

**ISO 9001**  
KOHLER  
POWER SYSTEMS  
NATIONALLY REGISTERED



## MPAC™ 500 Controller Features

- User-friendly interface with easy-to-read international symbols
- Source available and contactor position indicators
- LED indication of system faults
  - Failure to acquire standby source
  - Failure to transfer
  - Auxiliary switch fault
- Common fault contact: latches closed on system faults shown above
- Engine start contact: provides contact closure to start the generator set
- Load control contact: allows 5-minute delay in startup of selected loads
- Test button (with or without load)
- Exercise set button
  - Weekly 20-minute generator set exercise
  - With or without load
- Single-phase voltage sensing on both sources,  $\pm 5\%$
- Line-to-line frequency sensing,  $\pm 2\%$
- Fixed time delays

## Standard Features

- UL listed
  - Models with load centers, UL 67 listed, file #E251086
  - Models without load centers, UL 1008 listed, file #E58962
- CSA certified, file #LR58301 (not applicable to service entrance models)
- 220/240 VAC, 50/60 Hz (selectable)
- 100, 200, and 400 amp models available
- Two-pole, single-phase open-transition transfer switch
- Contactor electrically and mechanically interlocked
- Double throw inherently interlocked design
- Solid neutral
- Contactor manually operable for maintenance purposes
- Silver alloy main contacts
- All models are 100% equipment rated and can be applied at the rated current without derating
- 100 and 200 amp models available with or without prewired Square D type QO load center
  - 100 amp load center models use up to 16 circuit breakers (up to 8 tandem breakers can be used for a maximum of 24 circuits)
  - 200 amp load center models use up to 24 circuit breakers
- Two enclosures available
  - NEMA Type 1 steel ANSI 49 gray enclosure for indoor installation. 100 amp and 200 amp models without load centers can be recess-mounted between wall studs (not service entrance model)
  - NEMA Type 3R corrosion-resistant aluminum ANSI 49 gray padlockable enclosure. Approved for indoor or outdoor installation
- Auxiliary position-indicating contacts (one set standard on 400 amp models only)
- Five-year limited warranty
- See page 5 for available accessories

## Service Entrance Model Features

- 200 and 400 amp service entrance rated automatic transfer switches available
- Service disconnect circuit breaker on the normal (utility) source (80% rated)
- NEMA 3R aluminum ANSI 49 gray enclosure (without load center)
- Circuit breaker for generator set battery charger
- Circuit breaker for engine heater (optional on 200 amp models, standard on 400 amp models)
- Auxiliary position-indicating contacts (one set standard on 400 amp models only)
- See page 5 for available SE model accessories

Environmental Specifications	
Operating temperature:	- 20°C to 70°C (- 4°F to 158°F)
Storage temperature:	- 40°C to 85°C (- 40°F to 185°F)
Humidity:	5 to 95% noncondensing

Contact Ratings	
Engine start	0.5 A @ 125 VAC; 2 A @ 30 VDC SPST normally closed (NC)
Common fault	0.5 A @ 125 VAC; 2 A @ 30 VDC SPST normally open (NO)
Load control	10 A @ 120 VAC SPST normally open (NO)
Auxiliary contacts (optional; one set standard on 400 amp models)	15 A @ 277 VAC Form C

Source Sensing	
Undervoltage dropout	80%
Undervoltage pickup	85%
Underfrequency dropout	90%
Underfrequency pickup	96%

Time Delays			
Time Delay	Factory Setting	Adjustment with Accessory Board*	
		Range	Increment
Engine start	3 seconds	1-10 seconds	1 second
Transfer from Normal to Emergency	3 seconds	1-10 seconds	1 second
Retransfer from Emergency to Normal	6 minutes	3-30 minutes	3 minutes
Engine cooldown	5 minutes	1-10 minutes	1 minute
Exercise run time	20 minutes	5-50 minutes	5 minutes
Exercise interval	1 week	1 week/2 week (DIP switch)	
Load control connection delay	5 minutes	5 or 10 minutes (DIP switch)	
Failure to acquire Emergency source	78 seconds	NA	
Undervoltage dropout	0.5 second	NA	
Underfrequency dropout	3 seconds	NA	

\* Optional accessory board required for time delay adjustments  
NA = not adjustable

Cable Sizes				
AL/CU UL-Listed Solderless Screw-Type Terminals for External Power Connections				
Switch Size, Amps	Range of Wire Sizes, Cu/Al			
	Normal and Emergency (per phase)	Load (per phase)	Neutral	Ground
100	(1) #14 to 1/0 AWG	(1) #14 to 1/0 AWG	(3) #12 to 1/0 AWG	(9) #14 to #4 AWG
100 B	(1) #14 to 1/0 AWG	(1) #14 to 1/0 AWG	(1) #6 to 2/0 AWG	(9) #14 to #4 AWG
200	(1) #6 AWG to 250 KCMIL	(1) #6 AWG to 250 KCMIL	(3) #6 AWG to 250 KCMIL	(9) #14 to #4 AWG
200 B	(1) #6 AWG to 250 KCMIL	(1) #6 AWG to 250 KCMIL	(1) #4 AWG to 250 KCMIL	(9) #14 to #4 AWG
200 SE	(1) #4 AWG to 300 KCMIL	(1) #6 AWG to 250 KCMIL	(1) #6 AWG to 250 KCMIL	(3) #14 to #1/0 AWG
400	(2) #1/0 AWG to 250 KCMIL or (1) #4 AWG to 600 KCMIL	(2) #1/0 AWG to 250 KCMIL or (1) #4 AWG to 600 KCMIL	(6) #1/0 AWG to 250 KCMIL or (3) #4 AWG to 600 KCMIL	(3) #14 to 1/0 AWG
400 SE	(2) #1/0 AWG to 250 KCMIL	(2) #1/0 AWG to 250 KCMIL	(6) #1/0 AWG to 250 KCMIL	(3) #14 to 1/0 AWG

B = Load center model  
SE = Service entrance model

## Contactor Ratings with Coordinated Circuit Breakers

The transfer switches are UL listed at 240 VAC maximum. The following table lists contactor withstand current ratings (WCR) for 100-400 ampere non-service entrance rated switches with specific manufacturer's circuit breakers per UL and Canadian safety standards. Suitable for control of motors, electric discharge lamps, tungsten filament lamps and electric heating equipment where the sum of motor full-load ampere ratings and the ampere ratings of other loads do not exceed the ampere rating of the switch and the tungsten load does not exceed 30 percent of switch rating.

<b>WCR Ratings with Specific Manufacturer's Molded-Case Circuit Breakers</b>				
Switch Rating, Amps	WCR, RMS Symmetrical Amps	Manufacturer	Type or Class	Maximum Size, Amps
100	10,000	Eaton/Cutler-Hammer	FCL, FB, QCHW, GB, GHB, GC, GHC, GD, EHD	100
			FDB, FD, HFD, FDC, CA, CAH	150
		Square D	FI, FC, FA, FH	100
			QOM1, QOM1-VH	125
			Q2, Q2-H, Q2H	175
			QOM2, QOM2-VH	225
			QB, QD, QG, GJ	250
		Siemens	CED6, ED2, ED4, ED6, HED4, HED6, QP(Q2125), QPH(Q2125H)	125
			QJ2, QJH2	150
		GE	THQB, THQC, THHQB, THHQC	100
			THHQL, TQDL, THQDL	125
			SE, TQD, THQD, THED	150
200	10,000	Eaton/Cutler-Hammer	CSR/BHW, FD, HFD	225
			JD, JDB, HJD	225-250
			JDC	250
			DK, KD, KDB, HKD, KDC, LCL, LA	400
		Square D	Q2, QOM2, QOM2-VH, Q2-H, Q2H	225
			KI, KA, KH, KC, QB, QD, QG, QJ	250
			LE, LX, LXI, LC, LI, LA, LH	400
		Siemens	FD6-A, FXD6-A, HFD6, CFD6	250
			TQDL, THQDL	125
		GE	THLC2	225
			SF	250
400	65,000	Cutler-Hammer	FCL, FB TRI-PAC	100
			FD, FDC, HFD	150
			HJD, JD, JDB, JDC	250
			HKD, KD, KDB, KDC, LA TRIPAC, LCL, DK, CHKD	400
			HLD, CHLD, LDC, CLDC	300-600
			NB TRI-PAC	300-800
		Square D	FC, FH, FI	100
			KA, KC, KH, KI	250
			LA, LC, LE, LH, LI, LX, LXI	400
			LI, LXI, LX, LE, LC	600
			MX, ME, MH	800
		Siemens	CED6, ED6, HED4, HED6, ED4	125
			CFD6, HFD6, FD6, FXD6	250
			CJD6, SCJD6, HHJD6, HHJXD6, SHJD6, HJD6, SJD6	400
			CLD6, SCLD6, HHLD6, HHLXD6, SHLD6, HLD6	600
			CMD6, SCMD6, HMD6, SHMD6, HMXD6, MD6, MXD6, SMD6	800
		Merlin Gerin	CF250L, CF250H	250
			CJ400L, CK400H, CJ400H, CK400N	400
			CJ600H	600
			CK800H, CK800N	800
		ABB	JHB	400
			S6	800

## Service Entrance Transfer Switch Ratings

The service entrance transfer switch is factory-equipped with a normal source disconnect circuit breaker.

Switch Rating, Amps	WCR, RMS Symmetrical Amps at 240 VAC
200	22,000
400	35,000

## Codes and Standards

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

- Underwriters Laboratories UL 67, Enclosed Panel Boards (load center models) file #E251086
- Underwriters Laboratories UL 1008, Standard for Automatic Transfer Switches for Use in Emergency Systems, file #E58962
- Underwriters Laboratories UL 508, Standard for Industrial Control Equipment
- CSA certified, file #LR58301 (not applicable to service entrance models)
- NFPA 70, National Electrical Code
- NFPA 110, Emergency and Standby Power Systems
- IEEE Standard 446, IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
- NEMA Standard IC10-1993 (formerly ICS2-447), AC Automatic Transfer Switches
- ANSI C37.90.1 (IEEE472), 2000, EFT/Surge Relay Systems
- EN61000-4-5 Surge Immunity Class 4 (voltage sensing and programmable inputs only)
- EN61000-4-4 Fast Transient Immunity Severity Level 4
- IEC Specifications for EMI/EMC Immunity
  - CISPR 11, Radiated and Conducted Emissions, Class B
  - IEC 61000-4-2, 2001, Electrostatic Discharge
  - IEC 61000-4-3, 2002, Radiated Immunity
  - IEC 61000-4-4, 2001, Electrical Fast Transients (Bursts)
  - IEC 61000-4-5, 2001, Surge Voltage Immunity
  - IEC 61000-4-6, 2003, Conducted RF Immunity
  - IEC 61000-4-8, Magnetic Field Immunity
  - IEC 61000-4-11, Voltage Dips and Interruptions

## Weights and Dimensions

Enclosure Type	Amps	Load Center	Shipping Weight kg (lb.)		Dimensions, H x W x D, mm (in.)	
NEMA 1 (steel)	100	None	10	(22)	610 x 330 x 154 *	(24.0 x 13.0 x 6.0) *
	100	16 circuits	19.5	(43)	914 x 406 x 154	(36.0 x 16.0 x 6.0)
	200	None	11	(24)	610 x 330 x 154 *	(24.0 x 13.0 x 6.0) *
	200	24 circuits	20.4	(45)	914 x 406 x 154	(36.0 x 16.0 x 6.0)
	400	None	68	(150)	1223 x 560 x 362	(48.1 x 22.0 x 14.3)
NEMA 3R (aluminum)	100	None	8.2	(18)	613 x 340 x 177	(24.1 x 13.4 x 7.0)
	100	16 circuits	15	(32)	917 x 416 x 177	(36.1 x 16.4 x 7.0)
	200	None	9.1	(20)	613 x 340 x 177	(24.1 x 13.4 x 7.0)
	200	24 circuits	16	(35)	917 x 416 x 177	(36.1 x 16.4 x 7.0)
	200 SE †	None	17	(37)	858 x 473 x 163	(33.8 x 18.6 x 6.4)
	400	None	54	(120)	1067 x 560 x 269	(42.0 x 22.0 x 10.6)
	400 SE †	None	59	(130)	1067 x 560 x 269	(42.0 x 22.0 x 10.6)

\* Can be recess-mounted between 16 in. O.C. wall studs.

† Service entrance model

## Available Accessories

### Accessory board

- Alarm horn indicates system faults
- Adjustable time delays:
  - Engine start
  - Engine cooldown
  - Preferred to standby
  - Standby to preferred
  - Exercise duration
- Inputs and Outputs:
  - Remote start/stop input (loaded)
  - Programmable exerciser input
  - Generator set supplying load output:  
10 A @ 120 V SPST normally open (NO) contact
- External alarm module connection
- Dip switches:
  - 1 week/2 week exerciser
  - Load/no load exercise mode (for optional programmable exerciser)
  - Momentary/maintained external start/stop input:  
Selects momentary (1 second) push button or maintained contact closure for remote start/stop signal
  - Load control, 5 minutes/10 minutes:  
Allows adjustment of the startup delay after transfer to generator set for selected loads (e.g. air conditioners or other large motor starting loads)
  - Audible alarm disable

### Auxiliary position-indicating contacts

- One closed on normal position and one closed on emergency position
- Form C contacts rated 15 A @ 277 VAC
- One set standard on 400 amp models

### External alarm module

- Alarm horn
- Alarm silence/lamp test button
- Remote start/stop button
- Generator supplying load indicator
- Fault indicator
- Fits into standard outlet box
- Multiple alarm modules can be connected
- Accessory board required

### Programmable exerciser

- Seven-day programmable timer allows scheduling up to 56 on/off events
- LCD display indicates day, time, program/run modes, and on/off/skip status
- Skip next cycle button
- 5-year lithium backup battery
- Accessory board required

### Wall-mount bezel (for Type 1 enclosures)

- For 100 and 200 amp recess-mounted switches
- For NEMA type 1 enclosures only (not for NEMA 3R or service entrance switches)

## Additional Accessories for Service Entrance Model

### Utility-side surge suppressor

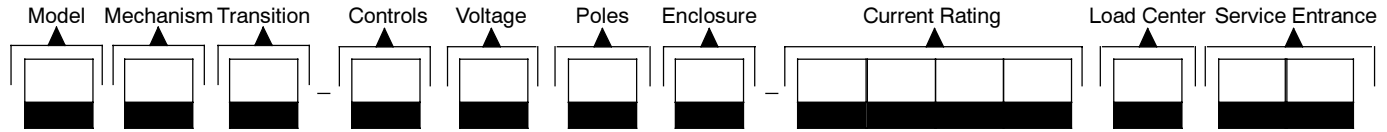
- Highly reliable surge protection
  - Fully automatic operation with automatic reset
  - LED status indication
  - Thermal fusing and short circuit protection
  - UL 1449 (second edition) listed at 330 V
  - Working voltage: 120/240 VAC split phase
  - Maximum continuous operating voltage: 140 VAC
  - Lines protected, AC: L-N, L-G, L-L, N-G
  - Maximum surge current: 80kA per phase (8/20 $\mu$ s)
  - Duty cycle performance (8/20 $\mu$ s):
    - 80,000 A, 1 impulse
    - 10,000 A, >4,000 impulses
    - 100 A, infinite
    - Long duration current pulse (10/10,000 $\mu$ s) capability:  
3600 A (tested)
  - Response time: <5ns
  - Remote indication contacts: Normally open (NO) and normally closed (NC) contacts rated 2 A @ 250 VAC
  - AIC short circuit rating: 100,000 RMS symmetrical amps, 240 V max.
  - Operating temperature range:  
–40°C to 85°C (–40°F to 185°F)
  - Humidity: 95% (non-condensing)
  - Let-through voltage:
    - 430 V @ 3 kA †
    - 690 V @ 10 kA †
- † 8/20 $\mu$ s waveform. Tested as per ANSI/IEEE C62.45 and ANSI/IEEE C62.41

### Enclosure space heater

- 150 Watts
- Hygrostat (humidity control)
- Built-in temperature limiter for overheat protection
- 15 A single-pole Square D type QO circuit breaker

### Accessory circuit breaker

- For generator set engine heater
- 15 A single-pole Square D type QO circuit breaker
- Standard on 400 amp SE models



**Kohler® Model Designation Key**

This chart explains the Kohler® transfer switch model designation system. The sample model designation shown is for a Model R service entrance rated automatic transfer switch that uses a standard-transition contactor with MPAC™ 500 electrical controls rated at 240 volts/60 Hz, 2 poles, 3 wires, and solid neutral in a NEMA 3R enclosure with a current rating of 200 amperes and no load center.

**SAMPLE MODEL DESIGNATION**

**RDT-CFNC-0200ASE**

**Model**

R: Model R automatic transfer switch

**Mechanism**

D: Specific-breaker rated

**Transition**

T: Standard transition

**Electrical Controls**

C: MPAC™ 500 (Microprocessor ATS Control)

**Voltage/Frequency**

D: 220 Volts/50 Hz  
 F: 240 Volts/60 Hz

**Number of Poles/Wires**

N: 2-pole, 3-wire, solid neutral

**Enclosure**

A: NEMA 1 (steel) \*  
 C: NEMA 3R (aluminum)

**Current Rating:** Numbers indicate the current rating of the switch in amperes:

0100: 100 amps      0200: 200 amps      0400: 400 amps

**Load Center**

A: Without load center  
 B: With load center (N/A for service entrance models)

**Service Entrance:**

SE: Service entrance model ‡  
 Blank: Not rated for service entrance

\* NEMA 1 only: 100 and 200 amp models without load centers can be recess-mounted between wall studs. Optional wall-mount bezel available.  
 ‡ Service entrance transfer switches are available with 200 or 400 amp ratings with NEMA 3R enclosures and no load center.

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