KOHLER KEP Transfer Switch User Guide

Contents

KOHLER KEP Transfer Switch

Product Information

Specifications:

- **Model:** KEP
- **Product Type:** Automatic Transfer Switches Service Entrance Rated Controller
- **Controller:** Decision-Maker MPAC 1500
- **Ratings:**
  - **Power Switching Device:** Molded case (MCCB) / Insulated Case (ICCB)
  - **Current:** 200A (MCCB), 100-1200A (ICCB), 800-4000A (ICCB)
  - **Voltage, Frequency:** 208-240 VAC 60 Hz, 208-480 VAC 60 Hz, 208-480 VAC, 60 Hz

Product Usage Instructions

Transfer Switch Standard Features:
The service entrance automatic transfer switches include various features such as enclosed contact power switching units with isolating mechanisms, UL 1008 listing, seismic certification, fully enclosed silver alloy contacts, short circuit current withstand testing, separate utility and generator power switching units, and more.

Service Disconnect Switch:
The service disconnect switch allows you to move the switch to the OFF position. It is a two-position switch with a padlockable cover that disconnects the normal and emergency sources. The controller display will show Service Disconnected, and the NOT IN AUTO LED will flash. An indicator lamp will illuminate to show that the switch is in the DISCONNECT position.

Automatic Transfer Switch Controller:
The Decision-Maker MPAC 1500 Controller features an LCD display with 4 lines x 20 characters, backlit for

visibility. It offers complete programming and viewing capability at the door using the keypad and LCD display. LED indicators for source availability, transfer switch position, service required (fault), and not in auto are provided. Modbus communication is standard, and it allows for programmable voltage and frequency pickup and dropout.

FAQ:

- **Q: What enclosures are available for the transfer switch?**
  A: NEMA 1, 3R, 4X, and 12 enclosures are available for the transfer switch.
- **Q: Can the transfer switch be manually operated?**
  A: Yes, the transfer switch has safe manual operation that permits easy operation even under adverse conditions.
- **Q: What types of overcurrent protection are included in the molded case circuit breakers and insulated case circuit breakers?**
  A: Molded case circuit breakers (MCCB) include thermal-magnetic or electronic trip overcurrent protection (80% rated), while insulated case circuit breakers (ICCB) include electronic trip overcurrent protection (100% rated).

Controller

- Decision-Makerr MPAC 1500

Ratings

Power Switching Device	Current	Voltage, Frequency
Molded case (MCCB)	200	208- 240 VAC 60 Hz
	100- 1200	208- 480 VAC 60 Hz
Insulated Case (ICCB)	800- 4000	208- 480 VAC, 60 Hz

Transfer Switch Standard Features

Enclosed Contact Power Switching Units

- Service entrance automatic transfer switches incorporate an isolating mechanism and overcurrent protection on the utility supply, eliminating the need to have a separate, upstream utility source circuit breaker/disconnect switch.
- UL 1008 listed, file #58962
- IBC seismic certification available
- Fully enclosed silver alloy contacts provide high withstand rating.
- 3-cycle short circuit current withstand-tested in accordance with UL 1008
- Completely separate utility and generator set power switching units provide redundancy (no common parts) and are easy to service.
- Utility disconnect power switching units have overcurrent protection; generator disconnect is available with or without overcurrent protection:
  - Molded case circuit breakers (MCCB) include thermal-magnetic or electronic trip overcurrent protection

(80% rated).
    - Molded case switches (MCSW) do not include overcurrent protection (100% rated) (available on generator disconnect only).
    - Insulated case circuit breakers (ICCB) include electronic trip overcurrent protection (100% rated).
    - Insulated case switches (ICSW) do not include overcurrent protection (100% rated) (available on generator disconnect only).
- Inherent stored-energy design prevents damage if manually switched while in service.
- Heavy-duty brushless gear motor and operating mechanism provide mechanical interlocking and extreme long life with minimal maintenance.
- Safe manual operation permits easy operation even under adverse conditions.
- All mechanical and control devices are visible and readily accessible.
- Padlockable service disconnect control switch
- Status indicators
- Two-position control circuit isolation switch disconnects utility power to the transfer switch controller.
- Load shed (Forced transfer from Emergency to OFF). (Customer-supplied signal [contact closure] is required for the forced transfer to OFF function.)
- ZEMA 1, 3R, 4X and 12 enclosures are available.

Service Disconnect Switch

- Service disconnect to OFF position
- Two-position switch with padlockable cover disconnects the normal and emergency sources.
- Controller display shows Service Disconnected and the NOT IN AUTO LED flashes.
- Lamp illuminates to indicate that the switch is in the DISCONNECT position.

Automatic Transfer Switch Controller

The Decision-Makerr MPAC 1500 Automatic Transfer Switch Controller is used on service entrance transfer switch models.

Decision-Makerr MPAC 1500 Controller

- LCD display, 4 lines x 20 characters, backlit
- Complete programming and viewing capability at the door using the keypad and LCD display
- LED indicators: Source available, transfer switch position, service required (fault), and “not in auto”

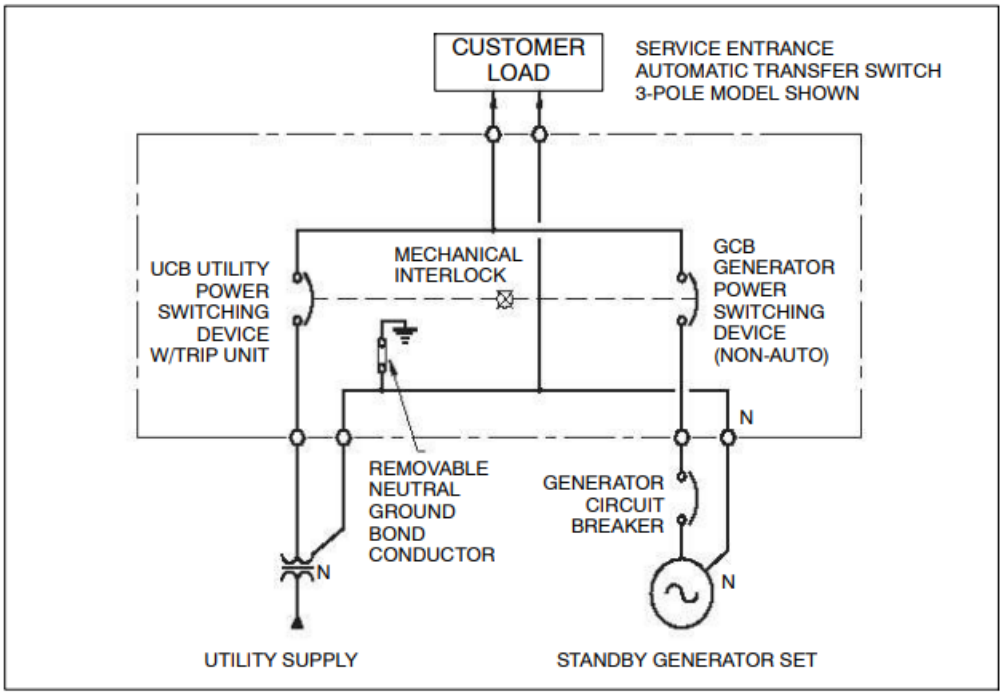
- Modbus communication is standard
- Programmable voltage and frequency pickup and dropout settings
- Programmable time delays
- Programmable generator exerciser
- Time-based load control
- Current-based load control (current sensing kit required)
- Two programmable inputs and two programmable outputs (one programmable input and one programmable output are used for factory connections on these models and are not available for customer connection)
- Up to four I/O extension modules available
- RS-485 communication standard
- Ethernet communication standard
- Three-source system
- Prime power

For more information about Decision-Makerr MPAC 1500 features and functions, see specification sheet G11-128.

Ratings

Withstand Current Ratings in RMS Symmetrical Amperes * (No upstream circuit breaker protection required)				
Power Switching Device	**Switch Rating, Amps**	**Voltage, Max.**	**Amps RMS**	
			@ 240 V	**@ 480 V**
Molded case	100	600	65,000	25,000
	150			
	200	**240**	100,000	NA
	250	600	65,000	65,000
	400	600	65,000	50,000
	600			
	800			
	1000			
	1200			
Insulated case	800	600	100,000	100,000
	1000			
	1200			
	1600			
	2000			
	2500			
	3000			
	4000			
* With molded case/insulated case switching devices equipped with integral overcurrent protection. (UL 1008 W CR)				

Typical Single-Line Diagram



Application Data

Auxiliary Position-Indicating Contacts	
MCCB Models	Use programmable digital outputs
ICCB Models	3 Normal, 2 Emergency Rated 2.5 A @ 24/48 VDC, 6 A @ 480VAC

Environmental Specifications	
Operating Temperature	– 15°C to 50°C (5°F to 122°F)
Storage Temperature	– 20°C to 70°C (- 4°F to 158°F)
Humidity	95% noncondensing

Cable Sizes

Model	Amps	Cable Sizes, Al/Cu Wire		
		Circuit Breaker (per Phase)	Neutral	Ground
KEP, MCCB	100	(1) #14 – 1/0 AWG	(3) #14 – 2/0 AWG	(3) #14 – 1/0 AWG
	150	(2) #2 – 4/0 AWG		
	200	(1) #6 – 350 KCMIL	(3) #6 – 350 KCMIL	
	250			
	400	(2) 2/0 – 500 KCMIL	(6) 2/0 – 500 KCMIL	(3) #6 – 350 KCMIL
	600			
	800	(3) 2/0 – 500 KCMIL	(9) 2/0 – 500 KCMIL	
	1000 1200	(4) 4/0 – 500 KCMIL	(12) 4/0 – 500 KCMIL	(3) #4 – 600 KCMIL or (6) 1/0 – 250 KCMIL
KEP, ICCB	800	(3) 3/0 – 750 KCMIL	(9) 3/0 – 750 KCMIL	(3) #6 – 250 KCMIL
	1000	(4) 3/0 – 750 KCMIL	(12) 3/0 – 750 KCMIL	
	1200			
	1600	(5) 3/0 – 750 KCMIL	(15) 3/0 – 750 KCMIL	
	2000	(6) 3/0 – 750 KCMIL	(18) 3/0 – 750 KCMIL	
	2500	(8) 3/0 – 750 KCMIL	(24) 3/0 – 750 KCMIL	
	3000	(9) 3/0 – 750 KCMIL	(27) 3/0 – 750 KCMIL	
	4000	(12) 3/0 – 750 KCMIL	(36) 3/0 – 750 KCMIL	

Circuit Breaker Specifications

KEP Molded Case Circuit Breakers (MCCB)								
Breaker			**Utility Disconnect**			**Generator Disconnect (note that units with MCSW selected will no t have a trip unit)**		
Mfr	**Amps**	**Model**	**Trip Unit**	**Type**	**Trip Unit Function**	**Trip Unit**	**Type**	**Trip Unit Function**
ABB	100	Tmax Ts3	NI	BM/EL	TM	NI	BM/EL	TM
	150	Tmax Ts3						
	200	Tmax Ts3						
	250 2P/3 P	Tmax T5	PR221	Electronic	LS/I	PR221	Electronic	LS/I
	250 4P	Isomax S5	PR211	Electronic	LI	PR211	Electronic	LI
	400	Tmax T6	PR221	Electronic	LS/I	PR221	Electronic	LS/I
	600	Tmax T6						
	800	Tmax T6						
	1000	Tmax T7	PR331/P	Electronic	LSIG	PR231/P		
	1200	Tmax T7						
NI = Non-interchangeable TM = Thermal/ Magnetic BM/EL = Bimetal/ Electromagnet MCSW = Molded Case Switch								

KEP Insulated Case Circuit Breakers (ICCB)								
Breaker			**Utility Disconnect**			**Generator Disconnect (note that units with ICSW selected will not have a trip unit)**		
Mfr	**Model**	**Amps**	**Trip Unit**	**Type**	**Trip Unit Function**	**Trip Unit**	**Type**	**Trip Unit Function**
Schneider	NW	800	ML 5.0A	Electronic	LSI	ML 3.0	Electronic	LI
	NW	1000	ML 6.0A	Electronic	LSIG	ML 3.0	Electronic	LI
	NW	1200						
	NW	1600						
	NW	2000						
	NW	2500						
	NW	3000						
	NW	4000						
ICSW = Insulated Case Switch ML = Micrologic								

Weights and Dimensions

Note: Always use the transfer switch dimension drawing for planning and installation. Weights and dimensions may vary for different configurations. See your local distributor for dimension drawings.
Weights and dimensions are shown for NEMA type 1 enclosures. Consult the factory for other enclosure types.

Molded Case Circuit Breaker (MCCB) Models									
Model	**Amps**	**Dimensions, mm (in.)**				**Weight, kg (lb.)**			**Dimension Drawing**
		Poles	**Height**	**Width**	**Depth**	**2P**	**3P**	**4P**	
KEP, MCCB	100-150	2,3,4	914 (36.0)	725 (28.5)	462 (18.2)	68 (150)	68 (150)	68 (150)	ADV-8612
	200	2,3	914 (36.0)	725 (28.5)	462 (18.2)	68 (150)	68 (150)	N/A	
	250	2,3,4	914 (36.0)	725 (28.5)	462 (18.2)	81 (178)	81 (178)	81 (178)	
	400	2,3,4	1231 (48.4)	995 (39.2)	486 (19.1)	195 (430)	195 (430)	195 (430)	ADV-8614
	600-800	2,3,4	1231 (48.4)	995 (39.2)	486 (19.1)	200 (441)	200 (441)	200 (441)	
	1000-1200	3,4	2009 (79.1)	864 (34.0)	515 (20.3)	N/A	247 (545)	254 (560)	ADV-8996

Insulated Case Circuit Breaker (ICCB) Models							
Model	**Amps**	**Poles**	**Dimensions, mm (in.)**			**Weight, kg (lb.)**	**Dimension Drawing**
			Height	**Width**	**Depth**		
KEP, ICCB	800	3	2324 (91.5)	914 (36.0)	1219 (48.0)	544 (1200)	ADV-8618
		4	2324 (91.5)	914 (36.0)	1219 (48.0)	635 (1400)	
	1000-1200	3	2324 (91.5)	914 (36.0)	1219 (48.0)	553 (1220)	
		4	2324 (91.5)	914 (36.0)	1219 (48.0)	644 (1420)	
	1600	3	2324 (91.5)	914 (36.0)	1372 (54.0)	598 (1320)	
		4	2324 (91.5)	914 (36.0)	1372 (54.0)	625 (1380)	
	2000	3	2324 (91.5)	914 (36.0)	1372 (54.0)	607 (1340)	
		4	2324 (91.5)	914 (36.0)	1372 (54.0)	644 (1420)	
	2500	3	2324 (91.5)	914 (36.0)	1524 (60.0)	625 (1380)	
		4	2324 (91.5)	1067 (42.0)	1524 (60.0)	662 (1460)	
	3000	3	2324 (91.5)	914 (36.0)	1524 (60.0)	644 (1420)	
		4	2324 (91.5)	1067 (42.0)	1524 (60.0)	680 (1500)	
	4000	3	2324 (91.5)	1372 (54.0)	1524 (60.0)	907 (2000)	

Codes and Standards

The ATS meets or exceeds the requirements of the following specifications:

- EN61000-4-4 Fast Transient Immunity Severity Level 4
- EN61000-4-5 Surge Immunity Class 4 (voltage sensing and programmable inputs only)
- IEC Specifications for EMI/EMC Immunity:
  - CISPR 11, Radiated Emissions
  - IEC 1000-4-2, Electrostatic Discharge
  - IEC 1000-4-3, Radiated Electromagnetic Fields
  - IEC 1000-4-4, Electrical Fast Transients (Bursts)
  - IEC 1000-4-5, Surge Voltage
  - IEC 1000-4-6, Conducted RF Disturbances
  - IEC 1000-4-8, Magnetic Fields
  - IEC 1000-4-11, Voltage Dips and Interruptions
- IEC 60947-6-1, Low Voltage Switchgear and Control Gear; Multifunction Equipment; Automatic Transfer Switching Equipment
- IEEE Standard 446, IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
- IEEE 472 (ANSI C37.90A) Ring Wave Test
- NEMA Standard ICS 10- 2005, Electromechanical AC Transfer Switch Equipment
- NFPA 70, National Electrical Code

- NFPA 99, Essential Electrical Systems for Health Care Facilities
- NFPA 110, Emergency and Standby Power Systems
- Underwriters Laboratories UL 1008, Standard for Automatic Transfer Switches for Use in Emergency Standby Systems file #58962

Accessories

Accessories are available either factory-installed or as loose kits, unless otherwise noted.

Digital Meter *

- Measure and display voltage, current, frequency, and power
- 35 programmable alarms
- LCD display, 67 x 62.5 mm (2.65 x 2.5 in.)
- Pushbutton operation
- Password- protected programming menus
- Two digital inputs
- Two digital outputs
- Two Form A relay outputs
- Serial port for optional network connections
- Data logging
- Factory- installed

  * Meter kit not available on MCCB models with NEMA 3R enclosures.

Heater, Anti-Condensation

- Hygrostat-controlled 120 VAC strip heater (customer-supplied voltage source required)
- 100 or 250 watts (sized for enclosure)
- Protective 15 Amp circuit breaker

Literature Kits

- Production literature kit (one set of literature is included with each transfer switch)
- Overhaul literature kit

RSA III Remote Serial Annunciator

- Monitors the generator set
- Monitors Normal and Emergency source status and connection
- Monitors ATS common alarm
- Allows remote testing of the ATS
- For more information, see specification sheet G6- 139.

Seismic Certification

- Certification depends on application and geographic location. Contact your distributor for details.
- Available for the transfer switches and enclosures shown below:

ATS Type and Size		**Enclosure, NEMA Type:**			
Type	**Amps**	**1**	**3R**	**4X**	**12**
MCCB	100- 600			•	
MCCB	100- 1200	•	•		•
ICCB	800- 4000	•	•		

Surge Protection Device (SPD)

- SPD available for the normal source supply
- Surge protection reduces transient voltages to harmless levels
- Protection modes: L-L / L-N / L-G / N-G
- Replaceable phase and neutral cartridges for service
- Frequency: 50- 60 Hz
- Operating Temperature Range: – 40 to 176_F (- 40 to 80_C)
- Remote contacts for customer-supplied status indicators:
  - Contacts: 1 NO, 1 NC
  - Min Load: 12VDC / 10 mA
  - Max. Load: 250 VAC / 1 A
  - Wire Size (max.): 16AWG
- Fuse protection: 30 amps / 600 V
- UL 1449, 3rd Edition for Type 2 applications
- IEC 61-643-1, 2nd Edition T2/11
- See additional specifications below

Extended Warranties

- 2-year basic
- 5-year basic
- 5-year comprehensive
- 10-year major components

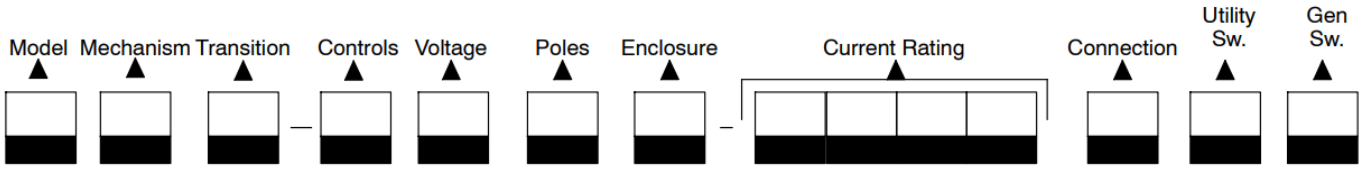
Controller Accessories
See the controller specification sheet for more information.

- Accessory Modules
  - Alarm Module
  - External Battery Supply Module
  - Input/Output Module
  - High-Power Input/Output Module

- Current Sensing Kit
- Line-to-Neutral Voltage Monitoring
- Padlockable User Interface Cover

SPD Specifications

Model Designation



Record the transfer switch model designation in the boxes. The transfer switch model designation defines characteristics and ratings as explained below.

Model

K: Kohler

Mechanism

E: Service Entrance Rated

Transition

P: Programmed

Controller

D: Decision-Maker® MPAC 1500, Automatic

Voltage/Frequency

C:	208 Volts/60 Hz	M:	480 Volts/60 Hz
F:	240 Volts/60 Hz	R:	220 Volts/60 Hz
K:	440 Volts/60 Hz		

Number of Poles/Wires

N: 2 Poles/3 Wires, Solid Neutral
T: 3 Poles/4 Wires, Solid Neutral
V: 4 Poles/4 Wires, Switched Neutral

Enclosure

A:	NEMA 1	C:	NEMA 3R
B:	NEMA 12	F:	NEMA 4X

Current, Amps

0100	0600	2000
0150	0800	2500
0200	1000	3000
0250	1200	4000
0400	1600	

Connections

S: Standard

Utility Switching Device

M: MCCB w/thermal magnetic trip 100-200 A
N: MCCB w/electronic trip 250-800 A
P: MCCB w/electronic trip and GF 1000-1200 A
R: ICCB w/electronic trip 800 A
T: ICCB w/electronic trip and GF 1000-4000 A

Generator Switching Device

K: MCSW 100-1200 A
M: MCCB w/thermal magnetic trip 100-200 A
N: MCCB w/electronic trip 250-1200 A
Q: ICSW 800-4000 A
R: ICCB w/electronic trip 800-4000 A

Note: Some selections are not available for every model. Contact your Kohler distributor for availability.

Availability is subject to change without notice. Kohler Co. reserves the right to change the design or specifications without notice and any obligation or liability whatsoever. Contact your local Kohler generator distributor for availability.

Documents / Resources

	KOHLER KEP Transfer Switch [pdf] User Guide KEP Transfer Switch, KEP, Transfer Switch, Switch

References

- Kohler Energy | Cleaner Energy Solutions for individuals, businesses and communities
- User Manual