Compendium of DMS Series

Three types of sensors

General type(DMS)

General type(Aqua Blue)

Waterproof type(Yellow)

Manipulator industry(A05-DMS)

Product characteristics:
1. Flexure resistant curve material can be used in manipulator industry, such as multi joint manipulator and tank chain.
2. In case of high temperature, much dust, or water droplets and oil dust, the sensor shall take corresponding dust-proof measures.

High deflection wire

The deflection is increased by about 20% compared with the general type

Oil resistance and deflection resistance (A06-DMS)

Product characteristics:
1. Flexure resistant curve material can be used in manipulator industry, such as multi joint manipulator and tank chain.
2. In case of welding slag, corresponding protective measures shall be taken for the sensor.

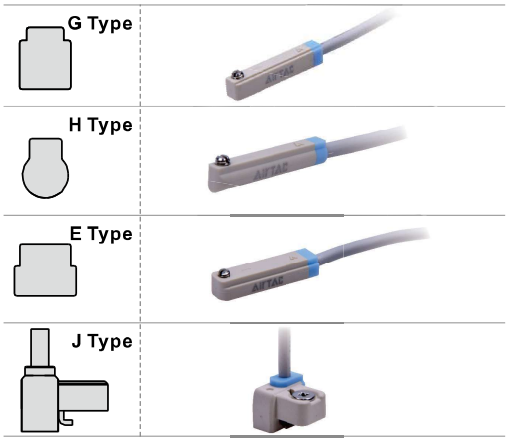
Oil resistant and flexural curve material

The deflection is increased by about 20% compared with the general type. It can be used in oil dust environment.

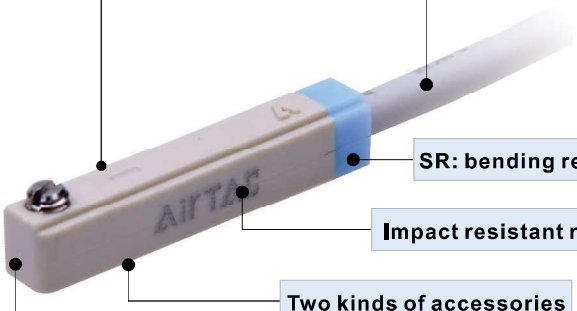
Waterproof design(IP68)

Note: The recommended minimum bending radius of A05-DMS,A06-DMS cables is 19mm.

Four types of cross section



Bending resistance



SR: bending resistance

Impact resistant materials

Two kinds of accessories

DMSG can be mounted with 2 accessories, applicable to multi-cylinders.

DMSG	F-MQ□
	
	F-SC□SH
	

DMS Specifications

Item	DMS		
Model	2-wire	NPN	PNP
Power supply voltage	10V ~ 28V DC	5V ~ 30V DC	
Switching current	2.5mA ~ 100mA	30V/200mA Max.	
Contact capacity	2.8W Max.	6.0W Max.	
Current consumption	3mA Max.	5mA Max.	
Internal voltage drop	3.5V Max.	0.7V Max.	
Leakage current	0.05mA Max.	0.01mA Max.	
Switching frequency	1000Hz		
Impact resistance	30G		
Circuit protection	Reverse polarity protection Surge protection		
Operating Temp.	-10℃ ~ 70℃		
Enclosure	DMS,A05-DMS: IP64 / A06-DMS: IP68		
Standard	CE marking, RoHS		

[Note] A05 \ A06 type has only two-wire type.

Ordering code for DMS

DMS G - □ 020 - □
A05-DMS G - □ 020
A06-DMS G - □ 020
1 2 3 4 5 6

G H E J M08 M12

①Industry code		Blank: General type A05: Manipulator industry A06: Oil resistance and deflection resistance
②Model		DMS : Solid State Sensor
③Specifications		G H E J [Noet1]
④Output type		Blank: 2 wire N : NPN [Noet2] P : PNP
⑤Lead wire	Direct lead wire	020: 2m 030: 3m 050: 5m 100: 10m
	Plug connector [Noet3]	M08:0.5m with M8 plug connector M12:0.5m with M12 plug connector M08010:1m with M8 plug connector M12010:1m with M12 plug connector M08020:2m with M8 plug connector M12020:2m with M12 plug connector M08030:3m with M8 plug connector M12030:3m with M12 plug connector
⑥Additional specification		Blank: General type W:Waterproof type IP68 [note4]

[Note1]Type J is not available for A06. [Note2]A05 and A06 have no NPN and PNP option. [Note3]A05 and A06 have no plug connector option.
[Note4]A05 ,J type and M08, M12 don't have a-w Waterproof option. Standard A06 model already has a waterproof function.
Add:The sockets of M08 and M12 need additional order. Please check on page 573.

Compendium of EMS Series

Three types of sensors

General type(EMS)

General type(Aqua Blue)

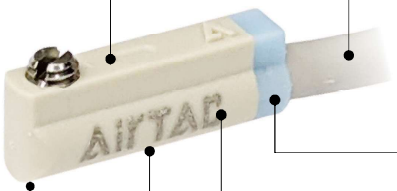
Manipulator industry(A05-EMS)

Product characteristics:
1. Flexure resistant curve material can be used in manipulator industry, such as multi joint manipulator and tank chain.
2. In case of high temperature, much dust, or water droplets and oil dust, the sensor shall take corresponding dust-proof measures.

High deflection wire

The deflection is increased by about 20% compared with the general type

Note: The recommended minimum bending radius of A05-EMS cables is 19mm.



Bending resistance

SR: bending resistance

Impact resistant materials

High cylinder installation flexibility

EMSG is the mini type corresponding to DMSG, which can be used for long and short strokes.
EMSH is the mini type corresponding to DMSH, which can be used for long and short strokes.

Two types of cross section

G Type 	General type(Aqua Blue) 
H Type 	General type(Aqua Blue) 

EMS Specifications

Item	EMS
Model	2-wire
Power supply voltage	10V ~ 28V DC
Switching current	2.5mA ~ 100mA
Contact capacity	2.8W Max.
Current consumption	3mA Max.
Internal voltage drop	3.5V Max.
Leakage current	0.06mA Max.
Switching frequency	1000Hz
Impact resistance	30G
Circuit protection	Reverse polarity protection Surge protection
Operating Temp.	-10℃ ~ 70℃
Enclosure	EMS,A05-EMS: IP64
Standard	CE marking, RoHS
Note	Temperature overheat protection

Ordering code for EMS

EMS G - □ 020 - □

A05-EMS G - □ 020

1 2 3 4 5 6

G  H  M08  M12 

①Industry code		Blank: General type A05: Manipulator industry
②Model		EMS：Solid State Sensor
③Specifications		G H
④Output type		Blank: 2 wire
⑤Lead wire	Direct lead wire	020: 2m 030: 3m 050: 5m 100: 10m
	Plug connector [Noet1]	M08:0.5m with M8 plug connector M12:0.5m with M12 plug connector M08010:1m with M8 plug connector M12010:1m with M12 plug connector M08020:2m with M8 plug connector M12020:2m with M12 plug connector M08030:3m with M8 plug connector M12030:3m with M12 plug connector
⑥Additional specification		Blank: General type

[Note1]A05 have no plug connector option.
Add:The sockets of M08 and M12 need additional order. Please check on page 573.

Compendium of CMS Series

Two types of sensors

General type(CMS)

General type(blue)

High temperature type (red)

Manipulator industry(A05-CMS)

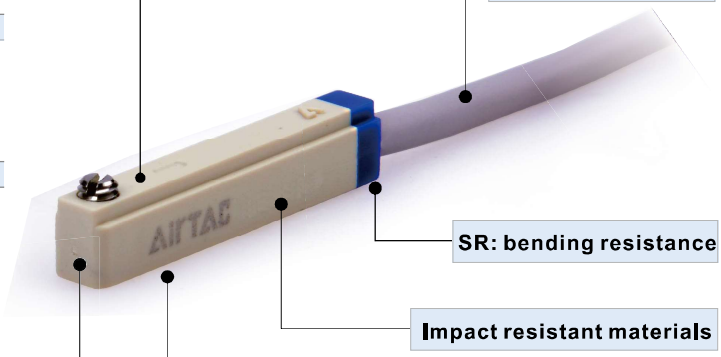
Product characteristics:
1. Flexure resistant curve material can be used in manipulator industry, such as multi joint manipulator and tank chain.
2. In case of high temperature, much dust, or water droplets and oil dust, the sensor shall take corresponding dust-proof measures.

High deflection wire

The deflection is increased by about 20% compared with the general type

Note: The recommended minimum bending radius of A05-CMS cables is 19mm.

Bending resistance



SR: bending resistance

Impact resistant materials

Two kinds of accessories

CMSG can be mounted with 2 accessories, applicable to multi-cylinders.

CMSG	F-MQ□
	 
	F-SC□SH
	 

Four types of cross section

G Type	
H Type	
E Type	
J Type	

CMS Specifications

Item	CMS	
Model	General	Heat resistant
Power supply voltage	5V ~ 240V AC/DC	
Switching current	100mA	
Contact capacity	10W Max.	
Current consumption	N/A	
Internal voltage drop	2.5V Max. @100mA DC	N/A
Leakage current	N/A	
Switching frequency	200Hz	
Impact resistance	30G	
Circuit protection	N/A	
Operating Temp.	-10℃ ~ 70℃	-10℃ ~ 125℃
Enclosure	IP64	
Standard	CE marking, RoHS	

Ordering code for CMS

CMS G - 020 - □

A05-CMS G - 020

1 2 3 4 5

G H E J M08 M12

①Industry code		Blank: General type A05: Manipulator industry
②Model		CMS : Reed Sensor
③Specifications		G H E J
④Lead wire	Direct lead wire	020: 2m 030: 3m 050: 5m 100: 10m
	Plug connector [Noet1]	M08:0.5m with M8 plug connector M12:0.5m with M12 plug connector M08010:1m with M8 plug connector M12010:1m with M12 plug connector M08020:2m with M8 plug connector M12020:2m with M12 plug connector M08030:3m with M8 plug connector M12030:3m with M12 plug connector
⑤Additional specification		Blank: General type H:Heat resistant [note2]

[Note1]A05 has no plug connector option. [Note2]A05 has no heat resistant option.
Add:The sockets of M08 and M12 need additional order. Please check on page 573.

Ordering code for accessories

F - MQ □ Cylinder Accessory

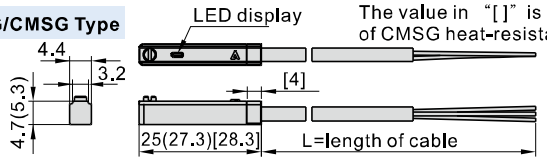
①Category	F：Accessory									
②Model	MQ：Cylinder Accessory									
③Cylinder	Aluminum alloy			Aluminum alloy (Thick type)			Stainless steel		
	Code	For series	For bore size	Code	For series	For bore size	Code	For series	For bore size
	A20: Φ20mm	MCK MBL	Φ20	A32T: Φ32mm	TWG	Φ32	S06: Φ6mm	PB/PBR MI MF MG MA/MAC	Φ6
	A25: Φ25mm		Φ25	A40T: Φ40mm		Φ40	S08: Φ8mm		Φ8
	A32: Φ32mm		Φ32	A50T: Φ50mm		Φ50	S10: Φ10mm		Φ10
	A40: Φ40mm		Φ40				S12: Φ12mm		Φ12
	A50: Φ50mm		Φ50				S16: Φ16mm		Φ16
	A63: Φ63mm		Φ63				S20: Φ20mm		Φ20
	A80: Φ80mm		Φ80				S25: Φ25mm		Φ25
							S32: Φ32mm		Φ32
							S40: Φ40mm		Φ40
							S50: Φ50mm		Φ50
							S63: Φ63mm		Φ63

F - SC □ SH Tie Rod Cylinder Accessory

①Category	F：Accessory		
②Model	SC：Tie Rod Cylinder Accessory		
③Cylinder	Code	For series	For bore size
	32	SC SGC	Φ32, Φ40
	50		Φ50
	63		Φ63
	80		Φ80, Φ100
	125		Φ125
	160		Φ160, Φ200
	250		Φ250
④Attached			

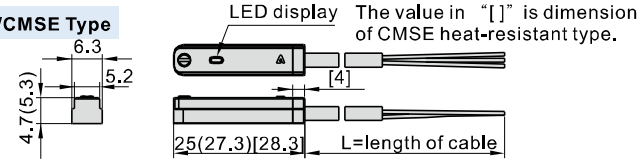
Dimensions

DMSG/CMSG Type



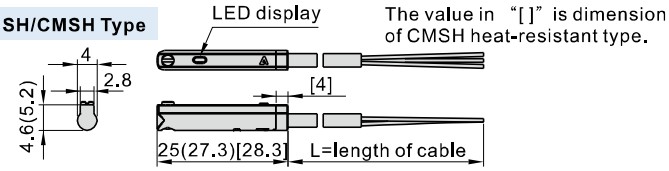
Note: The value in "( )" is dimension of CMSG type.

DMSE/CMSE Type



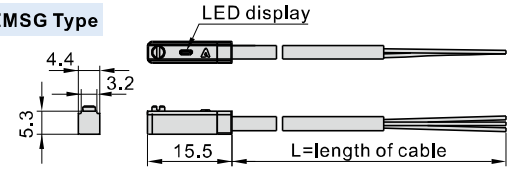
Note: The value in "( )" is dimension of CMSE type.

DMSH/CMSH Type



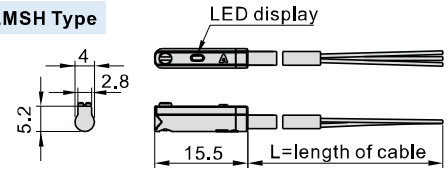
Note: The value in "( )" is dimension of CMSH type.

EMSG Type

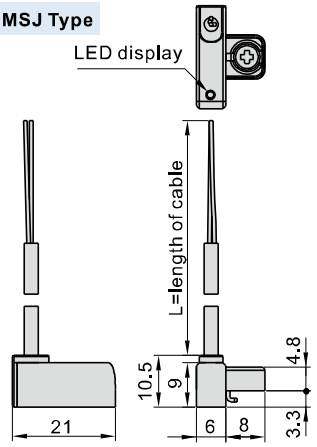


Note:a number in the bracket is the dimension of CMSH.

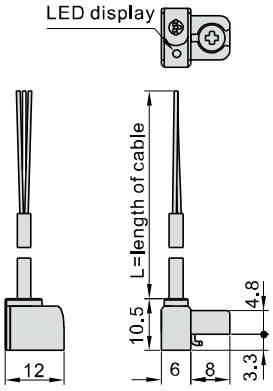
EMSH Type



CMSJ Type



DMSJ Type

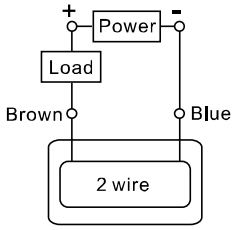


length of cable specification	length of cable(L)
020 Type	2000mm
030 Type	3000mm
050 Type	5000mm

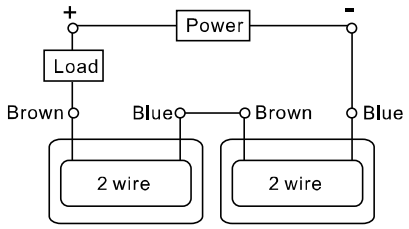
Connection method

2 wire, reed sensor connection

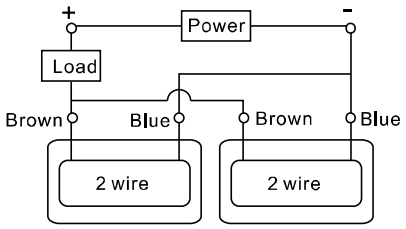
1.General connection



2.Series connection(And)



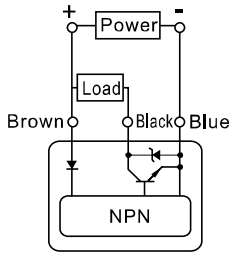
3.Parallel connection(OR)



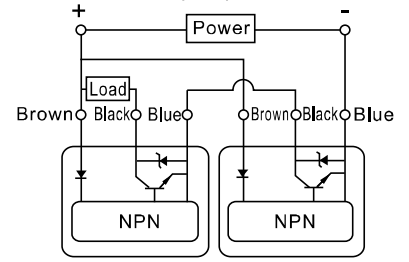
3 wire, solid state NPN connection

Note: The indicator lights will light up when both auto switches are turned NO.

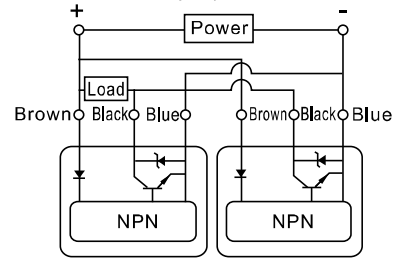
1.General connection



2.Series connection(And)



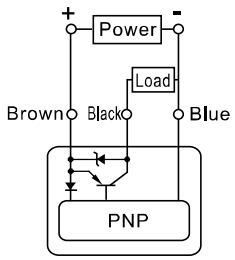
3.Parallel connection(OR)



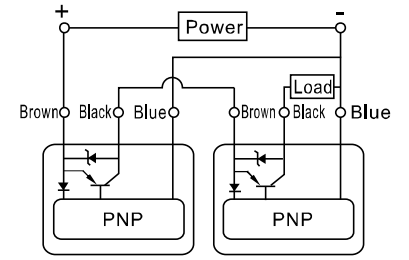
3 wire, solid state PNP connection

Note: The indicator lights will light up when both auto switches are turned NO.

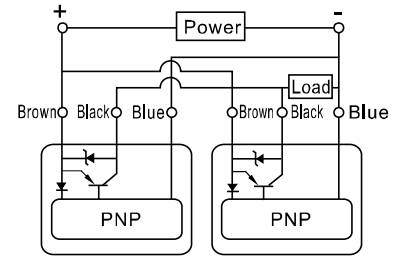
1.General connection



2.Series connection(And)



3.Parallel connection(OR)



The selection of sensor

DMSG	CMSG	EMSG	HFKL				MCK						ACQ/TACQ										ACQ			HFKP				RMT	RMT/RMTL				
			10	16	20	25	25	32	40	50	63	80	12	16	20	25	32	40	50	63	80	100	125	140	160	16	20	25	32	10	16	20	25	32	40
				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

HFK	HFK/HFKP						HFK	TCL/TCM												QCK									TR					
10	16	20	25	32	40		6	10	12	16	20	25	32	40	50	63	80	100	12	16	20	25	32	40	50	63	6	10	16	20	25	32
	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

SAU						HFZ							HFY						HFP					MD/MK					
32	40	50	63	80	100	6	10	16	20	25	32	40	6	10	16	20	25	32	10	16	20	25	32	6	10	16	20	25	32
•	•	•	•	•	•			•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Stainless steel																														
PB/PBR					MI		MI/TMI			MI	MF			MG				MA/MAC												
6	8	10	12	16	8	10	12	16	20	25	32	40	20	25	32	40	20	25	32	40	50	63	16	20	25	32	40	50	63
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Aluminum alloy										
MBL						MCK				
20	25	32	40	50	63	40	50	63	80	
•	•	•	•	•	•	•	•	•	•	

It needs an accessory to mount a sensor on a cylinder

SGC			
125	160	200	250
•	•	•	•

It needs an accessory to mount a sensor on a cylinder

DMSJ	CMSJ	ACQ/TACQ						SDA										QCK				QDK			
		32	40	50	63	80	100	12	16	20	25	32	40	50	63	80	100	32	40	50	63	20	25	32	40
		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

DMSH	CMSH	EMSH	ACQ			TC		HFZ						HFY	HFP	HFR						HFC							HFT				
			125	140	160	6	10	6	10	16	20	25	32	40	6	32	10	16	20	25	32	16	20	25	32	40	50	63	10	16	20	25	32
			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

QDK				HLQ/HLQL						HLS/HLSL						MU						HLH				MPG					
20	25	32	40	6	8	12	16	20	25	6	8	12	16	20	25	6	8	10	12	16	20	6	10	16	20	6	8	10	12	16	
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	

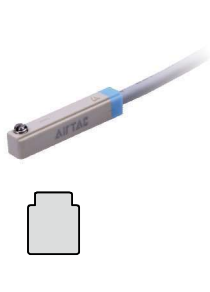
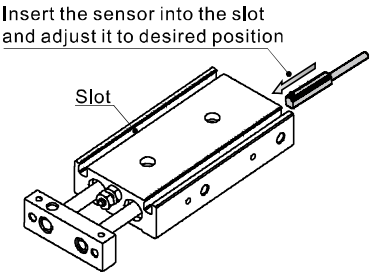
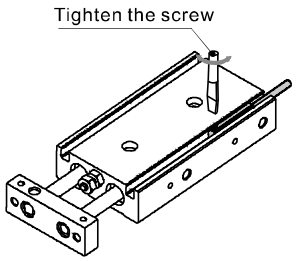
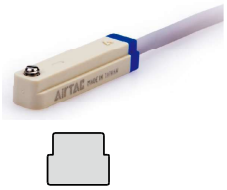
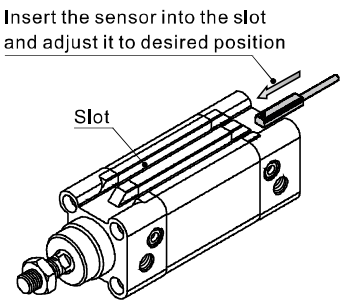
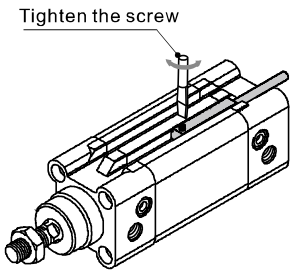
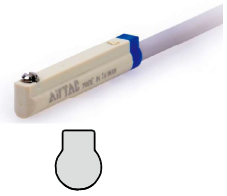
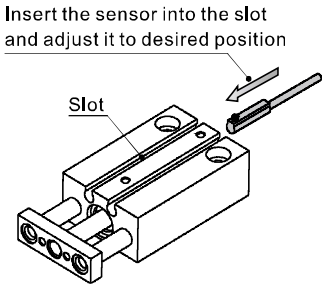
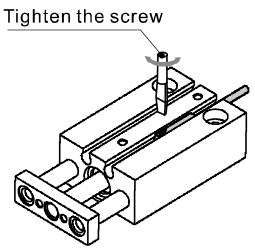
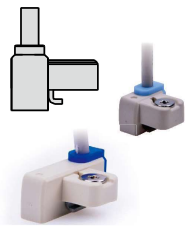
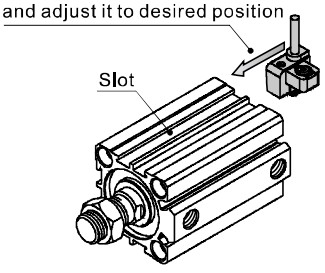
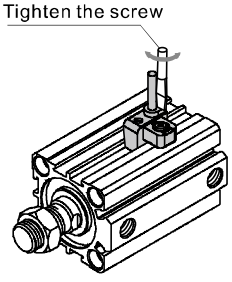
HRQ										HFK						HLF				HGS				RMH				HFD				
2	3	7	10	20	30	50	70	100	200	10	16	20	25	32	40	8	12	16	20	6	8	10	12	10	16	20	25	8	12	16	20	25
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•

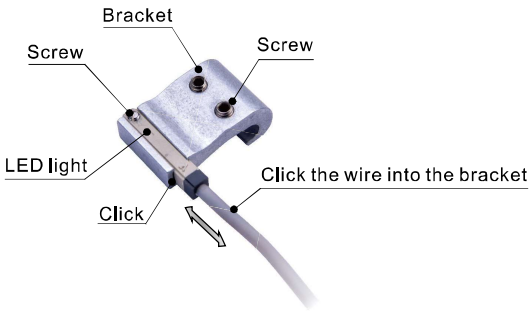
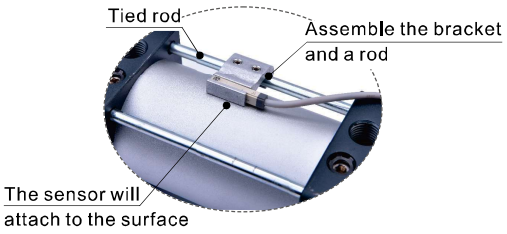
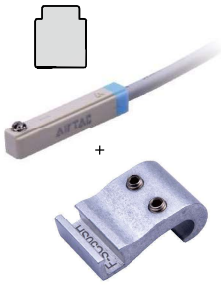
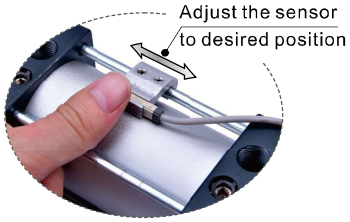
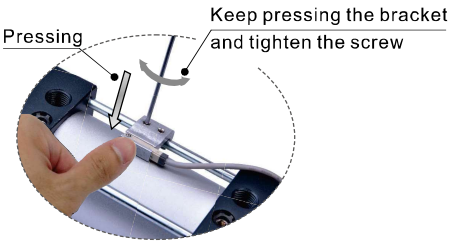
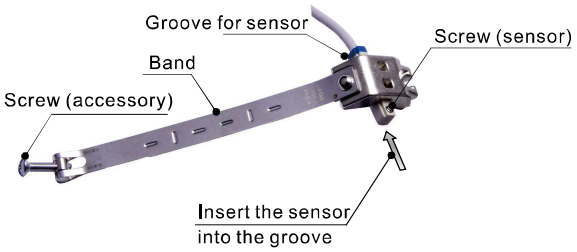
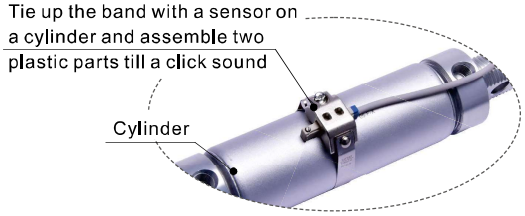
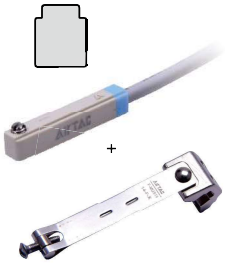
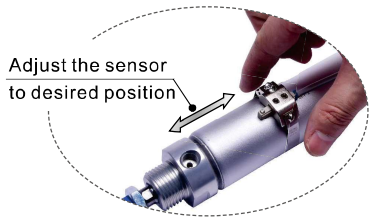
HFKL				HFCQ						HRS					HFKP			
10	16	20	25	16	20	25	32	40	50	63	10	15	20	30	40	16	20	25	32
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Note: HFZ6 can not use CMSH sensors

DMSE	CMSE	SAI/TSAI						SAI			ACE										
		32	40	50	63	80	100	125	160	200	12	16	20	25	32	40	50	63	80	100	125
		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Installation

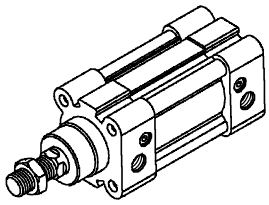
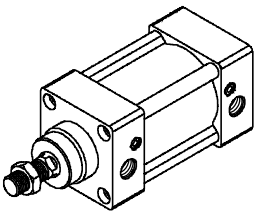
Sensor model	Procedure		
DMSG/CMSG/EMSG	1	2	3
			
DMSE/CMSE	1	2	3
			
DMSH/CMSH/EMSH	1	2	3
			
DMSJ/CMSJ	1	2	3
			

Sensor model	Procedure	
DMSG+(F-SC□SH) CMSG+(F-SC□SH)	1 	2 
	3 	4 
DMSG+(F-MQ□) CMSG+(F-MQ□)	1 	2 
	3 	4 

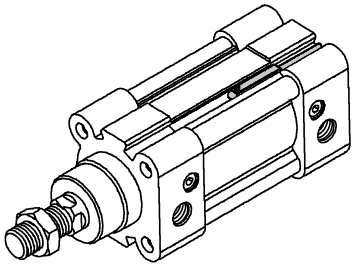
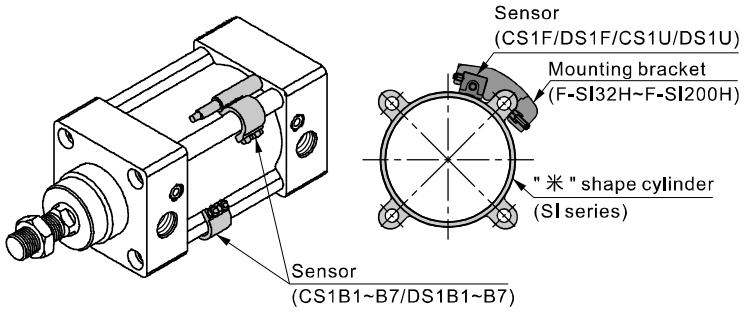
Sensor for " 米 " shape cylinder

SAI, SAU series will substitute for SI, SU series. And the corresponding sensors have some adjustments as the chart below.

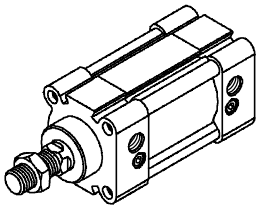
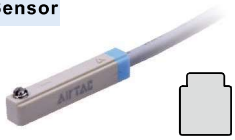
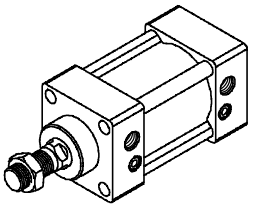
Cylinder and accessory

New type(SAI)		Previous type(SI)		
Cylinder	Sensor	Cylinder	Sensor	
	 CMSE \ DMSE		 CS1B1 / DS1B1 CS1B2 / DS1B2 CS1B3 / DS1B3 CS1B4 / DS1B4 CS1B5 / DS1B5 CS1B6 / DS1B6 CS1B7 / DS1B7	 CS1F/DS1F/CS1U/DS1U + F-SI32H/F-SI40H F-SI50H/F-SI63H F-SI80H/F-SI100H F-SI125H/F-SI160H F-SI200H

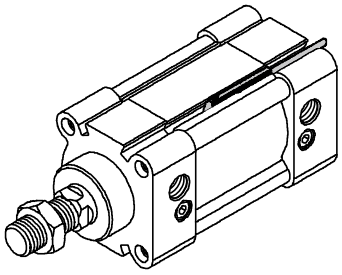
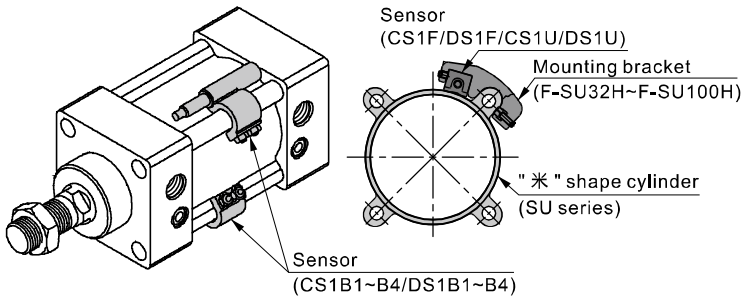
Installation

New type(SAI)	Previous type(SI)
	

Cylinder and accessory

New type(SAU)		Previous type(SU)		
Cylinder	Sensor	Cylinder	Sensor	
	 DMSG \ CMSG\ EMSG		 CS1B1 / DS1B1 CS1B2 / DS1B2 CS1B3 / DS1B3 CS1B4 / DS1B4	 CS1F/DS1F/CS1U/DS1U + F-SU32H/F-SU40H F-SU50H/F-SU63H F-SU80H/F-SU100H

Installation

New type(SAU)	Previous type(SU)
	

Socket

Ordering code

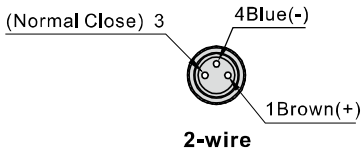
F - EC M08 B 020 - □

1 2 3 4 5 6

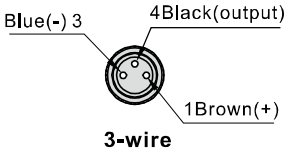
①Catagory code	F：Accessory
②Specification code	EC：Connecting Wire
③Socket type	M08:M8 socket M12:M12 socket
④Wire type	B: 2-wire type C:3-wire type
⑤Wire length	020: 2 meters 030:3meters 050:5meters 100:10meters
⑥Additional specification	Blank: General type

Appearance

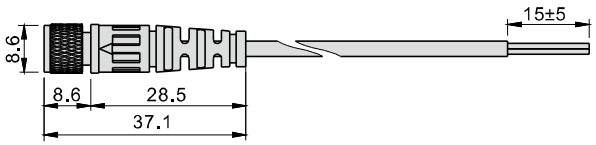
M8 socket



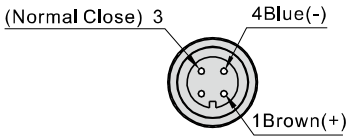
2-wire



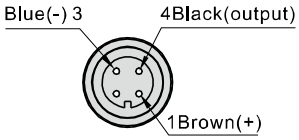
3-wire



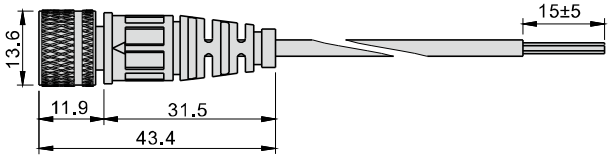
M12 socket



2-wire



3-wire



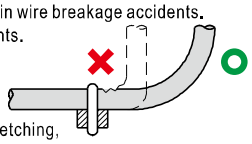
Instruction

1. Sensor shall not fall down or bear great impact when it is installed.
2. The wire of the Sensor shall not move with the action of cylinder.
3. Clamping torque shall be within the allowable scope when the Sensor is installed(0.15~0.2Nm).
4. Sensor shall be installed in the middle position of the action scope.
5. Sensor wiring:
   A. The wire is unable to bear repetitive torsion and tension.
      Please wire an external load before switch the power on.
   B. No poor insulation in wire.
   C. Do not wire with power line, high voltage line or use one wiring pipe.
   D. Pleas wire the circuit correctly base on the circuit diagram.
6. Execute scheduled maintenance by the following guidelines:
   A. Make sure the sensor is firmly fixed.
   B. Make sure the wire is intact.
   C. Make sure that LED indicate the movement of cylinder correctly.
7. Application of environment:
   A. It is Not allow to use the sensor in the environment with explosive gas.
   B. Magnetic sensor shall not be used in the environment with external magnetism.
   C. Magnetic sensor shall not be used in the environment that is always eroded by water.
   D. Magnetic sensor shall not be used in the environment with oil moisture or chemical substance.
   E. Magnetic sensor shall not be used in the environment with periodically changing temperature.
   F. Magnetic sensor shall not be used in the environment with excessively great impact.
   G. Magnetic sensor shall not be used in the environment with sources of electrical pulse.
   H. Avoid the environment with accumulated iron power and dense magnetic objects.

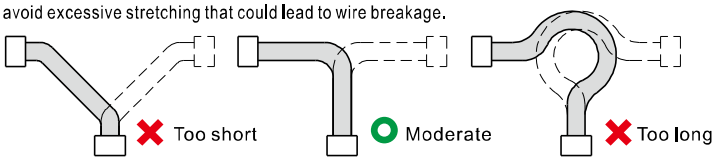
Precautions for wiring

Do not install the wires in the following ways, as it may result in wire breakage accidents.

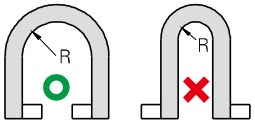
1.Do not excessively bend or tighten the cables at the tie points.



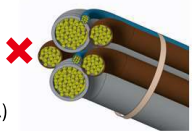
2.Cables should be routed to avoid repeated bending and stretching, as bending stress and tensile force can cause wire breakage.
When installing in oscillating conditions, be sure to account for the cable's bending allowance to avoid excessive stretching that could lead to wire breakage.



3.When fixing and laying cables (without considering oscillation), the bending radius (R) of the cables should be as large as possible.



4.Do not bundle multiple cables together (especially cables or pneumatic tubes with different outer diameters) at the bending points.



5.Precautions for Cable Carrier Use:
（1）Bending Radius of the Cable Carrier: The bending radius (R) should be 10 times or greater than the outer diameter of the cable.
（2）Prevent Twisting of Cables during Wiring: Cables inside the cable carrier should not be twisted. Place the cables horizontally or suspend them to eliminate any twisting.
（3）Avoid Over-fixing Inside the Cable Carrier: When wiring, ensure that no tension is applied to the cables, and do not fix the cables to movable parts.
Secure the cables only at the two fixed ends of the cable carrier.