General Specifications

Models AFV40S, AFV40D
Field Control Unit
Duplexed Field Control Unit
(for FIO, with Cabinet)

■ GENERAL
This GS covers the hardware specifications of the Field Control Unit (FCU) which is the core of the control function of the Field Control Station (FCS).

■ STANDARD SPECIFICATIONS
For the installation specifications and environmental conditions that are common to the systems, refer to “Integrated Production Control System CENTUM VP System Overview” (GS 33J01A10-01EN).

- Memory Protection During Power Failure
  Battery
  Battery Backup for Main Memory: Max. 72 hours
  Battery Recharge Time: Min. 48 hours

- READY Contact Output
  3 terminals (NC, NO and C)
  Contact Points open or close during FCU failure
  Contact Rating:
    Rated voltage: 250 V AC, max. 30 V DC
    Rated current: Max. 2 A
    Rated power supply: Max. 125 VA

- Communication Interface
  Vnet/IP Interface: Dual-redundant
  ESB Bus Interface: Dual-redundant or single
    (Always dual-redundant for AFV40D)

For more details, refer to the GS “Integrated Production Control System CENTUM VP System Overview” (GS 33J01A10-01EN).

- House Keeping (HK) Function
A House Keeping Unit (HKU) is standard hardware component provided with the type of FCU. With the HK function is able to monitor the environmental conditions of the connected cabinets via HK bus and/or optical ESB bus, and display HKU’s operating status on HIS.

  System alarms can also be displayed.
  Cable: HK Bus cable (AKBHKSU)
  Units that can be connected HKU of AFV40S: HKU of ACUKT1, ACUKT2, ACB51, or XL-Cabinet.
  Maximum number of connectable cabinets: 9/FCU (AFV40S)
  Total maximum length of cable: 100 m (*1)

  *1: The each section connected in a daisy chain with HK bus.

- Equipment in Cabinet
  FCU: 1
  Power Distribution Board with Built-in HKU: 1
    (Dual or single power supply)
  Power Supply Bus Unit, Vertical Type (AEPV7D): 2
    (1 at front and 1 at rear)
  Node Fan Unit (ANFAN) (*1): Max. 4
    (2 at front and 2 at rear)
  Door Fan Unit (AIP601): 4
    (2 for front doors and 2 for rear doors)
  *1: Specify the option code.

- Module Configuration in FCU
  Power Supply Module (PW481, PW482, or PW484): 2 modules in case of a dual-redundant configuration.
  Processor Module (CP471 or CP461): 2 modules for dual-redundant configuration.
  A dual-redundant configuration is enabled by using 2 identical modules with same model code (CP471 or CP461).
  ESB Bus Coupler Module (EC401 or EC402): 2 modules in case of a dual-redundant configuration.
  I/O Modules (*1): Max. 6

  *1: Non-standard components.
Installation Restrictions
To install Optical ESB Bus Node Units (ANB11□) or ESB Bus Node Units (ANB10□) in a remote location, use the Optical ESB Bus Repeater Master Module (ANT401 or ANT411) to connect them with an optical fiber cable. To install Optical ESB Bus Repeater Master Modules in the FCU, install a pair of modules in slots 1 to 6 from right to left according to the number of branches. In a single configuration, install the individual modules in slots 1, 3, and 5 in order from right to left. For details, see “Optical ESB Bus Repeater Module” (GS 33J60F51-01EN/GS 33J60F52-01EN).

For the restrictions and notes for installing I/O modules, see “FIO System Overview” (GS 33J60A10-01EN).

No. of Node Units Connectable with FCU
The total number of ESB Bus Node Units (ANB10□) or Optical ESB Bus Node Units (ANB11□) that can be connected to FCU are 13 or less.

No. of Units installable in Cabinet
FCU: Max. 1/cabinet (front)
Unit (*1): Max. 11/cabinet (5 at front and 6 at rear)
*1: ESB Bus Node Unit (ANB10□), and Unit for Optical ESB Bus Repeater Module (ANT10U)

No. of Node Fan Units installable in Cabinet
The required number of Node Fan Units (ANFAN) varies depending on the total number of units (*1) that are installed in the cabinet. The required number of Node Fan Units needs to be specified as an option.

<table>
<thead>
<tr>
<th>The total No. of units (*1)</th>
<th>The required No. of Node Fan Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 4</td>
<td>1</td>
</tr>
<tr>
<td>5 - 9</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>11</td>
<td>4</td>
</tr>
</tbody>
</table>

*1: ESB Bus Node Unit (ANB10□), and Unit for Optical ESB Bus Repeater Module (ANT10U)

Power Supply
Voltage: 100-120 V AC, Frequency: 50/60 Hz
Voltage: 220-240 V AC, Frequency: 50/60 Hz
Voltage: 24 V DC
Specify with the Suffix Code.

Power Consumption
100-120 V AC: 2500 VA (at max. node installation)
220-240 V AC: 2860 VA (at max. node installation)
24 V DC: 71A (at max. node installation)

Weight
Approx. 240kg (excluding node)
Approx. 360 kg (at max. node installation)

Connection
Power Supply: M6 screw terminal connection (dual power system possible)
Grounding: M8 screw terminal connection
READY Contact Output: M4 screw terminal connection

Paint Color
Main body: Frosty white (Munsell No. 2.5 Y 8.4/1.2)
Channel base: Spring black (Munsell No. 3.3PB2.5/0.5)

Channel Base Option Specification
Channel base with hole for cable: (Option Code: /CH)
A hole for cables, 300 (length) by 40(width) mm is opened at the rear of the channel base (with filler plate at time of delivery).

IP Protection Rating
IP20
### EXTERNAL DIMENSIONS

![Diagram showing external dimensions with units in mm: Front view shows dimensions 2105 x 800 x 25, with side view showing 800 x 25.]

Nominal Tolerances:
- Nominal tolerance is ± 0.8 mm for the dimensions of 0.5 mm or more and 120 mm or less, and the combined nominal tolerance is ± 1.5 mm.
- The nominal tolerance is in accordance with JEM 1459 for the dimensions over 120 mm.

### HARDWARE CONFIGURATION

When installing ESB Bus Node Units in the cabinet using ESB Coupler Module (EC401), up to 9/FCU (AFV40□) can be installed.

When installing ESB Bus Node Units in the cabinet using the ESB Coupler Module (EC402), up to 11/FCU (AFV40□) can be installed.

Up to 5 node units can be installed at the front of the cabinet, and up to 6 node units at the rear.

![Diagram showing node installation position and configuration in cabinet (when using EC402).]
■ HK BUS CONNECTION EXAMPLE

HK Bus
Transmission Distance: Max. 100 m

Optical ESB Bus (Max. 50 km)

AFV40
ACB51
ETBC

ESB Bus

HK Bus
Transmission Distance: Max. 100 m

ACB51
ETBC

Feb. 1, 2015-00
### Models and Suffix Codes

**Field Control Unit (for FIO, with Cabinet)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFV40S</td>
<td>Field Control Unit (for FIO, with Cabinet)</td>
</tr>
<tr>
<td>-A</td>
<td>Standard type (for CP471) (*1)</td>
</tr>
<tr>
<td>-S</td>
<td>Standard type (for CP461) (*2)</td>
</tr>
<tr>
<td>3</td>
<td>Dual-redundant Vnet/IP, single power supply (*3)</td>
</tr>
<tr>
<td>4</td>
<td>Dual-redundant Vnet/IP, dual-redundant power supply</td>
</tr>
</tbody>
</table>

**Suffix Codes**

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Single ESB Bus, EC401×1</td>
</tr>
<tr>
<td>2 Single ESB Bus, EC401×2 (*3)</td>
</tr>
<tr>
<td>3 Single ESB Bus, EC402×1</td>
</tr>
<tr>
<td>4 Dual-redundant ESB Bus, EC402×2 (*3)</td>
</tr>
<tr>
<td>Always 1</td>
</tr>
<tr>
<td>1 100-120 V AC Power Supply</td>
</tr>
<tr>
<td>2 220-240 V AC Power Supply</td>
</tr>
<tr>
<td>4 24 V DC Power Supply</td>
</tr>
<tr>
<td>Basic type</td>
</tr>
<tr>
<td>1 LFS1700 Control function for field control station (for AFV30/AFV40, Vnet/IP and FIO) (for CP461) (*4)</td>
</tr>
<tr>
<td>2 Always 2 (R6.01 or later)</td>
</tr>
</tbody>
</table>

**Option Codes**

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/S1F Node unit for Single ESB Bus Single power supply (*5) [Model: ANB10S-3]</td>
</tr>
<tr>
<td>/S2F Node unit for Single ESB Bus Dual-redundant power supply (*5) [Model: ANB10S-4]</td>
</tr>
<tr>
<td>/D2F Node unit for Dual-redundant ESB Bus</td>
</tr>
<tr>
<td>/T1A Unit for Optical ESB Bus Repeater Module</td>
</tr>
<tr>
<td>/T2A Unit for Optical ESB Bus Repeater Module</td>
</tr>
<tr>
<td>/T1A Node fan unit (*6) [Model: ANFAN]</td>
</tr>
<tr>
<td>/T2A Node fan unit (*6) [Model: ANFAN]</td>
</tr>
<tr>
<td>/CH Channel base with cable hole (*7)</td>
</tr>
<tr>
<td>/CE With CE Marking, RCM, EAC Marking, and KC Marking</td>
</tr>
<tr>
<td>/ATDOC Explosion Protection Manual (*8)</td>
</tr>
</tbody>
</table>

**Note:**
- Node Units must be installed in the cabinet in the following order: first ANB10 and then ANT10U.
- Connector Unit for ESB Bus and ESB Bus Cable (YCB301) in the cabinet are all already connected. However, ESB Bus Cable between ANB10 and ANT10U is not connected.
- To perform HK bus communication between cabinets, HKUs of the cabinets must be connected with the HK Bus Cable (AKBHKU). (To connect cabinets with the optical ESB bus, the HK bus cable is not required.)
- The existing AFV40S-S for CENTUM VP R5 can be used with CENTUM VP R6.01 or later.

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*1: CP471 runs with CENTUM VP R6.05 or later version of Control Function for Field Control Station. CP471 can be combined with the style code S3 or later of ESB bus coupler module EC401. See GS 33J60E30-01EN.

*2: Shipped with CP461. Also CP471 is usable. Replacement from CP461 to CP471 is prohibited to perform by a user. Replacement work must be done by the service engineer authorized by Yokogawa Electric Corporation. CP471 can be combined with the style code S3 or later of ESB bus coupler module EC401. See GS 33J60E30-01EN.

*3: Suffix codes "-S1F" and "-S2F" cannot be specified.

*4: This suffix code is acceptable to only AFV40S-S and CENTUM VP R5.

*5: Specify the number of units to be installed (1 to 9, A, or B) in as needed. (If the number of units to be installed is 10, specify "A," and if 11, specify "B.")

*6: Node Fan Units (ANFAN) must be specified as follows according to the total number of units (ANB10/ANT10U) to be installed in the cabinet.

*7: If "/CH" is specified, CE Marking, RCM, EAC Marking, and KC Marking cannot be specified.

*8: Select the option code "/ATDOC" to follow the ATEX Directive for use in potentially explosive atmospheres.
Duplexed Field Control Unit (for FIO, with Cabinet)

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFV40D</td>
<td>Duplexed Field Control Unit (for FIO, with Cabinet)</td>
</tr>
<tr>
<td>-A</td>
<td>Standard type (for CP471) (*1)</td>
</tr>
<tr>
<td>-S</td>
<td>Standard type (for CP461) (*2)</td>
</tr>
<tr>
<td>4</td>
<td>Dual-redundant Vnet/IP, dual-redundant power supply</td>
</tr>
<tr>
<td>2</td>
<td>Dual-redundant ECB Bus, EC401*2</td>
</tr>
<tr>
<td>4</td>
<td>Dual-redundant ESB Bus, EC402*2</td>
</tr>
<tr>
<td>1</td>
<td>Single power supply</td>
</tr>
<tr>
<td>2</td>
<td>Dual power supply</td>
</tr>
<tr>
<td>1</td>
<td>100-120 V AC Power Supply</td>
</tr>
<tr>
<td>2</td>
<td>220-240 V AC Power Supply</td>
</tr>
<tr>
<td>4</td>
<td>24 V DC Power Supply</td>
</tr>
<tr>
<td>0</td>
<td>Basic type</td>
</tr>
<tr>
<td>1</td>
<td>LFS1700 Control function for field control station for AFV30/AFV40, Vnet/IP and FIO (for CP461) (*3)</td>
</tr>
<tr>
<td>2</td>
<td>Always 2 (R6.01 or later)</td>
</tr>
</tbody>
</table>

**Suffix Codes**

- A: Standard type (for CP471) (*1)
- S: Standard type (for CP461) (*2)

**Option Codes**

- /T2A: Unit for Optical ESB Bus Repeater Module [Model: ANTI0U-4□□]
- /FAN: Node FAN unit (*5) [Model: ANFAN]
- /CH: Channel base with cable hole (*6)
- /CE: With CE Marking, RCM, EAC Marking, and KC Marking
- /ATDOC: Explosion Protection Manual (*7)

**Note:**
- Node Units must be installed in the cabinet in the following order: first ANB10□ and then ANTI0U.
- Connector Unit for ESB Bus and ESB Bus Cable (YCB301) in the cabinet are all already connected. However, ESB Bus Cable between ANB10□ and ANTI0U is not connected.
- To perform HK bus communication between cabinets, HKUs of the cabinets must be connected with the HK Bus Cable (AKBHKU). (To connect cabinets with the optical ESB bus, the HK bus cable is not required.)
- The existing AFV40D-S□□□□□□ for CENTUM VP R5 can be used with CENTUM VP R6.01 or later.

*1: CP471 runs with CENTUM VP R6.05 or later version of Control Function for Field Control Station. CP471 can be combined with the style code S3 or later of ESB bus coupler module EC401. See GS 33J60E30-01EN.

*2: Shipped with a pair of CP461. Also a pair of CP471 is usable. Replacement from CP461 to CP471 is prohibited to perform by a user. Replacement work must be done by the service engineer authorized by Yokogawa Electric Corporation. CP471 can be combined with the style code S3 or later of ESB bus coupler module EC401. See GS 33J60E30-01EN.

*3: This suffix code is acceptable to only AFV40D-S□□□□□□ and CENTUM VP R5.

*4: Specify the number of units (1 to 9, A, or B) to be installed in □ as needed. (If the number of units to be installed is 10, specify “A,” and if 11, specify “B.”)

*5: Node Fan Units (ANFAN) must be specified as follows according to the total number of ANB10□ and ANTI0U units that are installed in the cabinet.

<table>
<thead>
<tr>
<th>Number of units</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 4</td>
<td>/1-FAN</td>
</tr>
<tr>
<td>5 to 9</td>
<td>/2-FAN</td>
</tr>
<tr>
<td>10</td>
<td>/3-FAN</td>
</tr>
<tr>
<td>11</td>
<td>/4-FAN</td>
</tr>
</tbody>
</table>

*6: If “/CH” is specified, CE Marking, RCM, EAC Marking, and KC Marking cannot be specified.

*7: Select the option code “/ATDOC” to follow the ATEX Directive for use in potentially explosive atmospheres.

**Side Panel for Cabinet**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACB2P</td>
<td>Side Panels for Cabinet</td>
</tr>
</tbody>
</table>

**Note:** Two panels are necessary when mounting on both sides of the cabinet.
SOFTWARE REQUIREMENT
A software license is required for AFV40 separately. For details, refer to the GS “VP6F1700 Control Function for Field Control Station (for AFV30/AFV40)” (GS 33J15C10-01EN) and “VP6F3100 Project I/O License” (GS 33J15A10-01EN).

REQUIREMENTS FOR USING SEM (SEQUENCE OF EVENTS MANAGER)
For using SEM, the hardware requires some conditions.
For details, refer to the GS “SEM Sequence of Events Manager” (GS 33J30D10-01EN).

STANDARD ACCESSORIES
The FCU is delivered with the following standard accessories.

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Part No.</th>
<th>Quantity</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter</td>
<td>T9070CB</td>
<td>2</td>
<td>for Door</td>
</tr>
</tbody>
</table>

RELATED PRODUCTS
Model AKT211 Connection Kit for Cabinet

APPLICABLE STANDARDS
Refer to the GS “Integrated Production Control System CENTUM VP System Overview (GS 33J01A10-01EN).”

ORDERING INFORMATION
Specify model and suffix codes.

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