AKR-30S/AKRU-30S Low Voltage Power Circuit Breakers

800 Ampere Frame

Introduction

The AKR-30S is a new low-voltage ac power circuit breaker designed to be competitive in *size, weight and ratings.* It is provided with the MicroVersaTrip® solid-state trip device currently used on all other AKR low voltage power circuit breakers.

Product Features

The closing mechanism for the AKR-30S low voltage power circuit breaker may be either the manually or electrically operated type. For manual operation, one handle stroke charges the spring to a predetermined over-center point for closing. For electrical operation, a solenoid charges the spring to a predetermined over-center point for closing. With both manual and electrical operations, the spring closing force is entirely independent of the charging method. The energy stored in the spring provides fast, uniform energy to close the contacts.

An optional, triple selective trip feature, available with the AKR-30S, provides both long time and short time selectivity up to the short time rating of the breaker, as well as instantaneous system protection between the short time and short circuit interrupting ratings.

Maintainability is a key feature of the AKR-30S. It is designed with fewer, easier-accessible parts. Combined with a lighter, 70-pound weight, this means lower cost and faster maintenance.

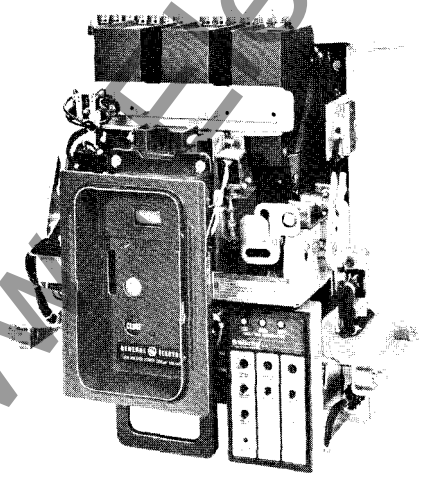

Figure 1 AKR-30S

Table 1 AKR-30S Ratings

System Nominal Voltage 60 Hz ac	Short Circuit Rating RMS Symmetrical, KA with Instantaneous or Triple Selective Trip Device		Short-Time Rating RMS Symmetrical KA
	Unfused	Fused	
600(635)(1)	22	200(2)	22
480(508)(1)	30	200(2)	22
240(254)(1)	42	200(2)	22

(1) Parenthetical value is maximum system voltage.
(2) 600 VAC maximum (corresponds to Class J and Class L fuse maximum voltage rating).

Fuse Sizes: AKRU-30S Integrally Fused - 225-600A Class J, 601-1600A Class L.

Table 2 Breaker Weights - AKR-6D-30S, AKRU-6D-30S

Draw Out Breaker Element	Net Weight (lbs.)		Shipping Weight (lbs.)	
	Manual	Electrical	Manual	Electrical
AKR-30S	70	90	80	100
AKRU-30S	90	110	100	120

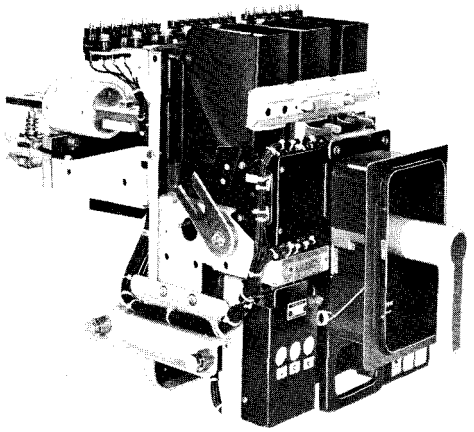

Figure 2 AKRU-30S

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Table 3 MicroVersaTrip® Characteristics for AKR/AKRU-30S

Sensor Current Rating		Current Setting (Multiple of Sensor Current Rating) (X)	Long-Time		Short-Time	
Fixed Sensors (X)	Tapped Sensors (X) (3)		Pick-up (Multiple of Current Setting) (C)	Delay (1) (Seconds)	Pick-up (Multiple of Current Setting (C)	Delay (2) (Seconds
100, 150 225, 300 400, 600 800	100, 150 225, 300 or 300, 400 600, 800	.5, .6, .7, .8, .85, .9, .95, 1.0	.8, .9, 1.0, 1.0, 1.1	2.5, 5, 10, 21	1.5, 2, 2.5, 3, 4, 5, 7 9	0.10, 0.22, 0.36

Adjustable Instantaneous Pick-up (Multiple of Sensor Current Rating) (X)	Triple Selective Trip with Fixed High Range Instantaneous (3) (4)	Fixed Instantaneous Override (Multiple of Sensor Amp. Rating or Tap Setting) (X)	Short-Time I^2T (1) (Seconds)	Ground Fault		Adjustable High Range Instantaneous (Multiples of Frame Max. Short-Time Rating) (3)
				Pick-up (Multiple of Sensor Current Rating) (X)	Delay (2) (Seconds)	
1.5, 2, 2.5, 3, 4, 6, 8, 10	22KA $^{+0}_{-20\%}$	15	0.4	.2, .25. .3, .35, .4, .45, .5, .6	0.10, 0.22, 0.36	.4, .6, .8 and 1.0

(1) Time delay shown at 600% of ampere setting at lower limit of each band.
(2) Time delay shown at lower limit of each band. All pick-up tolerances are ± 10%.
(3) The only tapped sensors available with high range instantaneous or short time only (triple selective trip) are 200/400, 300/600 or 400/800.
(4) Triple selective trip is standard when long time/short time only is required.

Table 4 Repetitive Duty and Normal Maintenance

AKR-30S Circuit Breaker Frame Size (Amperes)	Number of Operations Between Servicing	Number of Operations Rated Continuous Current Switching (1) (3) (4) (5) (6) (7) (8) and (10)	Number of No-Load Operations Closing and Opening (1) (2) (3) (4) (5) (6) and (7)	Number of Operations Inrush Current Switching (3) (4) (5) (6) (7) (9) (10)
800	1750	2800	9700	1400

(1) Servicing consists of adjusting, cleaning, lubricating, tightening, etc., as recommended. When current is interrupted, dressing of contacts may be required as well. The operations listed are on the basis of servicing at intervals of 6 months or less.
(2) When closing and opening no-load.
(3) With rated control voltage applied.
(4) Frequency of operation not to exceed 20 in 10 minutes or 30 in an hour. Rectifiers or other auxiliary devices may further limit the frequency of operation.
(5) Servicing at no greater intervals than shown in Column 2 above.
(6) No functional parts should have been replaced during the listed operations.
(7) The circuit breaker should be in a condition to carry its rated continuous current at rated maximum voltage and perform at least one opening operation at rated short-circuit current. After completion of this series of operations, functional part replacement and general servicing may be necessary.
(8) When closing and opening current up to the continuous current rating of the circuit breaker at voltages up to the rated maximum voltage and at 85% power factor or higher.
(9) When closing currents up to 600% and opening currents up to 100% of the continuous current rating of the circuit breaker, at voltages up to the rated maximum voltage, at 80% power factor or higher.
When closing currents up to 600% of the continuous current rating of the circuit breaker, at voltages up to rated maximum voltage, at 50% power factor or less, the number of operations shown shall be reduced to 10% of the number listed.
(10) If a fault operation occurs before the completion of the listed operations, servicing is recommended and possible functional part replacements may be necessary, depending on previous accumulated duty, fault magnitude, and expected future operations.

Accessories

Shunt Trip
Undervoltage Tripping Device
- Auxiliary Switch
- Bell Alarm Device (with or without lockout)

Operating time (cycles on 60 Hz base) - Closing electrically (time from energizing closing circuit until contacts touch is five cycles.)

Table 5 Closing Mechanism Operating Current

Rated Voltage	Inrush	Sustained	Recommended Fuse Size
120 Volt, 60 Hz (Operating range 104-127 VAC)	153	78	30
125 Volt DC (Operating range 100-140 VAC)	44	44	10
240 Volt, 60 Hz (Operating range 208-254 VAC)	68	28	15
250 Volt DC (Operating range 200-280V DC	24	24	6

Operating time (cycles on 60 Hz base) - Opening (maximum clearing time) with instantaneous overcurrent trip is three cycles, and with shunt trip is three and one-half cycles.

Table 6 Shunt Trip Current

Rated Voltage		Voltage Range	Amperes Inrush/Sustained
AC	120	104-127	12.3/10.8
	240	208-254	3.9/3.4
DC	125	70-140	1.9/1.9
	250	140-280	1.0/1.0

Table 7 Undervoltage Device Current

Rated Voltage		Inrush	Sealed
AC	120	.66	.24
	240	.37	.12
DC	125	.08	.08
	250	.04	.04

Table 8 Bell Alarm Contact Ratings

Contact Voltage		Contact Ratings Amperes	
		Inrush	Continuous
AC	120	30	10
	240	15	5
	480	7	3
DC	125	2.5	2.5
	250	0.9	0.9

Table 9 Auxiliary Switch Contact Ratings

Control Voltage		Auxiliary Switch Interrupting Ratings (Amperes) (1)	
		Non Inductive	Inductive
AC	115	75	50
	240	50	25
	480	25	12
DC	48	25	—
	125	11	6.3
	250	2	1.8

(1) Limited to 20A continuous rating of switch on all breakers and to 15A continuous rating of #16 wire on draw out breakers.

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

For further information call or write your local General Electric Sales Office or . . .

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