

Transfer Switches



OTIII Series - Automatic

40-3000 Amps

Power Sentry Automatic Electronic Control
Automatic, Remote, Manual Transfer/Retransfer



Optional Features Shown

Description

Designed for continuous operation and switching electrical loads between primary power and standby generator sets, Onan Series OTIII automatic transfer switches monitor the primary power source, signal generator set startup, automatically transfer power, and return the load to the primary power source once the utility returns and is stabilized.

High-pressure silver alloy contacts withstand thousands of switching cycles without burning, pitting, or welding. They require no routine contact maintenance and provide 100% continuous current ratings.

In **utility-to-genset applications**, the control system monitors utility and genset power. When utility power fails or is unsatisfactory, the switch starts the genset and transfers critical loads to the genset. The switch automatically transfers loads back to the utility when utility power returns.

In **utility-to-utility applications**, the control system monitors the primary utility source and transfers the critical load to a secondary utility source when primary power fails or is unsatisfactory. The switch automatically transfers loads back to the primary source when power is restored.

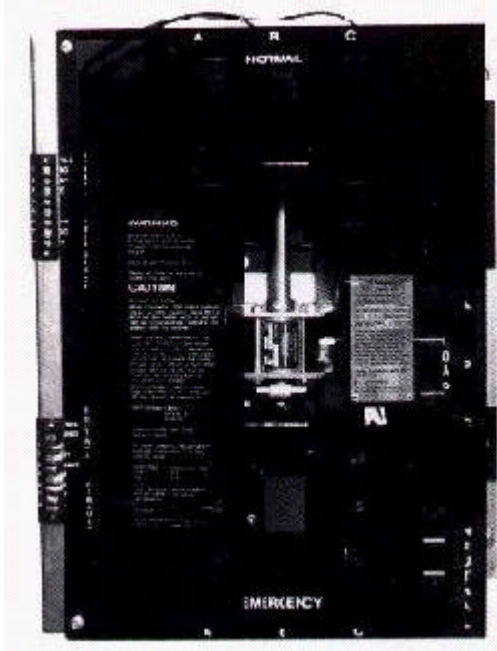
In **genset-to-genset applications**, the transfer switch automatically controls multiple gensets, allowing one genset to power the load with another genset as standby. The running (lead) unit can be selected manually or may be changed automatically with an optional changeover clock.

Features

- **Advanced Transfer Switch Mechanism** - Unique bi-directional linear actuator provides low-friction, constant force, straight-line transfer switch action during automatic operation.
- **Power Sentry® Electronic Control** - Electronic control includes system surge voltage isolation, all-phase monitoring on each power source, four standard time delays and diagnostic LEDs.
- **Non-Automatic Operation** - Ideal for non-emergency applications via remote control or manual transfer/retransfer.
- **Manual Operation** - Manual operating handles, shielded terminations, and over-center type contact mechanisms allow effective, manual operation (40-1000 A switches).
- **Positive Interlocking** - Mechanical and electrical interlocking prevent source-to-source connection through the power or control wiring.
- **Main Contacts** - Heavy-duty silver alloy contacts with separate arcing surfaces and multileaf arc chutes rated for total system transfer including overload interruption.
- **Easy Service/Access** - Plug connections, door-mounted controls, ample access space, and compatible terminal markings.
- **Product lines, accessories and services** - Onan offers a wide range of products and services to precisely suit your requirements.
- **Certifications** - Onan OTIII Transfer Switches are certified to a wide range of standards.
- **Warranty** - Onan offers single-source responsibility at both the factory and distributor levels for warranty, service, and parts support.

Transfer Switch Mechanism

A full range of OTIII 3-pole (solid neutral) and 4-pole (switched neutral) models are available, rated from 40 to 3000 A.



- A bi-directional linear actuator powers OTIII Transfer Switches through 1000 A. This design provides low-friction, constant force, straight-line transfer switch action. No complex gears or linkages.
- Independent break-before-make action is used for both 3-pole and 4-pole/switched neutral switches. Switched neutral switches prevent the nuisance ground fault tripping that can result from overlapping designs.
- A mechanical interlock prevents simultaneous closing of normal and emergency contacts. The interlock positively prevents dangerous source-to-source connections.
- Electrical interlocks prevent simultaneous closing signals to normal and emergency contacts and interconnection of normal and emergency sources through the control wiring.
- Long-life, high pressure, silver alloy contacts resist burning and pitting. Separate arcing surfaces further protect the main contacts. Contacts are mechanically held in both normal and emergency positions.
- Permanently attached operating handles, shielded termination, and over-center type contact mechanisms allow effective, manual operation (40-1000 A switches).

Specifications-Transfer Switch Mechanism

Voltage Rating	Transfer switches rated from 40 A through 3000 A are rated at 600 VAC.
Arc Interruption	Multiple leaf arc chutes cool and quench the arcs. Covers prevent interphase flashover and are transparent for visual inspection.
Neutral Bar	A full current-rated neutral bar with lugs is standard on 3-pole transfer switches supplied with cabinet.
Auxillary Contacts	Two contacts (one for each source) provided for customer use. Wired to terminal block for easy access. Rated at 10A continuous and 250 VAC maximum.
Operating Temperature	-40°F (-40°C) to 122°F (50°C)
Storage Temperature	-40°F (-40°C) to 140°F (60°C)
Humidity	Up to 95% relative, noncondensing
Altitude	Up to 10,000 ft (3,000 m) without derating
Surge Withstand Ratings	Guidelines for locations. Surge test waveforms for location category B3, per IEEE C 62.41. Testing per guidelines in IEEE 62.45.
Total Transfer Time (source-to-source)	Will not exceed 6 cycles at 60 Hz with normal voltage applied to the actuator and without programmed transition installed.
Manual Operation Handles	Transfer switches rated through 1000 A are equipped with permanently attached operating handles and quick-break, quick-make contact mechanisms. Transfer switches over 1000 A are equipped with manual operators for service use only under de-energized conditions.

Controls

Power Sentry Automatic Electronic Control

Standard Power Sentry automatic electronic control includes system surge voltage isolation, all-phase monitoring on each power source, four standard time delays, and diagnostic LEDs. Primary features include:

- Optical isolation on all logic inputs
- Relays used on all outputs
- High isolation transformers for AC power inputs
- LED lamps verify control status
- Field adjustable voltage sensors and time delays



Time Delay Functions

Start - Prevents nuisance generator set starts in the event of momentary power system variation or loss. (Not included in utility to utility systems.)

Transfer - Allows generator set to stabilize before application of load. Avoids power interruption if normal source variation or loss is momentary. Allows staggered transfer of loads in multiple transfer switch systems.

Retransfer - Allows the utility to stabilize before retransfer of load. Prevents needless power interruption if return of normal source is momentary. Allows staggered transfer of loads in multiple transfer switch systems.

Stop - Maintains availability of generator set for immediate reconnection in the event that the normal source fails shortly after retransfer. Allows gradual generator set cool-down by running unloaded. (Not included in utility-to-utility systems)

Adjustable Voltage Sensors	Adjustable Solid State Time Delays	Control Mode LED Status Indicators
Pickup: 85% to 98% of nominal voltage Dropout: 75% to 98% of pickup setting Dropout Time Delay: 0.5 seconds fixed	Start: 0 to 15 seconds Transfer: 2 to 120 seconds Retransfer: 0 to 30 minutes Stop: 0 to 10 minutes	Source 1 OK Source 2 OK Generator Set Start Signal Transfer Timing Transfer Complete Retransfer Timing Retransfer Complete Timing for Stop

Certifications



Transfer switches meet or exceed leading code requirements:

NEMA - All switches comply with NEMA ICS 10

UL - All switches are UL-1008 listed, and switch accessories are UL listed for factory or field installation; UL approved cabinets; UL listed CU-AL terminals

ISO9001 - This transfer switch was designed and manufactured in facilities certified to ISO9001

NFPA Testing - A complete representative prototype transfer switch has been subjected to a number of demanding tests to verify the design integrity and performance under both normal and abnormal operating conditions per the requirements of NFPA 70, 99, and 110

CSA - All switches are CSA certified up to 600 VAC

Enclosures

As shown below, the OTIII transfer switch and Power Sentry control are mounted in a single-door enclosure.

- Key-lockable cabinet
- Normal (Source 1) and Emergency (Source 2) transfer switch position and source available lamps included
- Wire bend space complies with 1999 NEC.



Enclosure Models

Utility to Generator Set - Includes key operated Test / Normal / Retransfer switch. Retransfer position provides immediate retransfer to normal, bypassing time delay.

Utility to Utility - Includes key operated Source 1 / Source 2 switch to select the preferred utility service.

Generator Set to Generator Set - Includes key operated Source 1 / Auto / Source 2 switch to select the lead generator set or to enable an automatic weekly changeover.

Non-Automatic/Manual - Includes key operated Local/Remote Switch.

Enclosure Colors - 40-1200 A, Onan Green; 1600-3000 A, Switchgear Gray.

Enclosure Dimensions - Transfer Switch in U.L. Type 1 Enclosure

Amp Rating	Height		Width		Door Closed		Door Open		Weight		Outline Drawing
	in	mm	in	mm	in	mm	in	mm	lb	kg	
40, 70, 125	27.0	686	20.5	521	12.0	305	31.5	800	82	37	310-0544
150, 225	35.5	902	26.0	660	16.0	406	41.0	1042	165	75	310-0414
260	43.5	1105	28.5	724	16.0	406	43.0	1093	170	77	310-0540
300, 400, 600	54.0	1372	25.5	648	16.5	420	40.5	1029	225	102	310-0416
800,1000	68.0	1727	30.0	762	19.5	495	48.5	1232	360	163	310-0417
1200	75.0	1905	36.0	915	21.5	546	54.0	1372	625	283	310-0482
1600, 2000 (1)	90.0	2286	36.0	915	48.0	1219	84.0	2134	1100	499	310-0483
3000 (1)	90.0	2286	36.0	915	48.0	1219	84.0	2134	1250	567	310-0484

Note 1: Rear or side access is required to complete power wiring installations.

Enclosure Dimensions - Transfer Switch in U.L. Type 3R, 4 or 12 Enclosure

Amp Rating	Height		Width		Door Closed		Door Open		Weight		Cabinet Type	Outline Drawing
	in	mm	in	mm	in	mm	in	mm	lb	kg		
40, 70, 125	34.0	865	26.5	675	12.5	320	36.5	927	125	57	3R, 12	310-0453
40, 70, 125	34.0	865	26.5	675	12.5	320	36.5	927	125	57	4	310-0445
150, 225	42.5	1080	30.5	775	16.0	406	44.0	1118	215	97	3R, 12	310-0454
150, 225	42.5	1080	30.5	775	16.0	406	44.0	1118	215	97	4	310-0446
260	46.0	1170	32.0	815	16.0	406	46.0	1168	255	102	3R, 12	310-0455
260	46.0	1170	32.0	815	16.0	406	46.0	1168	255	102	4	310-0447
300, 400, 600	59.0	1500	27.5	700	16.5	420	41.5	1054	275	125	3R, 12	310-0456
300, 400, 600	59.0	1500	27.5	700	16.5	420	41.5	1054	275	125	4	310-0448
800, 1000	73.5	1865	32.5	825	19.5	495	49.5	1257	410	186	3R, 12	310-0457
800, 1000	73.5	1865	32.5	825	19.5	495	49.5	1257	410	186	4	310-0449
1200	75.0	1905	36.0	915	21.5	546	55.0	1397	625	283	3R, 12, 4	310-0482
1600, 2000 (1)	90.0	2286	32.5	826	51.0	1295	79.0	2007	1100	499	3R, 12, 4	310-0744
3000 (1)	90.0	2286	38.0	965	51.0	1295	84.5	2146	1250	567	3R, 12, 4	310-0745

Note 1: Rear or side access is required to complete power wiring installations.

Transfer Switch Lug Capacities

All lugs accept copper or aluminum wire unless indicated otherwise.

Amp Rating	Cables Per Phase	Size
40, 70, 125	1	#12 AWG - 2/0
150, 225	1	#6 AWG - 300 MCM
260	1	#6 AWG - 400 MCM
300, 400	1	3/0 - 600 MCM
300, 400	2	3/0 - 250 MCM
600	2	250 - 500 MCM
800 - 1000	4	250 - 500 MCM
1200	4	#2 AWG - 600 MCM
1600, 2000 (1)	8	#2 AWG - 600 MCM
3000 (1)	8	#2 AWG - 600 MCM

Caution: Do not run control wiring through power cable conduit or raceway.

Note 1: Lugs on these ratings are optional.

UL Withstand and Closing Ratings*

When protected by circuit breakers or fuses of the size and type listed below, the withstand and closing ratings are stated in symmetrical RMS amperes.

Transfer Switch Ampere	FUSE PROTECTION		MCCB PROTECTION		CLB PROTECTION	
	WCR @ Volts Max. with Current Limiting Fuses	Max Fuse, Size and Type	WCR @ Volts Max with Specific Manufacturers MCCBs	Max MCCB Rating	With Specific Current Limiting Breakers (CLB) **	Max. CLB Rating
40-125 A	200,000 A (480 VAC)	200 A Class J, RK1, RK5	14,000 A (480 VAC)	225 A	200,000 A (480 VAC)	225 A
40-125 A	200,000 A (600 VAC)	200 A Class J, RK1, RK5	14,000 A (600 VAC)	225 A	100,000 A (600 VAC)	225 A
150-260 A	200,000 A (480 VAC)	600 A Class J, RK1, RK5, 1200 A Class L	30,000 A (480 VAC)	400 A	200,000 A (480 VAC)	400 A
150-260 A	200,000 A (600 VAC)	600 A Class J, RK1, RK5, 1200 A Class L	30,000 A (600 VAC)	400 A	100,000 A (600 VAC)	400 A
300-600 A	200,000 A (480 VAC)	1200 A Class L	65,000 A (480 VAC)	1200 A	200,000 A (480 VAC)	1200 A
300-600 A	200,000 A (600 VAC)	1200 A Class L	65,000 A (600 VAC)	1200 A	100,000 A (600 VAC)	1200 A
800-1000 A	200,000 A (480 VAC)	2000 A Class L	65,000 A (480 VAC)	1400 A	150,000 A (480VAC)	1400 A
800-1000 A	200,000 A (600 VAC)	2000 A Class L	NA	NA	100,000 A (600 VAC)	1400A
1200 A	200,000 A (480 VAC)	3000 A Class L	85,000 A (480 VAC)	1600 A	85,000 A (480 VAC)	1600 A
1200 A	150,000 A (600 VAC)	3000 A Class L	65,000 A (600 VAC)	1600 A	65,000 A (600 VAC)	1600 A
1600-2000 A	200,000 A (480 VAC)	2500 A Class L	100,000 A (480 VAC)	4000 A	100,000 A (480 VAC)	4000 A
1600-2000 A	150,000 A (600 VAC)	2500 A Class L	85,000 A (600 VAC)	4000 A	85,000A (600 VAC)	4000 A
3000 A	200,000 A (480 VAC)	4000 A Class L	100,000 A (480 VAC)	4000 A	100,000 A (480 VAC)	4000 A
3000 A	150,000 A (600 VAC)	4000 A Class L	85,000 A (600 VAC)	4000 A	85,000 A (600 VAC)	4000 A

* Please refer to Onan Publication R-1029 for a complete listing of Ratings and Breaker selections

** Ratings vary with breaker type. Please refer to the Onan Publication R-1029 for a complete listing.

Submittal Detail

Automatic Transfer Switch Options

Current Ratings

- S046 40 Amps
- S047 70 Amps
- S048 125 Amps
- S049 150 Amps
- S050 225 Amps
- S051 260 Amps
- S052 300 Amps
- S053 400 Amps
- S054 600 Amps
- S055 800 Amps
- S056 1000 Amps
- S057 1200 Amps
- S058 1600 Amps
- S059 2000 Amps
- S060 3000 Amps

Voltage (Line-Line) Ratings

- R020 120 Volts(*)
- R021 208 Volts
- R022 220 Volts
- R023 240 Volts
- R024 380 Volts
- R025 416 Volts
- R026 480 Volts
- R027 600 Volts

(*): Line to Neutral Voltage (not available on 1200 - 3000 amp switches)

Pole Configuration

- A028 Poles - 3 (Solid Neutral)
- A029 Poles - 4 (Switched Neutral - not available 40 - 125 amps)

Frequency

- A044 60 Hertz
- A045 50 Hertz

Application

- A035 Appl - Utility to Genset
- A036 Appl - Utility to Utility
- A037 Appl - Genset to Genset
- A038 Non Automatic/Remote

System Options

- A041 Single Phase, 2-wire or 3-wire (not available 1200-3000 amps)
- A042 Three Phase, 3-wire or 4-wire

Enclosure

- B001 Type 1: General purpose indoor (similar to IEC type IP30)
- B002 Type 3R: Intended for outdoor use (dustproof and rainproof) (Similar to IEC type IP34)
- B003 Type 4: Indoor or outdoor use (watertight) (Similar to IEC type IP65)
- B004 Open Construction: No enclosure - includes Automatic Transfer Switch and Controls.
- B010 Type 12: Indoor use, dust-tight and drip-tight (similar to IEC type IP61)

Meter Package

- D001 Meters - None
 - D002 Meters - Door Mounted
- Voltmeter - 2.5 in (63.5 mm) 2% accuracy
Ammeter - 2.5 in (63.5 mm) 2% accuracy
Frequency Meter - 2.5 in (63.5 mm), pointer type
Phase Selector switch - Phase-to-phase voltage sensing on both normal and emergency sources

Listing

- A046 Listing - UL 1008/CSA Certification
- A047 Certification - CSA
- A048 Listing - Not Applicable
- A064 Listing - NFPA 20 (not available 1200-3000 amps)

Options and Accessories

Shipping Configuration

- A050 Packing - Wooden Crate
- A051 Packing - Export Box

Controls

- C015 Start Time Delay (90 sec)
- C016 Control - Over/Under Voltage/Frequency, Source 2
- C017 Control - Over/Under Voltage/Frequency, Source 1

Programmed Transition - Slows switch operation for an adjustable delay period to provide an open period during transfer (and retransfer).

- J021 Prgm Transition, 1-7.5 sec.
- J022 Prgm Transition, 1-60 sec.

Exerciser Clock

- J001 7-day solid-state exerciser clock

Battery Chargers

- K001 Battery Charger - 2A, 12/24 V
- K002 Battery Charger - 10 A, 12 V
- K003 Battery Charger 10 A, 24 V

Auxiliary Relays - Relays are UL-Listed and factory installed. All relays provide (2) normally open and (2) normal closed isolated contacts rated 10A @ 600 VAC. Relay terminals accept (1) 18 ga. to (2) 12 ga. wires per terminal.

- L001 Aux Relay - 24 VAC Coil
- L002 Aux Relay - Emergency Position Relay energized when OT-III in Source 2 (Emergency) position
- L003 Aux Relay - Normal Position. Relay energized when OT-III in Source 1 (Normal) position
- L004 Aux Relay - Emergency Source. Relay energized when Source 2 (Emergency) available
- L005 Aux Relay - Normal Source. Relay energized when Source 1 (Normal) available
- L101/201 Aux Relay. (101 -24 VDC; L201 12 VDC) Installed, not wired
- L102/202 Aux Relay - Emergency Position (L102 -24 VDC; L202 - 12 VDC). Relay energized when OT-III in Source 2 (Emergency) position. Wired from OT-III Auxiliary contacts, control power derived from genset starting batteries.
- L103/203 Aux Relay - Normal Position (L103 -24 VDC; L203 -12 VDC) Relay energized when OT-III in Source 1 (Normal) position, Wired from OT-III auxiliary contacts, control power derived from genset starting battery.
- L104/204 Aux Relay - Genset Start Contacts (L104 24 VDC; L204 - 12 VDC) Provides additional isolated contacts to indicate genset starting signal has been initiated.

Applications Modules

- M001 Module - Signal. provides remote indication of voltage sensing outputs and pre/post transfer signals
- M002 Module - 3-wire start
- M003 Terminal Block - 30 points (not wired)
- M004 Monitor - Phase Sequence/Balance
- M006 Sequencer - Genset to Genset (12 VDC). Controls which genset starts first in a genset-to-genset standby application
- M007 Load Shed - From Emergency. Drives OT-III to neutral position when remote signal contact closes
- M008 Module - Alarm. Provides visual and audible indication when switch is connected to emergency source
- M010 Sequencer - Standby Set Start (24 VDC). Controls which genset starts first in a genset standby application
- N001 Switch - Auto/Manuals Change enables or disables automatic retransfer
- N002 Terminal Block - Battery Charger Alarms
- N005 Term Blk -Src 1/2 Rmt Signal
- N008 Terminal Lugs - Cable. (1600 -3000 A only)
- N009 Power Connect - Bus Stabs. (150 - 1000 A open construction only)

Available Products and Services

A wide range of products and services is available to match your power generation system requirements. Cummins Onan products and services include:

- Diesel and Spark-Ignited Generator Sets
- Transfer Switches
- Bypass Switches
- Parallel Load Transfer Equipment
- Digital Paralleling Switchgear
- PowerCommand Network and Software
- Distributor Application Support
- Planned Maintenance Agreements

Warranty

All components and subsystems are covered by an express limited one-year warranty. Extended factory warranties and local distributor maintenance agreements are also available.

See your distributor for more information



Onan Corporation
1400 73rd Avenue N.E.
Minneapolis, MN 55432
612.574.5000
Fax: 612.574.5298

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