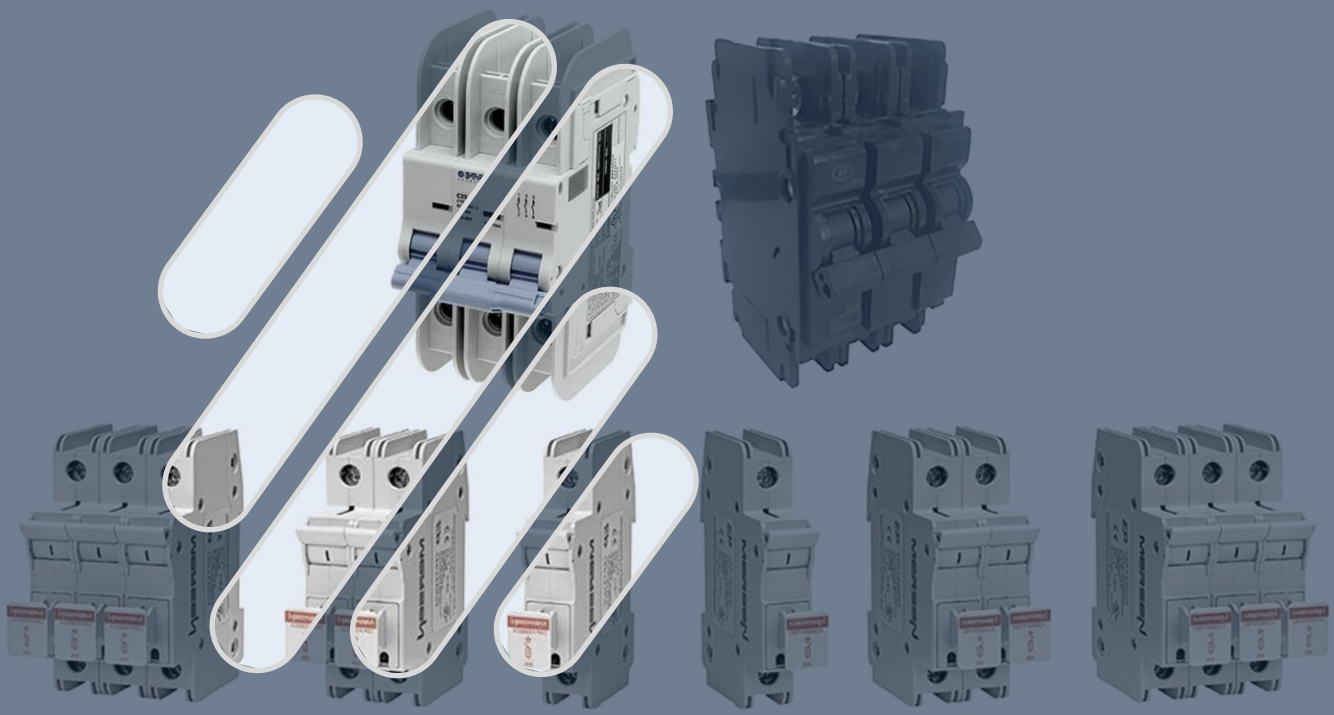
MCA

Electrical Distribution . Controls . Metal Fabrication



EMERGENCY POWER SYSTEMS SELECTIVE COORDINATION GUIDE

SELECTIVE COORDINATION, EMERGENCY POWER CIRCUITS, AND NEC REQUIREMENTS

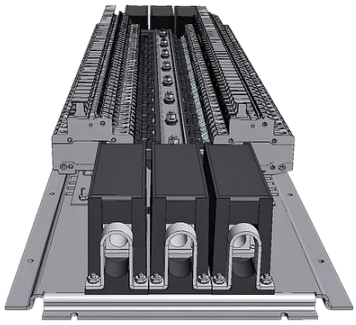
The JANUS cULus panelboard is compatible with most molded case breakers, miniature circuit breakers, and fused switches. The open architecture of the JANUS panelboard allows for breaker and fuse combinations that are fully selective coordinated.

The National Electrical Code (NEC) requires Emergency Power Circuits to be selectively coordinated in the following applications:

NEC 620.62 Elevator Circuits
NEC 700.27 (28) Emergency Systems
NEC 701.18 (27) Legally Required Standby Systems
NEC 708.54 Critical Operations Power Systems
NEC 517.26 Essential Electrical Systems

The NEC states the following concerning the requirement for selectively coordinated systems:

"Selective coordination shall be selected by a licensed professional engineer or other qualified person engaged primarily in the design, installation, or maintenance of electrical systems. The selection shall be documented and made available to those authorized to design, install, inspect, maintain, and operate the system."



SELECTIVE COORDINATION

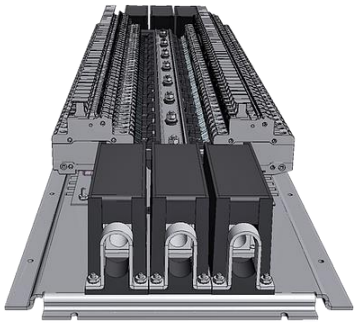
Selective Coordination Definition

Selective coordination is defined by the NEC in Article 100 as:

"Localization of an overcurrent condition to restrict outages to the circuit or equipment affected,
accomplished by the choice selection and installation of overcurrent protective devices and their ratings or settings for the full range of available overcurrents, from overload to the maximum available fault current, and for the full range of overcurrent protective device opening times associated with those overcurrents."

A selectively coordinated system is one where a branch circuit or "downstream" breaker experiences a short circuit. The breaker isolates the fault while all other breakers are not affected and remain energized. Only the "downstream" breaker opens and all "upstream" breakers remain operational.

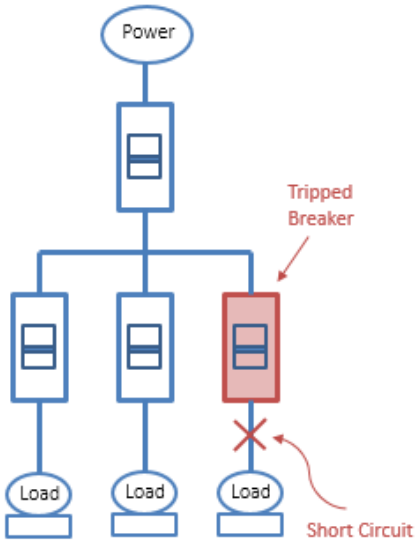
A non-selectively coordinated system is one where a branch circuit or "downstream" breaker experiences a short circuit. The breaker does not isolate the fault and the "downstream" breaker and the "upstream" breaker both open and the entire system is no longer operational.



SELECTIVE COORDINATION

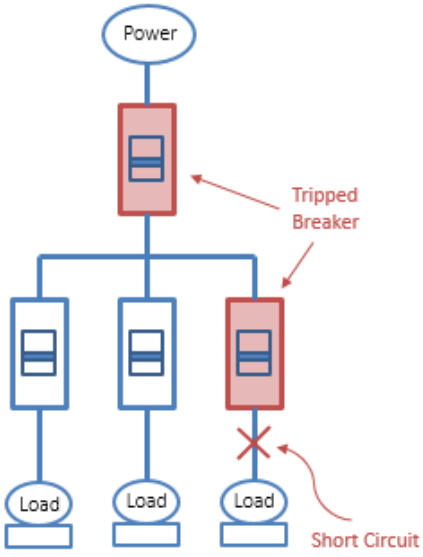
How to Selectively Coordinate Power Systems

Selective coordination of a power distribution system is dependent on the tripping characteristics of several different breakers and their ability to work together to isolate system faults. The performance characteristics of a combination of breakers are determined by conducting short circuit testing in a laboratory setting. Coordination testing is not governed by UL standards and is "self-certified" by breaker manufacturers. Each breaker manufacturer publishes tables that detail breaker combinations and values that have been tested and "certified" as coordinated.



Coordinated System

A short circuit situation where the immediately affected breaker opens the circuit and **isolates** the fault. All other breakers remain closed and the system is operational.



Non-Coordinated System

A short circuit situation where the immediately affected breaker opens the circuit and **does not isolate** the fault. The main breaker also opens and the entire system is no longer operational.

CIRCUIT PROTECTION

The JANUS cULus panelboard is compatible with all available breakers listed below and is selectively coordinated to the values listed.

ABB

225A Main - S200U & S800U Branch @ 120/240VAC

Main Breaker	Branch Breaker	Amps	Coordination Rating
TS3	S200U	1	28.6kA
TS3	S200U	2	28.6kA
TS3	S200U	3	28.6kA
TS3	S200U	4	28.6kA
TS3	S200U	5	28.6kA
TS3	S200U	6	28.6kA
TS3	S200U	7	28.6kA
TS3	S200U	8	28.6kA
TS3	S200U	10	28.6kA
TS3	S200U	15	28.6kA
TS3	S200U	20	28.6kA
TS3	S200U	25	28.6kA
TS3	S200U	30	28.6kA
TS3	S200U	40	28.6kA
TS3	S200U	50	28.6kA

ABB

225A Main - S200UP Branch @ 480VAC

Main Breaker	Branch Breaker	Amps	Coordination Rating
TS3	S200UP	1	14kA
TS3	S200UP	2	14kA
TS3	S200UP	3	14kA
TS3	S200UP	4	14kA
TS3	S200UP	5	14kA
TS3	S200UP	6	14kA
TS3	S200UP	7	14kA
TS3	S200UP	8	14kA
TS3	S200UP	10	14kA
TS3	S200UP	15	14kA
TS3	S200UP	20	14kA
TS3	S200UP	25	14kA

Schneider / SqD

225A Main - QOU Branch @ 120/240VAC

Main Breaker	Branch Breaker	Amps	Coordination Rating
LA-MC / LH-MC	QOU 1P 120VAC	10	18kA
	QOU 2P 120/240VAC	10	18kA
	QOU 3P 240VAC	10	18kA
LA-MC / LH-MC	QOU 1P 120VAC	15	18kA
	QOU 2P 120/240VAC	15	18kA
	QOU 3P 240VAC	15	18kA
LA-MC / LH-MC	QOU 1P 120VAC	20	18kA
	QOU 2P 120/240VAC	20	18kA
	QOU 3P 240VAC	20	18kA
LA-MC / LH-MC	QOU 1P 120VAC	25	11kA
	QOU 2P 120/240VAC	25	18kA
	QOU 3P 240VAC	25	8kA
LA-MC / LH-MC	QOU 1P 120VAC	30	11kA
	QOU 2P 120/240VAC	30	18kA
	QOU 3P 240VAC	30	8kA
LA-MC / LH-MC	QOU 1P 120VAC	35	10kA
	QOU 2P 120/240VAC	35	10kA
	QOU 3P 240VAC	35	7.5kA
LA-MC / LH-MC	QOU 1P 120VAC	45	10kA
	QOU 2P 120/240VAC	45	10kA
	QOU 3P 240VAC	45	7.5kA
LA-MC / LH-MC	QOU 1P 120VAC	50	10kA
	QOU 2P 120/240VAC	50	10kA
	QOU 3P 240VAC	50	10kA
LA-MC / LH-MC	QOU 1P 120VAC	60	8kA
	QOU 2P 120/240VAC	60	10kA
	QOU 3P 240VAC	60	6.5kA
LA-MC / LH-MC	QOU 1P 120VAC	70	7kA
	QOU 2P 120/240VAC	70	10kA
	QOU 3P 240VAC	70	6kA
LA-MC / LH-MC	QOU 1P 120VAC	80	~
	QOU 2P 120/240VAC	80	6kA
	QOU 3P 240VAC	80	6kA
LA-MC / LH-MC	QOU 1P 120VAC	90	~
	QOU 2P 120/240VAC	90	6kA
	QOU 3P 240VAC	90	6kA
LA-MC / LH-MC	QOU 1P 120VAC	100	~
	QOU 2P 120/240VAC	100	6kA
	QOU 3P 240VAC	100	6kA

CIRCUIT PROTECTION

MCA

The JANUS cULus panelboard is compatible with all available breakers listed below and is selectively coordinated to the values listed.

Schneider / SqD

225A Main - QOU Branch @ 120/240VAC

Main Breaker	Branch Breaker	Amps	Coordination Rating
JJU3250	QOU 1P 120VAC	All	2.6kA
	QOU 2P 120/240VAC	All	2.6kA
	QOU 3P 240VAC	All	2.6kA
LJ	QOU 1P 120VAC	All	2.6kA
	QOU 2P 120/240VAC	All	2.6kA
	QOU 3P 240VAC	All	2.6kA
PJ	QOU 1P 120VAC	All	10kA
	QOU 2P 120/240VAC	All	10kA
	QOU 3P 240VAC	All	10kA
QJ	QOU 1P 120VAC	All	1.7kA
	QOU 2P 120/240VAC	All	1.7kA
	QOU 3P 240VAC	All	1.7kA
JL	QOU 1P 120VAC	All	2.5kA
	QOU 2P 120/240VAC	All	2.5kA
	QOU 3P 240VAC	All	2.5kA
JLU3250	QOU 1P 120VAC	All	2.6kA
	QOU 2P 120/240VAC	All	2.6kA
	QOU 3P 240VAC	All	2.6kA
LL	QOU 1P 120VAC	All	2.6kA
	QOU 2P 120/240VAC	All	2.6kA
	QOU 3P 240VAC	All	2.6kA

Eaton / Cutler-Hammer

225A Main - QC Branch @ 120/240VAC

Main Breaker	Branch Breaker	Amps	Coordination Rating
F	QC 1P 120VAC	All	2.3kA
	QC 2P 120/240VAC	All	2.3kA
	QC 3P 240VAC	All	2.3kA
J	QC 1P 120VAC	All	2.3kA
	QC 2P 120/240VAC	All	2.3kA
	QC 3P 240VAC	All	2.3kA
JG	QC 1P 120VAC	All	3.0kA
	QC 2P 120/240VAC	All	3.0kA
	QC 3P 240VAC	All	3.0kA
K	QC 1P 120VAC	All	4.2kA
	QC 2P 120/240VAC	All	4.2kA
	QC 3P 240VAC	All	4.2kA
LD	QC 1P 120VAC	All	10kA
	QC 2P 120/240VAC	All	10kA
	QC 3P 240VAC	All	10kA
LHH	QC 1P 120VAC	All	10kA
	QC 2P 120/240VAC	All	10kA
	QC 3P 240VAC	All	10kA
LG	QC 1P 120VAC	All	10kA
	QC 2P 120/240VAC	All	10kA
	QC 3P 240VAC	All	10kA

Schneider / SqD

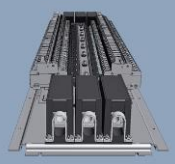
225A Main - QOU Branch @ 120/240VAC

Main Breaker	Branch Breaker	Amps	Coordination Rating
QB	QOU 1P 120VAC	All	1.7kA
	QOU 2P 120/240VAC	All	1.7kA
	QOU 3P 240VAC	All	1.7kA
JD	QOU 1P 120VAC	All	2.5kA
	QOU 2P 120/240VAC	All	2.5kA
	QOU 3P 240VAC	All	2.5kA
JDU3250	QOU 1P 120VAC	All	2.6kA
	QOU 2P 120/240VAC	All	2.6kA
	QOU 3P 240VAC	All	2.6kA
QD	QOU 1P 120VAC	All	1.7kA
	QOU 2P 120/240VAC	All	1.7kA
	QOU 3P 240VAC	All	1.7kA
LD	QOU 1P 120VAC	All	2.6kA
	QOU 2P 120/240VAC	All	2.6kA
	QOU 3P 240VAC	All	2.6kA
JG	QOU 1P 120VAC	All	2.5kA
	QOU 2P 120/240VAC	All	2.5kA
	QOU 3P 240VAC	All	2.5kA
JGU3250	QOU 1P 120VAC	All	2.5kA
	QOU 2P 120/240VAC	All	2.5kA
	QOU 3P 240VAC	All	2.5kA
LG	QOU 1P 120VAC	All	2.6kA
	QOU 2P 120/240VAC	All	2.6kA
	QOU 3P 240VAC	All	2.6kA
NT-H	QOU 1P 120VAC	All	10kA
	QOU 2P 120/240VAC	All	10kA
	QOU 3P 240VAC	All	10kA
PG	QOU 1P 120VAC	All	10kA
	QOU 2P 120/240VAC	All	10kA
	QOU 3P 240VAC	All	10kA
PK	QOU 1P 120VAC	All	10kA
	QOU 2P 120/240VAC	All	10kA
	QOU 3P 240VAC	All	10kA
QG	QOU 1P 120VAC	All	1.7kA
	QOU 2P 120/240VAC	All	1.7kA
	QOU 3P 240VAC	All	1.7kA
NW-N	QOU 1P 120VAC	100	10kA
	QOU 2P 120/240VAC	100	10kA
	QOU 3P 240VAC	100	10kA
JJ	QOU 1P 120VAC	All	2.5kA
	QOU 2P 120/240VAC	All	2.5kA
	QOU 3P 240VAC	All	2.5kA

MCA

Established in 1904 MCA Fabrication provides manufacturing services and produces electrical products in a 135,000 sqft facility located just outside Nashville.

POWER DISTRIBUTION PANELBOARDS



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