azbil

Sapphire Capacitance Diaphragm Gauge

Model V8C/V8S

Model V8C　Model V8S

Azbil's diaphragm gauges—
accelerating the evolution of process technology

Azbil Corporation

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Azbil Corporation
Advanced Automation Company

1-12-2 Kawana, Fujisawa
Kanagawa 251-8522 Japan

URL: https://www.azbil.com

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Model V8C Integrated Model

Further evolution of the integrated model, with higher performance.

Compact size

40 % less volume than our previous products, thanks to improved arrangement of components

Improved degrees of freedom in installation

Heat-dissipating structure allows installation as you like—vertically or horizontally

User-set self-heating temperature (integrated model)

Polynomial operation capability allows temperature correction over a wide range. Self-heating temperature can be set in a range of 45–200 °C

High-speed response as fast as 1 ms

High speed was achieved with special components and noise-reducing design

Analog output
Event output
Power
Digital input

Digital communication
PC loader communication
Status display

Setup
Zero-point adjustment
Event status

CPU
Memory

A/D converter
Temperature sensors for circuits

Capacitance pressure sensor
Temperature sensor for the pressure sensor
Temperature sensor for the heater*
*Self-heating models only

Model V8S Separated Model

Handles the high temperatures required for advanced processes.

Temperature characteristic compensation

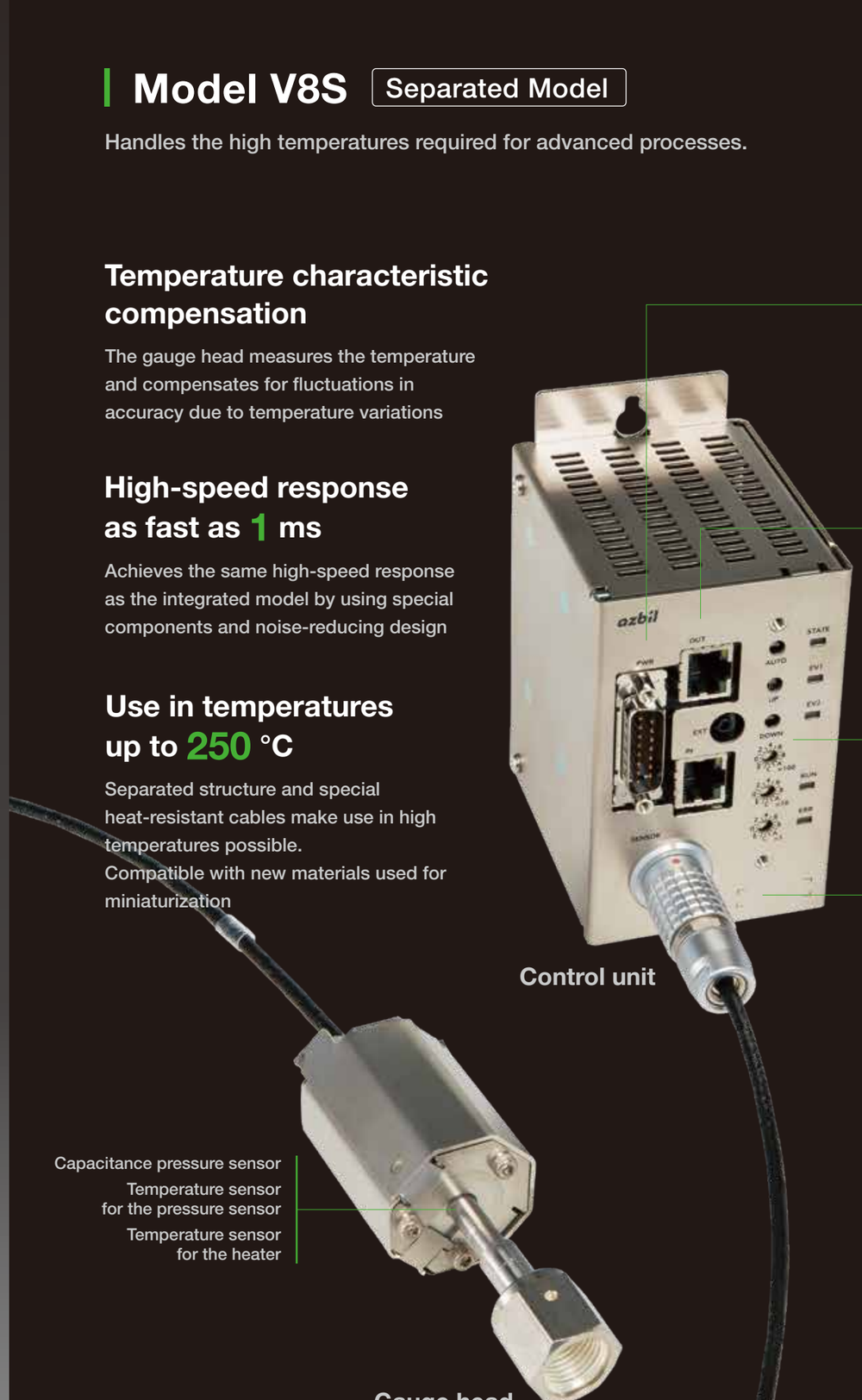
The gauge head measures the temperature and compensates for fluctuations in accuracy due to temperature variations

High-speed response as fast as 1 ms

Achieves the same high-speed response as the integrated model by using special components and noise-reducing design

Use in temperatures up to 250 °C

Separated structure and special heat-resistant cables make use in high temperatures possible.
Compatible with new materials used for miniaturization



Analog output
Event output
Power
Digital input

Digital communication
PC loader communication
Status display

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CPU
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Temperature sensors for circuits

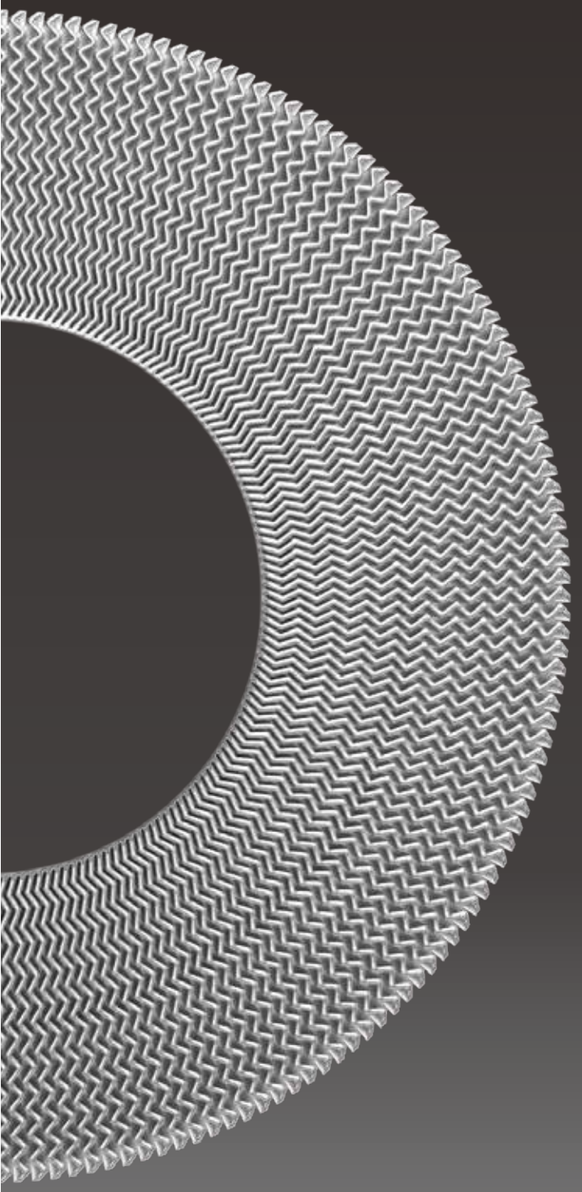
Control unit

Capacitance pressure sensor
Temperature sensor for the pressure sensor
Temperature sensor for the heater

Gauge head

Improved resistance to deposition
(an option for certain models)

Zero shift is cut to 1/10 that of our previous products by MEMS processing technology.

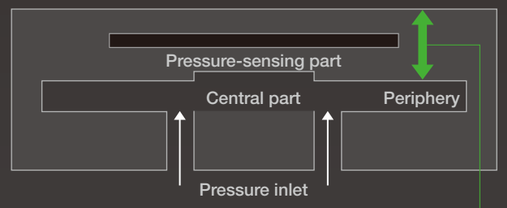


The baffle structure increases the frequency of collision of active chemical species against the wall surface, which helps to deactivate them

Stress-balanced structure

Zero-point shift is reduced by thickening the periphery of the pressure-sensing part to offset the stress applied to the periphery and the central part, thereby making the pressure-sensing part unlikely to deform.

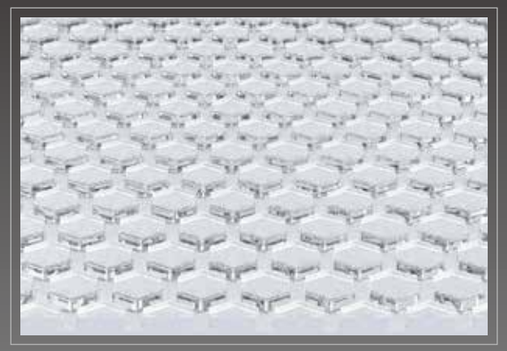
V8 sensor structure



Periphery is thickened

Uneven sensor chip surface

Processing makes the surface uneven, which breaks up deposited film and reduces stress that deposition causes



Specifications

	Model V8C (Integrated Model)	Model V8S (Separated Model)
Accuracy	0.25–0.5 % rdg. (10 % FS of the range or higher, depending on the model)	0.5 % rdg. (10 % FS of the range or higher)
Zero temperature characteristic	0.004–0.032 % FS/°C*	0.016–0.032 % FS/°C* with the gauge head and control unit
Span temperature characteristic	0.02 % rdg./°C	0.02 % rdg./°C with the gauge head and control unit
Resolution	1/10000 FS at 1st-order filter time constant setting of 30 ms or more	1/10000 FS at 1st-order filter time constant setting of 30 ms or more
Operating ambient temperature	Low limit 0–20 °C, high limit 35–70 °C	Control unit: 10–60 °C
	Limits depend on the model, mounting posture, and presence of cooling air	Gauge head: 10–250 °C
Pressure measurement update cycle	0.27 ms	
Response time (63 % response)	1–25 ms* <Can be changed using the PC setup tool>	
Gas-contacting material	Sapphire, nickel alloy, baffle materials (flat plate baffle: nickel alloy; multilayer baffle: SUS316L), coupling materials	
Internal capacity	2–6 cm^3*	2 cm^3
Allowable pressure	110–300 kPa abs*	

Max. power consumption/current	Max. power consumption	Max. current		Max. power consumption	Max. current	
		At ±15 V	At 24 V		At ±15 V	At 24 V
	2–22 W*	0.1–0.8 A*	0.1–1.1 A*	2–3 W*	0.1–0.2 A*	0.1 A

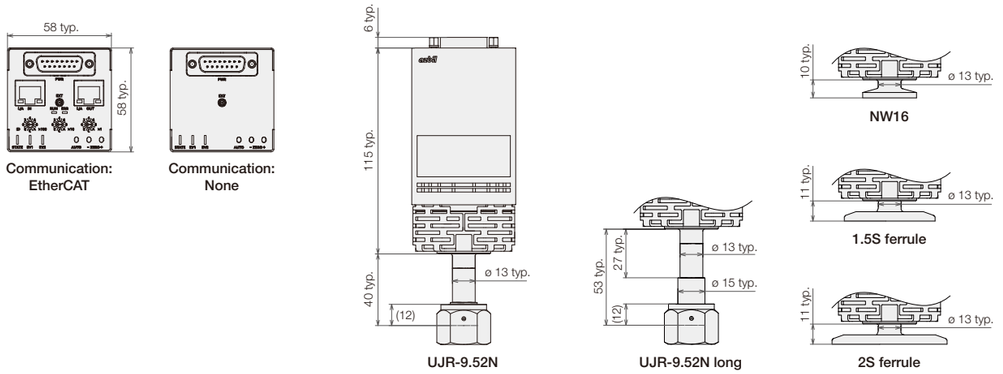
Output signal	Output voltage: 0–10 V DC. Allowable load resistance: 10 kΩ min.	
I/O connector	D-sub 15-pin male connector, #4-40 UNC retaining screws	
Warm-up time	30 min (normal), 1 h max.	10 min max.
Protection rating	IP20	
Event relay	Output relays: 4	
	Component used: UL-listed photorelay	
	Contact form: 1a (N.O. only). Maximum load: 0.3 A. Maximum voltage: 30 V DC	
	Output functions: trip point output, warm-up completion output, error output	
Digital input (DI)	Inputs: 4	
	Connectable output type: No-voltage contacts or open collector (sink type)	
	Functions: zero-point adjustment, 1st-order filter enable/disable, self-heating temperature options	
EtherCAT® communication	ETG.5003-1: Semiconductor Device Profile, Part 1: Common Device Profile	
	ETG.5003.2080: Semiconductor Device Profile, Part 2080: Specific Device	
	Profile: Vacuum Pressure Gauge V1.3.0 | 1.5.0 (OD)	
Standards compliance	CE-marked, UKCA-marked, EN IEC 63000 (RoHS), EN 61326-1, EN 61326-2-3 (for use in industrial locations) (EMC directive), KC-marked	
Related products	Setup tools: Smart Loader Package (model SLP-V8, soon to be released on the Azbil website free of charge) USB loader cable (model 81441177-001, sold separately)	

*The exact figure depends on the model.

Model V8C (Integrated Model)

External dimensions

(Unit: mm)



Model selection table (sales start date differs depending on the model; please contact a sales representative for details)

Basic model No.	Sensor chip, baffle, range series	Pressure range	Self-heating temp., variable temp. 1	Communication	Coupling	Event 1 setting	Event 2 setting	Variable temp. 2	Supplied documents	Description
V8C										Integrated model
	*									See table 1
		*								See table 2
			*							See table 3
				0						None
				5						EtherCAT
					*					See table 4
						***				**.* % FS. Always OFF if "NNN" is specified.
							***			**.* % FS. Always OFF if "NNN" is specified.
								*		See table 3
									D	Inspection data
									Y	Inspection data and traceability certificate

Table 1. Sensor chip, baffle, range series

Code	Sensor chip	Baffle	Range series
0	Flat	Flat plate	P
1	Flat	Flat plate	T
2	Uneven	Flat plate	P
3	Uneven	Flat plate	T
4	Flat	Multilayer	P
5	Flat	Multilayer	T
6	Uneven	Multilayer	P
7	Uneven	Multilayer	T

Table 2. Absolute pressure range

Code	P series	T series
E	10 Pa	13.332 Pa
F	20 Pa	26.664 Pa
G	25 Pa	33.331 Pa
H	100 Pa	133.32 Pa
J	200 Pa	266.64 Pa
K	300 Pa	399.97 Pa
L	500 Pa	666.61 Pa
M	1000 Pa	1333.2 Pa
N	2000 Pa	2666.4 Pa
P	3000 Pa	3999.7 Pa
Q	5000 Pa	6666.1 Pa
R	10000 Pa	13332 Pa
S	20000 Pa	26664 Pa
T	30000 Pa	39997 Pa
U	50000 Pa	66661 Pa
V	100 kPa	133.32 kPa

Table 3. Self-heating temperature

Codes for fixed self-heating temperatures				Codes for variable self-heating temperatures*			
Code IV	Self-heating temp.	Code IX	Variable temp. 2	Code IV	Variable temp. 1	Code IX	Variable temp. 2
R	No self-heating	0	None	–	–	–	–
A	45 °C			L	45 °C	A	45 °C
B	80 °C			M	80 °C	B	80 °C
C	100 °C			N	100 °C	C	100 °C
D	125 °C			P	125 °C	D	125 °C
E	150 °C			Q	150 °C	E	150 °C
F	160 °C			S	160 °C	F	160 °C
G	180 °C			T	180 °C	G	180 °C
H	200 °C			U	200 °C	H	200 °C
V	60 °C			W	60 °C	V	60 °C

*Variable temperatures 1–2 can be specified individually and can be switched by digital input.
Variable temperatures 1–2 are default settings. Variable temperature 1 is set as the default setting for variable temperatures 3–8. Temperatures can be changed in the range of 45–200 °C by the Smart Loader Package.
At the time of shipment, the product is set to the mode where self-heating temperatures can be switched by digital input.
If the mode is changed by the Smart Loader Package or EtherCAT communication, the self-heating temperature can be switched directly by the Smart Loader Package or by EtherCAT.

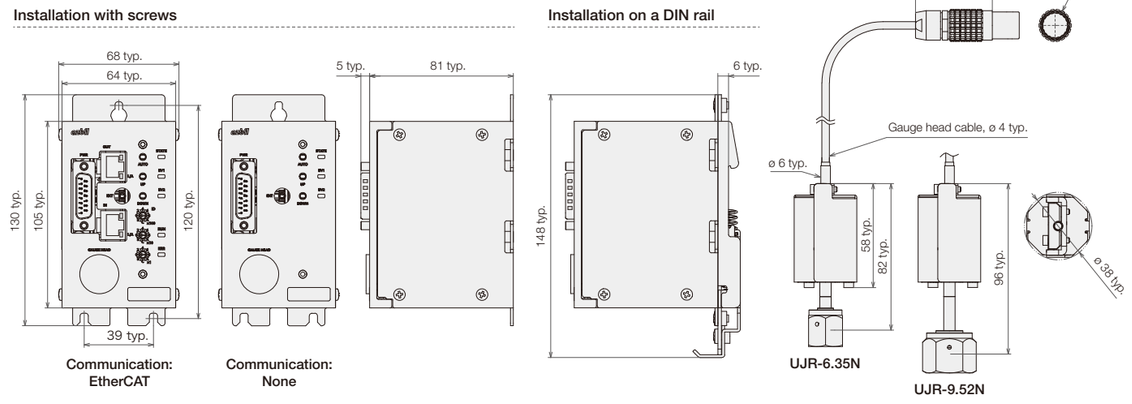
Table 4. Coupling

Code	Coupling
D	Fujikin UJR-9.52N-CT union nut, F1 coating / SUS316L / with pure ring
H	Fujikin UJR-9.52N-CT union nut, F1 coating / SUS316L / long / with pure ring
S	NW16 / SUS316L
U	2S ferrule / SUS316L
V	1.5S ferrule / SUS316L

Model V8S (Separated Model)

External dimensions

(Unit: mm)



Model selection table (sales start date differs depending on the model; please contact a sales representative for details)

Basic model No.	Sensor chip, baffle, range series	Pressure range	Gauge head reference temp.	Communication	Coupling	Event 1 setting	Event 2 setting	Cable length	Supplied documents	Description
V8S										Separated model
	*									See table 1
		*								See table 2
			*							See table 3
				0						None
				5						EtherCAT
					*					See table 4
						***				**.* % FS. Always OFF if "NNN" is specified.
							***			**.* % FS. Always OFF if "NNN" is specified.
								*		See table 5
									D	Inspection data
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P	3000 Pa	3999.7 Pa
Q	5000 Pa	6666.1 Pa
R	10000 Pa	13332 Pa
S	20000 Pa	26664 Pa
T	30000 Pa	39997 Pa
U	50000 Pa	66661 Pa
V	100 kPa	133.32 kPa

Table 3. Gauge head reference temp.

Code	Temperature
A	45 °C
B	80 °C
C	100 °C
D	125 °C
E	150 °C
F	160 °C
G	180 °C
H	200 °C
J	240 °C
K	250 °C

Note: These are the temperatures at which the accuracy is specified. Model V8S does not have a self-heating function.

Table 4. Coupling

Code	Coupling
D	Fujikin UJR-9.52N-CT union nut, F1 coating / SUS316L / with pure ring
N	Fujikin UJR-6.35N-CT union nut, F1 coating / SUS316L / with pure ring

Table 5. Gauge head cable length

Code	Cable length
A	0.5 m
B	1 m
D	2 m
F	2.9 m