

# General Specifications

## Analog I/O Modules (for FIO)



### GS 33Q06Q40-31E

#### ■ GENERAL

This GS covers the hardware specifications of the Analog I/O Modules (FIO) that can be installed in the Node Unit for ESB Bus (ANB10S, ANB10D), the Node Unit for ER Bus (ANR10S, ANR10D) and Compact Field Control Unit (for FIO) (AFF50S, AFF50D, AFV10S, AFV10D).

#### ■ STANDARD SPECIFICATIONS

##### ● Current/Voltage Input Modules (Non-Isolated)

These modules mainly receive 4 to 20 mA DC or 1 to 5 V DC standardized signal from 2-wire/4-wire transmitters. They can be used in dual redundant configuration.

| Items                                   |           | Specifications                                                                              |                                                               |                             |
|-----------------------------------------|-----------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------|
| Model                                   |           | AAI141 (*1)                                                                                 | AAV141                                                        | AAV142                      |
| Number of input channels                |           | 16, non-isolated                                                                            | 16, non-isolated (differential input)                         | 16, non-isolated            |
| Input signal                            |           | 4 to 20 mA DC                                                                               | 1 to 5 V DC (allowable common mode voltage $\pm 1$ V or less) | -10 to 10 V DC              |
| Allowable input current/voltage         |           | 27 mA                                                                                       | $\pm 7.5$ V                                                   | $\pm 13$ V                  |
| Withstanding voltage                    |           | —                                                                                           | —                                                             | —                           |
| Input resistance                        | Power ON  | 400 $\Omega$ (at 20 mA) to 1000 $\Omega$ (at 4 mA) (*2)                                     | 1 M $\Omega$ or more                                          | 1 M $\Omega$ or more        |
|                                         | Power OFF | 500 k $\Omega$ or more                                                                      | 340 k $\Omega$ or more                                        | 660 k $\Omega$ or more      |
| Accuracy                                |           | $\pm 16$ $\mu$ A                                                                            | $\pm 4$ mV                                                    | $\pm 20$ mV                 |
| Data update period                      |           | 10 ms                                                                                       |                                                               |                             |
| Step response time                      |           | 100 ms                                                                                      |                                                               |                             |
| Transmitter power supply                |           | 14.8 V or more (at 20 mA) (*3)<br>26.4 V or less (at 0 mA)<br>(output current limit: 27 mA) | —                                                             | —                           |
| Setting of 2-wire or 4-wire transmitter |           | For each channel by setting pin                                                             | —                                                             | —                           |
| Drift due to ambient temperature change |           | $\pm 16$ $\mu$ A/10 $^{\circ}$ C                                                            | $\pm 4$ mV/10 $^{\circ}$ C                                    | $\pm 20$ mV/10 $^{\circ}$ C |
| Maximum current consumption             |           | 310 mA (5 V DC),<br>450 mA (24 V DC)                                                        | 350 mA (5 V DC)                                               | 350 mA (5 V DC)             |
| Weight                                  |           | 0.2 kg                                                                                      | 0.2 kg                                                        | 0.2 kg                      |
| External connection                     |           | Pressure clamp terminal, KS cable, MIL connector cable                                      |                                                               |                             |
| HART communication (*4)                 |           | Available                                                                                   | —                                                             | —                           |

\*1: This module does not allow a Zener barrier to be connected. If the module is to be used in intrinsically safe applications, use an isolation barrier.

\*2: Viewed from the terminals, module input resistance is, depending on the current flowing:

$$250 \Omega + \frac{\text{voltage drop in the input protection circuit}}{\text{current value}}$$

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\*3: This voltage is developed between connecting terminals for this module's 2-wire transmitter. When calculating if transmitter minimum operating voltage requirement will be satisfied, remember to allow for voltage drop in external wiring.

\*4: R3.02 or later version supports HART function. When installing the module with HART function to a remote node, the firmware of EB401 must be Rev 2 or later.  
For HART function specifications, refer to "HART Communication Package (for A□□□□-H) (GS 33Q03L70-31E)."

### ● Current/Voltage I/O Modules (Non-Isolated)

These modules provide eight inputs and eight outputs to support up to eight loops.

They can be used in dual redundant configuration.

| Items                                   |           | Specifications                                             |                    |                                                                     |                    |
|-----------------------------------------|-----------|------------------------------------------------------------|--------------------|---------------------------------------------------------------------|--------------------|
| Model                                   |           | AAI841 (*1)                                                |                    | AAB841 (*6)                                                         |                    |
| Number of I/O channels                  |           | 8-channel input/8-channel output, non-isolated             |                    | 8-channel input/8-channel output, non-isolated (differential input) |                    |
| I/O signal                              |           | Input: 4 to 20 mA                                          | Output: 4 to 20 mA | Input: 1 to 5 V (allowable common mode voltage ±1 V or more)        | Output: 4 to 20 mA |
| Allowable input current/voltage         |           | 25 mA                                                      | —                  | ±7.5 V                                                              | —                  |
| Withstanding voltage                    |           | —                                                          |                    | —                                                                   |                    |
| Input resistance                        | Power ON  | 400 Ω (at 20 mA) to 1000 Ω (at 4 mA) (*2)                  | —                  | 1 MΩ or more                                                        | —                  |
|                                         | Power OFF | 500 kΩ or more                                             | —                  | 340 kΩ or more                                                      | —                  |
| Allowable load resistance               |           | —                                                          | 0 to 750 Ω (*3)    | —                                                                   | 0 to 750 Ω         |
| Circuit-open detection                  |           | —                                                          | Less than 0.65 mA  | —                                                                   | Less than 0.65 mA  |
| Accuracy                                |           | Input: ±16 μA                                              | output: ±48 μA     | Input: ±4 mV                                                        | output: ±48 μA     |
| Data update period                      |           | 10 ms                                                      |                    |                                                                     |                    |
| Input step response time                |           | 100 ms                                                     |                    |                                                                     |                    |
| Output step response time               |           | 40 ms                                                      |                    |                                                                     |                    |
| Transmitter power supply                |           | 14.8 V or more (at 20 mA)<br>26.4 V or less (at 0 mA) (*4) |                    | —                                                                   |                    |
| Setting of 2-wire or 4-wire transmitter |           | For each channel by setting pin                            |                    | —                                                                   |                    |
| Temperature drift                       |           | ±0.1 %/10 °C                                               |                    |                                                                     |                    |
| Maximum current consumption             |           | 310 mA (5 V DC), 500 mA (24 V DC)                          |                    | 310 mA (5 V DC), 250 mA (24 V DC)                                   |                    |
| Weight                                  |           | 0.3 kg                                                     |                    |                                                                     |                    |
| External connection                     |           | Pressure clamp terminal, KS cable, MIL connector cable     |                    |                                                                     |                    |
| HART communication (*5)                 |           | Available                                                  |                    | —                                                                   |                    |

\*1: This module does not allow a Zener barrier to be connected. If the module is to be used in intrinsically safe applications, use an isolation barrier.

\*2: Viewed from the terminals, module input resistance is, depending on the current flowing:

$$250 \, \Omega + \frac{\text{voltage drop in the input protection circuit}}{\text{current value}}$$

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\*3: When installing to a remote node that conforms to the temperature environment and using it under the temperature environment (60 to 70  $^{\circ}$ C), the allowable load resistance is 200 to 750  $\Omega$ .

\*4: This voltage is developed between connecting terminals for this module's 2-wire transmitter. When calculating if transmitter minimum operating voltage requirement will be satisfied, remember to allow for voltage drop in external wiring.

\*5: R3.02 or later version supports HART function. When installing the module with HART function to a remote node, the firmware of EB401 must be Rev 2 or later.

For HART function specifications, refer to "HART Communication Package (for A□□□□-H) (GS 33Q03L70-31E)."

\*6: The module current output does not allow a Zener barrier to be connected. If the module is to be used in intrinsically safe applications, use an isolation barrier.

### ● Voltage Output Module (Non-Isolated)

This module outputs -10 to +10 V DC.

It can be used in dual redundant configuration.

| Items                       | Specifications                                         |
|-----------------------------|--------------------------------------------------------|
| Model                       | AAV542                                                 |
| Number of output channels   | 16, non-isolated                                       |
| Output signal               | -10 to 10 V                                            |
| Withstanding voltage        | —                                                      |
| Allowable load resistance   | More than 10 kΩ                                        |
| Accuracy                    | Larger of ±0.3 %/FS and ±12 mV                         |
| Data update period          | 10 ms                                                  |
| Output step response time   | 40 ms                                                  |
| Temperature drift           | Larger of ±0.1 %/10 °C and ±10 mV/10 °C                |
| Maximum current consumption | 450 mA (5 V DC)                                        |
| Weight                      | 0.2 kg                                                 |
| External connection         | Pressure clamp terminal, KS cable, MIL connector cable |

### ● Current Input Modules (Isolated)

This module inputs 4 to 20 mA.

It can be used in dual redundant configuration.

| Items                                   | Specifications                                                                        |
|-----------------------------------------|---------------------------------------------------------------------------------------|
| Model                                   | AAI143 (*1)                                                                           |
| Number of input channels                | 16, isolated                                                                          |
| Input signal                            | 4 to 20 mA                                                                            |
| Allowable input current                 | 24 mA                                                                                 |
| Withstanding voltage                    | Between input and system: 1500 V AC, For 1 minute (*4)                                |
| Input resistance                        | Power ON 270 Ω (20 mA) to 350 Ω (4 mA) (*2)                                           |
|                                         | Power OFF 500 kΩ or more                                                              |
| Accuracy                                | ±16 μA                                                                                |
| Data update period                      | 10 ms                                                                                 |
| Transmitter power supply                | 19.0 V or more (at 20 mA) 25.5 V or less (at 0 mA) (output current limit: 25 mA) (*5) |
| Setting of 2-wire or 4-wire transmitter | For each channel by setting pin                                                       |
| Drift due to ambient temperature change | ±16 μA/10 °C                                                                          |
| Maximum current consumption             | 230 mA (5 V DC), 540 mA (24 V DC)                                                     |
| Weight                                  | 0.3 kg                                                                                |
| External communication                  | Pressure clamp terminal, MIL connector cable, Dedicated cable (KS1)                   |
| HART communication (*3)                 | Available                                                                             |

\*1: This module does not allow a Zener barrier to be connected. If the module is to be used in intrinsically safe applications, use an isolation barrier.

\*2: Viewed from the terminals, module input resistance is, depending on the current flowing:

$$250 \, \Omega + \frac{\text{voltage drop in the input protection circuit}}{\text{current value}}$$

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\*3: When installing the module with HART function to a remote node, the firmware of EB401 must be Rev 2 or later.

For HART function specifications, refer to "HART Communication Package (for A□□□□-H) (GS 33Q03L70-31E)."

\*4: The withstanding voltage for using the dedicated cable is 500 V AC (between the input signal and the system).

The withstanding voltage for using MIL connector cable depends on the electrical specifications of its cable.

\*5: This voltage is developed between connecting terminals for this module's 2-wire transmitter. When calculating if transmitter minimum operating voltage requirement will be satisfied, remember to allow for voltage drop in external wiring.

### ● Current Output Modules (Isolated)

This module outputs 4 to 20 mA.

It can be used in dual redundant configuration. (\*1)

| Items                                   | Specifications                                                              |                                                                         |
|-----------------------------------------|-----------------------------------------------------------------------------|-------------------------------------------------------------------------|
|                                         | AAI543-□5□/-□E□                                                             | AAI543-□6□/-□F□ (*2)                                                    |
| Number of output channels               | 16, isolated, standard switch-over response in redundant configuration (*3) | 16, isolated, fast switch-over response in redundant configuration (*3) |
| Output signal                           | 4 to 20 mA                                                                  |                                                                         |
| Withstanding voltage                    | Between output and system: 1500 V AC, For 1 minute (*4)                     |                                                                         |
| Allowable load resistance               | 0 to 750 Ω                                                                  |                                                                         |
| Circuit-open detection                  | Less than 0.65 mA                                                           |                                                                         |
| Accuracy                                | ±48 μA                                                                      |                                                                         |
| Data update period                      | 10 ms                                                                       |                                                                         |
| Drift due to ambient temperature change | ±16 μA/10 °C                                                                |                                                                         |
| Maximum current consumption             | 230 mA (5 V DC), 540 mA (24 V DC)                                           |                                                                         |
| Weight                                  | 0.4 kg                                                                      |                                                                         |
| External communication                  | Pressure clamp terminal, MIL connector cable, Dedicated cable (KS1)         |                                                                         |
| HART communication (*5)                 | Available                                                                   |                                                                         |

\*1: Use two modules with the same suffix code for use in dual-redundant configuration.

\*2: When AAI543-□6□/-□F□ is installed in a remote node, the ambient temperature should be 0 to 60 °C.

\*3: The time during which the output to the field falls below 4 mA at switch-over is 100 ms at maximum for AAI543-□5□/-□E□ (standard response) and 2 ms at maximum for AAI543-□6□/-□F□ (fast response).  
When any fast response field devices are connected to dual redundantly configured modules, AAI543-□6□/-□F□ (fast response) should be used.

\*4: The withstanding voltage for using the dedicated cable is 500 V AC (between the input signal and the system).  
The withstanding voltage for using MIL connector cable depends on the electrical specifications of its cable.

\*5: When installing the module with HART function to a remote node, the firmware of EB401 must be Rev 2 or later.  
For HART function specifications, refer to "HART Communication Package (for A□I□□□-H) (GS 33Q03L70-31E)."

### ● Voltage Input Modules (Isolated)

It can be used in dual redundant configuration.

| Items                                   | Specifications                                                              |              |
|-----------------------------------------|-----------------------------------------------------------------------------|--------------|
|                                         | AAV144                                                                      |              |
| Number of input channels                | 16, isolated                                                                |              |
| Input signal                            | 1 to 5 V                                                                    | -10 to 10 V  |
| Switching input signals                 | Input Signals can be set together for CH1 to CH16                           |              |
| Allowable input voltage                 | ±30 V                                                                       |              |
| Withstanding isolated voltage           | Between input and system: 1500 V AC Withstanding voltage, For 1 minute (*1) |              |
| Input resistance                        | Power ON                                                                    | 1 MΩ         |
|                                         | Power OFF                                                                   | 200 kΩ       |
| Accuracy                                | ±4 mV                                                                       | ±20 mV       |
| Data update period                      | 10 ms                                                                       |              |
| Drift due to ambient temperature change | ±4 mV/10 °C                                                                 | ±20 mV/10 °C |
| Maximum current consumption             | 500 mA (5 V DC)                                                             |              |
| Weight                                  | 0.2 kg                                                                      |              |
| External communication                  | Pressure clamp terminal, MIL connector cable, Dedicated cable (KS1)         |              |

\*1: The withstanding voltage for using the dedicated cable is 500 V AC (between the input signal and the system).  
The withstanding voltage for using MIL connector cable depends on the electrical specifications of its cable.

### ● Voltage Output Modules (Isolated)

It can be used in dual redundant configuration.

| Items                                   | Specifications                                                               |
|-----------------------------------------|------------------------------------------------------------------------------|
| Model                                   | AAV544                                                                       |
| Number of output channels               | 16, isolated                                                                 |
| Output signal                           | -10 to 10V                                                                   |
| Withstanding voltage                    | Between output and system: 1500 V AC Withstanding voltage, For 1 minute (*1) |
| Allowable load resistance               | 5 k $\Omega$ or more                                                         |
| Accuracy                                | The larger one among $\pm 12$ mV or $\pm 0.3$ %FS                            |
| Data update period                      | 10 ms                                                                        |
| Drift due to ambient temperature change | The larger one among $\pm 0.1$ %/10 °C or $\pm 10$ mV/10 °C                  |
| Maximum current consumption             | 860 mA (5 V DC)                                                              |
| Weight                                  | 0.2 kg                                                                       |
| External communication                  | Pressure clamp terminal, MIL connector cable, Dedicated cable (KS1)          |

\*1: The withstanding voltage for using the dedicated cable is 500 V AC (between the input signal and the system).  
The withstanding voltage for using MIL connector cable depends on the electrical specifications of its cable.

### ● TC Input/RTD Input Modules (Isolated)

These modules receive signals from mV, thermocouple (TC) and RTD.

They can be used in dual redundant configuration.

| Items                                                   |           | Specifications                                                                                          |                                                             |
|---------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Model                                                   |           | AAT141                                                                                                  | AAR181                                                      |
| Number of input channels                                |           | 16, isolated (*7)                                                                                       | 12, isolated                                                |
| Input signal                                            |           | TC: JIS C1602:1995, IEC584:1995<br>Type J, K, E, B(*1), R, S, T, N<br>mV: -100 to 150 mV, -20 to 80 mV  | RTD: JIS C1604:1997, IEC751:1995<br>Pt100 (3-wire type)(*6) |
| Switching input signals                                 |           | TC/mV can be set individually for CH1 to CH16.                                                          | CH1 to CH12 are RTD inputs.                                 |
| Allowable input voltage                                 |           | ±5 V                                                                                                    | ±5 V                                                        |
| Withstanding voltage                                    |           | Between input and system: 1500 V AC, For 1 minute                                                       |                                                             |
| Input resistance                                        | Power ON  | 2 MΩ or more                                                                                            |                                                             |
|                                                         | Power OFF | 2 MΩ or more                                                                                            |                                                             |
| Accuracy                                                |           | TC: ±30 μV<br>mV: ±80 μV for span (-100 to 150 mV)<br>±30 μV for span (-20 to 80 mV)                    | RTD: ±120 mΩ                                                |
| Allowable total resistance of signal source plus wiring |           | 1000 Ω or less                                                                                          | 40 Ω or less (wiring resistance per wire) (*2)              |
| Effect of allowable signal source resistance (1000 Ω)   |           | ±20 μV(*3)                                                                                              | —                                                           |
| Reference junction compensation accuracy                |           | Within ±1 °C (*4) (*5)                                                                                  | —                                                           |
| Measurement current                                     |           | —                                                                                                       | RTD: 1 mA                                                   |
| Temperature drift                                       |           | ±80 μV/10 °C (-100 to 150 mV input)<br>±30 μV/10 °C (TC/-20 to 80 mV input)                             | ±120 mΩ/10 °C (RTD input)                                   |
| Data update period                                      |           | 1 s                                                                                                     |                                                             |
| Burn-out                                                |           | All channels can be set together.<br>Setting: Not available/available (UP/DOWN)<br>detection time: 60 s |                                                             |
| Maximum current consumption                             |           | 450 mA (5 V DC)                                                                                         | 450 mA (5 V DC)                                             |
| Weight                                                  |           | 0.2 kg                                                                                                  |                                                             |
| External connection                                     |           | Pressure clamp terminal                                                                                 |                                                             |

\*1: Type B does not carry out temperature compensation and can not measure under 44 °C

\*2: Wiring resistance for the signal cables of IN□A and IN□C must be identical.

\*3: In dual redundant configuration, this effect is ±40 μV.

\*4: This accuracy changes due to the installation condition.

If measured temperature is lower than 0 °C, multiply the above value by the following coefficient (K):

$$K = \frac{\text{Thermoelectromotive force per degree at 0 °C}}{\text{Thermoelectromotive force per degree at measured temperature}}$$

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\*5: Reference junction compensation accuracy varies depending on the temperature environment of pressure clamp terminal.

#### Specifications for Node only

| Temperature Environment | Reference Junction Compensation accuracy |
|-------------------------|------------------------------------------|
| -20 to 15 °C            | ±2 °C                                    |
| 15 to 45 °C             | ±1 °C                                    |
| 45 to 70 °C             | ±2 °C                                    |

#### Specifications for installing in a standard cabinet

| Temperature Environment | Reference Junction Compensation accuracy |
|-------------------------|------------------------------------------|
| 0 to 50 °C              | ±2 °C                                    |

\*6: AAR181 also supports JPt100.

\*7: Please use a non-ground type thermocouple (TC) for AAT141 because it is an isolated module. Otherwise the multi-point ground that the ground type thermocouple (TC) is used for the multiple channels of the module will cause a temperature error.

### ● Current Input Module and Current I/O Module (Isolated Channels)

The Current Input Module receives signals of 4 to 20 mA. The Current I/O Module receives and outputs signals of 4 to 20 mA. These two modules are isolated between the field and the system as well as between each channel.

These two modules can be used in dual redundant configuration.

| Items                       |           | Specifications                                                                                                |                                                                                                                       |
|-----------------------------|-----------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Model                       |           | AAI135 (*1)                                                                                                   | AAI835 (*1)                                                                                                           |
| Number of I/O channels      |           | 8-channel input, isolated channels                                                                            | 4-channel input/4-channel output, isolated channels                                                                   |
| I/O signal                  |           | 4 to 20 mA                                                                                                    | Input: 4 to 20 mA<br>Output: 4 to 20 mA                                                                               |
| Allowable input current     |           | 25 mA                                                                                                         | 25 mA<br>—                                                                                                            |
| Withstanding voltage        |           | Between input and system:<br>500 V AC, For 1 minute<br>Between input channels:<br>500 V AC, For 1 minute (*2) | Between input/output and system: 500 V AC, For 1 minute<br>Between input/output channels: 500 V AC, For 1 minute (*2) |
| Input resistance            | Power ON  | 290 Ω (at 20 mA) to 450 Ω (at 4 mA) (*3)                                                                      |                                                                                                                       |
|                             | Power OFF | 500 kΩ or more                                                                                                |                                                                                                                       |
| Allowable load resistance   |           | —                                                                                                             | 0 to 750 Ω (*4)                                                                                                       |
| Circuit-open detection      |           | —                                                                                                             | Less than 0.65 mA                                                                                                     |
| Accuracy                    |           | ±16 μA                                                                                                        | Input: ±16 μA<br>Output: ±48 μA                                                                                       |
| Data update period          |           | 10 ms                                                                                                         |                                                                                                                       |
| Transmitter power supply    |           | 15.0 V or more (at 20 mA)<br>29.3 V or less (at 0 mA) (*5)                                                    | 15.0 V or more (at 20 mA)<br>29.3 V or less (at 0 mA) (*5)<br>—                                                       |
| Temperature drift           |           | ±16 μA/10 °C                                                                                                  |                                                                                                                       |
| Maximum current consumption |           | 360 mA (5 V DC), 450 mA (24 V DC)                                                                             | 360 mA (5 V DC), 450 mA (24 V DC)                                                                                     |
| Weight                      |           | 0.3 kg                                                                                                        |                                                                                                                       |
| External connection         |           | Pressure clamp terminal, MIL connector cable, Dedicated cable (KS1)                                           |                                                                                                                       |
| HART communication (*6)     |           | Available                                                                                                     | Available                                                                                                             |

\*1: This module does not allow a Zener barrier to be connected. If the module is to be used in intrinsically safe applications, use an isolation barrier.

\*2: The withstanding voltage for using MIL connector cable depends on the electrical specifications of its cable.

\*3: Viewed from the terminals, module input resistance is, depending on the current flowing:

$$250 \, \Omega + \frac{\text{voltage drop in the input protection circuit}}{\text{current value}}$$

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\*4: When installing to a remote node that conforms to the temperature environment and using it under the temperature environment (60 to 70 °C), the allowable load resistance is 200 to 750 Ω.

\*5: This voltage is developed between connecting terminals for this module's 2-wire transmitter. When calculating if transmitter minimum operating voltage requirement will be satisfied, remember to allow for voltage drop in external wiring.

\*6: R3.02 or later version supports HART function. When installing the HART compliant module to a remote node, the firmware of EB401 must be Rev 2 or later.

For HART function specifications, refer to "HART Communication Package (for A□I□□□-H) (GS 33Q03L70-31E)."

### ● TC Input/RTD Input Module (Isolated Channels)

These modules receive signals from mV, thermocouple (TC), RTD, and potentiometer (POT). These are isolated between the field and the system as well as between each channel.

They can be used in dual redundant configuration.

These two modules can be used in dual redundant configuration.

| Items                                                   |           | Specifications                                                                                                                  |                                                                                                                                                     |
|---------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Model                                                   |           | AAT145                                                                                                                          | AAR145                                                                                                                                              |
| Number of input channels                                |           | 16, isolated channels                                                                                                           | 16, isolated channels                                                                                                                               |
| Input signal                                            |           | TC: JIS C1602:1995 (*1), IEC584:1995 Type J, K, E, B (*2), R, S, T, N<br>mV: -100 to 150 mV, -20 to 80 mV                       | RTD: JIS C1604:1997 (*3), IEC751:1995 Pt100 (3-wire type)<br>POT: Total resistance 100 Ω to 10 kΩ Span resistance: 50 % or more of total resistance |
| Switching input signals                                 |           | TC/mV can be set individually for CH1 to CH16.                                                                                  | RTD/POT can be selected individually for CH1 to CH16.                                                                                               |
| Allowable input voltage                                 |           | ±5 V                                                                                                                            | ±5 V                                                                                                                                                |
| Withstanding voltage                                    |           | Between input and system: 500 V AC (for single card: 1500 V AC), For 1 minute<br>Between input channels: 200 V AC, For 1 minute |                                                                                                                                                     |
| Input resistance                                        | Power ON  | 1 MΩ or more                                                                                                                    |                                                                                                                                                     |
|                                                         | Power OFF | 1 MΩ or more                                                                                                                    |                                                                                                                                                     |
| Accuracy                                                |           | ±40 μV                                                                                                                          | RTD: ±150 mΩ<br>POT: ±0.2 %/FS                                                                                                                      |
| Allowable total resistance of signal source plus wiring |           | 1000 Ω or less                                                                                                                  | 150 Ω or less (wiring resistance per wire)(*4)                                                                                                      |
| Effect of allowable signal source resistance (1000 Ω)   |           | ±20 μV                                                                                                                          | —                                                                                                                                                   |
| Reference junction compensation accuracy                |           | ±1 °C (*5) (6)                                                                                                                  | —                                                                                                                                                   |
| Measurement current                                     |           | —                                                                                                                               | RTD: 1 mA                                                                                                                                           |
| Data update period                                      |           | 1 s                                                                                                                             |                                                                                                                                                     |
| Burn-out                                                |           | All channels can be set together.<br>Setting: not available/available (UP/DOWN)<br>detection time: 60 s                         |                                                                                                                                                     |
| Temperature drift                                       |           | ±80 μV/10 °C                                                                                                                    | RTD: ±0.3 Ω/10 °C<br>POT: ±0.4 %/10 °C                                                                                                              |
| Maximum current consumption                             |           | 350 mA (5 V DC)                                                                                                                 | 350 mA (5 V DC)                                                                                                                                     |
| Weight                                                  |           | 0.3 kg                                                                                                                          |                                                                                                                                                     |
| External connection                                     |           | Dedicated cable (KS1)                                                                                                           | Dedicated cable (KS8/AKB335)                                                                                                                        |

\*1: Model AAT145 is also in compliance with JIS C1602:1981.

\*2: Type B does not carry out temperature compensation and can not measure under 44 °C.

\*3: Model AAR145 is also in compliance with JIS C1604:1989 (Pt100, JPt100).

\*4: Wiring resistance for the signal cables of IN□A and IN□B must be identical.

\*5: This accuracy changes due to the installation condition.

If measured temperature is lower than 0 °C, multiply the above value by the following coefficient (K):

$$K = \frac{\text{Thermoelectromotive force per degree at 0 °C}}{\text{Thermoelectromotive force per degree at measured temperature}}_{F05E.ai}$$

\*6: Reference junction compensation accuracy varies depending on the temperature environment of terminal board (AET4D).

#### Specifications for Terminal board only

| Temperature Environment | Reference Junction Compensation accuracy |
|-------------------------|------------------------------------------|
| -20 to 0 °C             | ±1.5 °C                                  |
| 0 to 30 °C              | ±1.0 °C                                  |
| 30 to 70 °C             | ±1.5 °C                                  |

#### Specifications for installing in a standard cabinet

| Temperature Environment | Reference Junction Compensation accuracy |
|-------------------------|------------------------------------------|
| 0 to 30 °C              | ±1.0 °C                                  |
| 30 to 50 °C             | ±1.5 °C                                  |

### ● Pulse Input Module (Isolated Channels)

This module receives contact ON/OFF, voltage pulse and current pulse. This is isolated between the field and the system as well as between each channel.

It can be used in dual redundant configuration.

| Items                       | Specifications                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Model                       | AAP135                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Number of input channels    | 8, isolated channels                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Input signal (*3)           | 2-wire type: Contact ON/OFF, voltage pulse, current pulse<br>(possible to supply transmitter power supply)<br>3-wire type: Power-supply-type voltage pulse                                                                                                                                                                                                                                                                                                                                   |
| Input frequency             | 0 to 10 kHz (*4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Withstanding voltage        | Between input and system: 500 V AC, For 1 minute<br>Between channels: 500 V AC, For 1 minute (*1)                                                                                                                                                                                                                                                                                                                                                                                            |
| Minimum input pulse width   | 40 $\mu$ s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Input signal level          | Contact input<br>Open/close levels of relay contact and transistor contact<br>Open: 100 k $\Omega$ or more, Close: 200 $\Omega$ or less<br>Contact capacity<br>When supplying 12 V DC: 15 V DC 15 mA or more<br>When supplying 24 V DC: 30 V DC 30 mA or more<br>Voltage/current pulse input (Current input is converted to voltage.)<br>VH (high level): 3 to 24 V DC<br>VL (low level): -1 to 8 V DC<br>VH-VL (swing value): 3 V or more<br>Signal source resistance: 1 k $\Omega$ or less |
| Shunt resistance            | Can be selected from none/200/500/1000 $\Omega$ .<br>(Open when power is OFF and for the standby side in a dual-redundant configuration)                                                                                                                                                                                                                                                                                                                                                     |
| Pull-up resistance          | 68 k $\Omega$ (12 V DC or 24 V DC)                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Filter                      | Filter for eliminating chattering can be set. (*2)                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Data update period          | 2 ms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Transmitter power supply    | Can select 24 V DC/12 V DC.<br>Limiter value 12 V DC $\pm$ 10 %: 40 mA, 24 V DC $\pm$ 10 %: 30 mA                                                                                                                                                                                                                                                                                                                                                                                            |
| Maximum current consumption | 300 mA (5 V DC), 400 mA (24 V DC)                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Weight                      | 0.3 kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| External connection         | Pressure clamp terminal, KS cable, MIL connector cable                                                                                                                                                                                                                                                                                                                                                                                                                                       |

\*1: The withstanding voltage for using MIL connector cable depends on the electrical specifications of its cable.

\*2: When the pulse input signal is dry contact (such as from a mechanical relay) up to 10 Hz, it is possible to eliminate the chattering.

\*3: The connection method of the field devices varies depending on the input signal.  
For details, please refer to "Installation Guidance (TI 33Q01J10-01E)."

\*4: Input frequency is 0 to 800 Hz to receive no-voltage contact signals between terminal B and C.

### ● Pulse Input Module for compatible PM1

This module receives 16-channel pulse train signals from pulse train input signal conditioner cards, and counts the pulses.

| Items                       | Specifications                      |
|-----------------------------|-------------------------------------|
| Model                       | AAP149                              |
| Number of input channels    | 16, non-isolated                    |
| Input signal                | Transistor contact (open collector) |
| Input frequency             | 0 to 6 kHz                          |
| Withstanding voltage        | —                                   |
| Pulse detection edge        | Trailing edge                       |
| Data update period          | 2 ms                                |
| Maximum current consumption | 400 mA (5 V DC)                     |
| Weight                      | 0.3 kg                              |
| External connection         | Dedicated cable (KS2)               |

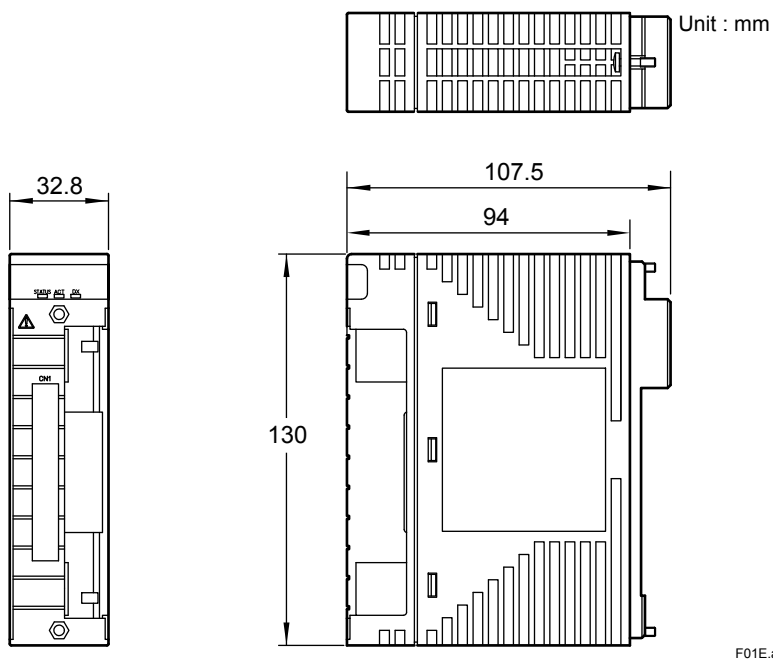
### ● Pulse Input Module / Analog Output Module for Compatible PAC

This module receives 8-channel pulse train signals, and outputs 4 to 20 mA. It can be used in dual redundant configuration.

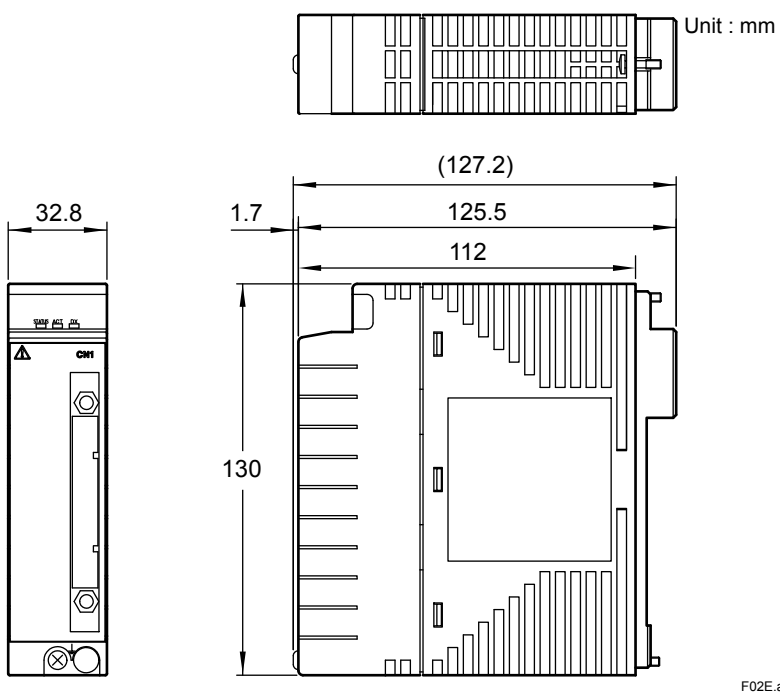
| Items                       | Specifications                                  |                                       |
|-----------------------------|-------------------------------------------------|---------------------------------------|
| Model                       | AAP849                                          |                                       |
| Number of I/O channels      | 8-channel input /8-channel output, not-isolated |                                       |
| I/O signal                  | Input: transistor contact (Open collector)      | Output: 4 to 20 mA                    |
| Input frequency             | 0 to 12 kHz                                     | —                                     |
| Pulse detection edge        | Trailing edge                                   | —                                     |
| Allowable load resistance   | —                                               | 0 to 750 $\Omega$                     |
| Circuit-open detection      | —                                               | Less than 0.65 mA                     |
| Accuracy                    | —                                               | $\pm 48 \mu\text{A}$                  |
| Data update period          | 1 ms                                            | 10 ms                                 |
| Output step response time   | —                                               | 40 ms                                 |
| Temperature drift           | —                                               | $\pm 16 \mu\text{A}/10^\circ\text{C}$ |
| Maximum current consumption | 310 mA (5V DC), 250 mA (24V DC)                 | —                                     |
| Weight                      | 0.3 kg                                          |                                       |
| External connection         | Dedicated cable (KS1)                           |                                       |

## ■ EXTERNAL DIMENSIONS

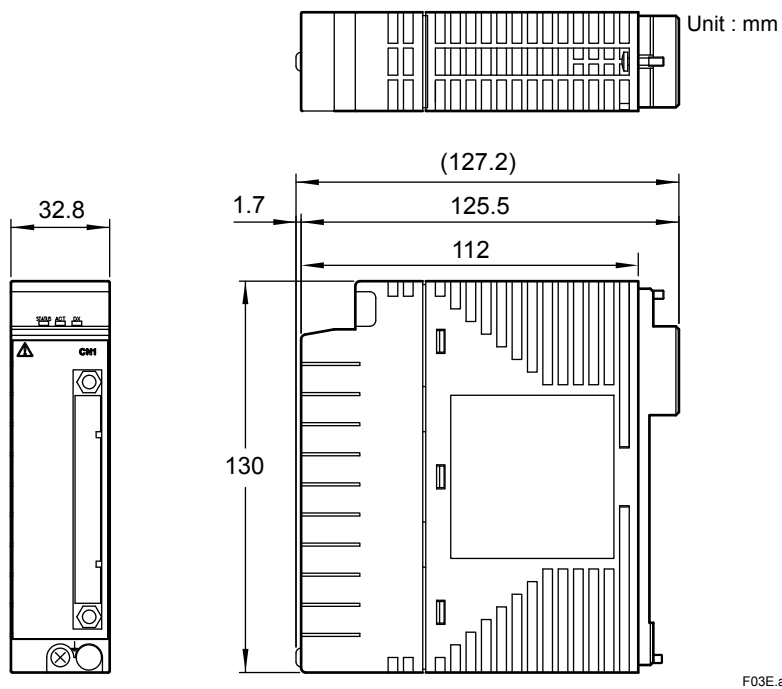
- AAI141, AAV141, AAV142, AAV144, AAI841, AAB841, AAV542, AAV544, AAI143, AAI543, AAT141, AAR181, AAI135, AAI835, AAP135



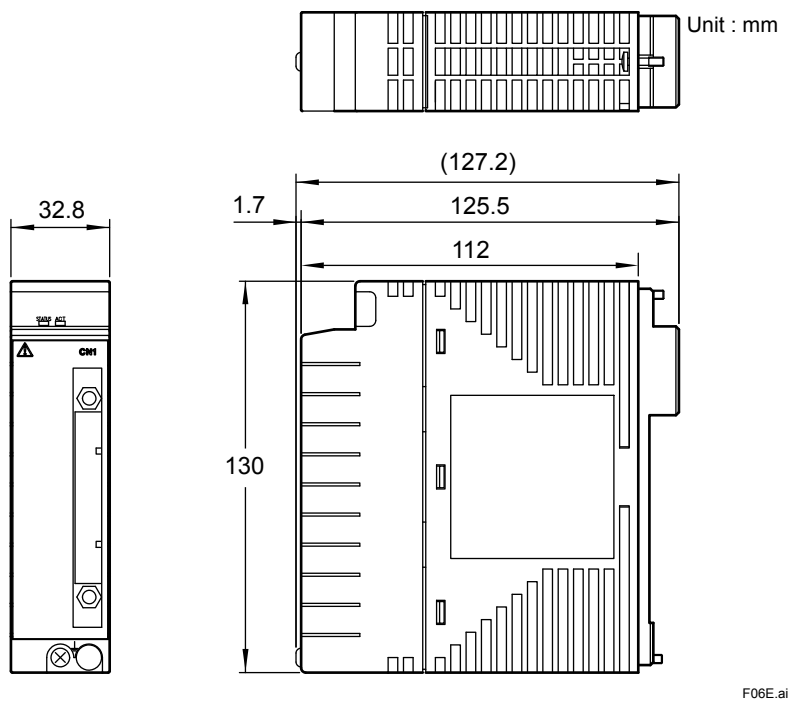
- AAT145, AAP849



● AAR145



● AAP149



## ■ MODELS AND SUFFIX CODES

|                     |        | Description                                                                                    |
|---------------------|--------|------------------------------------------------------------------------------------------------|
| <b>Model</b>        | AAI135 | Analog Input Module (4 to 20 mA, 8-channel, Isolated channels)                                 |
| <b>Suffix Codes</b> | -S     | Standard type                                                                                  |
|                     | -H     | With digital communication (HART protocol)                                                     |
|                     | 5      | With no explosion protection                                                                   |
|                     | E      | With explosion protection                                                                      |
|                     | 0      | Basic type                                                                                     |
| <b>Option Codes</b> | 3      | With ISA Standard G3 option and temperature (-20 to 70 °C) option                              |
|                     | /13A00 | With KS Cable Interface Adapter [Model: ATI3A-00]                                              |
|                     | /K4A00 | With KS Cable Interface Adapter [Model: ATK4A-00]                                              |
|                     | /13S00 | With Pressure Clamp Terminal Block for Isolated Analog [Model: ATI3S-00]                       |
|                     | /13S10 | With Pressure Clamp Terminal Block for Isolated Analog (surge absorber) [Model: ATI3S-10]      |
|                     | /13D00 | With Dual Pressure Clamp Terminal Block for Isolated Analog [Model: ATI3D-00]                  |
|                     | /13D10 | With Dual Pressure Clamp Terminal Block for Isolated Analog (surge absorber) [Model: ATI3D-10] |
|                     | /CCC01 | With Connector Cover for MIL Cable [Model: ACCC01]                                             |

|                     |        | Description                                                                                    |
|---------------------|--------|------------------------------------------------------------------------------------------------|
| <b>Model</b>        | AAI835 | Analog I/O Module (4 to 20 mA, 4-channel input/4-channel output, Isolated channels)            |
| <b>Suffix Codes</b> | -S     | Standard type                                                                                  |
|                     | -H     | With digital communication (HART protocol)                                                     |
|                     | 5      | With no explosion protection                                                                   |
|                     | E      | With explosion protection                                                                      |
|                     | 0      | Basic type                                                                                     |
| <b>Option Codes</b> | 3      | With ISA Standard G3 option and temperature (-20 to 70 °C) option                              |
|                     | /B3A00 | With KS Cable Interface Adapter [Model: ATB3A-00]                                              |
|                     | /K4A00 | With KS Cable Interface Adapter [Model: ATK4A-00]                                              |
|                     | /13S00 | With Pressure Clamp Terminal Block for Isolated Analog [Model: ATI3S-00]                       |
|                     | /13S10 | With Pressure Clamp Terminal Block for Isolated Analog (surge absorber) [Model: ATI3S-10]      |
|                     | /13D00 | With Dual Pressure Clamp Terminal Block for Isolated Analog [Model: ATI3D-00]                  |
|                     | /13D10 | With Dual Pressure Clamp Terminal Block for Isolated Analog (surge absorber) [Model: ATI3D-10] |
|                     | /CCC01 | With Connector Cover for MIL Cable [Model: ACCC01]                                             |

|                     |        | Description                                                       |
|---------------------|--------|-------------------------------------------------------------------|
| <b>Model</b>        | AAT145 | TC/mV Input Module (16-channel, Isolated channels)                |
| <b>Suffix Codes</b> | -S     | Standard type                                                     |
|                     | 5      | With no explosion protection                                      |
|                     | E      | With explosion protection                                         |
|                     | 0      | Basic type                                                        |
|                     | 3      | With ISA Standard G3 option and temperature (-20 to 70 °C) option |

|                     |        | Description                                                       |
|---------------------|--------|-------------------------------------------------------------------|
| <b>Model</b>        | AAR145 | RTD/POT Input Module (16-channel, Isolated channels)              |
| <b>Suffix Codes</b> | -S     | Standard type                                                     |
|                     | 5      | With no explosion protection                                      |
|                     | E      | With explosion protection                                         |
|                     | 0      | Basic type                                                        |
|                     | 3      | With ISA Standard G3 option and temperature (-20 to 70 °C) option |

|                     |        | Description                                                                          |
|---------------------|--------|--------------------------------------------------------------------------------------|
| <b>Model</b>        | AAP135 | Pulse Input Module (8-channel, Pulse count, 0 to 10 kHz, Isolated channels)          |
| <b>Suffix Codes</b> | -S     | Standard type                                                                        |
|                     | 5      | With no explosion protection                                                         |
|                     | E      | With explosion protection                                                            |
|                     | 0      | Basic type                                                                           |
| <b>Option Codes</b> | 3      | With ISA Standard G3 option and temperature (-20 to 70 °C) option                    |
|                     | /13A00 | With KS Cable Interface Adapter [Model: AT13A-00]                                    |
|                     | /K4A00 | With KS Cable Interface Adapter [Model: ATK4A-00]                                    |
|                     | /13S00 | With Pressure Clamp Terminal Block for Pulse [Model: AT13S-00]                       |
|                     | /13S10 | With Pressure Clamp Terminal Block for Pulse (surge absorber) [Model: AT13S-10]      |
|                     | /13D00 | With Dual Pressure Clamp Terminal Block for Pulse [Model: AT13D-00]                  |
|                     | /13D10 | With Dual Pressure Clamp Terminal Block for Pulse (surge absorber) [Model: AT13D-10] |
| <b>Option Codes</b> | /CCC01 | With Connector Cover for MIL Cable [Model: ACCC01]                                   |

|                     |        | Description                                                                             |
|---------------------|--------|-----------------------------------------------------------------------------------------|
| <b>Model</b>        | AAI143 | Analog Input Module (4 to 20 mA, 16-channel, Isolated)                                  |
| <b>Suffix Codes</b> | -S     | Standard type                                                                           |
|                     | -H     | With HART Communication                                                                 |
|                     | 5      | With no explosion protection                                                            |
|                     | E      | With explosion protection                                                               |
|                     | 0      | Basic type                                                                              |
| <b>Option Codes</b> | 3      | With ISA Standard G3 option and temperature (-20 to 70 °C) option                       |
|                     | /K4A00 | With KS Cable Interface Adapter (For connecting AEA4D Terminal Board) [Model: ATK4A-00] |
|                     | /A4S00 | With Pressure Clamp Terminal Block [Model: ATA4S-00]                                    |
|                     | /A4S10 | With Pressure Clamp Terminal Block (surge absorber) [Model: ATA4S-10]                   |
|                     | /A4D00 | With Dual Pressure Clamp Terminal Block [Model: ATA4D-00]                               |
|                     | /A4D10 | With Dual Pressure Clamp Terminal Block (surge absorber) [Model: ATA4D-10]              |
|                     | /CCC01 | With Connector Cover for MIL Cable [Model: ACCC01]                                      |

|                     |        | Description                                                                                |
|---------------------|--------|--------------------------------------------------------------------------------------------|
| <b>Model</b>        | AAI543 | Analog Output Module (4 to 20 mA, 16-channel, Isolated)                                    |
| <b>Suffix Codes</b> | -S     | Standard type                                                                              |
|                     | -H     | With HART Communication                                                                    |
|                     | 5      | Standard switch-over response in redundant configuration with no explosion protection (*1) |
|                     | 6      | Fast switch-over response in redundant configuration with no explosion protection (*2)     |
|                     | E      | Standard switch-over response in redundant configuration with explosion protection (*1)    |
|                     | F      | Fast switch-over response in redundant configuration with explosion protection (*2)        |
|                     | 0      | Basic type                                                                                 |
|                     | 1      | With ISA Standard G3 option                                                                |
| <b>Option Codes</b> | 3      | With ISA Standard G3 option and temperature (-20 to 70 °C) option                          |
|                     | /K4A00 | With KS Cable Interface Adapter (For connecting AEA4D Terminal Board) [Model: ATK4A-00]    |
|                     | /A4S00 | With Pressure Clamp Terminal Block [Model: ATA4S-00]                                       |
|                     | /A4S10 | With Pressure Clamp Terminal Block (surge absorber) [Model: ATA4S-10]                      |
|                     | /A4D00 | With Dual Pressure Clamp Terminal Block [Model: ATA4D-00]                                  |
|                     | /A4D10 | With Dual Pressure Clamp Terminal Block (surge absorber) [Model: ATA4D-10]                 |
|                     | /CCC01 | With Connector Cover for MIL Cable [Model: ACCC01]                                         |

\*1: If "standard switch-over response in redundant configuration" is selected, "basic type" or "with ISA Standard G3 option and temperature (-20 to 70 °C) option" may be specified.

\*2: If "fast switch-over response in redundant configuration" is selected, "basic type" or "with ISA Standard G3 option" may be specified.

|                     |        | Description                                                                           |
|---------------------|--------|---------------------------------------------------------------------------------------|
| <b>Model</b>        | AAV144 | Analog Input Module (-10 to +10 V, 16-channel, Isolated)                              |
| <b>Suffix Codes</b> | -S     | Standard type                                                                         |
|                     | 5      | With no explosion protection                                                          |
|                     | E      | With explosion protection                                                             |
|                     | 0      | Basic type                                                                            |
| <b>Option Codes</b> | 3      | With ISA Standard G3 option and temperature (-20 to 70 °C) option                     |
|                     | /K4A00 | With KS Cable Interface Adapter [Model: ATK4A-00]                                     |
|                     | /A4S00 | With Pressure Clamp Terminal Block for Analog [Model: ATA4S-00]                       |
|                     | /A4S10 | With Pressure Clamp Terminal Block for Analog (surge absorber) [Model: ATA4S-10]      |
|                     | /A4D00 | With Dual Pressure Clamp Terminal Block for Analog [Model: ATA4D-00]                  |
|                     | /A4D10 | With Dual Pressure Clamp Terminal Block for Analog (surge absorber) [Model: ATA4D-10] |
|                     | /CCC01 | With Connector Cover for MIL Cable [Model: ACCC01]                                    |

|                     |        | Description                                                                            |
|---------------------|--------|----------------------------------------------------------------------------------------|
| <b>Model</b>        | AAV544 | Analog Output Module (-10 to +10 V, 16-channel, Isolated)                              |
| <b>Suffix Codes</b> | -S     | Standard Type                                                                          |
|                     | 5      | With no explosion protection                                                           |
|                     | E      | With explosion protection                                                              |
|                     | 0      | Basic type                                                                             |
| <b>Option Codes</b> | 3      | With ISA Standard G3 option and temperature (-20 to 70 °C) option                      |
|                     | /K4A00 | With KS Cable Interface Adapter [Model : ATK4A-00]                                     |
|                     | /A4S00 | With Pressure Clamp Terminal Block for Analog [Model : ATA4S-00]                       |
|                     | /A4S10 | With Pressure Clamp Terminal Block for Analog (surge absorber) [Model : ATA4S-10]      |
|                     | /A4D00 | With Dual Pressure Clamp Terminal Block for Analog [Model : ATA4D-00]                  |
|                     | /A4D10 | With Dual Pressure Clamp Terminal Block for Analog (surge absorber) [Model : ATA4D-10] |
|                     | /CCC01 | With Connector Cover for MIL Cable [Model : ACCC01]                                    |

|                     |        | Description                                                                                    |
|---------------------|--------|------------------------------------------------------------------------------------------------|
| <b>Model</b>        | AAT141 | TC/mV Input Module (16-channel, Isolated)                                                      |
| <b>Suffix Codes</b> | -S     | Standard type                                                                                  |
|                     | 5      | With no explosion protection                                                                   |
|                     | E      | With explosion protection                                                                      |
|                     | 0      | Basic type                                                                                     |
| <b>Option Codes</b> | 3      | With ISA Standard G3 option and temperature (-20 to 70 °C) option                              |
|                     | /T4S00 | With Pressure Clamp Terminal Block for Thermocouple/mV [Model: ATT4S-00]                       |
|                     | /T4S10 | With Pressure Clamp Terminal Block for Thermocouple/mV (surge absorber) [Model: ATT4S-10]      |
|                     | /T4D00 | With Dual Pressure Clamp Terminal Block for Thermocouple/mV [Model: ATT4D-00]                  |
|                     | /T4D10 | With Dual Pressure Clamp Terminal Block for Thermocouple/mV (surge absorber) [Model: ATT4D-10] |
|                     | /CCC01 | With Connector Cover for MIL Cable [Model: ACCC01]                                             |

|                     |        | Description                                                                        |
|---------------------|--------|------------------------------------------------------------------------------------|
| <b>Model</b>        | AAR181 | RTD Input Module (12-channel, Isolated)                                            |
| <b>Suffix Codes</b> | -S     | Standard type                                                                      |
|                     | 5      | With no explosion protection                                                       |
|                     | E      | With explosion protection                                                          |
|                     | 0      | Basic type                                                                         |
|                     | 3      | With ISA Standard G3 option and temperature (-20 to 70 °C) option                  |
| <b>Option Codes</b> | /R8S00 | With Pressure Clamp Terminal Block for RTD [Model: ATR8S-00]                       |
|                     | /R8S10 | With Pressure Clamp Terminal Block for RTD (surge absorber) [Model: ATR8S-10]      |
|                     | /R8D00 | With Dual Pressure Clamp Terminal Block for RTD [Model: ATR8D-00]                  |
|                     | /R8D10 | With Dual Pressure Clamp Terminal Block for RTD (surge absorber) [Model: ATR8D-10] |
|                     | /CCC01 | With Connector Cover for MIL Cable [Model: ACCC01]                                 |

|                     |        | Description                                                                           |
|---------------------|--------|---------------------------------------------------------------------------------------|
| <b>Model</b>        | AAI141 | Analog Input Module (4 to 20 mA, 16-channel, Non-Isolated)                            |
| <b>Suffix Codes</b> | -S     | Standard type                                                                         |
|                     | -H     | With digital communication (HART protocol)                                            |
|                     | 5      | With no explosion protection                                                          |
|                     | E      | With explosion protection                                                             |
|                     | 0      | Basic type                                                                            |
|                     | 3      | With ISA Standard G3 option and temperature (-20 to 70 °C) option                     |
| <b>Option Codes</b> | /K4A00 | With KS Cable Interface Adapter [Model: ATK4A-00]                                     |
|                     | /A4S00 | With Pressure Clamp Terminal Block for Analog [Model: ATA4S-00]                       |
|                     | /A4S10 | With Pressure Clamp Terminal Block for Analog (surge absorber) [Model: ATA4S-10]      |
|                     | /A4D00 | With Dual Pressure Clamp Terminal Block for Analog [Model: ATA4D-00]                  |
|                     | /A4D10 | With Dual Pressure Clamp Terminal Block for Analog (surge absorber) [Model: ATA4D-10] |
|                     | /CCC01 | With Connector Cover for MIL Cable [Model: ACCC01]                                    |

|                     |        | Description                                                                           |
|---------------------|--------|---------------------------------------------------------------------------------------|
| <b>Model</b>        | AAV141 | Analog Input Module (1 to 5 V, 16-channel, Non-Isolated)                              |
| <b>Suffix Codes</b> | -S     | Standard type                                                                         |
|                     | 5      | With no explosion protection                                                          |
|                     | E      | With explosion protection                                                             |
|                     | 0      | Basic type                                                                            |
|                     | 3      | With ISA Standard G3 option and temperature (-20 to 70 °C) option                     |
| <b>Option Codes</b> | /K4A00 | With KS Cable Interface Adapter [Model: ATK4A-00]                                     |
|                     | /A4S00 | With Pressure Clamp Terminal Block for Analog [Model: ATA4S-00]                       |
|                     | /A4S10 | With Pressure Clamp Terminal Block for Analog (surge absorber) [Model: ATA4S-10]      |
|                     | /A4D00 | With Dual Pressure Clamp Terminal Block for Analog [Model: ATA4D-00]                  |
|                     | /A4D10 | With Dual Pressure Clamp Terminal Block for Analog (surge absorber) [Model: ATA4D-10] |
|                     | /CCC01 | With Connector Cover for MIL Cable [Model: ACCC01]                                    |

|                     |        | Description                                                                           |
|---------------------|--------|---------------------------------------------------------------------------------------|
| <b>Model</b>        | AAV142 | Analog Input Module (-10 to +10 V, 16-channel, Non-Isolated)                          |
| <b>Suffix Codes</b> | -S     | Standard type                                                                         |
|                     | 5      | With no explosion protection                                                          |
|                     | E      | With explosion protection                                                             |
|                     | 0      | Basic type                                                                            |
| <b>Option Codes</b> | 3      | With ISA Standard G3 option and temperature (-20 to 70 °C) option                     |
|                     | /K4A00 | With KS Cable Interface Adapter [Model: ATK4A-00]                                     |
|                     | /A4S00 | With Pressure Clamp Terminal Block for Analog [Model: ATA4S-00]                       |
|                     | /A4S10 | With Pressure Clamp Terminal Block for Analog (surge absorber) [Model: ATA4S-10]      |
|                     | /A4D00 | With Dual Pressure Clamp Terminal Block for Analog [Model: ATA4D-00]                  |
|                     | /A4D10 | With Dual Pressure Clamp Terminal Block for Analog (surge absorber) [Model: ATA4D-10] |
|                     | /CCC01 | With Connector Cover for MIL Cable [Model: ACCC01]                                    |

|                     |        | Description                                                                            |
|---------------------|--------|----------------------------------------------------------------------------------------|
| <b>Model</b>        | AAV542 | Analog Output Module (-10 to +10 V, 16-channel, Non-Isolated)                          |
| <b>Suffix Codes</b> | -S     | Standard Type                                                                          |
|                     | 5      | With no explosion protection                                                           |
|                     | E      | With explosion protection                                                              |
|                     | 0      | Basic type                                                                             |
| <b>Option Codes</b> | 3      | With ISA Standard G3 option and temperature (-20 to 70 °C) option                      |
|                     | /K4A00 | With KS Cable Interface Adapter [Model : ATK4A-00]                                     |
|                     | /A4S00 | With Pressure Clamp Terminal Block for Analog [Model : ATA4S-00]                       |
|                     | /A4S10 | With Pressure Clamp Terminal Block for Analog (surge absorber) [Model : ATA4S-10]      |
|                     | /A4D00 | With Dual Pressure Clamp Terminal Block for Analog [Model : ATA4D-00]                  |
|                     | /A4D10 | With Dual Pressure Clamp Terminal Block for Analog (surge absorber) [Model : ATA4D-10] |
|                     | /CCC01 | With Connector Cover for MIL Cable [Model : ACCC01]                                    |

|                     |        | Description                                                                                                 |
|---------------------|--------|-------------------------------------------------------------------------------------------------------------|
| <b>Model</b>        | AAI841 | Analog I/O Module<br>(4 to 20 mA input , 4 to 20 mA output, 8-channel input/8-channel output, Non-Isolated) |
| <b>Suffix Codes</b> | -S     | Standard type                                                                                               |
|                     | -H     | With digital communication (HART protocol)                                                                  |
|                     | 5      | With no explosion protection                                                                                |
|                     | E      | With explosion protection                                                                                   |
|                     | 0      | Basic type                                                                                                  |
| <b>Option Codes</b> | 3      | With ISA Standard G3 option and temperature (-20 to 70 °C) option                                           |
|                     | /K4A00 | With KS Cable Interface Adapter [Model : ATK4A-00]                                                          |
|                     | /A4S00 | With Pressure Clamp Terminal Block for Analog [Model : ATA4S-00]                                            |
|                     | /A4S10 | With Pressure Clamp Terminal Block for Analog (surge absorber) [Model : ATA4S-10]                           |
|                     | /A4D00 | With Dual Pressure Clamp Terminal Block for Analog [Model : ATA4D-00]                                       |
|                     | /A4D10 | With Dual Pressure Clamp Terminal Block for Analog (surge absorber) [Model : ATA4D-10]                      |
|                     | /CCC01 | With Connector Cover for MIL Cable [Model : ACCC01]                                                         |

|                     |        | Description                                                                                           |
|---------------------|--------|-------------------------------------------------------------------------------------------------------|
| <b>Model</b>        | AAB841 | Analog I/O Module (1 to 5 V input, 4 to 20 mA output, 8-channel input/8-channel output, Non-Isolated) |
| <b>Suffix Codes</b> | -S     | Standard type                                                                                         |
|                     | 5      | With no explosion protection                                                                          |
|                     | E      | With explosion protection                                                                             |
|                     | 0      | Basic type                                                                                            |
| <b>Option Codes</b> | 3      | With ISA Standard G3 option and temperature (-20 to 70 °C) option                                     |
|                     | /K4A00 | With KS Cable Interface Adapter [Model : ATK4A-00]                                                    |
|                     | /M4A00 | With MAC2 Compatible Adapter [Model : ATM4A-00]                                                       |
|                     | /V4A00 | With VM2 Compatible Adapter [Model : ATV4A-00] (*1)                                                   |
|                     | /A4S00 | With Pressure Clamp Terminal Block for Analog [Model : ATA4S-00]                                      |
|                     | /A4S10 | With Pressure Clamp Terminal Block for Analog (surge absorber) [Model : ATA4S-10]                     |
|                     | /A4D00 | With Dual Pressure Clamp Terminal Block for Analog [Model : ATA4D-00]                                 |
|                     | /A4D10 | With Dual Pressure Clamp Terminal Block for Analog (surge absorber) [Model : ATA4D-10]                |
|                     | /CCC01 | With Connector Cover for MIL Cable [Model : ACCC01]                                                   |

\*1: When using this adapter, 4 to 20 mA output (8-channel) of AAB841 varies to 1 to 5 V output.

|                     |        | Description                                                                           |
|---------------------|--------|---------------------------------------------------------------------------------------|
| <b>Model</b>        | AAP149 | Pulse Input Module PM1 compatible (16-channel, Pulse count, 0 to 6 kHz, Non-Isolated) |
| <b>Suffix Codes</b> | -S     | Standard type                                                                         |
|                     | 0      | Always 0                                                                              |
|                     | 0      | Basic type                                                                            |
|                     | 1      | With ISA Standard G3 option                                                           |

|                     |        | Description                                                                                                                                             |
|---------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Model</b>        | AAP849 | Pulse Input Module/ Analog Output Module for compatible PAC<br>(Pulse count Input, 4 to 20 mA output, 8-channel input / 8-channel output, Non-Isolated) |
| <b>Suffix Codes</b> | -S     | Standard type                                                                                                                                           |
|                     | 0      | Always 0                                                                                                                                                |
|                     | 0      | Basic type                                                                                                                                              |
|                     | 1      | With ISA Standard G3 option                                                                                                                             |

## ■ ORDERING INFORMATION

Specify models and suffix codes.

For selecting the right products for explosion protection, please refer to TI 33Q01J30-01E without fail.

## ■ TRADEMARK

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