Easergy MiCOM P632

Transformer Differential Protection Device

P632/EN M/R-b5-A

Version P632 -312 -413/414 -661

Technical Manual

Volume 2 of 2

Schneider Electric

A1 Function Groups

CBF_1	*Circuit breaker failure protection*
CBF_2	*Circuit breaker failure protection*
CMD_1	*Single-pole commands*
COMM1	*“Logical” communication interface 1*
COMM2	*“Logical” communication interface 2*
COUNT	*Binary counts*
CS	*Cyber Security*
CTS	*Current transformer supervision*
DEV01	*External device*
DEV02	*External device*
DEV03	*External device*
DIFF	*Differential protection*
DTOC1	*Definite-time overcurrent protection*
DTOC2	*Definite-time overcurrent protection*
DVICE	*Device*
F_KEY	*Configurable function keys*
f<>	*Over-/underfrequency protection*
FT_DA	*Fault data acquisition*
FT_RC	*Fault recording*
GOOSE	*Generic Object Orientated Substation Events*
IDMT1	*Inverse-time overcurrent protection*
IDMT2	*Inverse-time overcurrent protection*
IEC	*IEC 61850 Communication*
ILOCK	*Interlocking logic*
INP	*Binary input*
IRIGB	*IRIG-B interface*
LED	*LED indicators*
LIM_1	*Limit value monitoring*
LIM_2	*Limit value monitoring*
LIMIT	*Limit value monitoring*

LOC	*Local control panel*
LOG_2	*Programmable Logic*
LOGIC	*Programmable Logic*
MAIN	*Main function*
MCM_1	*Measuring-circuit monitoring*
MCM_2	*Measuring-circuit monitoring*
MEASI	*Measured data input*
MEASO	*Measured data output*
MT_RC	*Monitoring signal recording*
OL_DA	*Overload data acquisition*
OL_RC	*Overload recording*
OP_RC	*Operating data recording*
OUTP	*Binary and analog output*
PC	*PC link*
PSS	*Parameter subset selection*
REF_1	*Ground differential protection*
REF_2	*Ground differential protection*
SFMON	*Self-monitoring*
SIG_1	*Single-pole signals*
THRM1	*Thermal overload protection*
TRMON	*Transformer monitoring*
V/f	*Overfluxing protection*
V<>	*Time-voltage protection*
VINP	*Virtual Inputs*

A2 Internal Signals

CBF: IN	Vol. 1, Fig. 3-170, (p. 3-213)
COMM1: Close request DEV01	Vol. 1, Fig. 3-199, (p. 3-244)
COMM1: Communication error	Vol. 1, Fig. 3-14, (p. 3-20) Vol. 1, Fig. 3-16, (p. 3-22)
COMM1: Count 1	Vol. 1, Fig. 3-212, (p. 3-264)
COMM1: Open request DEV01	Vol. 1, Fig. 3-199, (p. 3-244)
COMM1: Selected protocol	Vol. 1, Fig. 3-10, (p. 3-16)
COMM1: Signal S001,log	Vol. 1, Fig. 3-207, (p. 3-258)
CTS: blocked	Vol. 1, Fig. 3-159, (p. 3-204)
CTS: End a faulty	Vol. 1, Fig. 3-161, (p. 3-205)
CTS: End b faulty	Vol. 1, Fig. 3-161, (p. 3-205)
CTS: Reset	Vol. 1, Fig. 3-163, (p. 3-207)
DEV01: Close request	Vol. 1, Fig. 3-197, (p. 3-241)
DEV01: Debounced cl. signal	Vol. 1, Fig. 3-208, (p. 3-259)
DEV01: Debounced op. signal	Vol. 1, Fig. 3-208, (p. 3-259)
DEV01: Enable SI Close	Vol. 1, Fig. 3-199, (p. 3-244)
DEV01: Enable SI Open	Vol. 1, Fig. 3-199, (p. 3-244)
DEV01: End close command	Vol. 1, Fig. 3-202, (p. 3-249)
DEV01: End open command	Vol. 1, Fig. 3-202, (p. 3-249)
DEV01: Latching time elaps.	Vol. 1, Fig. 3-197, (p. 3-241)
DEV01: Latching time runn.	Vol. 1, Fig. 3-197, (p. 3-241)
DEV01: Open request	Vol. 1, Fig. 3-197, (p. 3-241)
DEV01: Protect. close cmd.	Vol. 1, Fig. 3-200, (p. 3-245)
DEV01: Protection trip cmd.	Vol. 1, Fig. 3-200, (p. 3-245)
DEV01: Switch. device runn.	Vol. 1, Fig. 3-202, (p. 3-249)
DIFF: I(2·f0),1	Vol. 1, Fig. 3-104, (p. 3-146)
DIFF: I(2·f0),2	Vol. 1, Fig. 3-104, (p. 3-146)
DIFF: I(2·f0),3	Vol. 1, Fig. 3-104, (p. 3-146)
DIFF: I(5·f0),1	Vol. 1, Fig. 3-105, (p. 3-147)
DIFF: I(5·f0),2	Vol. 1, Fig. 3-105, (p. 3-147)
DIFF: I(5·f0),3	Vol. 1, Fig. 3-105, (p. 3-147)

DIFF: Id,1	Vol. 1, Fig. 3-102, (p. 3-144)
DIFF: Id,2	Vol. 1, Fig. 3-102, (p. 3-144)
DIFF: Id,3	Vol. 1, Fig. 3-102, (p. 3-144)
DIFF: IR,1	Vol. 1, Fig. 3-102, (p. 3-144)
DIFF: IR,2	Vol. 1, Fig. 3-102, (p. 3-144)
DIFF: IR,3	Vol. 1, Fig. 3-102, (p. 3-144)
DIFF: Ready	Vol. 1, Fig. 3-95, (p. 3-136)
DIFF: Sound match	Vol. 1, Fig. 3-96, (p. 3-137)
DTOC: I> Starting A	Vol. 1, Fig. 3-117, (p. 3-163) Vol. 1, Fig. 3-118, (p. 3-164)
DTOC: I> Starting B	Vol. 1, Fig. 3-117, (p. 3-163) Vol. 1, Fig. 3-118, (p. 3-164)
DTOC: I> Starting C	Vol. 1, Fig. 3-117, (p. 3-163) Vol. 1, Fig. 3-118, (p. 3-164)
DTOC: I>> Starting A	Vol. 1, Fig. 3-117, (p. 3-163) Vol. 1, Fig. 3-118, (p. 3-164)
DTOC: I>> Starting B	Vol. 1, Fig. 3-117, (p. 3-163) Vol. 1, Fig. 3-118, (p. 3-164)
DTOC: I>> Starting C	Vol. 1, Fig. 3-117, (p. 3-163) Vol. 1, Fig. 3-118, (p. 3-164)
DTOC: I>>> Starting A	Vol. 1, Fig. 3-117, (p. 3-163) Vol. 1, Fig. 3-118, (p. 3-164)
DTOC: I>>> Starting B	Vol. 1, Fig. 3-117, (p. 3-163) Vol. 1, Fig. 3-118, (p. 3-164)
DTOC: I>>> Starting C	Vol. 1, Fig. 3-117, (p. 3-163) Vol. 1, Fig. 3-118, (p. 3-164)
f<>: fMeas	Vol. 1, Fig. 3-147, (p. 3-193)
f<>: No. periods reached	Vol. 1, Fig. 3-147, (p. 3-193)
FT_DA: Save measured values	Vol. 1, Fig. 3-88, (p. 3-126)
FT_RC: Fault recording n	Vol. 1, Fig. 3-93, (p. 3-132)
_Iam,A,a	Vol. 1, Fig. 3-97, (p. 3-138)
_Iam,A,b	Vol. 1, Fig. 3-97, (p. 3-138)
_Iam,B,a	Vol. 1, Fig. 3-97, (p. 3-138)
_Iam,B,b	Vol. 1, Fig. 3-97, (p. 3-138)

_Iam,C,a	Vol. 1, Fig. 3-97, (p. 3-138)
_Iam,C,b	Vol. 1, Fig. 3-97, (p. 3-138)
Ineg/Ipos>,y	Vol. 1, Fig. 3-160, (p. 3-205)
Ineg/Ipos>>,y	Vol. 1, Fig. 3-160, (p. 3-205)
INP: Fct. assignm. U xxx	Vol. 1, Fig. 3-31, (p. 3-55) Vol. 1, Fig. 3-41, (p. 3-65) Vol. 1, Fig. 3-60, (p. 3-96) Vol. 1, Fig. 3-79, (p. 3-113) Vol. 1, Fig. 3-168, (p. 3-211) Vol. 1, Fig. 3-171, (p. 3-214) Vol. 1, Fig. 3-172, (p. 3-215) Vol. 1, Fig. 3-183, (p. 3-226) Vol. 1, Fig. 3-191, (p. 3-232)
INP: Oper. mode U xxx	Vol. 1, Fig. 3-31, (p. 3-55)
INP: State U xxx	Vol. 1, Fig. 3-31, (p. 3-55)
Ipos>,y	Vol. 1, Fig. 3-160, (p. 3-205)
_Is,1,a	Vol. 1, Fig. 3-99, (p. 3-141)
_Is,1,b	Vol. 1, Fig. 3-99, (p. 3-141)
_Is,2,a	Vol. 1, Fig. 3-99, (p. 3-141)
_Is,2,b	Vol. 1, Fig. 3-99, (p. 3-141)
_Is,3,a	Vol. 1, Fig. 3-99, (p. 3-141)
_Is,3,b	Vol. 1, Fig. 3-99, (p. 3-141)
LED: Fct.assig. Hxx green	Vol. 1, Fig. 3-47, (p. 3-79)
LED: Fct.assig. Hxx red	Vol. 1, Fig. 3-47, (p. 3-79)
LED: Oper. mode H xx	Vol. 1, Fig. 3-47, (p. 3-79)
LED: State Hxx green	Vol. 1, Fig. 3-47, (p. 3-79)
LED: State Hxx red	Vol. 1, Fig. 3-47, (p. 3-79)
LOC: Remote&local control	Vol. 1, Fig. 3-8, (p. 3-12)
LOC: Return t.select. trg	Vol. 1, Fig. 3-4, (p. 3-8)
MAIN: Blck.1 sel.functions	Vol. 1, Fig. 3-63, (p. 3-99)
MAIN: Blck.2 sel.functions	Vol. 1, Fig. 3-63, (p. 3-99)
MAIN: Blck.3 sel.functions	Vol. 1, Fig. 3-63, (p. 3-99)
MAIN: Blck.4 sel.functions	Vol. 1, Fig. 3-63, (p. 3-99)
MAIN: DEVxx is a C.B.	Vol. 1, Fig. 3-192, (p. 3-233)

MAIN: Direct motor control	Vol. 1, Fig. 3-192, (p. 3-233)
MAIN: Protection active	Vol. 1, Fig. 3-60, (p. 3-96)
MAIN: Reset LED	Vol. 1, Fig. 3-75, (p. 3-109)
MAIN: Time tag	Vol. 1, Fig. 3-74, (p. 3-107)
MEASO: Enable	Vol. 1, Fig. 3-41, (p. 3-65)
MEASO: Output value x	Vol. 1, Fig. 3-43, (p. 3-69) Vol. 1, Fig. 3-45, (p. 3-75)
MEASO: Reset meas.val.outp.	Vol. 1, Fig. 3-42, (p. 3-66)
OUTP: Fct.assignment K xxx	Vol. 1, Fig. 3-38, (p. 3-63) Vol. 1, Fig. 3-45, (p. 3-75) Vol. 1, Fig. 3-206, (p. 3-256)
OUTP: Oper. mode K xxx	Vol. 1, Fig. 3-38, (p. 3-63)
OUTP: State K xxx	Vol. 1, Fig. 3-38, (p. 3-63)
OUTP: Test in progress	Vol. 1, Fig. 3-38, (p. 3-63) Vol. 1, Fig. 3-39, (p. 3-64)
REF_1: Id,N,a	Vol. 1, Fig. 3-112, (p. 3-157)
REF_1: IR,N,a	Vol. 1, Fig. 3-112, (p. 3-157)
SIG_1: Debounced sign. M001	Vol. 1, Fig. 3-208, (p. 3-259)
Signal 1 EXT	Vol. 1, Fig. 3-191, (p. 3-232)
Signal 2 EXT	Vol. 1, Fig. 3-191, (p. 3-232)
THRM1: Block. by CTA error	Vol. 1, Fig. 3-140, (p. 3-186)
THRM1: With CTA	Vol. 1, Fig. 3-140, (p. 3-186)
V/f: Enable meas.	Vol. 1, Fig. 3-151, (p. 3-197)

A3 Glossary

Modules

A:	Communication module
B:	Digital bus module
L:	MMI module
P:	Processor module
T:	Transformer module
V:	Power supply module
X:	Binary I/O module
Y:	Analog I/O module

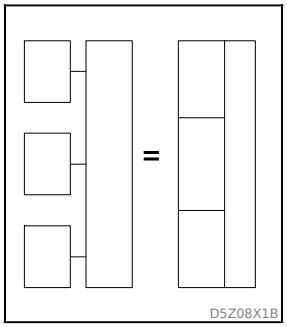
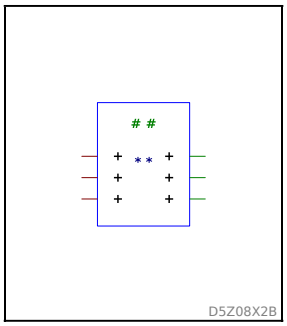
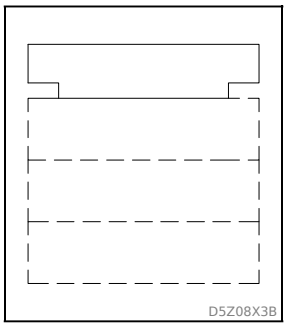
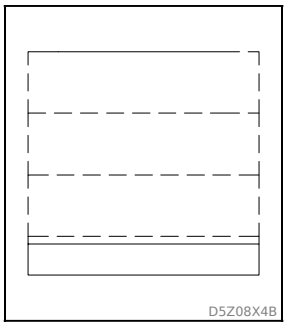
Symbols

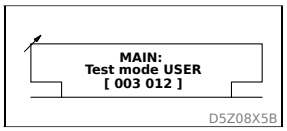
Graphic symbols for block diagrams

Binary elements in compliance with DIN 40900 part 12, September 1992, IEC 617-12: modified 1991

Analog information processing in compliance with DIN 40900 part 13, January 1981. To document the linking of analog and binary signals, additional symbols have been used, taken from several DIN documents.

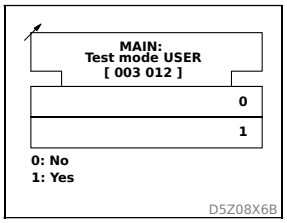
As a rule, direction of the signal flow is from left to right and from top to bottom. Other flow directions are marked by an arrow. Input signals are listed on the left side of the signal flow, output signals on the right side.

Symbol	Description
	To obtain more space for representing a group of related elements, contours of the elements may be joined or cascaded if the following rules are met: There is no functional linkage between elements whose common contour line is oriented in the signal flow direction. Note: This rule does not necessarily apply to configurations with two or more signal flow directions, such as for symbols with a control block and an output block. There exists at least one logical link between elements whose common contour line runs perpendicularly to the signal flow direction.
	**Components of a symbol** A symbol consists of a contour or contour combination and one or more qualifiers. **Description of the example symbol in the left column** ● Blue line: Contur ● Dark red lines: Inputs ● Green lines: Outputs ● Green hash characters: Preferred location for the general function qualifying symbol ● Dark blue asterisk characters: Alternative location for the general function qualifying symbol
	**Control block** A control block contains an input function common to several symbols. It is used for the collective setting of several trigger elements, for example.
	**Output block** An output block contains an output function common to several symbols.



Settable control block

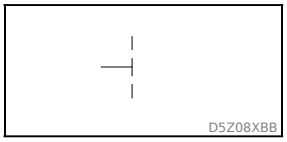
The 6 digits in square brackets represent the address under which the function shown in the text is implemented.



Settable control block with function blocks

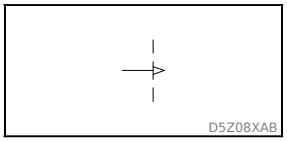
The digits in the function block show the settings that are possible for this function.

The text below the symbol assigns the corresponding unit or meaning to each setting.



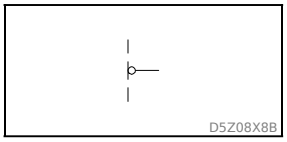
Static input

Only the state of the binary input variable is effective.



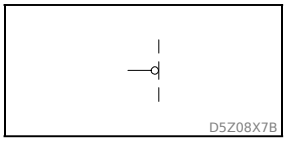
Dynamic input

Only the transition from value 0 to value 1 is effective.



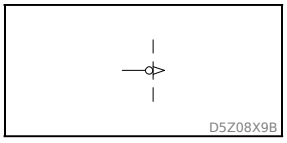
Negation of an output

The value up to the border line is negated at the output.



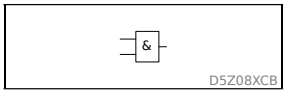
Negation of an input

The input value is negated before the border line.



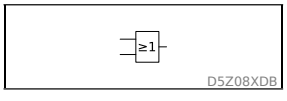
Dynamic input with negation

Only the transition from value 1 to value 0 is effective.



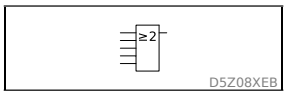
AND element

The output variable will be 1 only if all input variables are 1.



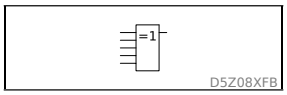
OR element

The output variable will be 1 only if at least one input variable is 1.



Threshold element

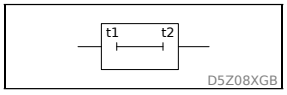
The output variable will be 1 only if at least two input variables are 1. The number in the symbol may be replaced by any other number.



(m out of n) element

The output variable will be 1 only if just one input variable is 1.

The number in the symbol may be replaced by any other number if the number of inputs is increased or decreased accordingly.

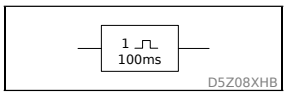


Delay element

The transition from value 0 to 1 at the output occurs after a time delay of t1 relative to the corresponding transition at the input.

The transition from value 1 to 0 at the output occurs after a time delay of t2 relative to the corresponding transition at the input.

t1 and t2 may be replaced by the actual delay values (in seconds or strobe ticks).

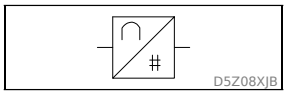


Monostable flip-flop

The output variable will be 1 only if the input variable changes to 1. The output variable will remain 1 for 100 ms, regardless of the duration of the input value 1 (non-retriggerable).

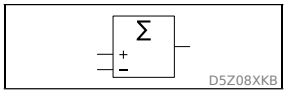
Without a 1 in the function block, the monostable flip-flop is retriggerable.

The time is 100 ms in this example, but it may be changed to any other duration.



Analog-digital converter

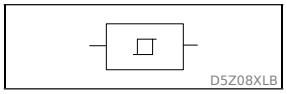
An analog input signal is converted to a binary signal.



Subtractor

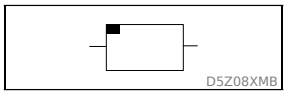
The output variable is the difference between the two input variables.

A **summing element** is obtained by changing the minus sign to a plus sign at the symbol input.



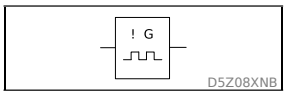
Schmitt Trigger with binary output signal

The binary output variable will be 1 if the input signal exceeds a specific threshold. The output variable remains 1 until the input signal drops below the threshold again.



Memory, general

Storage of a binary or analog signal.

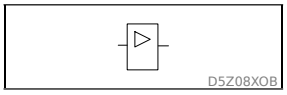


Non-stable flip-flop

When the input variable changes to 1, a pulse sequence is generated at the output.

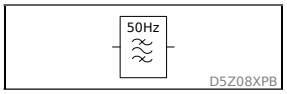
The ! to the left of the G indicates that the pulse sequence starts with the input variable transition (synchronized start).

If there is a ! to the right of the G, the pulse sequence ends with the ending of the 1 signal at the input (synchronized stop).



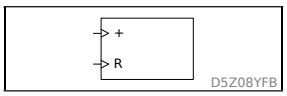
Amplifier

The output variable is 1 only if the input variable is also 1.



Band pass filter

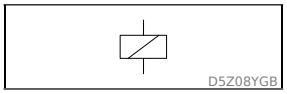
The output only transmits the 50 Hz component of the input signals. All other frequencies (above and below 50 Hz) are attenuated.



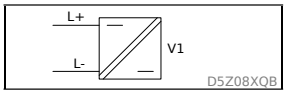
Counter

At the + input the input variable transitions from 0 to 1 are counted and stored in the function block.

At the R(eset) input a transition of the input variable from 0 to 1 resets the counter to 0.



Electromechanical drive in general, here a relay, for example.



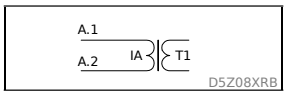
Signal level converter

with electrical isolation between input and output.

L+ = pos. voltage input

L− = neg. voltage input

U1 = device identifier



Input transformer with phase and item identifiers (according to DIN EN 60445)

Phase identifiers for current inputs:

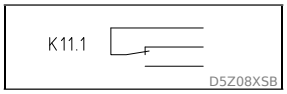
- for A: A1 and A2
- for B: B1 and B2
- for C: C1 and C2
- for N: N1 and N2

Phase identifiers for voltage inputs

- via transformer 1:
  - for A: 1U
  - for B: 1V
  - for C: 1W
  - for N: 1N
- via transformer 2:
  - for A: 2U
  - for B: 2V

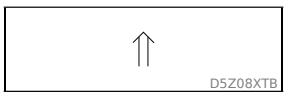
Item identifiers

- for current transformers:
  - for A: T1
  - for B: T2
  - for C: T3
  - for N: T4
- for voltage transformer 1:
  - for A: T5
  - for B: T6
  - for C: T7
  - for N: T8
- for $V_{G\text{-}N}$ transformer: T90
- for voltage transformer 2:
  - for A: T15



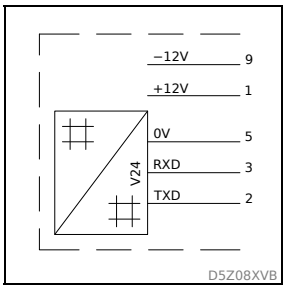
Change-over contact

with item identifier



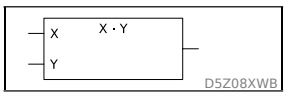
Special symbol

Output relay in normally-energized arrangement (“closed-circuit operation”).



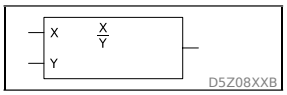
PC interface

with pin connections



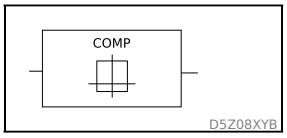
Multiplier

The output variable is the result of the multiplication of the two input variables.



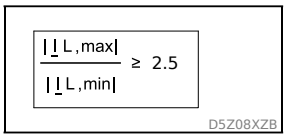
Divider

The output variable is the result of the division of the two input variables.



Comparator

The output variable becomes 1 only if the input variable(s) are equal to the function in the function block.



Formula block

The output variable becomes 1 only if the input variable(s) satisfy the equation in the function block

---

Examples of Signal Names

All settings and signals relevant for protection are shown in the block diagrams of Chapter “Operation” as follows:

Signal Name	Description
♦ FT_RC: Fault recording n 305 100	Internal signal names are not coded by a data model address. In the block diagrams they are marked with a diamond. The small figure underneath the signal name represents a code that is irrelevant to the user. The internal signal names used and their origins are listed in Appendix.
DIST: VNG>> triggered [036 015]	Signal names coded by a data model address are represented by their address (shown in square brackets). Their origin is given in Chapters “Setting” and “Information and Control Functions”.
MAIN: General reset USER [003 002] ↗1: Execute	A specific setting to be used later on is shown with its signal name, address, and the setting preceded by the setting arrow.

Symbols Used

Symbol	Meaning
t	Time duration
V	Voltage, potential difference
$\underline{V}$	Complex voltage
I	Electrical current
$\underline{I}$	Complex current
$\underline{Z}$	Complex impedance
$\lvert\underline{Z}\rvert$	Modulus of complex impedance
f	Frequency
δ	Temperature in °C
Σ	Sum, result
Ω	Unit of electrical resistance
α	Angle
φ, ϕ	Phase angle. With subscripts: specific angle between a defined current and a defined voltage.
τ	Time constant
ΔT	Temperature difference in K

A4 Telecontrol Interfaces

A4.1 Telecontrol Interface per EN 60870-5-101 or IEC 870-5-101 (Companion Standard)

This section incorporates Section 8 of EN 60870-5-101 (1996), which includes a general definition of the telecontrol interface for substation control systems.

A4.1.1 Interoperability

This application-based standard (companion standard) specifies parameter sets and other options from which subsets are to be selected in order to implement specific telecontrol systems. Certain parameters such as the number of bytes (octets) in the COMMON ADDRESS of the ASDU are mutually exclusive. This means that only one value of the defined parameter is allowed per system. Other parameters, such as the listed set of different process information in the command and monitor direction, permit definition of the total number or of subsets that are suitable for the given application. This section combines the parameters given in the previous sections in order to facilitate an appropriate selection for a specific application. If a system is made up of several system components supplied by different manufacturers, then it is necessary for all partners to agree on the selected parameters.

The boxes for the selected parameters should be checked *[see National Preface of EN 60870-5-101]*.

> *The overall definition of a system may also require individual selection of certain parameters for specific parts of a system such as individual selection of scaling factors for individually addressable measured values.*

A4.1.1.1 Network Configuration (Network-Specific Parameters)

[✓]	Point-to-point configuration	[✓]	Multipoint-party line configuration
[✓]	Multiple point-to-point configuration	[ ]	Multipoint-star configuration

A4.1.1.2 Physical Layer (Network-Specific Parameters)

(See National Preface of EN 60870-5-101.)

Transmission Rate (Control Direction)

(The transmission rates for control direction and monitor direction must be identical.)

Unbalanced interface V.24/V.28, Standardized	Unbalanced interface V.24/V.28, Recommended with > 1 200 bit/s	Balanced interface X.24/X.27
[ ] 100 bit/s	[✓] 2400 bit/s	[ ] 2400 bit/s
[ ] 200 bit/s	[✓] 4800 bit/s	[ ] 4800 bit/s
[ ] 300 bit/s	[✓] 9600 bit/s	[ ] 9600 bit/s
[✓] 600 bit/s		[ ] 19200 bit/s
[✓] 1200 bit/s		[ ] 38400 bit/s
		[ ] 56000 bit/s
		[ ] 64000 bit/s

Transmission Rate (Monitor Direction)

(The transmission rates for control direction and monitor direction must be identical.)

Unbalanced interface V.24/V.28, Standardized	Unbalanced interface V.24/V.28, Recommended with > 1 200 bit/s	Balanced interface X.24/X.27
[ ] 100 bit/s	[✓] 2400 bit/s	[ ] 2400 bit/s
[ ] 200 bit/s	[✓] 4800 bit/s	[ ] 4800 bit/s
[ ] 300 bit/s	[✓] 9600 bit/s	[ ] 9600 bit/s
[✓] 600 bit/s		[ ] 19200 bit/s
[✓] 1200 bit/s		[ ] 38400 bit/s
		[ ] 56000 bit/s
		[ ] 64000 bit/s

A4.1.1.3 Link Layer (Network-Specific Parameters)

(See National Preface of EN 60870-5-101.)

Frame format FT 1.2, single character 1, and the fixed time-out interval are used exclusively in this companion standard.

	Link Transmission Procedure
[✓]	Balanced transmission
[✓]	Unbalanced transmission

	Address Field of the Link
[✓]	Not present (balanced transmission only)
[✓]	One octet
[✓]	Two octets (balanced transmission only)
[✓]	Structured
[✓]	Unstructured

	Frame Length
[240]	Maximum length L (number of octets)

A4.1.1.4 Application Layer

(See National Preface of EN 60870-5-101.)

Transmission mode for application data

Mode 1 (least significant octet first), as defined in clause 4.10 of IEC 870-5-4, is used exclusively in this companion standard.

Common Address of ASDU (System-Specific Parameter)

[✓]	One octet	[✓]	Two octets

Information Object Address (System-Specific Parameter)

[✓]	One octet	[✓]	Structured
[✓]	Two octets	[✓]	Unstructured
[✓]	Three octets		

Cause of Transmission (System-Specific Parameter)

[✓]	One octet	[✓]	Two octets (with originator address)

Selection of Standard ASDUs

Process Information in Monitor Direction (Station-Specific Parameter)

[✓]	<1>	=	Single-point information	M_SP_NA_1
[✓]	<2>	=	Single-point information with time tag	M_SP_TA_1
[✓]	<3>	=	Double-point information	M_DP_NA_1
[✓]	<4>	=	Double-point information with time tag	M_DP_TA_1
[✓]	<5>	=	Step position information	M_ST_NA_1
[✓]	<6>	=	Step position information with time tag	M_ST_TA_1
[✓]	<7>	=	Bit string of 32 bit	M_BO_NA_1
[✓]	<8>	=	Bit string of 32 bit with time tag	M_BO_TA_1
[✓]	<9>	=	Measured value, normalized value	M_ME_NA_1
[✓]	<10>	=	Measured value, normalized value with time tag	M_ME_TA_1
[✓]	<11>	=	Measured value, scaled value	M_ME_NB_1
[✓]	<12>	=	Measured value, scaled value with time tag	M_ME_TB_1
[ ]	<13>	=	Measured value, short floating point value	M_ME_NC_1
[ ]	<14>	=	Measured value, short floating point value with time tag	M_ME_TC_1
[✓]	<15>	=	Integrated totals	M_IT_NA_1
[✓]	<16>	=	Integrated totals with time tag	M_IT_TA_1
[✓]	<17>	=	Event of protection equipment with time tag	M_EP_TA_1
[✓]	<18>	=	Packed start events of protection equipment with time tag	ME_EP_TB_1
[✓]	<19>	=	Packed output circuit information of protection equipment with time tag	M_EP_TC_1
[ ]	<20>	=	Packed single-point information with status change detection	M_PS_NA_1
[ ]	<21>	=	Measured value, normalized value without quality descriptor	M_ME_ND_1

Process Information in Monitor Direction (Station-Specific Parameter)

(Incorrectly identified with control direction in IEC 870-5-101.)

[✓]	<45>	=	Single command	C_SC_NA_1
[✓]	<46>	=	Double command	C_DC_NA_1
[✓]	<47>	=	Regulating step command	C_IT_NA_1
[ ]	<48>	=	Set point command, normalized value	C_RC_NA_1
[ ]	<49>	=	Set point command, scaled value	C_SE_NB_1
[ ]	<50>	=	Set point command, short floating point value	C_SE_NC_1
[ ]	<51>	=	Bit string of 32 bit	C_BO_NA_1

System Information in Monitor Direction (Station-Specific Parameter)

[✓]	<70>	=	End of initialization	ME_EI_NA_1

System Information in Control Direction (Station-Specific Parameter)

[✓]	<100>	=	Interrogation command	C_IC_NA_1
[✓]	<101>	=	Counter interrogation command	C_CI_NA_1
[✓]	<102>	=	Read command	C_RD_NA_1
[✓]	<103>	=	Clock synchronization command	C_CS_NA_1
[✓]	<104>	=	Test command	C_TS_NB_1
[ ]	<105>	=	Reset process command	C_RP_NC_1
[ ]	<106>	=	Delay acquisition command (See National Preface of EN 60870-5-101.)	C_CD_NA_1

Parameter in Control Direction (Station-Specific Parameter)

[✓]	<110>	=	Parameter of measured value, normalized value	P_ME_NA_1
[✓]	<111>	=	Parameter of measured value, scaled value	P_ME_NB_1
[ ]	<112>	=	Parameter of measured value, short floating point value	P_ME_NC_1
[ ]	<113>	=	Parameter activation	P_AC_NA_1

File Transfer (Station-Specific Parameter)

[ ]	<120>	=	File ready	F_FR_NA_1
[ ]	<121>	=	Section ready	F_SR_NA_1
[ ]	<122>	=	Call directory, select file, call file, call section	F_SC_NA_1
[ ]	<123>	=	Last section, last segment	F_LS_NA_1
[ ]	<124>	=	Ack file, ack section	F_AF_NA_1
[ ]	<125>	=	Segment	F_SG_NA_1
[ ]	<126>	=	Directory	F_DR_TA_1

A4.1.1.5 Basic Application Functions

(See National Preface of EN 60870-5-101.)

Station Initialization (Station-Specific Parameter)

[✓]	Remote initialization

General Interrogation (System- or Station-Specific Parameter)

[✓] Global		
[✓] Group 1	[✓] Group 7	[✓] Group 13
[✓] Group 2	[✓] Group 8	[✓] Group 14
[✓] Group 3	[✓] Group 9	[✓] Group 15
[✓] Group 4	[✓] Group 10	[✓] Group 16
[✓] Group 5	[✓] Group 11	
[✓] Group 6	[✓] Group 12	

Addresses per group have to be defined.

Clock Synchronization (Station-Specific Parameter)

[✓]	Clock synchronization

Command Transmission (Object-Specific Parameter)

[✓]	Direct command transmission	[ ]	Select and execute command
[ ]	Direct set point command transmission	[ ]	Select and execute set point command
		[ ]	C_SE ACTTERM used

[✓]	No additional definition
[ ]	Short pulse duration (Execution duration determined by a system parameter in the outstation)
[ ]	Long pulse duration (Execution duration determined by a system parameter in the outstation)
[ ]	Persistent output

Transmission of Integrated Totals (Station- or Object-Specific Parameter)

[ ]	Counter request	[✓]	General request counter
[✓]	Counter freeze without reset	[✓]	Request counter group 1
[ ]	Counter freeze with reset	[✓]	Request counter group 2
[ ]	Counter reset	[✓]	Request counter group 3
		[✓]	Request counter group 4

Addresses per group have to be specified

Parameter Loading (Object-Specific Parameter)

[✓]	Threshold value
[ ]	Smoothing value
[ ]	Low limit for transmission of measured value
[ ]	High limit for transmission of measured value

Parameter Activation (Object-Specific Parameter)

[ ]	Act/deact of persistent cyclic or periodic transmission of the addressed object

File Transfer (Station-Specific Parameter)

[ ]	File transfer in monitor direction	F_FR_NA_1
[ ]	File transfer in control direction	F_FR_NA_1

A4.2 Communication Interface per IEC 60870-5-103

This section incorporates Section 8 of IEC 60870-5-103, including definitions applicable to the P632.

A4.2.1 Interoperability

A4.2.1.1 Physical Layer

A4.2.1.1.1 Electrical Interface

[✓]	EIA RS 485
[✓]	No. of loads: 32 for one device

Note: EIA RS 485 defines the loads in such a way that 32 of such loads can be operated on one line. For detailed information see EIA RS 485, Section 3.

A4.2.1.1.2 Optical Interface

[✓]	Glass fiber
[✓]	Plastic fiber
[✓]	F-SMA connector
[ ]	BFOC/2.5 connector

A4.2.1.1.3 Transmission Rate

[✓]	9600 bit/s
[✓]	19200 bit/s

A4.2.1.2 Link Layer

There are no selection options for the link layer.

A4.2.1.3 Application Layer

A4.2.1.3.1 Transmission Mode for Application Data

Mode 1 (least significant octet first) as defined in clause 4.10 of IEC 60870-5-4 is used exclusively in this companion standard.

A4.2.1.3.2 Common Address of ASDU

[✓]	One COMMON ADDRESS of ASDU (identical to the station address)
[ ]	More than one COMMON ADDRESS of ASDU

A4.2.1.3.3 Selection of Standard Information Numbers in Monitor Direction

System Functions in Monitor Direction

	INF	Description
[✓]	<0>	End of general interrogation
[✓]	<0>	Time synchronization
[✓]	<2>	Reset FCB
[✓]	<3>	Reset CU
[✓]	<4>	Start / restart
[ ]	<5>	Power on

Status Indications in Monitor Direction

	INF	Description	P632 Designations (Address) Description
[ ]	<16>	Auto-recloser active	
[ ]	<17>	Teleprotection active	
[✓]	<18>	Protection active	(003 030) MAIN: Device on-line
[✓]	<19>	LED reset	(021 010) MAIN: Reset indicat. USER
[✓]	<20>	Blocking of monitor direction	(037 075) COMM1: Sig./meas.val.block.
[✓]	<21>	Test mode	(037 071) MAIN: Test mode
[ ]	<22>	Local parameter setting	
[✓]	<23>	Characteristic 1	(036 090) PSS: PS 1 active
[✓]	<24>	Characteristic 2	(036 091) PSS: PS 2 active
[✓]	<25>	Characteristic 3	(036 092) PSS: PS 3 active
[✓]	<26>	Characteristic 4	(036 093) PSS: PS 4 active
[✓]	<27>	Auxiliary input 1	(034 000) LOGIC: Input 01 EXT
[✓]	<28>	Auxiliary input 2	(034 001) LOGIC: Input 02 EXT
[✓]	<29>	Auxiliary input 3	(034 002) LOGIC: Input 03 EXT
[✓]	<30>	Auxiliary input 4	(034 003) LOGIC: Input 04 EXT

Monitoring Signals (Supervision Indications) in Monitor Direction

	INF	Description	P632 Designations (Address) Description
[ ]	<32>	Measurand supervision I	
[ ]	<33>	Measurand supervision V	
[ ]	<35>	Phase sequence supervision	
[✓]	<36>	Trip circuit supervision (The message content is formed from the OR operation of the individual signals.)	(041 200) SFMON: Relay Kxx faulty
[ ]	<37>	I>> back-up operation	
[✓]	<38>	VT fuse failure	(004 061) MAIN: M.c.b. trip V EXT
[ ]	<39>	Teleprotection disturbed	
[✓]	<46>	Group warning	(036 100) SFMON: Warning (relay)
[✓]	<47>	Group alarm	(004 065) MAIN: Blocked/faulty

Earth Fault Indications in Monitor Direction

	INF	Description	P632 Designations (Address) Description
[ ]	<48>	Earth fault A	
[ ]	<49>	Earth fault B	
[ ]	<50>	Earth fault C	
[ ]	<51>	Earth fault forward, i.e. line	
[ ]	<52>	Earth fault reverse, i.e. busbar	

Fault Indications in Monitor Direction

	INF	Description	P632 Designations (Address) Description
[ ]	<64>	Start / pick-up A	
[ ]	<65>	Start / pick-up B	
[ ]	<66>	Start / pick-up C	
[ ]	<67>	Start / pick-up N	
[✓]	<68>	General trip	(036 071) MAIN: Gen. trip command 1
[ ]	<69>	Trip A	
[ ]	<70>	Trip B	
[ ]	<71>	Trip C	
[ ]	<72>	Trip I>> (back-up operation)	
[ ]	<73>	Fault location X in ohms	
[ ]	<74>	Fault forward/line	
[ ]	<75>	Fault reverse/busbar	
[ ]	<76>	Teleprotection signal transmitted	
[ ]	<77>	Teleprotection signal received	
[ ]	<78>	Zone 1	
[ ]	<79>	Zone 2	
[ ]	<80>	Zone 3	
[ ]	<81>	Zone 4	
[ ]	<82>	Zone 5	
[ ]	<83>	Zone 6	
[✓]	<84>	General starting	(036 000) MAIN: General starting
[ ]	<85>	Breaker failure	
[✓]	<86>	Trip measuring system A	(041 002) DIFF: Trip signal 1
[✓]	<87>	Trip measuring system B	(041 003) DIFF: Trip signal 2
[✓]	<88>	Trip measuring system C	(041 004) DIFF: Trip signal 3
[ ]	<89>	Trip measuring system N	
[ ]	<90>	Trip I>	
[ ]	<91>	Trip I>>	

	INF	Description	P632 Designations (Address) Description
[ ]	<92>	Trip IN>	
[ ]	<93>	Trip IN>>	

Auto-Reclosure Indications in Monitor Direction

	INF	Description	P632 Designations (Address) Description
[ ]	<128>	CB ‘on’ by AR	
[ ]	<129>	CB ‘on’ by long-time AR	
[ ]	<130>	AR blocked	

Measurands in Monitor Direction

	INF	Description	P632 Designations (Address) Description
[ ]	<144>	Measurand I	
[ ]	<145>	Measurands I, V	
[ ]	<146>	Measurands I, V, P, Q	
[ ]	<147>	Measurands I_N, V_{EN}	
[ ]	<148>	Measurands $I_{A,B,C}$, $V_{A,B,C}$, P, Q, f	

Generic Functions in Monitor Direction

	INF	Description
[ ]	<240>	Read headings of all defined groups
[ ]	<241>	Read values or attributes of all entries of one group
[ ]	<243>	Read directory of a single entry
[ ]	<244>	Read value or attribute of a single entry
[ ]	<245>	General interrogation of generic data
[ ]	<249>	Write entry with confirmation
[ ]	<250>	Write entry with execution
[ ]	<251>	Write entry abort

A4.2.1.3.4 Selection of Standard Information Numbers in Control Direction

System Functions in Control Direction

	INF	Description
[✓]	<0>	Initiation of general interrogation
[✓]	<0>	Time synchronization

General Commands in Control Direction

	INF	Description	P632 Designations (Address) Description
[ ]	<16>	Auto-recloser on/off	
[ ]	<17>	Teleprotection on/off	
[✓]	<18>	Protection on/off	(003 030) MAIN: Device on-line
[✓]	<19>	LED reset	(021 010) MAIN: Reset indicat. USER
[✓]	<23>	Activate characteristic 1 (Switches PSS: Param.subs.sel. USER to *Parameter subset 1*.)	(003 060) PSS: Param.subs.sel. USER
[✓]	<24>	Activate characteristic 2 (Switches PSS: Param.subs.sel. USER to *Parameter subset 2*.)	(003 060) PSS: Param.subs.sel. USER
[✓]	<25>	Activate characteristic 3 (Switches PSS: Param.subs.sel. USER to *Parameter subset 3*.)	(003 060) PSS: Param.subs.sel. USER
[✓]	<26>	Activate characteristic 4 (Switches PSS: Param.subs.sel. USER to *Parameter subset 4*.)	(003 060) PSS: Param.subs.sel. USER

Generic Functions in Control Direction

	INF	Description
[ ]	<240>	Read headings of all defined groups
[ ]	<241>	Read values or attributes of all entries of one group
[ ]	<243>	Read directory of a single entry
[ ]	<244>	Read value or attribute of a single entry
[ ]	<245>	General interrogation of generic data
[ ]	<248>	Write entry
[ ]	<249>	Write entry with confirmation
[ ]	<250>	Write entry with execution
[ ]	<251>	Write entry abort

A4.2.1.3.5 Basic Application Functions

[✓]	Test mode
[✓]	Blocking of monitor direction
[✓]	Disturbance data
[ ]	Generic services
[✓]	Private data

A4.2.1.3.6 Miscellaneous

Measured values are transmitted both with ASDU 3 and ASDU 9. As defined in Sec. 7.2.6.8, the maximum MVAL can be either 1.2 or 2.4 times the rated value. In ASDU 3 and ASDU 9, different ratings may not be used; in other words, there is only one choice for each measurand.

Measured value	**Max. MVAL = nom. value multiplied by**		
	1.2	or	2.4
Current A	[ ]		[ ]
Current B	[ ]		[ ]
Current C	[ ]		[ ]
Voltage A-G	[ ]		[ ]
Voltage B-G	[ ]		[ ]
Voltage C-G	[ ]		[ ]
Enabled power P	[ ]		[ ]
Reactive power Q	[ ]		[ ]
Frequency f	[ ]		[ ]
Voltage A-B	[ ]		[ ]

A5 List of Bay Types

A5.1 Key to the List of Bay Types

Supported Bay Types

In general, the selection of a bay type (via MAIN: Type of bay) is accepted by the P632 only if all of the following requirements are fulfilled:

- The selected ID number is known by the P632, i. e. is available as a pre-defined standard bay type.
- A binary I/O module 6I 6O has been fitted to slot 7 (40 TE case) or 16 (84 TE case).
- The hardware (in particular the set of all binary I/O modules and power supply) has got a sufficient number of inputs and outputs as required by the selected bay type.
- Bay types with more than 3 switchgear devices are **not** supported by the P632.
- None of the inputs/outputs required by the selected bay type has been previously assigned to a non-control function.

In case of the setting MAIN: Auto-assignment I/O = Yes, the following two constraints must be noted:

- The activation of a new bay type overwrites all DEVxx / SIG_1 / CMD_1 assignments to I/O elements that have been previously made (for the previous bay type definition).
- If the automatic I/O assignment fails because some required inputs and outputs have been assigned to a non-control function, or because the number of I/O elements available is not sufficient, then the previously selected bay type remains active and an error message “Signal from device: Hardware module not fitted (0x8063)” is reported in the “`kommprot.txt`” log file.

Sorting the Bay Types

The bay types are sorted by the criteria listed below. These criteria are encoded in the first three characters of the bay type code (example: **A11.100.R01**) given in brackets after the Bay Type No. (example: **2**). Sorting is first by “Type of bay” in the order given below, then within each group by the second and third character in ascending order.

- Type of bay
  - A – Feeder bays
  - L – Bus sectionalizer bay
  - Q –Bus coupler bay
  - K – Bus coupler and sectionalizer bay
  - M – Busbar measurement bay
  - E – Busbar grounding bay
  - X – Other bay type
- Number of busbars
  - 1 – Single busbar
  - 2 – Double busbar
  - 9 – Without busbar / other configurations
- Equipment
  - 1 – Bays with switch truck or withdrawable switchgear assembly
  - 2 – Bays with two circuit breakers or switch disconnectors on switch trucks or withdrawable switchgear assembly
  - 3 – Bays with stationary switchgear units
  - 5 – Bays with stationary switchgear units and three-position disconnector
  - 9 – Other bay types

Key

Bay Type No.: This number indicates the value to be set at MAIN: Type of bay (Menu branch *Par/Conf*) in order to configure the unit for the selected bay type.

Special Designations for External Devices:

- *Mot.relay*: Motor relay
- *Shunt wd.*: Shunt winding

Table “Assignment of Binary Inputs and Output Relays”:

Column *“Switchgear unit”*: This column begins with the designation for the external device (switchgear unit). The function group follows in brackets. The function group encompasses all setting options for monitoring the switchgear unit and its signals. “Open” and “Close(d)” indicate the signal message or control direction of the switchgear unit.

Column *“Binary Input”*: The “Open” or “Closed” signal should be connected to the binary input U xxxx. The connection points of the binary input U xxxx are shown in the terminal connection diagrams.

Column *“Output relay”*: The “Open” or “Close” control of the switchgear unit is effected via output relay K xxxx. The connection points of the output relay K xxxx are shown in the terminal connection diagrams.

Table “Bay Interlock Equations for Operation without Station Interlocking”:

The interlock equations are stored at substation control level, not at unit level.

Symbols used in the Boolean interlock equations:

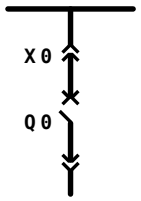
- **/**: Negation
- **0**: Switchgear unit “Open”
- **I** : Switchgear unit “Closed”
- **X**: Switchgear unit in intermediate position
- **FctBl1**: Function block 1, configuration at MAIN: Inp.asg. fct.block.1 (menu branch *Par/Func/Cont*)
- **FctBl2**: Function block 1, configuration at MAIN: Inp.asg. fct.block.2 (menu branch *Par/Func/Cont*)

A5.2 Predefined Bay Types

A5.2.1 Feeder Bays

A5.2.1.1 Bay type No. 2: Feeder bay with circuit breaker, single busbar

A11.100.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	

Tab. A5-1: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

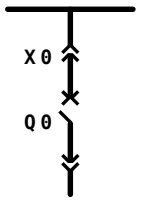
Tab. A5-2: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-3: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.2 Bay type No. 3: Feeder bay with circuit breaker, single busbar

A11.100.R02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	

Tab. A5-4: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

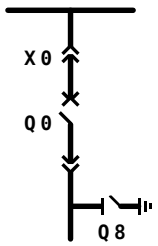
Tab. A5-5: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-6: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.3 Bay type No. 546: Feeder bay with circuit breaker, single busbar, direct motor control

A11.101.M03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-7: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

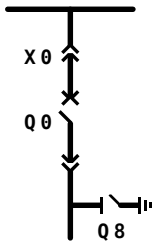
Tab. A5-8: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-9: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.4 Bay type No. 4: Feeder bay with circuit breaker, single busbar

A11.101.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-10: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

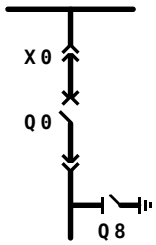
Tab. A5-11: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-12: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.5 Bay type No. 5: Feeder bay with circuit breaker, single busbar

A11.101.R02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-13: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

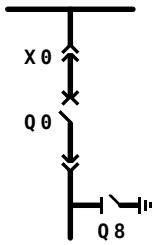
Tab. A5-14: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-15: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.6 Bay type No. 6: Feeder bay with circuit breaker, single busbar

A11.101.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	

Tab. A5-16: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

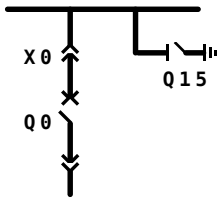
Tab. A5-17: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-18: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.7 Bay type No. 523: Feeder bay with circuit breaker, single busbar

A11.108.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q15 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-19: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & (*Q15*=0) & /(FctBl1=I) & /(FctBl2=I)

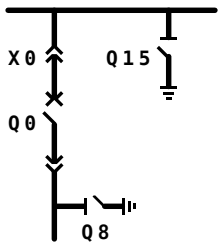
Tab. A5-20: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & (*Q15*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-21: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.8 Bay type No. 549: Feeder bay with circuit breaker, single busbar, direct motor control

A11.109.M03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q8 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X0 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q15 ()	Open	U B01	/	
	Close(d)	U B02	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-22: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & (*Q15*=0) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0) & (*Q15*=0)

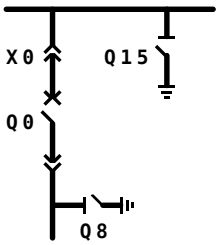
Tab. A5-23: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & (*Q15*=0) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0) & (*Q15*=0)

Tab. A5-24: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.9 Bay type No. 244: Feeder bay with circuit breaker, single busbar

A11.109.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q15 ()	Open	U C01	/	
	Close(d)	U C02	/	

Tab. A5-25: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

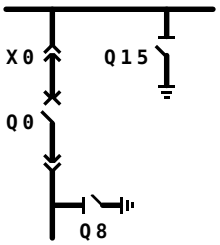
Tab. A5-26: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-27: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.10 Bay type No. 544: Feeder bay with circuit breaker, single busbar

A11.109.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q15 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-28: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & (*Q15*=0) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0) & (*Q15*=0)

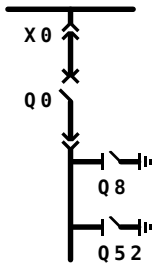
Tab. A5-29: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & (*Q15*=0) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0) & (*Q15*=0)

Tab. A5-30: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.11 Bay type No. 567: Feeder bay with circuit breaker, single busbar

A11.132.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q52 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-31: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

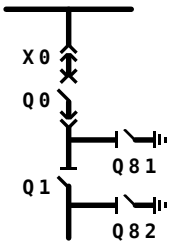
Tab. A5-32: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-33: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.12 Bay type No. 521: Feeder bay with circuit breaker, single busbar

A11.134.R02.1

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q1 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q81 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q82 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-34: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(*Q1*=X) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)

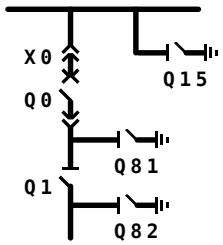
Tab. A5-35: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(*Q1*=X) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)

Tab. A5-36: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.13 Bay type No. 519: Feeder bay with circuit breaker, single busbar

A11.135.R02.1

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q1 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q81 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q82 ()	Open	U B03	/	
	Close(d)	U B04	/	
Q15 ()	Open	U B05	/	
	Close(d)	U B06	/	

Tab. A5-37: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(*Q1*=X) & (*Q15*=0) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)

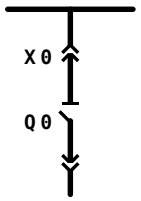
Tab. A5-38: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(*Q1*=X) & (*Q15*=0) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)

Tab. A5-39: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.14 Bay type No. 7: Feeder bay with switch disconnector, single busbar

A11.200.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	

Tab. A5-40: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

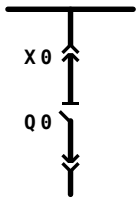
Tab. A5-41: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-42: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.15 Bay type No. 8: Feeder bay with switch disconnector, single busbar

A11.200.R02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	

Tab. A5-43: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

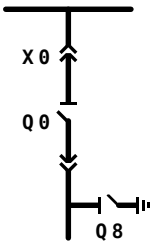
Tab. A5-44: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-45: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.16 Bay type No. 9: Feeder bay with switch disconnector, single busbar

A11.201.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-46: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

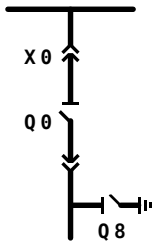
Tab. A5-47: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-48: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.17 Bay type No. 10: Feeder bay with switch disconnector, single busbar

A11.201.R02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-49: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

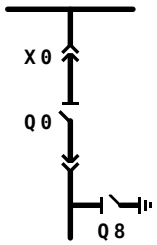
Tab. A5-50: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-51: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.18 Bay type No. 11: Feeder bay with switch disconnector, single busbar

A11.201.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	

Tab. A5-52: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

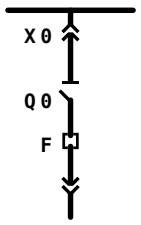
Tab. A5-53: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-54: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.19 Bay type No. 12: Feeder bay with switch disconnector / fuse unit, single busbar

A11.400.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-55: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

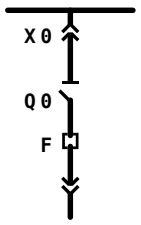
Tab. A5-56: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-57: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.20 Bay type No. 13: Feeder bay with switch disconnector / fuse unit, single busbar

A11.400.R02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-58: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

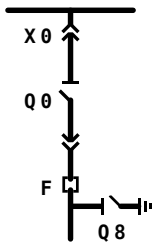
Tab. A5-59: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-60: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.21 Bay type No. 14: Feeder bay with switch disconnector / fuse unit, single busbar

A11.401.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-61: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

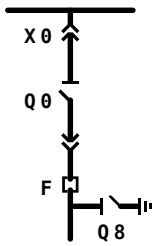
Tab. A5-62: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-63: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.22 Bay type No. 15: Feeder bay with switch disconnector / fuse unit, single busbar

A11.401.R02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-64: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

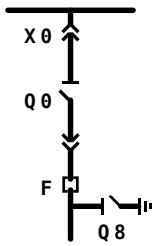
Tab. A5-65: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-66: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.23 Bay type No. 16: Feeder bay with switch disconnector / fuse unit, single busbar

A11.401.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-67: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

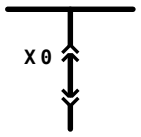
Tab. A5-68: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-69: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.24 Bay type No. 17: Feeder bay with other switchgear unit, single busbar

A11.900.R01

Switchgear unit		Binary input	Output relay	
X0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	

Tab. A5-70: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

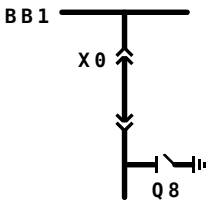
Tab. A5-71: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-72: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.25 Bay type No. 504: Feeder bay with other switchgear unit, single busbar

A11.901.R00

Switchgear unit		Binary input	Output relay	
X0 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-73: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

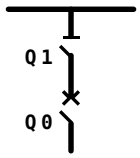
Tab. A5-74: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-75: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.26 Bay type No. 541: Feeder bay with circuit breaker, single busbar

A13.104.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	

Tab. A5-76: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(FctBl1=I) & /(FctBl2=I)

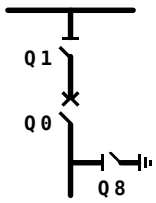
Tab. A5-77: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(FctBl1=I) & /(FctBl2=I)

Tab. A5-78: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.27 Bay type No. 18: Feeder bay with circuit breaker, single busbar, direct motor control

A13.105.M03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-79: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0)

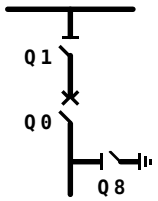
Tab. A5-80: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0)

Tab. A5-81: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.28 Bay type No. 19: Feeder bay with circuit breaker, single busbar

A13.105.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-82: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

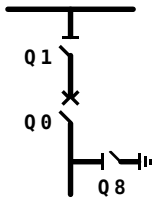
Tab. A5-83: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-84: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.29 Bay type No. 20: Feeder bay with circuit breaker, single busbar

A13.105.R02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-85: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

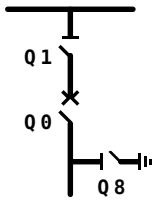
Tab. A5-86: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-87: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.30 Bay type No. 21: Feeder bay with circuit breaker, single busbar

A13.105.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	

Tab. A5-88: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0)

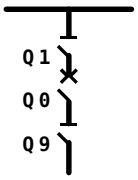
Tab. A5-89: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0)

Tab. A5-90: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.31 Bay type No. 557: Feeder bay with circuit breaker, single busbar

A13.106.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q9 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	

Tab. A5-91: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

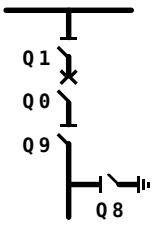
Tab. A5-92: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-93: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.32 Bay type No. 22: Feeder bay with circuit breaker, single busbar, direct motor control

A13.107.M04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q9 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-94: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q8	Close(d)	(*Q9*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

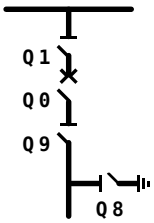
Tab. A5-95: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q8	Close(d)	(*Q9*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-96: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.33 Bay type No. 23: Feeder bay with circuit breaker, single busbar

A13.107.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q9 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-97: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)

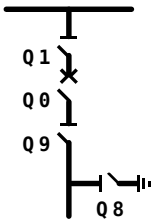
Tab. A5-98: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-99: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.34 Bay type No. 24: Feeder bay with circuit breaker, single busbar

A13.107.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q9 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-100: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

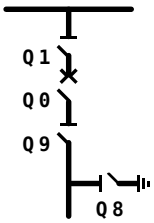
Tab. A5-101: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-102: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.35 Bay type No. 25: Feeder bay with circuit breaker, single busbar

A13.107.R04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q9 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	

Tab. A5-103: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q8	Close(d)	(*Q9*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

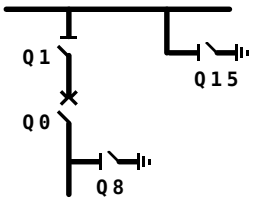
Tab. A5-104: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q8	Close(d)	(*Q9*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-105: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.36 Bay type No. 508: Feeder bay with circuit breaker, single busbar

A13.111.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q15 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-106: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & (*Q15*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0) & (*Q15*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0)

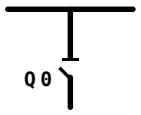
Tab. A5-107: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & (*Q15*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0) & (*Q15*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0)

Tab. A5-108: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.37 Bay type No. 26: Feeder bay with switch disconnector, single busbar

A13.200.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	

Tab. A5-109: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

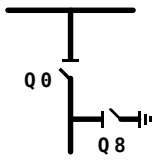
Tab. A5-110: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-111: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.38 Bay type No. 27: Feeder bay with switch disconnector, single busbar, direct motor control

A13.201.M02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q8 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-112: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q0*=0)

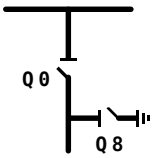
Tab. A5-113: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q0*=0)

Tab. A5-114: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.39 Bay type No. 28: Feeder bay with switch disconnector, single busbar

A13.201.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q8 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	

Tab. A5-115: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

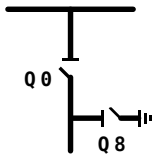
Tab. A5-116: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-117: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.40 Bay type No. 29: Feeder bay with switch disconnector, single busbar

A13.201.R02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q8 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	

Tab. A5-118: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q0*=0)

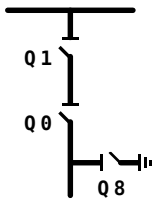
Tab. A5-119: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q0*=0)

Tab. A5-120: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.41 Bay type No. 30: Feeder bay with switch disconnector, single busbar, direct motor control

A13.205.M03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-121: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0)

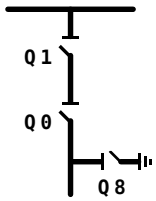
Tab. A5-122: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0)

Tab. A5-123: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.42 Bay type No. 31: Feeder bay with switch disconnector, single busbar

A13.205.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-124: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

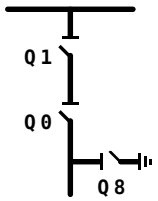
Tab. A5-125: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-126: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.43 Bay type No. 32: Feeder bay with switch disconnector, single busbar

A13.205.R02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-127: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

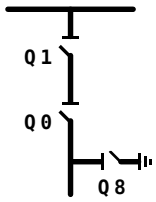
Tab. A5-128: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-129: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.44 Bay type No. 33: Feeder bay with switch disconnector, single busbar

A13.205.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	

Tab. A5-130: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0)

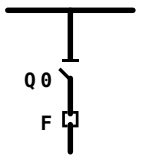
Tab. A5-131: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0)

Tab. A5-132: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.45 Bay type No. 34: Feeder bay with switch disconnector / fuse unit, single busbar

A13.400.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-133: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

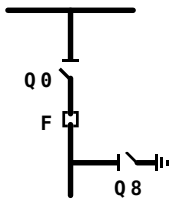
Tab. A5-134: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-135: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.46 Bay type No. 35: Feeder bay with switch disconnector / fuse unit, single busbar, direct motor control

A13.401.M02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q8 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
F (SIG_1: Signal S011 EXT)		U B05	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-136: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q0*=0)

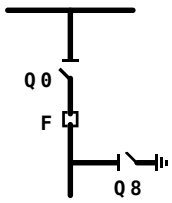
Tab. A5-137: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q0*=0)

Tab. A5-138: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.47 Bay type No. 36: Feeder bay with switch disconnector / fuse unit, single busbar

A13.401.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q8 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-139: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

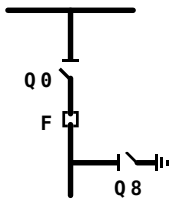
Tab. A5-140: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-141: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.48 Bay type No. 37: Feeder bay with switch disconnector / fuse unit, single busbar

A13.401.R02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q8 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-142: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q0*=0)

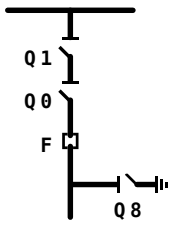
Tab. A5-143: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q0*=0)

Tab. A5-144: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.49 Bay type No. 38: Feeder bay with switch disconnector / fuse unit, single busbar, direct motor control

A13.405.M03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
F (SIG_1: Signal S011 EXT)		U B05	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-145: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0)

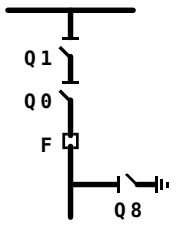
Tab. A5-146: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0)

Tab. A5-147: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.50 Bay type No. 39: Feeder bay with switch disconnector / fuse unit, single busbar

A13.405.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-148: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

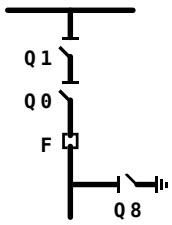
Tab. A5-149: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-150: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.51 Bay type No. 40: Feeder bay with switch disconnector / fuse unit, single busbar

A13.405.R02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-151: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

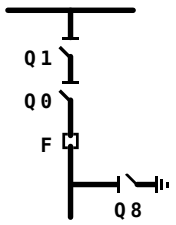
Tab. A5-152: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-153: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.52 Bay type No. 41: Feeder bay with switch disconnector / fuse unit, single busbar

A13.405.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-154: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0)

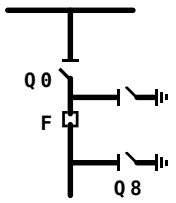
Tab. A5-155: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0)

Tab. A5-156: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.53 Bay type No. 503: Feeder bay with switch disconnector / fuse unit, single busbar

A13.432.R02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q8 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-157: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q0*=0)

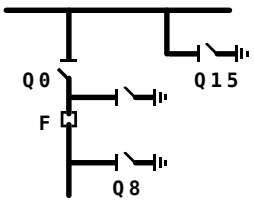
Tab. A5-158: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q0*=0)

Tab. A5-159: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.54 Bay type No. 507: Feeder bay with switch disconnector / fuse unit, single busbar

A13.433.R02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q8 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q15 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-160: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q8*=0) & (*Q15*=0) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q0*=0)

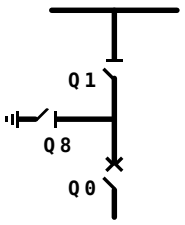
Tab. A5-161: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q8*=0) & (*Q15*=0) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q0*=0)

Tab. A5-162: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.55 Bay type No. 220: Feeder bay with circuit breaker, single busbar, direct motor control

A15.105.M02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-163: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

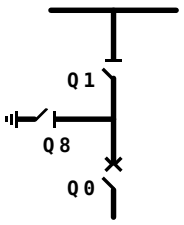
Tab. A5-164: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-165: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.56 Bay type No. 42: Feeder bay with circuit breaker, single busbar, direct motor control

A15.105.M03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-166: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Open	(*Q0*=I)
	Close(d)	(*Q0*=0) & (*Q1*=0) & /(FctBl1=I) & /(FctBl2=I)

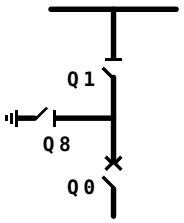
Tab. A5-167: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Open	(*Q0*=I)
	Close(d)	(*Q0*=0) & (*Q1*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-168: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.57 Bay type No. 43: Feeder bay with circuit breaker, single busbar

A15.105.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-169: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

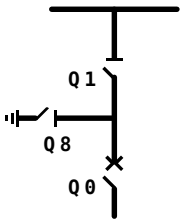
Tab. A5-170: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-171: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.58 Bay type No. 221: Feeder bay with circuit breaker, single busbar

A15.105.R02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-172: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

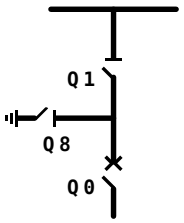
Tab. A5-173: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-174: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.59 Bay type No. 44: Feeder bay with circuit breaker, single busbar

A15.105.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	

Tab. A5-175: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Open	(*Q0*=I)
	Close(d)	(*Q0*=0) & (*Q1*=0) & /(FctBl1=I) & /(FctBl2=I)

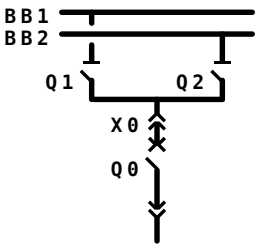
Tab. A5-176: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q8	Open	(*Q0*=I)
	Close(d)	(*Q0*=0) & (*Q1*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-177: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.60 Bay type No. 45: Feeder bay with circuit breaker, double busbar, direct motor control

A21.104.M04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-178: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

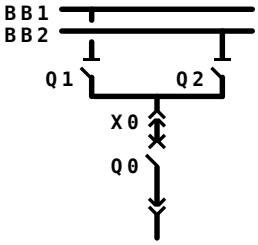
Tab. A5-179: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

Tab. A5-180: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.61 Bay type No. 46: Feeder bay with circuit breaker, double busbar

A21.104.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q2 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-181: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

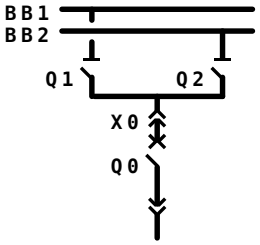
Tab. A5-182: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-183: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.62 Bay type No. 47: Feeder bay with circuit breaker, double busbar

A21.104.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-184: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)

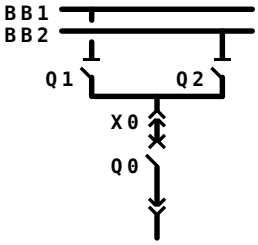
Tab. A5-185: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-186: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.63 Bay type No. 48: Feeder bay with circuit breaker, double busbar

A21.104.R04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	

Tab. A5-187: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

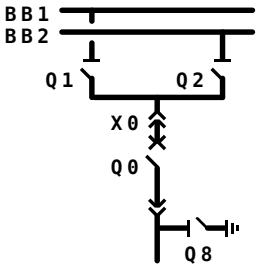
Tab. A5-188: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

Tab. A5-189: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.64 Bay type No. 49: Feeder bay with circuit breaker, double busbar, direct motor control

A21.105.M05

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q8 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-190: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q8*=0)

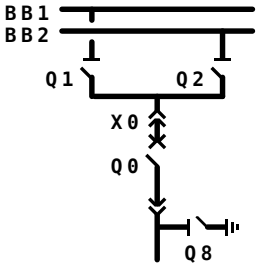
Tab. A5-191: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q8*=0)

Tab. A5-192: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.65 Bay type No. 50: Feeder bay with circuit breaker, double busbar

A21.105.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q2 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-193: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

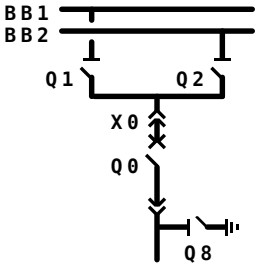
Tab. A5-194: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-195: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.66 Bay type No. 51: Feeder bay with circuit breaker, double busbar

A21.105.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-196: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)

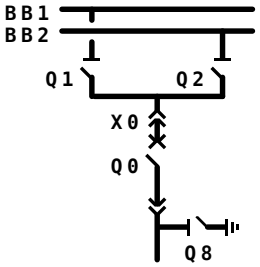
Tab. A5-197: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-198: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.67 Bay type No. 52: Feeder bay with circuit breaker, double busbar

A21.105.R04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-199: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q8*=0)

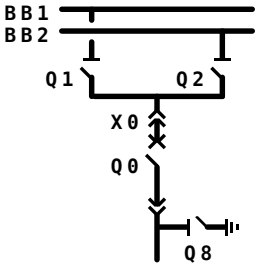
Tab. A5-200: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q8*=0)

Tab. A5-201: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.68 Bay type No. 53: Feeder bay with circuit breaker, double busbar

A21.105.R05

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q8 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	

Tab. A5-202: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q8*=0)

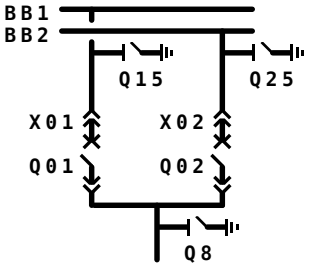
Tab. A5-203: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q8*=0)

Tab. A5-204: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.69 Bay type No. 526: Feeder bay with circuit breaker, double busbar

A21.125.R02

Switchgear unit		Binary input	Output relay	
Q01 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q02 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X02 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	
Q15 ()	Open	U B05	/	
	Close(d)	U B06	/	
Q25 ()	Open	U C01	/	
	Close(d)	U C02	/	

Tab. A5-205: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*X01*=X) & /(*X02*=X) & (*Q15*=0) & (*Q25*=0) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*X01*=X) & /(*X02*=X) & (*Q15*=0) & (*Q25*=0) & /(FctBl1=I) & /(FctBl2=I)

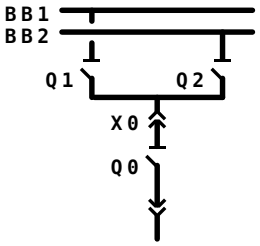
Tab. A5-206: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*X01*=X) & /(*X02*=X) & (*Q15*=0) & (*Q25*=0) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*X01*=X) & /(*X02*=X) & (*Q15*=0) & (*Q25*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-207: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.70 Bay type No. 54: Feeder bay with switch disconnector, double busbar, direct motor control

A21.204.M04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-208: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

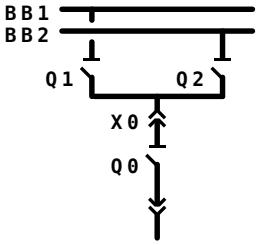
Tab. A5-209: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

Tab. A5-210: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.71 Bay type No. 55: Feeder bay with switch disconnector, double busbar

A21.204.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q2 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-211: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

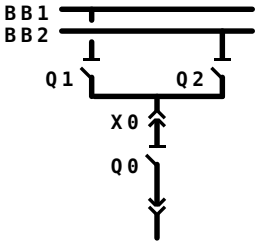
Tab. A5-212: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-213: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.72 Bay type No. 56: Feeder bay with switch disconnector, double busbar

A21.204.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-214: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)

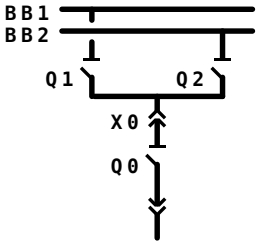
Tab. A5-215: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-216: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.73 Bay type No. 57: Feeder bay with switch disconnector, double busbar

A21.204.R04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	

Tab. A5-217: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

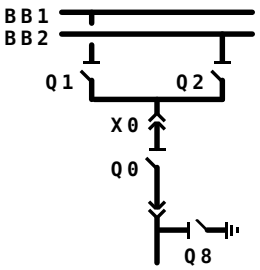
Tab. A5-218: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

Tab. A5-219: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.74 Bay type No. 58: Feeder bay with switch disconnector, double busbar, direct motor control

A21.205.M05

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q8 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-220: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q8*=0)

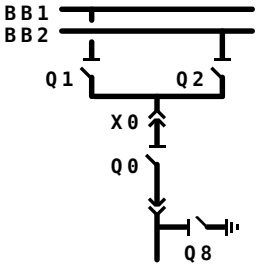
Tab. A5-221: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q8*=0)

Tab. A5-222: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.75 Bay type No. 59: Feeder bay with switch disconnector, double busbar

A21.205.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q2 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-223: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

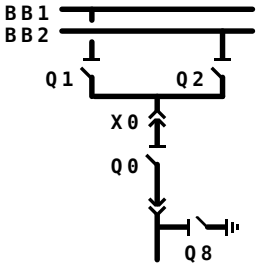
Tab. A5-224: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-225: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.76 Bay type No. 60: Feeder bay with switch disconnector, double busbar

A21.205.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-226: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)

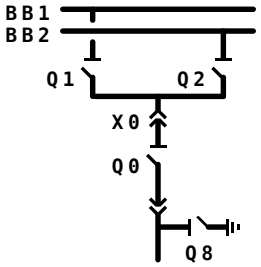
Tab. A5-227: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-228: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.77 Bay type No. 61: Feeder bay with switch disconnector, double busbar

A21.205.R04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-229: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q8*=0)

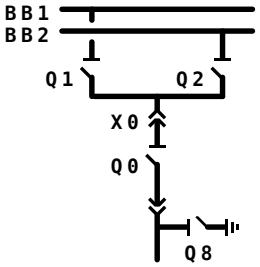
Tab. A5-230: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q8*=0)

Tab. A5-231: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.78 Bay type No. 62: Feeder bay with switch disconnector, double busbar

A21.205.R05

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q8 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	

Tab. A5-232: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q8*=0)

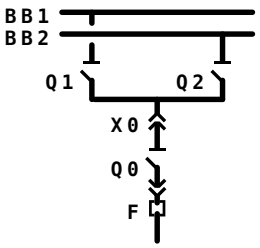
Tab. A5-233: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q8*=0)

Tab. A5-234: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.79 Bay type No. 63: Feeder bay with switch disconnector / fuse unit, double busbar, direct motor control

A21.404.M04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
F (SIG_1: Signal S011 EXT)		U B05	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-235: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

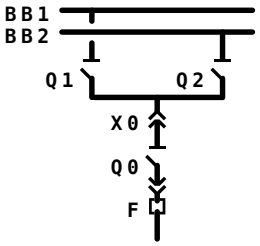
Tab. A5-236: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

Tab. A5-237: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.80 Bay type No. 64: Feeder bay with switch disconnector / fuse unit, double busbar

A21.404.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q2 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-238: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

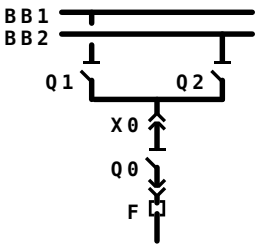
Tab. A5-239: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-240: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.81 Bay type No. 65: Feeder bay with switch disconnector / fuse unit, double busbar

A21.404.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-241: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)

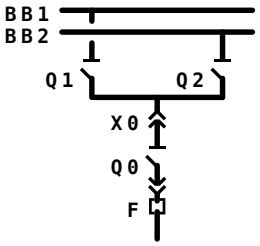
Tab. A5-242: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-243: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.82 Bay type No. 66: Feeder bay with switch disconnector / fuse unit, double busbar

A21.404.R04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-244: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

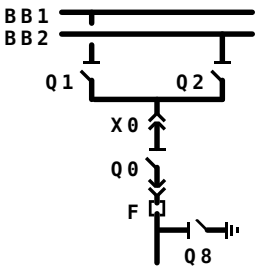
Tab. A5-245: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

Tab. A5-246: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.83 Bay type No. 67: Feeder bay with switch disconnector / fuse unit, double busbar, direct motor control

A21.405.M05

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q8 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
F (SIG_1: Signal S011 EXT)		U B05	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-247: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q8*=0)

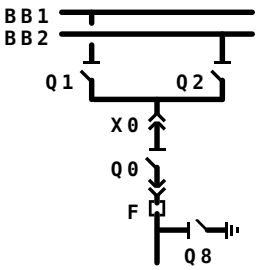
Tab. A5-248: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q8*=0)

Tab. A5-249: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.84 Bay type No. 68: Feeder bay with switch disconnector / fuse unit, double busbar

A21.405.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q2 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-250: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

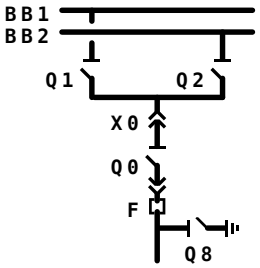
Tab. A5-251: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-252: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.85 Bay type No. 69: Feeder bay with switch disconnector / fuse unit, double busbar

A21.405.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-253: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)

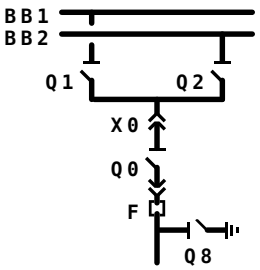
Tab. A5-254: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-255: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.86 Bay type No. 70: Feeder bay with switch disconnector / fuse unit, double busbar

A21.405.R04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-256: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q8*=0)

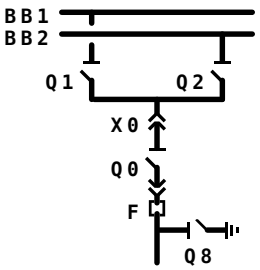
Tab. A5-257: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q8*=0)

Tab. A5-258: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.87 Bay type No. 71: Feeder bay with switch disconnector / fuse unit, double busbar

A21.405.R05

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q8 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-259: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q8*=0)

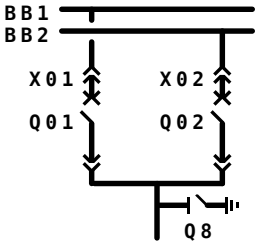
Tab. A5-260: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X0*=0)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q8*=0)

Tab. A5-261: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.88 Bay type No. 72: Feeder bay with circuit breaker, double busbar

A22.101.R02

Switchgear unit		Binary input	Output relay	
Q01 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q02 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X02 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-262: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	(*Q02*=0) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	(*Q01*=0) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)

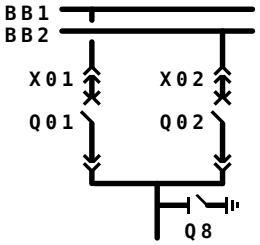
Tab. A5-263: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-264: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.89 Bay type No. 73: Feeder bay with circuit breaker, double busbar

A22.101.R04

Switchgear unit		Binary input	Output relay	
Q01 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q02 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X02 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-265: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	(*Q02*=0) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	(*Q01*=0) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
X01	Open	(*Q01*=0)
	Close(d)	(*Q01*=0) & (*Q8*=0)
X02	Open	(*Q02*=0)
	Close(d)	(*Q02*=0) & (*Q8*=0)

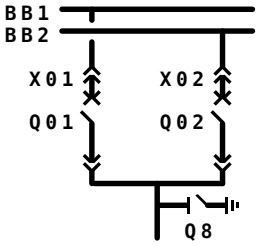
Tab. A5-266: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
X01	Open	(*Q01*=0)
	Close(d)	(*Q01*=0) & (*Q8*=0)
X02	Open	(*Q02*=0)
	Close(d)	(*Q02*=0) & (*Q8*=0)

Tab. A5-267: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.90 Bay type No. 74: Feeder bay with circuit breaker, double busbar

A22.101.R05

Switchgear unit		Binary input	Output relay	
Q01 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q02 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X02 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q8 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	

Tab. A5-268: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	(*Q02*=0) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	(*Q01*=0) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X01*=0) & (*X02*=0)
X01	Open	(*Q01*=0)
	Close(d)	(*Q01*=0) & (*Q8*=0)
X02	Open	(*Q02*=0)
	Close(d)	(*Q02*=0) & (*Q8*=0)

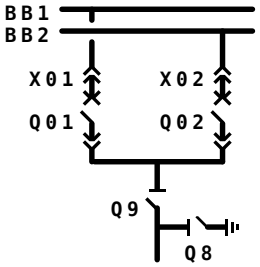
Tab. A5-269: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X01*=0) & (*X02*=0)
X01	Open	(*Q01*=0)
	Close(d)	(*Q01*=0) & (*Q8*=0)
X02	Open	(*Q02*=0)
	Close(d)	(*Q02*=0) & (*Q8*=0)

Tab. A5-270: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.91 Bay type No. 75: Feeder bay with circuit breaker, double busbar

A22.103.R02

Switchgear unit		Binary input	Output relay	
Q01 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q02 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X02 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q9 ()	Open	U B03	/	
	Close(d)	U B04	/	
Q8 ()	Open	U B05	/	
	Close(d)	U B06	/	

Tab. A5-271: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	(*Q02*=0) & /(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	(*Q01*=0) & /(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)

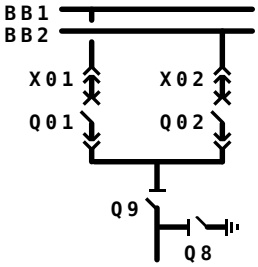
Tab. A5-272: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-273: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.92 Bay type No. 76: Feeder bay with circuit breaker, double busbar

A22.103.R03

Switchgear unit		Binary input	Output relay	
Q01 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q02 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X02 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q9 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
Q8 ()	Open	U B05	/	
	Close(d)	U B06	/	

Tab. A5-274: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	(*Q02*=0) & /(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	(*Q01*=0) & /(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q9	Open	(*Q01*=0) & (*Q02*=0)
	Close(d)	(*Q01*=0) & (*Q02*=0) & (*Q8*=0)

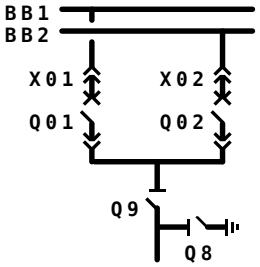
Tab. A5-275: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q9	Open	(*Q01*=0) & (*Q02*=0)
	Close(d)	(*Q01*=0) & (*Q02*=0) & (*Q8*=0)

Tab. A5-276: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.93 Bay type No. 77: Feeder bay with circuit breaker, double busbar

A22.103.R05

Switchgear unit		Binary input	Output relay	
Q01 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q02 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X02 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q9 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
Q8 ()	Open	U B05	/	
	Close(d)	U B06	/	

Tab. A5-277: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	(*Q02*=0) & /(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	(*Q01*=0) & /(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q9	Open	(*Q01*=0) & (*Q02*=0)
	Close(d)	(*Q01*=0) & (*Q02*=0) & (*Q8*=0)
X01	Open	(*Q01*=0)
	Close(d)	(*Q01*=0)
X02	Open	(*Q02*=0)
	Close(d)	(*Q02*=0)

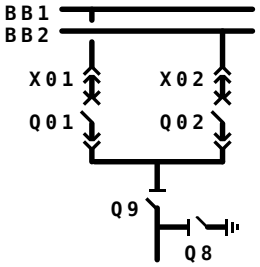
Tab. A5-278: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q9	Open	(*Q01*=0) & (*Q02*=0)
	Close(d)	(*Q01*=0) & (*Q02*=0) & (*Q8*=0)
X01	Open	(*Q01*=0)
	Close(d)	(*Q01*=0)
X02	Open	(*Q02*=0)
	Close(d)	(*Q02*=0)

Tab. A5-279: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.94 Bay type No. 78: Feeder bay with circuit breaker, double busbar

A22.103.R06

Switchgear unit		Binary input	Output relay	
Q01 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q02 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X02 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q9 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
Q8 ()	Open	U B05	K B05	
	Close(d)	U B06	K B06	

Tab. A5-280: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	(*Q02*=0) & /(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	(*Q01*=0) & /(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q9*=0)
Q9	Open	(*Q01*=0) & (*Q02*=0)
	Close(d)	(*Q01*=0) & (*Q02*=0) & (*Q8*=0)
X01	Open	(*Q01*=0)
	Close(d)	(*Q01*=0)
X02	Open	(*Q02*=0)
	Close(d)	(*Q02*=0)

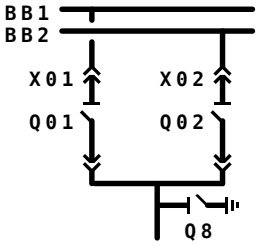
Tab. A5-281: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q9*=0)
Q9	Open	(*Q01*=0) & (*Q02*=0)
	Close(d)	(*Q01*=0) & (*Q02*=0) & (*Q8*=0)
X01	Open	(*Q01*=0)
	Close(d)	(*Q01*=0)
X02	Open	(*Q02*=0)
	Close(d)	(*Q02*=0)

Tab. A5-282: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.95 Bay type No. 79: Feeder bay with switch disconnector, double busbar

A22.201.R02

Switchgear unit		Binary input	Output relay	
Q01 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q02 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X02 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-283: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	(*Q02*=0) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	(*Q01*=0) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)

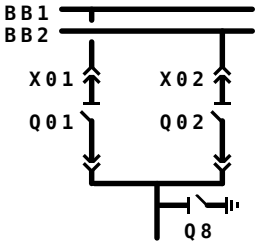
Tab. A5-284: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-285: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.96 Bay type No. 80: Feeder bay with switch disconnector, double busbar

A22.201.R04

Switchgear unit		Binary input	Output relay	
Q01 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q02 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X02 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-286: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	(*Q02*=0) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	(*Q01*=0) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
X01	Open	(*Q01*=0)
	Close(d)	(*Q01*=0) & (*Q8*=0)
X02	Open	(*Q02*=0)
	Close(d)	(*Q02*=0) & (*Q8*=0)

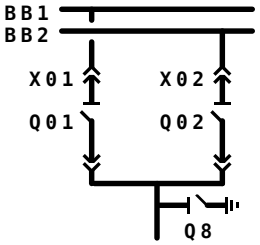
Tab. A5-287: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
X01	Open	(*Q01*=0)
	Close(d)	(*Q01*=0) & (*Q8*=0)
X02	Open	(*Q02*=0)
	Close(d)	(*Q02*=0) & (*Q8*=0)

Tab. A5-288: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.97 Bay type No. 81: Feeder bay with switch disconnector, double busbar

A22.201.R05

Switchgear unit		Binary input	Output relay	
Q01 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q02 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X02 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q8 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	

Tab. A5-289: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	(*Q02*=0) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	(*Q01*=0) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X01*=0) & (*X02*=0)
X01	Open	(*Q01*=0)
	Close(d)	(*Q01*=0) & (*Q8*=0)
X02	Open	(*Q02*=0)
	Close(d)	(*Q02*=0) & (*Q8*=0)

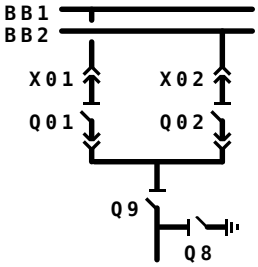
Tab. A5-290: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X01*=0) & (*X02*=0)
X01	Open	(*Q01*=0)
	Close(d)	(*Q01*=0) & (*Q8*=0)
X02	Open	(*Q02*=0)
	Close(d)	(*Q02*=0) & (*Q8*=0)

Tab. A5-291: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.98 Bay type No. 82: Feeder bay with switch disconnector, double busbar

A22.203.R02

Switchgear unit		Binary input	Output relay	
Q01 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q02 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X02 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q9 ()	Open	U B03	/	
	Close(d)	U B04	/	
Q8 ()	Open	U B05	/	
	Close(d)	U B06	/	

Tab. A5-292: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	(*Q02*=0) & /(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	(*Q01*=0) & /(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)

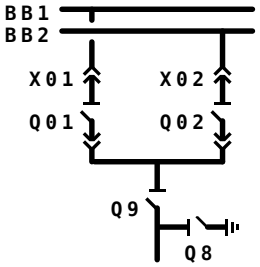
Tab. A5-293: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-294: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.99 Bay type No. 83: Feeder bay with switch disconnector, double busbar

A22.203.R03

Switchgear unit		Binary input	Output relay	
Q01 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q02 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X02 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q9 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
Q8 ()	Open	U B05	/	
	Close(d)	U B06	/	

Tab. A5-295: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	(*Q02*=0) & /(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	(*Q01*=0) & /(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q9	Open	(*Q01*=0) & (*Q02*=0)
	Close(d)	(*Q01*=0) & (*Q02*=0) & (*Q8*=0)

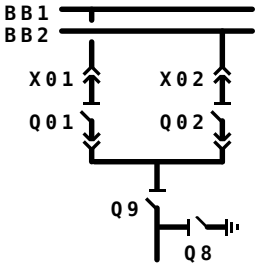
Tab. A5-296: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q9	Open	(*Q01*=0) & (*Q02*=0)
	Close(d)	(*Q01*=0) & (*Q02*=0) & (*Q8*=0)

Tab. A5-297: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.100 Bay type No. 84: Feeder bay with switch disconnector, double busbar

A22.203.R05

Switchgear unit		Binary input	Output relay	
Q01 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q02 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X02 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q9 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
Q8 ()	Open	U B05	/	
	Close(d)	U B06	/	

Tab. A5-298: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	(*Q02*=0) & /(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	(*Q01*=0) & /(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q9	Open	(*Q01*=0) & (*Q02*=0)
	Close(d)	(*Q01*=0) & (*Q02*=0) & (*Q8*=0)
X01	Open	(*Q01*=0)
	Close(d)	(*Q01*=0)
X02	Open	(*Q02*=0)
	Close(d)	(*Q02*=0)

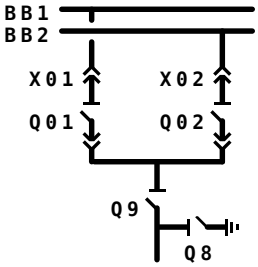
Tab. A5-299: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q9	Open	(*Q01*=0) & (*Q02*=0)
	Close(d)	(*Q01*=0) & (*Q02*=0) & (*Q8*=0)
X01	Open	(*Q01*=0)
	Close(d)	(*Q01*=0)
X02	Open	(*Q02*=0)
	Close(d)	(*Q02*=0)

Tab. A5-300: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.101 Bay type No. 85: Feeder bay with switch disconnector, double busbar

A22.203.R06

Switchgear unit		Binary input	Output relay	
Q01 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q02 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X02 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q9 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
Q8 ()	Open	U B05	K B05	
	Close(d)	U B06	K B06	

Tab. A5-301: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	(*Q02*=0) & /(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	(*Q01*=0) & /(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q9*=0)
Q9	Open	(*Q01*=0) & (*Q02*=0)
	Close(d)	(*Q01*=0) & (*Q02*=0) & (*Q8*=0)
X01	Open	(*Q01*=0)
	Close(d)	(*Q01*=0)
X02	Open	(*Q02*=0)
	Close(d)	(*Q02*=0)

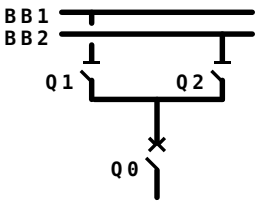
Tab. A5-302: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*Q9*=X) & /(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q9*=0)
Q9	Open	(*Q01*=0) & (*Q02*=0)
	Close(d)	(*Q01*=0) & (*Q02*=0) & (*Q8*=0)
X01	Open	(*Q01*=0)
	Close(d)	(*Q01*=0)
X02	Open	(*Q02*=0)
	Close(d)	(*Q02*=0)

Tab. A5-303: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.102 Bay type No. 86: Feeder bay with circuit breaker, double busbar, direct motor control

A23.104.M03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-304: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)

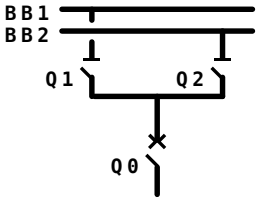
Tab. A5-305: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-306: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.103 Bay type No. 87: Feeder bay with circuit breaker, double busbar

A23.104.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q2 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-307: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(FctBl1=I) & /(FctBl2=I)

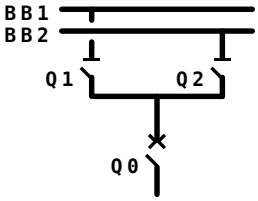
Tab. A5-308: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-309: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.104 Bay type No. 88: Feeder bay with circuit breaker, double busbar

A23.104.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	

Tab. A5-310: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)

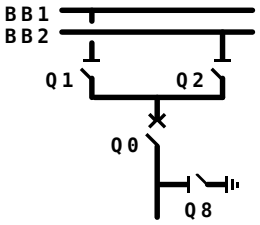
Tab. A5-311: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-312: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.105 Bay type No. 89: Feeder bay with circuit breaker, double busbar, direct motor control

A23.105.M04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-313: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0) & (*Q8*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

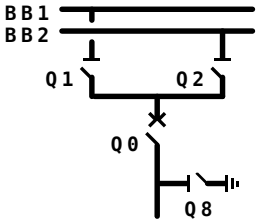
Tab. A5-314: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Close(d)	(*Q8*=0)
Q2	Close(d)	(*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

Tab. A5-315: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.106 Bay type No. 90: Feeder bay with circuit breaker, double busbar

A23.105.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q2 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-316: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

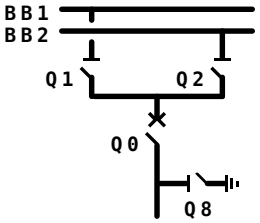
Tab. A5-317: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-318: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.107 Bay type No. 91: Feeder bay with circuit breaker, double busbar

A23.105.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-319: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0) & (*Q8*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q8*=0)

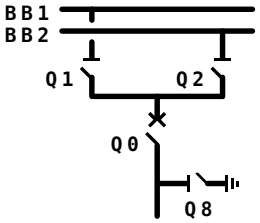
Tab. A5-320: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Close(d)	(*Q8*=0)
Q2	Close(d)	(*Q8*=0)

Tab. A5-321: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.108 Bay type No. 92: Feeder bay with circuit breaker, double busbar

A23.105.R04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	

Tab. A5-322: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0) & (*Q8*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

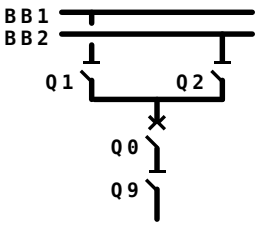
Tab. A5-323: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Close(d)	(*Q8*=0)
Q2	Close(d)	(*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

Tab. A5-324: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.109 Bay type No. 93: Feeder bay with circuit breaker, double busbar, direct motor control

A23.106.M04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q9 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-325: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

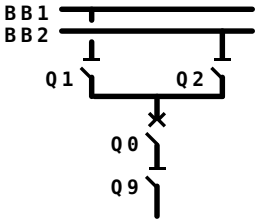
Tab. A5-326: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-327: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.110 Bay type No. 94: Feeder bay with circuit breaker, double busbar

A23.106.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q2 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q9 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-328: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)

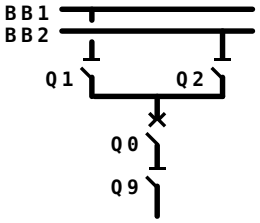
Tab. A5-329: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-330: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.111 Bay type No. 95: Feeder bay with circuit breaker, double busbar

A23.106.R04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q9 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	

Tab. A5-331: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

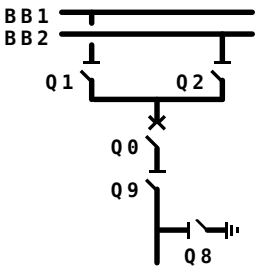
Tab. A5-332: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-333: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.112 Bay type No. 96: Feeder bay with circuit breaker, double busbar, direct motor control

A23.107.M05

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q9 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q8 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-334: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
Q8	Close(d)	(*Q9*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

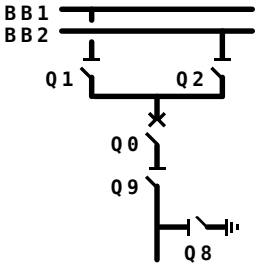
Tab. A5-335: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q9*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-336: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.113 Bay type No. 97: Feeder bay with circuit breaker, double busbar

A23.107.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q2 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q9 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-337: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)

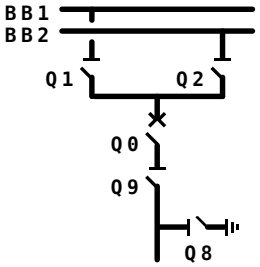
Tab. A5-338: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-339: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.114 Bay type No. 98: Feeder bay with circuit breaker, double busbar

A23.107.R04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q9 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-340: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

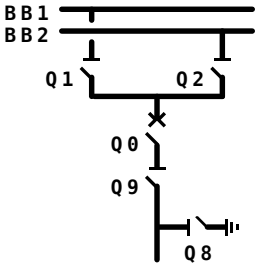
Tab. A5-341: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-342: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.115 Bay type No. 99: Feeder bay with circuit breaker, double busbar

A23.107.R05

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q9 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q8 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	

Tab. A5-343: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
Q8	Close(d)	(*Q9*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

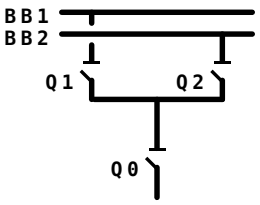
Tab. A5-344: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q9*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-345: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.116 Bay type No. 100: Feeder bay with switch disconnector, double busbar, direct motor control

A23.204.M03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-346: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)

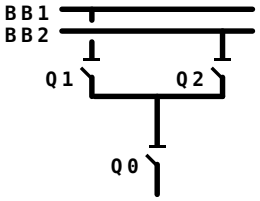
Tab. A5-347: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-348: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.117 Bay type No. 101: Feeder bay with switch disconnector, double busbar

A23.204.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q2 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-349: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(FctBl1=I) & /(FctBl2=I)

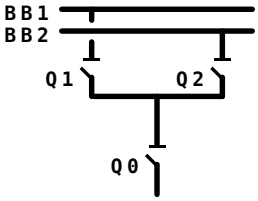
Tab. A5-350: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-351: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.118 Bay type No. 102: Feeder bay with switch disconnector, double busbar

A23.204.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	

Tab. A5-352: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)

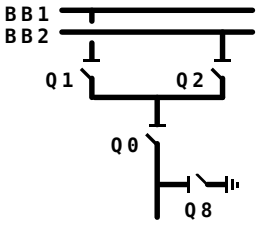
Tab. A5-353: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-354: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.119 Bay type No. 103: Feeder bay with switch disconnector, double busbar, direct motor control

A23.205.M04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-355: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0) & (*Q8*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

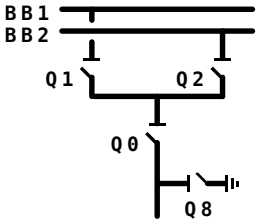
Tab. A5-356: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Close(d)	(*Q8*=0)
Q2	Close(d)	(*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

Tab. A5-357: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.120 Bay type No. 104: Feeder bay with switch disconnector, double busbar

A23.205.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q2 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-358: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

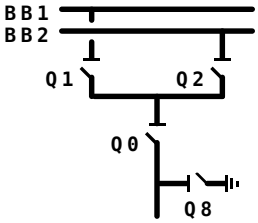
Tab. A5-359: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-360: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.121 Bay type No. 105: Feeder bay with switch disconnector, double busbar

A23.205.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-361: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0) & (*Q8*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q8*=0)

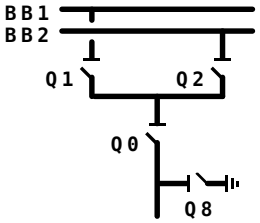
Tab. A5-362: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Close(d)	(*Q8*=0)
Q2	Close(d)	(*Q8*=0)

Tab. A5-363: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.122 Bay type No. 106: Feeder bay with switch disconnector, double busbar

A23.205.R04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	

Tab. A5-364: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0) & (*Q8*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

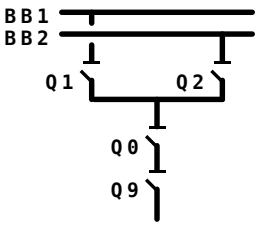
Tab. A5-365: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Close(d)	(*Q8*=0)
Q2	Close(d)	(*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

Tab. A5-366: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.123 Bay type No. 107: Feeder bay with switch disconnector, double busbar, direct motor control

A23.206.M04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q9 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-367: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

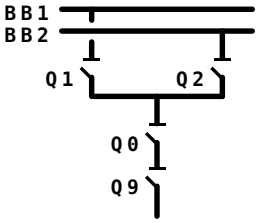
Tab. A5-368: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-369: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.124 Bay type No. 108: Feeder bay with switch disconnector, double busbar

A23.206.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q2 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q9 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-370: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)

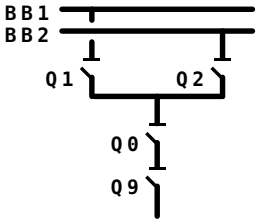
Tab. A5-371: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-372: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.125 Bay type No. 109: Feeder bay with switch disconnector, double busbar

A23.206.R04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q9 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	

Tab. A5-373: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

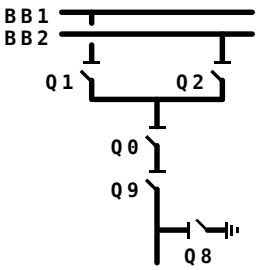
Tab. A5-374: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-375: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.126 Bay type No. 110: Feeder bay with switch disconnector, double busbar, direct motor control

A23.207.M05

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q9 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q8 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-376: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
Q8	Close(d)	(*Q9*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

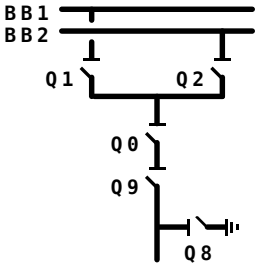
Tab. A5-377: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q9*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-378: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.127 Bay type No. 111: Feeder bay with switch disconnector, double busbar

A23.207.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q2 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q9 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-379: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)

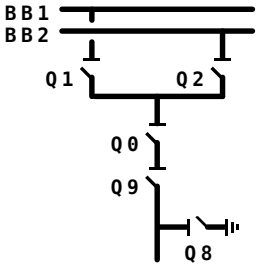
Tab. A5-380: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-381: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.128 Bay type No. 112: Feeder bay with switch disconnector, double busbar

A23.207.R04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q9 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-382: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

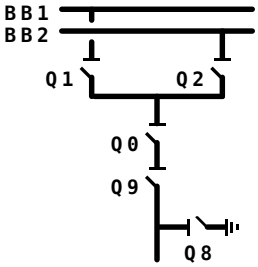
Tab. A5-383: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-384: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.129 Bay type No. 113: Feeder bay with switch disconnector, double busbar

A23.207.R05

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q9 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q8 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	

Tab. A5-385: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
Q8	Close(d)	(*Q9*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

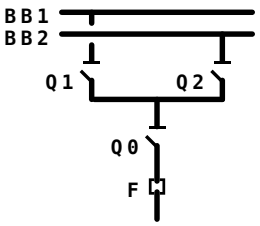
Tab. A5-386: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*Q9*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*Q9*=0)
Q9	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-387: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.130 Bay type No. 114: Feeder bay with switch disconnector / fuse unit, double busbar, direct motor control

A23.404.M03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
F (SIG_1: Signal S011 EXT)		U B05	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-388: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)

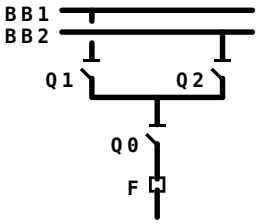
Tab. A5-389: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-390: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.131 Bay type No. 115: Feeder bay with switch disconnector / fuse unit, double busbar

A23.404.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q2 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-391: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(FctBl1=I) & /(FctBl2=I)

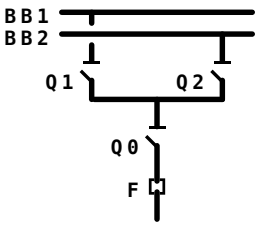
Tab. A5-392: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-393: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.132 Bay type No. 116: Feeder bay with switch disconnector / fuse unit, double busbar

A23.404.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-394: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)

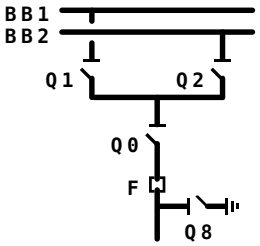
Tab. A5-395: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-396: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.133 Bay type No. 117: Feeder bay with switch disconnector / fuse unit, double busbar, direct motor control

A23.405.M04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
F (SIG_1: Signal S011 EXT)		U B05	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-397: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0) & (*Q8*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

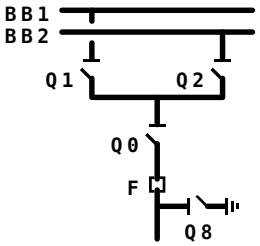
Tab. A5-398: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Close(d)	(*Q8*=0)
Q2	Close(d)	(*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

Tab. A5-399: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.134 Bay type No. 118: Feeder bay with switch disconnector / fuse unit, double busbar

A23.405.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q2 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-400: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

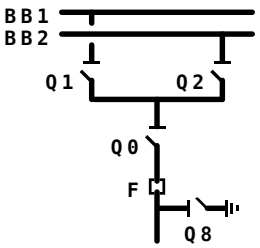
Tab. A5-401: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-402: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.135 Bay type No. 119: Feeder bay with switch disconnector / fuse unit, double busbar

A23.405.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-403: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0) & (*Q8*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q8*=0)

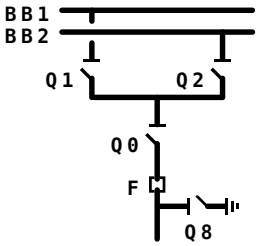
Tab. A5-404: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Close(d)	(*Q8*=0)
Q2	Close(d)	(*Q8*=0)

Tab. A5-405: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.136 Bay type No. 120: Feeder bay with switch disconnector / fuse unit, double busbar

A23.405.R04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-406: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0) & (*Q8*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

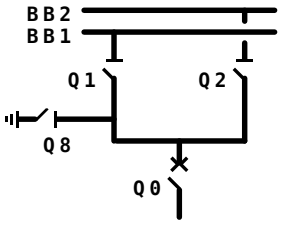
Tab. A5-407: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Close(d)	(*Q8*=0)
Q2	Close(d)	(*Q8*=0)
Q8	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0)

Tab. A5-408: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.137 Bay type No. 222: Feeder bay with circuit breaker, double busbar, direct motor control

A25.105.M03.1

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-409: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0) & (*Q8*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q8*=0)

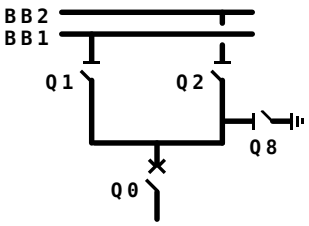
Tab. A5-410: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Close(d)	(*Q8*=0)
Q2	Close(d)	(*Q8*=0)

Tab. A5-411: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.138 Bay type No. 223: Feeder bay with circuit breaker, double busbar, direct motor control

A25.105.M03.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-412: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0) & (*Q8*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q8*=0)

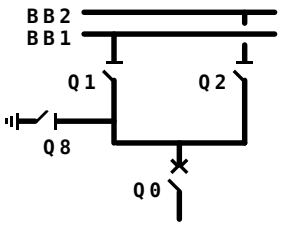
Tab. A5-413: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Close(d)	(*Q8*=0)
Q2	Close(d)	(*Q8*=0)

Tab. A5-414: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.139 Bay type No. 121: Feeder bay with circuit breaker, double busbar, direct motor control

A25.105.M04.1

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-415: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0) & (*Q8*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q8*=0)
Q8	Open	(*Q0*=I) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & /(FctBl1=I) & /(FctBl2=I)

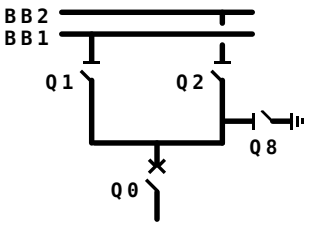
Tab. A5-416: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Close(d)	(*Q8*=0)
Q2	Close(d)	(*Q8*=0)
Q8	Open	(*Q0*=I) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-417: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.140 Bay type No. 122: Feeder bay with circuit breaker, double busbar, direct motor control

A25.105.M04.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-418: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0) & (*Q8*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q8*=0)
Q8	Open	(*Q0*=I) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & /(FctBl1=I) & (FctBl2=I)

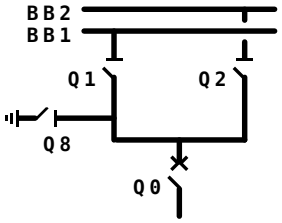
Tab. A5-419: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Close(d)	(*Q8*=0)
Q2	Close(d)	(*Q8*=0)
Q8	Open	(*Q0*=I) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-420: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.141 Bay type No. 123: Feeder bay with circuit breaker, double busbar

A25.105.R01.1

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q2 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-421: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

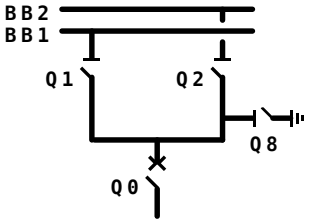
Tab. A5-422: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-423: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.142 Bay type No. 124: Feeder bay with circuit breaker, double busbar

A25.105.R01.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q2 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-424: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

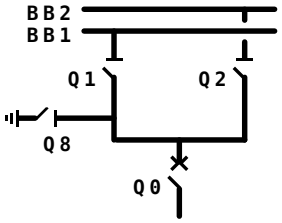
Tab. A5-425: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-426: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.143 Bay type No. 224: Feeder bay with circuit breaker, double busbar

A25.105.R03.1

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-427: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0) & (*Q8*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q8*=0)

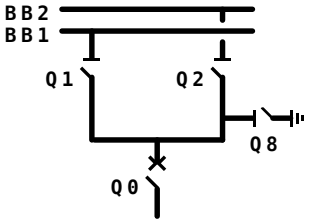
Tab. A5-428: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Close(d)	(*Q8*=0)
Q2	Close(d)	(*Q8*=0)

Tab. A5-429: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.144 Bay type No. 225: Feeder bay with circuit breaker, double busbar

A25.105.R03.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-430: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0) & (*Q8*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q8*=0)

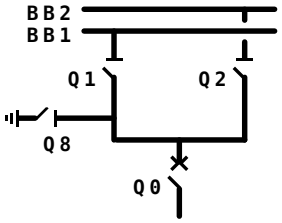
Tab. A5-431: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Close(d)	(*Q8*=0)
Q2	Close(d)	(*Q8*=0)

Tab. A5-432: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.145 Bay type No. 125: Feeder bay with circuit breaker, double busbar

A25.105.R04.1

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	

Tab. A5-433: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0) & (*Q8*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q8*=0)
Q8	Open	(*Q0*=I) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & /(FctBl1=I) & /(FctBl2=I)

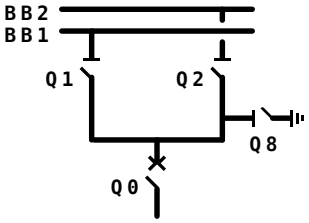
Tab. A5-434: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Close(d)	(*Q8*=0)
Q2	Close(d)	(*Q8*=0)
Q8	Open	(*Q0*=I) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-435: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.146 Bay type No. 126: Feeder bay with circuit breaker, double busbar

A25.105.R04.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	

Tab. A5-436: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0) & (*Q8*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q8*=0)
Q8	Open	(*Q0*=I) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & /(FctBl1=I) & /(FctBl2=I)

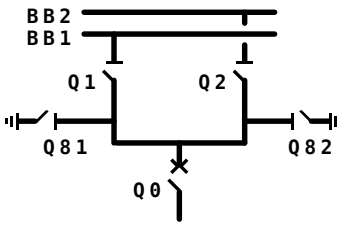
Tab. A5-437: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Close(d)	(*Q8*=0)
Q2	Close(d)	(*Q8*=0)
Q8	Open	(*Q0*=I) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-438: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.147 Bay type No. 127: Feeder bay with circuit breaker, double busbar

A25.128.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q2 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q81 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q82 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-439: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q81*=0) & (*Q82*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q81*=0) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)

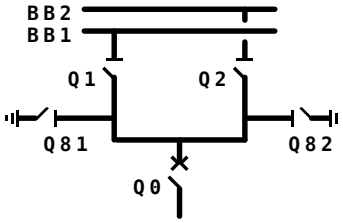
Tab. A5-440: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q81*=0) & (*Q82*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q81*=0) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-441: Bay Interlock Equations for Operation with Station Interlocking

A5.2.1.148 Bay type No. 128: Feeder bay with circuit breaker, double busbar

A25.128.R05

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q81 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q82 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	

Tab. A5-442: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q81*=0) & (*Q82*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q81*=0) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0) & (*Q81*=0) & (*Q82*=0)
Q2	Open	(*Q0*=0) & (*Q1*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q81*=0) & (*Q82*=0)
Q81	Open	(*Q0*=I) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & /(FctBl1=I) & /(FctBl2=I)
Q82	Open	(*Q0*=I) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-443: Bay Interlock Equations for Operation without Station Interlocking

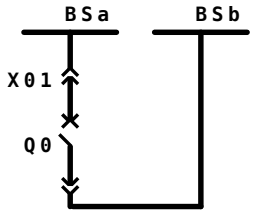
Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q81*=0) & (*Q82*=0)
	Close(d)	/(*Q1*=X) & /(*Q2*=X) & (*Q81*=0) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)
Q1	Close(d)	(*Q81*=0) & (*Q82*=0)
Q2	Close(d)	(*Q81*=0) & (*Q82*=0)
Q81	Open	(*Q0*=I) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & /(FctBl1=I) & /(FctBl2=I)
Q82	Open	(*Q0*=I) & (*Q1*=0) & (*Q2*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-444: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2 Bus Sectionalizer Bays

A5.2.2.1 Bay type No. 133: Bus sectionalizer bay with circuit breaker, single busbar

L11.100.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X01 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	

Tab. A5-445: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(FctBl1=I) & /(FctBl2=I)

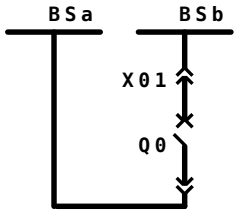
Tab. A5-446: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-447: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.2 Bay type No. 553: Bus sectionalizer bay with circuit breaker, single busbar

L11.100.R01.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X01 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	

Tab. A5-448: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(FctBl1=I) & /(FctBl2=I)

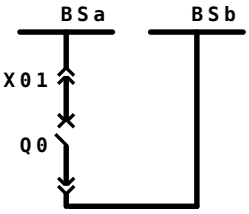
Tab. A5-449: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-450: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.3 Bay type No. 134: Bus sectionalizer bay with circuit breaker, single busbar

L11.100.R02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X01 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	

Tab. A5-451: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(FctBl1=I) & /(FctBl2=I)
X01	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

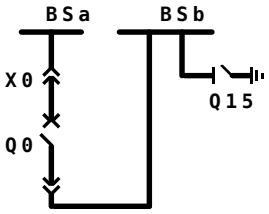
Tab. A5-452: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(FctBl1=I) & /(FctBl2=I)
X01	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-453: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.4 Bay type No. 528: Bus sectionalizer bay with circuit breaker, single busbar

L11.102.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q15 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-454: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & (*Q15*=0) & /(FctBl1=I) & /(FctBl2=I)

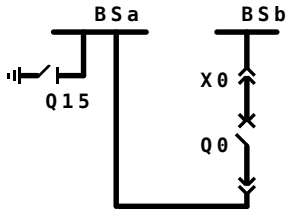
Tab. A5-455: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & (*Q15*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-456: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.5 Bay type No. 542: Bus sectionalizer bay with circuit breaker, single busbar

L11.102.R01.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q15 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-457: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & (*Q15*=0) & /(FctBl1=I) & /(FctBl2=I)

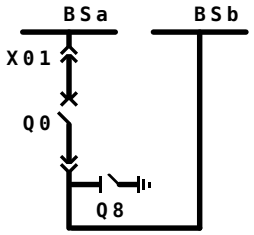
Tab. A5-458: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & (*Q15*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-459: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.6 Bay type No. 135: Bus sectionalizer bay with circuit breaker, single busbar

L11.104.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X01 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-460: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(FctBl1=I) & /(FctBl2=I)

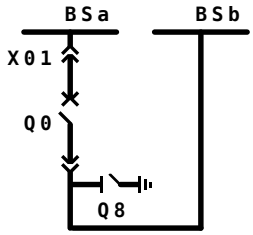
Tab. A5-461: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-462: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.7 Bay type No. 136: Bus sectionalizer bay with circuit breaker, single busbar

L11.104.R02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X01 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-463: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(FctBl1=I) & /(FctBl2=I)
X01	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

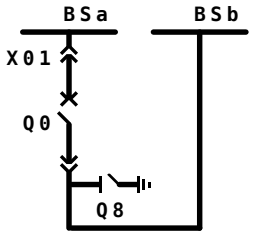
Tab. A5-464: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(FctBl1=I) & /(FctBl2=I)
X01	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-465: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.8 Bay type No. 137: Bus sectionalizer bay with circuit breaker, single busbar

L11.104.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X01 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q8 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	

Tab. A5-466: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X01*=0) & (*Q8*=I)
X01	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

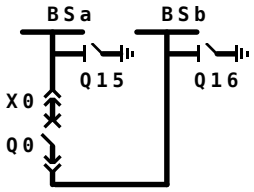
Tab. A5-467: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X01*=0)
X01	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-468: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.9 Bay type No. 547: Bus sectionalizer bay with circuit breaker, single busbar, direct motor control

L11.112.M04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q15 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q16 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-469: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
Q15	Close(d)	(*Q15*=I)
Q16	Close(d)	(*Q16*=I)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0) & (*Q16*=0)

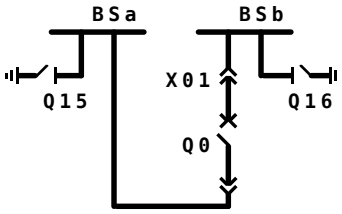
Tab. A5-470: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0) & (*Q16*=0)

Tab. A5-471: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.10 Bay type No. 564: Bus sectionalizer bay with circuit breaker, single busbar

L11.112.R01.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X01 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q15 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q16 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-472: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)

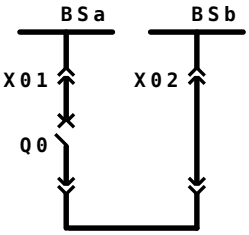
Tab. A5-473: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-474: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.11 Bay type No. 138: Bus sectionalizer bay with circuit breaker, single busbar

L11.116.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X01 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
X02 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-475: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)

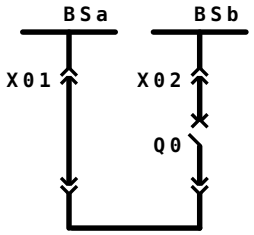
Tab. A5-476: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-477: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.12 Bay type No. 545: Bus sectionalizer bay with circuit breaker, single busbar

L11.116.R01.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X01 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
X02 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-478: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)

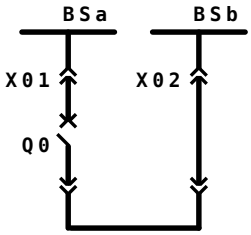
Tab. A5-479: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-480: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.13 Bay type No. 139: Bus sectionalizer bay with circuit breaker, single busbar

L11.116.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X01 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X02 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	

Tab. A5-481: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
X01	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
X02	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

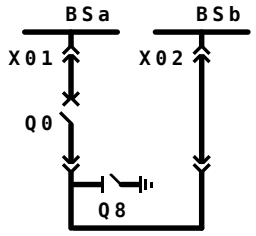
Tab. A5-482: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
X01	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
X02	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-483: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.14 Bay type No. 548: Bus sectionalizer bay with circuit breaker, single busbar, direct motor control

L11.120.M03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q8 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X02 ()	Open	U B01	/	
	Close(d)	U B02	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-484: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X01*=0) & (*X02*=0)
X01	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

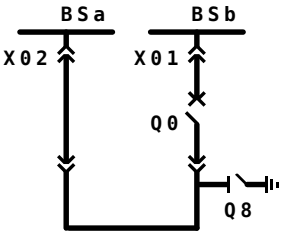
Tab. A5-485: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X01*=0) & (*X02*=0)
X01	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-486: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.15 Bay type No. 552: Bus sectionalizer bay with circuit breaker, single busbar, direct motor control

L11.120.M03.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q8 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X02 ()	Open	U B01	/	
	Close(d)	U B02	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-487: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X01*=0) & (*X02*=0)
X01	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

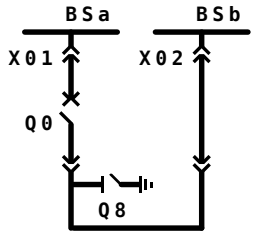
Tab. A5-488: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X01*=0) & (*X02*=0)
X01	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-489: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.16 Bay type No. 140: Bus sectionalizer bay with circuit breaker, single busbar

L11.120.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X01 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
X02 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-490: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)

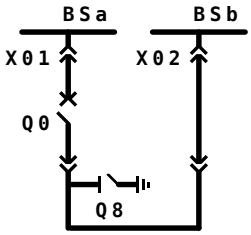
Tab. A5-491: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-492: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.17 Bay type No. 141: Bus sectionalizer bay with circuit breaker, single busbar

L11.120.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X01 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X02 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-493: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
X01	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
X02	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

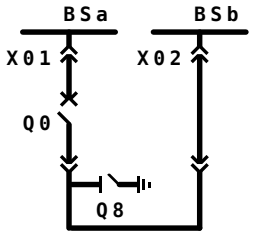
Tab. A5-494: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
X01	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
X02	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-495: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.18 Bay type No. 543: Bus sectionalizer bay with circuit breaker, single busbar

L11.120.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X01 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X02 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q8 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	

Tab. A5-496: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X01*=0) & (*X02*=0)
X01	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

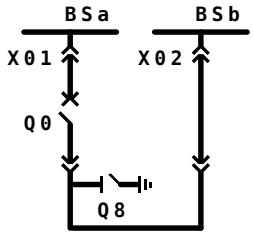
Tab. A5-497: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X01*=0) & (*X02*=0)
X01	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-498: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.19 Bay type No. 142: Bus sectionalizer bay with circuit breaker, single busbar

L11.120.R04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X01 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X02 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	

Tab. A5-499: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X01*=0) & (*X02*=0)
X01	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
X02	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

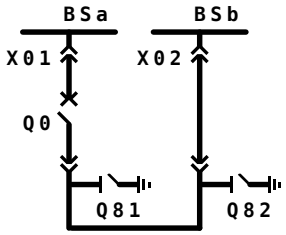
Tab. A5-500: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)
Q8	Close(d)	(*X01*=0) & (*X02*=0)
X01	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
X02	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-501: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.20 Bay type No. 558: Bus sectionalizer bay with circuit breaker, single busbar

L11.128.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X01 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
X02 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q81 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q82 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-502: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)

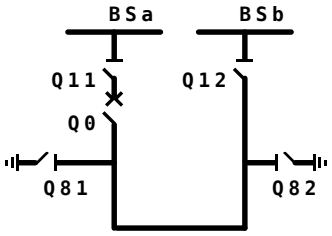
Tab. A5-503: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-504: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.21 Bay type No. 143: Bus sectionalizer bay with circuit breaker, single busbar, direct motor control

L13.113.M03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q12 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q81 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q82 ()	Open	U B03	/	
	Close(d)	U B04	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-505: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q81*=0) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)

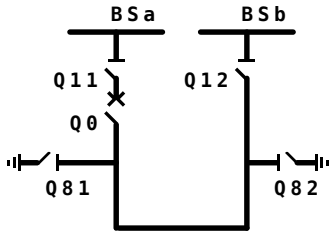
Tab. A5-506: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q81*=0) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)

Tab. A5-507: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.22 Bay type No. 144: Bus sectionalizer bay with circuit breaker, single busbar, direct motor control

L13.113.M05

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q12 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q81 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q82 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-508: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q81*=0) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)
Q81	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=0)
Q82	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=0)

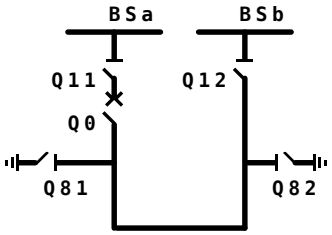
Tab. A5-509: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q81*=0) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)
Q81	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=0)
Q82	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=0)

Tab. A5-510: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.23 Bay type No. 145: Bus sectionalizer bay with circuit breaker, single busbar

L13.113.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q12 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q81 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q82 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-511: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q81*=0) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)

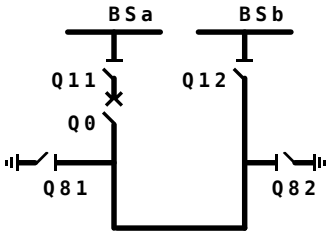
Tab. A5-512: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q81*=0) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-513: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.24 Bay type No. 146: Bus sectionalizer bay with circuit breaker, single busbar

L13.113.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q12 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q81 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q82 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-514: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q81*=0) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)

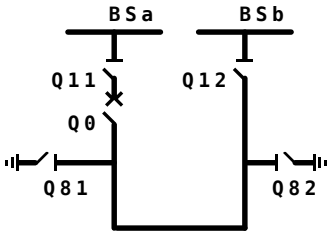
Tab. A5-515: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q81*=0) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)

Tab. A5-516: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.25 Bay type No. 517: Bus sectionalizer bay with circuit breaker, single busbar

L13.113.R03.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q12 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q81 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q82 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-517: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q81*=0) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)
Q81	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=0)

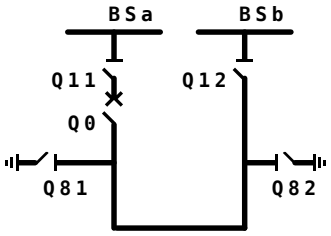
Tab. A5-518: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q81*=0) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)
Q81	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=0)

Tab. A5-519: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.26 Bay type No. 147: Bus sectionalizer bay with circuit breaker, single busbar

L13.113.R05

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q12 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q81 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q82 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	

Tab. A5-520: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q81*=0) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)
Q81	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=0)
Q82	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=0)

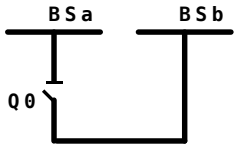
Tab. A5-521: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q81*=0) & (*Q82*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q81*=0) & (*Q82*=0)
Q81	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=0)
Q82	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=0)

Tab. A5-522: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.27 Bay type No. 148: Bus sectionalizer bay with switch disconnector, single busbar

L13.200.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	

Tab. A5-523: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

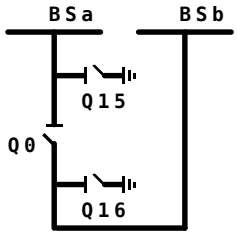
Tab. A5-524: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-525: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.28 Bay type No. 149: Bus sectionalizer bay with switch disconnector, single busbar

L13.202.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q15 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q16 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-526: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)

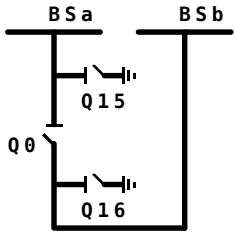
Tab. A5-527: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-528: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.29 Bay type No. 150: Bus sectionalizer bay with switch disconnector, single busbar

L13.202.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q15 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q16 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	

Tab. A5-529: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
Q15	Close(d)	(*Q0*=0) & (*Q15*=I)
Q16	Close(d)	(*Q0*=0) & (*Q16*=I)

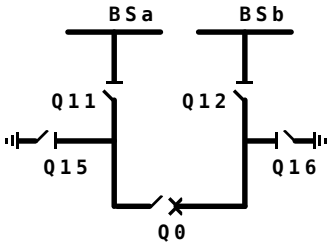
Tab. A5-530: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	(*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
Q15	Close(d)	(*Q0*=0)
Q16	Close(d)	(*Q0*=0)

Tab. A5-531: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.30 Bay type No. 226: Bus sectionalizer bay with circuit breaker, single busbar, direct motor control

L15.113.M03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q12 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q15 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q16 ()	Open	U B03	/	
	Close(d)	U B04	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-532: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q16*=0)

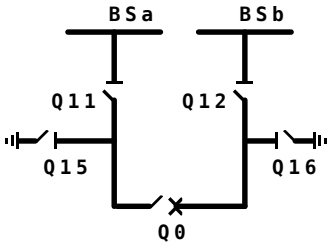
Tab. A5-533: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q16*=0)

Tab. A5-534: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.31 Bay type No. 151: Bus sectionalizer bay with circuit breaker, single busbar, direct motor control

L15.113.M05

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q12 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q15 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q16 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-535: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q16*=0)
Q15	Open	(*Q0*=I) & (*Q12*=I)
	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q15*=I)
Q16	Open	(*Q0*=I) & (*Q11*=I)
	Close(d)	(*Q0*=0) & (*Q12*=0) & (*Q11*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q16*=I)

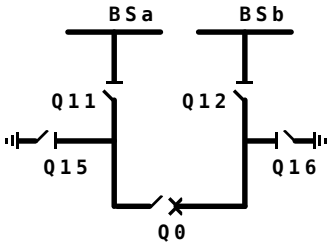
Tab. A5-536: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q16*=0)
Q15	Open	(*Q0*=I) & (*Q12*=I)
	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=I) & /(FctBl1=I) & /(FctBl2=I)
Q16	Open	(*Q0*=I) & (*Q11*=I)
	Close(d)	(*Q0*=0) & (*Q12*=0) & (*Q11*=I) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-537: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.32 Bay type No. 152: Bus sectionalizer bay with circuit breaker, single busbar

L15.113.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q12 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q15 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q16 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-538: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)

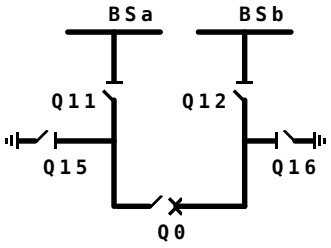
Tab. A5-539: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-540: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.33 Bay type No. 227: Bus sectionalizer bay with circuit breaker, single busbar

L15.113.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q12 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q15 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q16 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-541: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q16*=0)

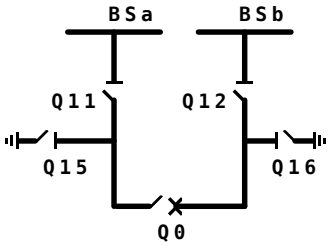
Tab. A5-542: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q16*=0)

Tab. A5-543: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.34 Bay type No. 153: Bus sectionalizer bay with circuit breaker, single busbar

L15.113.R05

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q12 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q15 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q16 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	

Tab. A5-544: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q16*=0)
Q15	Open	(*Q0*=I) & (*Q12*=I)
	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q15*=I)
Q16	Open	(*Q0*=I) & (*Q11*=I)
	Close(d)	(*Q0*=0) & (*Q12*=0) & (*Q11*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q16*=I)

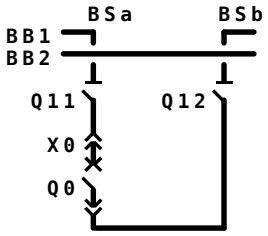
Tab. A5-545: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q16*=0)
Q15	Open	(*Q0*=I) & (*Q12*=I)
	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=I) & /(FctBl1=I) & /(FctBl2=I)
Q16	Open	(*Q0*=I) & (*Q11*=I)
	Close(d)	(*Q0*=0) & (*Q12*=0) & (*Q11*=I) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-546: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.35 Bay type No. 154: Bus sectionalizer bay with circuit breaker, double busbar, direct motor control

L21.101.M04.1

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q12 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-547: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
X0	Open	(*Q0*=0) & (*Q11*=0) & (*Q12*=0)
	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=0)

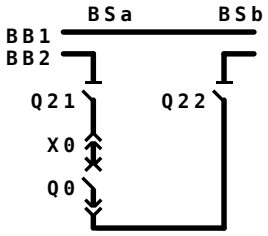
Tab. A5-548: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
X0	Open	(*Q0*=0) & (*Q11*=0) & (*Q12*=0)
	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=0)

Tab. A5-549: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.36 Bay type No. 155: Bus sectionalizer bay with circuit breaker, double busbar, direct motor control

L21.101.M04.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q21 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q22 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-550: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q21*=X) & /(*Q22*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q21	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q22	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
X0	Open	(*Q0*=0) & (*Q21*=0) & (*Q22*=0)
	Close(d)	(*Q0*=0) & (*Q21*=0) & (*Q22*=0)

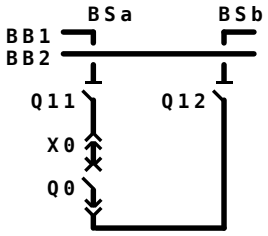
Tab. A5-551: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q21*=X) & /(*Q22*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q21	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q22	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
X0	Open	(*Q0*=0) & (*Q21*=0) & (*Q22*=0)
	Close(d)	(*Q0*=0) & (*Q21*=0) & (*Q22*=0)

Tab. A5-552: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.37 Bay type No. 156: Bus sectionalizer bay with circuit breaker, double busbar

L21.101.R01.1

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q12 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-553: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

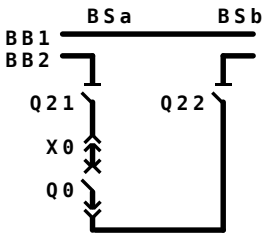
Tab. A5-554: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-555: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.38 Bay type No. 157: Bus sectionalizer bay with circuit breaker, double busbar

L21.101.R01.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q21 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q22 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-556: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q21*=X) & /(*Q22*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

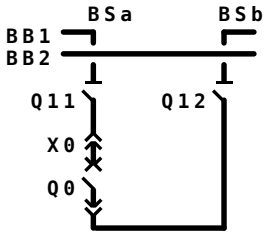
Tab. A5-557: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q21*=X) & /(*Q22*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-558: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.39 Bay type No. 158: Bus sectionalizer bay with circuit breaker, double busbar

L21.101.R03.1

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q12 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-559: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

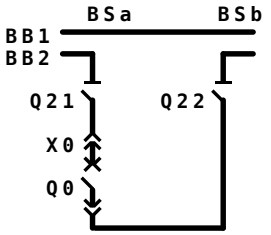
Tab. A5-560: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-561: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.40 Bay type No. 159: Bus sectionalizer bay with circuit breaker, double busbar

L21.101.R03.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q21 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q22 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-562: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q21*=X) & /(*Q22*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q21	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q22	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

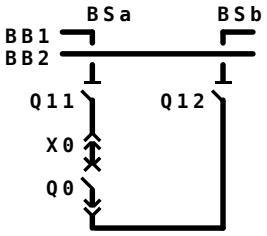
Tab. A5-563: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q21*=X) & /(*Q22*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q21	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q22	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-564: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.41 Bay type No. 160: Bus sectionalizer bay with circuit breaker, double busbar

L21.101.R04.1

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q12 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	

Tab. A5-565: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
X0	Open	(*Q0*=0) & (*Q11*=0) & (*Q12*=0)
	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=0)

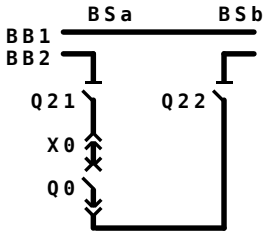
Tab. A5-566: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
X0	Open	(*Q0*=0) & (*Q11*=0) & (*Q12*=0)
	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=0)

Tab. A5-567: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.42 Bay type No. 161: Bus sectionalizer bay with circuit breaker, double busbar

L21.101.R04.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q21 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q22 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	

Tab. A5-568: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q21*=X) & /(*Q22*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q21	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q22	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
X0	Open	(*Q0*=0) & (*Q21*=0) & (*Q22*=0)
	Close(d)	(*Q0*=0) & (*Q21*=0) & (*Q22*=0)

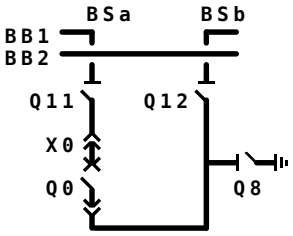
Tab. A5-569: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q21*=X) & /(*Q22*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q21	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q22	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
X0	Open	(*Q0*=0) & (*Q21*=0) & (*Q22*=0)
	Close(d)	(*Q0*=0) & (*Q21*=0) & (*Q22*=0)

Tab. A5-570: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.43 Bay type No. 513: Bus sectionalizer bay with circuit breaker, double busbar

L21.109.R03.1

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q12 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-571: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & /(*X0*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

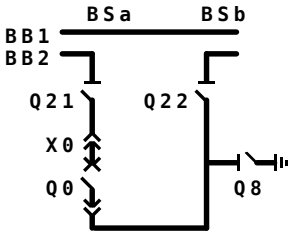
Tab. A5-572: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q11*=X) & /(*Q12*=X) & /(*X0*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-573: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.44 Bay type No. 514: Bus sectionalizer bay with circuit breaker, double busbar

L21.109.R03.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q21 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q22 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q8 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-574: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q21*=X) & /(*Q22*=X) & /(*X0*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q21	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q22	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

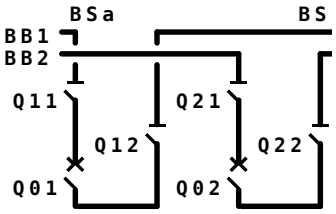
Tab. A5-575: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q21*=X) & /(*Q22*=X) & /(*X0*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q21	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q22	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-576: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.45 Bay type No. 162: Bus sectionalizer bay with circuit breaker, double busbar

L23.101.R02

Switchgear unit		Binary input	Output relay	
Q01 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q02 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q11 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q12 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q21 ()	Open	U B03	/	
	Close(d)	U B04	/	
Q22 ()	Open	U B05	/	
	Close(d)	U B06	/	

Tab. A5-577: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*Q11*=X) & /(*Q12*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*Q21*=X) & /(*Q22*=X) & /(FctBl1=I) & /(FctBl2=I)

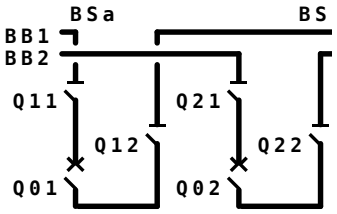
Tab. A5-578: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*Q11*=X) & /(*Q12*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*Q21*=X) & /(*Q22*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-579: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.46 Bay type No. 163: Bus sectionalizer bay with circuit breaker, double busbar

L23.101.R06

Switchgear unit		Binary input	Output relay	
Q01 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q02 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q11 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q12 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q21 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
Q22 ()	Open	U B05	K B05	
	Close(d)	U B06	K B06	

Tab. A5-580: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*Q11*=X) & /(*Q12*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*Q21*=X) & /(*Q22*=X) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q01*=0)
	Close(d)	(*Q01*=0)
Q12	Open	(*Q01*=0)
	Close(d)	(*Q01*=0)
Q21	Open	(*Q02*=0)
	Close(d)	(*Q02*=0)
Q22	Open	(*Q02*=0)
	Close(d)	(*Q02*=0)

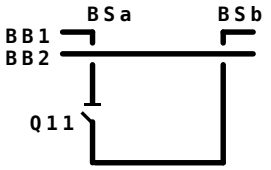
Tab. A5-581: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q01	Close(d)	/(*Q11*=X) & /(*Q12*=X) & /(FctBl1=I) & /(FctBl2=I)
Q02	Close(d)	/(*Q21*=X) & /(*Q22*=X) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q01*=0)
	Close(d)	(*Q01*=0)
Q12	Open	(*Q01*=0)
	Close(d)	(*Q01*=0)
Q21	Open	(*Q02*=0)
	Close(d)	(*Q02*=0)
Q22	Open	(*Q02*=0)
	Close(d)	(*Q02*=0)

Tab. A5-582: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.47 Bay type No. 554: Bus sectionalizer bay with other switchgear unit, double busbar, direct motor control

L23.901.M01.1

Switchgear unit		Binary input	Output relay	
Q11 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-583: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

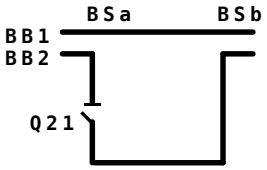
Tab. A5-584: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-585: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.48 Bay type No. 555: Bus sectionalizer bay with other switchgear unit, double busbar, direct motor control

L23.901.M01.2

Switchgear unit		Binary input	Output relay	
Q21 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-586: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

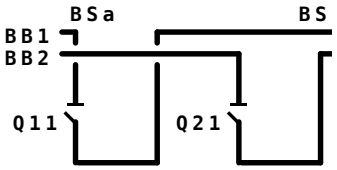
Tab. A5-587: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-588: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.49 Bay type No. 164: Bus sectionalizer bay with other switchgear unit, double busbar

L23.901.R02

Switchgear unit		Binary input	Output relay	
Q11 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q21 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	

Tab. A5-589: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q11	Open	(*Q11*=0)
	Close(d)	(*Q11*=I)
Q21	Open	(*Q21*=0)
	Close(d)	(*Q21*=I)

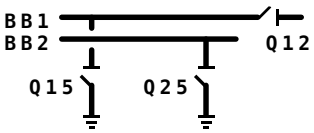
Tab. A5-590: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-591: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.50 Bay type No. 242: Bus sectionalizer bay with other switchgear unit, double busbar, direct motor control

L23.903.M01.3

Switchgear unit		Binary input	Output relay	
Q12 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q15 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q25 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-592: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q12	Open	(*Q12*=0)
	Close(d)	(*Q12*=I)

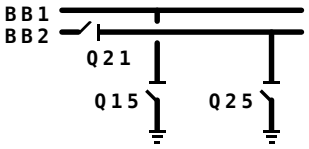
Tab. A5-593: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-594: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.51 Bay type No. 243: Bus sectionalizer bay with other switchgear unit, double busbar, direct motor control

L23.903.M01.4

Switchgear unit		Binary input	Output relay	
Q21 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q15 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q25 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-595: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q21	Open	(*Q21*=0)
	Close(d)	(*Q21*=I)

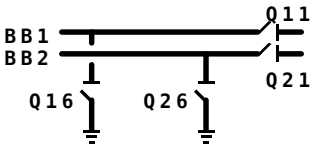
Tab. A5-596: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-597: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.52 Bay type No. 511: Bus sectionalizer bay with other switchgear unit, double busbar, direct motor control

L23.903.M02

Switchgear unit		Binary input	Output relay	
Q11 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q21 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q16 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q26 ()	Open	U B01	/	
	Close(d)	U B02	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-598: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q11	Open	(*Q11*=0)
	Close(d)	(*Q11*=I)
Q21	Open	(*Q21*=0)
	Close(d)	(*Q21*=I)

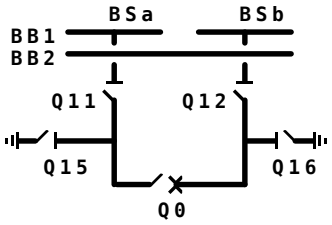
Tab. A5-599: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-600: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.53 Bay type No. 228: Bus sectionalizer bay with circuit breaker, double busbar, direct motor control

L25.113.M03.1

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q12 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q15 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q16 ()	Open	U B03	/	
	Close(d)	U B04	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-601: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q16*=0)

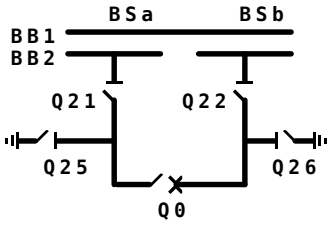
Tab. A5-602: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q16*=0)

Tab. A5-603: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.54 Bay type No. 229: Bus sectionalizer bay with circuit breaker, double busbar, direct motor control

L25.113.M03.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q21 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q22 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q25 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q26 ()	Open	U B03	/	
	Close(d)	U B04	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-604: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q25*=0) & (*Q26*=0)
	Close(d)	/(*Q21*=X) & /(*Q22*=X) & (*Q25*=0) & (*Q26*=0) & /(FctBl1=I) & /(FctBl2=I)
Q21	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q25*=0)
Q22	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q26*=0)

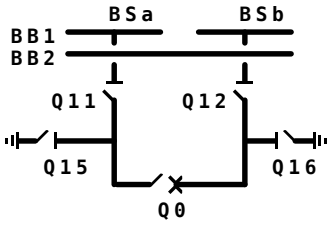
Tab. A5-605: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q25*=0) & (*Q26*=0)
	Close(d)	/(*Q21*=X) & /(*Q22*=X) & (*Q25*=0) & (*Q26*=0) & /(FctBl1=I) & /(FctBl2=I)
Q21	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q25*=0)
Q22	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q26*=0)

Tab. A5-606: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.55 Bay type No. 165: Bus sectionalizer bay with circuit breaker, double busbar, direct motor control

L25.113.M05.1

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q12 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q15 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q16 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-607: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q16*=0)
Q15	Open	(*Q0*=I) & (*Q12*=I)
	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q15*=I)
Q16	Open	(*Q0*=I) & (*Q11*=I)
	Close(d)	(*Q0*=0) & (*Q12*=0) & (*Q11*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q16*=I)

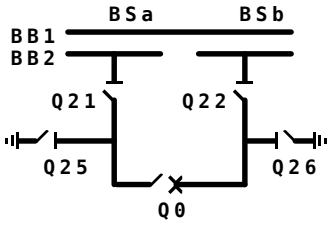
Tab. A5-608: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q16*=0)
Q15	Open	(*Q0*=I) & (*Q12*=I)
	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=I) & /(FctBl1=I) & /(FctBl2=I)
Q16	Open	(*Q0*=I) & (*Q11*=I)
	Close(d)	(*Q0*=0) & (*Q12*=0) & (*Q11*=I) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-609: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.56 Bay type No. 166: Bus sectionalizer bay with circuit breaker, double busbar, direct motor control

L25.113.M05.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q21 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q22 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q25 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q26 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-610: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q25*=0) & (*Q26*=0)
	Close(d)	/(*Q21*=X) & /(*Q22*=X) & (*Q25*=0) & (*Q26*=0) & /(FctBl1=I) & /(FctBl2=I)
Q21	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q25*=0)
Q22	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q26*=0)
Q25	Open	(*Q0*=I) & (*Q22*=I)
	Close(d)	(*Q0*=0) & (*Q21*=0) & (*Q22*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q25*=I)
Q26	Open	(*Q0*=I) & (*Q21*=I)
	Close(d)	(*Q0*=0) & (*Q22*=0) & (*Q21*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q26*=I)

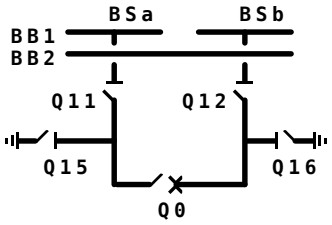
Tab. A5-611: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q25*=0) & (*Q26*=0)
	Close(d)	/(*Q21*=X) & /(*Q22*=X) & (*Q25*=0) & (*Q26*=0) & /(FctBl1=I) & /(FctBl2=I)
Q21	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q25*=0)
Q22	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q26*=0)
Q25	Open	(*Q0*=I) & (*Q22*=I)
	Close(d)	(*Q0*=0) & (*Q21*=0) & (*Q22*=I) & /(FctBl1=I) & /(FctBl2=I)
Q26	Open	(*Q0*=I) & (*Q21*=I)
	Close(d)	(*Q0*=0) & (*Q22*=0) & (*Q21*=I) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-612: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.57 Bay type No. 167: Bus sectionalizer bay with circuit breaker, double busbar

L25.113.R01.1

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q12 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q15 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q16 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-613: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)

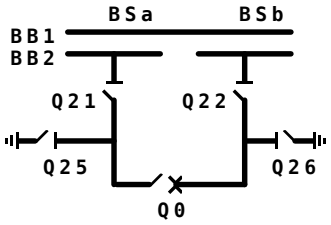
Tab. A5-614: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-615: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.58 Bay type No. 168: Bus sectionalizer bay with circuit breaker, double busbar

L25.113.R01.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q21 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q22 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q25 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q26 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-616: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q25*=0) & (*Q26*=0)
	Close(d)	/(*Q21*=X) & /(*Q22*=X) & (*Q25*=0) & (*Q26*=0) & /(FctBl1=I) & /(FctBl2=I)

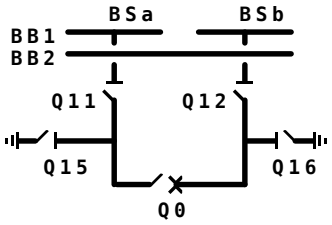
Tab. A5-617: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q25*=0) & (*Q26*=0)
	Close(d)	/(*Q21*=X) & /(*Q22*=X) & (*Q25*=0) & (*Q26*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-618: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.59 Bay type No. 230: Bus sectionalizer bay with circuit breaker, double busbar

L25.113.R03.1

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q12 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q15 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q16 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-619: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q16*=0)

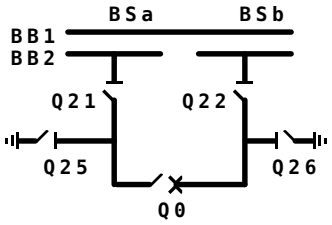
Tab. A5-620: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q16*=0)

Tab. A5-621: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.60 Bay type No. 231: Bus sectionalizer bay with circuit breaker, double busbar

L25.113.R03.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q21 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q22 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q25 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q26 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-622: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q25*=0) & (*Q26*=0)
	Close(d)	/(*Q21*=X) & /(*Q22*=X) & (*Q25*=0) & (*Q26*=0) & /(FctBl1=I) & /(FctBl2=I)
Q21	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q25*=0)
Q22	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q26*=0)

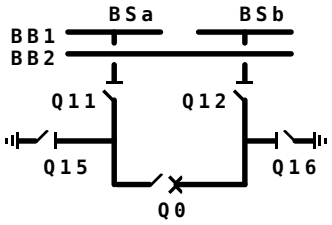
Tab. A5-623: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q25*=0) & (*Q26*=0)
	Close(d)	/(*Q21*=X) & /(*Q22*=X) & (*Q25*=0) & (*Q26*=0) & /(FctBl1=I) & /(FctBl2=I)
Q21	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q25*=0)
Q22	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q26*=0)

Tab. A5-624: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.61 Bay type No. 169: Bus sectionalizer bay with circuit breaker, double busbar

L25.113.R05.1

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q11 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q12 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q15 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q16 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	

Tab. A5-625: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q16*=0)
Q15	Open	(*Q0*=I) & (*Q12*=I)
	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q15*=I)
Q16	Open	(*Q0*=I) & (*Q11*=I)
	Close(d)	(*Q0*=0) & (*Q12*=0) & (*Q11*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q16*=I)

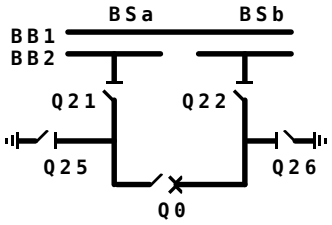
Tab. A5-626: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q16*=0)
	Close(d)	/(*Q11*=X) & /(*Q12*=X) & (*Q15*=0) & (*Q16*=0) & /(FctBl1=I) & /(FctBl2=I)
Q11	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q12	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q16*=0)
Q15	Open	(*Q0*=I) & (*Q12*=I)
	Close(d)	(*Q0*=0) & (*Q11*=0) & (*Q12*=I) & /(FctBl1=I) & /(FctBl2=I)
Q16	Open	(*Q0*=I) & (*Q11*=I)
	Close(d)	(*Q0*=0) & (*Q12*=0) & (*Q11*=I) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-627: Bay Interlock Equations for Operation with Station Interlocking

A5.2.2.62 Bay type No. 170: Bus sectionalizer bay with circuit breaker, double busbar

L25.113.R05.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q21 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q22 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q25 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q26 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	

Tab. A5-628: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q25*=0) & (*Q26*=0)
	Close(d)	/(*Q21*=X) & /(*Q22*=X) & (*Q25*=0) & (*Q26*=0) & /(FctBl1=I) & /(FctBl2=I)
Q21	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q25*=0)
Q22	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q26*=0)
Q25	Open	(*Q0*=I) & (*Q22*=I)
	Close(d)	(*Q0*=0) & (*Q21*=0) & (*Q22*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q25*=I)
Q26	Open	(*Q0*=I) & (*Q21*=I)
	Close(d)	(*Q0*=0) & (*Q22*=0) & (*Q21*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q26*=I)

Tab. A5-629: Bay Interlock Equations for Operation without Station Interlocking

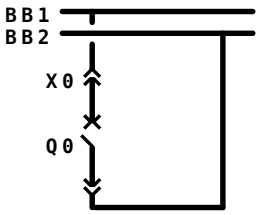
Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q25*=0) & (*Q26*=0)
	Close(d)	/(*Q21*=X) & /(*Q22*=X) & (*Q25*=0) & (*Q26*=0) & /(FctBl1=I) & /(FctBl2=I)
Q21	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q25*=0)
Q22	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q26*=0)
Q25	Open	(*Q0*=I) & (*Q22*=I)
	Close(d)	(*Q0*=0) & (*Q21*=0) & (*Q22*=I) & /(FctBl1=I) & /(FctBl2=I)
Q26	Open	(*Q0*=I) & (*Q21*=I)
	Close(d)	(*Q0*=0) & (*Q22*=0) & (*Q21*=I) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-630: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3 Bus Coupler Bays

A5.2.3.1 Bay type No. 505: Bus coupler bay with circuit breaker, double busbar

Q21.100.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	

Tab. A5-631: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

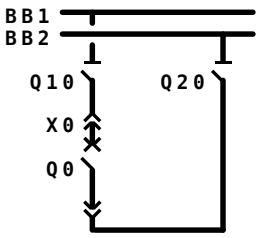
Tab. A5-632: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-633: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.2 Bay type No. 197: Bus coupler bay with circuit breaker, double busbar, direct motor control

Q21.101.M04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-634: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
X0	Open	(*Q0*=0) & (*Q10*=0) & (*Q20*=0)
	Close(d)	(*Q0*=0) & (*Q10*=0) & (*Q20*=0)

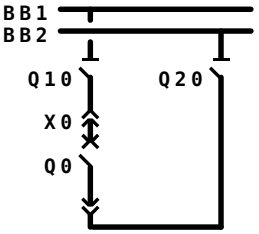
Tab. A5-635: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
X0	Open	(*Q0*=0) & (*Q10*=0) & (*Q20*=0)
	Close(d)	(*Q0*=0) & (*Q10*=0) & (*Q20*=0)

Tab. A5-636: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.3 Bay type No. 198: Bus coupler bay with circuit breaker, double busbar

Q21.101.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q20 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-637: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

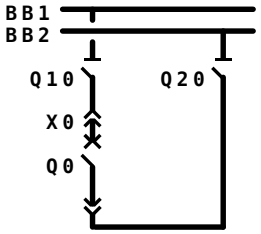
Tab. A5-638: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-639: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.4 Bay type No. 199: Bus coupler bay with circuit breaker, double busbar

Q21.101.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-640: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

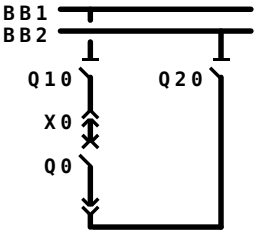
Tab. A5-641: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-642: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.5 Bay type No. 200: Bus coupler bay with circuit breaker, double busbar

Q21.101.R04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	

Tab. A5-643: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
X0	Open	(*Q0*=0) & (*Q10*=0) & (*Q20*=0)
	Close(d)	(*Q0*=0) & (*Q10*=0) & (*Q20*=0)

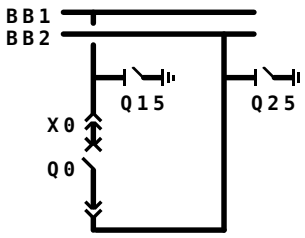
Tab. A5-644: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
X0	Open	(*Q0*=0) & (*Q10*=0) & (*Q20*=0)
	Close(d)	(*Q0*=0) & (*Q10*=0) & (*Q20*=0)

Tab. A5-645: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.6 Bay type No. 556: Bus coupler bay with circuit breaker, double busbar, direct motor control

Q21.112.M04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q15 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q25 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-646: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & (*Q15*=0) & (*Q25*=0) & /(FctBl1=I) & /(FctBl2=I)
Q15	Close(d)	(*Q15*=I)
Q25	Close(d)	(*Q25*=I)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

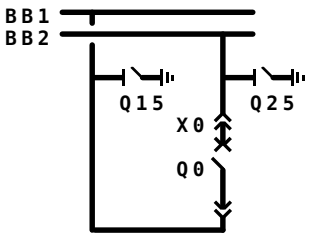
Tab. A5-647: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & (*Q15*=0) & (*Q25*=0) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-648: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.7 Bay type No. 565: Bus coupler bay with circuit breaker, double busbar, direct motor control

Q21.112.M04.2

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q15 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q25 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X0 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-649: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & (*Q15*=0) & (*Q25*=0) & /(FctBl1=I) & /(FctBl2=I)
Q15	Close(d)	(*Q15*=I)
Q25	Close(d)	(*Q25*=I)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

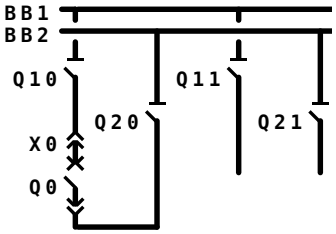
Tab. A5-650: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & (*Q15*=0) & (*Q25*=0) & /(FctBl1=I) & /(FctBl2=I)
X0	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-651: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.8 Bay type No. 201: Bus coupler bay with circuit breaker, double busbar

Q21.117.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q20 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q11 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q21 ()	Open	U B03	/	
	Close(d)	U B04	/	
X0 ()	Open	U B05	/	
	Close(d)	U B06	/	

Tab. A5-652: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

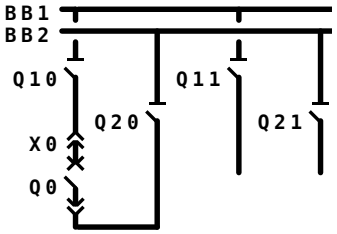
Tab. A5-653: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-654: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.9 Bay type No. 202: Bus coupler bay with circuit breaker, double busbar

Q21.117.R05

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q11 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q21 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
X0 ()	Open	U B05	/	
	Close(d)	U B06	/	

Tab. A5-655: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

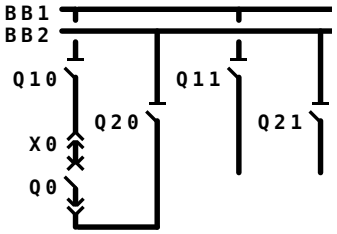
Tab. A5-656: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-657: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.10 Bay type No. 203: Bus coupler bay with circuit breaker, double busbar

Q21.117.R06

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q11 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q21 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
X0 ()	Open	U B05	K B05	
	Close(d)	U B06	K B06	

Tab. A5-658: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
X0	Open	(*Q0*=0) & (*Q10*=0) & (*Q20*=0)
	Close(d)	(*Q0*=0) & (*Q10*=0) & (*Q20*=0)

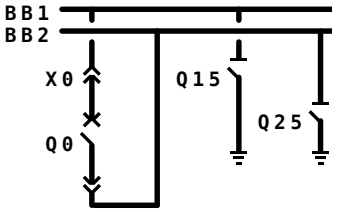
Tab. A5-659: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
X0	Open	(*Q0*=0) & (*Q10*=0) & (*Q20*=0)
	Close(d)	(*Q0*=0) & (*Q10*=0) & (*Q20*=0)

Tab. A5-660: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.11 Bay type No. 245: Bus coupler bay with circuit breaker, double busbar

Q21.132.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q15 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q25 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-661: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

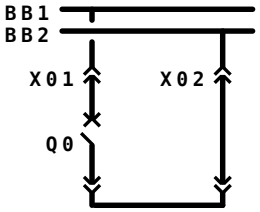
Tab. A5-662: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X0*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-663: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.12 Bay type No. 563: Bus coupler bay with circuit breaker, double busbar

Q21.133.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X01 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
X02 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-664: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)

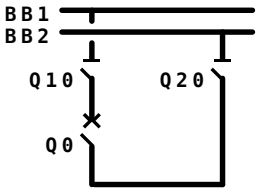
Tab. A5-665: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*X01*=X) & /(*X02*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-666: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.13 Bay type No. 204: Bus coupler bay with circuit breaker, double busbar, direct motor control

Q23.101.M03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-667: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

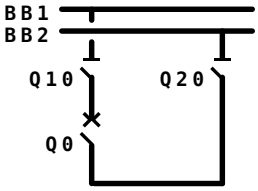
Tab. A5-668: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-669: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.14 Bay type No. 205: Bus coupler bay with circuit breaker, double busbar

Q23.101.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q20 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	

Tab. A5-670: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(FctBl1=I) & /(FctBl2=I)

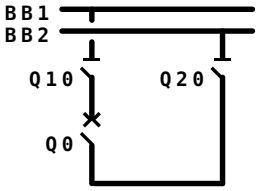
Tab. A5-671: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-672: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.15 Bay type No. 206: Bus coupler bay with circuit breaker, double busbar

Q23.101.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	

Tab. A5-673: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

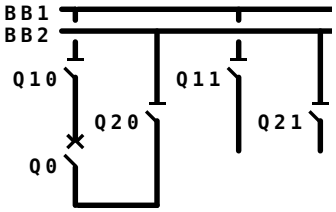
Tab. A5-674: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-675: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.16 Bay type No. 207: Bus coupler bay with circuit breaker, double busbar

Q23.117.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q20 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q11 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q21 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-676: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(FctBl1=I) & /(FctBl2=I)

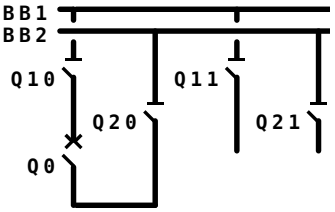
Tab. A5-677: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-678: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.17 Bay type No. 208: Bus coupler bay with circuit breaker, double busbar

Q23.117.R05

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q11 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q21 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	

Tab. A5-679: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

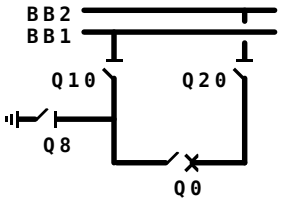
Tab. A5-680: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q10*=X) & /(*Q20*=X) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0)

Tab. A5-681: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.18 Bay type No. 236: Bus coupler bay with circuit breaker, double busbar, direct motor control

Q25.105.M03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-682: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

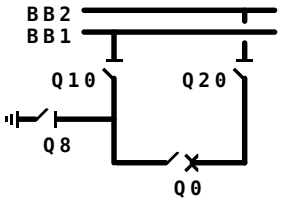
Tab. A5-683: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q20	Open	(*Q0*=0) & (*Q8*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-684: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.19 Bay type No. 209: Bus coupler bay with circuit breaker, double busbar, direct motor control

Q25.105.M04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-685: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Open	(*Q0*=I) & (*Q20*=I)
	Close(d)	(*Q0*=0) & (*Q10*=0) & (*Q20*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q8*=I)

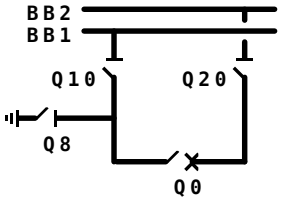
Tab. A5-686: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q20	Open	(*Q0*=0) & (*Q8*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Open	(*Q0*=I) & (*Q20*=I)
	Close(d)	(*Q0*=0) & (*Q10*=0) & (*Q20*=I) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-687: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.20 Bay type No. 210: Bus coupler bay with circuit breaker, double busbar

Q25.105.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q20 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-688: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

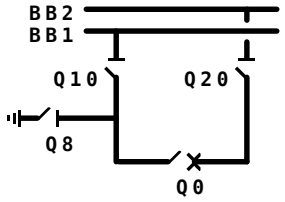
Tab. A5-689: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-690: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.21 Bay type No. 237: Bus coupler bay with circuit breaker, double busbar

Q25.105.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-691: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

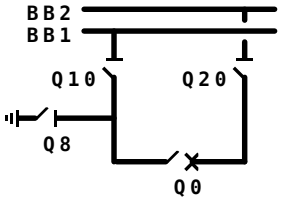
Tab. A5-692: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-693: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.22 Bay type No. 211: Bus coupler bay with circuit breaker, double busbar

Q25.105.R04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	

Tab. A5-694: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Open	(*Q0*=I) & (*Q20*=I)
	Close(d)	(*Q0*=0) & (*Q10*=0) & (*Q20*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q8*=I)

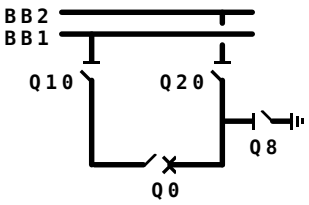
Tab. A5-695: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Open	(*Q0*=I) & (*Q20*=I)
	Close(d)	(*Q0*=0) & (*Q10*=0) & (*Q20*=I) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-696: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.23 Bay type No. 238: Bus coupler bay with circuit breaker, double busbar, direct motor control

Q25.109.M03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-697: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

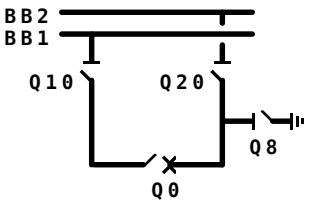
Tab. A5-698: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-699: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.24 Bay type No. 212: Bus coupler bay with circuit breaker, double busbar, direct motor control

Q25.109.M04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-700: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Open	(*Q0*=I) & (*Q10*=I)
	Close(d)	(*Q0*=0) & (*Q20*=0) & (*Q10*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q8*=I)

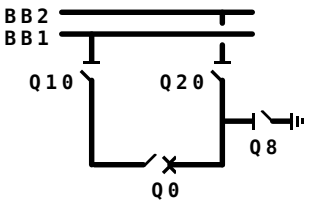
Tab. A5-701: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Open	(*Q0*=I) & (*Q10*=I)
	Close(d)	(*Q0*=0) & (*Q20*=0) & (*Q10*=I) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-702: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.25 Bay type No. 213: Bus coupler bay with circuit breaker, double busbar

Q25.109.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q20 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-703: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

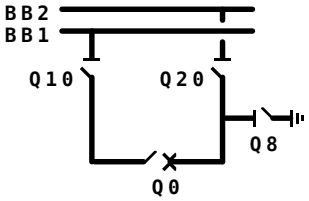
Tab. A5-704: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-705: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.26 Bay type No. 239: Bus coupler bay with circuit breaker, double busbar

Q25.109.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-706: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

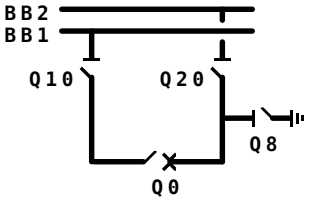
Tab. A5-707: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)

Tab. A5-708: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.27 Bay type No. 214: Bus coupler bay with circuit breaker, double busbar

Q25.109.R04

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q8 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	

Tab. A5-709: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Open	(*Q0*=I) & (*Q10*=I)
	Close(d)	(*Q0*=0) & (*Q20*=0) & (*Q10*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q8*=I)

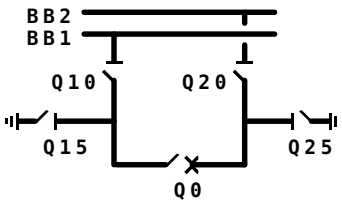
Tab. A5-710: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q8*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q8*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q8*=0)
Q8	Open	(*Q0*=I) & (*Q10*=I)
	Close(d)	(*Q0*=0) & (*Q20*=0) & (*Q10*=I) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-711: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.28 Bay type No. 240: Bus coupler bay with circuit breaker, double busbar, direct motor control

Q25.113.M03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q15 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q25 ()	Open	U B03	/	
	Close(d)	U B04	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-712: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q25*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q15*=0) & (*Q25*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q25*=0)

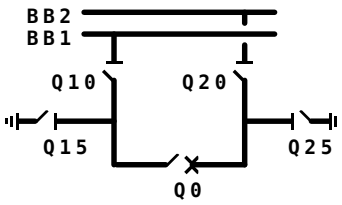
Tab. A5-713: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q25*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q15*=0) & (*Q25*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q25*=0)

Tab. A5-714: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.29 Bay type No. 215: Bus coupler bay with circuit breaker, double busbar, direct motor control

Q25.113.M05

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q15 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q25 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-715: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q25*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q15*=0) & (*Q25*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q15	Open	(*Q0*=I) & (*Q20*=I)
	Close(d)	(*Q0*=0) & (*Q10*=0) & (*Q20*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q15*=I)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q25*=0)
Q25	Open	(*Q0*=I) & (*Q10*=I)
	Close(d)	(*Q0*=0) & (*Q20*=0) & (*Q10*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q25*=I)

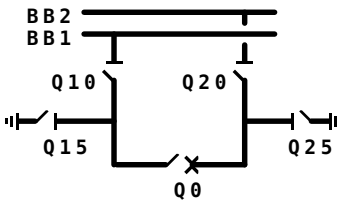
Tab. A5-716: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q25*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q15*=0) & (*Q25*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q15	Open	(*Q0*=I) & (*Q20*=I)
	Close(d)	(*Q0*=0) & (*Q10*=0) & (*Q20*=I) & /(FctBl1=I) & /(FctBl2=I)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q25*=0)
Q25	Open	(*Q0*=I) & (*Q10*=I)
	Close(d)	(*Q0*=0) & (*Q20*=0) & (*Q10*=I) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-717: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.30 Bay type No. 216: Bus coupler bay with circuit breaker, double busbar

Q25.113.R01

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Q20 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q15 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q25 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-718: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q25*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q15*=0) & (*Q25*=0) & /(FctBl1=I) & /(FctBl2=I)

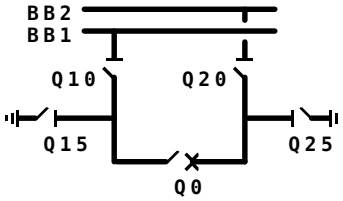
Tab. A5-719: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q25*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q15*=0) & (*Q25*=0) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-720: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.31 Bay type No. 241: Bus coupler bay with circuit breaker, double busbar

Q25.113.R03

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q15 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q25 ()	Open	U B03	/	
	Close(d)	U B04	/	

Tab. A5-721: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q25*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q15*=0) & (*Q25*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q25*=0)

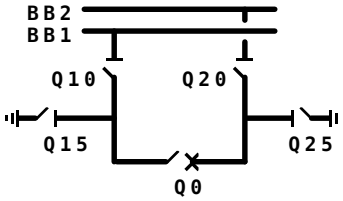
Tab. A5-722: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q25*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q15*=0) & (*Q25*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q25*=0)

Tab. A5-723: Bay Interlock Equations for Operation with Station Interlocking

A5.2.3.32 Bay type No. 217: Bus coupler bay with circuit breaker, double busbar

Q25.113.R05

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q15 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q25 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	

Tab. A5-724: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q25*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q15*=0) & (*Q25*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q15	Open	(*Q0*=I) & (*Q20*=I)
	Close(d)	(*Q0*=0) & (*Q10*=0) & (*Q20*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q15*=I)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q25*=0)
Q25	Open	(*Q0*=I) & (*Q10*=I)
	Close(d)	(*Q0*=0) & (*Q20*=0) & (*Q10*=I) & /(FctBl1=I) & /(FctBl2=I) & (*Q25*=I)

Tab. A5-725: Bay Interlock Equations for Operation without Station Interlocking

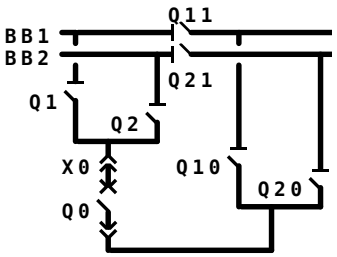
Switchgear unit	Control O/C	Interlock equation
Q0	Open	(*Q15*=0) & (*Q25*=0)
	Close(d)	/(*Q10*=X) & /(*Q20*=X) & (*Q15*=0) & (*Q25*=0) & /(FctBl1=I) & /(FctBl2=I)
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q15*=0)
Q15	Open	(*Q0*=I) & (*Q20*=I)
	Close(d)	(*Q0*=0) & (*Q10*=0) & (*Q20*=I) & /(FctBl1=I) & /(FctBl2=I)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q25*=0)
Q25	Open	(*Q0*=I) & (*Q10*=I)
	Close(d)	(*Q0*=0) & (*Q20*=0) & (*Q10*=I) & /(FctBl1=I) & /(FctBl2=I)

Tab. A5-726: Bay Interlock Equations for Operation with Station Interlocking

A5.2.4 Bus Coupler and Sectionalizer Bays

A5.2.4.1 Bay type No. 218: Bus coupler and sectionalizer bay with circuit breaker, double busbar

K29.101.R02

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	/	
	Close(d)	U A02	/	
Q10 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q20 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q11 ()	Open	U B01	/	
	Close(d)	U B02	/	
Q21 ()	Open	U B03	/	
	Close(d)	U B04	/	
X0 ()	Open	U B05	/	
	Close(d)	U B06	/	
Q1 ()	Open	U C01	/	
	Close(d)	U C02	/	
Q2 ()	Open	U C03	/	
	Close(d)	U C04	/	

Tab. A5-727: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q20*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q10*=0)

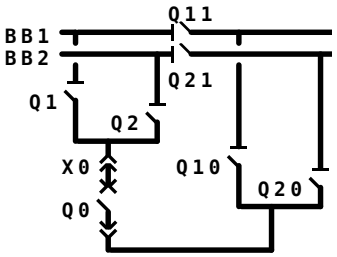
Tab. A5-728: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q10	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q20*=0)
Q20	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q10*=0)

Tab. A5-729: Bay Interlock Equations for Operation with Station Interlocking

A5.2.4.2 Bay type No. 219: Bus coupler and sectionalizer bay with circuit breaker, double busbar

K29.101.R06

Switchgear unit		Binary input	Output relay	
Q0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q1 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q2 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q11 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Q21 ()	Open	U B03	K B03	
	Close(d)	U B04	K B04	
X0 ()	Open	U B05	K B05	
	Close(d)	U B06	K B06	
Q10 ()	Open	U C01	/	
	Close(d)	U C02	/	
Q20 ()	Open	U C03	/	
	Close(d)	U C04	/	

Tab. A5-730: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(*Q10*=X) & /(*Q20*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q11	Open	(*Q0*=I) & (*Q1*=I) & (*Q10*=I) & (*X0*=I)
	Close(d)	(*Q0*=I) & (*Q1*=I) & (*Q10*=I) & (*X0*=I)
Q2	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
Q21	Open	(*Q0*=I) & (*Q2*=I) & (*Q20*=I) & (*X0*=I)
	Close(d)	(*Q0*=I) & (*Q2*=I) & (*Q20*=I) & (*X0*=I)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q10*=0) & (*Q20*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q10*=0) & (*Q20*=0)

Tab. A5-731: Bay Interlock Equations for Operation without Station Interlocking

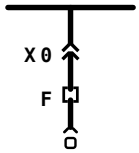
Switchgear unit	Control O/C	Interlock equation
Q0	Close(d)	/(*Q1*=X) & /(*Q2*=X) & /(*X0*=X) & /(*Q10*=X) & /(*Q20*=X) & /(FctBl1=I) & /(FctBl2=I)
Q1	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q2*=0)
Q11	Open	(*Q0*=I) & (*Q1*=I) & (*Q10*=I) & (*X0*=I)
	Close(d)	(*Q0*=I) & (*Q1*=I) & (*Q10*=I) & (*X0*=I)
Q2	Open	(*Q0*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0)
Q21	Open	(*Q0*=I) & (*Q2*=I) & (*Q20*=I) & (*X0*=I)
	Close(d)	(*Q0*=I) & (*Q2*=I) & (*Q20*=I) & (*X0*=I)
X0	Open	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q10*=0) & (*Q20*=0)
	Close(d)	(*Q0*=0) & (*Q1*=0) & (*Q2*=0) & (*Q10*=0) & (*Q20*=0)

Tab. A5-732: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5 Busbar Measurement Bays

A5.2.5.1 Bay type No. 171: Busbar measurement bay with fuse unit, single busbar

M11.300.R00

Switchgear unit		Binary input	Output relay	
X0 (*DEV01*)	Open	U A01	/	
	Close(d)	U A02	/	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-733: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

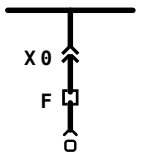
Tab. A5-734: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-735: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.2 Bay type No. 172: Busbar measurement bay with fuse unit, single busbar

M11.300.R01

Switchgear unit		Binary input	Output relay	
X0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-736: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

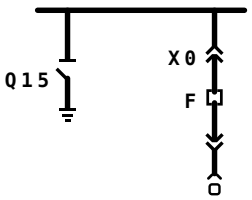
Tab. A5-737: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-738: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.3 Bay type No. 540: Busbar measurement bay with fuse unit, single busbar

M11.304.R02

Switchgear unit		Binary input	Output relay	
Q15 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
X0 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-739: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q15	Close(d)	(*Q15*=I)

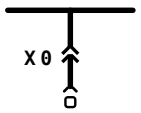
Tab. A5-740: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-741: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.4 Bay type No. 173: Busbar measurement bay with other switchgear unit, single busbar

M11.900.R00

Switchgear unit		Binary input	Output relay	
X0 (*DEV01*)	Open	U A01	/	
	Close(d)	U A02	/	

Tab. A5-742: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

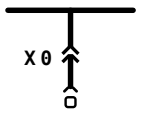
Tab. A5-743: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-744: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.5 Bay type No. 174: Busbar measurement bay with other switchgear unit, single busbar

M11.900.R01

Switchgear unit		Binary input	Output relay	
X0 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	

Tab. A5-745: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

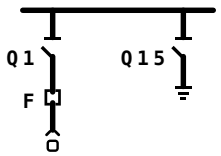
Tab. A5-746: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-747: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.6 Bay type No. 175: Busbar measurement bay with fuse unit, single busbar, direct motor control

M13.312.M02

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q15 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
F (SIG_1: Signal S011 EXT)		U B05	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-748: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q15	Close(d)	(*Q15*=I)

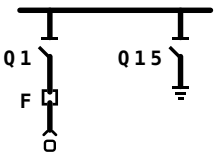
Tab. A5-749: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-750: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.7 Bay type No. 176: Busbar measurement bay with fuse unit, single busbar

M13.312.R01

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q15 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-751: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

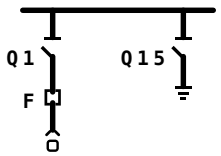
Tab. A5-752: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-753: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.8 Bay type No. 177: Busbar measurement bay with fuse unit, single busbar

M13.312.R02

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q15 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
F (SIG_1: Signal S011 EXT)		U B05	/	

Tab. A5-754: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q15	Close(d)	(*Q15*=I)

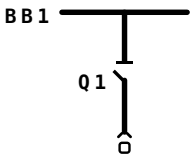
Tab. A5-755: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-756: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.9 Bay type No. 506: Busbar measurement bay with other switchgear unit, single busbar

M13.902.R00

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	/	
	Close(d)	U A02	/	

Tab. A5-757: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

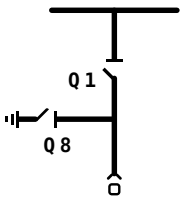
Tab. A5-758: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-759: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.10 Bay type No. 232: Busbar measurement bay with other switchgear unit, single busbar, direct motor control

M15.903.M01

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q8 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-760: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q1	Close(d)	(*Q8*=0)

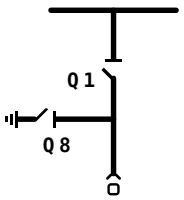
Tab. A5-761: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q1	Close(d)	(*Q8*=0)

Tab. A5-762: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.11 Bay type No. 178: Busbar measurement bay with other switchgear unit, single busbar, direct motor control

M15.903.M02

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q8 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-763: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q1	Close(d)	(*Q8*=0)
Q8	Close(d)	(*Q1*=0)

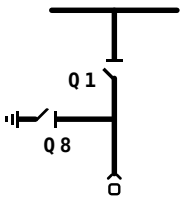
Tab. A5-764: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q1	Close(d)	(*Q8*=0)
Q8	Close(d)	(*Q1*=0)

Tab. A5-765: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.12 Bay type No. 233: Busbar measurement bay with other switchgear unit, single busbar

M15.903.R01

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q8 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	

Tab. A5-766: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q1	Close(d)	(*Q8*=0)

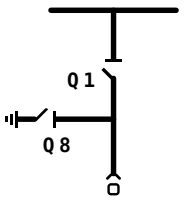
Tab. A5-767: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q1	Close(d)	(*Q8*=0)

Tab. A5-768: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.13 Bay type No. 179: Busbar measurement bay with other switchgear unit, single busbar

M15.903.R02

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q8 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	

Tab. A5-769: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q1	Close(d)	(*Q8*=0)
Q8	Close(d)	(*Q1*=0)

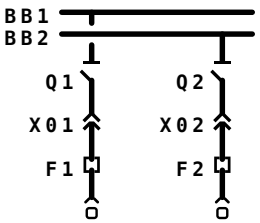
Tab. A5-770: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q1	Close(d)	(*Q8*=0)
Q8	Close(d)	(*Q1*=0)

Tab. A5-771: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.14 Bay type No. 180: Busbar measurement bay with fuse unit, double busbar

M21.302.R02

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q2 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X02 ()	Open	U B01	/	
	Close(d)	U B02	/	
F1 (SIG_1: Signal S011 EXT)		U B05	/	
F2 (SIG_1: Signal S012 EXT)		U B06	/	

Tab. A5-772: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

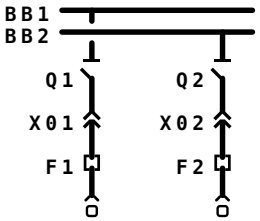
Tab. A5-773: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-774: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.15 Bay type No. 181: Busbar measurement bay with fuse unit, double busbar

M21.302.R04

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q2 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X02 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
F1 (SIG_1: Signal S011 EXT)		U B05	/	
F2 (SIG_1: Signal S012 EXT)		U B06	/	

Tab. A5-775: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
X01	Open	(*Q1*=0)
	Close(d)	(*Q1*=0)
X02	Open	(*Q2*=0)
	Close(d)	(*Q2*=0)

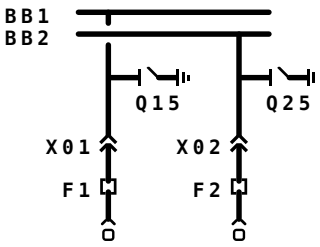
Tab. A5-776: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
X01	Open	(*Q1*=0)
	Close(d)	(*Q1*=0)
X02	Open	(*Q2*=0)
	Close(d)	(*Q2*=0)

Tab. A5-777: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.16 Bay type No. 182: Busbar measurement bay with fuse unit, double busbar

M21.312.R02

Switchgear unit		Binary input	Output relay	
Q15 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q25 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X02 ()	Open	U B01	/	
	Close(d)	U B02	/	
F1 (SIG_1: Signal S011 EXT)		U B05	/	
F2 (SIG_1: Signal S012 EXT)		U B06	/	

Tab. A5-778: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q15	Close(d)	(*Q15*=I)
Q25	Close(d)	(*Q25*=I)

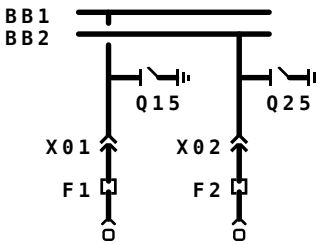
Tab. A5-779: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-780: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.17 Bay type No. 183: Busbar measurement bay with fuse unit, double busbar

M21.312.R04

Switchgear unit		Binary input	Output relay	
Q15 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q25 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X02 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
F1 (SIG_1: Signal S011 EXT)		U B05	/	
F2 (SIG_1: Signal S012 EXT)		U B06	/	

Tab. A5-781: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q15	Close(d)	(*Q15*=I)
Q25	Close(d)	(*Q25*=I)

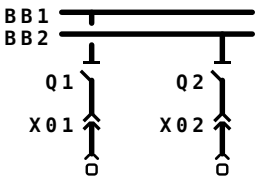
Tab. A5-782: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-783: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.18 Bay type No. 184: Busbar measurement bay with other switchgear unit, double busbar

M21.902.R02

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q2 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X02 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-784: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

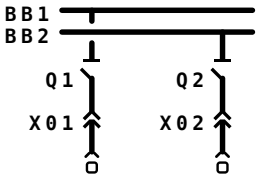
Tab. A5-785: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-786: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.19 Bay type No. 185: Busbar measurement bay with other switchgear unit, double busbar

M21.902.R04

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q2 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X02 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	

Tab. A5-787: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
X01	Open	(*Q1*=0)
	Close(d)	(*Q1*=0)
X02	Open	(*Q2*=0)
	Close(d)	(*Q2*=0)

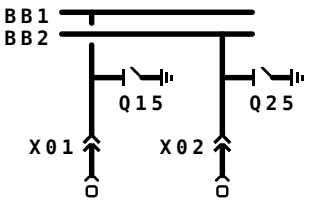
Tab. A5-788: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
X01	Open	(*Q1*=0)
	Close(d)	(*Q1*=0)
X02	Open	(*Q2*=0)
	Close(d)	(*Q2*=0)

Tab. A5-789: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.20 Bay type No. 186: Busbar measurement bay with other switchgear unit, double busbar

M21.912.R02

Switchgear unit		Binary input	Output relay	
Q15 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q25 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
X02 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-790: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q15	Close(d)	(*Q15*=I)
Q25	Close(d)	(*Q25*=I)

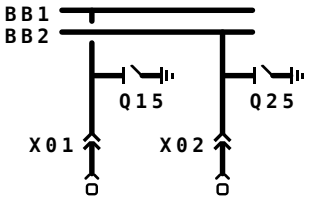
Tab. A5-791: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-792: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.21 Bay type No. 187: Busbar measurement bay with other switchgear unit, double busbar

M21.912.R04

Switchgear unit		Binary input	Output relay	
Q15 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q25 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
X01 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
X02 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	

Tab. A5-793: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q15	Close(d)	(*Q15*=I)
Q25	Close(d)	(*Q25*=I)

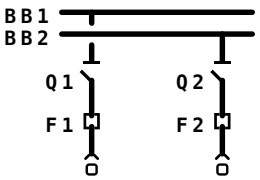
Tab. A5-794: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-795: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.22 Bay type No. 188: Busbar measurement bay with fuse unit, double busbar

M23.302.R02

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q2 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
F1 (SIG_1: Signal S011 EXT)		U B05	/	
F2 (SIG_1: Signal S012 EXT)		U B06	/	

Tab. A5-796: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

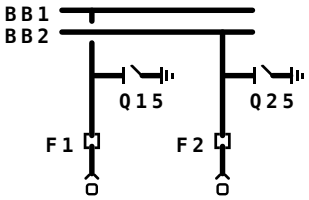
Tab. A5-797: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-798: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.23 Bay type No. 189: Busbar measurement bay with fuse unit, double busbar

M23.312.R02

Switchgear unit		Binary input	Output relay	
Q15 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q25 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
F1 (SIG_1: Signal S011 EXT)		U B05	/	
F2 (SIG_1: Signal S012 EXT)		U B06	/	

Tab. A5-799: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q15	Close(d)	(*Q15*=I)
Q25	Close(d)	(*Q25*=I)

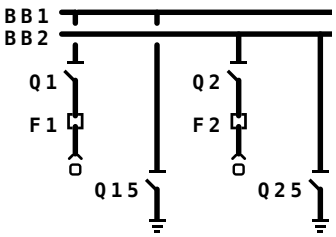
Tab. A5-800: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-801: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.24 Bay type No. 190: Busbar measurement bay with fuse unit, double busbar, direct motor control

M23.328.M04

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q2 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q15 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q25 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
F2 (SIG_1: Signal S010 EXT)		U B04	/	
F1 (SIG_1: Signal S011 EXT)		U B05	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-802: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q15	Close(d)	(*Q15*=I)
Q25	Close(d)	(*Q25*=I)

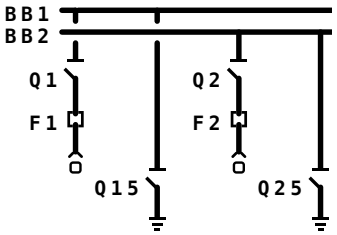
Tab. A5-803: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-804: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.25 Bay type No. 191: Busbar measurement bay with fuse unit, double busbar

M23.328.R02

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q2 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q15 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q25 ()	Open	U B01	/	
	Close(d)	U B02	/	
F1 (SIG_1: Signal S011 EXT)		U B05	/	
F2 (SIG_1: Signal S012 EXT)		U B06	/	

Tab. A5-805: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

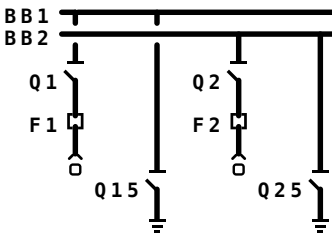
Tab. A5-806: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-807: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.26 Bay type No. 192: Busbar measurement bay with fuse unit, double busbar

M23.328.R04

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q2 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q15 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q25 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
F1 (SIG_1: Signal S011 EXT)		U B05	/	
F2 (SIG_1: Signal S012 EXT)		U B06	/	

Tab. A5-808: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q15	Close(d)	(*Q15*=I)
Q25	Close(d)	(*Q25*=I)

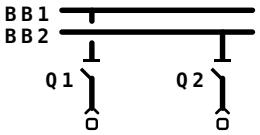
Tab. A5-809: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-810: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.27 Bay type No. 193: Busbar measurement bay with other switchgear unit, double busbar

M23.902.R02

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q2 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	

Tab. A5-811: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

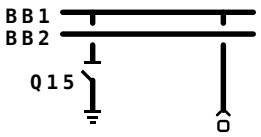
Tab. A5-812: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-813: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.28 Bay type No. 559: Busbar measurement bay with other switchgear unit, double busbar

M23.904.R00

Switchgear unit		Binary input	Output relay	
Q15 (*DEV01*)	Open	U A01	/	
	Close(d)	U A02	/	

Tab. A5-814: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

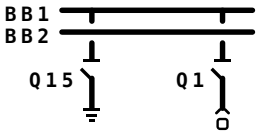
Tab. A5-815: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-816: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.29 Bay type No. 509: Busbar measurement bay with other switchgear unit, double busbar, direct motor control

M23.906.M01

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q15 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-817: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

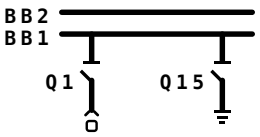
Tab. A5-818: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-819: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.30 Bay type No. 529: Busbar measurement bay with other switchgear unit, double busbar, direct motor control

M23.906.M02

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q15 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-820: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q15	Close(d)	(*Q15*=I)

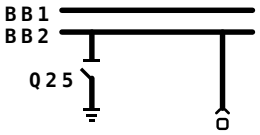
Tab. A5-821: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-822: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.31 Bay type No. 560: Busbar measurement bay with other switchgear unit, double busbar

M23.908.R00

Switchgear unit		Binary input	Output relay	
Q25 (*DEV01*)	Open	U A01	/	
	Close(d)	U A02	/	

Tab. A5-823: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

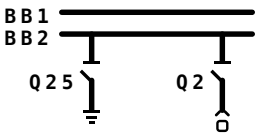
Tab. A5-824: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-825: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.32 Bay type No. 510: Busbar measurement bay with other switchgear unit, double busbar, direct motor control

M23.910.M01

Switchgear unit		Binary input	Output relay	
Q2 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q25 (*DEV02*)	Open	U A03	/	
	Close(d)	U A04	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-826: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

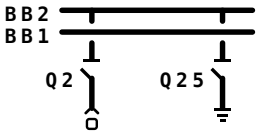
Tab. A5-827: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-828: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.33 Bay type No. 530: Busbar measurement bay with other switchgear unit, double busbar, direct motor control

M23.910.M02

Switchgear unit		Binary input	Output relay	
Q2 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q25 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-829: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q25	Close(d)	(*Q25*=I)

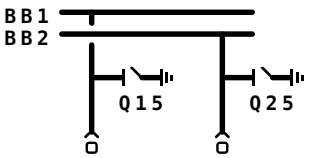
Tab. A5-830: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-831: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.34 Bay type No. 194: Busbar measurement bay with other switchgear unit, double busbar

M23.912.R02

Switchgear unit		Binary input	Output relay	
Q15 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q25 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	

Tab. A5-832: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q15	Close(d)	(*Q15*=I)
Q25	Close(d)	(*Q25*=I)

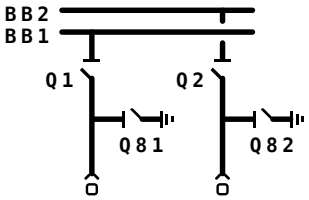
Tab. A5-833: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-834: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.35 Bay type No. 234: Busbar measurement bay with other switchgear unit, double busbar, direct motor control

M25.903.M02

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q2 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q81 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q82 ()	Open	U B01	/	
	Close(d)	U B02	/	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-835: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q1	Close(d)	(*Q81*=0)
Q2	Close(d)	(*Q82*=0)

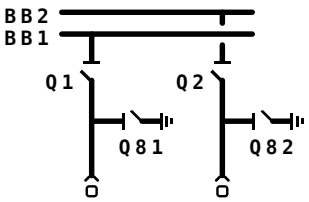
Tab. A5-836: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q1	Close(d)	(*Q81*=0)
Q2	Close(d)	(*Q82*=0)

Tab. A5-837: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.36 Bay type No. 195: Busbar measurement bay with other switchgear unit, double busbar, direct motor control

M25.903.M04

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q2 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q81 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q82 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-838: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q1	Close(d)	(*Q81*=0)
Q2	Close(d)	(*Q82*=0)
Q81	Close(d)	(*Q1*=0)
Q82	Close(d)	(*Q2*=0)

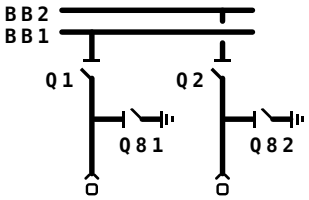
Tab. A5-839: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q1	Close(d)	(*Q81*=0)
Q2	Close(d)	(*Q82*=0)
Q81	Close(d)	(*Q1*=0)
Q82	Close(d)	(*Q2*=0)

Tab. A5-840: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.37 Bay type No. 235: Busbar measurement bay with other switchgear unit, double busbar

M25.903.R02

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q2 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q81 (*DEV03*)	Open	U A05	/	
	Close(d)	U A06	/	
Q82 ()	Open	U B01	/	
	Close(d)	U B02	/	

Tab. A5-841: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q1	Close(d)	(*Q81*=0)
Q2	Close(d)	(*Q82*=0)

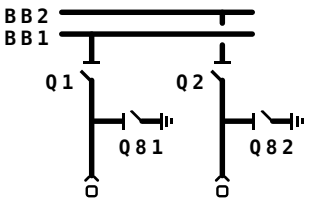
Tab. A5-842: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
Q1	Close(d)	(*Q81*=0)
Q2	Close(d)	(*Q82*=0)

Tab. A5-843: Bay Interlock Equations for Operation with Station Interlocking

A5.2.5.38 Bay type No. 196: Busbar measurement bay with other switchgear unit, double busbar

M25.903.R04

Switchgear unit		Binary input	Output relay	
Q1 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q2 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Q81 (*DEV03*)	Open	U A05	K A05	
	Close(d)	U A06	K A06	
Q82 ()	Open	U B01	K B01	
	Close(d)	U B02	K B02	

Tab. A5-844: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q1	Close(d)	(*Q81*=0)
Q2	Close(d)	(*Q82*=0)
Q81	Close(d)	(*Q1*=0)
Q82	Close(d)	(*Q2*=0)

Tab. A5-845: Bay Interlock Equations for Operation without Station Interlocking

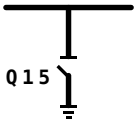
Switchgear unit	Control O/C	Interlock equation
Q1	Close(d)	(*Q81*=0)
Q2	Close(d)	(*Q82*=0)
Q81	Close(d)	(*Q1*=0)
Q82	Close(d)	(*Q2*=0)

Tab. A5-846: Bay Interlock Equations for Operation with Station Interlocking

A5.2.6 Busbar Grounding Bays

A5.2.6.1 Bay type No. 129: Busbar grounding bay with other switchgear unit, single busbar, direct motor control

E13.901.M01

Switchgear unit		Binary input	Output relay	
Q15 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-847: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q15	Close(d)	(*Q15*=I)

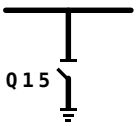
Tab. A5-848: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-849: Bay Interlock Equations for Operation with Station Interlocking

A5.2.6.2 Bay type No. 130: Busbar grounding bay with other switchgear unit, single busbar

E13.901.R01

Switchgear unit		Binary input	Output relay	
Q15 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	

Tab. A5-850: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q15	Close(d)	(*Q15*=I)

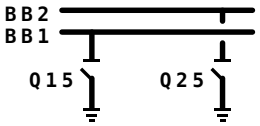
Tab. A5-851: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-852: Bay Interlock Equations for Operation with Station Interlocking

A5.2.6.3 Bay type No. 131: Busbar grounding bay with other switchgear unit, double busbar, direct motor control

E23.903.M02

Switchgear unit		Binary input	Output relay	
Q15 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q25 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	
Motor relay (SIG_1: Signal S012 EXT)		U B06	/	
Shunt winding (CMD_1: Command C011)		/	K B05	
Motor relay (CMD_1: Command C012)		/	K B06	

Tab. A5-853: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q15	Close(d)	(*Q15*=I)
Q25	Close(d)	(*Q25*=I)

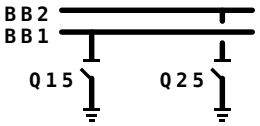
Tab. A5-854: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-855: Bay Interlock Equations for Operation with Station Interlocking

A5.2.6.4 Bay type No. 132: Busbar grounding bay with other switchgear unit, double busbar

E23.903.R02

Switchgear unit		Binary input	Output relay	
Q15 (*DEV01*)	Open	U A01	K A01	
	Close(d)	U A02	K A02	
Q25 (*DEV02*)	Open	U A03	K A03	
	Close(d)	U A04	K A04	

Tab. A5-856: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
Q15	Close(d)	(*Q15*=I)
Q25	Close(d)	(*Q25*=I)

Tab. A5-857: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-858: Bay Interlock Equations for Operation with Station Interlocking

A5.2.7 Other Bay Types

A5.2.7.1 Bay type No. 1: Other bay type with other switchgear unit, without busbar

X99.901.R00

Switchgear unit	Binary input	Output relay	
—			

Tab. A5-859: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-860: Bay Interlock Equations for Operation without Station Interlocking

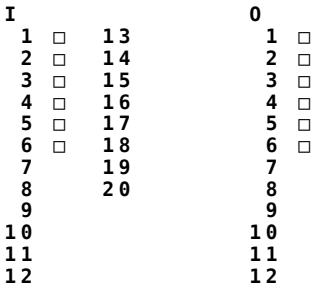
Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-861: Bay Interlock Equations for Operation with Station Interlocking

A5.2.7.2 Bay type No. 980: Other bay type with other switchgear unit, without busbar

X99.902.R06.2

Switchgear unit	Binary input	Output relay	
S001 (SIG_1: Signal S001 EXT)	U A01	/	
S002 (SIG_1: Signal S002 EXT)	U A02	/	
S003 (SIG_1: Signal S003 EXT)	U A03	/	
S004 (SIG_1: Signal S004 EXT)	U A04	/	
S005 (SIG_1: Signal S005 EXT)	U A05	/	
S006 (SIG_1: Signal S006 EXT)	U A06	/	
C001 (CMD_1: Command C001)	/	K A01	
C002 (CMD_1: Command C002)	/	K A02	
C003 (CMD_1: Command C003)	/	K A03	
C004 (CMD_1: Command C004)	/	K A04	
C005 (CMD_1: Command C005)	/	K A05	
C006 (CMD_1: Command C006)	/	K A06	



Tab. A5-862: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

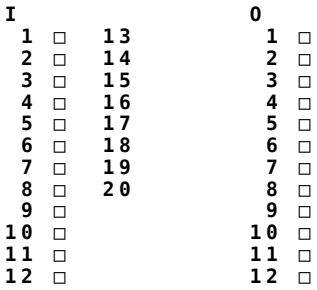
Tab. A5-863: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-864: Bay Interlock Equations for Operation with Station Interlocking

A5.2.7.3 Bay type No. 981: Other bay type with other switchgear unit, without busbar

X99.903.R12.2

Switchgear unit	Binary input	Output relay	
S001 (SIG_1: Signal S001 EXT)	U A01	/	
S002 (SIG_1: Signal S002 EXT)	U A02	/	
S003 (SIG_1: Signal S003 EXT)	U A03	/	
S004 (SIG_1: Signal S004 EXT)	U A04	/	
S005 (SIG_1: Signal S005 EXT)	U A05	/	
S006 (SIG_1: Signal S006 EXT)	U A06	/	
S007 (SIG_1: Signal S007 EXT)	U B01	/	
S008 (SIG_1: Signal S008 EXT)	U B02	/	
S009 (SIG_1: Signal S009 EXT)	U B03	/	
S010 (SIG_1: Signal S010 EXT)	U B04	/	
S011 (SIG_1: Signal S011 EXT)	U B05	/	
S012 (SIG_1: Signal S012 EXT)	U B06	/	
C001 (CMD_1: Command C001)	/	K A01	
C002 (CMD_1: Command C002)	/	K A02	
C003 (CMD_1: Command C003)	/	K A03	
C004 (CMD_1: Command C004)	/	K A04	
C005 (CMD_1: Command C005)	/	K A05	
C006 (CMD_1: Command C006)	/	K A06	
C007 (CMD_1: Command C007)	/	K B01	
C008 (CMD_1: Command C008)	/	K B02	
C009 (CMD_1: Command C009)	/	K B03	
C010 (CMD_1: Command C010)	/	K B04	
C011 (CMD_1: Command C011)	/	K B05	
C012 (CMD_1: Command C012)	/	K B06	

Tab. A5-865: Assignment of Binary Inputs and Output Relays

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-866: Bay Interlock Equations for Operation without Station Interlocking

Switchgear unit	Control O/C	Interlock equation
		—

Tab. A5-867: Bay Interlock Equations for Operation with Station Interlocking

A6 P632 Version History

Version		Changes
P632 **-301** **-401** **-601** **Release: 2001-01-15**	**Hardware**	
		Initial product release
	Diagram	
		Initial product release
	Software	
		Initial product release
P632 **-301** **-401** **-601-701** **Release: 2001-04-03**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	
		Cyrillic characters supported. Analog (I/O) module Y supported
	COMM1	Communication interfaces supported with protocols selectable by switch-over.
	IRIG-B	Bug fixing for clock synchronization by IRIG-B signal
P632 **-301** **-401** **-601-703** **Release: 2001-08-02**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	
		Improved calibration algorithm.
P632 **-301** **-401** **-601-704** **Release: 2001-12-17**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	
		Device types with ring-terminal connection supported.
P632	**Hardware**	

Version		Changes
-302 **-401/402** **-602** **Release: 2002-01-25**		Designs with ring-terminal connection have been added. New option with accelerated output module featuring 4 thyristors.
	Diagram	
		Connection diagrams for device types fitted with ring-terminal connection have been added. New option with accelerated output module is taken into account.
	Software	
	DVICE	Selection of spontaneous signals and setting of a 'Time-out' have been added.
	COMM1	The interface communication protocol ‘COURIER’ has been added. Selection and testing of spontaneous signals have been added to the interface communication protocols according to IEC 60870-5-103, IEC 60870-5-101 and ILS-C.
	MEASI	Display of the temperature as a per-unit value has been added.
	MAIN	Separate setting for the secondary nominal current value of the system transformers for measurement of phase currents and residual currents. Assignment of the ‘logical’ communication interfaces COMM1 and COMM2 to the communication channels of module A. Grouping of the signals issued by measuring circuit monitoring (MCMON) to form a multiple signal.
	DIFF	The signals (041 221) DIFF: Id>> triggered and (041 222) DIFF: Id>>> triggered have been added.
	THRM1	Modified texts for some of the settings. Per-unit measured values have been added. The signal (039 154) THRM1: Not ready has been added.
	MCM_x	The measuring circuit monitoring functions are now available.
	V/f	The overfluxing protection function is now available.
	COMM2	“Logical” communication interface 2 (function group COMM2) added to communication.
	LOGIC	Increase of the number of logic inputs from 16 to 40.
P632 **-302**	**Hardware**	

Version		Changes
-401/402 **-602-705** **Release: 2002-04-19**		No changes.
	Diagram	
		No changes.
	Software	
	DVICE	**Bug fixing:** ● The device was blocked following a start-up if either one of the protections V<> or f<> were enabled, due to erroneous hardware selfidentification.
P632 **-302** **-401/402** **-602-706** **Release: 2002-06-06**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	
	LOC	**Bug fixing:** ● Two pixels in the Cyrillic characters were displayed incorrectly. This bug affected only the language variant -805.
P632 **-302** **-401/402** **-603** **Release: 2002-11-27**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	
	IDMT	Accuracy of tripping time is improved. Particularly the characteristic “IEC extremely inverse” is now within the claimed tolerance range.
	DVICE	**Bug fixing:** ● A device ID for the entry of an order extension number was missing.

Version		Changes
	DIFF	Amplitude matching factor restrictions are relaxed. Zero sequence current filtering for odd vector group IDs is improved. Setting ranges of the tripping characteristic and of the unrestrained differential element are extended. The hysteresis of the tripping characteristic can now be disabled. Definite-time trip delay is available.
	REF_x	Amplitude matching factor restrictions are relaxed. Two new operating modes are available. One provides a high impedance measuring principle. The setting range of the unrestrained differential element is extended. New tripping signals are provided for the application of the low impedance operating mode with autotransformers.
	f<>	Measurements of minimum frequency during an underfrequency situation and maximum frequency during an overfrequency situation have been added.
	V/f	Setting range of operate value V/f: V/f>> PSx is extended.
P632 **-303** **-403/404** **-605** **Release: 2004-04-30**	**Hardware**	
		The Ethernet communication module is available. The new hardware variants now offer, per ordering option, additional operating thresholds for the binary signal inputs: ● >18 V (standard variant) (no order ext. No.) ● >90 V (60...70% of $V_{A,nom}$ = 125...150 V) (Order ext. No. 461) ● >155 V (60...70% of $V_{A,nom}$ = 220...250 V) (Order ext. No. 462) Installation of the standard variant is generally recommended if the application does not specifically require such binary signal inputs with higher operate thresholds.
	Diagram	
		The updated connection diagrams now include the interfaces for the Ethernet communication module: ● P632 -403 (for 40TE case, pin-terminal connection) ● P632 -404 (for 84TE case, ring-terminal connection)

Version		Changes
	Software	
	UCA2	Initial implementation of the UCA2 communication protocol. Extension to the expanded spontaneous signaling range. In addition, GOOSE messages and fault transmission are now supported.
	DIFF	The saturation discriminator was further improved.
P632 **-304** **-403/404** **-606** **Release: 2005-05-09**	**Hardware**	
		The new hardware variants now offer, per ordering option, additional operating thresholds for the binary signal inputs: ● >73 V (67% of $V_{A,nom}$ = 110 V) (Order ext. No. -463) ● >146 V (67% of $V_{A,nom}$ = 220 V) (Order ext. No. -464) Installation of the standard variant is still generally recommended if the application does not specifically require such binary signal inputs with higher operating thresholds. An optional processor board with a DSP coprocessor is now available. This coprocessor provides a better overall performance of the supplementary functions of the device. The coprocessor is required for the use of the new current transformer supervision function (CTS).
	Diagram	
		No changes.
	Software	

Version		Changes
	SFMON	The configuration table of the user defined alarm condition has been extended by the instantaneous and timed outputs 30...32(t) of the programmable LOGIC: ● (098 053) SFMON: Output 30 ~ (042 090) LOGIC: Output 30 ● (098 054) SFMON: Output 30 (t) ~ (042 091) LOGIC: Output 30 (t) ● (098 055) SFMON: Output 31 ~ (042 092) LOGIC: Output 31 ● (098 056) SFMON: Output 31 (t) ~ (042 093) LOGIC: Output 31 (t) ● (098 057) SFMON: Output 32 ~ (042 094) LOGIC: Output 32 ● (098 058) SFMON: Output 32 (t) ~ (042 095) LOGIC: Output 32 (t) These logic outputs are included in the warning signals by setting SFMON: Fct. assign. warning and they are also recorded in the monitoring signal memory. These signals can be used to create an alarm signal under complex application conditions. This signaling has no influence on the device's operation (i.e. no warm restart or blocking). Addendum: As of version –605 the “memory function” for the warning signal memory may be set. After the associated timer stage has elapsed, a renewed occurrence of a warning is processed the same way as if it where a first occurrence.

Version		Changes
	COMM1	Bug fixing in the COURIER protocol: Upon activation of COURIER protocol a warm restart of the device was initiated. **Bug fixing:** ● IEC 60870-5-101: Support of the 7-byte time tag length has been corrected: (003 198) COMM1: Time tag length = *7 Byte* ● IEC 60870-5-101: Transmission of negative cyclic measured values has been corrected. ● IEC 60870-5-101: Acknowledgment of the general scan command has been corrected. ● IEC 60870-5-101: Signals in the general scan are now transmitted correctly without a time tag. ● IEC 60870-5-101: Command rejections issued internally by the protection device (between the processor module and communication module) are no longer signaled by the communication interface. ● IEC 60870-5-101: Commands are now transmitted correctly, even when the ASDU address length is 2 byte: (003 193) COMM1: Address length ASDU = *2 byte*
	FT_RC	The recording duration for binary tracks is now limited to 1 minute in order to prevent recording of endless events.
	MAIN	Priority control of clock synchronization is now settable. Positive- and negative-sequence currents from all ends are now continuously calculated and displayed as measured operating data (primary and per-unit values).
	OL_RC, FT_RC	Overload and fault recording now have a joint and complete list of possible entries (merged list of all previous signals). In practice it became apparent that limitations with regard to possible entries in both recording memories would bring no advantages but make analyzing more difficult, as both recording memories could be open at the same time (e.g. a thermal overload situation could lead to a loss of insulation which would cause a fault).

Version		Changes
	DIFF	The minimum setting value for the characteristic gradients m1 and m2 have been modified to 0.10 (previously 0.15). The starting condition for the saturation discriminator was modified so that the DIFF protection testing may now be carried out again with conventional test sets (which do not provide correct transient signals). Along with the new CTS function, an additional threshold, (080 000) DIFF: Idiff>(CTS) PSx, is provided in order to de-sensitize differential protection in case there is a fault in the CT's secondary circuit. For more information about this feature please refer to CTS description. **Bug fixing:** ● In some cases the overreaching inrush stabilization function did not operate properly. In addition the signal from the inrush stabilization was sometimes immediately reset when a differential protection trip was issued.
	REF_x	If the new current transformer supervision (CTS) function is used, the ground fault differential protection function associated with the faulted end was blocked when a CT fault was detected. For more information about this feature please refer to CTS description.
	CTS	First implementation of a current transformer secondary wiring supervision which operates fast enough to prevent differential protection from tripping under load in case of a CT failure. This function can only be used if the new processor board with DSP coprocessor is fitted!
	MCM_x	The existing measuring-circuit monitoring functions, based on the phase currents per end, have been enhanced and can now be used to detect broken conductors (“broken conductor protection”) on the CTs' primary sides.
		Note: This software version is compatible to all previous hardware versions.
P632 **-304** **-403/404** **-610** **Release: 2006-03-02**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	

Version		Changes
		Note: This software version is compatible to all previous hardware versions.
	IEC, GOOSE, GSSE	Implementation of the new substation communication protocol per IEC 61850 standard. Implementation of communication procedures for the exchange of binary information in an Ethernet network section. Function group GSSE is compatible to previous UCA2-GOOSE. Function group GOOSE is acc. to IEC 61850-GOOSE.
	UCA2	The substation communication protocol per UCA2 standard is **not** supported with this firmware version.
	MAIN	Phase reversal logic is now available. This feature allows that the phase reversal switch in motor/ generator applications can be located inside the protection zone of the transformer differential relay. The vector group numbers of the power transformer are now settable per parameter subset. This feature can be used in protection of phase angle regulating transformers.
	DIFF	**Bug fixing:** ● The trip signals of the 3 measuring systems (e.g. (041 002) DIFF: Trip signal 1 were falsely instantaneously raised, regardless of the set trip delay time. Note that the (041 075) DIFF: Trip signal was correctly timed.
	IDMTx	Accuracy of tripping time is improved, particularly in case of the characteristic “IEC extremely inverse”.
P632 **-305** **-403/404** **-610** **Release: 2006-06-23**	**Hardware**	
		No changes at this time. During the release proceedings of software version –610, a new option with the order extension number -937 for the Ethernet module was released and therefore the hardware version changes from -304 to -305.
	Diagram	
		No changes.
	Software	
		No changes.
P632 **-305**	**Hardware**	

Version		Changes
-403/404 **-610-710** **Release: 2006-06-23**		No changes.
	Diagram	
		No changes.
	Software	
		Note: This version is not released for applications with IEC 61850 systems! Version -610-714 may be used as an alternative.
	DIFF	**Bug fixing:** ● In versions -606 to -610 inrush signaling from all three measuring systems was suppressed when harmonic blocking in measuring system 1 was triggered. This was not accompanied by tripping. Nevertheless there was the possibility of an overreaction (tripping) when an inrush condition was not recognized by one measuring system with the operating mode set to “Not phase-selective” and in an other measuring system the second harmonic component reached a value of approximately between 70% and 130% of the fundamental.
	FT_DA	**Bug fixing:** ● The fault data for FT_DA: Fault curr.IY,b p.u. (026 088) were mistakenly calculated on the basis of current $I_{Y,a}$.
P632 **-305** **-403/404** **-610-712** **Release: 2006-10-09**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	
	IEC	**Bug fixing:** ● If communication was interrupted during control access via the Ethernet interface using the operating program MiCOM S1, renewed control access was only possible after a warm restart of the P632. ● Previously a break in the client-server communications link could occur after approximately 49 days for about 20 minutes. GOOSE and GSSE are not affected.

Version		Changes
		Note: This version is not released for applications with IEC 61850 systems! Version -610-714 may be used as an alternative.
	COMM1	The upgraded communications software 3.18 is now implemented. Various small bugs have been fixed in communication protocols per IEC 60870-5-101 and MODBUS.
P632 **-305** **-403/404** **-610-713** **Release: 2006-12-12**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	
		Note: This version is not released for applications with IEC 61850 systems! Version -610-714 may be used as an alternative.
	MAIN	**Bug fixing:** ● The sequence of MAIN: General starting (036 000) and DIFF: Trip signal (041 075) have been changed such that starting always comes first.
P632 **-305** **-403/404** **-610-714** **Release: 2007-02-07**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	
	IEC	**Bug fixing:** ● Previously a break in the client-server communications link could occur after approximately 49 days for about 20 minutes. GOOSE and GSSE are not affected.
P632 **-306** **-405/406** **-611** **Release: 2007-03-15**	**Hardware**	

Version		Changes
		As an ordering option for the 40TE and 84TE model versions there is now a variant available with a detachable HMI. The detachable HMI is always supplied with a case width of 40TE. The detachable HMI provides the following new features: ● 6 freely configurable function keys as well as 6 freely configurable LED indicators (H18 to H23) each situated next to a function key. ● The freely configurable LED indicators (H4 to H16 and H18 to H23) are provided as multi-color LEDs. **Note:** When the local control panel is ordered together with a detachable HMI for hardware version -306, it is delivered with function keys and multi-colored LED indicators fitted. Otherwise the earlier local control panel is delivered without having function keys and multi-colored LED indicators fitted. With hardware version -307 and irrelevant of the ordering option, the local control panel is delivered with function keys and multi-colored LED indicators fitted.
	Diagram	
		The updated connection diagrams now include the interfaces to connect the detachable HMI. ● P632 -405 (for 40TE case, pin-terminal connection) ● P632 -406 (for 84TE case, ring-terminal connection)
	Software	

Version		Changes
	IEC	Implementation of active monitoring of the communications data links to logged-on clients with the parameter (104 062) IEC: TCP keep-alive timer. This active monitoring now replaces previous passive monitoring by parameter (104 050) IEC: Inactivity timer. Implementation of an automatic switchover to daylight saving time, activated by parameter (104 219) IEC: Switch.dayl.sav.time. Switchover times for the automatic switch to daylight saving time are governed by the following settings: ● (104 220) IEC: Dayl.sav.time start ● (104 221) IEC: Dayl.sav.time st. d ● (104 222) IEC: Dayl.sav.time st. m ● (104 223) IEC: Dayl.sav.t.st.0:00 + ● (104 225) IEC: Dayl.sav.time end ● (104 226) IEC: Dayl.sav.time end d ● (104 227) IEC: Dayl.sav.time end m ● (104 228) IEC: Dayl.sav.t.end 0:00+ A second SNTP server may now be applied for time synchronization. Should no answer be transmitted by the first SNTP server the next request is automatically transferred to the second SNTP server (backup function). ● (104 202) IEC: SNTP server 1 IP ● (104 210) IEC: SNTP server 2 IP Instead of setting a router address and target network, so as to establish a communication link to a client situated exterior to the local network, now only the setting of the gateway address is required via (104 011) IEC: Gateway address. Now “unbuffered reports” are available for all logical nodes.
	LED	Configuration, operating mode and physical state of the permanently configured LED indicators H1 and H17 are now displayed via configuration parameters and physical state signals. The new detachable HMI provides the following extended display functionalities: ● The operating mode for the LED indicators has been extended by the operating mode LED flashing. ● Two differing signals may now be assigned to the freely configurable LED indicators (H 4 to H 16 and H 18 to H 23) to emit either red or green light. If both assigned signals are active the resulting LED color will be 'amber' (yellow).

Version		Changes
	CBF_x	Implementation of the new circuit breaker failure protection function including a current reset criterion. The number of availabe function groups corresponds to the number of transformer ends, that is for the P632, 2 function groups are available.
	LOC	Because of the ordering option “detachable HMI” this additional Device Identification parameter is now available: LOC: Local HMI exists (221 099).
	LOC, MAIN	Respective binary signal inputs (if previously unavailable) are assigned to all default reset functions. These binary input functions are now available in the configuration list for the two newly implemented group resetting functions as well as the extended functional assignment for the CLEAR key ('C'): ● (005 248) MAIN: Fct.assign. reset 1 ● (005 249) MAIN: Fct.assign. reset 2 ● (005 251) LOC: Assignment reset key Two menu jump lists may now be configured. These menu jump lists make it possible to select individual menu points (i.e. set values, counters, triggering functions, event logs) in a freely definable sequence. ● (030 238) LOC: Fct. menu jmp list 1 ● (030 239) LOC: Fct. menu jmp list 2
	F_KEY	The new control panel (HMI) is fitted with 6 freely configurable function keys which may be used either as switches or keys, and are password protected. Because of this the function group F_KEY “Configurable Function Keys” has been added.
P632 **-306/307** **-405/406** **-611-715** **Release: 2007-06-12**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	
	LOC	**Bug fixing:** ● Reset functions configured to the CLEAR key ('C') are now carried out correctly. A system restart could previously occur when the detachable HMI was disconnected.

Version		Changes
	FT_DA	**Bug fixing:** ● The fault data for differential current and restraining current issued by the ground differential protection function REF_2 are now also calculated correctly when the operating mode is set to “*Low imped. / IP,max*” (previously they had twice the value).
	REF_x	When the differential protection is triggered these functions are now blocked as long as at least one of the following conditions is met: ● DIFF: Meas.system 1 trigg. (041 124) ● DIFF: Meas.system 2 trigg. (041 125) ● DIFF: Meas.system 3 trigg. (041 126)
	CBF_x	Timer stages ‘t1 3p’ and ‘t2’ of function CBF_2 are now processed regardless of the setting at CBF_1.
	IEC	The ICD files have been modified. urcbMX has been added to the logical nodes PhsPDIF1, Rf1PDIF1, Rf2PDIF1 and Rf3PDIF2. Implementation of the communication protocol IEC 61850 in these versions is KEMA certified.
P632 **-306/307** **-405/406** **-611-716** **Release: 2007-08-31**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	
	IEC	The data model of the measured operating values for differential current and restraining current in the functions DIFF and REF_x is now implemented according to the data attributes for the standard WYE, ACT and ACD classes. Note: With this implementation, the “phase” measured values from the DIFF protection functions correspond to the measured values of the three measuring systems: ● “phSA” = Measuring system 1 ● “phSB” = Measuring system 2 ● “phSC” = Measuring system 3 Accordingly the measured values from the REF_x protection functions are modeled as “neut”. ICD and PICS-MICS-ADL files have been upgraded accordingly.

Version		Changes
P632 **-307** **-405/406** **-611** **Release: 2007-11-05**	**Hardware**	
		New hardware version -307 **Note:** When the local control panel is ordered together with a detachable HMI for hardware version -306, it is delivered with function keys and multi-colored LED indicators fitted. Otherwise the earlier local control panel is delivered without having function keys and multi-colored LED indicators fitted. With hardware version -307 and irrelevant of the ordering option, the local control panel is delivered with function keys and multi-colored LED indicators fitted.
	Diagram	
		No changes.
	Software	
		No changes.
P632 **-308** **-407/408** **-620** **Release: 2008-06-06**	**Hardware**	
		The binary I/O module X(4H) with four high-break contacts is now available. The binary I/O module X(6I/6O) for the control of up to three switchgear units is available as an additional option.
	Diagram	
		The updated connection diagrams now include the new binary I/O modules X(4H) and X(6I/6O). ● P632 -407 (for 40TE case, pin-terminal connection) ● P632 -408 (for 84TE case, ring-terminal connection)
	Software	

Version		Changes
	IEC	IEC: Deadband value (104 051) was divided into several individual settings: ● (104 229) IEC: Update Measurements ● (104 230) IEC: Dead band IP ● (104 231) IEC: Dead band IN ● (104 232) IEC: Dead band VPP ● (104 233) IEC: Dead band VPG ● (104 234) IEC: Dead band f ● (104 235) IEC: Dead band P ● (104 236) IEC: Dead band phi ● (104 237) IEC: Dead band Z ● (104 238) IEC: Dead band min/max ● (104 239) IEC: Dead band ASC ● (104 240) IEC: Dead band temp. ● (104 241) IEC: Dead band 20mA
	DVICE	The previous parameter DVICE: Order No. (000 001) has been renamed to DVICE: AFS Order No. (001 000).
	LOC	The parameters (005 251) and (080 110) have been renamed to LOC: Fct. reset key (005 251) and LOC: Fct. read key (080 110) without any changes in their functionality. Now the selection offered for the parameter LOC: Language (003 020) no longer is between, e.g. German, and English but between “Regional language” and “Reference language”. (This will not cause any changes in functionality as the Reference language is US English and the Regional language will depend on the language order option.)
	GOOSE	Several GOOSE signals have been added as part of the new control functionality. For a detailed listing see the “Settings” and “Information and Control Functions” chapters.

Version		Changes
	MAIN	The following menu points are now available for each parameter subset: ● MAIN: Vnom prim. end a PSx ● MAIN: Vnom prim. end b PSx The parameter (003 030) has been renamed to MAIN: Device on-line. **Note:** These signal assignment parameters are visible in the data model for 4 circuit breakers. However, for the P632 they can be used only in accordance with the actual number of CBs supported. With the P632, 2 circuit breakers are available. In order to configure function keys with control functions the following parameters are available which may be assigned to four of the six function keys: ● MAIN: Device selection key (006 001) ● MAIN: Device OPEN key (006 002) ● MAIN: Device CLOSE key (006 003) ● MAIN: Local/Remote key (006 004) The P632 now features the acquisition of debounced binary signals for control functions, and the parameter MAIN: Time tag (221 098). As part of the control functionality the P632 now features additional parameters: ● MAIN: Type of bay (220 001) ● MAIN: Customized bay type (221 062)
	MEASI	The result of the temperature measurement may now also be read out as the maximum value since the last reset operation (temperature T_{max}).
	INP	The setting INP: Filter (010 220) is now available for conformity with standard IEC 60255-22-7, class A.
	FT_DA	Correction: The wrong internal timing where the parameter FT_DA: Run time to meas. (004 199) could take on the value “Overflow” has been corrected.
	THRM1	Correction: With the following menu points the step size for temperature values has been reduced from 0.01 to 0.001: ● THRM1: Object temp. p.u. 1 (004 205) ● THRM1: Coolant temp. p.u. 1 (004 206)

Version		Changes
	CBF_x	The parameter (056 007) has been renamed to CBF_1: Function group CBF_1 without any changes in the functionality. The following parameter may now not only be set to an explicit time value but also to “Blocked”: ● CBF_2: Delay/fault beh. CB (022 227) The startup criterion has been modified. After a CBF startup the state of the general trip signal or the external trigger signal are now no longer considered. The CBF will then only reset if the current criterion is met (current values to fall below I< with all three phases) or the CB state is open.
	DEV01 ... DEV03	New function groups “External Devices xx” (xx = 01, 02, 03) as part of the implementation of control functions.
	ILOCK	New function group “Interlocking Logic” as part of the implementation of control functions.
	CMD_1	New function group “Single Pole Commands” as part of the implementation of control functions.
	SIG_1	New function group “Single Pole Signals” as part of the implementation of control functions.
P632 **-308** **-407/408** **-620-718** **Release: 2008-09-18**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	
	LOC	**Bug fixing:** ● Using the function where the set password can be made visible on the LC-display by pressing all four arrow keys simultaneously during the start up of the device is now also possible with the new local control panel (with function keys).
	PSS	**Bug fixing:** ● The time tags for the following spontaneous signals (according to the communications protocol per IEC-60870-5-10x) and the entry in the operating data memory did not match: ◦ PSS: PS 1 active (036 090) ◦ PSS: PS 2 active (036 091) ◦ PSS: PS 3 active (036 092) ◦ PSS: PS 4 active (036 093)

Version		Changes
	V<>	**Bug fixing:** After a warm restart the following setting was not active: V<>: tTransient PSx (076 029) = Blocked Because of this, the following signals were issued when undervoltage conditions were present: ● V<>: tV< elaps. transient (042 023) ● V<>: tV<< elapsed trans. (042 025)
	CBF_x	The release condition for the function has been dissociated from the drop-out of the internal trip signal. Therefore the sequence will now only be stopped when a loss of load/undercurrent condition has occurred or when the CB signals that its contacts are open. **Bug fixing:** ● The time tags for the CBF_1: Ready (038 009) and CBF_2: Ready (043 076) spontaneous signals (according to the communications protocol per IEC-60870-5-10x) and the entry in the operating data memory did not match.

Version		Changes
	IEC	Bug fixing pertaining to the COMTRADE fault files which a client receives via the IEC 61850 interface: Stating of “Control Modes” in the ICD file has been corrected. The IEC data model is not affected by this. **Bug fixing:** ● The automatically generated data file names are now correct with fault numbers exceeding 999. Data file names are issued according to this format: yyyymmdd_HHMMSS_xxx_rNNNN.eee With: yyyy = year mm = month dd = day HH = hour MM = minute SS = second xxx = millisecond r = permanent single character NNNN = fault number eee = file extension In previous versions the dot (.) was overwritten for fault numbers exceeding 999. ● The correct number of binary channels is now entered in the COMTRADE configuration file (*.cfg). In the previous version the number of binary channels was given as n*16+1 when, because of the function configuration, n*16 binary information signals were recorded. Therefore values stored in the *.cfg file and the *.dat file did not match.
P632 **-308** **-407/408** **-621** **Release: 2009-01-08**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	

Version		Changes
	IEC	The processing times for the control and monitoring of switchgear units between the Ethernet communication module and the main CPU have been reduced. The data object LN_CFG has been extended in logical nodes Dt1NgsPTOC1, Dt2NgsPTOC1 and Dt3NgsPTOC1. The AlmGGIO logical node has been extended by the following signals: ● Alm5: THRM1: CTA error (039 127) ● Alm7: MEASI: PT100 faulty (040 190) ● Alm8: MEASI: Overload 20mA input (040 191) ● Alm9: MEASI: Open circ. 20mA inp. (040 192) ● Alm10: CTS: Operated (updating) (036 099) The 'Bl.f.' data objects are now available in all nodes: PTOC, PTOV, PTUV, PTTR, PTOF, PTUF, RBRF, PVPH. Because of this, the 'Blocking EXT' condition has been removed from the 'MODE'. The parameter at address (104 232) IEC: Dead band VPP has been renamed to IEC: Dead band V. Since the corresponding measured values are not provided by the P632, the following addresses have been deleted: ● IEC: Dead band VPG (104 233) ● IEC: Dead band P (104 235) ● IEC: Dead band Z (104 237) ● IEC: Dead band ASC (104 239) ● IEC: Update cycle energy (104 060)
	COMM1	Bug fixing with the use of the MODBUS communication protocol: Faults can now be read out.
	MAIN	Display of the following settings has been limited in accordance with the device function. Visible in the P632 are: ● MAIN: Sig. asg. CB1 open (021 017) ● MAIN: Sig. asg. CB1 closed (021 020) ● MAIN: Sig. asg. CB2 open (021 061) ● MAIN: Sig. asg. CB2 closed (021 060) ● MAIN: Device selection key (006 001) ● MAIN: Device OPEN key (006 002) **Bug fixing:** ● The measured operating values for the positive sequence currents are now calculated independently of the DTOC/IDMT protection functions.

Version		Changes
	DIFF	The starting condition for the saturation discriminator has been enhanced by the addition of a further minimum condition for the restraining quantity with basic filtering. Without this minimum condition, the saturation discriminator could be incorrectly triggered during the test of a characteristic using virtual test signals in the absence of a preload current.
	REF_x	Blocking of the REF functions while the DIFF protection (functional enhancement by -611 -715) has been triggered can now be enabled/disabled using setting parameters. Furthermore the REF_1: Blocking EXT (019 051) and REF_2: Blocking EXT (019 052) binary signal input functions are now available to allow for a more flexible application of the functions. Since operational readiness is no longer solely dependent on the device setting, its state is also signaled: REF_1: Ready (019 054), REF_2: Ready (019 055), i.e. REF_x enabled AND NOT blocked.
	REF_1	The function has been enhanced so that further ends can be included into the protection reach, e.g. in ground differential protection for autotransformers.
	CBF_x	As an option, the loss of load/undercurrent criterion can now also be used with the residual current. The external function startup may now occur either when only the loss of load/undercurrent criterion is applied or also with the CB contact position scanning criterion.
	DEV02, DEV03	**Bug fixing:** ● The menu text in the reference language (English) has been corrected for the following signals: ◦ DEV02: Switch. device open (218 002) corrected to: DEV02: Open cmd. received ◦ DEV02: Switch. device closed (218 003) corrected to: DEV02: Close cmd. received ◦ DEV03: Switch. device open(218 004) corrected to: DEV03: Open cmd. received ◦ DEV03: Switch. device closed (218 005) corrected to: DEV03: Close cmd. received
P632 **-308** **-407/408** **-621-720** **Release: 2009-07-29**	**Hardware**	
		No changes.
	Diagram	
		No changes.

Version		Changes
	Software	
	DIFF	**Bug fixing:** ● It could happen that triggering of the saturation discriminator by an external fault was not reset fast enough when an additional fault had occurred within the same protection zone.
	CBF_x	**Bug fixing:** ● The associated signal CBF_x : Current flow y (y=A, B, C) would sometimes jitter during an open command. ● Triggering of the circuit breaker failure protection function would sometimes be delayed. Further delays could sometimes occur with the signals for CBF_1 and CBF_2.
P632 **-308** **-407/408** **-622** **Release: 2011-02-09**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	
	PC	The following parameter has been removed: PC: Name of manufacturer (003 183). **Note:** Compatibility even with older versions of the operating program continues to be guaranteed.
	COMM1	The data point (003 178) COMM1: -103 prot. variant may now be used to select between the -103 protocol variants *Private* and *Compatible*. The protocol variant *Compatible* corresponds to the VDEW implementation. Note: As before this setting is hidden unless an IEC 60870-5 protocol is enabled. The data point (003 214) COMM1: MODBUS prot. variant may now be used to select between the MODBUS protocol variants *Private* and *Compatible*. The protocol variant *Compatible* corresponds to the MODBUS implementation in the MiCOM Px20 and Px40 protection devices. The protocol variant *Private* corresponds to the first implementation of the MODBUS protocol. Note: As before this setting is hidden unless the MODBUS protocol is enabled.

Version		Changes
	COMM1, COMM2	The menu points (003 161) COMM1: Name of manufacturer and (103 161) COMM2: Name of manufacturer can no longer be set by using a selection list but, for reasons of compatibility, they may now be defined as free text. The default is *SE* but, in individual cases, it may become necessary to enter texts differing from the default. **Notes:** ● These parameters can only be set using the operating program and it is not possible to set them locally using the integrated local control panel (HMI). The maximum text length is 8 characters and designations exceeding this will be truncated. ● The parameter COMM1: Name of manufacturer is hidden unless an IEC 60870-5 protocol is enabled.
	IEC	**Bug fixing:** ● The implementation of the IEC 61850 signals RBRFn and the IEC 61850 modeling of I_N in the Logical Nodes MMXU and MSQ has been modified so that it matches other MiCOM Px3x protection devices.
	MAIN	**Bug fixing:** ● Settings for daylight saving time were reset after a warm restart.
	LED, MAIN, ...	The English designation text of the following data point has been changed, but functionality remains unchanged. The old designation is shown on the left and the new designation on the right-hand side. LED: Fct. assig. H12 rot → LED: Fct.assig. H12 red
P632 **-308** **-407/408** **-630** **Release: 2011-02-09**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	
	IEC, GOOSE	Phase 2 of the IEC 61850 communications protocol has been implemented.

Version		Changes
	MAIN	New logic state signals for clock synchronization: The parameter: MAIN: Time synchronized (009 109) shows whether an external clock synchronization had been carried out. This signal is reset after 10 minutes.
	PC	The following parameter has been removed: PC: Name of manufacturer (003 183). **Note:** Compatibility even with older versions of the operating program continues to be guaranteed.
	COMM1	The data point (003 178) COMM1: -103 prot. variant may now be used to select between the -103 protocol variants *Private* and *Compatible*. The protocol variant *Compatible* corresponds to the VDEW implementation. Note: As before this setting is hidden unless an IEC 60870-5 protocol is enabled. The data point (003 214) COMM1: MODBUS prot. variant may now be used to select between the MODBUS protocol variants *Private* and *Compatible*. The protocol variant *Compatible* corresponds to the MODBUS implementation in the MiCOM Px20 and Px40 protection devices. The protocol variant *Private* corresponds to the first implementation of the MODBUS protocol. Note: As before this setting is hidden unless the MODBUS protocol is enabled. Communications protocol IEC 60870-5-103: When checking during test operations it is now possible to trigger signals (SIG) and contact positions (DEV) from the control part (previously only possible from the protection part). These new addresses were added: ● Oper/CtrlTest/COMM1 ● (221 105) COMM1: Sel. pos. dev.test ◦ *Not assigned* ◦ *DEV01* ◦ *DEV02* ◦ *DEV03* ● (221 106) COMM1: Test position dev. ◦ *don't execute* ◦ *execute open* ◦ *execute close* ◦ *execute intermed.*

Version		Changes
	COMM1, COMM2	The menu points (003 161) COMM1: Name of manufacturer and (103 161) COMM2: Name of manufacturer can no longer be set by using a selection list but, for reasons of compatibility, they may now be defined as free text. The default is *SE* but, in individual cases, it may become necessary to enter texts differing from the default. **Notes:** ● These parameters can only be set using the operating program and it is not possible to set them locally using the integrated local control panel (HMI). The maximum text length is 8 characters and designations exceeding this will be truncated. ● The parameter COMM1: Name of manufacturer is hidden unless an IEC 60870-5 protocol is enabled.
	IEC	**Bug fixing:** ● The implementation of the IEC 61850 signals RBRFn and the IEC 61850 modeling of I_N in the Logical Nodes MMXU and MSQ has been modified so that it matches other MiCOM Px3x protection devices.
	LED, MAIN, ...	The English designation text of the following data point has been changed, but functionality remains unchanged. The old designation is shown on the left and the new designation on the right-hand side. CTS: Reset latching EXT → CTS: Reset latch. EXT
	DVICE	The new data point (008 233) DVICE: SW vers.Chin.DHMI DM is a purely internal version number (for the order option “Chinese display”). **Bug fixing:** ● Display problems with the Fault Panel are resolved.
	V/f	The setting range for V/f: t at V/f=1.05 PSx has been extended: ● Previously: 1.0 s to 1000.0 s in steps of 0.1 s, ● Now: 1.0 s to 6000.0 s in steps of 0.1 s. Similarly, the setting range for V/f: Reset time PSx has been extended: ● Previously: 0 s to 10000 s in steps of 1 s, ● Now: 0 s to 60000 s in steps of 1 s.

Version		Changes
	DEVxx	Device identifiers can now be edited. In the “Designat. ext. dev.” parameters the ‘Device Name User’ setting should be selected. Then the text for the device’s name, entered by the user at each of the “DEV-Name User” parameters, will be used as the device’s designation. The maximum number of 4 characters was not changed from the previous permanent default setting. Parameters: ● DEV01: DEV-Name User (218 101) ● DEV02: DEV-Name User (218 102) ● DEV03: DEV-Name User (218 103)
	ILOCK	As the interlock conditions are also transmitted together with reporting in the newly implemented phase 2 of the IEC 61850 communication protocol, it is now a requirement that these interlock conditions are cyclically checked and not, as before, only with the request for a switching operation. Therefore this new parameter has been introduced: (221 104) ILOCK: Cycle t interl.check The cycle time (range from 100 ms to 10 s) is set here, after which a check of the interlock conditions is carried out. As additional processor capacity must be provided for each of these checks it must be ensured that a favorable compromise is found for the cycle time setting value. On the one hand it is desirable to select a cycle time value which is as short as possible so that changes in the interlock conditions are updated without any notable delays, but on the other hand this cycle time value should not be so short that the P632 system will be under too much strain. As the P632 CPU load is dependent on the total number of function groups having been configured it is not possible to suggest a generally acceptable cycle time value.
P632 **-308** **-407/408** **-622-724** **Release: 2012-02-01**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	

Version		Changes
	IEC	**Bug fixing:** ● If single-pole signals of function group SIG_1 were active during device startup, this could lead to an aborted initialization of the Ethernet communication module. ● During the process of connection with clients that use the “IntegrityPeriod” option, sporadically the MMS communication of the Ethernet communication module would crash without an internal monitoring response to re-establish the functionality. (GOOSE messaging and other communication tasks were not affected.) ● Upon receiving a “Cancel” command while a switchgear device is selected, a positive acknowledgement response (“Ack OK”) is sent. Previously, a “Negative ack” was sent. ● Reports of events could get lost if too many state changes occurred in a short period of time, especially during secondary injection testing. ● If clients did connect to the device immediately after completion of Ethernet communication module startup, this could lead to the temporary erroneous reporting of default values for the external device status (DEVxx) and of the single-pole signals (SIG_1).
	GOOSE	The GOOSE Time Allowed to Live (TAL) supervision is enhanced with respect to simultaneous state changes of multiple GOOSE messages.
	PC, COMM2	**Bug fixing:** ● If clients did connect to the device immediately after startup of the Ethernet communication module, the initialization of the second internal communication interface could remain incomplete. As a consequence, access by the operating program via the COMM2 interface or by tunneling was not possible in this case.
P632 **-308** **-407/408** **-630-725** **Release: 2012-02-01**	**Hardware**	

Version		Changes
		The P632 is now fitted with an improved power supply module. Note that the voltage range has changed for DC input: ● For the DC / AC variant, the range is ◦ now 60 ... 250 VDC / 100 ... 230 VAC ◦ (previously 48 ... 250 VDC / 100 ... 230 VAC). ● For the DC-only variant, the range is ◦ now 24 ... 60 VDC ◦ (previously 24 VDC). A new communication module (“REB” = *“Redundant Ethernet Board”*) is now available as an ordering option. This module can be used for redundant communication via IEC 61850 and may be fitted to slot 2, as an alternative to the other communication modules. The following communication protocols are supported: ● SHP (Self-Healing Protocol). ● RSTP (Rapid Spanning Tree Protocol). ● DHP (Dual-Homing Protocol). A detailed description of the module and the appropriate network connections is available as a separate document (“Redundant Ethernet Board, Application Guide”).
	Diagram	
		The diagrams now include the new “REB” module: ● P632 -409 (for 40TE case, pin-terminal connection) ● P632 -410 (for 84TE case, ring-terminal connection)
	Software	

Version		Changes
	IEC	The Originator Category information is now extensively supported for control commands. **Bug fixing:** ● If single-pole signals of function group SIG_1 were active during device startup, this could lead to an aborted initialization of the Ethernet communication module. ● During the process of connection with clients that use the “IntegrityPeriod” option, sporadically the MMS communication of the Ethernet communication module would crash without an internal monitoring response to re-establish the functionality. (GOOSE messaging and other communication tasks were not affected.) ● Upon receiving a “Cancel” command while a switchgear device is selected, a positive acknowledgement response (“Ack OK”) is sent. Previously, a “Negative ack” was sent. ● If clients did connect to the device immediately after completion of Ethernet communication module startup, this could lead to the temporary erroneous reporting of default values for the external device status (DEVxx) and of the single-pole signals (SIG_1). ● Reports of events could get lost if too many state changes occurred in a short period of time, especially during secondary injection testing. ● Events that occured after a communication link had been interrupted and before this interruption had been detected by the server, were not sent as “Buffered reports” after the connection was re-established.
	GOOSE	The GOOSE Time Allowed to Live (TAL) supervision is enhanced with respect to simultaneous state changes of multiple GOOSE messages.
	PC, COMM2	**Bug fixing:** ● If clients did connect to the device immediately after startup of the Ethernet communication module, the initialization of the second internal communication interface could remain incomplete. As a consequence, access by the operating program via the COMM2 interface or by tunneling was not possible in this case.
P632 **-310** **-409/410** **-650**	**Hardware**	

Version		Changes
Release: 2013-07-12		The P632 is now fitted with an improved processor module. The previously optional DSP coprocessor is no longer needed. The current transformer supervision (CTS) function is generally available.
	Diagram	
		No changes.
	Software	
	OP_RC	The operating data recording buffer size has been enlarged. It now can store up to 1000 events.
		New MiCOM P30 platform software. Many parameter labels have been modified so that they harmonize with other MiCOM P30 devices.
	DVICE	Instead of one parameter for the software version (previously: (002 120) DVICE: Software version) the version numbers -6xx and -7xx are now separately stored in two new parameters: ● (010 167) DVICE: Software version 6XX ● (010 168) DVICE: Software version 7XX Minor version index 7xx is now starting from 700 with each new major version 6xx.
	PC, DVICE	It is now possible to upload new firmware into the device via the TCP/IP protocol. For this purpose there are several new network settings that are not identical to the ones already existing within function group IEC: ● (111 004) PC: IP address ◦ (111 005) PC: IP address 1 ◦ (111 006) PC: IP address 2 ◦ (111 006) PC: IP address 3 ● (111 008) PC: Subnet mask ◦ (111 009) PC: Subnet mask 1 ◦ (111 010) PC: Subnet mask 2 ◦ (111 011) PC: Subnet mask 3 ● (111 016) PC: IP address mode ● (111 017) PC: IP Enable config. For testing purposes, information parameters store the updated network settings for this firmware uploading network. ● (111 000) DVICE: IP address ● (111 001) DVICE: Subnet mask ● (111 003) DVICE: MAC address

Version		Changes
	COMM1	In the communication protocol per IEC 60870-5-103 positive command acknowledgement can now be set to use either single-character E5 (as previous versions) or a short message FT 1.5.
	IEC	The number of clients for a report has been increased: An unbuffered report (urcbA ... urcbP) can be allocated to max. 8 clients (previously: 1), and a buffered report (brcbA ... brcbH) can be allocated to max. 4 clients (previously: 1).
	OUTP	**Bug notice:** With version P63x -650 the test operation of output relays can be executed independent from the off-line state of the device!
	MAIN	The previously available parameters (003 039) MAIN: Warm restart und (000 085) MAIN: Cold restart have been relabeled MAIN: Soft Warm restart and MAIN: Soft Cold restart, respectively. They still trigger a restart of the device, but now the hardware tests are not carried out anymore during the startup phase. (This way the restart needs less time.) For a restart including hardware tests, the following new parameters can now be used: ● (010 166) MAIN: Warm restart ● (009 254) MAIN: Cold restart
	Control (DEVxx, MAIN)	It is possible to download multiple customized bay types without cold restart. Selection parameter has been changed in that way, that any of the downloaded baytypes could be selected through its ID number: ● (220 000) MAIN: Type of bay A new alarm signal for switchgear operating time exceeded is implemented: ● (221 110) MAIN: DEV op.time exceeded This signal will be raised if the command does not reset successfully by switchgear position indication or external run-back signal within set operating time.
	LOG_2	There is a new function group LOG_2 (Programmable Logic 2). It is identical to the previously available function group LOGIC, but it offers only four logical equations. These, however, have long-term timers, settable from 0 to 60000 s (= 16 hours, 40 minutes).
P632 **-310** **-409/410** **-631** **Release: 2013-11-18**	**Hardware**	
		No changes.
	Diagram	
		No changes.

Version		Changes
	Software	
		This release of the Transformer Differential Protection Device MiCOM P632 has been certified by the KEMA.
P632 **-310** **-409/410** **-650-701** **Release: 2014-03-20**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	
	OUTP	**Bug fixing:** ● States of output relays are now stored after power off/on cycle.
	LED	**Bug fixing:** ● LED states are now stored after power off/on cycle.
	REF_x	**Bug fixing:** ● Due to the implementation of enhanced algorithms for the suppression of noise components in the samples, the measuring values of the ground differential protection are now calculated with higher accuracy and provide a better implementation of the tripping characteristic.
P632 **-310** **-409/410** **-650-702** **Release: 2014-05-06**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	
	DIFF	**Bug fixing:** ● The operate value of the overfluxing restraint of differential protection (ratio of the fifth harmonic component to the fundamental wave of the differential current, (072 160) DIFF: Ov. I(5f0)/I(f0) PSx) is now implemented correctly.
P632 **-310**	**Hardware**	
		No changes.

Version		Changes
-409/410 **-650-703** **Release: 2014-09-16**	**Diagram**	
		No changes.
	Software	
		No changes.
P632 **-310** **-409/410** **-651** **Release: 2015-02-20**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	
	FT_RC	**Bug fixing:** ● The fault recording triggers (016 018) FT_RC: Id> and (016 019) FT_RC: IR> were not operating correctly. This has now been corrected.
	PC, COMM1, COMM2	**Bug fixing:** ● When reading the list of stored fault recordings according to the IEC 60870-5-103 communications protocol (with the operating program), the additional binary information “Recording with tripping” and “Recording triggered by starting” are now correctly transmitted.
	IEC	**Bug fixing:** ● Disabling the protection via binary input ((003 026) MAIN: Disable protect. EXT = *Yes*) could have interrupted the IEC 61850 communication permanently. This has now been corrected.
	OUTP	**Bug fixing:** ● Latched outputs were not reset when executing a general reset. This has now been corrected.
	DEV01	**Bug fixing:** ● Control of DEV01 was not possible without fitted binary I/O module X(6I/6O). The link of the protection trip command to the DEV01 open command (e.g. (210 021) DEV01: With gen. trip cmd.1 = *Yes*) did not function. This has now been corrected.

Version		Changes
	DIFF	Implementation of a binary input signal for blocking the differential protection function: ● (003 163) DIFF: Blocking EXT
P632 **-311** **-411/412** **-652** **Release: 2015-06-23**	**Hardware**	
		As a variant, the new binary I/O module X(6I 3O) is now available to provide the power supply module with an additional 6 binary signal inputs and 3 output relays. The Redundancy Ethernet Board (REB) can now be ordered with an additional redundancy protocol: PRP (Parallel Redundancy Protocol) is available now as an alternative to RSTP, SHP or DHP.
	Diagram	
		The updated connection diagrams now include the new binary I/O module X(6I 3O): ● P632 -411 (for 40 TE case, with pin-terminal connection) ● P632 -412 (for 84 TE case, with ring-terminal connection)
	Software	
	GOOSE	The number of GOOSE inputs has been extended to 128: Extension of available GOOSE inputs from 32× 1-pole/32× 2-pole to 128 GOOSE inputs configurable in the IED Configurator tool. Max. 128× 1-pole binary signals freely configurable in the device or alternatively up to max. 128× 2-pole switchgear position indications for using the Control/Interlocking conditions. The number of GOOSE inputs has been extended to 128: Extension of available GOOSE inputs from 32× 1-pole/32× 2-pole to 128 GOOSE inputs configurable in the IED Configurator tool. Max. 128× 1-pole binary signals freely configurable in the device or alternatively up to max. 128× 2-pole switchgear position indications for using the Control/Interlocking conditions.
	GSSE	Function group GSSE has been removed. It has been replaced by the extended GOOSE input option.
	IEC	**Bug fixing:** ● Required parameters were missing from the set of available options of IEC: SigGGIO1 selection.
	MAIN	The maximum values of the measured primary currents have been increased to *65000 A*.

Version		Changes
	FT_DA	The primary values for the phase and residual fault currents (for every transformer end) have been added.
	DTOCx, IDMTx	New setting parameters allow to select for each overcurrent stage of the phase and the residual currents whether the starting decision shall be based on the fundamental or on the r.m.s. value. Remark: For the negative-sequence stages, the starting decision is always based on the fundamental.
	THRMx	The thermal overload protection can now alternatively also be applied to the measured or calculated neutral current: ● (013 184) THRM1: Select current PSx
	LOGIC	The number of logic outputs (equations) has been extended to 128.
	COUNT	Function group COUNT has become available. Four binary counters can be used to count the positive pulse edges of a binary signal present at an appropriately configured binary signal input.
P632 **-311** **-411/412** **-653** **Release: 2016-11-07**	**Hardware**	
		No changes.
	Diagram	
		No changes.
	Software	
	COMM1	**Bug fixing:** ● A device reboot with physical channel 2 assigned to COMM1 and busy does no longer block the communication. ● Bug fixing in the DNP3.0 protocol: The following bugs upon device reboot have been eliminated: – not all Class 0 objects were available – the link re-establishing stage permanently timed-out ● Bug fixing in the Modbus protocol: After receiving single-pole commands (e.g. CMD_1: Command C001), no response was sent from P632 to the master device.
	IEC	**Bug fixing:** ● Correct command originators are now reported by rcb upon change of control point.

Version		Changes
	SFMON	**Bug fixing:** ● Self-monitoring of internal supply voltages (15V, -15V, 24V) and output relay contacts has been corrected to cope all kind of defects
	MAIN	New group signals have been implemented with fixed meaning: ● (019 201) DIFF Sat.discr. trigg. = saturation discriminator picked up in at least one measuring system ● (019 213) DIFF Inrush blk. trigg. = inrush blocking picked up in at least one measuring system ● (019 202) DIFF Overflux.bl. trigg. = overflux blocking picked up in at least one measuring system ● (019 214) DIFF Harm.block. trigg. = inrush or overflux blocking triggered ● (019 200) MAIN REFn trip signal = any REF element tripped Additionally 8 user configurable group signals have been implemented: ● (019 192) MAIN Group signal 01 to (019 199) MAIN Group signal 08 For each of them up to 32 internal signals can be freely combined using Boolean operators NOT, AND, OR. These state signals are continuously updated, but with no latching nor settable pick up/ release delay timers. The configuration lists of general trip commands has been updated to incorporate new group signals and TRMON trip signals.
	FT_RC	Disturbance recording of neutral currents and voltage has been made user settable (to avoid recording if no CT/VT is connected). The configuration lists for fault recording triggers has been updated to incorporate new group signals and TRMON signals. Bug fixing: Binary signals are now correctly recorded during the whole post-fault period.
	DTOCn	New group signals have been implemented which combine the trip signals of each DTOC function: ● (019 215) DTOC1: Trip signal ● (019 216) DTOC2: Trip signal

Version		Changes
	V<>	New group signals have been implemented, indicating that one or both timers of the over-/ undervoltage elements has elapsed: ● (019 220) V<>: tV>/>> elapsed ● (019 219) V<>: tV</<< elapsed ● (019 221) V<>: tV</<< elapsed &Vmin
	MCM_n	The hysteresis on operation thresholds 'MCM_n: Ineg/ Ipos> PSx' has been improved to avoid chattering starting signals.
	CBF_n	Function of external triggering has been made more robust: If only single-pole trigger (e.g. 038.205 CBF_1 Start 3p EXT) is configured, then this input must be active as long as the CBF timer is running. Otherwise CBF resets as soon as the trigger input signal resets.
	TRMON	Implementation of a dedicated Transformer Monitoring function group that provides inputs for external transformer protection equipment (3 sets of Buchholz alarm and trip, insulation alarm).
P632 **-312** **-413/414** **-660** **Release: 2017-07-21**	**Hardware**	
		The P632 is now fitted with Ethernet module (SEB LC/ RJ45 or REB LC/RJ45). This module is used for IEC 61850 Edition 1 and Edition 2 and is fitted to slot 2, as an alternative to other communication modules. HSR/PRP communication protocols are supported.
	Diagram	
		The updated connection diagrams now include the Ethernet module communication interface with SEB and REB. ● P632 -413 (for 40 TE case, with pin-terminal connection) ● P632 -414 (for 84 TE case, with ring-terminal connection)
	Software	

Version		Changes
	CS	Implementation of a dedicated function group that provides Cyber Security protection to mitigate the security risks. The Security Administration Tool is required for RBAC configuration and setting changes. ● (180 031) CS: CyberSecurity Vers. ● (180 002) CS: Number of users ● (180 032) CS: Comms logout ● (180 033) CS: HMI logout ● (180 043) CS: Comms username ● (180 034) CS: HMI username ● (180 013) CS: User access role ● (180 011) CS: Max login attempts ● (180 010) CS: Login attempts left ● (180 015) CS: Blocking time ● (180 012) CS: Blocking time left ● (180 041) CS: Result EPW setting ● (180 003) CS: Change pincode ● (180 044) CS: Config disabled ● (180 014) CS: Recovery Password ● (180 045) CS: Reset RABC
	IEC	The protocol of the redundant connection is configurable with IEC: ETH COMM Mode . When Ethernet module (REB or SEB) is used, second Ethernet information is provided. ● (104 080) IEC: ETH COMM Mode ● (104 072) IEC: Gateway address 2 ● (104 070) IEC: IP address 2 ● (104 073) IEC: Block Port A/B ● (104 074) IEC: Block Port C ● (221 125) IEC: Ctrl blocked user ● (104 071) IEC: Subnet mask 2 ● (104 079) IEC: IEC prot. variant
P632 **-312** **-413/414** **-661** **Release: 2017-12-19**	**Hardware**	
		PRP/HSR/RSTP communication protocols are supported.
	Diagram	
		No changes.
	Software	

Version		Changes
	IEC	The RSTP protocol is supported and configurable via IEC: ETH COMM Mode. IEC 60870-5-104 protocol has been added. It can be enabled and selected via IEC: IEC60870-5-104enable and IEC: IEC prot. varian. To improve network administration, VLAN and port assignment are supported.
	VINP	VINP functional group includes 64 virtual inputs and is intended to process binary information from the Ethernet module running with protocol IEC 60870-5-104. This function group is only visible if IEC: IEC60870-5-104enable is set to Yes.

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