

Ground fault indication relay - H550, H666, H667, H668



> **Specification sheet**

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Code requirements

NFPA 70, the U.S. National Electrical Code (NEC) requires that services of 1000 amps and larger in capacity which operate at more than 150 volts from line-to-neutral must be provided with ground fault equipment. Generator sets rated at 1000 amps and larger which serve as emergency power must be provided with ground fault indication equipment. Health care facilities that utilize ground fault protection equipment must be provided with a coordinated multi-level ground fault system.

Cummins Power Generation ground fault indication equipment is designed for use in emergency/standby power systems, for indication of ground fault conditions during generator set operation.

Features

Suitable for indicating a ground fault condition on a generator set which is either locally or remotely grounded.

Supply voltage - Operates on 24 VDC (nominal) control power - fully functional at voltages from 18-30 VDC.

Direct connection - Suitable for direct connection to generator sets operating at voltages up to 600 VAC (line to line).

Ground fault current settings - 100-1200 A, in 10 discrete settings: 100, 150, 200, 250, 300, 450, 600, 750, 800, 1200 A.

Monitoring - Provides continuous monitoring of neutral-to-ground with LED indication for open connection.

Factory mounted controls - Available factory-mounted and interconnected to Cummins Power Generation Detector™ series PowerCommand® controls.

Link reconnection - For use with either 3-pole (solid neutral) or 4-pole (switched neutral) transfer switches.

Indicating lamps - For Relay on (green), ground fault current over setting (red), loss of ground connection (red).

Time delay settings – Adjustable 0-10 seconds.

Circuit board - One-piece molded case fully potted.

Contacts - One set of form C output, 8A at 250 VAC, 8A at 30 VDC.

“Test” - Push-button.

“Reset” - Push-button.

Percent full scale metering output - 0-1 mA full scale.

Bonding jumper - Sized per NEC requirements.

Construction

The relay is provided in a non-conducting phenolic case, with provisions for panel mounting or mounting to a standard DIN rail (panel mounting is recommended for mounting on a generator set). Relay components are fully potted with epoxy resin for vibration resistance and durability.

The relay includes an integral terminal block assembly, which accepts wires up to 12-gauge.

Relay function selection link (auto/hand reset).

Environmental range - Operating -10 °C to +60 °C, storage -20 °C to 70 °C.

DC supply burden – 2.5 W.

Transfer switch type selection link - (3-pole or 4-pole).

System operation

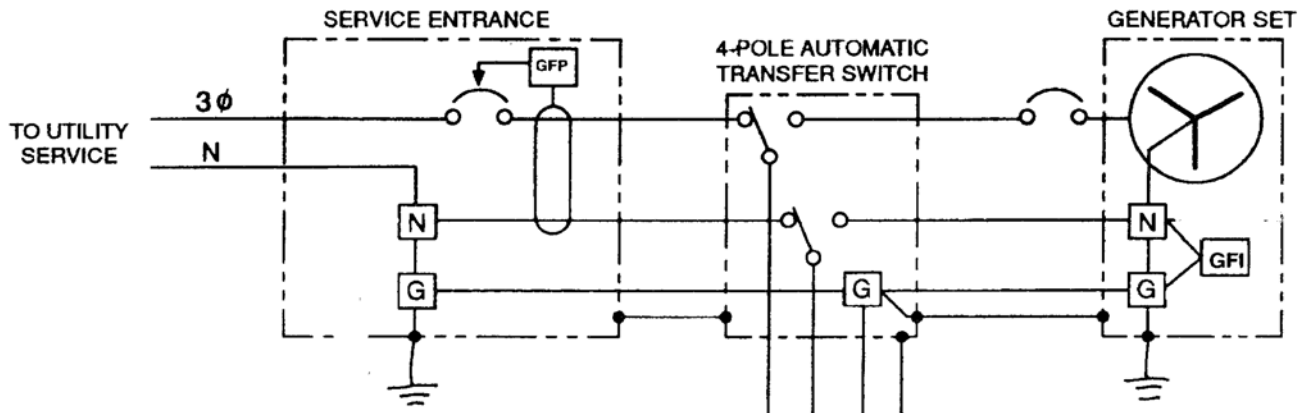
The ground fault relay continuously monitors the voltage across the neutral-to-ground bonding jumper and lights the ground fault alarm lamp on the generator set control when the connection is broken.

When the generator set is running, the relay continuously monitors the neutral-to-ground generator set connection and lights the ground fault alarm lamp on the generator set control when a ground fault condition is sensed.

Alarm condition can be cleared by pushing the reset switch on the generator set control panel. Actual ground fault current level can be monitored with a 0-1 mA meter, directly from the relay. A push button test switch is provided to simulate ground fault conditions and operate the relay and indication circuitry. Addition of the auto-reset link activates automatic reset of the relay after the ground fault condition has cleared.

System schematic

Separately derived system connections (local grounding connection).



Neutral-to-ground bonding jumper must be sized per code requirements. For non-separately derived systems (3-phase/4-wire systems with 3-pole transfer switch), the ground connection and the neutral-to-ground bonding jumper on the generator set are removed, and the 3-pole ATS link is added to the ground fault relay. For non-separately derived systems a label must be applied to the service entrance switchboard, indicating that removal of the equipment-bonding jumper can cause hazardous operating conditions.

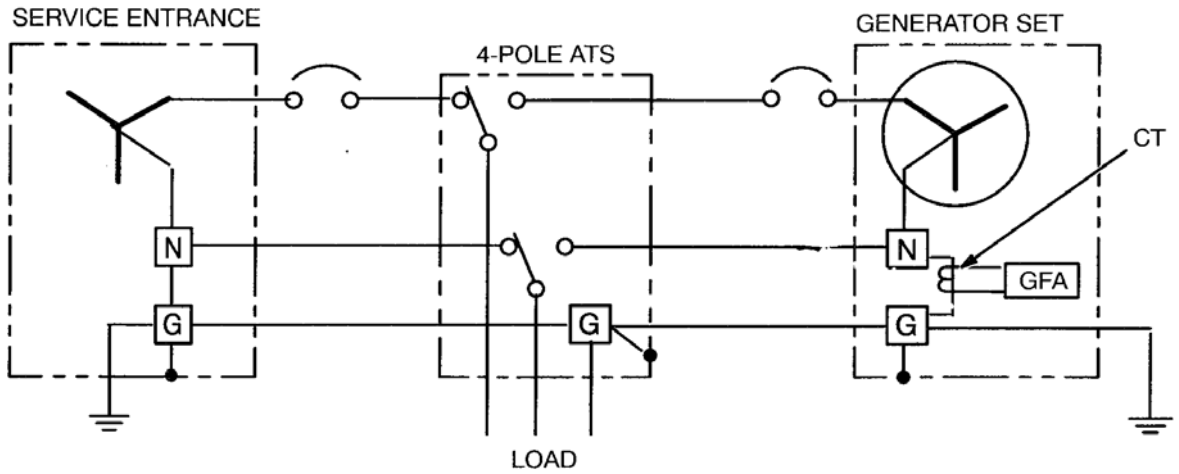
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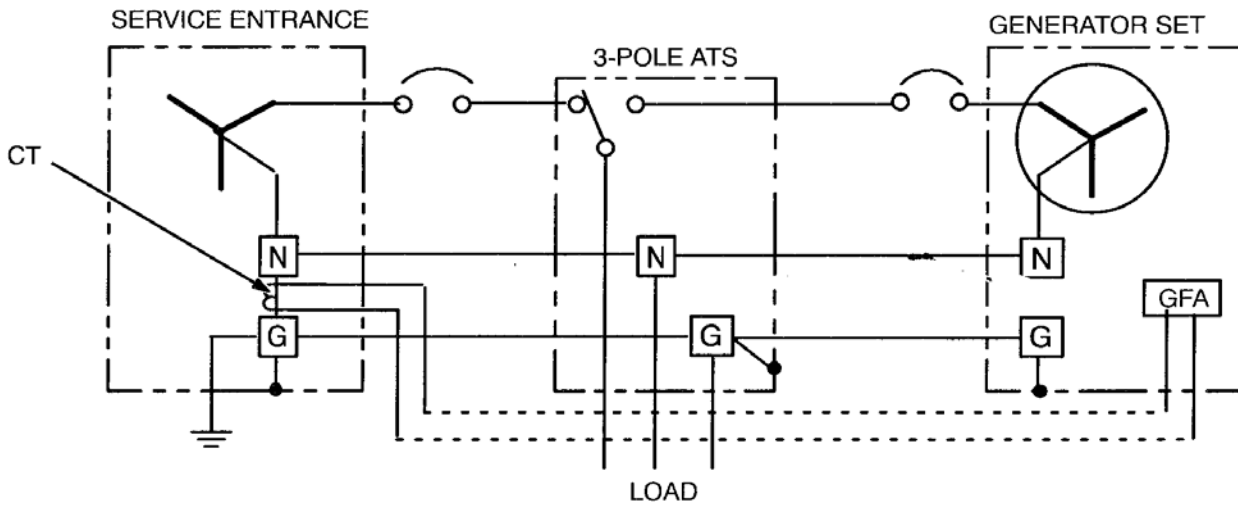


0179-3509 – TYPE A



THREE-PHASE, FOUR-WIRE UTILITY, 4-POLE ATS

0179-3509 – TYPE B



THREE-PHASE, FOUR-WIRE UTILITY, 3-POLE ATS

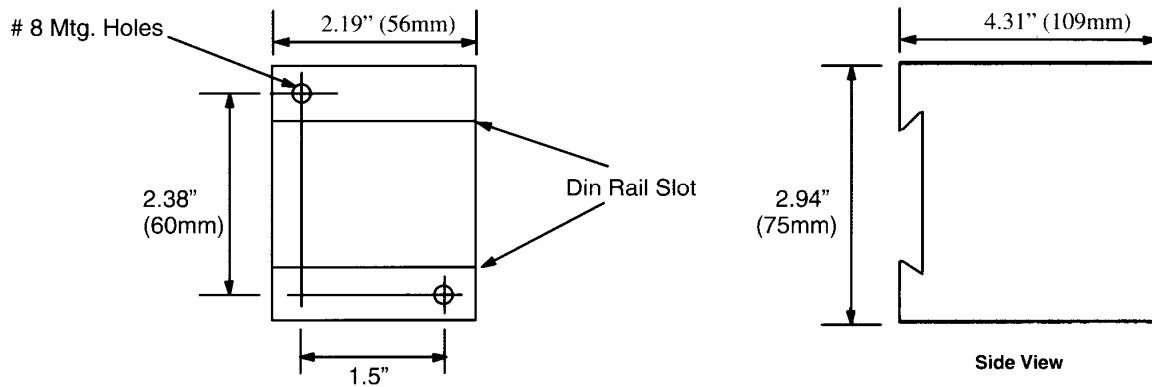
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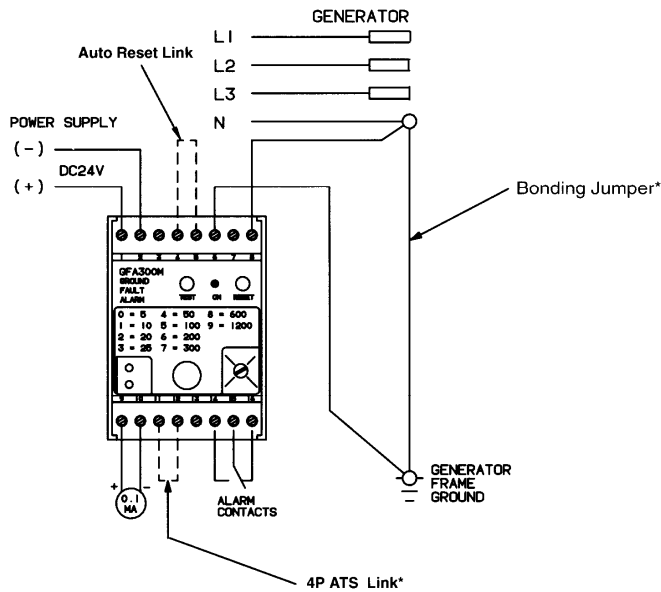


Outline detail



Weight: 19 oz (540 grams)

Interconnection detail



* Required only with separately derived systems. Bonding jumper is included in kit.

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Field installation kits

Accessory Kit #	Corresponding Production Part #	Critical Component	Used with Alt frame size 4 or 5	Used with Alt frame size 6 or 7	Feature Code	Miscellaneous	Instruction Sheet
0179-3244-05	0179-3244-03	0307-3003-01	X		H550	For use with PCC2100	C645
0179-3244-06	0179-3244-07	0307-3003-01		X	H550	For use with PCC2100	C645
0179-3244-09	0179-3244-08	0307-3003-01	X			For use with PCC2100	C645
0179-3428-02	0179-3428-01	0307-3003-01	X		H550	For use with PCC3200, PCC3201	C706
0179-3509-03	0179-3509-01	0307-3003-01		X	H667/H668	Ground Fault Kit – PCC2100/3100, 4-pole. Separately derived transfer switch (SDTS). Installation onto generator set equipped with or without set mounted circuit breaker box.	C656
0179-3509-04	0179-3509-02	0307-3003-01		X	H666	Ground Fault Kit – PCC3200, 4-pole NSDTS (H666) NON-separately derived transfer switch (NSDTS). Installation onto generator set equipped with or without set mounted circuit breaker box.	C656
0179-3509-07	0179-3509-05	0307-3003-01		X	H667/H668	Ground Fault Kit – PCC3200, 4-pole. Separately derived transfer switch (SDTS). Installation onto generator set equipped with or without set mounted circuit breaker box.	C656
0179-3509-08	0179-3509-06	0307-3003-01		X	H666	Ground Fault Kit – PCC3200, 3-pole. NON-separately derived transfer switch (NSDTS). Installation onto generator set equipped with or without set mounted circuit breaker box.	C656
0300-4582-05	0300-4582-03	0307-3003-01	X		H550	For use with PCC3100	C646

Feature descriptions

H550-2 = The unit is equipped with an adjustable sensor to detect a ground fault condition on the main alternator output. A fault condition illuminates an indicating lamp on the genset control panel. Sensor features include: -0 to 1.0 second adjustable time delay. Ground fault pickup settings: 100, 150, 200, 250, 300, 450, 600, 750, 800, 1200 Amps – “Test” and “Reset” buttons and functional condition indicating lights. Suitable for operating voltages up to 600 VAC.

H666-2-2 = The generator set is equipped with a current transformer and a ground fault indication relay for use with a 3-pole, non-separately derived transfer switch only, with or without a set mounted circuit breaker. The current transformer will be shipped loose and must be installed at the customer service entrance ground bond connection. Wiring from the current transformer must be brought back to set mounted relay. Other components included with this feature include a set mounted ground fault indication relay. The current transformer has a 4.25 inch round window.

H667-2-2 = The generator set is equipped with a current transformer and ground fault indication relay for use with a 4-pole, separately derived transfer switch and set mounted circuit breaker. The CT is mounted in the circuit breaker box mounted on the left side of the genset as viewed from the generator end. The genset neutral and ground are bonded.

H668-2-2 = The generator set is equipped with a current transformer and ground fault indication relay for use with a 4-pole, separately derived transfer switch and set mounted circuit breaker. The CT is mounted in the circuit breaker box mounted on the right side of the genset as viewed from the generator end. The genset neutral and ground are bonded.

Certification



ISO9001 - This product was designed and manufactured in facilities certified to ISO9001.

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		GFI Relay Kit - by feature option				Applicable Compatibility Rules				Production Part #
Model	Spec	H550	H666	H667	H668	Also Required:		Not for use with:		
DFEC	L	0179-3244-05					WYE Connection	PCC2100	R107-2 or R108-2	0179-3244-03
DFEC	L	0300-4582-05				HC4 / HC5	WYE Connection	PCC Control	R107-2 or R108-2	0300-4582-03
DFED	H	0179-3244-05					WYE Connection	PCC2100	R107-2 or R108-2	0179-3244-03
DFED	H	0300-4582-05				HC4 / HC5	WYE Connection	PCC Control	R107-2 or R108-2	0300-4582-03
DFAB	N	0179-3244-05					WYE Connection	PCC2100	R107-2 or R108-2	0179-3244-03
DFAB	N	0300-4582-05				HC4 / HC5	WYE Connection	PCC Control	R107-2 or R108-2	0300-4582-03
DFAC	N	0179-3244-05					WYE Connection	PCC2100	R107-2 or R108-2	0179-3244-03
DFAC	N	0300-4582-05				HC4 / HC5	WYE Connection	PCC Control	R107-2 or R108-2	0300-4582-03
DFEG	F	0179-3244-06					WYE Connection	PCC2100	R107-2 or R108-2	0179-3244-07
DFEG	F	0179-3428-02					WYE Connection	PCC3201	R107-2 or R108-2	0179-3428-01
DFEH	F	0179-3244-06					WYE Connection	PCC2100	R107-2 or R108-2	0179-3244-07
DFEH	F	0179-3428-02					WYE Connection	PCC3201	R107-2 or R108-2	0179-3428-01
DFEJ	F	0179-3244-06					WYE Connection	PCC2100	R107-2 or R108-2	0179-3244-07
DFEJ	F	0179-3428-02					WYE Connection	PCC3201	R107-2 or R108-2	0179-3428-01
DFEK	F	0179-3244-06					WYE Connection	PCC2100	R107-2 or R108-2	0179-3244-07
DFEK	F	0179-3428-02					WYE Connection	PCC3201	R107-2 or R108-2	0179-3428-01
DFGB	K	0179-3244-05				HC5	WYE Connection	PCC2100		0179-3244-03
DFGB	K	0300-4582-05				HC4 / HC5	WYE Connection	PCC Control		0300-4582-03
DQHAA	A	0179-3244-09					WYE Connection	PCC2100	R107-2 or R108-2	0179-3244-08
DQHAB	A	0179-3244-09					WYE Connection	PCC2100	R107-2 or R108-2	0179-3244-08
DQAD	E	0179-3244-05					WYE Connection	PCC2100	R107-2 or R108-2	0179-3244-03
DQAE	E	0179-3244-05					WYE Connection	PCC2100	R107-2 or R108-2	0179-3244-03
DQAF	E	0179-3244-05					WYE Connection	PCC2100	R107-2 or R108-2	0179-3244-03
DFCB	Z	0179-3244-05					WYE Connection	PCC2100	R107-2 or R108-2	0179-3244-03
DFCB	Z	0300-4582-05				HC4 / HC5	WYE Connection	PCC Control	R107-2 or R108-2	0300-4582-03
DFCC	Z	0179-3244-05					WYE Connection	PCC2100	R107-2 or R108-2	0179-3244-03
DFCC	Z	0300-4582-05				HC4 / HC5	WYE Connection	PCC Control	R107-2 or R108-2	0300-4582-03
DFCE	J	0179-3244-05					WYE Connection	PCC2100	R107-2 or R108-2	0179-3244-03
DFCE	J	0300-4582-05				HC4 / HC5	WYE Connection	PCC Control	R107-2 or R108-2	0300-4582-03
DFLC	W		0179-3509-04			3 Pole Transfer Switch	VLL<=690		HC5 or P80 Alternators	0179-3509-02
DFLE	F		0179-3509-04			3 Pole Transfer Switch	VLL<=690		HC5 or P80 Alternators	0179-3509-02
DFGB	K		0179-3509-04			3 Pole Transfer Switch	VLL<=690		HC5 or P80 Alternators	0179-3509-02
DFGE	C		0179-3509-04			3 Pole Transfer Switch	VLL<=690		HC5 or P80 Alternators	0179-3509-02
DFHA	H		0179-3509-04			3 Pole Transfer Switch	VLL<=690		HC5 or P80 Alternators	0179-3509-02
DFHB	H		0179-3509-04			3 Pole Transfer Switch	VLL<=690		HC5 or P80 Alternators	0179-3509-02
DFHC	G		0179-3509-04			3 Pole Transfer Switch	VLL<=690		HC5 or P80 Alternators	0179-3509-02
DFHD	E		0179-3509-04			3 Pole Transfer Switch	VLL<=690		HC5 or P80 Alternators	0179-3509-02
DQCA	B		0179-3509-04			3 Pole Transfer Switch	VLL<=690	PCC2100	HC5 or P80 Alternators	0179-3509-02
DQCB	B		0179-3509-08			3 Pole Transfer Switch	VLL<=690	PCC3201	HC5 or P80 Alternators	0179-3509-06
DQCB	B		0179-3509-04			3 Pole Transfer Switch	VLL<=690	PCC2100	HC5 or P80 Alternators	0179-3509-02
DQCB	B		0179-3509-08			3 Pole Transfer Switch	VLL<=690	PCC3201	HC5 or P80 Alternators	0179-3509-06
DQCC	B		0179-3509-04			3 Pole Transfer Switch	VLL<=690	PCC2100	HC5 or P80 Alternators	0179-3509-02
DQCC	B		0179-3509-08			3 Pole Transfer Switch	VLL<=690	PCC3201	HC5 or P80 Alternators	0179-3509-06
DQGAA	A		0179-3509-08			3 Pole Transfer Switch			VLL<=690	0179-3509-06
DQGAB	A		0179-3509-08			3 Pole Transfer Switch			VLL<=690	0179-3509-06
DQKB	G		0179-3509-08			3 Pole Transfer Switch	VLL<=690		HC5 or P80 Alternators	0179-3509-06
DQKC	G		0179-3509-08			3 Pole Transfer Switch	VLL<=690		HC5 or P80 Alternators	0179-3509-06
DQKD	A		0179-3509-08			3 Pole Transfer Switch	VLL<=690		HC5 or P80 Alternators	0179-3509-06
DQKH	B		0179-3509-08			3 Pole Transfer Switch	VLL<=690		HC5 or P80 Alternators	0179-3509-06
DQKAA	A		0179-3509-08			3 Pole Transfer Switch	VLL<=690		HC5 or P80 Alternators	0179-3509-06
DQKAB	A		0179-3509-08			3 Pole Transfer Switch	VLL<=690		HC5 or P80 Alternators	0179-3509-06
DQFAA	A		0179-3509-08			3 Pole Transfer Switch	VLL<=690		HC5 or P80 Alternators	0179-3509-06
DQFAB	A		0179-3509-08			3 Pole Transfer Switch	VLL<=690		HC5 or P80 Alternators	0179-3509-06
DQFAC	A		0179-3509-08			3 Pole Transfer Switch	VLL<=690		HC5 or P80 Alternators	0179-3509-06
DQFAD	A		0179-3509-08			3 Pole Transfer Switch	VLL<=690		HC5 or P80 Alternators	0179-3509-06
DFLC	W			0179-3509-03		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690		Entrance Box only or HC5 or P80 Alt	0179-3509-01
DFLE	F			0179-3509-03		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690		Entrance Box only or HC5 or P80 Alt	0179-3509-01
DFGB	K			0179-3509-03		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690		Entrance Box only or HC5 or P80 Alt	0179-3509-01
DFGE	C			0179-3509-03		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690		Entrance Box only or HC5 or P80 Alt	0179-3509-01
DFHA	H			0179-3509-03		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690		Entrance Box only or HC5 or P80 Alt	0179-3509-01
DFHB	H			0179-3509-03		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690		Entrance Box only or HC5 or P80 Alt	0179-3509-01
DFHC	G			0179-3509-03		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690		Entrance Box only or HC5 or P80 Alt	0179-3509-01

		GFI Relay Kit - by feature option				Applicable Compatibility Rules				Production Part #
Model	Spec	H550	H666	H667	H668	Also Required:		Not for use with:		
DFHD	E			0179-3509-03		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690		Entrance Box only or HC5 or P80 Alt	0179-3509-01
DQCA	B			0179-3509-03		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690	PCC2100	Entrance Box only or HC5 or P80 Alt	0179-3509-01
DQCA	B			0179-3509-07		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690	PCC3201	Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQCB	B			0179-3509-03		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690	PCC2100	Entrance Box only or HC5 or P80 Alt	0179-3509-01
DQCB	B			0179-3509-07		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690	PCC3201	Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQCC	B			0179-3509-03		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690	PCC2100	Entrance Box only or HC5 or P80 Alt	0179-3509-01
DQCC	B			0179-3509-07		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690	PCC3201	Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQGAA	A			0179-3509-07		4 Pole, Transfer Switch, Left Side Breaker			VLL<=690	0179-3509-05
DQGAB	A			0179-3509-07		4 Pole, Transfer Switch, Left Side Breaker			VLL<=690	0179-3509-05
DQKB	G			0179-3509-07		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQKC	G			0179-3509-07		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQKD	A			0179-3509-07		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQKH	B			0179-3509-07		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQKAA	A			0179-3509-07		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQKAB	A			0179-3509-07		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQFAA	A			0179-3509-07		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQFAB	A			0179-3509-07		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQFAC	A			0179-3509-07		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQFAD	A			0179-3509-07		4 Pole, Transfer Switch, Left Side Breaker	VLL<=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05
DFLC	W				0179-3509-03	4 Pole Transfer Switch, Right Side Breaker	VLL <=690		Entrance Box only or HC5 or P80 Alt	0179-3509-01
DFLE	F				0179-3509-03	4 Pole Transfer Switch, Right Side Breaker	VLL <=690		Entrance Box only or HC5 or P80 Alt	0179-3509-01
DFGB	K				0179-3509-03	4 Pole Transfer Switch, Right Side Breaker	VLL <=690		Entrance Box only or HC5 or P80 Alt	0179-3509-01
DFGE	C				0179-3509-03	4 Pole Transfer Switch, Right Side Breaker	VLL <=690		Entrance Box only or HC5 or P80 Alt	0179-3509-01
DFHA	H				0179-3509-03	4 Pole Transfer Switch, Right Side Breaker	VLL <=690		Entrance Box only or HC5 or P80 Alt	0179-3509-01
DFHB	H				0179-3509-03	4 Pole Transfer Switch, Right Side Breaker	VLL <=690		Entrance Box only or HC5 or P80 Alt	0179-3509-01
DFHC	G				0179-3509-03	4 Pole Transfer Switch, Right Side Breaker	VLL <=690		Entrance Box only or HC5 or P80 Alt	0179-3509-01
DFHD	E				0179-3509-03	4 Pole Transfer Switch, Right Side Breaker	VLL <=690		Entrance Box only or HC5 or P80 Alt	0179-3509-01
DQCA	B				0179-3509-03	4 Pole Transfer Switch, Right Side Breaker	VLL <=690	PCC2100	Entrance Box only or HC5 or P80 Alt	0179-3509-01
DQCA	B				0179-3509-07	4 Pole Transfer Switch, Right Side Breaker	VLL <=690	PCC3201	Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQCB	B				0179-3509-03	4 Pole Transfer Switch, Right Side Breaker	VLL <=690	PCC2100	Entrance Box only or HC5 or P80 Alt	0179-3509-01
DQCB	B				0179-3509-07	4 Pole Transfer Switch, Right Side Breaker	VLL <=690	PCC3201	Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQCC	B				0179-3509-03	4 Pole Transfer Switch, Right Side Breaker	VLL <=690	PCC2100	Entrance Box only or HC5 or P80 Alt	0179-3509-01
DQCC	B				0179-3509-07	4 Pole Transfer Switch, Right Side Breaker	VLL <=690	PCC3201	Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQGAA	A				0179-3509-07	4 Pole Transfer Switch, Right Side Breaker			Right side Breaker and VLL <=690	0179-3509-05
DQGAB	A				0179-3509-07	4 Pole Transfer Switch, Right Side Breaker			Right side Breaker and VLL <=690	0179-3509-05
DQKB	G				0179-3509-07	4 Pole Transfer Switch, Right Side Breaker	VLL <=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQKC	G				0179-3509-07	4 Pole Transfer Switch, Right Side Breaker	VLL <=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQKD	A				0179-3509-07	4 Pole Transfer Switch, Right Side Breaker	VLL <=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQKH	B				0179-3509-07	4 Pole Transfer Switch, Right Side Breaker	VLL <=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQKAA	A				0179-3509-07	4 Pole Transfer Switch, Right Side Breaker	VLL <=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQKAB	A				0179-3509-07	4 Pole Transfer Switch, Right Side Breaker	VLL <=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQFAA	A				0179-3509-07	4 Pole Transfer Switch, Right Side Breaker	VLL <=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQFAB	A				0179-3509-07	4 Pole Transfer Switch, Right Side Breaker	VLL <=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQFAC	A				0179-3509-07	4 Pole Transfer Switch, Right Side Breaker	VLL <=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05
DQFAD	A				0179-3509-07	4 Pole Transfer Switch, Right Side Breaker	VLL <=690		Entrance Box only or HC5 or P80 Alt	0179-3509-05

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Americas
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Warning: Back feed to a utility system can cause electrocution and/or property damage. Do not connect generator sets to any building electrical system except through an approved device or after building main switch is open.

Warning: For professional use only. Must be installed by a qualified service technician. Improper installation presents hazards of electrical shock and improper operation, resulting in severe personal injury and/or property damage.