General Specifications

GS 33J60E20-01EN

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

CENTUM VP

[Release 6]

■ 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

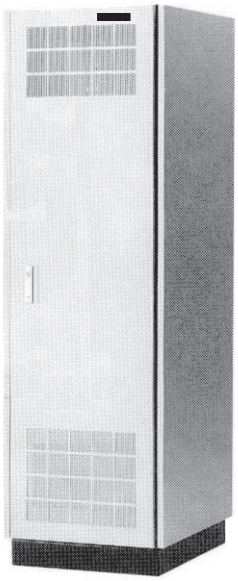
Vnet/IP Interface: Dual-redundant
ESB Bus Interface: Dual-redundant or single
(Always dual-redundant for AFV40D)

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 (AKBHKU)
Units that can be connected HKU of AFV40□: HKU of ACUKT1, ACUKT2, ACB51, or XL-Cabinet.
Maximum number of connectable cabinets: 9/FCU (AFV40□)
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.

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● 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

Max. 13/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.

The total No. of units (*1)	The required No. of Node Fan Units
0 - 4	1
5 - 9	2
10	3
11	4

*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

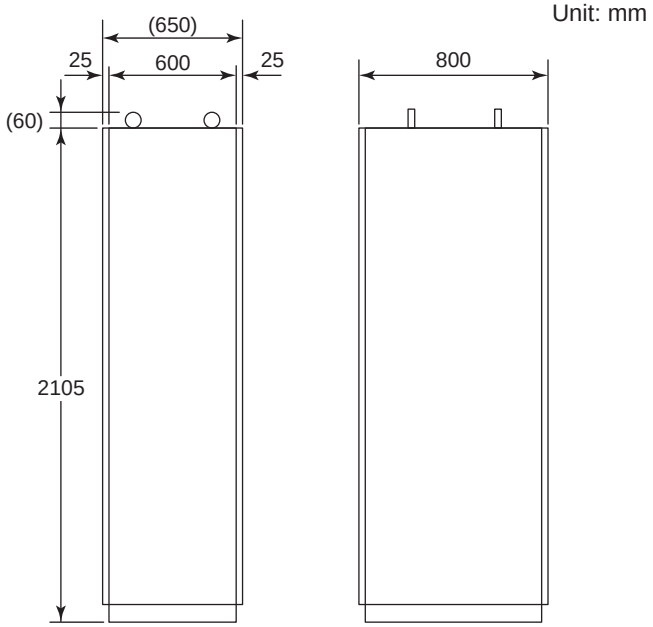
Channel base with hole for cable: (Option Code:/CH)
A hole for cables, 300 (length) by 40(width) mm is opened at the rear of the channel base (with filler plate at time of delivery).

● IP Protection Rating

IP20

■ EXTERNAL DIMENSIONS

Unit: mm



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.

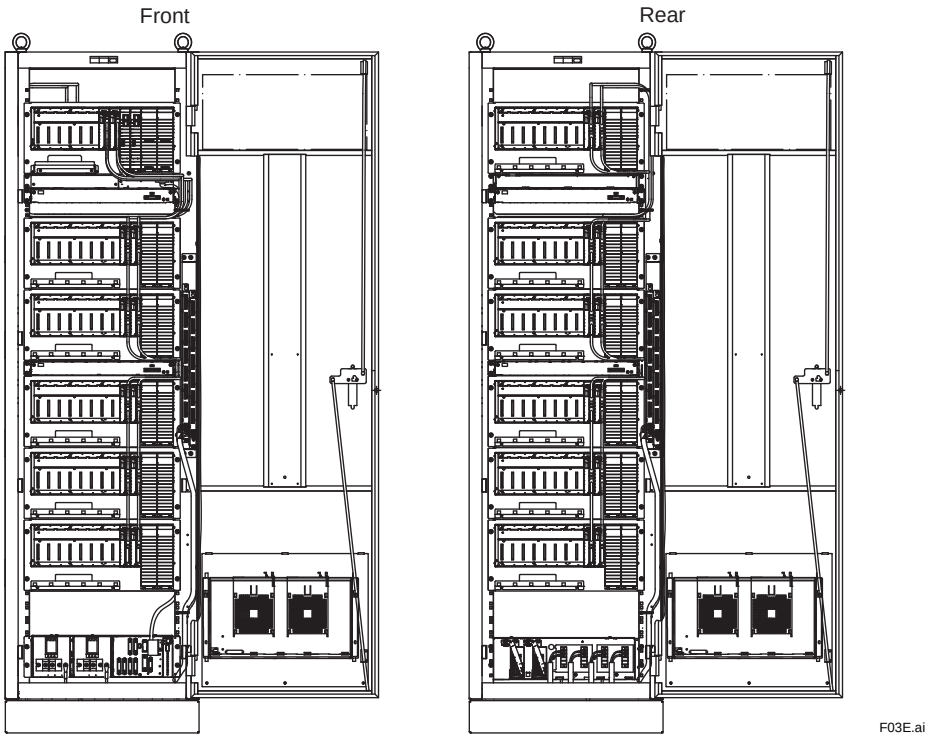
The nominal tolerance is in accordance with JEM 1459 for the dimensions over 120 mm.

■ HARDWARE CONFIGURATION

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

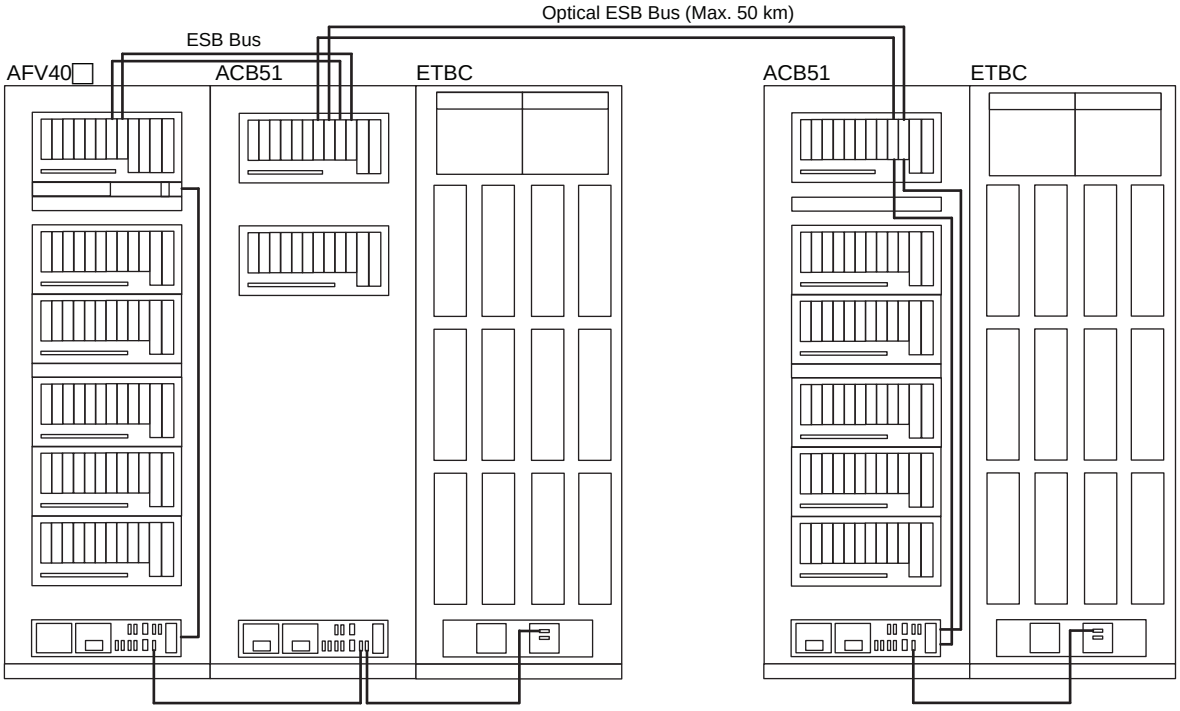
When installing ESB Bus Node Units in the cabinet using the ESB Coupler Module (EC402), up to 11/FCU (AFV40☐) can be installed.

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



Example of node installation position and configuration in cabinet (when using EC402)

■ HK BUS CONNECTION EXAMPLE



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■ Models and Suffix Codes

Field Control Unit (for FIO, with Cabinet)

		Description
Model	AFV40S	Field Control Unit (for FIO, with Cabinet)
Suffix Codes	-A	Standard type (for CP471) (*1)
	-S	Standard type (for CP461) (*2)
	3	Dual-redundant Vnet/IP, single power supply (*3)
	4	Dual-redundant Vnet/IP, dual-redundant power supply
	1	Single ESB Bus, EC401×1
	2	Dual-redundant ESB Bus, EC401×2 (*3)
	3	Single ESB Bus, EC402×1
	4	Dual-redundant ESB Bus, EC402×2 (*3)
	1	Always 1
	1	100-120 V AC Power Supply
	2	220-240 V AC Power Supply
	4	24 V DC Power Supply
	0	Basic type
	1	LFS1700 Control function for field control station (for AFV30☐/AFV40☐, Vnet/IP and FIO) (for CP461) (*4)
	2	Always 2 (R6.01 or later)
Option Codes	/☐-S1F	Node unit for Single ESB Bus Single power supply (*5) [Model: ANB10S-3☐5]
	/☐-S2F	Node unit for Single ESB Bus Dual-redundant power supply (*5) [Model: ANB10S-4☐5]
	/☐-D2F	Node unit for Dual-redundant ESB Bus Dual-redundant power supply (*5) [Model: ANB10D-4☐5]
	/☐-T1A	Unit for Optical ESB Bus Repeater Module Single power supply (*5) [Model: ANT10U-3☐5]
	/☐-T2A	Unit for Optical ESB Bus Repeater Module Dual-redundant power supply (*5) [Model: ANT10U-4☐5]
	/☐-FAN	Node fan unit (*6) [Model: ANFAN]
	/CH	Channel base with cable hole (*7)
	/CE	With CE Marking, RCM, EAC Marking, and KC Marking
	/ATDOC	Explosion Protection Manual (*8)

Note: Node Units must be installed in the cabinet in the following order: first ANB10☐ and then ANT10U.
Note: 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.
Note: 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.)
Note: The existing AFV40S-S☐☐☐☐☐1 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 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 "-☐32☐☐☐☐" and "-☐34☐☐☐☐" 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.")
The maximum number of units (ANB10☐/ANT10U) that can be installed in the cabinet is 11. When installing different types of unit in the cabinet, installation is only possible in a configuration that meets the following conditions.
"-☐31☐☐☐☐" or "-☐33☐☐☐☐": "/☐-S1F" and "/☐-T1A"
"-☐41☐☐☐☐" or "-☐43☐☐☐☐": "/☐-S2F"
"-☐42☐☐☐☐" or "-☐44 ☐☐☐☐": "/☐-D2F" and "/☐-T2A"
*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.
Number of units is 0 to 4: "/1-FAN"
Number of units is 5 to 9: "/2-FAN"
Number of units is 10: "/3-FAN"
Number of units is 11: "/4-FAN"
*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)

		Description
Model	AFV40D	Duplexed Field Control Unit (for FIO, with Cabinet)
Suffix Codes	-A	Standard type (for CP471) (*1)
	-S	Standard type (for CP461) (*2)
	4	Dual-redundant Vnet/IP, dual-redundant power supply
	2	Dual-redundant ECB Bus, EC401×2
	4	Dual-redundant ESB Bus, EC402×2
	1	Single power supply
	2	Dual power supply
	1	100-120 V AC Power Supply
	2	220-240 V AC Power Supply
	4	24 V DC Power Supply
	0	Basic type
	1	LFS1700 Control function for field control station (for AFV30☐/AFV40☐, Vnet/IP and FIO) (for CP461) (*3)
	2	Always 2 (R6.01 or later)
Option Codes	/☐-D2F	Node unit for dual-redundant ESB Bus Dual-redundant power supply (*4) [Model: ANB10D-4☐5]
	/☐-T2A	Unit for Optical ESB Bus Repeater Module Dual-redundant power supply (*4) [Model: ANT10U-D 4☐5]
	/☐-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 ANT10U.
Note: 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.
Note: 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.)
Note: The existing AFV40D-S☐☐☐☐☐1 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.”)
The maximum number of units (ANB10☐/ANT10U) that can be installed in the cabinet is 11.
*5: Node Fan Units (ANFAN) must be specified as follows according to the total number of ANB10☐ and ANT10U units that are installed in the cabinet.
Number of units is 0 to 4: “/1-FAN”
Number of units is 5 to 9: “/2-FAN”
Number of units is 10: “/3-FAN”
Number of units is 11: “/4-FAN”
*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

		Description
Model	ACB2P	Side Panels for Cabinet

Note: Two panels are necessary when mounting on both sides of the cabiet.