General Specifications

Integrated Production Control System CENTUM VP System Overview

CENTUM VP

GS 33J01A10-01EN

[Release 6]

■ GENERAL

CENTUM VP is an integrated production control system for controlling plants that is used in a wide range of fields, including petroleum refining, oil upstream, chemistry, iron and steel, food, and electric power. This General Specification (GS) describes the system specifications of CENTUM VP as well as the components and network specifications.

■ COMPONENTS AND SOFTWARE

The CENTUM VP system consists of a variety of equipment including equipment for operation and monitoring and equipment for control, and is built by connecting those components via a control bus and Ethernet.

● Automation Design Suite (AD Suite)

The AD Suite provides an engineering environment for configuring and maintaining overall control systems, including plant instrumentation, safety instrumentation, and maintenance management.

The AD Suite consists of Automation Design Server (AD Server), Automation Design Organizer (AD Organizer), and VP Builder.

The AD Server manages all the engineering data of the AD Suite.

VP6E5000 Engineering Server Function is a license to use the AD Server.

The AD Organizer is the main software for engineering for module-based engineering as described later in this document.

The VP Builder is the generic name for System View, Recipe View, and other builders launched by Views. The VP Builder is the main software for engineering for module-less engineering as described later in this document.

VP6E5100 Standard Engineering Function is a license to use the AD Organizer and the VP Builder.

Since the AD Suite centrally manages all the CENTUM VP's engineering data on the AD Server database, the latest design information is always available when expanding, modifying or maintaining the system, which prevents unnecessary engineering work to confirm inconsistencies between the design information and the actual information stored in the system.

Change histories of the AD Organizer and the VP Builder are stored in the AD Server, and the AD Organizer is used to browse the change history.

The AD Server, the AD Organizer, and the VP Builder can run on a single computer.

● Engineering Station (ENG)

CENTUM VP ENG is a computer equipped with VP6E5100 Standard Engineering Function used for engineering of the AD Suite.
The AD Organizer and VP Builder of the AD Suite can be used on the ENG.
The ENG can run on a computer where HIS is installed.

Additional functions such as Module-based Engineering, Tuning Parameter Management, Bulk Editing, Change Control, and Dependency Analysis can be performed by using various optional packages for the AD Suite.

● Module-based Engineering

Module-based engineering refers to an engineering method which transforms the control logic and design information into modules, and it designs control applications and alarms by combining the modules in the AD Suite.

Modules are independent software components which represent design patterns containing integrated customer information and knowledge in the past, which also include components, such as the control logic, alarm attribute, and design information. By reusing of modules created in previous projects, engineering efficiency is improved, quality of engineering becomes consistent, and the project period is reduced.

When the document generation function of the module-based engineering package is used, all the design information generated from each of the module and all kinds of engineering data can be integrated into a single document file.

In case the module-based engineering is not used the module-less engineering method, an engineering method that has been implemented by CENTUM VP R5 or earlier, is applied that the engineering is done by the hardware after the hardware configuration is determined.

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● **Tuning Parameter Management**

This function manages the function block tuning parameter values designed when creating control applications and the current tuning parameter values of the FCS. The designed tuning parameter values can be compared with the FCS's current tuning parameter values, and the designed tuning parameter values can be set on the FCS.

In addition, the current values of tuning parameters set in the FCS can be reflected to the design values in the AD Server.

● **Bulk Editing**

This function collectively edits setting items such as control logics and alarm attributes of multiple modules that are designed when creating control applications. Functions to help automate bulk editing and data consistency check for setting items such as defined tag names and detailed definitions of functional blocks are provided as well.

● **Change Management**

This function manages changes occurred during the engineering work, which enables to prevent omitting making changes to applications and allows for keeping records for changes in planning, executions, and test results.

● **Dependency Analysis**

This function analyzes the extent of the impacts caused by changes made during the engineering work. Dependency Analysis Tool provides a function to analyze which control logic, I/O, or graphic tags are connected to which tags.

● **AD Suite Related Software**

The following software is available for AD Suite. For details on each function, refer to the GS for each software.

VP6E5000 Engineering Server Function
VP6E5100 Standard Engineering Function
VP6E5210 Module-based Engineering Package
VP6E5215 Tuning Parameter Management Package (for Module-based Engineering)
VP6E5216 Batch Editing Package (for Module-based Engineering)
VP6E5250 Change Control Package
VP6E5260 Dependency Analysis Package

● **Other Engineering Related Software**

The following software which can even be used with just VP Builder is available for engineering with CENTUM VP. For details on each function, refer to the GS for each software.

VP6E5110 Access Control Package
VP6E5150 Graphic Builder
VP6E5165 Batch Builder (VP Batch)
VP6E5166 Recipe Management Package (VP Batch)
VP6E5170 Access Administrator Package (FDA:21 CFR Part 11 compliant) (*1)
VP6E5420 Test Function
VP6E5425 Expanded Test Functions
VP6E5426 FCS Simulator Package
VP6E5427 HIS Simulator Package
VP6E5450 Multiple Project Connection Package
VP6E5490 Self-documentation Package

*1:   This package includes the functions of VP6E5110 Access Control Package.

● **Logical I/O Points**

The number of I/Os that can be used in a CENTUM VP project is calculated as the logical I/O points. To use these I/Os, the following license is required.

VP6F3100 Project I/O License
For details on the calculation method, refer to the GS "VP6F3100 Project I/O License" (GS 33J15A10-01EN).

● **Human Interface Station (HIS)**

An HIS provides the human machine interface of the CENTUM VP system for operation and monitoring of a plant, and is a computer with the Operation and Monitoring Function software package installed. Both the Operation and Monitoring Function software and the Engineering Function software can coexist on an HIS.

For details on HIS, refer to the following GS.

• Standard Operation and Monitoring Function (GS 33J05D10-01EN)
• Vnet/IP Interface Card (GS 33J50C10-01EN)

Operation and Monitoring Software

The following software is available for operation and monitoring with an HIS. For details on each function, refer to the GS for each software.

VP6H1100 Standard Operation and Monitoring Function
VP6H1140 Eight-loop Simultaneous Operation Package (for AIP831)
VP6H2411 Exaopc OPC Interface Package (for HIS)
VP6H2412 CENTUM Data Access Library
VP6H4000 Million Tag Handling Package
VP6H4100 Configured Information Reference Package
VP6H4150 Output to External Recorder Package
VP6H4190 Line Printer Support Package
VP6H4200 Historical Message Integration Package (Meeting FDA Regulations)
VP6H4410 Control Drawing Status Display Package
VP6H4420 Logic Chart Status Display Package
VP6H4450 Multiple Project Connection Package
VP6H4600 Multiple-Monitor Support Package
VP6H4700 Advanced Alarm Filter Package
VP6H6510 Long-term Data Archive Package
VP6H6530 Report Package
VP6H6660 Process Management Package (VP Batch)
VP6H6710 FCS Data Setting/Acquisition Package (PICOT)

Software Operating Environment

The HIS, AD Server, AD Organizer, and VP Builder run on the following Microsoft Windows operating systems.

Windows Vista Business SP2 (32-bit) (*1)
Windows Server 2008 Standard SP2 (32-bit) (*2)
Windows 7 Professional SP1 (64-bit) (*3)
Windows Server 2008 R2 Standard SP1 (64-bit) (*4)
Windows Server 2012 R2 Standard (64-bit) (*5)
Windows 10 Enterprise 2016 LTSB (64-bit) (*6)
Windows Server 2016 Standard (64-bit) (*7)

*1:	Supported by R6.03.10 or earlier, available for HIS's OS only
*2:	Supported by R6.03.10 or earlier
*3:	Supported by R6.07.00 or earlier
*4:	Supported by R6.07.00 or earlier
*5:	Available for domain controller, file server, and UGS2's OS only
*6:	Supported by R6.04.00 or later, include IoT edition
*7:	Supported by R6.06.00 or later

For more details of the compatibility of the CENTUM VP revisions and Microsoft OS service packs, refer to the GS Standard Operation and Monitoring Function" (GS 33J05D10-01EN), and "Engineering Server Function and Standard Engineering Function" (GS 33J10D10-01EN). Consult Yokogawa for limitations in running CENTUM VP HIS software with other third-party software programs that run on Windows.

Electronic Instruction Manual

CENTUM VP's instruction manuals are provided as electronic data on the same DVD as the system software.

VP6C5495 Electronic Instruction Manual

For details, refer to the GS "Electronic Instruction Manual" (GS 33J01W10-01EN).

● **Unified Alarms and Conditions Server (UACS)**

UACS provides functions that can further improve the efficiency of alarm management in process control by suppressing alarms, unifying alarm formats, and displaying alarms for easy recognition.

UACS is configured as UACS Station and UACS Client, UACS Station provides these alarm management functions.

When two UACS Stations in the same VP project are configured in pairs, UACS Client automatically switches connected UACS Station in the event of a UACS Station failure.

UACS related software

VP6A2500 Unified Alarms and Conditions Server (UACS)
VP6A2505 UACS Simulator Package
VP6A2510 UACS Advanced Suppression Function
VP6A2580 UACS Multiple Project Connection Package
VP6A2700 UACS Client License

For details, refer to the GS "Unified Alarms and Conditions Server (UACS), UACS Simulator Package, UACS Advanced Suppression Function, UACS Multiple Project Connection Package, UACS Client License" (GS 33J05D30-01EN).

● **Remote Operation and Monitoring Function (HIS-TSE)**

HIS-TSE enables operation and monitoring (some functions are limited) of a plant from a remote computer that does not have Operation and Monitoring Function installed. Multiple computers are able to perform operation and monitoring simultaneously via the network by utilizing Terminal services (TS) in Windows Server. The same screens as the HIS can even be displayed on a computer located away from the instrument room as long as the computer is connected through the network.

　VP6H1150 Server for Remote Operation and Monitoring Function
For details, refer to the GS "Server for Remote Operation and Monitoring Function" (GS 33J05D20-01EN)

● **Field Control Station (FCS)**

An FCS implements control computation functions using each function block and I/O functions using process and software I/Os.

For the field control unit (FCU) which is the core control part of an FCS, the following units are available.

　A2FV50S　Field Control Unit (for N-IO, 19-inch Rack Mountable Type)
　A2FV50D　Duplexed Field Control Unit (for N-IO, 19-inch Rack Mountable Type)
　A2FV70S　Field Control Unit (for RIO System Upgrade, 19-inch Rack Mountable Type)
　A2FV70D　Duplexed Field Control Unit (for RIO System Upgrade, 19-inch Rack Mountable Type)
　AFV30S　　Field Control Unit (for FIO, 19-inch Rack Mountable Type)
　AFV30D　　Duplexed Field Control Unit (for FIO, 19-inch Rack Mountable Type)
　AFV40S　　Field Control Unit (for FIO, with Cabinet)
　AFV40D　　Duplexed Field Control Unit (for FIO, with Cabinet)
For details, refer to the GS "Field Control Unit/Duplexed Field Control Unit (for N-IO, 19-inch Rack Mountable Type)" (GS 33J62E10-01EN), "Field Control Unit, Cabinet Utility Kit (for RIO System Upgrade)" (GS 33J64E10-01EN), "Field Control Unit/Duplexed Field Control Unit (for FIO, 19-inch Rack Mountable Type)" (GS 33J60E10-01EN), and "Field Control Unit/Duplexed Field Control Unit (for FIO, with Cabinet)" (GS 33J60E20-01EN).

For details on FCS I/O related equipment, refer to the GS "FIO System Overview" (GS 33J60A10-01EN), "N-IO System Overview" (GS 33J62A10-01EN), and "N-IO Node (for RIO System Upgrade)" (GS 33J64F10-01EN).

Basic Software
　VP6F1700 Control Function for Field Control Station (for AFV30□/AFV40□)
　VP6F1800 Control Function for Field Control Station (for A2FV50□)
　VP6F1900 Control Function for Field Control Station (for A2FV70□)
For details, refer to the GS 33J15C10-01EN, GS 33J15C15-01EN, and GS 33J15C20-01EN.

Subsystem Communication Function
An FCS can communicate with subsystems and field devices to exchange data. The following types of communication are supported. For details on communication functions, refer to the GS for each hardware.

 • Serial Communication
　Serial Communication Module (for N-IO/FIO) (GS 33J60G10-01EN)
 • Ethernet Communication
　Ethernet Communication Module (for N-IO/FIO) (GS 33J60G11-01EN)
 • Foundation Fieldbus Communication
　Foundation Fieldbus Communication Module (for N-IO/FIO) (GS 33J60G20-01EN)
 • PROFIBUS-DP Communication
　PROFIBUS-DP Communication Module (for N-IO/FIO) (GS 33J60G85-01EN)
 • PROFINET Communication
　PROFINET Communication Module (for N-IO/FIO) (GS 33J60G90-01EN)

Optional Software
In addition to the basic software, various optional software is available for implementing special function blocks that operate on FCS.

　VP6F3210 PID with Packet Loss Compensation Package (for Field Wireless)
　VP6F3132 Valve Pattern Monitor Package
　VP6F8620 Off-Site Block Package
For details, refer to the GS for each software.

● **Generic Subsystem Gateway (GSGW)**

A GSGW is a station for the operation and monitoring of subsystems. Using a computer as a platform, a GSGW communicates with subsystems via the generic OPC DA interface defined by the OPC Foundation. Subsystem data is assigned to the function blocks of the GSGW, and the function blocks can be operated and monitored from an HIS in the same way as with a control station.

　VP6F1250 Generic Subsystem Gateway Package
For details, refer to the GS "Generic Subsystem Gateway Package" (GS 33J20F10-01EN).

● **System Integration OPC Station (SIOS)**

SIOS is a station to integrate CENTUM VP and the third-party process control systems (PCSs). SIOS enables CENTUM VP exchanges data with and receives alarms and events from the third-party PCSs via OPC interface.

   VP6B2100 System Integration OPC Client Package

For details, refer to the GS "System Integration OPC Client Package" (GS 33J20D10-01EN).

● **Unified Gateway Station (UGS/UGS2)**

UGS/UGS2 are stations exclusively used for Vnet/IP to integrate CENTUM VP and subsystem controllers such as STARDOM controllers (FCN/FCJ) and other third-party programmable logic controllers (PLCs).

The UGS standard functions allow CENTUM VP to communicate with subsystem controllers via various communication protocols such as Modbus, EtherNet/IP or OPC DA, which enables CENTUM VP to operate and monitor those subsystems via the UGS in the same way as its own FCS.

By using two units of the UGS/UGS2, the configuration can be made dual-redundant.

•UGS
  VP6B1500 Unified Gateway Station (UGS) Standard Function
  VP6B1501 Dual-redundant Package (for UGS)
  VP6B1550 OPC Communication Package (for UGS)
  VP6B1553 Modbus Communication Package (for UGS)
  VP6B1570 IEC 61850 IED Communication Package (for UGS)
  VP6B1591 EtherNet/IP Communication Package (for UGS)

•UGS2
  VP6B1600 Unified Gateway Station (UGS2) Standard Function
  VP6B1601 Dual-redundant Package (for UGS2)
  VP6B1650 OPC Communication Package (for UGS2)
  VP6B1653 Modbus Communication Package (for UGS2)
  VP6B1670 IEC 61850 IED Communication Package (for UGS2)
  VP6B1691 EtherNet/IP Communication Package (for UGS2)

For details, refer to the GS of each of the software.

● **Advanced Process Control Station (APCS)**

An APCS is used for implementing advanced control and computation to improve plant efficiency using a server connected via Vnet/IP.

   VP6F1200 APCS Control Functions

For details, refer to the GS "APCS Control Functions APCS Package Set" (GS 33J15U10-01EN).

● **Vnet/IP**

Vnet/IP is a control network for connecting CENTUM VP components with each other. For more details, refer to the Chapter NETWORK SPECIFICATIONS described later.

● **Layer 2 Switch (L2SW)**

An L2SW is used for relaying communications between devices connected to the Vnet/IP network. The Vnet/IP system area connected by the L2SW is referred to as the Vnet/IP domain. In a Vnet/IP domain, use an L2SW with support for a communication speed of 1 Gbps.

● **Layer 3 Switch (L3SW)**

An L3SW is used for relaying communications between Vnet/IP domains. For connections between Vnet/IP domains, use an L3SW with support for a communication speed of 1 Gbps.

● **SNTP Server**

SNTP server performs time synchronization via networks. Connect Vnet/IP station to SNTP server for synchronizing its time to the Universal Time, Coordinated (UTC).

● **V net Router**

A V net router is used to connect a Vnet/IP domain and V net domain to relay control communications. Data can be exchanged in both directions between the Vnet/IP domain and V net domain connected by the V net router. The control stations of one domain can be operated and monitored from the other domain.

   AVR10D   Duplexed V net Router (Duplexed Communication Modules and Power Supply Modules)

For the hardware specifications, refer to the GS "Duplexed V net Router" (GS 33J50D10-01EN).

● **Wide Area Communication Router (WAC Router)**

A WAC router is the hardware used for connecting two Vnet/IP domains via a wide area network (WAN) through a public network or a dedicated network. It enables the operation and monitoring of FCS/SCS distributed in a remote Vnet/IP domain. Satellite communications can also be used as a WAN.

　AW810D　Wide Area Communication Router

For the hardware specifications, refer to the GS "Wide Area Communication Router" (GS 33J50D20-01EN).

● **Other Devices**

The printers and other peripheral devices supported by each operating system can also be used. For details on other supported devices, consult Yokogawa.

■ RELEVANT SYSTEMS

● **Plant Resource Manager (PRM)**

PRM is a software package for managing field devices and equipment online. It allows for reducing a plant's total cost of ownership (TCO) by using device management tools to manage device status and maintenance information.

In addition to Foundation fieldbus devices, HART devices, and field wireless devices (conforming to ISA 100.11a) that have a digital communication function, PRM supports conventional analog devices that have no digital communication function.

For details on the specifications for PRM, refer to the GS "Plant Resource Manager" (GS 30B05A10-01EN).

● **ProSafe-RS Safety Instrumented System**

ProSafe-RS has been certified by the German certification body Technische Überwachungs Verein (TÜV) as a safety instrumented system that satisfies up to safety integrity level (SIL) 3 defined in IEC 61508.

A safety control station (SCS) of ProSafe-RS monitors plant safety and implements safety control. A safety engineering PC (SENG) performs the engineering and maintenance of the SCS. Furthermore, ProSafe-RS can be integrated with CENTUM VP to enable the operation and monitoring of an SCS from an HIS. For details, refer to the GS "ProSafe-RS Safety Instrumented System (for Vnet/IP)" (GS 32Q01B10-31E).

■ SECURITY MEASURES

● **Endpoint Security Service**

Endpoint Security Service reduces the risk of viruses infecting computers and provides support for maintaining the health of the control system throughout the plant's lifecycle. Endpoint Security Service provides services such as AV/OS Implementation Service, AV/OS Update Service, Virus Check Service, and Software Backup Service. For details, refer to the GS "Endpoint Security Service" (GS 43D02T30-02E).

Anti-virus Software
The Anti-virus software AV11000 (*1) is dedicated for Yokogawa control system based on the McAfee's intrusion prevention technologies. This product is used as standard anti-virus software for Yokogawa IA systems.

　*1:　On and after June 1, 2018, AV11000 becomes a part of solutions in the Endpoint Security Service above. For details, refer to "Basic Endpoint Security Solution" (GS 43D02T30-05).

Whitelisting Software
The Whitelisting Software SS1WL1□ is a whitelist method software provided for the CENTUM VP system that is based on the application control technology of McAfee, Inc. It restricts the running of malicious programs and unauthorized programs by allowing only programs for which permission has been granted in advance to run. This software can be used together with conventional antivirus software to provide even more effective security measures. For details, refer to the GS "SS1WL1C/SS1WL1S Whitelisting Software for Endpoint Security" (GS 30A15A30-01-E).

● **IT Security Tool**

With this tool which is common to Yokogawa system products, the CENTUM VP system components can be hardened by using Windows security functions. The tool easily enables to configure security settings.
CENTUM VP R6.04.00 and later adopts IT security version 2.0 which enhances to strengthen the security measures.

■ SYSTEM SPECIFICATIONS

● Project ID License

VP6CPJT project ID license is required for each CENTUM VP project. All the software licenses become valid under this project ID license.

● Project I/O License

Project I/O license is provided to determine the maximum number of logical I/O poionts that can be used in a single CENTUM VP project. The maximum number of usable I/Os in a project is determined by the number of project I/O licenses assigned to that project. For details on how to calculate the logical I/O points, refer to the GS "VP6F3100 Project I/O License" (GS 33J15A10-01EN).

The term "logical I/O points" is sometimes referred to as "logical IO points", but they are the same.

● License group

In CENTUM VP R6 software, several licenses are divided into smaller groups by the logical I/O points and the project scales.

(A) License groups by the logical I/O points
VP6H1100 Standard Operation and Monitoring Function
VP6E5100 Standard Engineering Function

Table License groups by logical I/O points

Suffix codes		Logical I/O points	Project scale
-V11	N01	Logical IO points are 2,000 or less	For Small/middle Scale Project
	N02	Logical IO points are 4,000 or less	
	N03	Logical IO points are 6,000 or less	For Large Scale Project
	N04	Logical IO points are 8,000 or less	
	N05	Logical IO points are 10,000 or less	
	N09	Logical IO points are 10,001 or more	

(B) License group by the project scale
VP6H1150 Server for Remote Operation and Monitoring Function
VP6H4410 Control Drawing Status Display Package
VP6H4420 Logic Chart Status Display Package
VP6H6660 Process Management Package
VP6H6710 FCS Data Setting/Acquisition Package (PICOT)
VP6E5420 Test Function
VP6E5490 Self-documentation Package

Table License groups by the project scale

Suffix codes		Project scale
-V11	N01	For Small/Middle Scale Project (Logical IO points are 4,000 or less)
	N03	For Large Scale Project (Logical IO points are 4,001 or more)

These licenses must be applied in the following manners by the CENTUM VP project.

• Suffix codes of the logical I/O points and project scale (Nxx) must be identical for the licenses listed in the license groups by the logical I/O points and by the project scale in a single project.
• Mixed use of the licenses for small/middle scale project and for large scale project cannot be acceptable in a single project.

● Product Maintenance License and Upgrade License

This product maintenance license is a license that supports maintenance of the functions of standard software running on a customer's system. For details, please refer to GS 30A01F10-01EN.

From CENTUM VP R6.04.00, upgrade license is required to revise software for revision-up and applying a patch. These upgrade licenses are attached to the product maintenance license. For details, please refer to GS 33A01B10-01EN.

● **RIO System Upgrade**

Solution to upgrade existing CENTUM RIO System (*1) to a latest CENTUM VP R6 System is provided. Its solution can be executed in phases or in a lump. For the product specifications, refer to the GS "Field Control Unit, Cabinet Utility Kit (for RIO System Upgrade)" (GS 33J64E10-01EN), "N-IO Node (for RIO System Upgrade)" (GS 33J64F10-01EN), and "Control Function for Field Control Station (for A2FV70□)" (GS 33J15C20-01EN).

   *1:   RIO is an acronym for Remote I/O. RIO System is a generic name of a system which has FCS for RIO. CENTUM CS, CENTUM CS 1000/3000, and CENTUM VP are included in RIO System.

● **FCS Online Upgrade**

The feature that can upgrade the FCS system program while continuing control operation is supported as a standard function. The target models and revisions are shown below.

   AFV30D, AFV40D: R5.01.10 or later
   A2FV50D: R6.01.00 or later
   A2FV70D: R6.03.00 or later

CPU modules should be duplexed for the FCS online upgrade. There are also some other items to consider, so a risk assessment will be conducted prior to implementation. For details, please contact Yokogawa sales window.

■ SYSTEM CONFIGURATION

● **HIS Operation and Monitoring Capacity**

Number of tag names: Up to 100,000 (up to 1,000,000 when using VP6H4000)

The number of tag names for which operation and monitoring is possible with one HIS is up to 100,000.

● **Minimum System Configuration**

The minimum system configuration consists of the following.

   HIS x 1 unit
   ENG (including AD Server) x 1 unit
   FCS x 1 unit

The HIS and ENG can be installed on the same computer.

● **Maximum System Configuration**

   64 Vnet/IP stations/domain
   16 domains/system
   256 stations/system

For the maximum number of FCSs that can be connected in the entire system, refer to the GS "● Maximum Number of FCSs per an entire system" in "■ REMARKS FOR SYSTEM CONFIGURATIONS.

Vnet/IP stations refer to devices such as a computer with Vnet/IP Interface Card (VI702) installed, an FCS for Vnet/IP, and a V net router.

The following lists some specific Vnet/IP stations.

   HIS: Human Interface Station
   ENG: Engineering Station (AD Organizer and VP builder)
   FCS: Field Control Station
   UACS: Unified Alarms and Conditions Server
   APCS: Advanced Process Control Station
   GSGW: Generic Subsystem Gateway
   SIOS: System Integration OPC Station
   UGS/UGS2:   Unified Gateway Station
   Exaopc: OPC Server Station
   AVR10D: V net Router
   AW810D: WAC Router
   L3SW: Layer 3 Switch

Devices connectable with CENTUM VP

   SENG: Safety Engineering PC
   SCS: Safety Control Station
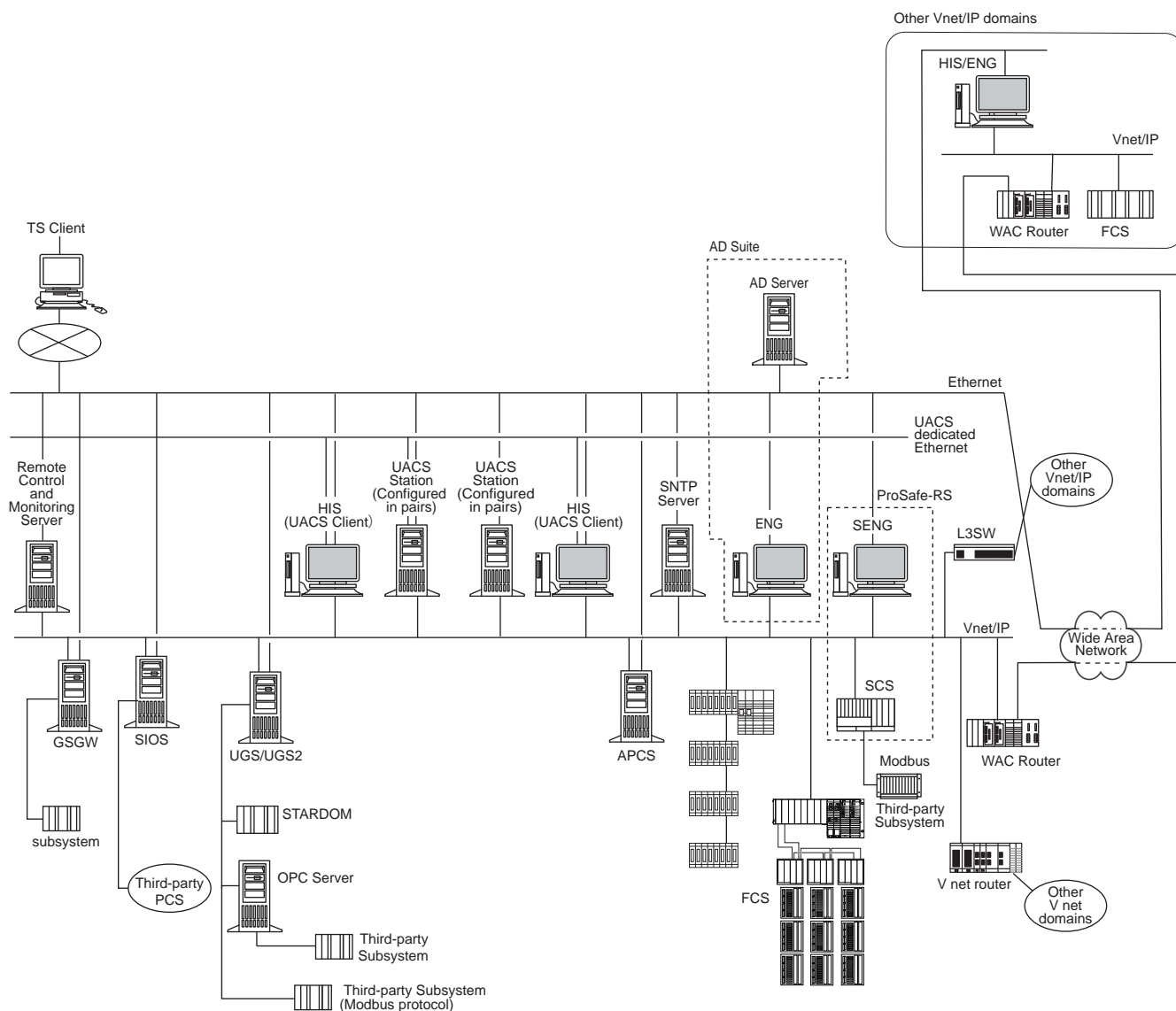
Figure An Example of System Configuration

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● **System Expansion**

Multiple Vnet/IP domains can be connected by using the layer three network switches (L3SWs) to establish multiple domain configurations.

Furthermore, using a V net router enables connecting with a system using other V net and/or VL net domains. An existing HF bus or RL bus system cannot be connected directly with Vnet/IP, but can be connected via a bus converter (BCV) on the V net connected using a V net router. The scale of the system can be expanded beyond the maximum system configuration per domain by connecting the system hierarchically using L3SWs and V net routers. This means an expanded system centered around CENTUM VP can be achieved by connecting hierarchically to other control systems.

Maximum number of domains: 16 (Vnet/IP domains + V net domains)
Number of domain layers that can be connected with Vnet/IP systems via V net routers: 3 layers (2 layers for bus converter and 3 layers for V net)
Number of tag names: Up to 100,000 (up to 1,000,000 when using VP6H4000 Million Tag Handling Package)
Connected devices: L3SWs, V net routers, and bus converters

When the V net layer limit is determined, the Vnet/IP domain and V net router in the access path are not counted as a layer. The following figure shows specifically the number of layers in a multiple domain configuration.

F02E.ai
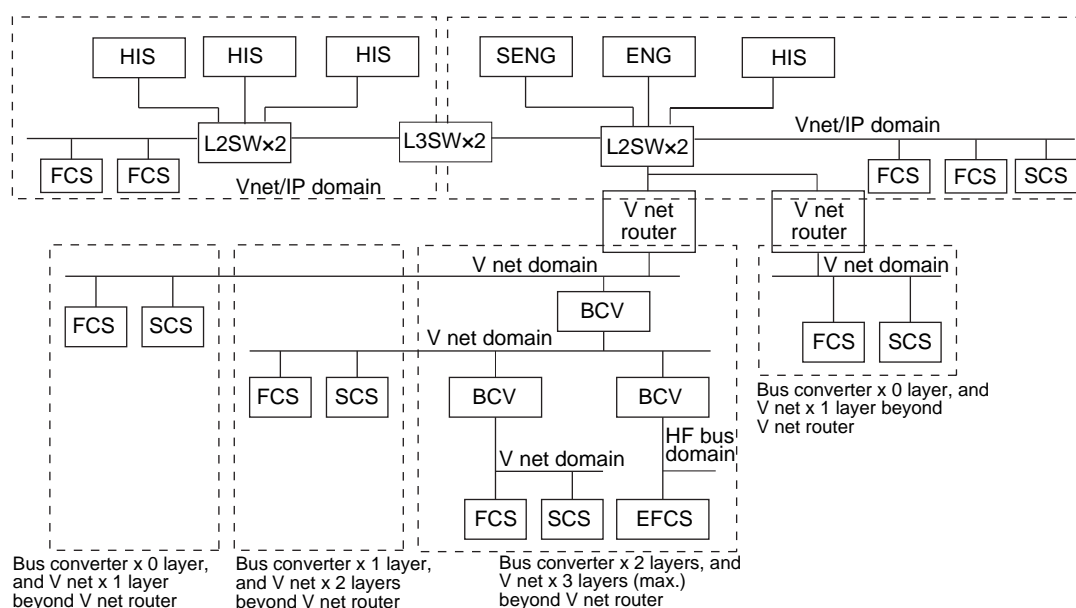
Figure An Example of System Expansion

A Vnet/IP domain and a V net domain can be configured as a single CENTUM VP project for engineering. Or, a Vnet/IP domain and a V net domain can be treated as different projects and connected with VP6H4450/VP6E5450 Multiple Project Connection Package.

■ MULTIPLE PROJECT CONNECTION

CENTUM VP manages FCS and HIS engineering data generated by the system generation function on a project basis. The multiple project connection function is for integrating the operation and monitoring of multiple projects. CENTUM VP HIS enables the integrated monitoring of CENTUM VP, CENTUM CS 3000, CENTUM CS 1000, and CENTUM CS projects without having to change the names duplicated among projects (e.g. tag names, project names, and plant layer names) and common resources (e.g. engineering units and operation marks). Connections such as the following are possible for a multiple project connection.

● Hierarchical Connection

This connection pattern has a hierarchical structure between domains. The lower-level CENTUM VP project can be operated from an HIS of the upper-level CENTUM VP project. Multiple Project Connection Package is required for the upper-level CENTUM VP project. The upper-level CENTUM VP project cannot be operated and monitored from the lower-level CENTUM VP project. The hierarchical connections shown below are available.

CENTUM VP→CENTUM VP   CENTUM VP→CENTUM CS 3000   CENTUM VP→CENTUM CS 1000   CENTUM VP→CENTUM CS
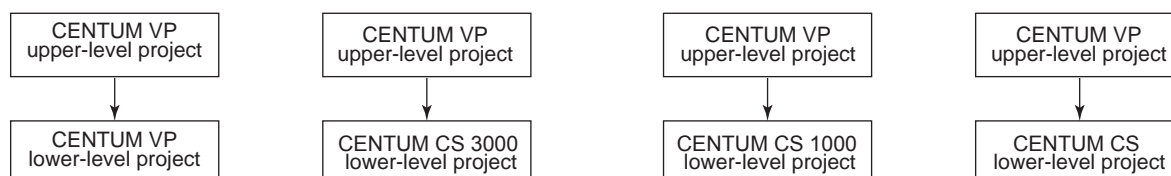
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● Bi-directional Connection

This connection pattern has no hierarchical structure. Operation and monitoring of the connected projects are enabled bi-directionally. The bi-directional connection is applicable only for CENTUM VP projects and/or CENTUM VP and CENTUM CS 3000 projects. Multiple project connection packages are required for both upper- and lower-levels of the systems.

CENTUM VP→CENTUM VP   CENTUM VP→CENTUM CS 3000
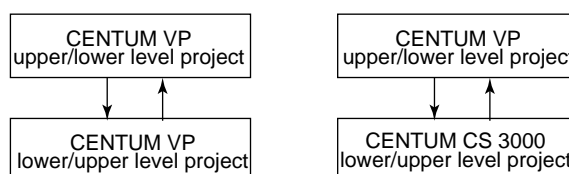
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For more details, refer to GS for VP6E5450, VP6H4450 Multiple Project Connection Package (GS 33J05K20-01EN).

■ NETWORK SPECIFICATIONS

CENTUM VP uses Vnet/IP, Ethernet, and UACS dedicated Ethernet for communications among Vnet/IP stations.

● Vnet/IP

Vnet/IP is a gigabit Ethernet-based control network for process automation. It provides real-time communication with high reliability which is indispensable for stable plant operations. Vnet/IP is a dual-redundant control network, consisting of Bus 1 and Bus 2. Bus 1 is normally used for control communication to transmit control data; however, when the Bus 1 fails, it automatically switches its communication path and Bus 2 continues the control communication without stopping. Furthermore, Bus 2 is used for open communication described later.

It can be connected between Vnet/IP domains using the wide area communication router and WAN.

The same is also available by the wide area connection via dedicated network using Layer 3 Switches. For the conditions of this connection, contact Yokogawa for further information.
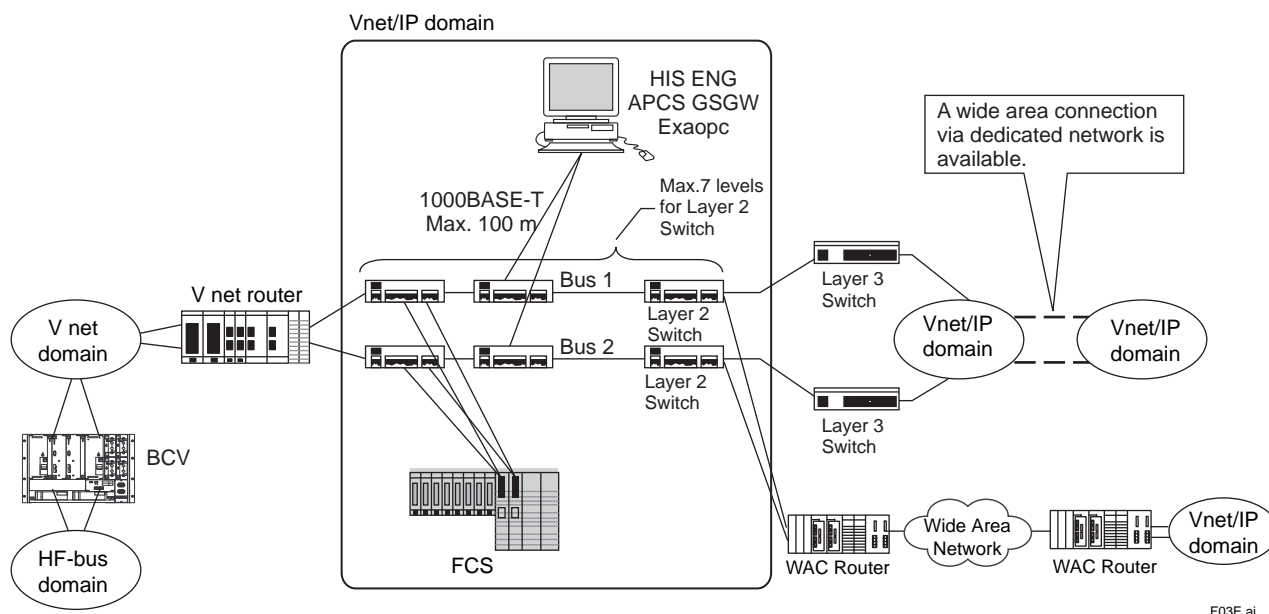
Figure Network Configuration

Communication Specification

Control Communication
Communication method: Read/write communication, message communication, link transmission
Link transmission period: 100 ms

Transmission specifications
Network topology: Star topology, Ring topology (*1) (*2)
Transmission redundancy: Dual-redundant (for control network communication only)

   *1:   The ring topology can be configured within the network domain only; however, L3SW can be applied as a network device to configure the ring topology.
   *2:   Since a network failure in the ring topology is detected by the L2SW or L3SW, the failure must be monitored on an HIS via an FCS.

Cable Specification
Cable: Unshielded twist-pair (UTP) with enhanced category 5 or superior (ANSI: TIA/EIA-568-B-compliant)
Connector: RJ-45 modular jack (ISO8877-compliant)

Connection	Cable Standard	Speed	Maximum Distance
Between component and a layer 2 switch	100BASE-TX (IEEE802.3u)	100 Mbps (*1)	100 m
	1000BASE-T (IEEE802.3ab)	1 Gbps	
Between layer 2 switches	1000BASE-T (IEEE802.3ab)	1 Gbps	100 m
	1000BASE-LX (IEEE802.3z)	1 Gbps	5 km (*2)
Between a layer 2 switch and a layer 3 switch	1000BASE-T (IEEE802.3ab)	1 Gbps	100 m
	1000BASE-LX (IEEE802.3z)	1 Gbps	5 km (*2)

   *1:   Applicable only for V net Router and ProSafe-RS SCS.
   *2:   1000 BASE-LX standard defines the transmission distance as up to 5 km for a single mode optical fiber. In case further length is required, refer to Network Switch for Vnet/IP (TI 30A10A30-01E).

Communications between Instruments
Distance between the two arbitrary stations in a domain: Maximum 40 km

> Note: Only one pair of media converters (SFP Modules) can be connected for establishing the communication among control stations such as FCS, ENG, and HIS, and Layer 2 switches.

● **Ethernet**

Ethernet is used for file transfer and information communication among HIS, ENG, and general-purpose Ethernet devices. Ethernet communication is usually performed via an Ethernet card mounted in a computer, server, or other device. Communication based on the various Ethernet-based standard protocols is referred to here as Ethernet communication.

Communication Protocol
Based on IEEE802.3

Conditions for Ethernet Communication using Vnet/IP Bus 2
Ethernet communication is usually performed using a network that is independent from Vnet/IP. However, when all the following conditions are met, Ethernet communication can be performed using Vnet/IP Bus 2. If any one of the conditions is not met, it is recommended to use a network that is independent from Vnet/IP for Ethernet communication.

- The system consists of only a Vnet/IP network and has no connection with V net or VL net via a V net router.
- The system does not include Exaopc (*1), HIS-TSE, UGS/UGS2 (*2), SIOS, GSGW, or APCS.
- There is no integration with ProSafe-RS.
- If PRM is used, the PRM server function and field communication server function run on the same computer and the PRM client function runs on a computer with a Vnet/IP interface card installed (an HIS or the computer running the field communication server).
- The HISs, ENG, and other computers with a Vnet/IP interface card installed are no more than 16 (*3).
- The devices connected to the L2SW for Bus 2 are the BUS2 ports of the Vnet/IP interface cards installed in the computers, network printer (*4), and file server (*4) only.
- WAC Router is not used.
- The system does not include UACS.

Ethernet communication performed with Vnet/IP Bus 2 is referred to as open communication. Vnet/IP enables dual-redundancy for control communication. Open communication is always performed with Bus 2. Normally, control communication is performed with Bus 1 and open communication is performed with Bus 2.

If an error occurs with control communication on the Bus 1 side, both control communication and open communication are performed with Bus 2.

> *1:   Refer to NTPF100 Exaopc OPC Interface Package (GS 36J02A10-01EN). This condition is not applicable to VP6H2411 Exaopc OPC Interface Package (for HIS).
> *2:   When creating a dual-redundant configuration of UGSs, it is strongly recommended to implement Ethernet communication not with Vnet/IP Bus 2 but with the network connected to the Ethernet cards of the UGSs. For details on creating a dual-redundant configuration of UGSs, refer to VP6B1501 Dual-redundant Package (for UGS) (GS 33J20C10-01EN). UGS2 cannot perform Ethernet communication using Vnet/IP Bus 2. An independent network for the Ethernet communication must be configured separately from Vnet/IP.
> *3:   If the number of computers with a Vnet/IP interface card installed exceeds 16, it is recommended to implement Ethernet communication not with Vnet/IP Bus 2 but with the network connected to the Ethernet cards of the computers. If the number of computers exceeds 50, this method is strongly recommended.
> *4:   If Ethernet communication is implemented with Vnet/IP Bus 2, a network printer and fileserver can be connected to Vnet/IP Bus 2. However, the total bandwidth used by the devices must be restricted so that it does not exceed 300 Mbps.

When open communication is performed by Bus 2, there are limitations and risks mentioned above. Independently of Bus 2, laying a dedicated network for Ethernet communication is strongly recommended. For details, refer to Vnet/IP Network Construction Guide (TI 30A10A05-01E).

● **UACS dedicated Ethernet**

UACS dedicated Ethernet is an essential network for handling communication of alarm information in UACS.

For details, refer to the GS "Unified Alarms and Conditions Server (UACS), UACS Simulator Package, UACS Advanced Suppression Function, UACS Multiple Project Connection Package, UACS Client License" (GS 33J05D30-01EN).

■ I/O COMMUNICATIONS BUS

● N-ESB Bus, Optical ESB Bus, ESB Bus, and F-SB Bus

An N-ESB bus, ESB bus, and optical ESB bus are used as I/O communication buses for connecting the FCU with N-IO nodes (*1) and FIO nodes (*2) in an N-IO system (*3).

Refer to the GS "Field Control Unit, Cabinet Utility Kit (for RIO System Upgrade)" (GS 33J64E10-01EN) for I/O communication buses of RIO System Upgrade.

An ESB bus and optical ESB bus are used as I/O communication buses for connecting the FCU with FIO nodes in an FIO system (*4).

An F-SB bus is used as an I/O communication bus for connecting the node interface unit with N-IO I/O units in an N-IO system.

Bus Connection Specifications
 N-ESB Bus
    Connectable nodes: N-IO nodes
    Number of connectable nodes: 32 N-IO nodes
    Maximum number of hops: 16 (for star connection)
    Maximum number of hops: 16 (for chain connection) (*5)

Optical ESB Bus and ESB Bus
    Connectable nodes:
      N-IO nodes and FIO nodes for N-IO system
      FIO nodes for FIO system
    Number of connectable nodes: (*6)
      32 N-IO nodes and 9 FIO nodes for N-IO system
      14 FIO nodes for FIO system
    Optical ESB bus connection type:
      Maximum number of hops for N-IO system:16 (for star connection) (*7)
      Maximum number of hops for FIO system:8 (for star connection)
      Maximum number of hops for N-IO system:16 (for chain connection) (*5) (*10)
      Maximum number of hops for FIO system:2 (for chain connection) (*5)

F-SB Bus

    Connectable nodes: N-IO I/O units (*8)
    Number of connectable nodes: 6 N-IO I/O units (*9)

    *1:   An N-IO node consists of one Node Interface Unit (A2NN30D) and up to six N-IO I/O units.
    *2:   An FIO node includes an ESB Bus Node Unit (ANB10□), Optical ESB Bus Node Unit (ANB11□), and Unit for Optical ESB
           Bus Repeater Module (ANT10U). ANT10U includes Optical ESB Bus Repeater Module (ANT401/ANT411 or ANT502/
           ANT512).
    *3:   N-IO system is made up of A2FV50□ and the components that are connected to A2FV50 through various IO bus.
    *4:   FIO systems is made up of AFV30□ (or AFV40□) and the componets that are connected to AFV30□ (or AFV40□) through
           various IO bus.
    *5:   When the Node Interface Units are connected in series (chain connection), keep the electricity turned on.
    *6:   The number of FIO nodes includes the CPU node (AFV30□ and AFV40□) and does not include ANT10U.
    *7:   Up to 24 hops are possible only when A2FV50□ is used for FCU and star connection is configured with ANT4□1 via
           EC402. (Supported by CENTUM VP R6.06.00 or later.)
    *8:   An N-IO I/O unit consists of a base plate, I/O module, etc. For details, refer to "N-IO System Overview" (GS
           33J62A10-01EN).
    *9:   Up to five Base Plates for Barrier (ANBN4D) can be connected.
    *10:   Up to 16 hops for chain connection of optical ESB bus is available when connecting N-IO nodes with optical ESB bus only.
           Up to 2 hops for the chain connection of Optical ESB bus is available when N-ESB bus and Optical ESB bus are used in
           combination or connecting FIO nodes in the same chain connection.

Transmission Specifications
N-ESB bus

    Transmission: Dual-redundant only
    Transmission speed:100 Mbps (equivalent to IEEE802.3 100Base-Tx)
    Transmission cable:UTP straight cable of CAT5e or better (ANSI Standard TIA/EIA-568-B compliant)
    Connector: 8-pin 8-core modular connector (ISO/IEC8877, RJ45)
    Maximum Transmission distance: 100 m

 Optical ESB bus
    Transmission:
            Dual-redundant or single(when the processor module has a dual-redundant configuration, dual-redundant
            transmission is mandatory.) (*1)
    Transmission speed: 192 Mbps
    Transmission cable: Optical fiber cable (*2)
    Maximum Transmission distance: 50 km (*3)

ESB bus
  Transmission:
        Dual-redundant or single (when the processor module has a dual-redundant configuration, dual-redundant transmission is mandatory.)(*4)
  Transmission speed: 128 Mbps
  Transmission cable: ESB bus cable (YCB301)
  Maximum Transmission distance: 10 m (*5)

F-SB bus
  Transmission: Dual-redundant only
  Transmission cable: F-SB bus cable (A2KLF00)
  Maximum Transmission distance: 1.95 m

*1:   Either single or dual-redundant can be selected for an FIO system. Dual-redundant is mandatory for an N-IO system.
*2:   Optical fiber cable specifications
       Connector: LC type (IEC 61754-20 compliant)
       Recommended cable: Quartz single-mode fiber (JIS C6835 SSMA-9.3/125, IEC 60793-2-50B1.1)
       Number of cores: 2
*3:   It is possible to extend the distance to up to 5 km using ANT401/ANT502/A2EN501 and to up to 50 km using ANT411/ANT512/A2EN501. Chain and star type topologies are applicable.
*4:   Either single or dual-redundant can be selected for an FIO system. Dual-redundant is mandatory for an N-IO system.
*5:   The distance is up to 10 m for EC401 and up to 10 m on the upper side and up to 10 m on the lower side for EC402.

The following figures show bus connection diagrams for an N-IO system and FIO system.
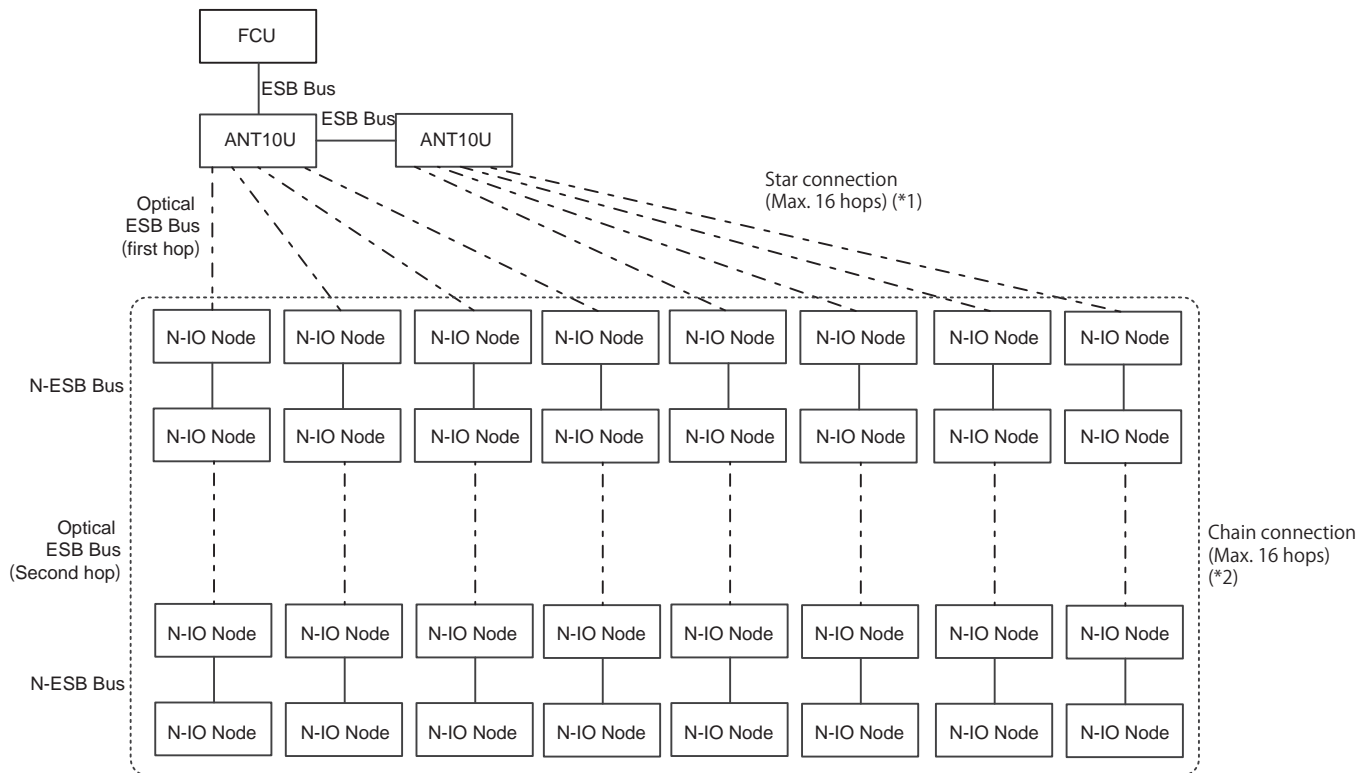
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N-IO node: Up to 32 nodes can be connected
Note: When the electricity is shut down for one of the Node Interface Units connected in series, the communications in between the Node Interface Units and I/O modules stop beyond the Node Interface Unit. In case electricity cut off occurs to some of the nodes connected in series, due to the difference in power line, connect the Node Interface Units in parallel.
*1:   Up to 24 hops are possible only when A2FV50□ is used for FCU and star connection is configured with ANT4□1 via EC402. (Supported by CENTUM VP R6.06.00 or later.)
*2:   Up to 16 hops in total of the chain connection is available when N-ESB bus and Optical ESB bus are used in combination. Up to 2 hops for the chain connection of Optical ESB bus is available when N-ESB bus and Optical ESB bus are used in combination or connecting FIO nodes in the same chain connection.

Figure N-IO System I/O Bus Connection Diagram 1
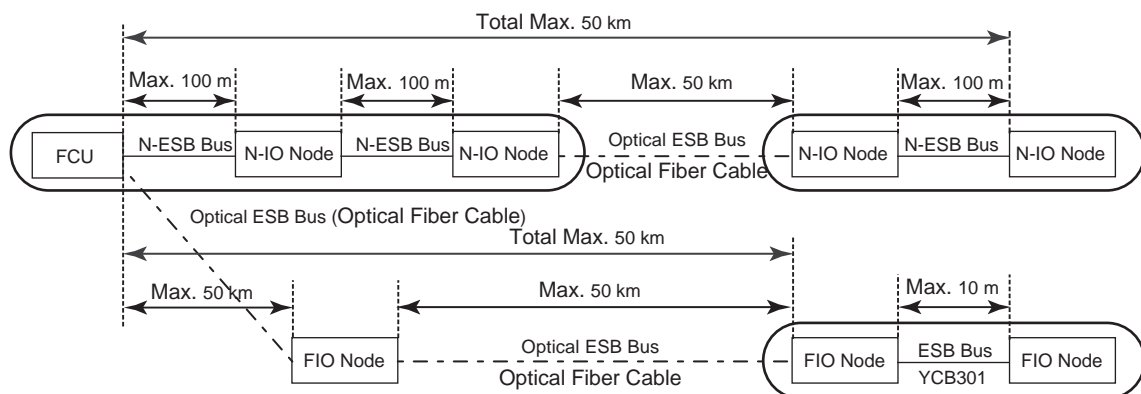
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Figure N-IO System I/O Bus Connection Diagram 2
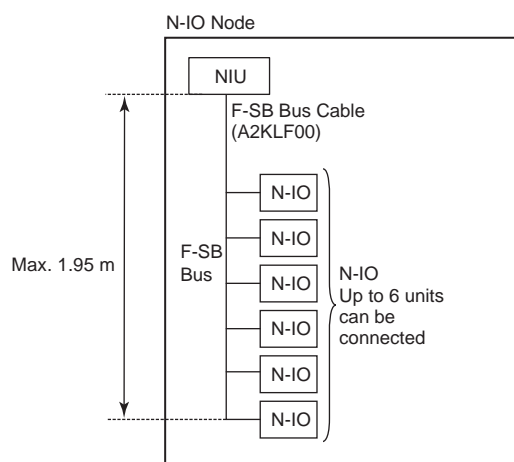
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NIU: Node Interface Unit
N-IO: N-IO I/O Unit

Figure N-IO System I/O Bus Connection Diagram 3
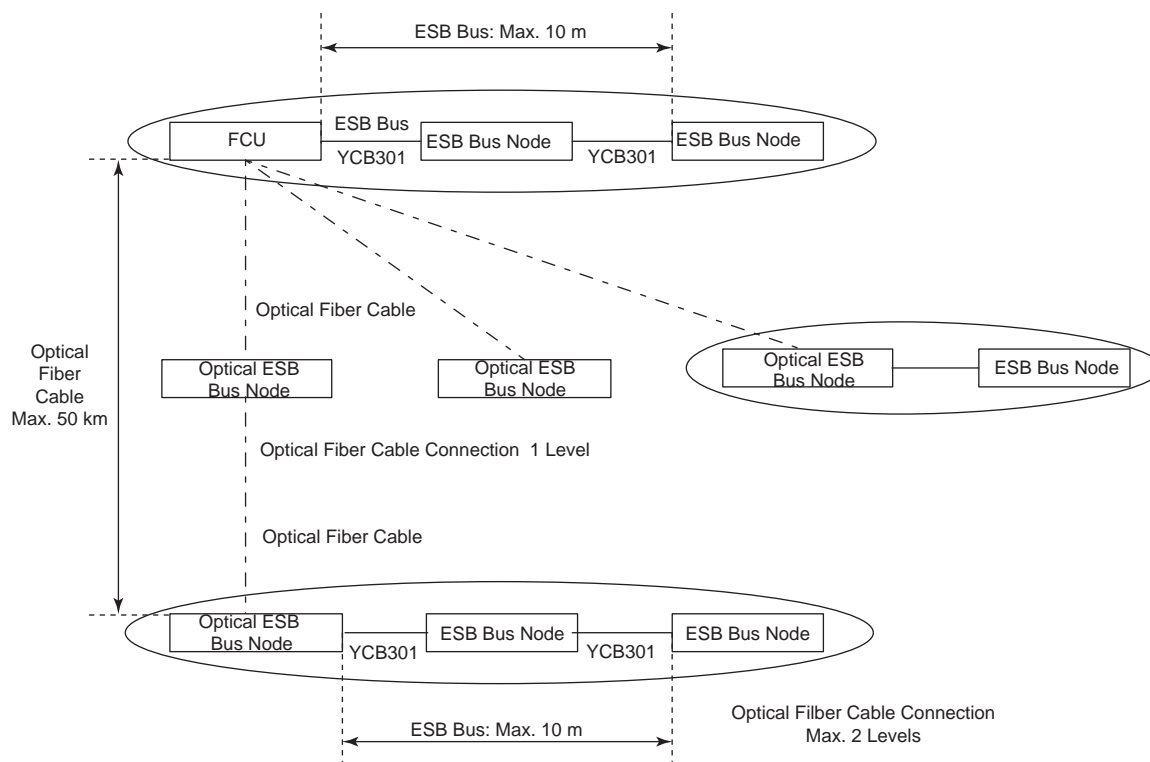
Figure FIO System I/O Bus Connection Diagram

■ REMARKS FOR SYSTEM CONFIGURATIONS

● Use of server due to the number of computer in a system

When a CENTUM VP system consists of five or more computers, for use as HIS and others, consider if a server (OS: Windows Server) is required or not for storing CENTUM VP project data. A server is required when a CENTUM VP system with nine or more computers and VP6E5425 Expanded Test Functions are applied. In case VP6E5170 Access Administrator Package (for FDA:21 CFR Part11 compliant) is applied where there are five or more computers connected, provide a server for historical data storage.

Project Data Storage

When a CENTUM VP system consists of more than five clients use below calculations to judge if it requires a server for project data storage or not. In case the calculated value is greater than the value on the right side (i.e. 9) save the project data in a server.

Judging Criteria

Equation 1	No. of Exaopc + No. of HIS + {(No. of ENG – 1) x 2} ≥ 9

• VP6H4450 Multiple Project Connection Function is in use.
 Calculate and judge by the criteria shown in the below table. When the number of stations is greater than the value on the right side of the equation, project data has to be stored on a server. Prepare two servers when the calculation results require one each for both upper and lower levels of the project. However, a server is not required when CENTUM CS is used for the lower-level project, and calculation is applied only for the upper-level project.

Table Judging Criteria

Multiple Project Connection Function is in use	Upper-level project	Equation 1
	Lower-level project	Equation 2

Judging Criteria

Equation 2	No. of Exaopc + No. of HIS + {(No. of ENG − 1) x 2} + α ≥ 9

α: No. of HIS withVP6H4450 Multiple Project Connection Packages on the upper-level project
No. of Exaopc: No. of computer with NTPF100 Exaopc OPC interface package.
(VP6H2411 Exaopc OPC Interface Package is excluded.)
No. of HIS: No. of computer with VP6H1100 Standard Operation and Monitoring Function
(Count all the number of this package used in the project.)
No. of ENG: No. of computer with VP6H1100 Standard Builder Function.
(Count all the number of this package used in the project. When it is resided with the standard operation and monitoring function, count them independently.)

Audit Trail Log Data Storage

When the sum of computers is five or more (for ENG, and Recipe Management computer) for stations connected to CENTUM VP while VP6E5170 Access Administrator Package (FDA: 21 CFR Part11 compliant) is resided, save the audit trail log data in a server. Calculate the sum of computers to be connected by using the following Equation 3. When the calculation result is four or less, there is no need for a server.

Equation 3	No. of stations connected = No. of recipe management package + No. of ENG

No. of Recipe Management Package: No. of computer with VP6E5166 Recipe Management Package (VP Batch).
No. of ENG: No. of computer with VP6E5100 Standard Builder Function.

● **Maximum number of FCS per an entire system**

A control drawing describes FCS's application program. It consists of several function blocks and inputs/outputs, and it describes a part of plant equipment control. When the expanded type or the large type is specified to the suffix code of the Control Function for Field Control Station (i.e. VP6F1700 for AFV30□/AFV40□, VP6F1800 for A2FV50□, or VP6F1900 for A2FV70□), application capacities and the database can be expanded. When creating a new FCS definition, the number of control drawings can be specified by the builder function. The number of control drawings can be selectable as shown below.

No. of control drawings: Selectable from 200 (default), 300, 400, or 500

Note: When the standard type is specified to the suffix code of VP6F1700, VP6F1800, or VP6F1900, the number of control drawings is fixed at 200.

The maximum number of FCS to be configured in the entire system depends on how many control drawings per FCS are specified. The table below shows a guideline of the maximum number of FCS that can be configured in a system when all the FCS selects the same number of control drawings per FCS. When different number of control drawings are assigned per FCS, the maximum number of FCS per system changes. Please contact Yokogawa for details.

Table A Guideline of Maximum No. of FCS by the No. of Control Drawings

No. of control drawings per FCS	Maximum No. of FCS per system
200	114 (*1)
300	83
400	65
500	54

*1: This is the sum of all types of FCS for Vnet/IP and V net. Out of 114 FCS, up to 86 of AFV30□/AFV40□, A2FV50□ and A2FV70□ can be configured. Please contact Yokogawa for details.

■ **COMPLIANCE TO FDA: 21 CFR PART 11**

Part 11 of Title 21 of the Code of Federal Regulations (21 CFR Part 11) is a regulation issued by the U. S. Food and Drug Administration (FDA) providing a criteria of electronic records, electronic signatures, and handwritten signatures executed to electronic records as equivalent to paper records and handwritten signatures executed on paper. The main categories of the FDA: 21 CFR Part 11 requirements to the process control system can be interpreted as "limiting system access to authorized individuals" and "audit trail" functions. For more details about compliance to FDA: 21 CFR Part 11, refer to the GS of "VP6E5170 Access Administrator Package (FDA:21 CFR Part 11 compliant)" (GS 33J10D40-01EN).

■ INSTALLATION ENVIRONMENT

Hardware standard installation environment is described as below. (*1)

Ambient temperature:
  0 to 50 °C (FCU, AVR10D, AW810D)
Ambient humidity:
  5 to 95% RH (FCU)
  10 to 90% RH (AVR10D, AW810D)
Temperature change rate: ± 10 °C/hour
Power supply:
  100 - 120 V AC ± 10%, Frequency; 50/60 Hz ± 3 Hz
  220 - 240 V AC ± 10%, Frequency; 50/60 Hz ± 3 Hz
  24 V DC ± 10%
Withstanding Voltage:
  100 - 120 and 220 - 240 V AC: 1500 V AC for 1 minute (*2)
  24 V DC: 500 V AC for 1 minute (*2)
Insulation resistance:
  20 MΩ/500 V DC (*2)
Grounding:
  The ground suitable for the power distribution system in the country or region has to be used for
  protective grounding system.
Noise:
  Electrical Field:
    Up to 3 V/m (26 MHz to 1.0 GHz)
    Up to 3 V/m (1.4 to 2.0 GHz)
    Up to 1 V/m (2.0 to 2.7 GHz)
  Magnetic Field:
    Up to 30 A/m (AC), Up to 400 A/m (DC)
  Static: Up to 4 kV (direct discharge), Up to 8 kV (aerial discharge)
Continuous Vibration:
  Displacement amplitude:
    Up to 0.25 mm (1 to 14 Hz)
  Acceleration: Up to 2 m/s^2 (14 to 100 Hz)

*1: For more details, refer to the specifications or GS.
    Computer: Specifications for computer.
     Network Switch for Vnet/IP: TI 30A10A30-01E
     Node Units and I/O Modules for FIO System: GS 33J60A10-01EN
     Node Units and I/O Modules for N-IO System: GS 33J62A10-01EN and GS 33J64E10-01EN
*2: Between power and grounding terminals.

■ REGULATORY COMPLIANCE

The CENTUM VP hardware devices are compliant with the standards shown in the table below.

For details on the standards and acquisition conditions, refer to Table "Standard List" which provides a summary for each standard.

Table Conformity Standards list (Safety Standard) (1/3)

Model		GS No.	Conformity Standards			
			CSA	CE	EAC	C₁
N-IO	A2FV50S-A□□1□□□	GS 33J62E10-01EN	X	X	X	X
	A2FV50S-A□□2□□□		—	X	X	X
	A2FV50S-A□□4□□□		—	X	X	X
	A2FV50D-A□□1□□□		X	X	X	X
	A2FV50D-A□□2□□□		—	X	X	X
	A2FV50D-A□□4□□□		—	X	X	X
	A2EN402	GS 33J62E50-01EN	X	X	X	X
	A2EN404		X	X	X	X
	A2NN30D	GS 33J62F10-01EN	X	X	X	X
	A2ZN3D (*1)	GS 33J62F40-01EN	—	X	X	X
	A2ZN4DC (*2)		—	X	X	X
	A2ZN5DC (*3)		—	X	X	X
	A2BN3D		X	X	X	X
	A2BN4D		X	X	X	—
	A2BN5D		X	X	—	—
	A2MMM843	GS 33J62F20-01EN	X	X	X	X
	A2MDV843		X	X	X	X
	A2SAM105	GS 33J62F30-01EN GS 33J64F10-01EN	X	X	X	X
	A2SAM505		X	X	X	X
	A2SAT105		X	X	X	X
	A2SAP105		X	X	X	X
	A2EXR001		X	X	X	X
	A2SDV105	GS 33J62F30-01EN	X	X	X	X
	A2SDV505		X	X	X	X
	A2SDV506		X	X	X	X
	A2SMX801		X	X	X	X
	A2SMX802		X	X	X	X
	A2BM4	GS 33J62H50-01EN	X	X	X	X
	A2PW503	GS 33J62K51-01EN	X	X	X	X
	A2PW504		X	X	X	X
	A2ZN70D	GS 33J62R10-01EN	Refer to the GS			
	A2ZN60D		Refer to the GS			
	A2NN70D		Refer to the GS			
	A2NN60D		Refer to the GS			
	A2CB60		Refer to the GS			
N-IO (for RIO System Upgrade)	A2FV70S-A□□1□□□	GS 33J64E10-01EN	X	X	X	X
	A2FV70S-A□□2□□□		—	X	X	X
	A2FV70S-A□□4□□□		—	X	X	X
	A2FV70D-A□□1□□□		X	X	X	X
	A2FV70D-A□□2□□□		—	X	X	X
	A2FV70D-A□□4□□□		—	X	X	X

X: Compliant   —: Non-compliant

Table Conformity Standards list (Safety Standard) (2/3)

Model		GS No.	Conformity Standards			
			CSA	CE	EAC	Cₚ
N-IO (for RIO System Upgrade)	A2CUKT3-C□1□	GS 33J64E10-01EN	X	X	X	X
	A2CUKT3-C□2□		—	X	X	X
	A2CUKT3-C□4□		X	X	X	X
	A2CUKT3-N□1□		X	X	X	X
	A2CUKT3-N□2□		—	X	X	X
	A2CUKT3-N□4□		—	X	X	X
	A2NN10D	GS 33J64F10-01EN	X	X	X	X
	A2NN20D		X	X	X	X
	A2BA3D		X	X	X	X
	AAB841-SK□ and others (*4)		X	X	X	X
	AAI143-HM□ and others (*5)		X	X	X	X
	ADV159-PK□ and others (*6)		X	X	X	X
	ADV159-PM□ and others (*7)		X	X	X	X
	AMT16M and others (*8)		X	X	X	X
FIO	VI702	GS 33J50C10-01EN	—	—	—	—
	AIP830	GS 33J50C32-01EN	Refer to the GS			
	AIP831	GS 33J50C33-01EN	Refer to the GS			
	AVR10D	GS 33J50D10-01EN	X	X	X	X
	YCB141		X	X	X	X
	YCB148		X	X	X	X
	YCB149		X	X	X	X
	AW810D	GS 33J50D20-01EN	X	X	X	X
	AFV30S-A□□1□□	GS 33J60E10-01EN	X	X	X	X
	AFV30S-A□□2□□		—	X	X	X
	AFV30S-A□□4□□		—	X	X	X
	AFV30D-A□□1□□		X	X	X	X
	AFV30D-A□□2□□		—	X	X	X
	AFV30D-A□□4□□		—	X	X	X
	AFV40S-A□□□1□□	GS 33J60E20-01EN	X	X	X	X
	AFV40S-A□□□2□□		—	X	X	X
	AFV40S-A□□□4□□		—	X	X	X
	AFV40D-A□□□1□□		X	X	X	X
	AFV40D-A□□□2□□		—	X	X	X
	AFV40D-A□□□4□□		—	X	X	X
	EC401	GS 33J60E50-01EN	X	X	X	X
	EC402	GS 33J60E51-01EN	X	X	X	X
	ANB10S,ANB10D	GS 33J60F20-01EN	X	X	X	X
	ANB11S,ANB11D	GS 33J60F30-01EN	X	X	X	X
	ANT10U	GS 33J60F50-01EN	X	X	X	X
	ANT401,ANT502	GS 33J60F51-01EN	X	X	X	X
	ANT411,ANT512	GS 33J60F52-01EN	X	X	X	X
	ANT421,ANT522	GS 33J60F55-01EN	X	X	X	X
	AAI141 and others (*9)	GS 33J60F60-01EN	X	X	X	X
	ADV151 and others (*10)	GS 33J60F70-01EN	X	X	X	X
	AGS813 and others (*11)	GS 33J60F90-01EN	X	X	X	X

X: Compliant   —: Non-compliant

GS 33J01A10-01EN Sep. 18, 2020-00

Table Conformity Standards list (Safety Standard) (3/3)

Model		GS No.	Conformity Standards			
			CSA	CE	EAC	C℮
FIO	ALR111, ALR121	GS 33J60G10-01EN	X	X	X	X
	ALE111	GS 33J60G11-01EN	X	X	X	X
	ALF111	GS 33J60G20-01EN	X	X	X	X
	ALP121	GS 33J60G85-01EN	X	X	X	X
	A2LP131	GS 33J60G90-01EN	X	X	X	X
	ATA4S and others (*12)	GS 33J60H20-01EN	—	—	—	—
	AEA3D and others (*13)	GS 33J60H50-01EN	X	X	X	X
	A1BA4D and others (*14)	GS 33J60H51-01EN	X	X	X	X
	ARM15A and others (*15)	GS 33J60H60-01EN	Refer to the GS	Refer to the GS (*17)	Refer to the GS (*17)	Refer to the GS (*17)
	MHC, MHM, SCFAN1	GS 33J60H70-01EN	X (*18)	—	—	—
	EM1 and others (*16)	GS 33J60H80-01EN	X	—	—	—
	ACB51	GS 33J60K10-01EN	X	X	X	X
	ACUKT1-□□1□		X	X	X	X
	ACUKT1-□□2□	GS 33J60K20-01EN	—	X	X	X
	ACUKT1-□□4□		X	X	X	X
	ACUKT2-□□1□		X	X	X	X
	ACUKT2-□□2□	GS 33J60K21-01EN	—	X	X	X
	ACUKT2-□□4□		X	X	X	X
	PW601		X	—	—	—
	PW602	GS 33J60K30-01EN	—	X	X	X
	AEP9D		—	X	X	X
	AEP7D-1□□		X	X	X	X
	AEP7D-2□□	GS 33J60K40-01EN	—	X	X	X
	AEP7D-4□□		X	X	X	X
	AEPV7D-1□□		X	X	X	X
	AEPV7D-2□□	GS 33J60K41-01EN	—	X	X	X
	AEPV7D-4□□		X	X	X	X

X: Compliant　　　　　　—: Non-compliant

*1: A2ZN3D is compliant to the standard including its components. For the components of A2ZN3D, refer to the GS "Base Plates (for N-IO) (GS 33J62F40-01EN)."
*2: A2ZN4DC is compliant to the standard including its components. For the components of A2ZN4DC, refer to the GS "Base Plates (for N-IO) (GS 33J62F40-01EN)."
*3: A2ZN5DC is compliant to the standard including its components. For the components of A2ZN5DC, refer to the GS "Base Plates (for N-IO) (GS 33J62F40-01EN)."
*4: AAV144-SK□, AAT145-SK□, AAR145-SK□
*5: AAI543-HM□, AAV144-SM□, AAT145-SM□, AAR145-SM□
*6: ADV559-PK□, ADV169-PK□, ADV569-PK□
*7: ADV159-PY□, ADV559-PM□, ADV559-PY□, ADV169-PM□, ADV569-PM□
*8: AMT16T, AMT16R, ADT16, ADT16A, ADT16B, ADT32
*9: AAV141, AAB141, AAI841, AAB841-S5□, AAB841-SE□, AAB842, AAI143-□5□, AAI143-□E□, AAI543-□5□, AAI543-□6□, AAI543-□E□, AAI543-□F□, AAV144-S5□, AAV144-SE□, AAV544, AAI135, AAI835, AAT145-S5□, AAT145-SE□, AAR145-S5□, AAR145-SE□, AAP135, AAP149, AAP849
*10: ADV161, ADV551, ADV561, ADV859, ADV159-P0□, ADV559-P0□, ADV869, ADV169-P0□, ADV569-P0□
*11: AGP813, AEGS1D, AEGP1D
*12: ATB5S, ATD5S, ATI3S, ATF9S, ATA4D, ATB5D, ATD5D, ATI3D, ATK4A, ATI3A, ATB3A, ATD5A, ATM4A, ATV4A
*13: AEA4D, AET4D, AED5D, AER4D, AEF9D
*14: A1BT4D, A1BR4D, A1BD5D
*15: ARM55D, ARM55W, ARM55T, ARM55C, ARS15B, ARS15M, ARS55M
*16: ET5, ER5, ES1, EH1, EH5, EA1, EA2, EA5, EA7, EH0, EA0, EC0, EC7, EP1, EP3, EX1, EXT, ESC
*17: ARS15M-1, ARS15M-2, ARS55M-1, ARS55M-2, ARS55M-3, and ARS15B-6 do not comply with the Safety standard [CE Marking], [EAC Marking], [C℮ Marking].
*18: The 100, 110, 115, and 120 V AC power supply specifications for MHC and MHM are compliant.

Table Conformity Standards list (EMC Standard) (1/3)

Model		GS No.	Conformity Standards				
			CE	RCM	KC	EAC	Cₚ
N-IO	A2FV50S-A☐☐1☐☐☐	GS 33J62E10-01EN	X	X	X	X	X
	A2FV50S-A☐☐2☐☐☐		X	X	X	X	X
	A2FV50S-A☐☐4☐☐☐		X	X	X	X	X
	A2FV50D-A☐☐1☐☐☐		X	X	X	X	X
	A2FV50D-A☐☐2☐☐☐		X	X	X	X	X
	A2FV50D-A☐☐4☐☐☐		X	X	X	X	X
	A2EN402	GS 33J62E50-01EN	X	X	X	X	X
	A2EN404		X	X	X	X	X
	A2NN30D	GS 33J62F10-01EN	X	X	X	X	X
	A2ZN3D (*1)	GS 33J62F40-01EN	X	X	—	X	X
	A2ZN4DC (*2)		X	X	—	X	X
	A2ZN5DC (*3)		X	X	—	X	X
	A2BN3D		X	X	—	X	X
	A2BN4D		X	X	—	X	—
	A2BN5D		X	X	—	—	—
	A2MMM843	GS 33J62F20-01EN	X	X	X	X	X
	A2MDV843		X	X	X	X	X
	A2SAM105	GS 33J62F30-01EN GS 33J64F10-01EN	X	X	X	X	X
	A2SAM505		X	X	X	X	X
	A2SAT105		X	X	X	X	X
	A2SAP105		X	X	X	X	X
	A2EXR001		—	—	—	—	—
	A2SDV105	GS 33J62F30-01EN	X	X	X	X	X
	A2SDV505		X	X	X	X	X
	A2SDV506		X	X	X	X	X
	A2SMX801		X	X	X	X	X
	A2SMX802		X	X	X	X	X
	A2BM4	GS 33J62H50-01EN	X	X	—	X	X
	A2PW503	GS 33J62K51-01EN	X	X	X	X	X
	A2PW504		X	X	X	X	X
	A2ZN70D	GS 33J62R10-01EN	Refer to the GS				
	A2ZN60D		Refer to the GS				
	A2NN70D		Refer to the GS				
	A2NN60D		Refer to the GS				
	A2CB60		Refer to the GS				
N-IO (for RIO System Upgrade)	A2FV70S-A☐☐1☐☐☐	GS 33J64E10-01EN	X	X	X	X	X
	A2FV70S-A☐☐2☐☐☐		X	X	X	X	X
	A2FV70S-A☐☐4☐☐☐		X	X	X	X	X
	A2FV70D-A☐☐1☐☐☐		X	X	X	X	X
	A2FV70D-A☐☐2☐☐☐		X	X	X	X	X
	A2FV70D-A☐☐4☐☐☐		X	X	X	X	X
	A2CUKT3-C☐1☐		X	X	X	X	X
	A2CUKT3-C☐2☐		X	X	X	X	X
	A2CUKT3-C☐4☐		X	X	X	X	X

X: Compliant   —: Non-compliant

Table Conformity Standards list (EMC Standard) (2/3)

Model		GS No.	Conformity Standards				
			CE	RCM	KC	EAC	C₊
N-IO (for RIO System Upgrade)	A2CUKT3-N□1□	GS 33J64E10-01EN	X	X	X	X	X
	A2CUKT3-N□2□		X	X	X	X	X
	A2CUKT3-N□4□		X	X	X	X	X
	A2NN10D	GS 33J64F10-01EN	X	X	X	X	X
	A2NN20D		X	X	X	X	X
	A2BA3D		X	X	X	X	X
	AAB841-SK□ and others (*4)		X	X	X	X	X
	AAI143-HM□ and others (*5)		X	X	X	X	X
	ADV159-PK□ and others (*6)	GS 33J64E10-01EN	X	X	X	X	X
	ADV159-PM□ and others (*7)		X	X	X	X	X
	AMT16M and others (*8)		X	X	X	X	X
FIO	VI702	GS 33J50C10-01EN	X	X	X	X	X
	AIP830	GS 33J50C32-01EN	Refer to the GS				
	AIP831	GS 33J50C33-01EN	Refer to the GS				
	AVR10D	GS 33J50D10-01EN	X	X	X	X	X
	YCB141		X	X	—	X	X
	YCB148		X	—	—	X	X
	YCB149		X	—	—	X	X
	AW810D	GS 33J50D20-01EN	X	X	X	X	X
	AFV30S-A□□1□□	GS 33J60E10-01EN	X	X	X	X	X
	AFV30S-A□□2□□		X	X	X	X	X
	AFV30S-A□□4□□		X	X	X	X	X
	AFV30D-A□□1□□		X	X	X	X	X
	AFV30D-A□□2□□		X	X	X	X	X
	AFV30D-A□□4□□		X	X	X	X	X
	AFV40S-A□□□1□□	GS 33J60E20-01EN	X	X	X	X	X
	AFV40S-A□□□2□□		X	X	X	X	X
	AFV40S-A□□□4□□		X	X	X	X	X
	AFV40D-A□□□1□□		X	X	X	X	X
	AFV40D-A□□□2□□		X	X	X	X	X
	AFV40S-A□□□4□□		X	X	X	X	X
	EC401	GS 33J60E50-01EN	X	X	X	X	X
	EC402	GS 33J60E51-01EN	X	X	X	X	X
	ANB10S, ANB10D	GS 33J60F20-01EN	X	X	X	X	X
	ANB11S, ANB11D	GS 33J60F30-01EN	X	X	X	X	X
	ANT10U	GS 33J60F50-01EN	X	X	X	X	X
	ANT401, ANT502	GS 33J60F51-01EN	X	X	X	X	X
	ANT411, ANT512	GS 33J60F52-01EN	X	X	X	X	X
	ANT421, ANT522	GS 33J60F55-01EN	X	X	X	X	X
	AAI141 and others (*9)	GS 33J60F60-01EN	X	X	X	X	X
	ADV151 and others (*10)	GS 33J60F70-01EN	X	X	X	X	X
	AGS813, other (*11)	GS 33J60F90-01EN	X	X	X	X	X
	ALR111, ALR121	GS 33J60G10-01EN	X	X	X	X	X

X: Compliant   —: Non-compliant

Table Conformity Standards list (EMC Standard) (3/3)

Model		GS No.	Conformity Standards				
			CE	RCM	KC	EAC	Cₚ
FIO	ALE111	GS 33J60G11-01EN	X	X	X	X	X
	ALF111	GS 33J60G20-01EN	X	X	X	X	X
	ALP121	GS 33J60G85-01EN	X	X	X	X	X
	A2LP131	GS 33J60G90-01EN	X	X	X	X	X
	ATA4S and others (*12)	GS 33J60H20-01EN	X (*17)	—	—	—	X (*17)
	AEA3D and others (*13)	GS 33J60H50-01EN	X	X	X	X	X
	A1BA4D and others (*14)	GS 33J60H51-01EN	X	X	X	X	X
	ARM15A and others (*15)	GS 33J60H60-01EN	Refer to the GS (*18)	Refer to the GS	Refer to the GS	Refer to the GS (*18)	Refer to the GS (*18)
	MHC, MHM, SCFAN1	GS 33J60H70-01EN	—	—	—	—	—
	EM1 and others (*16)	GS 33J60H80-01EN	—	—	—	—	—
	ACB51	GS 33J60K10-01EN	X	X	X	X	X
	ACUKT1-□□1□	GS 33J60K20-01EN	X	X	X	X	X
	ACUKT1-□□2□		X	X	X	X	X
	ACUKT1-□□4□		X	X	X	X	X
	ACUKT2-□□1□	GS 33J60K21-01EN	X	X	X	X	X
	ACUKT2-□□2□		X	X	X	X	X
	ACUKT2-□□4□		X	X	X	X	X
	PW601	GS 33J60K30-01EN	—	—	—	—	—
	PW602		X	X	X	X	X
	AEP9D		X	X	X	X	X
	AEP7D-1□□	GS 33J60K40-01EN	X	X	X	X	X
	AEP7D-2□□		X	X	X	X	X
	AEP7D-4□□		X	X	X	X	X
	AEPV7D-1□□	GS 33J60K41-01EN	X	X	X	X	X
	AEPV7D-2□□		X	X	X	X	X
	AEPV7D-4□□		X	X	X	X	X

X: Compliant   —: Non-compliant

*1: A2ZN3D is compliant to the standard including its components. For the components of A2ZN3D, refer to the GS "Base Plates (for N-IO) (GS 33J62F40-01EN)."
*2: A2ZN4DC is compliant to the standard including its components. For the components of A2ZN4DC, refer to the GS "Base Plates (for N-IO) (GS 33J62F40-01EN)."
*3: A2ZN5DC is compliant to the standard including its components. For the components of A2ZN5DC, refer to the GS "Base Plates (for N-IO) (GS 33J62F40-01EN)."
*4: AAV144-SK□, AAT145-SK□, AAR145-SK□
*5: AAI543-HM□, AAV144-SM□, AAT145-SM□, AAR145-SM□
*6: ADV559-PK□, ADV169-PK□, ADV569-PK□
*7: ADV159-PY□, ADV559-PM□, ADV559-PY□, ADV169-PM□, ADV569-PM□
*8: AMT16T, AMT16R, ADT16, ADT16A, ADT16B, ADT32
*9: AAV141, AAB141, AAI841, AAB841-S5□, AAB841-SE□, AAB842, AAI143-□5□, AAI143-□E□, AAI543-□5□, AAI543-□6□, AAI543-□E□, AAI543-□F□, AAV144-S5□, AAV144-SE□, AAV544, AAI135, AAI835, AAT145-S5□, AAT145-SE□, AAR145-S5□, AAR145-SE□, AAP135, AAP149, AAP849
*10: ADV161, ADV551, ADV561, ADV859, ADV159-P0□, ADV559-P0□, ADV869, ADV169-P0□, ADV569-P0□
*11: AGP813, AEGS1D, AEGP1D
*12: ATB5S, ATD5S, ATI3S, ATF9S, ATA4D, ATB5D, ATD5D, ATI3D, ATK4A, ATI3A, ATB3A, ATD5A, ATM4A, ATV4A
*13: AEA4D, AET4D, AED5D, AER4D, AEF9D
*14: A1BT4D, A1BR4D, A1BD5D
*15: ARM55D, ARM55W, ARM55T, ARM55C, ARS15B, ARS15M, ARS55M
*16: ET5, ER5, ES1, EH1, EH5, EA1, EA2, EA5, EA7, EH0, EA0, EC0, EC7, EP1, EP3, EX1, EXT, ESC
*17: Several types of pressure clamp terminals, compliant to EMC standard, have built-in surge absorbers to protect I/O modules from surges without external lightning arresters or the like.
*18: ARS15M-1, ARS15M-2, ARS55M-1, ARS55M-2, ARS55M-3, and ARS15B-6 do not comply with the EMC conformity standard [CE Marking], [EAC Marking], [Cₚ Marking].

Table Conformity Standards list (Standards for Hazardous Location Equipment) (1/4)

Model		GS No.	Conformity Standards										
			CSA		FM		ATEX		IECEx		KCs	EAC	EACS
			IS	NI	IS	NI	Type i	Type n	Type i	Type n	IS	IS	Type n
N-IO	A2FV50S-A□□1□□□	GS 33J62E10-01EN	—	—	—	X	—	—	—	—	—	—	—
	A2FV50S-A□□2□□□		—	—	—	X	—	—	—	—	—	—	—
	A2FV50S-A□□4□□□		—	—	—	X	—	X	—	X	—	—	X
	A2FV50D-A□□1□□□		—	—	—	X	—	—	—	—	—	—	—
	A2FV50D-A□□2□□□		—	—	—	X	—	—	—	—	—	—	—
	A2FV50D-A□□4□□□		—	—	—	X	—	X	—	X	—	—	X
	A2EN402-S□□1□□	GS 33J62E50-01EN	—	—	—	X	—	X	—	X	—	—	X
	A2EN404-S□□1□□		—	—	—	X	—	X	—	X	—	—	X
	A2NN30D-□3□□□□□1□	GS 33J62F10-01EN	—	X	—	X	—	—	—	—	—	—	—
	A2NN30D-□4□□□□□1□		—	X	—	X	—	X	—	X	—	—	X
	A2ZN3D (*1)	GS 33J62F40-01EN	—	—	—	—	—	X	—	—	—	—	—
	A2ZN4DC (*2)		—	—	—	—	—	X	—	—	—	—	—
	A2ZN5DC (*3)		—	—	—	—	—	X	—	—	—	—	—
	A2BN3D-□□1□□		—	X	—	X	—	X	—	X	—	—	X
	A2BN4D-2□1□□		—	X	—	X	—	X	—	X	—	—	—
	A2BN5D-2□1□□		X	X	X	X	X	X	X	X	X	X	—
	A2MMM843-SS□1□□	GS 33J62F20-01EN	—	X	—	X	—	X	—	X	—	—	X
	A2MDV843-0S□1□□		—	X	—	X	—	X	—	X	—	—	X
	A2SAP105-S1□□	GS 33J62F30-01EN GS 33J64F10-01EN	—	X	—	X	—	X	—	X	—	—	X
	A2EXR001-S□□□1□□		—	—(*4)	—	—(*4)	—	X	—	X	—	—	X
	A2SAM105-H1□□		—	X	—	X	—	X	—	X	—	—	X
	A2SAM505-H1□□		—	X	—	X	—	X	—	X	—	—	X
	A2SAT105-S1□□		—	X	—	X	—	X	—	X	—	—	X
	A2SMX802-S1□□		—	X	—	X	—	X	—	X	—	—	X
	A2BM4-1□□	GS 33J62H50-01EN	—	X	—	X	—	X	—	X	—	—	X
	A2SDV105-S1□□	GS 33J62F30-01EN	—	X	—	X	—	X	—	X	—	X	X
	A2SDV505-S1□□		—	X	—	X	—	X	—	X	—	X	X
	A2SDV506-S1□□		—	X	—	X	—	X	—	X	—	—	X
	A2SMX801-S1□□		—	X	—	X	—	X	—	X	—	—	X
	A2PW503-S□1□□	GS 33J62K51-01EN	—	X	—	X	—	—	—	—	—	—	—
	A2PW504-S□1□□		—	X	—	X	—	X	—	X	—	—	X
	A2ZN70D	GS 33J62R10-01EN	Refer to the GS										
	A2ZN60D		Refer to the GS										
	A2NN70D		Refer to the GS										
	A2NN60D		Refer to the GS										
	A2CB60		Refer to the GS										
N-IO (for RIO System Upgrade)	A2FV70S-A□□1□□□	GS 33J64E10-01EN	—	—	—	—	—	—	—	—	—	—	—
	A2FV70S-A□□2□□□		—	—	—	—	—	—	—	—	—	—	—
	A2FV70S-A□□4□□□		—	—	—	—	—	—	—	—	—	—	—

X: Compliant   —: Non-compliant

Table Conformity Standards list (Standards for Hazardous Location Equipment) (2/4)

Model		GS No.	Conformity Standards										
			CSA		FM		ATEX		IECEx		KCs	EAC	EACS
			IS	NI	IS	NI	Type i	Type n	Type i	Type n	IS	IS	Type n
N-IO (for RIO System Upgrade)	A2FV70D-A□□1□□□	GS 33J64E10-01EN	—	—	—	—	—	—	—	—	—	—	—
	A2FV70D-A□□2□□□		—	—	—	—	—	—	—	—	—	—	—
	A2FV70D-A□□4□□□		—	—	—	—	—	—	—	—	—	—	—
	A2CUKT3-C□1□		—	—	—	—	—	—	—	—	—	—	—
	A2CUKT3-C□2□		—	—	—	—	—	—	—	—	—	—	—
	A2CUKT3-C□4□		—	—	—	—	—	—	—	—	—	—	—
	A2CUKT3-N□1□		—	—	—	—	—	—	—	—	—	—	—
	A2CUKT3-N□2□		—	—	—	—	—	—	—	—	—	—	—
	A2CUKT3-N□4□		—	—	—	—	—	—	—	—	—	—	—
	A2NN10D	GS 33J64F10-01EN	—	—	—	—	—	—	—	—	—	—	—
	A2NN20D		—	—	—	—	—	—	—	—	—	—	—
	A2BA3D		—	—	—	—	—	—	—	—	—	—	—
	AAB841-SK□ and others (*5)		—	—	—	—	—	—	—	—	—	—	—
	AAI143-HM□ and others (*6)		—	—	—	—	—	—	—	—	—	—	—
	ADV159-PK□ and others (*7)		—	—	—	—	—	—	—	—	—	—	—
	ADV159-PM□ and others (*8)		—	—	—	—	—	—	—	—	—	—	—
	AMT16M and others (*9)		—	—	—	—	—	—	—	—	—	—	—
FIO	VI702	GS 33J50C10-01EN	—	—	—	—	—	—	—	—	—	—	—
	AIP830	GS 33J50C32-01EN	—	—	—	—	—	—	—	—	—	—	—
	AIP831	GS 33J50C33-01EN	—	—	—	—	—	—	—	—	—	—	—
	AVR10D	GS 33J50D10-01EN	—	—	—	—	—	—	—	—	—	—	—
	YCB141		—	X	—	X	—	X	—	—	—	—	—
	YCB148		—	—	—	—	—	—	—	—	—	—	—
	YCB149		—	—	—	—	—	—	—	—	—	—	—
	AW810D-□□□□1E, AW810D-□□□□1F	GS 33J50D20-01EN	—	—	—	X	—	—	—	—	—	—	—
	AW810D-□□□□2E, AW810D-□□□□2F		—	—	—	X	—	—	—	—	—	—	—
	AW810D-□□□□4E, AW810D-□□□□4F		—	—	—	X	—	X	—	X	—	—	X
	AFV30S-A□□1□□	GS 33J60E10-01EN	—	—	—	X	—	—	—	—	—	—	—
	AFV30S-A□□2□□		—	—	—	X	—	—	—	—	—	—	—
	AFV30S-A□□4□□		—	—	—	X	—	X	—	—	—	—	—
	AFV30D-A□□1□□		—	—	—	X	—	—	—	—	—	—	—
	AFV30D-A□□2□□		—	—	—	X	—	—	—	—	—	—	—
	AFV30D-A□□4□□		—	—	—	X	—	X	—	—	—	—	—
	AFV40S-A□□□1□□	GS 33J60E20-01EN	—	—	—	—	—	—	—	—	—	—	—
	AFV40S-A□□□2□□		—	—	—	—	—	—	—	—	—	—	—
	AFV40S-A□□□4□□		—	—	—	—	—	—	—	—	—	—	—
	AFV40D-A□□□1□□		—	—	—	—	—	—	—	—	—	—	—

X: Compliant   —: Non-compliant

Table Conformity Standards list (Standards for Hazardous Location Equipment) (3/4)

Model		GS No.	Conformity Standards										
			CSA		FM		ATEX		IECEx		KCs	EAC	EACS
			IS	NI	IS	NI	Type i	Type n	Type i	Type n	IS	IS	Type n
FIO	AFV40D-A□□□2□□	GS 33J60E20-01EN	—	—	—	—	—	—	—	—	—	—	—
	AFV40D-A□□□4□□		—	—	—	—	—	—	—	—	—	—	—
	EC401	GS 33J60E50-01EN	—	—	—	X	—	X	—	X	—	—	X
	EC402	GS 33J60E51-01EN	—	—	—	X	—	X	—	X	—	—	X
	ANB10S-□1E, -□1F, -□1G	GS 33J60F20-01EN	—	X	—	X	—	—	—	—	—	—	—
	ANB10S-□2E, -□2F, -□2G		—	—	—	X	—	—	—	—	—	—	—
	ANB10S-□4E, -□4F, -□4G		—	X	—	X	—	X	—	—	—	—	—
	ANB10D-□1E, -□1F, -□1G		—	X	—	X	—	—	—	—	—	—	—
	ANB10D-□2E, -□2F, -□2G		—	—	—	X	—	—	—	—	—	—	—
	ANB10D-□4E, -□4F, -□4G		—	X	—	X	—	X	—	X	—	—	X
	ANB11S-□1E, -□1F	GS 33J60F30-01EN	—	X	—	X	—	—	—	—	—	—	—
	ANB11S-□2E, -□2F		—	—	—	X	—	—	—	—	—	—	—
	ANB11S-□4E, -□4F		—	X	—	X	—	X	—	—	—	—	—
	ANB11D-□1E, -□1F (□=6,B,D)		—	X	—	X	—	—	—	—	—	—	—
	ANB11D-□2E, -□2F (□=6,B,D)		—	—	—	X	—	—	—	—	—	—	—
	ANB11D-□4E, -□4F (□=6,B,D)		—	X	—	X	—	X	—	X	—	—	X
	ANT10U	GS 33J60F50-01EN	—	X	—	X	—	X	—	X	—	—	X
	ANT401-EE, -EF	GS 33J60F51-01EN	—	X	—	X	—	X	—	X	—	—	X
	ANT502-EE, -EF		—	X	—	X	—	X	—	X	—	—	X
	ANT411-EE, -EF	GS 33J60F52-01EN	—	X	—	X	—	X	—	X	—	—	X
	ANT512-EE, -EF		—	X	—	X	—	X	—	X	—	—	X
	ANT421-E□	GS 33J60F55-01EN	—	X	—	X	—	X	—	X	—	—	X
	ANT522-E□		—	X	—	X	—	X	—	X	—	—	X
	AAI141 and others (*10)	GS 33J60F60-01EN	—	X	—	—	—	X	—	—	—	—	—
	AAI143 and others (*11)		—	X	—	X	—	X	—	—	—	—	—
	AAP149 and AAP849		—	—	—	—	—	—	—	—	—	—	—
	ADV151 and others (*12)	GS 33J60F70-01EN	—	X	—	X	—	X	—	—	—	—	—
	ADV859 and others (*13)		—	—	—	—	—	—	—	—	—	—	—
	AGS813 and others (*14)	GS 33J60F90-01EN	—	—	—	—	—	—	—	—	—	—	—
	ALR111, ALR121	GS 33J60G10-01EN	—	X	—	X	—	X	—	X	—	—	X
	ALE111	GS 33J60G11-01EN	—	X	—	X	—	X	—	X	—	—	X
	ALF111	GS 33J60G20-01EN	—	X	—	X	—	X	—	X	—	—	X
	ALP121	GS 33J60G85-01EN	—	—	—	—	—	—	—	—	—	—	—
	A2LP131	GS 33J60G90-01EN	—	—	—	—	—	—	—	—	—	—	—
	ATA4S and others (*15)	GS 33J60H20-01EN	—	X	—	X	—	—	—	—	—	—	

X: Compliant   —: Non-compliant

Table Conformity Standards list (Standards for Hazardous Location Equipment) (4/4)

Model		GS No.	Conformity Standards										
			CSA		FM		ATEX		IECEx		KCs	EAC	EACS
			IS	NI	IS	NI	Type i	Type n	Type i	Type n	IS	IS	Type n
FIO	ATF9S-□□	GS 33J60H20-01EN	—	X	—	X	—	—	—	—	—	—	—
	ATM4A and ATV4A		—	X	—	—	—	—	—	—	—	—	—
	AEA3D and others (*16)	GS 33J60H50-01EN	—	X	—	X	—	X	—	—	—	—	—
	AEF9D-□E, AEF9D-□F		—	X	—	X	—	X	—	X	—	—	X
	A1BA4D and others (*17)	GS 33J60H51-01EN	—	X	—	X	—	X	—	—	—	—	—
	ARM15A and others (*18)	GS 33J60H60-01EN	—	—	—	—	—	—	—	—	—	—	—
	MHC, MHM, SCFAN1	GS 33J60H70-01EN	—	—	—	—	—	—	—	—	—	—	—
	EM1 and others (*19)	GS 33J60H80-01EN	—	—	—	—	—	—	—	—	—	—	—
	ACB51	GS 33J60K10-01EN	—	—	—	—	—	—	—	—	—	—	—
	ACUKT1-□□1□	GS 33J60K20-01EN	—	—	—	—	—	—	—	—	—	—	—
	ACUKT1-□□2□		—	—	—	—	—	—	—	—	—	—	—
	ACUKT1-□□4□		—	—	—	—	—	—	—	—	—	—	—
	ACUKT2-□□1□	GS 33J60K21-01EN	—	—	—	—	—	—	—	—	—	—	—
	ACUKT2-□□2□		—	—	—	—	—	—	—	—	—	—	—
	ACUKT2-□□4□		—	—	—	—	—	—	—	—	—	—	—
	PW601, PW602	GS 33J60K30-01EN	—	—	—	—	—	—	—	—	—	—	—
	AEP9D		—	X	—	X	—	X	—	—	—	—	—
	AEP7D-1□□	GS 33J60K40-01EN	—	X	—	X	—	—	—	—	—	—	—
	AEP7D-2□□		—	X	—	X	—	—	—	—	—	—	—
	AEP7D-4□□		—	X	—	X	—	X	—	—	—	—	—
	AEPV7D-1□□	GS 33J60K41-01EN	—	X	—	X	—	—	—	—	—	—	—
	AEPV7D-2□□		—	—	—	X	—	—	—	—	—	—	—
	AEPV7D-4□□		—	X	—	X	—	X	—	X	—	—	X
	ETBC, ETBP	GS 33J60K50-01EN	—	—	—	—	—	—	—	—	—	—	—

X: Compliant   —: Non-compliant

*1:   A2ZN3D is compliant to the standard including its components. For the components of A2ZN3D, refer to the GS "Base Plates (for N-IO) (GS 33J62F40-01EN)."
*2:   A2ZN4DC is compliant to the standard including its components. For the components of A2ZN4DC, refer to the GS "Base Plates (for N-IO) (GS 33J62F40-01EN)."
*3:   A2ZN5DC is compliant to the standard including its components. For the components of A2ZN5DC, refer to the GS "Base Plates (for N-IO) (GS 33J62F40-01EN)."
*4:   A2EXR001 is a simple apparatus. Certification of FM NI and CSA NI is not required for the simple apparatus itself. Simple apparatus must be installed in accordance with the safety rules of Nonincendive Field Wiring based on NEC andCEC.
*5:   AAV144-SK□, AAT145-SK□, AAR145-SK□
*6:   AAI543-HM□, AAV144-SM□, AAT145-SM□, AAR145-SM□
*7:   ADV559-PK□, ADV169-PK□, ADV569-PK□
*8:   ADV159-PY□, ADV559-PM□, ADV559-PY□, ADV169-PM□, ADV569-PM□
*9:   AMT16T, AMT16R, ADT16, ADT16A, ADT16B, ADT32
*10: AAV141, AAB141, AAI841, AAB841-S5□, AAB841-SE□, AAB842
*11: AAI143-□5□, AAI143-□E□, AAI543-□5□, AAI543-□6□, AAI543-□E□, AAI543-□F□, AAV144-S5□, AAV144-SE□, AAV544, AAI135, AAI835, AAT145-S5□, AAT145-SE□, AAR145-S5□, AAR145-SE□, AAP135
*12: ADV161, ADV551, ADV561
*13: ADV159-P0□, ADV559-P0□, ADV869, ADV169-P0□, ADV569-P0□
*14: AGP813, AEGS1D, AEGP1D
*15: ATB5S, ATD5S, ATI3S, ATA4D, ATB5D, ATD5D, ATI3D, ATK4A, ATI3A, ATB3A, ATD5A
*16: AEA4D, AET4D, AED5D, AER4D
*17: A1BT4D, A1BR4D, A1BD5D
*18: ARM55D, ARM55W, ARM55T, ARM55C, ARS15B, ARS15M, ARS55M
*19: ET5, ER5, ES1, EH1, EH5, EA1, EA2, EA5, EA7, EH0, EA0, EC0, EC7, EP1, EP3, EX1, EXT, ESC

Table Conformity Standards (Marine Standards) (1/2)

Model		GS No.	Conformity Standards			
			ABS	BV	LR	DNV GL
N-IO	A2FV50S-A□□□□□□	GS 33J62E10-01EN	X	X	X	X
	A2FV50D-A□□□□□□		X	X	X	X
	A2EN402	GS 33J62E50-01EN	X	X	X	X
	A2EN404		X	X	X	X
	A2NN30D-□□□1□□□□□	GS 33J62F10-01EN	X	X	X	X
	A2BN3D-1□□□□	GS 33J62F40-01EN	X	X	X	X
	A2BN4D (*1)		X	X	X	X
	A2BN5D (*1)		X	X	X	X
	A2MMM843	GS 33J62F20-01EN	X	X	X	X
	A2MDV843		X	X	X	X
	A2SAM105	GS 33J62F30-01EN	X	X	X	X
	A2SAM505		X	X	X	X
	A2SAT105		X	X	X	X
	A2SAP105		X	X	X	X
	A2EXR001		X	X	X	X
	A2SDV105		X	X	X	X
	A2SDV505		X	X	X	X
	A2SDV506		X	X	X	X
	A2SMX801		X	X	X	X
	A2SMX802		X	X	X	X
	A2BM4	GS 33J62H50-01EN	X	X	X	X
	A2DCV01	GS 33J62F40-01EN	X	X	X	X
	A2KLF00	GS 33J62J10-01EN	X	X	X	X
	A2KPB00		X	X	X	X
	A2NN70D	GS 33J62R10-01EN	Refer to the GS			
	A2NN60D		Refer to the GS			
	A2CB60		Refer to the GS			
N-IO (for RIO System Upgrade	A2FV70S-A□□□□□□	GS 33J64E10-01EN	—	—	—	—
	A2FV70D-A□□□□□□		—	—	—	—
	A2CUKT3		—	—	—	—
	A2NN10D	GS 33J64F10-01EN	—	—	—	—
	A2NN20D		—	—	—	—
	A2BA3D		—	—	—	—
	A2SAM105		—	—	—	—
	A2SAM505		—	—	—	—
	A2SAP105		—	—	—	—
	A2EXR001		—	—	—	—
	A2SAT105		—	—	—	—
	AAB841-SK, others (*2)		—	—	—	—
	AAI143-HM, others (*3)		—	—	—	—
	ADV159-PK, others (*4)		—	—	—	—

X: Compliant   —: Non-compliant
Note: In order to comply with the marine standards, the specific installation methods must be followed. Refer to the TI "CENTUM
VP Installation Guide (TI 33J01J10-01EN)."

Table Conformity Standards (Marine Standards) (2/2)

Model		GS No.	Conformity Standards			
			ABS	BV	LR	DNV GL
N-IO (for RIO System Upgrade	ADV159-PM, others (*5)	GS 33J64F10-01EN	—	—	—	—
	AMT16M, others (*6)		—	—	—	—
FIO	AFV30S-A□□□□□	GS 33J60E10-01EN	X	X	X	X
	AFV30D-A□□□□□		X	X	X	X
	ANB10S	GS 33J60F20-01EN	X	X	—	X
	ANB10D		X	X	X	X
	ANB11S	GS 33J60F30-01EN	X	X	X	X
	ANB11D		X	X	X	X
	ANT10U	GS 33J60F50-01EN	X	X	X	X
	EC401	GS 33J60E50-01EN	X	X	X	X
	EC402	GS 33J60E51-01EN	X	X	X	X
	ANT401	GS 33J60F51-01EN	X	X	X	X
	ANT502		X	X	X	X
	ANT411	GS 33J60F52-01EN	X	X	X	X
	ANT512		X	X	X	X
	AAI135 and others (*7)	GS 33J60F60-01EN	X	X	X	X
	ADV151 and others (*8)	GS 33J60F70-01EN	X	X	X	X
	ALR111	GS 33J60G10-01EN	X	X	X	X
	ALR121	GS 33J60G10-01EN	X	X	X	X
	ALE111	GS 33J60G11-01EN	X	X	X	X
	ALF111	GS 33J60G20-01EN	X	X	X	X
	ALP121	GS 33J60G85-01EN	X	X	X	X
	A2LP131	GS 33J60G90-01EN	X	X	X	X
	AKB136 and others (*9)	GS 33J60J10-01EN	X	X	X	X
	MRI	GS 33K55R40-50E	X	X	—	—
	MRO	GS 33K55R40-50E	X	X	—	—
	AVR10D-□□□□1	GS 33J50D10-01EN	X	X	X	X
	AW810D	GS 33J50D20-01EN	X	X	X	X
	AIP830 (*10)	GS 33J50C32-01EN	X	X	X	X
	AIP831 (*10)	GS 33J50C33-01EN	X	X	X	X
	VI702	GS 33J50C10-01EN	X	X	X	X
	A1BA4D and others (*11)	GS 33J60H51-01EN	X	X	X	X

X: Compliant   —: Non-compliant

Note: In order to comply with the marine standards, the specific installation methods must be followed. Refer to the TI "CENTUM VP Installation Guide (TI 33J01J10-01EN)."
*1:   DIN rail type is not applicable for marine standards.
*2:   AAV144-SK□, AAT145-SK□, AAR145-SK□
*3:   AAI543-HM□, AAV144-SM□, AAT145-SM□, AAR145-SM□
*4:   ADV559-PK□, ADV169-PK□, ADV569-PK□
*5:   ADV159-PY□, ADV559-PM□, ADV559-PY□, ADV169-PM□, ADV569-PM□
*6:   AMT16T, AMT16R, ADT16, ADT16A, ADT16B, ADT32
*7:   AAI141, AAI143-□5□, AAI143-□E□, AAI543-□5□, AAI543-□6□, AAI543-□E□, AAI543-□F□, AAI835, AAI841, AAP135, AAR145-S5□, AAR145-SE□, AAT145-S5□, AAT145-SE□
*8:   ADV159-P0□, ADV551, ADV559-P0□, ADV859
*9:   AKB161, AKB331, KS1, KS2, KS8, YCB301
*10:   Except for /VESA option code.
*11:   A1BT4D, A1BR4D, A1BD5D

Table Conformity Standards for FIO/N-IO Components (1/3)

Applicable Components			A2PW503, A2PW504, A2NN10D, A2NN20D, A2NN30D, A2BN3D, A2BN4D, A2BN5D, and the devices sourced from A2PW503 or A2PW504		A2FV50D, A2FV50S, A2FV70D, and A2FV70S and the devices sourced from PW481, PW482 or PW484			AFV30D, AFV30S, ANB10D, ANB10S, ANB11D, ANB11S and ANT10U and the devices sourced from PW481, PW482 or PW484		
Input Power Supply Voltage			100 -240 V AC	24 V DC	100 - 120 V AC	220 - 240 V AC	24 V DC	100 - 120 V AC	220 - 240 V AC	24 V DC
Safety Standard (*1) (*2) (*3)	CSA	CAN/CSA-C22.2 No.61010-1	X	X	X	—	—	X	—	X (*29)
		CAN/CSA-IEC 61010-2-201	X	X	X	—	—	X	—	X (*29)
		CAN/CSA-C22.2 No.61010-2-030 (*8)	X	X	—	—	—	—	—	—
	CE Marking (*4) Low voltage directive	EN 61010-1	X	X	X	X	X	X	X	X
		EN 61010-2-201	X	X	X	X	X	X	X	X
		EN 61010-2-030 (*9)	X	X	—	—	—	X	X	X
		EN60825-1 (*10)	X	X	X	X	X	X	X	X
	EAC Marking (*25)	CU TR 004	X	X	X	X	X	X	X	X
	FDA (CDRH) (*10)	21 CFR Part 1040.10	X	X	X	X	X	X	X	X
	Morocco Compliance Marking (C☡ Marking) Low voltage directive (*4)	NM EN 61010 1	X	X	X	X	X	X	X	X
		NM EN 61010 2 201	X	X	X	X	X	X	X	X
		NM EN 61010 2 030(*9)	X	X	—	—	—	X	X	X
		NM EN 60825 1(*10)	X	X	X	X	X	X	X	X
EMC Standard (*2) (*12)	CE Marking EMC directive	EN 55011 Class A Group 1 (*11)	X	X	X	X	X	X	X	X
		EN 61000-6-2	X	X	X	X	X	X	X	X
		EN 61000-3-2 (*13)	X (*15)	—	—	X	—	—	X	—
		EN 61000-3-3 (*14)	X (*15)	—	—	X	—	—	X	—
		EN 61326-1 (*19)	—	X	—	—	—	—	—	—
	RCM	EN 55011 Class A Group 1 (*11)	X	X	X	X	X	X	X	X
	KC Marking	Korea Electromagnetic Conformity Standard	X	X	X	X	X	X	X	X
	EAC Marking (*25)	CU TR 020	X	X	X	X	X	X	X	X
	Morocco Compliance Marking (C☡ Marking) EMC directive	NM EN 55011 Class A Group 1	X	X	X	X	X	X	X	X
		NM EN 61000 6 2	X	X	X	X	X	X	X	X
		NM EN 61000 3 2(*13)	X (*15)	—	—	X	—	—	X	—
		NM EN 61000 3 3(*14)	X (*15)	—	—	X	—	—	X	—
Standards for Hazardous Location Equipment (*26)	CSA	Intrinsic safety (*21) — CAN/CSA-C22.2 No. 60079-0:11 CAN/CSA-C22.2 No. 60079-11:14	X	X	—	—	—	—	—	—

X: Compliant　　　　　—: Non-compliant

Table Conformity Standards for FIO/N-IO Components (2/3)

Applicable Components				A2PW503, A2PW504, A2NN10D, A2NN20D, A2NN30D, A2BN3D, A2BN4D, A2BN5D, and the devices sourced from A2PW503 or A2PW504		A2FV50D, A2FV50S, A2FV70D, and A2FV70S and the devices sourced from PW481, PW482 or PW484			AFV30D, AFV30S, ANB10D, ANB10S, ANB11D, ANB11S and ANT10U and the devices sourced from PW481, PW482 or PW484		
Input Power Supply Voltage				100 -240 V AC	24 V DC	100 - 120 V AC	220 - 240 V AC	24 V DC	100 - 120 V AC	220 - 240 V AC	24 V DC
Standards for Hazardous Location Equipment (*26)	CSA	Non-Incendive (*5)	CAN/CSA- C22.2 No.213-M1987 CAN/CSA-C22.2 No.61010-1-12 CAN/CSA-IEC 61010-2-201:14 CAN/CSA-C22.2 No.61010-2-030-12	—	—	—	—	—	X (*16)	—	X (*16)
		Non-Incendive (*5)	CAN/CSA- C22.2 No.0-10 (R2015) CAN/CSA- C22.2 No.213-M1987 (R2013) CAN/CSA-C22.2 No.61010-1-12 CAN/CSA-IEC 61010-2-201:14 CAN/CSA-C22.2 No.61010-2-030-12	X	X	—	—	—	—	—	—
		Non-Incendive (*22)	CAN/CSA-C22.2 No. 61010-1-12 CAN/CSA-C22.2 No. 60079-0:11 CAN/CSA-C22.2 No. 213-M1987 (R2013) CAN/CSA-C22.2 No. 60079-15:12	X	X	—	—	—	—	—	—
		Non-Incendive (*23)	CSA-C22.2 No.213-M1987 (R2013) CAN/CSA-C22.2 No. 60079-0:2015 CAN/CSA-C22.2 No. 60079-15:2012 CAN/CSA-C22.2 No. 61010-1:2012	X	X	—	—	—	—	—	—
	FM	Intrinsic safety (*24)	Class 3600:2011 Class 3610:2010 ANSI/ISA-60079-0 (12.00.01)-2013 ANSI/ISA-60079-11 (12.02.01)-2014	X	X	—	—	—	—	—	—
		Nonincendive (*6)	Class 3600:2011 Class 3611:2004 Class 3810:2005	X	X	X	X	X	X	X	X
		Nonincendive (*25)	Class 3600:2011 Class 3611:2004 Class 3810:2005 ANSI/ISA-60079-15 (12.12.02)-2012 ANSI/ISA-60079-0 (12.00.01)-2013	X	X	—	—	—	—	—	—
	ATEX	Type i (*17)	EN 60079-0:2012+A11:2013 EN 60079-11:2012	X	X	—	—	—	—	—	—
		Type n (*7)	EN 60079-0:2012+A11:2013 EN 60079-15:2010	—	X (*19)	—	—	X	—	—	X

X: Compliant   —: Non-compliant

Table Conformity Standards for FIO/N-IO Components (3/3)

Applicable Components				A2PW503, A2PW504, A2NN10D, A2NN20D, A2NN30D, A2BN3D, A2BN4D, A2BN5D, and the devices sourced from A2PW503 or A2PW504		A2FV50D, A2FV50S, A2FV70D, and A2FV70S and the devices sourced from PW481, PW482 or PW484			AFV30D, AFV30S, ANB10D, ANB10S, ANB11D, ANB11S and ANT10U and the devices sourced from PW481, PW482 or PW484		
Input Power Supply Voltage				100 -240 V AC	24 V DC	100 - 120 V AC	220 - 240 V AC	24 V DC	100 - 120 V AC	220 - 240 V AC	24 V DC
Standards for Hazardous Location Equipment (*26)	IECEx	Type i (*18)	IEC 60079-0:2011 IEC 60079-11:2011	X	X	—	—	—	—	—	—
		Type n (*20)	IEC 60079-0:2011 IEC 60079-15:2010	—	X	—	—	X	—	—	X (*16)
	KCs (*27)	Intrinsic Safety	Notice of Ministry of Labor No. 2013-54	X	X	—	—	—	—	—	—
	EAC (*28)	Intrinsic Safety	TP TC 012/2011	X	X	—	—	—	—	—	—
	Emirates Conformity Assessment Scheme (ECAS-Ex)	Type n (*30)	IEC 60079-0: 2011 IEC 60079-15: 2010	—	X	—	—	X	—	—	X (*16)
Marine (*26)	ABS (American Bureau of Shipping)		—	X	X	X	X	X	X	X	X
	BV (Bureau Veritas)		—	X	X	X	X	X	X	X	X
	LR (Lloyd's Register), ENV2		—	X	X	X	X	X	X	X	X
	DNV GL		—	X	X	X	X	X	X	X	X

X: Compliant   —: Non-compliant

Note: For details on A2NN70D (System model: A2ZN70D), A2NN60D (System model: A2ZN60D), and A2CB60, refer to the GS "N-IO Field enclosure" (GS 33J62R10-01EN).

Note: In relation to the CE Marking, the manufacturer and the authorised representative for CENTUM in the EEA are indicated below:
Manufacturer: YOKOGAWA Electric Corporation (2-9-32 Nakacho, Musashino-shi, Tokyo 180-8750, Japan.)
Authorised representative in the EEA: Yokogawa Europe B.V. (Euroweg 2, 3825 HD Amersfoort, The Netherlands.)

*1:   For ensuring all the hardware devices to satisfy the safety standards, the dedicated breakers in the power supply distribution board must conform to the following specifications.
          [CSA] CSA C22.2 No.5 or UL 489
          [CE Marking] EN 60947-1 and EN 60947-3
          [EAC Marking, C$_A$ Marking] EN 60947-1 and EN 60947-3
*2:   For the rack mountable devices, DIN rail mountable devices, and wall mountable devices to meet the Safety Standards and EMC Standards, the devices must be installed in a lockable metal cabinet. The cabinet must conform to IEC/EN/CSA 61010-2-201 or provide degrees of protection IP3X or above and IK09 or above.
*3:   CENTUM measurement input corresponds to the measurement category O (Other) based on IEC/EN 61010-2-030 and CAN/CSA-C 22.2 No. 61010-2-030. The measurement category I defined in IEC/EN 61010-1: 2001 and CAN/CSA-C 22.2 No. 61010-1-04 has been changed to O (Other). For details, see "CENTUM VP Installation Guidance" (TI 33J01J10-01EN).
*4:   When a product is out of the scope of Low Voltage Directive (LVD), the conformity to LVD is not declared. However, the conformity to this standard is secured.
*5:   Explosion-proof specification for CSA NI:
          Class I, Division 2,Groups A, B, C and D Temperature code T4
              FIO components and N-IO components except for A2BN4D and A2BN5D are compliant.
         There are specific conditions of use to comply with CSA NI.
         For details, refer to the Explosion Protection (TI 33Q01J30-01E).
*6:   Explosion-proof specification for FM NI:
          Class I, Division 2,Groups A, B, C and D Temperature code T4
         There are specific conditions of use to comply with FM NI.
         For details, refer to the Explosion Protection (TI 33Q01J30-01E).

*7:   Explosion-proof specification for ATEX Type n:
        ⟨Ex⟩ II 3G Ex nA nC II C T4 Gc X
             AFV30S, AFV30D, ANB10S, ANB10D, ANB11S, ANB11D, A1BD5D, A2FV50S, A2FV50D, and
             A2SDV506 are compliant.
        ⟨Ex⟩ II 3G Ex nA IIC T4 Gc X
             The power supply specifications for FIO other than AFV30S, AFV30D, ANB10S, ANB10D, ANB11S,
             ANB11D, A1BD5D, A2FV50S, A2FV50D, and A2SDV506 are compliant.
        ⟨Ex⟩ II 3 (1) G Ex nA [ia Ga] IIC T4 Gc
             A2BN5D is compliant.
        "X" indicates specific condition of use. For details, refer to the Explosion Protection (TI 33Q01J30-01E).
        "Type of protection" of the below products is indicated together with modules installed in.
        AFV30S, AFV30D, ANB10S, ANB10D, ANB11S, ANB11D, ANT10U, and AW810D
*8:   A2MMM843, A2SAP105, A2SAM105 and A2SAT105 are in the scope of this standard.
*9:   A2MMM843, A2SAP105, A2SAM105, A2SAT105, AAI141, AAI135, AAV141, AAI143, AAV144, AAB141, AAB842, AAI841,
        AAB841, AAI835, AAT145, AAR145, AAP135, AAP149, AAP849, AGS813 and AGP813 are in the scope of this standard.
*10:   Only ANT401, ANT411, ANT421, ANT502, ANT512, ANT522 and A2EN501 (Only optical ESB Bus) are compliant with
        safety of laser products.
*11:   A Class A hardware device is designed for use in the industrial environment. Please use this device in the industrial
        environment only.
*12:   Except for A2BN3D, A2BN4D, A2BN5D, A2NN70D and A2NN60D, lightening arrestors or the like are required to meet this
        surge immunity standard. The length of the cable to feed the external power supply for AGS813 AO channels should not
        exceed 30 meters.
*13:   An external device such as a power unit with harmonic current neutralizer and an active harmonics conditioner must be
        connected to meet this harmonic current emission standard.
*14:   The specified limits of voltage drop across wiring must be satisfied to meet this standard.
*15:   Only the 100-120 V AC power supply specification is not compliant. Only the 200-220 VAC power supply specification is
        compliant.
*16:   Without AFV30S/D.
*17:   Explosion-proof specification for ATEX Type i:
        ⟨Ex⟩ II 3 (1) G Ex nA [ia Ga] IIC T4 Gc
        ⟨Ex⟩ II (1) D [Ex ia Da] IIIC
        ⟨Ex⟩ I (M1) [Ex ia Ma] I
             A2BN5D is compliant.
*18:   Explosion-proof specification for IECEx Type i:
        Ex nA [ia Ga] IIC T4 Gc
        [Ex ia Da] IIIC
        [Ex ia Ma] I
             A2BN5D is compliant.
*19:   A2BN5D conforms to EN 61326-1. If A2BN5D is used with intrinsic safety barriers for analog input, analog output, or
        temperature input mounted, the accuracy under the electromagnetic immunity conditions (acceptance criteria A) is within
        ±1 % of the span.
*20:   Explosion-proof specification for IECEx Type n:
        Ex nA [ia Ga] IIC T4 Gc
        [Ex ia Da] III C
        [Ex ia Ma] I
             A2BN5D is compliant.
        Ex nA nC IIC T4 Gc
             A2FV5S, A2FV50D, and A2SDV506 are compliant
        Ex nA II C T4 Gc
             N-IO components except for A2FV50S, A2FV50D, and A2SDV506 are compliant
        There are specific conditions of use to comply with IECEx Type n.
        For details, refer to the Explosion Protection (TI 33Q01J30-01E).
*21:   Explosion proof specification for CSA IS:
        For use as an Intrinsically Safe Associated Apparatus for Class I, II, III Division I Groups A, B, C, D, E, F and G
        or
        Intrinsically Safe Associated Apparatus Class I Zone 0, Group IIC, Temperature Class T4
        or
        Intrinsically Safe Associated Apparatus Zone 20, Group IIIC
             A2BN5D is compliant.
*22:   Explosion proof specification for CSA NI:
        Class I, Division 2 Groups A, B, C, and D Temperature Class T4;
        Non-Sparking Class I, Zone 2, Group IIC, Temperature Class T4;
        hazardous locations.
             A2BN5D is compliant.
*23:   Explosion proof specification for CSA NI:
        Class I, Division 2, Groups A, B, C, and D, T4;
        Non Sparking for Class I, Zone 2, Ex nA IIC T4 Gc hazardous (classified) locations
        with an ambient temperature rating of -20°C to +60°C.
             A2BN4D is compliant.

*24: Explosion-proof specification for FM IS:
           For use as an Intrinsically Safe Associated Apparatus for Class I, II, III Division I Groups A, B, C, D, E, F and G
           or
           Intrinsically Safe Associated Apparatus Class I Zone 0, Group IIC, Temperature Class T4
           or
           Intrinsically Safe Associated Apparatus Zone 20, Group IIIC
                 A2BN5D is compliant.
*25: Explosion proof specification for FM NI:
           Class I, Division 2, Groups A, B, C, and D, Temperature Class T4;
           Non-Sparking Class I, Zone 2 Group IIC, Temperature Class T4;
           hazardous (classified) locations.
                 A2BN5D is compliant.
           Class I, Division 2, Groups A, B, C, and D, T4;
           Non Sparking for Class I, Zone 2, AEx nA IIC T4 Gc hazardous (classified) locations
           with an ambient temperature rating of -20°C to +60°C.
                 A2BN4D is compliant.
*26: Without A2FV70S, A2FV70D, A2NN10D, and A2NN20D.
*27: Explosion-proof specification for KCs IS:
           Ex nA [ia] IIC T4 -20°C ≤ Ta ≤ 60°C
                 A2BN5D is compliant.
*28: Explosion-proof specification for EAC IS:
           [Ex ia Ga] IIC
           [Ex ia Da] III C
           [Ex ia Ma] I
                 A2BN5D is compliant.
*29: Except for AFV30S and AFV30D.
*30: Explosion-proof specification for ECAS-Ex Type n:
           Ex nA nC IIC T4 Gc
                 A2FV5S, A2FV50D, and A2SDV506 are compliant
           Ex nA II C T4 Gc
                 N-IO components except for A2FV50S, A2FV50D, and A2SDV506 are compliant
      There are specific conditions of use to comply with ECAS-Ex Type n.
      For details, refer to the Explosion Protection (TI 33Q01J30-01E).

● **Environmental Standards**

• EU Directive of "Restriction of the use of the certain hazardous substances in electrical and electronics equipment (RoHS)". CENTUM VP models compliant with the CE Marking also comply with this directive.

• CENTUM VP integrated production control system is intended to be sold and used only as a part of equipment which is excluded from EU WEEE (Waste Electrical and Electronic Equipment) Directive, such as large-scale stationary industrial tools, a large-scale fixed installation and so on, and therefore, subjected to the exclusion from the scope of the WEEE Directive.

• "Administration on the Control of Pollution Caused by Electrical and Electronic Products" in the People's Republic of China. The Product information required by the law is disclosed on the Yokogawa's website. Please refer to the following web site.

  http://www.yokogawa.com/dcs/CNRoHS/

• "UAE Cabinet Decision No. 10 of 2017 (UAE RoHS)" in United Arab Emirates
  CENTUM VP models (*1) compliant with the CE Marking also comply with this law.
      *1:   Except for A2BN4D and A2BN5D.

■ SOFTWARE LICENSE AGREEMENT AND LIMITED WARRANTY FOR CENTUM VP RELEASE 6

● **Software License Agreement**

Prior to start using the CENTUM VP Release 6 software, refer to the website below and agree on all the terms and conditions of the "CENTUM VP Software License Agreement."

CENTUM VP Software License Agreement
  http://www.yokogawa.com/EndUserLicenseAgreement/

● **Limited Warranty**

The CENTUM VP R6 and later versions are provided with the limited warranty which covers its software media only. Support services over vulnerability and nonconformance shall be provided by Product Maintenance License (PML) and Lifecycle Agreement from the date of handover as agreed mutually by customer and Yokogawa. For more details of PML and Lifecycle Agreement, refer to the following GS for each.

· Product Maintenance License (GS 30A01F10-01EN)
· Lifecycle Agreement "Sustainable Plan" (GS 43D02H21-16EN)

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