EJ95

Semiconductor Industry

EJ95 Intrinsically Safe Pressure Sensor

Outline

**Acquired international explosion-proof standards [IECEx], also acquired Japanese standards and European standards [ATEX].
Moreover, enable global response considering acquisition of overseas standards.**

Features

- **Acquired IECEx, ATEX, Japanese explosion-proof standards, TS, NEPSI and KCs**
- **Incorporated external zero adjustment function**
- **Accuracy (±0.25% F.S.), Improvement of temperature characteristics**
- **Environmental resistance: IP65 equivalent**
- **Exterior is all stainless steel**

List of grade

Cleanliness These pressure transmitters have been assembled, calibrated, inspected and packaged in a clean room, paying special attention for maintaining cleanliness.

Grade		UC (Ultra Clean)	EP (Electro Polishing)
Model number		EJ95-□□6	EJ95-□□E
Surface roughness of gas contact		0.18μm Ra Avg. 0.7μm Rz Max.	0.18μm Ra Avg.
Wetted parts	Pressure sensor	Co-Ni alloy	SUS316L
	Fitting *1	SUS316L	SUS316L
Maximum allowable pressure *2		200% of rated pressure	150% of rated pressure
Leakage (Helium leak rate)		5 x 10^{-12} Pa·m^3/s and under	5 x 10^{-12} Pa·m^3/s and under
Particle		Zero count for size 0.1 μm or greater (In our inspection standard)	Zero count for size 0.1 μm or greater (In our inspection standard)
Cleaning		Ultra clearance (Cleaning)	Ultra clearance (Cleaning)
Operating media *3 (Recommended)		High-purity gas, semiconductor material gas, etc.	High-purity gas, semiconductor material gas, etc.

*1 For UC Grade, the pressure transmitter can be manufactured in DOUBLE MELT material by request. Please contact us.
*2 Allowable maximum pressure is the upper limit of pressure value which may safely be applied to the product and remain in specification once pressure is returned to the rated pressure range with a couple of times overpressurization for about 10 minutes.
Effects of continuous overpressure are not guaranteed.
*3 Ensure that pressure media is compatible with wetted parts.

General specification

Item	Description
Fluid	Process gasses for semiconductor industry
Pressure range	0 to 0.3, 0.5, 1, 2, 3.5, 5, 10, 20 MPa -0.1 to 0.3, 0.5, 1, 2 MPa ※Other compound ranges are also available. Please contact us.
Accuracy *1	±0.25% F.S. (at 23℃)
Internal volume	Approx. 0.9 cm^3 (In case of type S, 1/4UJR, it depends on shape of fitting.)
Fitting type	Type T, Type S
Connection	Connection fitting for semiconductor (1/4・3/8 UJR, VCR, CVC, etc.)
Pressure sensor seal method	Welding type
Power supply voltage	11 to 28V DC ※Refer to the following formula for the relation between the power supply voltage.
Load resistance	R max. (Ω)=50E−500〔E: Power supply voltage〕*2
Output	4 to 20mA DC
Transmission	2-wire system
Temperature characteristics (ZERO, SPAN)	±0.25% F.S. / 10℃
Operating temperature range	-20 to 60℃ (No icing or condensation)
Storage temperature range	-30 to 80℃ (No icing or condensation)
Insulation resistance	100MΩ or Higher (Form fittings to input/output terminal collectively 50V DC)
Electric connection	M12 Connector (4-Pin)
Zero-point adjuster	External Zero. ADJ. (Side) ※Push-turn Type
Case material	SUS304, SUS305, chloroprene rubber/POM (for zero-point adjuster portion)
Container protection class	Equivalent to IP65 (under JIS C 0920) ※Cable with M12 connector fitted.
Weight	Approx. 160 g (For S Type, the cable is excluded. It depends on the fitting type.)

＊1 Accuracy includes the effects of Linearity, Hysteresis and Repeatability.
＊2 Relational Expression of load Resistance is specification of EJ95 single unit. In fact, It depends on Combination with Safety Cage.

Intrinsically safe specification

Intrinsically safe standard	IECEx (International)	ATEX*1 (Europe)	JAPAN	TS (Taiwan)	NEPSI (China)	KCs (Korea)
Certificate number	IECEx CML 19.0013	CML 19ATEX2063	CML 19JPN2184	TD10003L (Identification No.)	GYJ24.1161X	19-AV4BO-0654
Hazardous area classifications	Zone0	Category 1G	Zone0			
Intrinsically safe construction type	Exia: Intrinsically safe construction; IIC: Gas group; T4: Temperature class; Ga: Equipment protection level					
Safety maintenance rating	Max. allowable voltage of intrinsically safe circuit (Ui): 28V Max. allowable current of intrinsically safe circuit (Ii): 93mA Max. allowable power of intrinsically safe circuit (Pi): 651mW Internal inductance of intrinsically safe circuit (Li): 0mH Internal capacitance of intrinsically safe circuit (Ci): 0.052μF Ambient temperature: -20℃ to 60℃					
External transmission cable	Li + Lc ≦ Lo　Lc: Inductance of external cable Ci + Cc ≦ Co　Cc: Capacitance of external cable (Differs depending on the safety barrier used)					
Withstand voltage	500 V AC, 1 min.					

*1 Comformity directive: 2014/34/EU (ATEX Directive)
※The intrinsically safe construction is achieved only when this pressure sensor is used in combination with a safety barrier.

Combined conditions related to safety barrier rating

Safety maintenance rating of intrinsic safety device	Combination conditions	Safety maintenance rating of the safety barrier
Maximum input voltage (Ui)	≧	Maximum output voltage (Uo)
Maximum input current (Ii)	≧	Maximum output current (Io)
Maximum input power (Pi)	≧	Maximum output power (Po)

Combined conditions related to parameter

Parameter of intrinsic safety device and wiring	Combined conditions	Parameter of safety barrier
Input inductance of EJ95 (Li) + Inductance of wiring (Lc)	≦	Maximum external inductance (Lo)
Input capacitance of EJ95 (Ci) + Capacitance of wiring (Cc)	≦	Maximum external capacitance (Co)

Recommended safety barrier

***The safety barrier can be selected by the customer.**

Insulation type

Item	Description		
Manufacturer	・P & F Co., Ltd.	・Cooper industries Japan K.K.	IDEC
Type	KFD2-STC4-Ex1*	MTL5541	D5014S (Input 1ch) D5014D (Input 2ch)
Type approval number (JP)	No. TC16232	No. TC19435	No. TC21005
Intrinsically safe construction type	Exia IIC *No test report can be issued for this product.	Exia IIC	Exia IIC

※Ground of intrinsic safety regulation is unnecessary because an insulated barrier is isolated from intrinsically safe circuit.

Zener Type

Item	Description
Manufacturer	・Cooper Industries Japan K.K
Type	MTL7787+
Type approval number (JP)	No. TC16447
Intrinsically safe construction type	Exia IIC

※Use of Zener safety barrier requires Type A intrinsic safety groundwork.

Group classification

The types of Intrinsically safe construction electrical equipment are classified into Group Ⅰ and Group Ⅱ according to the place where they are used.
This equipment belongs to Group Ⅱ and is used in hazardous locations in factories or offices, except for hazardous locations in the mine.

・Applicable group of gas or steam

Gas or steam	Applicable group		
A	ⅡA	ⅡB	ⅡC
B	—	ⅡB	ⅡC
C	—	—	ⅡC

・Ignition point of gas or steam which T4 can apply (Within bold-line rectangle)

Ignition point of gas or steam	Applicable temperature class					
Higher than 450℃	T1	T2	T3	T4	T5	T6
Higher than 300℃	—	T2	T3	T4	T5	T6
Higher than 200℃	—	—	T3	T4	T5	T6
Higher than 135℃	—	—	—	T4	T5	T6
Higher than 100℃	—	—	—	—	T5	T6
Higher than 85℃	—	—	—	—	—	T6

・Examples of applicable gas and steam

Group \ Temperature class	T1	T2	T3	T4	T5	T6
ⅡA	Acetone Ammonia Ethane Acetic acid Ethyl acetate Toluene Benzene Methane	1-Butanol Butane Propane Methanol	Hexane	Acetaldehyde		Ethyl nitrite
ⅡB	Carbon monoxide	Ethylene Ethylene oxide Ethanol		Ethyl methyl Ether		
ⅡC	Hydrogen	Acetylene				Carbon disulfide

Equipment protection level (EPL) classification symbol

Ga: Equipment for explosive gas atmospheres, having a "very high" Level of Protection, which is not a source ofignition in normal operation, during expected malfunctions or during rare malfunctions.

Gb: Equipment for explosive gas atmospheres, having a "high" Level of Protection, which is not a source of ignitionin normal operation or during expected malfunctions.

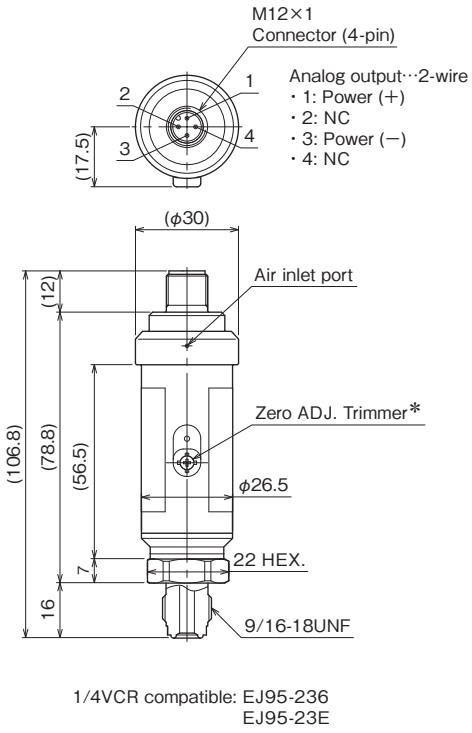
Gc: Equipment for explosive gas atmospheres, having an "enhanced" Level of Protection, which is not a source ofignition in normal operation and which may have some additional protection to ensure that it remains inactive as an ignition source in the case of regular expected occurrences (for example failure of a lamp).

Dimensions 1

Unit: mm

UC/EP Grade

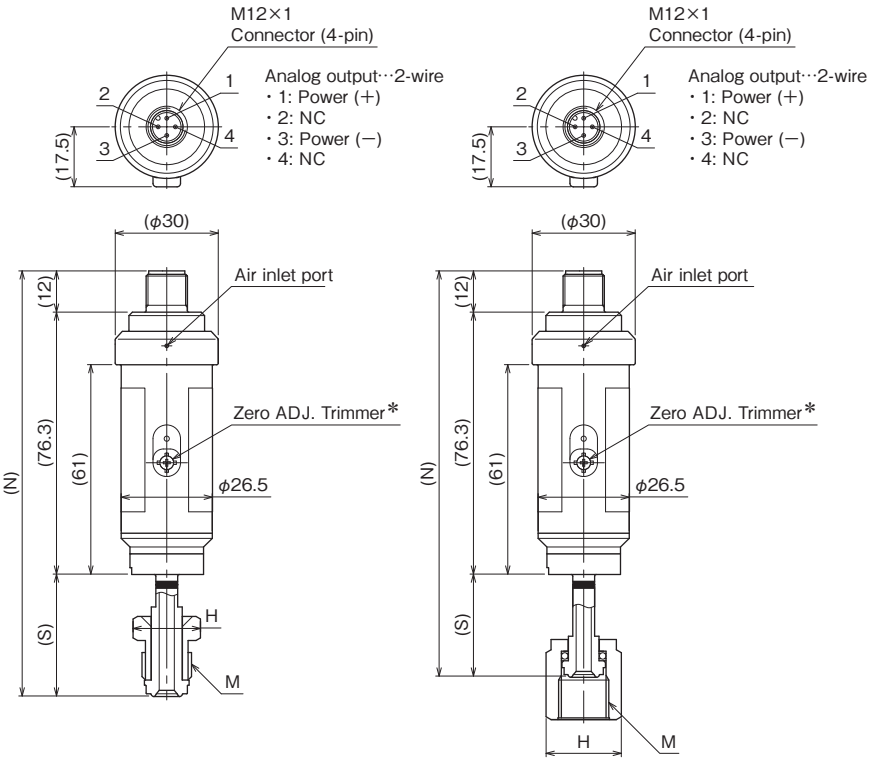
Type S
Male Integrated



1/4VCR compatible: EJ95-236
EJ95-23E

UC/EP Grade

Type S
Male nut/Female nut



*: Not to be removed

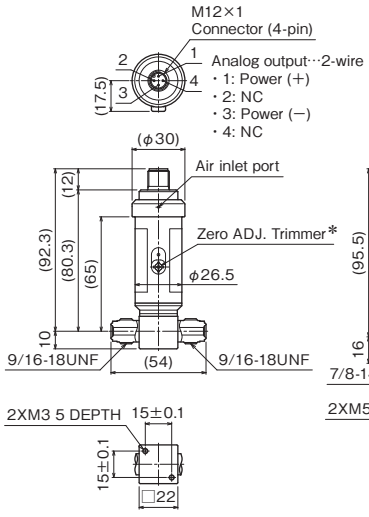
Grade	Connection	Piping DIA.	Screw size M	Dimensions			Model number
				N	S	H	
UC	VCR Male nut	1/4	9/16-18UNF	121.8	33.5	16 × 18.5 Hex.	EJ95-2J6
	VCR Female nut (Bearings are not included)			119.2	30.9	19 × 21.9 Hex.	EJ95-2L6
	UJR Male nut			124.8	36.5	17 × 19.6 Hex.	EJ95-2N6
	UJR Female nut (With pure ring)			122.3	34	19 × 21.9 Hex.	EJ95-2Q6
	CVC Male nut			123.8	35.5	15.8 × 18.2 Hex.	EJ95-2W6
	CVC Female nut (Bearings are not included)			119.2	30.9	19 × 21.9 Hex.	EJ95-2Y6

Grade	Connection	Piping DIA.	Screw size M	Dimensions			Model number
				N	S	H	
EP	UJR Male nut	1/4	9/16-18UNF	122.3	34	17 × 19.6 Hex.	EJ95-2NE
	UJR Female nut (With pure ring)			119.3	31	19 × 21.9 Hex.	EJ95-2QE

Dimensions 2

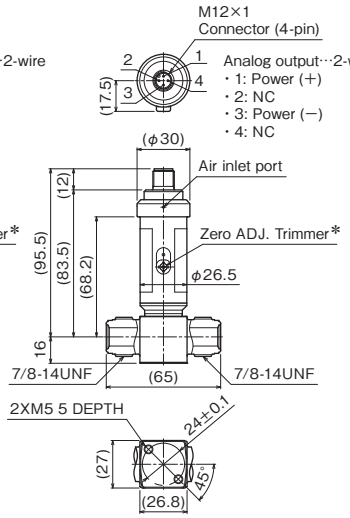
Unit: mm

UC/EP Grade — **Type T Male Integrated**



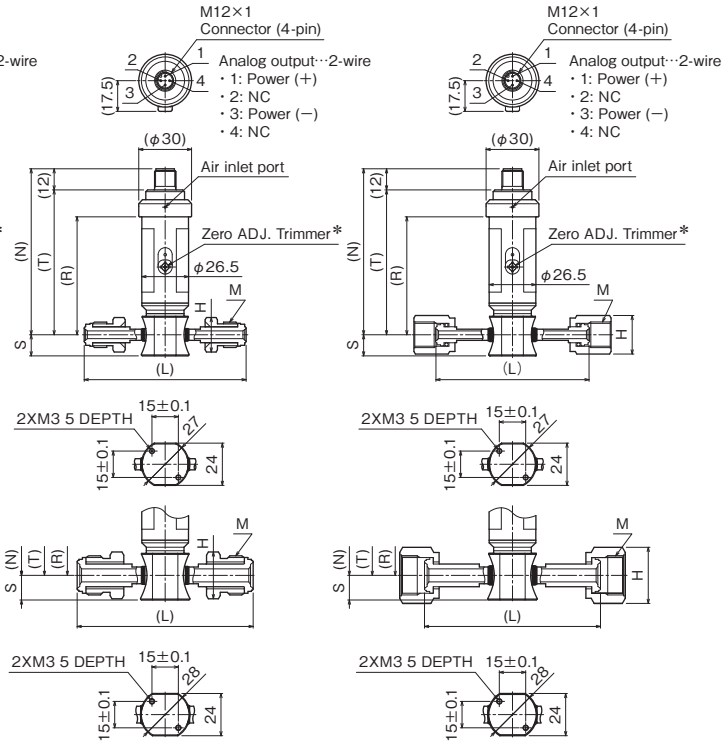
1/4VCR compatible: EJ95-136
EJ95-13E

EP Grade — **Type T Male Integrated**



3/8 (1/2) VCR compatible: EJ95-14E

UC/EP Grade — **Type T Male nut/Female nut**



*: Not to be removed

Grade	Connection	Piping DIA.	Screw size M	Dimensions N	T	R	S	H	L	Model number
UC	VCR Male nut	1/4	9/16-18UNF	94.3	82.3	67	12	16 × 18.5 Hex.	86	EJ95-1J6
		3/8	7/8-14UNF	96.3	84.3	69	14	24 × 27.7 Hex.	90.5	EJ95-1K6
	VCR Female nut (Bearings are not included)	1/4	9/16-18UNF	94.3	82.3	67	12	19 × 21.9 Hex.	80.8	EJ95-1L6
		3/8	7/8-14UNF	96.3	84.3	69	14	27 × 31.2 Hex.	81.8	EJ95-1M6
	UJR Male nut	1/4	9/16-18UNF	94.3	82.3	67	12	17 × 19.6 Hex.	87	EJ95-1N6
		3/8	7/8-14UNF	96.3	84.3	69	14	23 × 26.6 Hex.	100	EJ95-1P6
	UJR Female nut (With pure ring)	1/4	9/16-18UNF	94.3	82.3	67	12	19 × 21.9 Hex.	87	EJ95-1Q6
		3/8	7/8-14UNF	96.3	84.3	69	14	26 × 30 Hex.	100	EJ95-1R6
	CVC Male nut	1/4	9/16-18UNF	94.3	82.3	67	12	15.8 × 18.2 Hex.	86	EJ95-1W6
		3/8	7/8-14UNF	96.3	84.3	69	14	23.8 × 27.5 Hex.	90.6	EJ95-1X6
	CVC Female nut (Bearings are not included)	1/4	9/16-18UNF	94.3	82.3	67	12	19 × 21.9 Hex.	80.8	EJ95-1Y6
		3/8	7/8-14UNF	96.3	84.3	69	14	27 × 31.2 Hex.	82	EJ95-1Z6

Grade	Connection	Piping DIA.	Screw size M	Dimensions N	T	R	S	H	L	Model number
EP	UJR Male nut	1/4	9/16-18UNF	94.3	82.3	67	12	17 × 19.6 Hex.	87	EJ95-1NE
		3/8	7/8-14UNF	96.3	84.3	69	14	23 × 26.6 Hex.	100	EJ95-1PE
	UJR Female nut (without bearings)	1/4	9/16-18UNF	94.3	82.3	67	12	19 × 21.9 Hex.	81	EJ95-1QE
		3/8	7/8-14UNF	96.3	84.3	69	14	26 × 30 Hex.	100	EJ95-1RE

Model number configuration

Please specify the model number, each specs and the range for ordering.

Model

E J 9 5	—			6	—		4	Y	1	0	×	×	×	×	×	×	
Intrinsically Safe Pressure Sensor UC Grade		①	②	③		④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮

Model number | Selective spec. | Additional spec. (Option)

① Mounting

1	Type T
2	Type S

② Connection

3	1/4	Compatible with VCR Male integrated
J	1/4	VCR Male nut
K	3/8	
L	1/4	VCR Female nut (Bearings are not included)
M	3/8	
N	1/4	UJR Male nut
P	3/8	
Q	1/4	UJR Female nut (With pure ring)
R	3/8	
W	1/4	CVC Male nut
X	3/8	
Y	1/4	CVC Female nut (Bearings are not included)
Z	3/8	

③ Wetted parts by grade

6	UC Grade ·Pressure sensor: Co-Ni alloy ·Fitting: SUS316L

④ Pressure range

Please specify the pressure range and units separately besides selection of range code.

C	-0.1 to 0.3MPa
D	-0.1 to 0.5MPa
E	-0.1 to 1MPa
F	-0.1 to 2MPa
1	0 to 0.3MPa
2	0 to 0.5MPa
3	0 to 1MPa
4	0 to 2MPa
5	0 to 3.5MPa
6	0 to 5MPa
7	0 to 10MPa
8	0 to 20MPa

⑤ Accuracy

4	±0.25%F.S.

⑥ Power source

Y	11 to 28V DC

⑦ Output

1	4 to 20mA DC (2-wire system)

⑧ Outlet for Electric Wire

0	M12 Connector (Without Cable / Only Pressure Sensor)

⑮ Document

0	Nil
1	Required (Please specify the desired documents separately.) Submission drawings, instruction manual, inspection procedure, mill test report, test report (1 pc 1 copy), inspection / traceability certificate, strength calculation, attended inspection

※Option: M12 Connector Cable

M12 Connector Cable		
PUR Cable (Oilproof)	Straight	Cable length: 3m
	Type L	
PVC Cable (Stainless Nut)	Straight	Cable length: 3m
	Type L	
PUR Cable (Oilproof)	Straight	Cable length: 5m
	Type L	
PVC Cable (Stainless Nut)	Straight	Cable length: 5m
	Type L	

When ordering the recommended barrier, please specify separately the desired specifications. When using the non-recommended barrier, please observe the "Safety maintenance rating".

*Specify "X" if there is no applicable specification.

Model number configuration

Please specify the model number, each specs and the range for ordering.

Model

E	J	9	5	—	①	②	③	—	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
Intrinsically Safe Pressure Sensor EP Grade																				

Model number			Selective spec.	Additional spec. (Option)
① Mounting	1	Type T		
	2	Type S		
② Connection	3	1/4	Compatible with VCR Male integrated	
	4	1/2 (3/8)	Compatible with VCR Male integrated	
	N	1/4	UJR Male nut	
	P	3/8		
	Q	1/4	UJR Female Nut (Without Pure Ring)	
	R	3/8		
③ Wetted parts by grade	E		EP Grade ·Pressure sensor: Co-Ni alloy ·Fitting: SUS316L	
④ Pressure range	C		-0.1 to 0.3MPa	
	D		-0.1 to 0.5MPa	
	E		-0.1 to 1MPa	
	F		-0.1 to 2MPa	
	1		0 to 0.3MPa	
	2		0 to 0.5MPa	
	3		0 to 1MPa	
	4		0 to 2MPa	
	5		0 to 3.5MPa	
	6		0 to 5MPa	
	7		0 to 10MPa	
	8		0 to 20MPa	
⑤ Accuracy	4		±0.25%F.S.	
⑥ Power source	Y		11 to 28V DC	
⑦ Output	1		4 to 20mA DC (2-wire system)	
⑧ Outlet for Electric Wire	0		M12 Connector (Without Cable / Only Pressure Sensor)	
⑮ Document			0 Nil	
			1 Required (Please specify the desired documents separately.) Submission drawings, instruction manual, inspection procedure, mill test report, test report (1 pc 1 copy), inspection / traceability certificate, strength calculation, attended inspection	

Please specify the pressure range and units separately besides selection of range code.

※Option: M12 Connector Cable

M12 Connector Cable		
PUR Cable (Oilproof)	Straight	Cable length: 3m
	Type L	
PVC Cable (Stainless Nut)	Straight	Cable length: 3m
	Type L	
PUR Cable (Oilproof)	Straight	Cable length: 5m
	Type L	
PVC Cable (Stainless Nut)	Straight	Cable length: 5m
	Type L	

When ordering the recommended barrier, please specify separately the desired specifications. When using the non-recommended barrier, please observe the "Safety maintenance rating".

*Specify "X" if there is no applicable specification.