

# ABB Procontic Programming System

## 907 PC 331 Programming and Test Software

Software Registration Form / Individual License  
General License Conditions for the Supply of  
Computer Software upon Payment of a Non-  
Recurring License Fee (ALCN) / Floppy Disks **1**

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**2**

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System-Specific Part  
ABB Procontic CS31  
Advant Controller 31

Order No.: GJP5 2046 00 R0402

System-Specific Part **3**

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# Notes on completing the software registration form

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**Please complete the software registration forms in full and using a typewriter or in block capitals. Please return the "Double" to ABB. Do not forget to sign the software registration forms!**

In order to prevent difficulties or delays in provision of software updates to you, the software registration form should contain the following information:

## Licensee

Name or company:	Full company name
Department/Contact person/Phone:	Name of department, name and telephone No. of contact person
Address:	Street/road and number of P.O. Box, country code, postal code, town/city
Date of delivery: (as defined in ALCN 4.1)	Already completed (if you do not have this information, please enter the day of reception)
Name/legally binding signature:	Name in block capitals and signature

## Customer Hardware (PC)

Hardware manufacturer:	Manufacturer of the PC used (e.g. Compaq)
Type:	Precise type designation of the PC (e.g. 80486DX, 33 MHz)

## Software Product

Product name:	Designation of the software (e.g. 907 PC 331; already completed)
Version:	Version number (already completed)
Identification No.:	Identification No. of the software (already completed)
Serial No.:	Production date of the diskettes (e.g. 12.98 = December 1998; already completed)
ABB order No. or ABB office:	ABB order No. or ABB field office which supplied the software (already completed)
New software version should be offered according to ALCN 6.2	State whether new software versions are to be offered in accordance with ALCN 6.2



# Specification in accordance with Item 5.2 ALCN

## General

The programming and test software 907 PC 33 serves to create programs for the ABB Procontic T200, ABB Procontic CS31 and Advant Controller 31 programmable logic controllers (PLCs). An installation program that functions largely automatically installs the software package on the PC.

This specification is valid for 907 PC 331/332. Following table gives an overview of the different PLC systems and the pertinent software packages:

<i>PLC system</i>	<i>programmable with:</i>
ABB Procontic T200	907 PC 332
ABB Procontic CS31	907 PC 331
Advant Controller 31	907 PC 331

The programming and test software 907 PC 33 is executable on:

commercially available, IBM-compatible personal computers with the following technical features:

- at least 4 Mbyte RAM for optimum performance
- Hard disk drive
- Diskette drive, 3 1/2", 1.44 MB
- EIA RS-232 serial interface for the PLC system
- Parallel or second serial interface for printer
- MS-DOS operating system V5.0 or higher
- Optionally a mouse for fast cursor control

The programming and test software 907 PC 33 permits simple and economical programming of PLC programs in the following notations:

- Function block diagram (FBD)
- Ladder diagram (LD)
- Instruction list (IL)

Both symbolic and absolute program input is possible. The PLC program is supplemented by symbolic designators, long text and comment. Auxiliary and error messages that can be called at all times, and also a syntax check, facilitate program input. Program creation as an FBD or LD takes place in a joint editor. Therefore, elements from the FBD and LD can be mixed and can also be linked to each other.

## Features

The scope of features and functions listed depends on individual PLCs' capabilities.

### Menu prompting

- Modern, clearly-arranged menu interface employing pop-up menus
- Color display
- Fast selection of menu options by mouse or on the keyboard
- Calls of external programs at the DOS level directly from the menu (DOS shell)

### Path information

- Input of a file name with the affiliated DOS path
- Display of the project overview in a file directory

### Password protection

- Several access privilege levels

### Modularization

- Handling of large projects
- Arrangement of projects in logical structures
- Subdivision into program and variable modules

### FBD/LD editor

- Uniform editor for programming with graphic symbols as a function block diagram and as a ladder diagram
- Connection of ladder diagram networks with elements of the function block diagram

### Extended IL editor

- Notation with symbols and long text in various forms
- Cursor control by mouse
- Selection of connection elements via a selection menu and using a mouse

### Variable editor

- Complete list of all entered variables
- Selectable sorting according to absolute or symbolic variables
- Adoption and transfer of variable lists from and to any chosen word processing systems
- Provision and adoption of variable lists for specific CAD/CAE systems

### Text editor

- Input of any ASCII files, up to 255 characters per line

### Comments

- Verbal description of networks or program segments

## Segment plans

- Subdivision of programs into segment plans
- Simple management by segment plan name and segment plan number

## Scope of functions

An extensive spectrum of commands is available for program creation:

- Syntax check of all variables
- Block commands
  - mark
  - delete
  - shift
  - copy
  - store
  - load
  - print
  - delete unused variables
- Search commands
  - according to sentence No.
  - according to word No.
  - according to variable
  - according to symbol
  - according to command
  - according to line number
  - repeat
  - according to segment plan
  - according to connection element
  - according to unassigned terminal
- Search and replace
- Insert
- Delete

## ONLINE functions

Numerous ONLINE functions support the user during the commissioning phase, e.g.:

- Status display in
  - function block diagram
  - ladder diagram
  - instruction list
  - variable list
- Program
  - transfer
  - start
  - abort
  - stop
  - continuation
  - status

- Single cycle on/off
- Breakpoint
  - setting
  - display
  - deletion
- Triggering
  - time
  - variable
- Overwriting
- Jogging
- Forcing
- Modification of
  - time and counter setpoints
  - variable addresses
  - operators
  - operand identifiers
  - program parts to a limited extent

Moreover, selected variables can be combined in ONLINE lists and their statuses can be displayed.

## Program documentation

Automatic program documentation embraces the following printed lists:

- function block diagram
- instruction list
- connection element library
- logic plan diagram
- ladder diagram
- variable list
- cross-reference list
- comment list
- ONLINE list
- text page
- data area
- modularization list
- total variable list
- total reference list
- system configuration

Outputs can be adapted to any printer.

## Print format editor

A special print format editor allows you to add an individual header and footer to the respective lists. Specific data can also be included automatically in this header or footer, e.g. name of the project file, date and time.

**FBD  
working aid**

<b>Input</b>	<b>Function</b>
<F10>	Help
<Esc>	Exit menu
<b>Block editing</b>	
<Ctrl>-K-B	Mark start of block
<Ctrl>-K-K	Mark end of block
<Ctrl>-K-H	Delete block marking
<Ctrl>-K-Y	Delete block
<Ctrl>-K-W	Save block on hard disk
<Ctrl>-K-R	Load block from hard disk
<Ctrl>-K-C	Copy block
<Ctrl>-K-V	Move block
<b>Searching</b>	
<Ctrl>-Q-F-A	Search for variable
<Shift><F8>	Search for CE
<Shift><F7>	Search for variable, not defined absolutely
<Shift><F9>	Search for unused CE connection
<Ctrl>-L	Repeat search
<b>Insert/delete line/column/comment</b>	
<Ctrl>-N	Insert line
<Ctrl>-Y	Delete line
<F2>	Insert column
<F1>	Delete column
<F5>	Insert comment
<F6>	Delete comment
<b>Special functions</b>	
<Space bar>	Display menu window
<Ctrl>-Z	Jump to single-line variable editor
<F9>	Toggle variable input or display, absolute or symbolic
<Shift><F5>	Select CE
<Shift><F6>	Evaluation of error file
<Ctrl><F3>	Display translated IL
<Ctrl><F8>	Display CE documentation
<Ctrl>-Q-W	Generate all connections on left/right of the CE
<Alt><F8>	Generate CE with connections
<Ctrl>-P	Display variable, display variable with symbol and long text, no modification possible

**Extended IL  
working aid**

<b>Input</b>	<b>Function</b>
<F10>	Help
<Esc>	Exit menu
<b>Block editing</b>	
<Ctrl>-K-B	Mark start of block
<Ctrl>-K-K	Mark end of block
<Ctrl>-K-H	Delete block marking
<Ctrl>-K-Y	Delete block
<Ctrl>-K-C	Copy block
<Ctrl>-K-V	Move block
<Ctrl>-K-W	Save block on hard disk
<Ctrl>-K-R	Load block from hard disk
<b>Searching</b>	
<Ctrl>-Q-F-A	Search for variable
<Ctrl>-Q-F-O	Search for symbol
<Ctrl>-Q-F-S	Search for sentence number
<Ctrl>-Q-F-W	Search for word number
<Shift><F8>	Search for CE
<Shift><F7>	Search for variable, not defined absolutely
<Shift><F9>	Search for unused connection
<Ctrl>-L	Repeat search
<b>Inserting/deleting</b>	
<Ctrl>-N	Insert line
<Ctrl>-Y	Delete line
Comment texts must be preceded by a semicolon (;)	
<b>Special functions</b>	
<Space bar>	Display menu window
<Ctrl>-Z	Jump to single-line variable editor
<F1>	Invert CE parameter
<Shift><F5>	Select CE
<Ctrl><F8>	Display CE documentation
<Ctrl>-W	Convert number bases
<F3>	Translate extended IL (menu is displayed)
<Ctrl><F3>	Display translated IL
<Shift><F6>	Error display
<Ctrl>-P	Display variable, display variable with symbol and long text, no modification is possible

**Extended IL  
working aid**

<b>Input</b>	<b>Function</b>
	<b>ONLINE commands</b>
<F4>	ONLINE on/off
<Alt>-1	Translate and send program changes (ONLINE off only)
<Alt>-2	Send program changes
<Alt>-3	Send program
<Alt>-4	Compare program
<Alt>-6	Send constants
<Alt>-7	Compare constants
<Alt>-8	Reactivate old program
<Alt>-S	Start program
<Alt>-A	Abort program
<Alt>-H	Stop program
<Alt>-C	Continue program
<Alt>-O	Switch on ONLINE list with ONLINE ON
<V>	Return to 'Display variable status'
<T>	Status trigger to variable
<Alt>-M	Status trigger to time
<0> (zero)	Freeze status on screen
<A>	Status of selected variables on/off
<5>	Collect for status of selected variables
<6>	Save status to ONLINE list
<Z>	Single cycle on/off
<S>	Single step on/off
<G>	Jog
<O>	ONLINE list editor
<1>	Collect for ONLINE list
<B>	Set breakpoint singly
<Alt>-B	Delete breakpoint singly
<W>	Set all breakpoints
<Alt>-W	Delete all breakpoints
<2>	Collect for breakpoint list
<Q>	Display breakpoint
<P>	Following the breakpoint on/off
<L>	Enter the breakpoint list
<4>	Collect for overwriting
<U>	Overwrite singly
<R>	Overwrite all
<3>	Collect for forcing
<F>	Force singly
<Alt>-F	Disable force singly
<E>	Force all
<Alt>-E	Disable force all
<Alt>-D	Read force values into ONLINE list
<X>	Toggle bit/word
<D>	Select value display dec/hex/oct; menu is displayed
<F9>	Toggle variable display, absolute or symbolic
<Ctrl>-P	Display variable, display variable with sym- bol and long text, no modification possible

**FBD  
working aid**

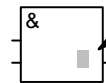
<b>Input</b>	<b>Function</b>
	<b>ONLINE commands</b>
<F4>	ONLINE on/off
<Alt>-1	Translate and send program changes (ONLINE off only)
<Alt>-2	Send program changes
<Alt>-3	Send program
<Alt>-4	Compare program
<Alt>-6	Send constants
<Alt>-7	Compare constants
<Alt>-8	Reactivate old program
<Alt>-S	Start program
<Alt>-A	Abort program
<Alt>-H	Stop program
<Alt>-C	Continue program
<Alt>-O	Switch on ONLINE list with ONLINE ON
<V>	Return to 'Display variable status'
<T>	Status trigger to variable
<Alt>-M	Status trigger to time
<0> (zero)	Freeze status on screen
<A>	Status of selected variables on/off
<5>	Collect for status of selected variables
<6>	Save status to ONLINE list
<Z>	Single cycle on/off
<S>	Single step on/off
<G>	Jog
<O>	ONLINE list editor
<1>	Collect for ONLINE list
<B>	Set breakpoint singly
<Alt>-B	Delete breakpoint singly
<W>	Set all breakpoints
<Alt>-W	Delete all breakpoints
<2>	Collect for breakpoint list
<Q>	Display breakpoint
<P>	Following the breakpoint on/off
<L>	Enter the breakpoint list
<4>	Collect for overwriting
<U>	Overwrite singly
<R>	Overwrite all
<3>	Collect for forcing
<F>	Force singly
<Alt>-F	Disable force singly
<E>	Force all
<Alt>-E	Disable force all
<Alt>-D	Read force values into ONLINE list
<X>	Toggle bit/word
<D>	Select value display dec/hex/oct; menu is displayed
<F9>	Toggle variable display, absolute or symbolic
<Ctrl>-P	Display variable, display variable with sym- bol and long text, no modification possible



### Call CE

1. Move the cursor to the required position
  2. Enter CE name on the keyboard
  3. Press <Enter key>
- or
1. Move the cursor to the required position
  2. Call the CE menu: Press <Shift><F5>
  3. Select the CE and press the <Enter key>

### Move CE

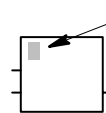


1. Position the cursor within the CE
2. Press the <Enter key>
3. Move the cursor to the required position and press the <Enter key>

### Delete CE

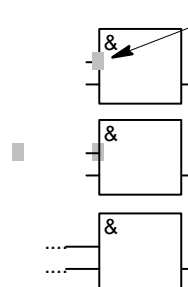
1. Position the cursor within the CE
2. Press the <Enter key> twice

### Swap CE



1. Position the cursor on the CE name
2. Enter the new CE name or select it in the CE menu
3. Press the <Enter key>

### Generating connections



1. Position the cursor on the input or output
2. Press the <Enter key>
3. Move the cursor to the left
4. Press <Ctrl>-Q-W

#### Notes:

You can also press the >Left mouse button< instead of the <Enter key>.

Delete marking: >Ctrl<-J

### Input

### Function

<F10> Help  
<Esc> Exit menu

### Block editing

<Ctrl>-K-B Mark start of block  
<Ctrl>-K-K Mark end of block  
<Ctrl>-K-H Delete block marking  
<Ctrl>-K-Y Delete block  
<Ctrl>-K-W Save block on hard disk  
<Ctrl>-K-R Load block from hard disk  
<Ctrl>-K-I Import variables  
<Ctrl>-K-E Export variables

### Searching

<Ctrl>-Q-F-A Search for variable  
<Ctrl>-Q-F-S Search for unused variable  
<Ctrl>-L Repeat search

### Inserting/deleting

<Ctrl>-N Insert line  
<Ctrl>-Y Delete line

### Special functions

<Space bar> Display menu window  
<F2> Define initial cursor position  
<F9> Toggle sorting according to variable/symbol  
<Ctrl>-W Convert number bases  
<Ctrl>-Q-A-W Replace variable range

**Variable editor  
working aid**

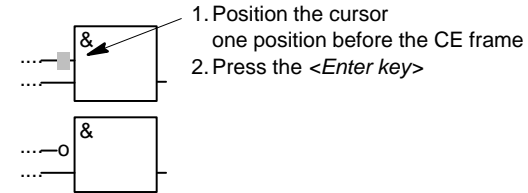
Input	Function
	<b>ONLINE commands</b>
<F4>	ONLINE on/off
<Alt>-S	Start program
<Alt>-A	Abort program
<Alt>-H	Stop program
<Alt>-C	Continue program
<Alt>-O	Switch on ONLINE list with ONLINE ON
<V>	Return to 'Display variable status'
<T>	Status trigger to variable
<Alt>-M	Status trigger to time
<0> (zero)	Freeze status on screen
<A>	Status of selected variables on/off
<5>	Collect for status of selected variables
<6>	Save status to ONLINE list
<Z>	Single cycle on/off
<S>	Single step on/off
<G>	Jog
<O>	ONLINE list editor
<1>	Collect for ONLINE list
<4>	Collect for overwriting
<U>	Overwrite singly
<R>	Overwrite all
<3>	Collect for forcing
<F>	Force singly
<E>	Force all
<Alt>-E	Disable force all
<Alt>-D	Display force values

**General  
working aid**

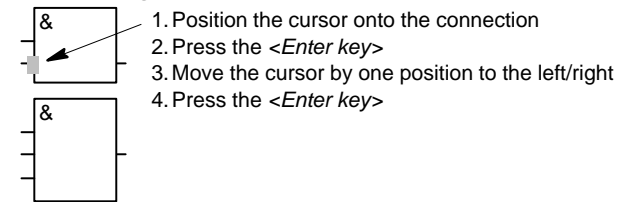
Input	Special functions
<Ctrl>-U	Call of file directories: If it is asked for file names, the concerned directory can be called with <Ctrl>-U

**FBD  
CE handling  
working aid**

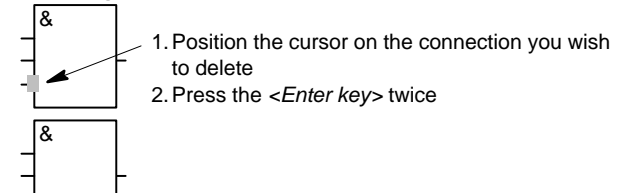
**Inverting a connection**



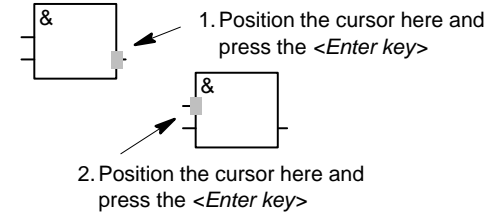
**Duplicating a connection**



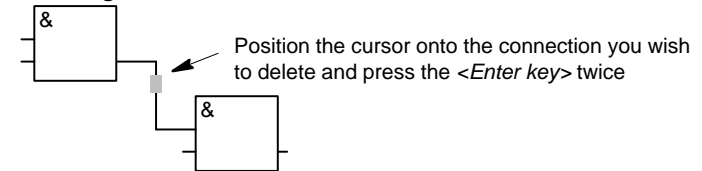
**Deleting a connection**



**Generating a connection**



**Deleting a connection**



## Working aid for 07KR31 / 07KT31 (variables and constants)

### Freely available variables and constants

#### Inputs

E 00,00...E 61,15:	Binary inputs, CS31 remote modules
E 62,00...E 62,11:	Binary inputs of the central unit 07 KR 31
E 62,00...E 62,11:	Binary inputs of the central unit 07 KT 31
E 63,14:	High-speed binary inputs ( $T_D = 0.02\text{ms}$ )
E 63,13:	High-speed counter, interrogation of zero crossing
EW 00,00...EW 05,15:	Analog inputs, CS31 remote modules
EW 08,00...EW 15,15:	Analog inputs, CS31 remote modules
EW 06,15:	High-speed counter, interrog. of counter content
EW 07,00...EW 07,07:	reserved
EW 07,08...EW 07,14:	Reading the real-time clock
EW 07,15:	Status for CS31 system bus, clock, battery

#### Outputs

A 00,00...A 61,15:	Binary outputs, CS31 remote modules
A 62,00...A 62,07:	Binary outputs of the central unit 07 KR 31
A 62,00...A 62,07:	Binary outputs of the central unit 07 KT 31
A 63,15:	High-speed counter
AW 00,00...AW 05,15:	Analog outputs, CS31 remote modules
AW 06,15:	High-speed counter, start value

#### Internal operands

M 00,00...M 21,15:	Binary flags
M 230,00...M 255,09:	Binary flags
S 00,00...S 15,15:	Steps
K 00,00...K 00,01:	Binary constants
MW 00,00...MW 05,15:	Word flags
MW 230,00...MW 239,15:	Word flags
KW 01,00...KW 07,15:	Word constants
MD 00,00...MD 01,15:	Double word flags
KD 00,01...KD 01,15:	Double word constants

#### Time values for time functions

KD yy,xx:	Time values for time functions such as ESV, ASV etc. are configured as <i>double word constants</i> or as <i>double word flags</i> . Only integral multiples of 5 ms are permitted.
MD yy,xx:	

#### System constants (Default values in SYS\_CONS.SYM)

##### Setting the operating modes

KW 00,00:	PLC operating mode (stand-alone PLC, master PLC, slave PLC)
KW 00,01:	Initialization: bit flag area
KW 00,02:	Initialization: word flag area
KW 00,03:	Initialization: double word flag area
KW 00,04:	Initialization: step chain flag area
KW 00,05:	Initialization: historical values
KW 00,06:	Application modes of the serial interface COM 1
KW 00,07:	PLC reaction to class 3 errors
KW 00,08:	PLC reaction to an overload/short circuit at transistor outputs
KW 00,09:	Initialization of the CS31 system
KW 00,10:	Size of the transmitting area of the slave PLC
KW 00,11:	Size of the receiving area of the slave PLC
KW 00,12...15:	reserved / must not be used

##### Setting the cycle time

KD 00,00:	Cycle time for the PLC program. Unit of measurement: ms. Admissible: only integral multiples of 5 ms.
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## Working aid for 07KR91 / 07KT92 / 07KT93 operands (variables and constants)

### Freely available variables and constants

#### Inputs

E 00,00...E 61,15:	Binary inputs, CS31 remote modules
E 62,00...E 63,03:	Binary inputs of the central unit 07 KR 91
E 62,00...E 62,11:	Binary inputs of the central unit 07 KT 92
E 62,00...E 63,07:	Binary inputs of the central unit 07 KT 93
E 63,14 und E 63,15:	High-speed binary inputs ( $T_D = 0.02\text{ms}$ )
E 63,13:	High-speed counter, interrogation of zero crossing
EW 00,00...EW 05,15:	Analog inputs, CS31 remote modules
EW 06,00...EW 06,03:	Analog inputs of the central unit 07 KT 92
EW 06,15:	High-speed counter, interrog. of counter content
EW 07,00...EW 07,07:	reserved
EW 07,08...EW 07,14:	Reading the real-time clock
EW 07,15:	Status for CS31 system bus, clock, battery

#### Outputs

A 00,00...A 61,15:	Binary outputs, CS31 remote modules
A 62,00...A 62,11:	Binary outputs of the central unit 07 KR 91
A 62,00...A 62,07:	Binary outputs of the central unit 07 KT 92
A 62,00...A 62,15:	Binary outputs of the central unit 07 KT 93
A 62,00:	High-speed counter; output of zero crossing
A 63,13...A 63,15:	High-speed counter
AW 00,00...AW 05,15:	Analog outputs, CS31 remote modules
AW 06,00:	Analog output of 07 KT 92 ( $-10\text{V} \dots +10\text{V}$ )
AW 06,15:	High-speed counter, start value

#### Internal operands

M 00,00...M 255,09:	Binary flags
S 00,00...S 127,15:	Steps
K 00,00...K 00,01:	Binary constants
MW 00,00...MW 253,15:	Word flags
KW 01,00...KW 39,15:	Word constants
MD 00,00...MD 31,15:	Double word flags
KD 00,01...KD 07,15:	Double word constants

#### Time values for time functions

KD yy,xx:	Time values for time functions such as ESV, ASV etc. are configured as <i>double word constants</i> or as <i>double word flags</i> . Only integral multiples of 5 ms are permitted.
MD yy,xx:	

#### System constants (Default values in SYS\_CONS.SYM)

##### Setting the operating modes

KW 00,00:	PLC operating mode (stand-alone PLC, master PLC, slave PLC)
KW 00,01:	Initialization: bit flag area
KW 00,02:	Initialization: word flag area
KW 00,03:	Initialization: double word flag area
KW 00,04:	Initialization: step chain flag area
KW 00,05:	Initialization: historical values
KW 00,06:	Application modes of the serial interface COM 1
KW 00,07:	PLC reaction to class 3 errors
KW 00,08:	PLC reaction to an overload/short circuit at transistor outputs
KW 00,09:	Initialization of the CS31 system
KW 00,10:	Size of the transmitting area of the slave PLC
KW 00,11:	Size of the receiving area of the slave PLC
KW 00,12...15:	reserved / must not be used

##### Setting the cycle time

KD 00,00:	Cycle time for the PLC program. Unit of measurement: ms. Admissible: only integral multiples of 5 ms.
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49 mm

**ABB Procontic  
Programming  
System**

**907 PC 331**  
AC31, CS31

**GJP5 2046 00**

**ABB Procontic  
Programming  
System**

**907 PC 331**  
AC31, CS31

**GJP5 2046 00**

**ABB Procontic  
Programming  
System**

**907 PC 331**  
AC31, CS31

**GJP5 2046 00**

59 mm

**ABB Procontic  
Programming  
System**

**907 PC 331**  
AC31, CS31

**GJP5 2046 00**

**ABB Procontic  
Programming  
System**

**907 PC 331**  
AC31, CS31

**GJP5 2046 00**

**ABB Procontic  
Programming  
System**

**907 PC 331**  
AC31, CS31

**GJP5 2046 00**

**ABB Procontic  
Programming  
System**

**907 PC 331**  
AC31, CS31

**GJP5 2046 00**

**ABB Procontic  
Programming  
System**

**907 PC 331**  
AC31, CS31

**GJP5 2046 00**

**ABB Procontic  
Programming  
System**

**907 PC 331**  
AC31, CS31

**GJP5 2046 00**

**ABB Procontic  
Programming  
System**

**907 PC 331**  
AC31, CS31

**GJP5 2046 00**

**ABB Procontic  
Programming  
System**

**907 PC 331**  
AC31, CS31

**GJP5 2046 00**

**ABB Procontic  
Programming  
System**

**907 PC 331**  
AC31, CS31

**GJP5 2046 00**