

### ■ GENERAL

*This GS describes the application portfolios for FCN/FCJ.*

*The Application Portfolios for FCN/FCJ are series of engineering parts to be used on Logic Designer, which is the FCN/FCJ's engineering tool.*

*Complicated functions composed of independent programs can be encapsulated into a single part called a Program Organization Unit (POU).*

*The Application Portfolios for FCN/FCJ is a set of various POU's, developed by Yokogawa, according to their processes and applications.*

*Thanks to these high-quality, high-performance parts, engineering efficiency is dramatically improved.*

*(Application Portfolio(s), though written in title cap, is not the name of a specific product, but is a bundle of software parts.)*

### ■ FEATURES

- Package of software parts (POUs) selected from Yokogawa's expertise of control system.
- Documentation of control specifications and application examples (including an operation monitoring window) is bundled to POU's for further advanced control systems.
- Application portfolios include:
  - [Basic Portfolio]
    - PAS Portfolio
    - SAMA Portfolio
    - Webmetry Basic Library Portfolio
    - Time Synchronization Server Portfolio
  - [Communication Portfolio]
    - FA-M3 Communication Portfolio
    - MELESEC-A Communication Portfolio
    - SYSMAC Communication Portfolio
    - Modbus Communication Portfolio
    - DNP3 Communication Portfolio
    - Temperature Controller Communication Portfolio
  - [Application-specific Portfolio]
    - Boiler Control Portfolio License
    - Boiler Auxiliary Control Portfolio License
  - [Java Package]
    - InfoWell
- Simply copying an application example and modifying it to suit the application will build a complex control system effortlessly and with reliability.

### ■ FUNCTION SPECIFICATIONS

#### ● Basic Portfolios

##### PAS Portfolio

From among a range of function blocks used in Yokogawa's distributed control systems, functions that are difficult to achieve with IEC61131-3 are chosen and redesigned for IEC61131-3-stipulated languages. PAS Portfolio provides:

- Regulatory control blocks, such as indicator, PID controller, and manual loader blocks, featuring easy-to-use instrument faceplates as an operation interface.
- Various calculation blocks featuring frequently used functions such as a line-segment function, time-delay, temperature and pressure correction.
- Sequence control blocks such as preset timers/counters and switch instrument blocks facilitating development of sequence logic and operation and monitoring functions.
- Using Logic Designer, simply performing wiring between blocks will achieve complex calculations, mode control logic, tracking logic, and more.
- Faceplates corresponding to each POU's are prepared on VDS. Using VDS together with PAS Portfolios, workloads of engineering for operation and monitoring functions will be reduced.
- By using the control loop definition function in the Logic Designer, anybody can easily develop a control loop in the Wizard or Fill-In-the-Form (FIF) format.

##### SAMA Portfolio

Provides calculation functions compliant with Scientific Apparatus Makers Association (SAMA) and often used in power processes.

- Assembling simple calculation functions such as adder, high/low limiter, and PID blocks will build an advanced control function.
- Regardless of using a larger number of function blocks than when using PAS Portfolio, a loop diagram based on SAMA Portfolio facilitates much easier identification of a loop's functions.
- Use PAS Portfolio together to enable operation and monitoring of a loop diagram based on SAMA Portfolio.

##### Webmetry Basic Library Portfolio

The Webmetry Basic Library Portfolio is used to facilitate creation of Web-based monitor applications that run on the FCN/FCJ Java functions. For more details, refer to GS 34P02P50-01E, "Webmetry Basic Library Portfolio."

##### Time Synchronization Server Portfolio

FCN/FCJ enables time synchronization among equipment supporting SNTP (Simple Network Time Protocol). FCN/FCJ can operate as an SNTP server or an SNTP client. FCN/FCJ requires time synchronization server portfolios in order to become an SNTP server. When the time synchronization server portfolio license is installed, a time synchronization server will start automatically. For details, refer to GS 34P02Q01-01E "FCN/FCJ Autonomous Controller Functions."

● **Communication Portfolios**

Communication portfolios provide STARDOM's controllers with functionality to directly communicate with different controllers and devices.

- Simple settings in communication devices are all needed for bi-directional communication.
- For the Modbus Communication Portfolio, refer to GS 34P02P21-01E "Modbus Communication Portfolio."
- For the DNP3 Communication Portfolio, refer to GS 34P02P22-01E "DNP3 Communication Portfolio."

● **Application-specific Portfolios**

Application-specific Portfolios are packages of control functions developed by drawing on Yokogawa's years of experience configuring control systems and tailored to a specific process or equipment unit.

- Combined with functions in PAS and SAMA Portfolios, Application-specific Portfolios help achieve especially hard-to-configure calculation assemblies.

● **Java Package**

**InfoWell**

The InfoWell is designed to allow use of control application data by web screen or e-mail without programming. For details, refer to 34P02P51-01E "InfoWell."

■ **OFFERINGS**

The following Application Portfolios are offered.

● **Basic Portfolios**

**PAS Portfolio**

PAS portfolios provide NPAS POU's that use engineering quantities (\*1) for data.

\*1: Data with an engineering unit-based value

Table NPAS POU (1/3)

| POU Name        | Description  |
|-----------------|--|
| NPAS_AI_ANLG    | Standard analog input                                  |
| NPAS_AI_TEMP    | Measured temperature input                             |
| NPAS_AI_PULS_QT | Pulse train input for metering integration             |
| NPAS_AI_PULS_CI | Pulse train input for control                          |
| NPAS_AI_PCNT    | Normalized data input                                  |
| NPAS_AO_ANLG    | Standard analog output                                 |
| NPAS_DI_STS     | Status input   |
| NPAS_DO_STS     | Status output  |
| NPAS_DO_STS_PW  | Pulse-width output                                     |
| NPAS_DO_STS_TP  | Time-proportioning on/off output                       |
| NPAS_DO_STS_PWH | High resolution pulse width output                     |
| NPAS_FFI_ANLG   | H1 FOUNDATION Fieldbus (FF-H1) analog input            |
| NPAS_FFI_STS    | FF-H1 status input                                     |
| NPAS_FFO_ANLG   | FF-H1 analog output                                    |
| NPAS_FFO_STS    | FF-H1 status output                                    |
| NPAS_FFRD_ANLG  | FF-H1 analog data reading                              |
| NPAS_FFRD_STS   | FF-H1 status data reading                              |
| NPAS_FFRD_DINT  | FF-H1 integer data reading                             |
| NPAS_FFWT_ANLG  | FF-H1 analog data writing                              |
| NPAS_FFWT_STS   | FF-H1 status data writing                              |
| NPAS_FFWT_DINT  | FF-H1 integer data writing                             |
| NPAS_AI_HART    | HART variable input                                    |
| NPAS_PVI        | Indicator block  |
| NPAS_PID        | PID controller block                                   |
| NPAS_PI_HLD     | Sampling PI controller block                           |
| NPAS_ONOFF      | Two-position on/off controller block                   |
| NPAS_ONOFF_G    | Three-position on/off controller block                 |
| NPAS_MLD        | Manual loader block (without output tracking)          |
| NPAS_MLD_PB     | Manual loader block (with output pushback)             |
| NPAS_MLD_BT     | Manual loader block (with bias tracking)               |
| NPAS_RATIO      | Ratio set block (without ratio tracking)               |
| NPAS_RATIO_RT   | Ratio set block (with ratio tracking)                  |
| NPAS_PG_L30     | 30-zone program set block (without bumpless switching) |
| NPAS_PG_L30_BP  | 30-zone program set block (with bumpless switching)    |

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Table NPAS POU (2/3)

| POU Name           | Description  |
|--------------------|--|
| NPAS_VELLIM        | Velocity limiter block (without output pushback)     |
| NPAS_VELLIM_PB     | Velocity limiter block (with output pushback)        |
| NPAS_AS_H          | Auto-selector block (high signal selector)           |
| NPAS_AS_M          | Auto-selector block (medium signal selector)         |
| NPAS_AS_L          | Auto-selector block (low signal selector)            |
| NPAS_FOUT          | Cascade signal distributor block                     |
| NPAS_FFSUM         | Feedforward signal summing block (without balancing) |
| NPAS_FFSUM_BL      | Feedforward signal summing block (with balancing)    |
| NPAS_XLMT_S        | Single cross-limit                                   |
| NPAS_XLMT_D        | Double cross-limit                                   |
| NPAS_BSET_F        | Batch set block for flow measurement                 |
| NPAS_BSET_LW       | Batch set block for weight measurement               |
| NPAS_SW_13 (SW_31) | One-pole three-position selector switch block        |
| NPAS_SW_19 (SW_91) | One-pole nine-position selector switch block         |
| NPAS_BPLS_SW       | Bumpless switching block                             |
| NPAS_SI_1          | Switch instrument block with 1 input                 |
| NPAS_SI_2          | Switch instrument block with 2 inputs                |
| NPAS_SO_1          | Switch instrument block with 1 output                |
| NPAS_SO_2          | Switch instrument block with 2 outputs               |
| NPAS_SIO_11        | Switch instrument block with 1 input and 1 output    |
| NPAS_SIO_12        | Switch instrument block with 1 input and 2 outputs   |
| NPAS_SIO_21        | Switch instrument block with 2 inputs and 1 output   |
| NPAS_SIO_22        | Switch instrument block with 2 inputs and 2 outputs  |
| NPAS_TM            | Timer with preset value                              |
| NPAS_CT            | Counter with preset value                            |
| NPAS_BCD_CI16      | 16-bit BCD input block                               |
| NPAS_BCD_CO16      | 16-bit BCD output block                              |
| NPAS_LDLAG         | Lead/lag   |
| NPAS_DLAY          | Dead time  |
| NPAS_AVE_M         | Moving average                                       |
| NPAS_AVE_C         | Cumulative average                                   |
| NPAS_FUNC_VAR      | Variable line-segment function                       |
| NPAS_TP_CFL        | Temperature and pressure correction                  |
| NPAS_T_CFL         | Temperature correction                               |

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Table NPAS POU (3/3)

| POU Name     | Description   |
|--------------|---|
| NPAS_P_CFL   | Pressure correction                                     |
| NPAS_ASTM1   | Old JIS-based ASTM correction                           |
| NPAS_ASTM2   | New JIS-based ASTM correction                           |
| NPAS_SQRT_LC | Square root extraction with low-input cutoff            |
| NPAS_BDBUF_R | Data buffer for real data                               |
| NPAS_BDBUF_T | Data buffer for time data                               |
| NPAS_AI2SW_A | Dual signal selector (type A)                           |
| NPAS_AI2SW_B | Dual signal selector (type B)                           |
| NPAS_AI3SW   | Analog-input 2-out-of-3 circuit                         |
| NPAS_SL2SW_A | High-low range switching (type A)                       |
| NPAS_SL2SW_B | High-low range switching (type B)                       |
| NPAS_PB6     | Six-pushbutton block                                    |
| NPAS_RS8_A   | Eight-input resource scheduler (permission non-holding) |
| NPAS_RS8_B   | Eight-input resource scheduler (permission holding)     |

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**SAMA Portfolio**

| POU Name   | Description   |
|------------|---|
| SD_S_MON2  | Two-point (HI/LO) monitor switch                          |
| SD_S_MON4  | Four-point (HH/HI/LO/LL) monitor switch                   |
| SD_S_SQRT  | Square root extractor with low-input cutoff               |
| SD_S_LAG   | Lag   |
| SD_S_AVE   | Moving average  |
| SD_S_LDLAG | Lead/lag  |
| SD_S_DLY   | Dead time   |
| SD_S_LEAD  | Derivative  |
| SD_S_INTEG | Integration   |
| SD_S_FX    | Line-segment function                                     |
| SD_S_HSEL  | High signal selector                                      |
| SD_S_MSEL  | Medium signal selector                                    |
| SD_S_LSEL  | Low signal selector                                       |
| SD_S_RLIM  | Rate limiter  |
| SD_S_HLLIM | High/low limiter  |
| SD_S_GB    | Gain and bias calculation                                 |
| SD_S_ADD2  | Adder   |
| SD_S_DIF2  | Subtractor  |
| SD_S_MUL2  | Multiplier  |
| SD_S_DIV2  | Divider   |
| SD_S_TSW   | Signal selector (without output tracking to target value) |
| SD_S_TSW2  | Signal selector (with output tracking to target value)    |
| SD_S_PID   | PID calculation   |
| SD_S_MA    | Manual loader   |
| SD_S_AND4  | Four-input AND  |
| SD_S_AND8  | Eight-input AND   |
| SD_S_OR4   | Four-input OR   |
| SD_S_OR8   | Eight-input OR  |
| SD_S_NOT   | NOT   |
| SD_S_WOUT  | Wipeout   |
| SD_S_TDWO  | Time delay wipeout  |
| SD_S_RTRG  | Rising-edge trigger                                       |
| SD_S_FTRG  | Falling-edge trigger                                      |
| SD_S_FFS   | Set-dominant flip-flop                                    |
| SD_S_FFR   | Reset-dominant flip-flop                                  |
| SD_S_OND   | On-delay  |
| SD_S_OFD   | Off-delay   |

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● **Communication Portfolios**

**FA-M3 Communication Portfolio**

| POU Name                     | Description                              |
|------------------------------|--|
| SD_CFAM3E_OPEN<br>(*1)       | Communication channel opening<br>(*4)    |
| SD_CFAM3E_BRD256<br>(*1)     | Bit device reading (max. 256 points)     |
| SD_CFAM3E_WRD064<br>(*1)     | Word device reading (max. 64 points)     |
| SD_CFAM3E_WRD502<br>(*1)     | Word device reading<br>(max. 502 points) |
| SD_CFAM3E_BWR256<br>(*1)     | Bit device writing (max. 256 points)     |
| SD_CFAM3E_WWR064<br>(*1)     | Word device writing (max. 64 points)     |
| SD_CFAM3E_WWR498<br>(*1)     | Word device writing (max. 498 points)    |
| SD_CPCLINKM_OPEN<br>(*2, *3) | Communication channel opening            |
| SD_CPCLINKM_BRD<br>(*2, *3)  | Bit device reading                       |
| SD_CPCLINKM_WRD<br>(*2, *3)  | Word device reading                      |
| SD_CPCLINKM_BWR<br>(*2, *3)  | Bit device writing                       |
| SD_CPCLINKM_WWR<br>(*2, *3)  | Word device writing                      |
| SD_CPCLINKM_WRW<br>(*2, *3)  | Random word device writing               |

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- \*1: Ethernet communication.
- \*2: Serial communication.
- \*3: These POU's can also be run with the license for FA-M3 Communication Portfolio or Temperature Controller Communication Portfolio.
- \*4: The equipment (not including connections with VDS/ASTMAC and other FCNs/FCJs) to which FCN/FCJ is connected via Ethernet can use a total of up to 15 channels.

**MELSEC-A Communication Portfolio (\*1)**

(All POU's are for Ethernet communication with MELSEC-A controllers.)

| POU Name          | Description                           |
|-------------------|---------------------------------------|
| SD_CMESECE_OPEN   | Communication channel opening (*2)    |
| SD_CMESECE_BRD256 | Bit device reading (max. 256 points)  |
| SD_CMESECE_WRD064 | Word device reading (max. 64 points)  |
| SD_CMESECE_WRD256 | Word device reading (max. 256 points) |
| SD_CMESECE_BWR256 | Bit device writing (max. 256 points)  |
| SD_CMESECE_WWR064 | Word device writing (max. 64 points)  |
| SD_CMESECE_WWR256 | Word device writing (max. 256 points) |

- \*1: MELSEC-A communication portfolio can communicate with MELSEC A Series controllers. Some devices (elements) in a MELSEC controller are inaccessible depending on the MELSEC controller model. For communication with MELSEC Q Series controllers, 1E frame data access is possible.
- \*2: The equipment (not including connections with VDS/ASTMAC and other FCNs/FCJs) to which FCN/FCJ is connected via Ethernet can use a total of up to 15 channels.

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**SYSMAC Communication Portfolio**

All POU's are for serial communication with SYSMAC controllers.)

| POU Name           | Description                   |
|--------------------|-------------------------------|
| SD_CSYSMACM_OPEN   | Communication channel opening |
| SD_CSYSMACM_BRD464 | Bit device reading            |
| SD_CSYSMACM_WRD029 | Word device reading           |
| SD_CSYSMACM_BWR464 | Bit device writing            |
| SD_CSYSMACM_WWR029 | Word device writing           |
| SD_CSYSMACM_SETRST | Forcible setting/resetting    |
| SD_CSYSMACM_STSCHG | Status change                 |

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**Temperature Controller Communication Portfolio**

| POU Name      | Description      |
|---------------|------------------|
| SD_CDIC_SCDL  | UT Scheduling    |
| SD_CDIC_UT    | UT controller    |
| SD_CDIC_UT_HC | UT HC controller |

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- Temperature controllers that can be connected are shown below. Note that they require a communication function (RS-485).  
Digital Indicating Controllers manufactured by Yokogawa Corporation:  
UT350, UT351, UT320, UT450, UT420, UT550, UT520, UT750
- A temperature controller can be connected to a serial port (RS-232-C) of FCJ, a serial port (RS-232-C) of the FCJ's CPU module, an RS-232-C Communication Module (NFLR111), or an RS-422/RS-485 Communication Module (NFLR121). An RS-232-C/RS-485 converter is required to connect a temperature controller using the RS-232-C.
- A total of up to eight modules can be installed for each FCN with respect to RS-232-C Communication Modules (NFLR111) and RS-422/RS-485 Communication Modules (NFLR121).
- If an FCN's CPU modules are configured in redundancy, it is not possible to use the serial ports (RS-232-C) of these CPU modules.
- Up to 16 temperature controllers can be connected per RS-485 line. If a temperature controller performs dual-loop control, it is counted as two controllers.
- This portfolio uses normalized data (0 – 100% data). Convert the normalized data to engineering quantity data before linking this portfolio to any NPAS POU of the PAS portfolio.

● **Cassettes in Application-specific Portfolios**

**Boiler Control Portfolio**

| POU Name      | Description  |
|---------------|--|
| SD_A_DRMLVL_A | Type A pressure compensation for drum level (engineering quantity data type) |
| SD_A_DRMLVL_B | Type B pressure compensation for drum level (normalized data type)           |
| SD_A_STMFL_A  | Type A steam flow calculation (engineering quantity data type)               |
| SD_A_STMFL_B  | Type B steam flow calculation (normalized data type)                         |

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**Boiler Auxiliary Control Portfolio**

| POU Name     | Description   |
|--------------|---|
| SD_A_MOTOR_A | Type A motor control (automatic failure detection and resetting)  |
| SD_A_MOTOR_B | Type B motor control (with external failure/resetting conditions) |
| SD_A_VALVE_A | Type A valve control (automatic failure detection and resetting)  |
| SD_A_VALVE_B | Type B valve control (with external failure/resetting conditions) |

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## ■ STYLE OF SOFTWARE SUPPLY

### Software Media

The programs and documents for all Application Portfolios excluding PAS Portfolio and Time Synchronization Server Portfolio are supplied as a CD-ROM. Hence, a CD-ROM drive is required for installation in the computer you use.

PAS Portfolio is included in the media (CD-ROM) of FCN/FCJ Software (Model NT203AJ).

### Order ID Sheet

The portfolio licenses come with an order ID sheet with the order ID number and password. Access the specified Web site of Yokogawa and enter the order ID number and password shown. Then, a file containing the respective license IDs for the supplied portfolios will be given. To use the Application Portfolio, register the supplied license ID to the FCN/FCJ system card.

## ■ MODELS AND SUFFIX CODES

### ● Software Media

|                     |         | Description                               |
|---------------------|---------|---|
| <b>Model</b>        | NT205AJ | Application Portfolio software media      |
| <b>Suffix Codes</b> | -P      | Programs (including electronic documents) |
|                     | C       | CD-ROM                                    |
|                     | 1       | Always 1                                  |
|                     | 1       | Always 1                                  |
|                     | E       | English version                           |

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### ● Portfolio Licenses

|                     |         | Description                     |
|---------------------|---------|---------------------------------|
| <b>Model</b>        | NT8001J | PAS Portfolio License           |
| <b>Suffix Codes</b> | -L      | License                         |
|                     | W       | License ID to be issued via Web |
|                     | 1       | Always 1                        |
|                     | 1       | Always 1                        |
|                     | A       | Standard                        |

T14E.EPS

|                     |         | Description                     |
|---------------------|---------|---------------------------------|
| <b>Model</b>        | NT8002J | SAMA Portfolio License          |
| <b>Suffix Codes</b> | -L      | License                         |
|                     | W       | License ID to be issued via Web |
|                     | 1       | Always 1                        |
|                     | 1       | Always 1                        |
|                     | A       | Standard                        |

T15E.EPS

|                     |         | Description  |
|---------------------|---------|--|
| <b>Model</b>        | NT8040J | Time Synchronization Server Portfolio License      |
| <b>Suffix Codes</b> | -L      | License  |
|                     | W       | The order ID sheet is delivered.                   |
|                     | 1       | Always 1   |
|                     | 1       | Always 1   |
|                     | A       | Standard (common to Japanese and English versions) |

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Note: This license is required only for FCN/FCJ which implements a server function (SNTP server). It is not required for clients (SNTP clients).

|                     |         | Description                           |
|---------------------|---------|---------------------------------------|
| <b>Model</b>        | NT8020J | FA-M3 Communication Portfolio License |
| <b>Suffix Codes</b> | -L      | License                               |
|                     | W       | License ID to be issued via Web       |
|                     | 1       | Always 1                              |
|                     | 1       | Always 1                              |
|                     | A       | Standard                              |

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|                     |         | Description                              |
|---------------------|---------|--|
| <b>Model</b>        | NT8021J | MELSEC-A Communication Portfolio License |
| <b>Suffix Codes</b> | -L      | License                                  |
|                     | W       | License ID to be issued via Web          |
|                     | 1       | Always 1                                 |
|                     | 1       | Always 1                                 |
|                     | A       | Standard                                 |

T18E.EPS

|                     |         | Description                            |
|---------------------|---------|--|
| <b>Model</b>        | NT8022E | SYSMAC Communication Portfolio License |
| <b>Suffix Codes</b> | -L      | License                                |
|                     | W       | License ID to be issued via Web        |
|                     | 1       | Always 1                               |
|                     | 1       | Always 1                               |
|                     | A       | Standard                               |

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|                     |         | Description  |
|---------------------|---------|--|
| <b>Model</b>        | NT8031E | Temperature Controller Communication Portfolio License |
| <b>Suffix Codes</b> | -L      | License  |
|                     | W       | License ID to be issued via Web                        |
|                     | 1       | Always 1   |
|                     | 1       | Always 1   |
|                     | A       | Standard   |

T21E.EPS

|                     |         | Description                      |
|---------------------|---------|----------------------------------|
| <b>Model</b>        | NT8101J | Boiler Control Portfolio License |
| <b>Suffix Codes</b> | -L      | License                          |
|                     | W       | License ID to be issued via Web  |
|                     | 1       | Always 1                         |
|                     | 1       | Always 1                         |
|                     | A       | Standard                         |

T22E.EPS

|                     |         | Description                                |
|---------------------|---------|--|
| <b>Model</b>        | NT8102J | Boiler Auxiliary Control Portfolio License |
| <b>Suffix Codes</b> | -L      | License                                    |
|                     | W       | License ID to be issued via Web            |
|                     | 1       | Always 1                                   |
|                     | 1       | Always 1                                   |
|                     | A       | Standard                                   |

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## ■ ORDERING INSTRUCTION

Specify the model and suffix codes.

## ■ RELATED DOCUMENTS

FCN/FCJ Autonomous Controller Functions

GS 34P02Q01-01E

Modbus Communication Portfolio GS 34P02P21-01E

DNP3 Communication Portfolio GS 34P02P22-01E

Webmetry Basic Library Portfolio GS 34P02P50-01E

InfoWell GS 34P02P51-01E

## ■ TRADEMARKS

- STARDOM is a trademark of Yokogawa Electric Corporation.
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- SYSMAC is a registered trademark of OMRON Corporation.
- Modbus is a registered trademark of AEG Schneider.
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