	81446721-001	CMS0200—standard gas model	–
	81446856-001	CMS0500—standard gas model	–