

## /// AR Circuit breaker, hydraulic magnetic

Rugged circuit breaker for extreme reliability, within long endurance applications and harsh environments

### AR Circuit breaker



### Description

Small hydraulic magnetic circuit breaker for railway applications, to protect electronic equipment and components against unintended high currents. Optional with integrated auxiliary contacts to monitor the circuit.

The trip point is always at maximum allowable current, independent of ambient temperature. Mid-trip handle to indicate clearly a breaker operation caused by electrical fault. With unique arc chute design which results in high interrupting capacities. Up to 6 poles which all break its electronic circuits when 1 breaker trips, for optimal protection of the system. Wide range of currents and options available.

### Application

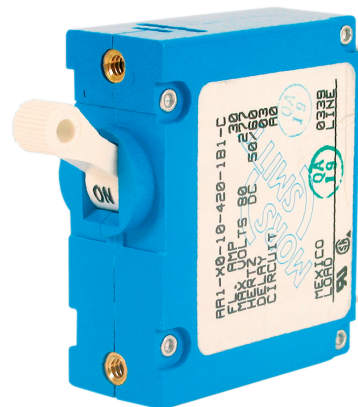
To be used in every application where electrical systems, circuits or components must be protected against too high currents. This situation can occur, when under strained or heavy use a motor or other load-generating component within the equipment will draw additional current from the power source. High currents cause the wires or components to overheat and ultimately burn up.

A circuit protection device should be employed at any point where a conductor size changes. Many electronic circuits and components like transformers have a lower overload withstand threshold level than conductors such as wires and cables. These components require circuit protection devices featuring very fast overload sensing and opening capabilities.

The AR-series circuit breaker can be used in all railway applications where protection against overload and short circuit is necessary, for example HVAC systems, (door) control systems, braking systems, passenger information systems, etc.

### Features

- Precise, temperature independent operation
- Panel mount
- Integrated auxiliary contacts (optional)
- Small design
- Up to 6 poles configuration
- High interrupting capacities due to unique arc chute method
- Mid-trip handle for electrical trip indication (optional)
- Immediate resetting possible
- Wide current range: 0.1 - 50 A
- Wide choice of time delays
- Maximum voltage 90 VDC / 277 VAC
- High contact pressure & longer contact life due to wiping self-cleaning contacts
- Flexibility by many options



### Railway compliancy

All our circuit breakers are designed according:

EN 50155	
IEC 60077 - 1/2/3/4	NF F 62-001 - 1/2/3
IEC 61373	NF F61-010
EN 50124-1	IEC 60068-2-30
EN 45545-2	IEC 60068-2-52
IEC 60947-2	MIL-STD-202G Method 107D, condition A
NF F16-101/102	MIL-STD-202G Method 106D

## Circuit breaker AR

### Technical specifications

#### Electrical characteristics

Application voltage	<b>DC for 1-6 poles</b>	<b>AC for 1-6 pole</b>
Rated voltage	12 - 72 VDC	12 - 251 VAC
Min. operating voltage	8.4 VDC	10.8 VAC
Max. operating voltage	90 VDC	277 VAC
	Remark: 8.4 - 80 VDC: max 50 A 80-90 VDC: max 40 A	
Current ratings	0.1 - 50 A (other ratings on request)	
Voltage coils	6 - 65 VDC, 6 - 240 VAC (other ratings on request)	
Dielectric strength	1500 VAC, 60 Hz for 1 minute between all electrically isolated terminals	
Insulation resistance	Minimum of 100 MΩ @ 500 VDC	
Operating frequency	50/60 Hz, DC	
Max. interrupting cap.	UL 0077	7500 A @ 80 VDC, 0.1 - 50 A 3000 A @ 250 VAC, 0.1 - 50 A 5000 A @ 250 VAC, 0.1 - 50 A (with backup fuse) 5000 A @ 277 VAC, 0.1 - 30 A (with backup fuse)
	IEC 60934	3000 A @ 65 VDC, 0.1 - 50 A 5000 A @ 65 VDC, 0.1 - 50 A (with backup fuse) 1500 A @ 80 VDC, 0.1 - 50 A 3000 A @ 80 VDC, 0.1 - 50 A (with backup fuse) 3000 A @ 250 VAC, 0.1 - 50 A 5000 A @ 250 VAC, 0.1 - 30 A (with backup fuse)
Auxiliary switch	Integrated, load side. SPST. Auxiliary switch senses the on-off position of circuit breaker handle, as well as the open-closed position of breaker contact.	
		Silver auxiliary contacts                      Gold auxiliary contacts
AC min. switching cap.	5 - 20 VAC: 100 mA ≥ 20 VAC: 10 mA	5 mA / 5 VAC
AC max. switching cap.	5 A / 125 VAC	100 mA / 125 VAC
DC min switching cap.	≤ 20 VDC: 100 mA ≥ 20 VDC: 10 mA	5 mA / 5 VDC
DC max. switching cap.	3 A / 32 VDC 100 mA / 125 VDC (max. 2000 cycles)	100 mA / 32 VDC 2 mA / 110 VDC (max. 2000 cycles)
	All loads mentioned are resistive loads.	

## Circuit breaker AR

### General characteristics

Number of poles	1, 2, 3, 4, 5 or 6 poles For DC and AC applications: 1-2 poles ≤ 50 A 3-6 poles ≤ 30 A	
Terminals	Stud / screw / double faston	See circuit & terminal diagrams.
Auxiliary contacts	Faston	See circuit & terminal diagrams.
Mounting	The hydraulic-magnetic circuit breakers of Mors Smitt can be mounted in any position. A hydraulic-magnetic breaker is designed to “must hold” at 100% of the breaker’s current rating and is calibrated to “must trip” at 125% of the breaker’s current rating. If the mounting position is +90 degrees from a vertical panel mount (handle facing down, ceiling mount position) the trip and must hold rating is reduced by approximately 10%. In ceiling mount position 10 % should be added to the rated current. In table mount position (handle facing up) the same rated current can be used as in wall position.	
Body	Blue colour	
Actuator	Several colours “I O” and/or “On-off” legends	
Int. circuit configuration	Series trip, shunt trip, relay trip & switch only	
Weight (average, depending on configuration)	65 g per pole	
Width per pole	19.2 mm	
Material	Half shell - BMC 605 Handle - Valox 420SEO UL94V0 Terminals - Brass with acid tin plate	

### Mechanical characteristics

Endurance	10.000 ON-OFF operations @ 6 per minute with rated current & voltage.
Trip free mechanism	Trips on short-circuit or on overload, even when actuator is forcibly held in the ON position.
Trip indication: Standard (no mid-trip)	When manually moving the operating handle from OFF to ON position, an auxiliary switch is actuated. When an overload or a short circuit causes the circuit breaker to trip, the operating handle moves positively to the OFF position and the auxiliary switch is actuated.
Mid-trip	When manually moving the operating handle from OFF to ON position, an auxiliary switch is actuated. When an overload or a short circuit causes the circuit breaker to trip, the operating handle moves positively to the mid position and the auxiliary switch is actuated.
Mid-trip with alarm switch	When manually moving the operating handle from OFF to ON position, an auxiliary switch is not actuated. When an overload or a short circuit causes the circuit breaker to trip, the operating handle moves positively to the mid position and the auxiliary switch is actuated. In this case the auxiliary switch is only actuated by an electrical trip, not by manually operating the handle.

Remark: It is possible to manually switch the circuit breaker to the mid-trip position when the handle is switched from OFF to ON position quickly and with strong upwards force. Normally this won't occur in standard use. This is a normal phenomenon related to the design of the product.

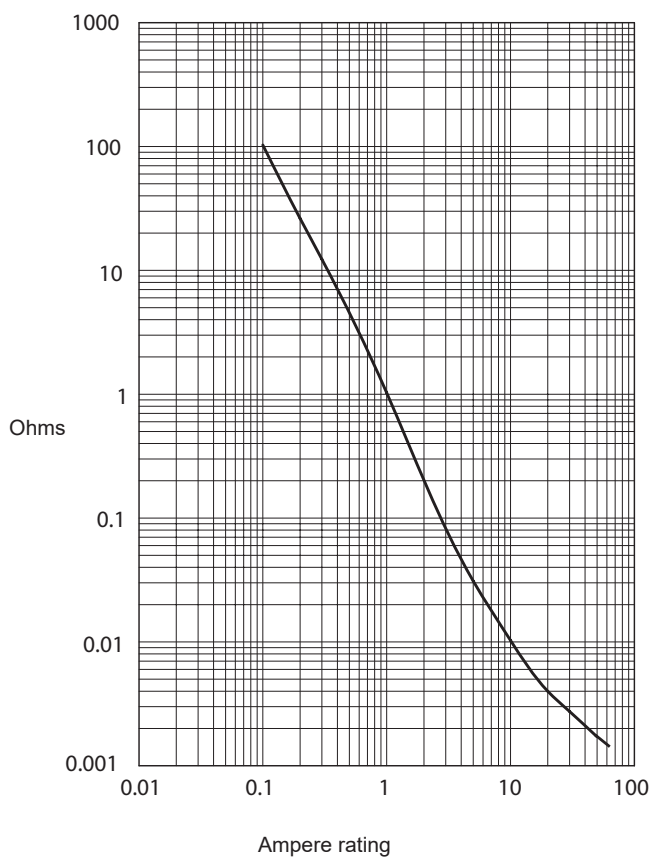
## Circuit breaker AR

### Environmental characteristics

Environmental	Complies to EN 50125-1 and IEC 60077-1
Operating temperature	-50 °C...+85 °C
Vibration	IEC 61373, Category 1, class B body mounted
Shock	IEC 61373, Category 1, class A & B body mounted
Thermal shock	Complies to MIL-107D 202 G method 107D, test condition A
Salt mist	Complies to IEC 60068-2-52 severity level 3
Damp heat	Complies to IEC 60068-2-30 test method Db variant 1
Fire & smoke	Complies to NF F 16101, NF F 16102
Protection	IEC 60529, IP40 when a panel is mounted over the circuit breaker
Moisture resistance / humidity	Complies to MIL-STD 202G method

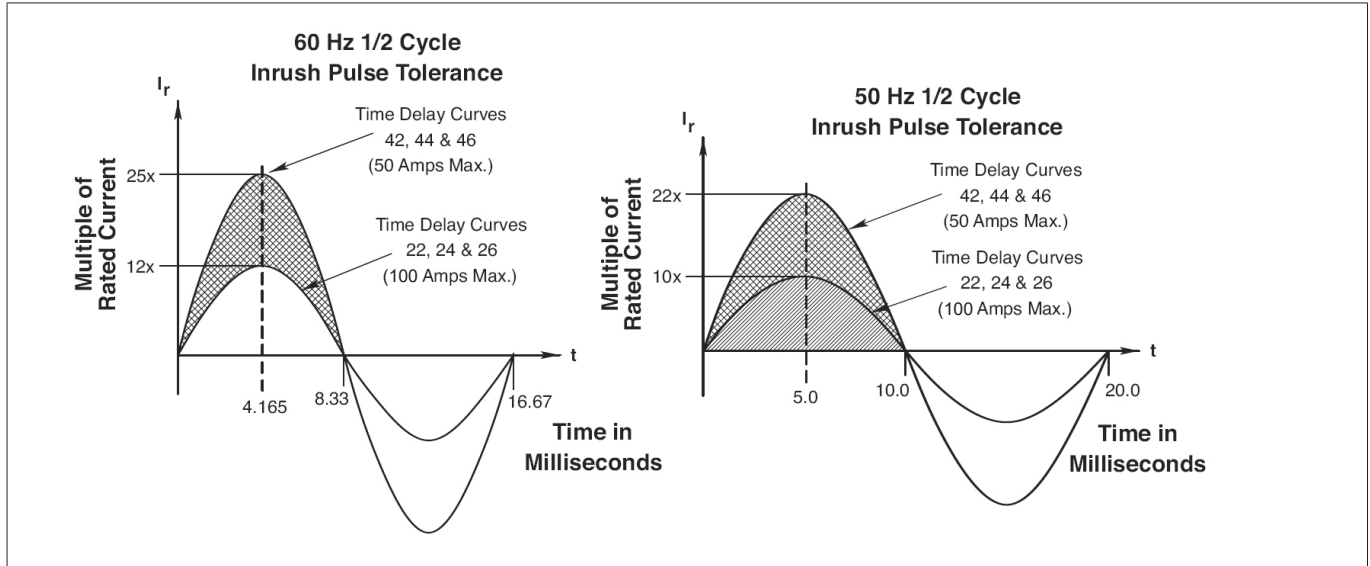
### Resistance, impedance

Resistance, impedance values from Line to Load terminals  
(Values based on series trip circuit breaker)



## Circuit breaker AR

### Inrush pulse tolerance



### Table of time delay values

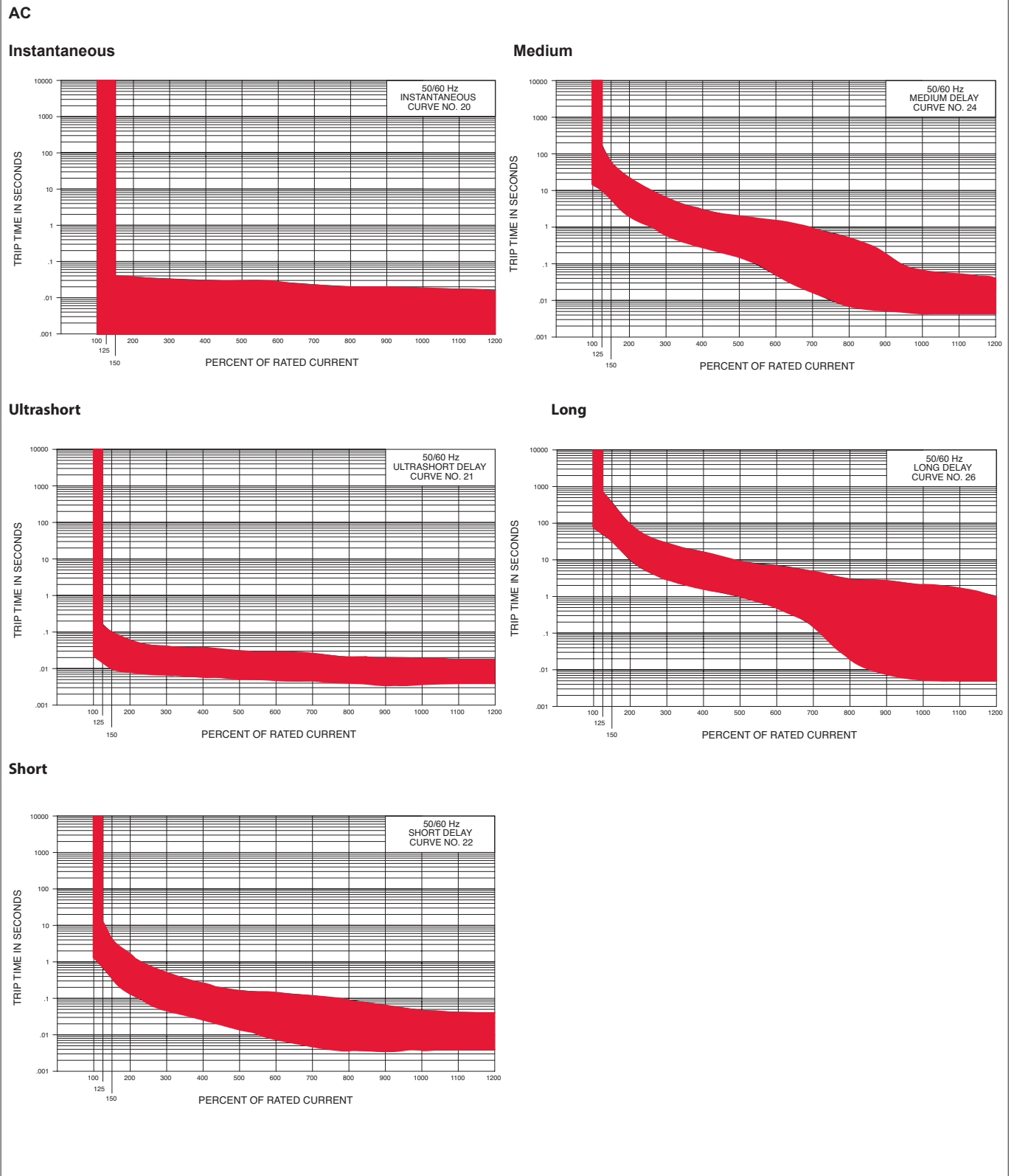
TRIP TIME (SECONDS)	PERCENT OF RATED CURRENT										
	DELAY	100%	125%	135%	150%	200%	400%	600%	800%	1000%	1200%
10	No Trip	May Trip	---	.032 MAX	.024 MAX	.020 MAX	.018 MAX	.016 MAX	.015 MAX	.013 MAX	
11	No Trip	.013 - .125	---	.010 - .070	.008 - .032	.006 - .020	.005 - .020	.004 - .020	.004 - .020	.004 - .020	
12	No Trip	.500 - 6.50	---	.300 - 3.00	.130 - 1.20	.031 - .220	.011 - .120	.004 - .090	.004 - .060	.004 - .040	
14	No Trip	2.00 - 60.0	---	1.20 - 40.0	.600 - 20.0	.150 - 3.00	.030 - 1.30	.004 - .600	.004 - .100	.004 - .100	
16	No Trip	45.0 - 345	---	20.0 - 150	9.00 - 60.0	1.40 - 11.4	.150 - 5.80	.009 - 3.70	.005 - 1.70	.005 - .500	
20	No Trip	May Trip	---	.040 MAX	.035 MAX	.030 MAX	.025 MAX	.020 MAX	.017 MAX	.015 MAX	
21	No Trip	.014 - .150	---	.011 - .095	.008 - .055	.006 - .035	.005 - .027	.005 - .021	.004 - .018	.004 - .017	
22	No Trip	.700 - 12.0	---	.350 - 4.00	.130 - 1.30	.027 - .220	.008 - .130	.004 - .090	.004 - .045	.004 - .040	
24	No Trip	10.0 - 160	---	6.00 - 60.0	2.20 - 20.0	.300 - 3.00	.050 - 1.30	.007 - .500	.005 - .060	.005 - .040	
26	No Trip	50.0 - 700	---	32.0 - 350	10.0 - 90.0	1.50 - 15.0	.500 - 7.00	.020 - 3.00	.006 - 2.00	.005 - 1.00	
42	No Trip	.700 - 12.0	---	.400 - 6.00	.180 - 2.30	.050 - .600	.026 - .300	.018 - .200	.014 - .150	.012 - .130	
44	No Trip	7.00 - 100	---	3.00 - 50.0	1.10 - 18.0	.220 - 3.00	.120 - 1.70	.075 - 1.20	.050 - .850	.042 - .720	
46	No Trip	50.0 - 700	---	31.0 - 350	12.0 - 150	1.50 - 20.0	.700 - 10.0	.404 - 7.90	.260 - 6.50	.198 - 5.80	
52	No Trip	.500 - 6.50	---	.340 - 4.50	.180 - 2.30	.051 - .600	.030 - .320	.018 - .220	.014 - .200	.012 - .130	
54	No Trip	1.50 - 50.0	---	.750 - 35.0	.350 - 18.0	.110 - 3.00	.070 - 1.70	.045 - 1.40	.039 - 1.30	.035 - 1.30	
56	No Trip	45.0 - 345	---	19.0 - 170	8.50 - 100	1.24 - 15.0	.410 - 9.00	.256 - 8.00	.210 - 5.50	.198 - 2.90	

**Notes:**

- Delay curves 11, 12, 14, 16, 21, 22, 24, 26, 42, 44, 46, 52, 54, 56: Breakers to hold 100% and must trip at 125% of rated current and greater within the time limit shown in this curve
- Delay curves 10, 20: Breakers to hold 100% and must trip at 150% of rated current and greater within the time limit shown in this curve
- All curves: Curve data shown represents breaker response at ambient temperature of 25 °C (77 °F) with no preloading. Breakers are mounted in standard wall-mount position. Delay times may vary at different temperature, the trip current rating remains unchanged
- On 50 amp and less current ratings, the minimum inrush pulse tolerance handling capability is 12 times the rated current on standard delays and 25 times the rated current on high inrush delays. These values are based on a 60 Hz 1/2 cycle, 8.33 ms pulse. High inrush delays should be specified for applications with high initial surge currents of short duration such as switching power supplies, highly capacitive loads and transformer loads

# Circuit breaker AR

## Time delay values

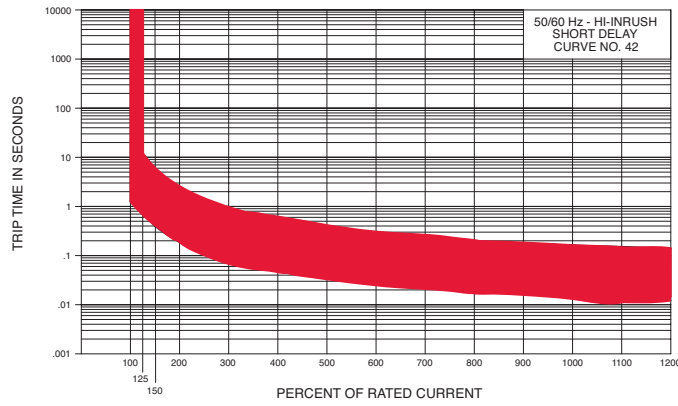


# Circuit breaker AR

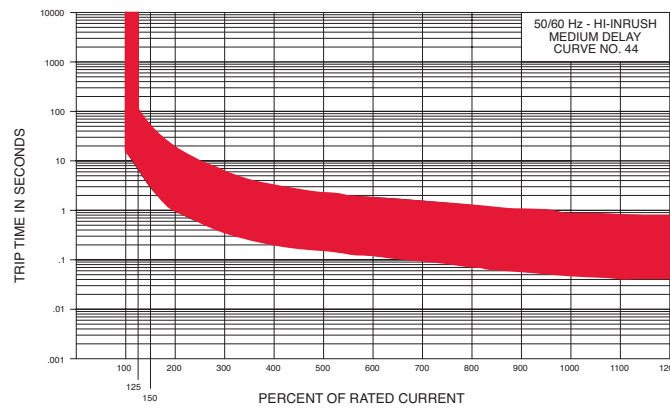
## Time delay values

### High Inrush AC

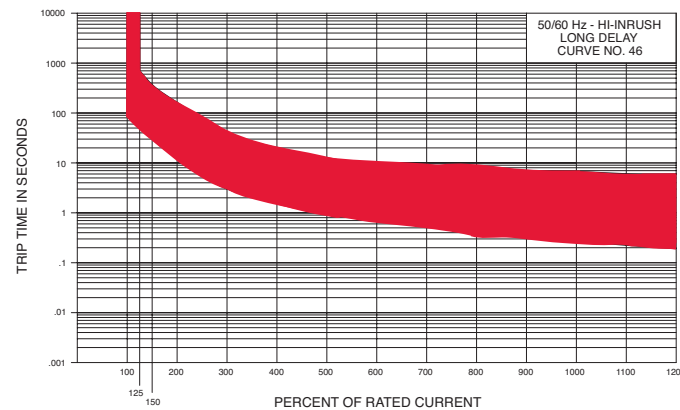
#### Short



#### Medium

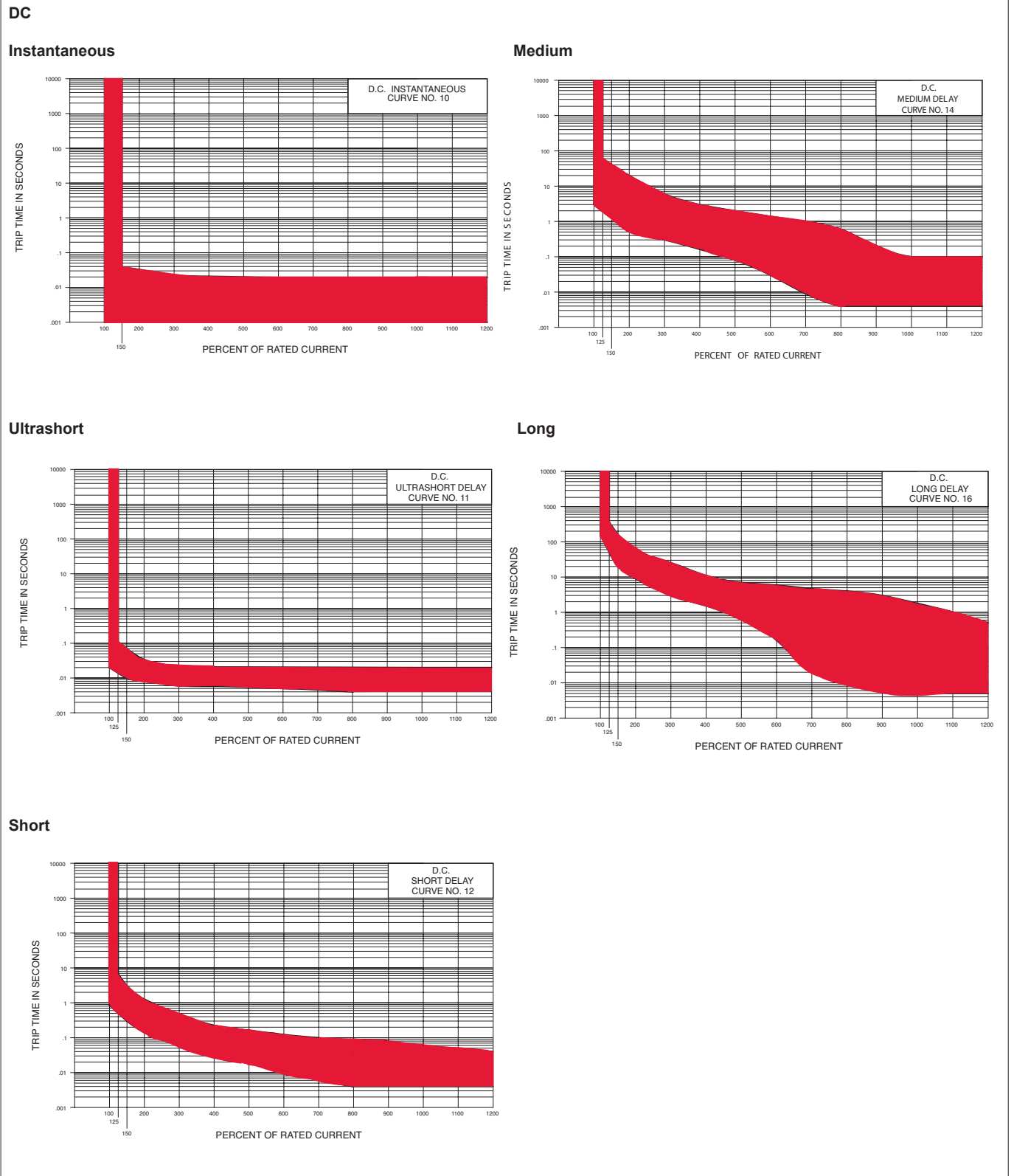


#### Long



# Circuit breaker AR

## Time delay values



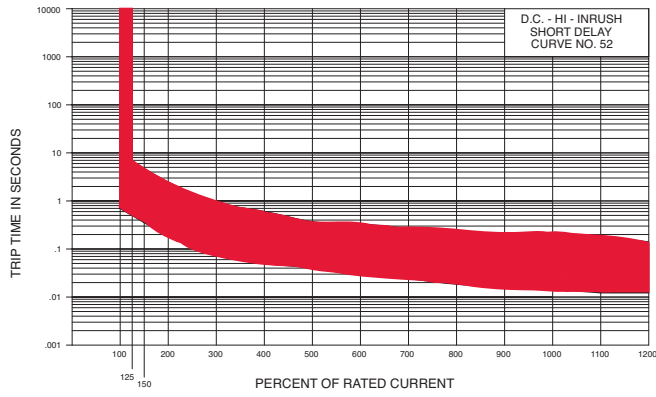


# Circuit breaker AR

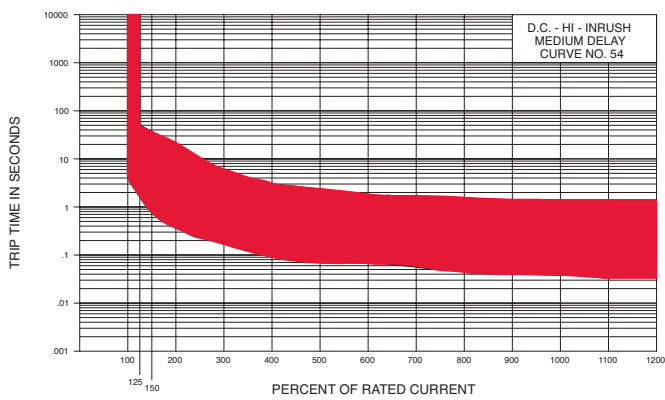
## Time delay values

### High Inrush DC

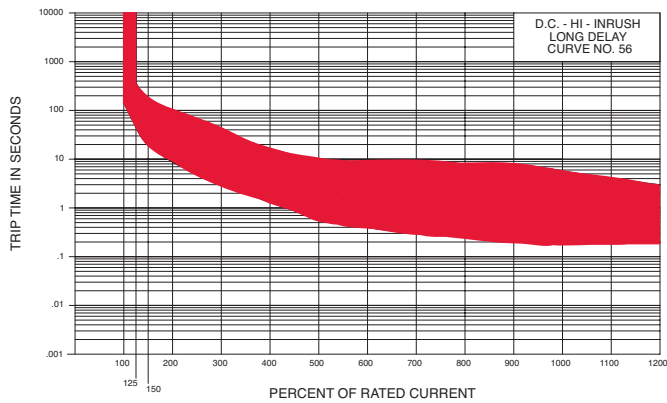
#### Short



#### Medium

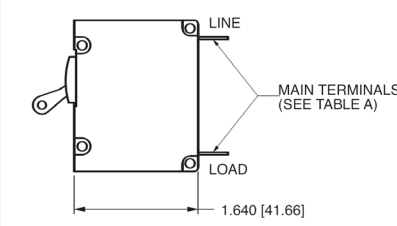
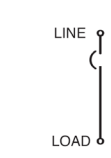
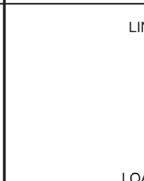
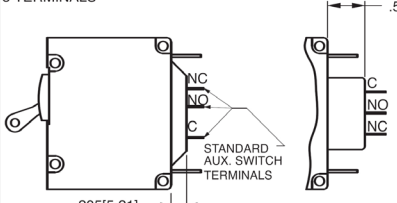
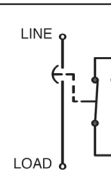
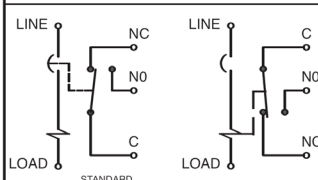
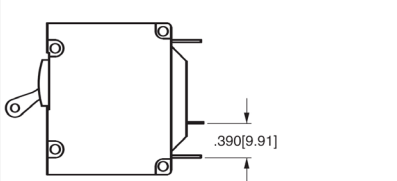

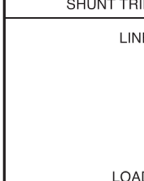




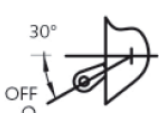















#### Long



# Circuit breaker AR

## Circuit & terminal diagrams

CIRCUIT BREAKER PROFILE	CIRCUIT SCHEMATIC		CIRCUIT SCHEMATIC		CIRCUIT CODE	AUX SWITCH CODE		
	ANSI	ANSI	ANSI	ANSI				
<b>2 TERMINALS</b>  <p>LINE LOAD MAIN TERMINALS (SEE TABLE A) 1.640 [41.66]</p>	SWITCH ONLY (NO COIL)	 <p>LINE LOAD</p>	A	0	SERIES TRIP	 <p>LINE LOAD</p>	BC	0
<b>5 TERMINALS</b>  <p>NC NO C STANDARD AUX. SWITCH TERMINALS .205[5.21] .520[13.21]</p>	SWITCH ONLY (NO COIL) WITH AUXILIARY SWITCH	 <p>LINE LOAD NC NO C</p>	A	2 3 4 A B	SERIES TRIP WITH (3) AUXILIARY/ALARM SWITCH	 <p>LINE LOAD NC NO C STANDARD AUX. SWITCH ALARM SWITCH</p>	BC	2 3 4 A B
<b>3 TERMINALS</b>  <p>.390[9.91]</p>	SHUNT TRIP	 <p>LINE LOAD SHUNT</p>	DE	0	DUAL COIL: SERIES TRIP CURRENT COIL, SHUNT TRIP VOLTAGE COIL	 <p>LINE LOAD VOLTAGE COIL</p>	H	0

HANDLE POSITION VS. AUX./ALARM SWITCH MODE						
CIRCUIT BREAKER MODE	STANDARD C/B		MID TRIP C/B		MID TRIP C/B + ALARM SWITCH MODE	
	HANDLE POSITION	AUX. SWITCH MODE	HANDLE POSITION	AUX. SWITCH MODE	HANDLE POSITION	AUX. SWITCH MODE
OFF						
ON						
ELECTRICAL TRIP						

### Circuit & terminal diagrams

PUSH-IN STUD  
MATING HOLE

#### AUXILIARY/ALARM SWITCH TERMINAL DETAIL

TABLE A TIGHTENING TORQUE SPECIFICATIONS	
THREAD SIZE	TORQUE
#6-32 & M3 MOUNTING HARDWARE	7-9 IN-LBS [0.8- 1.0 NM]
#8-32 & M4 THREAD TERMINAL SCREW	12-15 IN-LBS [1.4-1.7 NM]
#10-32 & M5 THREAD TERMINAL SCREW	15-20 IN-LB [1.7-2.3 NM]

TABLE B		
TERMINAL DESCRIPTION	DEPTH BEHIND PANEL	
MAIN	TAB (Q.C.)	2.000 [50.80]
	SCREW TYPE	2.032 [51.61]
SHUNT & DUAL COIL	TAB (Q.C.)	2.207 [56.10]
	SCREW #8-32 W/UPTURNED LUGS	2.364 [60.05]
AUX. SWITCH*	.093 TAB (Q.C.)	2.095 [53.20]
	.110 TAB (Q.C.)	2.189 [55.60]
	SOLDER TYPE	1.970 [50.00]

\* AVAILABLE ON SERIES TRIP AND SWITCH ONLY CIRCUITS. WHEN CALLED FOR ON MULTI-POLE UNITS, ONLY ONE AUX. SWITCH IS NORMALLY SUPPLIED.

### TERMINAL DIMENSIONAL DETAIL & RATING

**TAB (Q.C.)**  
≤ 30AMP

**BUS**  
#8-32 ≤ 30 AMP  
#10-32 ≤ 50 AMP  
M5 ≤ 30 AMP  
M4 ≤ 50 AMP

**PUSH-IN STUD**  
≤ 50 AMP

**UPTURN LUG**  
#8-32 ≤ 30 AMP  
#10-32 ≤ 30 AMP  
M5 ≤ 30 AMP  
M4 ≤ 30 AMP

**M6 STUD**  
≤ 50 AMP

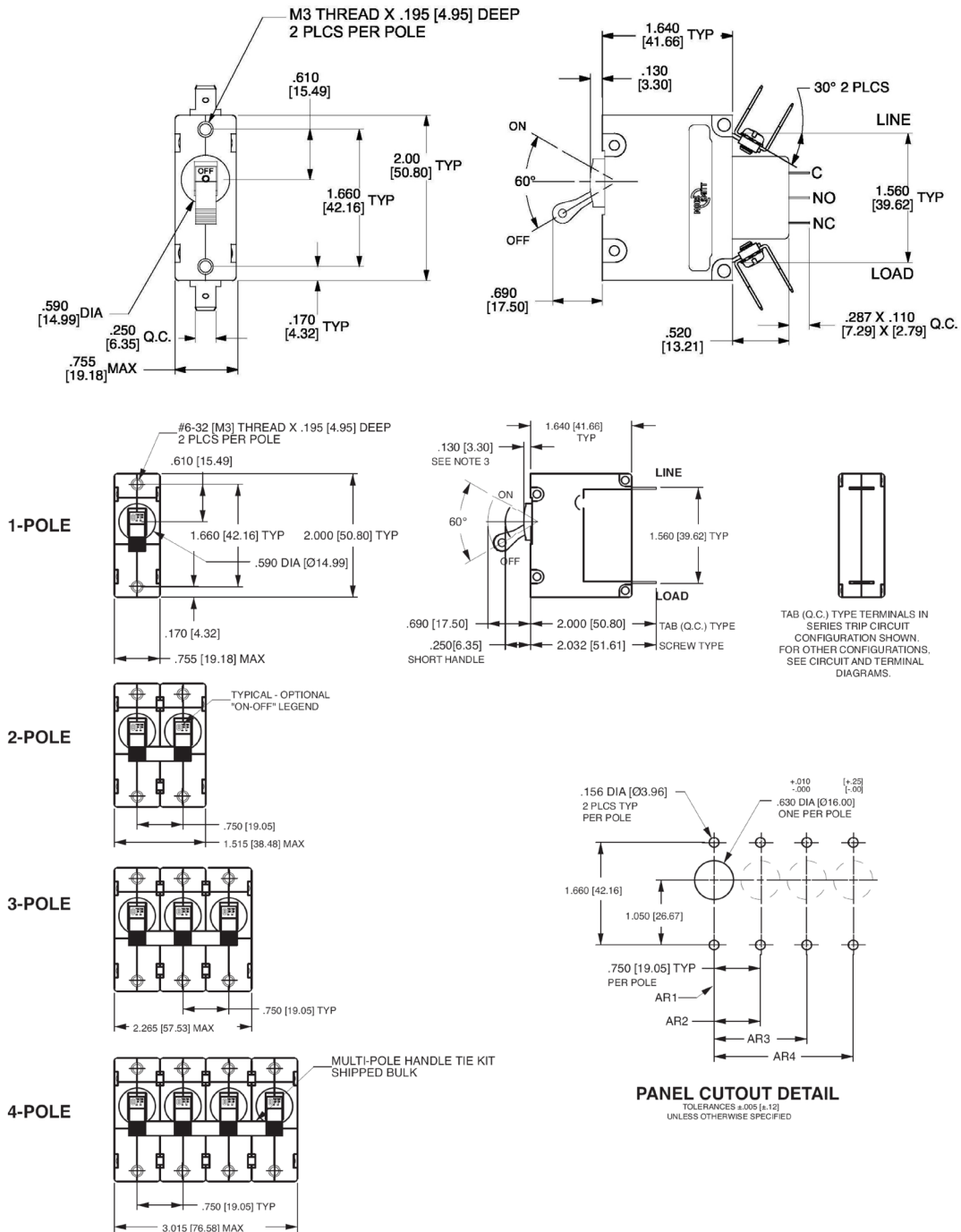
**M6 Threaded 17mm Stud**  
(With NFF washers & nut)  
≤ 50 AMP

Notes: 1. All dimensions are in inches [millimeters]  
2. Tolerance ± 0.020 [0.51] unless otherwise specified

# Circuit breaker AR

## Circuit & terminal diagrams

AR circuit breaker with option U: double Faston terminals

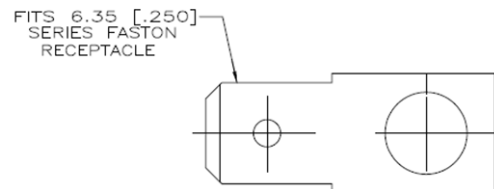
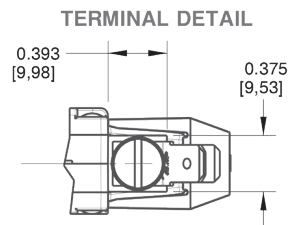
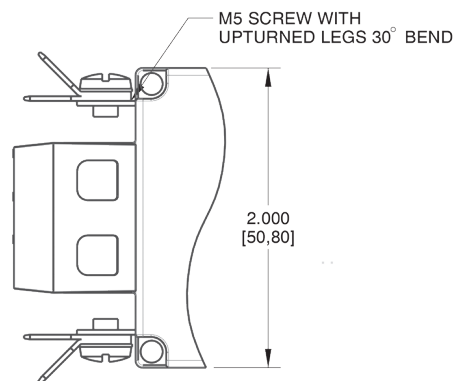
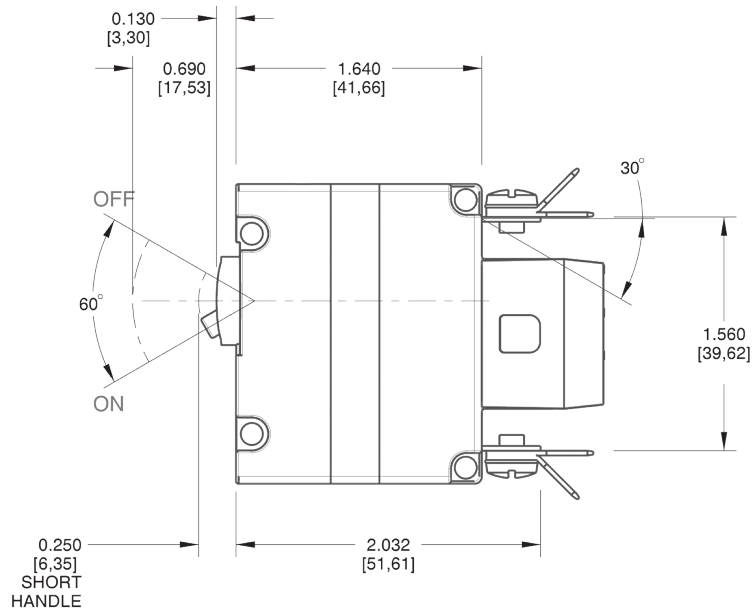


- Notes:
1. All dimensions are in inches [millimeters]
  2. Tolerance  $\pm 0.020$  [0.51] unless otherwise specified

# Circuit breaker AR

## Circuit & terminal diagrams

AR circuit breaker with option Y: Y type Faston terminals



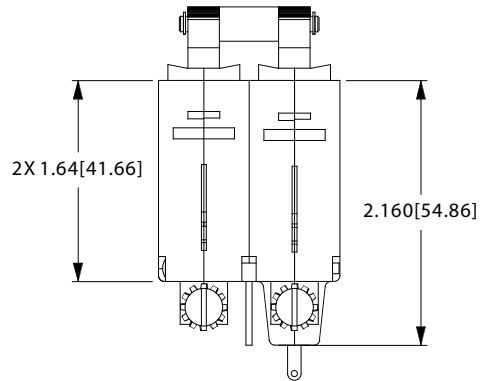
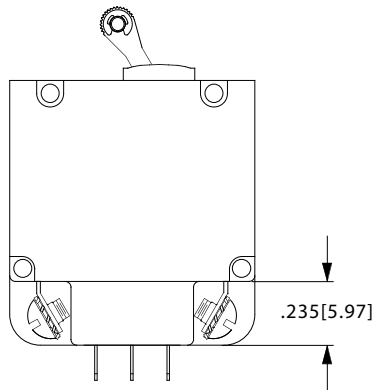
TAB (QC) <=10AMP

- Notes:
1. All dimensions are in inches [millimeters]
  2. Tolerance  $\pm 0.020$  [0.51] unless otherwise specified

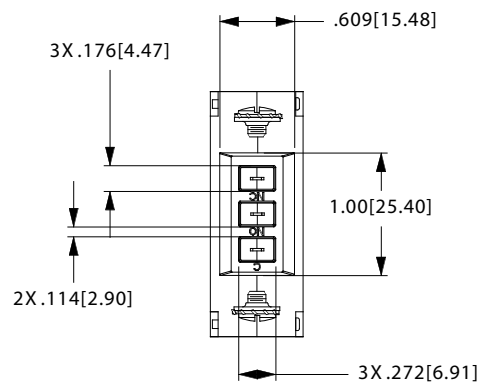
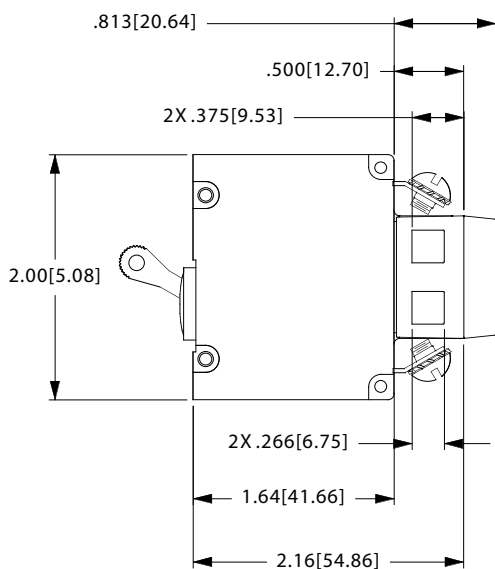
# Circuit breaker AR

## Form & fit drawings

### Terminal barriers



### Mounted cover auxiliary switch



- Notes:
1. All dimensions are in inches [millimeters]
  2. Tolerance  $\pm 0.02020$  [0.51] unless otherwise specified

## Circuit breaker AR

### Ordering scheme AR - page 1

AR  -  -  - ....codes continue on following page.....

Poles <sup>1</sup>	1	1 pole
	2	2 poles
	3	3 poles
	4	4 poles
	5	5 poles
	6	6 poles

Current rating (amperes) <sup>2</sup>	210	0.100	440	4.000	Or voltage coil (nominal rated voltage) <sup>2</sup>	
	215	0.150	445	4.500	A06	6 DC
	220	0.200	450	5.000	A12	12 DC
	225	0.250	455	5.500	A18	18 DC
	230	0.300	460	6.000	A24	24 DC
	235	0.350	465	6.500	A32	32 DC
	240	0.400	470	7.000	A48	48 DC
	245	0.450	475	7.500	A65	65 DC
	250	0.500	480	8.000		
	260	0.600	485	8.500		
	265	0.650	490	9.000	J06	6 AC
	270	0.700	495	9.500	J12	12 AC
	275	0.750	610	10.000	J18	18 AC
	280	0.800	615	15.000	J24	24 AC
	285	0.850	616	16.000	J48	48 AC
	290	0.900	617	17.000	J65	65 AC
	295	0.950	618	18.000	K20	120 AC
	410	1.000	620	20.000	L40	240 AC
	512	1.250	622	22.000		
	415	1.500	624	24.000		
	517	1.750	625	25.000		
	420	2.000	630	30.000		
	522	2.250	635	35.000 <sup>1</sup>		
	425	2.500	640	40.000 <sup>1</sup>		
	527	2.750	650	50.000 <sup>1</sup>		
	430	3.000				
	435	3.500				

(Over values on request)

Frequency & delay	03	DC, 50/60 Hz, switch only
	10	DC instantaneous
	11	DC ultra short
	12	DC short
	14	DC medium
	16	DC long
	20	50/60 Hz instantaneous
	21	50/60 Hz ultra short
	22	50/60 Hz short
	24	50/60 Hz medium
	26	50/60 Hz long
	42 <sup>3</sup>	50/60 Hz short, hi-inrush
	44 <sup>3</sup>	50/60 Hz medium, hi-inrush
	46 <sup>3</sup>	50/60 Hz long, hi-inrush
	52 <sup>3</sup>	DC, short, hi-inrush
	54 <sup>3</sup>	DC, medium, hi-inrush
	56 <sup>3</sup>	DC, long, hi-inrush

# Circuit breaker

## AR

### Ordering scheme AR - page 2

Circuit	A <sup>4</sup> B C D <sup>5</sup> E <sup>5</sup> H <sup>5,6</sup>								Switch only (no coil) Series trip (current) Series trip (voltage) Shunt trip (current) Shunt trip (voltage) Dual coil with shunt trip voltage coil																																																		
Actuator <sup>7</sup>	A B S T								Handle, one per pole Handle, one per multiple unit Mid-trip handle, one per pole Mid-trip handle, one per pole & alarm switch																																																		
Actuator colour & legend	..								<table border="1"> <thead> <tr> <th>Actuator colour</th> <th>I-O</th> <th>On-Off</th> <th>Dual</th> <th>Legend colour</th> </tr> </thead> <tbody> <tr><td>White</td><td>A</td><td>B</td><td>1</td><td>Black</td></tr> <tr><td>Black</td><td>C</td><td>D</td><td>2</td><td>White</td></tr> <tr><td>Red</td><td>F</td><td>G</td><td>3</td><td>White</td></tr> <tr><td>Green</td><td>H</td><td>J</td><td>4</td><td>White</td></tr> <tr><td>Blue</td><td>K</td><td>L</td><td>5</td><td>White</td></tr> <tr><td>Yellow</td><td>M</td><td>N</td><td>6</td><td>Black</td></tr> <tr><td>Grey</td><td>P</td><td>Q</td><td>7</td><td>Black</td></tr> <tr><td>Orange</td><td>R</td><td>S</td><td>8</td><td>Black</td></tr> <tr><td>White (short handle)<sup>8</sup></td><td>V</td><td>W</td><td>0</td><td>Black</td></tr> </tbody> </table>	Actuator colour	I-O	On-Off	Dual	Legend colour	White	A	B	1	Black	Black	C	D	2	White	Red	F	G	3	White	Green	H	J	4	White	Blue	K	L	5	White	Yellow	M	N	6	Black	Grey	P	Q	7	Black	Orange	R	S	8	Black	White (short handle) <sup>8</sup>	V	W	0	Black
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Auxiliary switch <sup>9</sup>		0 2 4 A B							Without auxiliary switch SPDT, 0.110 QC term. SPDT, 0.110 QC term. (gold contacts) SPDT, 0.110 QC term. with mounted cover SPDT, 0.110 QC term. (gold contacts) with mounted cover																																																		
Terminal <sup>10</sup>			1 <sup>11</sup> 2 3 <sup>12</sup> 4 5 <sup>12</sup> 6 7 <sup>12</sup> 8 9 <sup>12</sup> B C E <sup>12</sup> F G <sup>12</sup> H <sup>12</sup> M <sup>12</sup> Q R T U V Y <sup>14</sup>						Push on, 0.250 tab (Q.C.) Screw 8-32 with upturned lugs Screw 8-32 bus type Screw 10-32 with upturned lugs Screw 10-32 bus type Screw 8-32 with upturned lugs and 30° bend Screw 8-32 bus type and 30° bend Screw 10-32 with upturned lugs and 30° bend Screw 10-32 bus type and 30° bend Screw M5 with upturned lugs Screw M4 with upturned lugs Screw M4 bus type Screw M5 with upturned lugs and 30° bend Screw M5 bus type and 30° bend Screw M5 bus type M6 threaded stud Push-in stud Screw M4 with upturned lugs and 30° bend Screw M4 bus type and 30° bend Double faston 0.25" / 6.3 mm M6 threaded stud 17 mm long with NFF washers and nut Terminal with Y-Faston (Q.C.)																																																		
Mounting & barriers				1 A 2 B					Mounting style Threaded insert Barriers 6-32 x 0.195 inch No 6-32 x 0.195 inch Yes, between poles only ISO M3 x 5 mm No ISO M3 x 5 mm Yes, between poles only																																																		
Agency approval <sup>13</sup>					A 2				Without approval TUV certified, UL recognized																																																		

Example : AR1-610-24-B-A-3-2-3-1-2



## Circuit breaker AR

### Notes:

1. Available up to two poles with AC or DC delays
2. Separate pole type voltage coils not rated for continuous duty. Available only with delay codes 10, 20 & 30
3. Available with circuit codes B & D only
4. For 0.1 - 30 A: select current code 630  
For 35 - 50 A: select current code 650
5. Available with terminal codes 1, 2 & 3. Current rating limited to 30 A maximum
6. Consult Mors Smitt for available dual coil options, as special catalogue number is required. With shunt construction, dual coils will trip instantaneously on line voltage. Dual coils require 30 VA minimum power to trip and are rated for intermittent duty only
7. Actuator code:  
S: Handle moves to mid-position only upon electrical trip of the breaker, available with all circuit codes, except switch only  
T: Handle moves to mid-position and alarm switch activates only upon electrical trip of the breaker, available with circuit codes B & C
8. Single pole only
9. On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole (rear view)
10. Screw terminals are recommended on ratings higher than 20 A  
Ratings over 30 A are only available with terminals codes 5, 9, G and H
11. Terminal code 1; up to 30 A, but not recommended over 20 A
12. Terminal codes 3, 5, 7, 9, E, G and H (bus type) are supplied with lock washers  
Terminals code M (M6 threaded stud) is supplied with lock and flat washers
13. TUV certified: not for switch only circuit and only for actuator legend 'I-O' and dual legend  
UL recognized: for most applications, not all  
Special applications without approvals: agency approval code A
14. Terminal code Y: up to 10 A, no agency approval

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 **Over 10 million Mors Smitt relays in use in rail transport applications worldwide!**

**Mors Smitt Asia Ltd.**  
26/F., Casey Aberdeen House  
38 Heung Yip Road, Wong Chuk Hang  
Hong Kong  
Tel: +852 2343 555  
[sales.msa@wabtec.com](mailto:sales.msa@wabtec.com)

**Mors Smitt France SAS**  
2 Rue de la Mandinière  
72300 Sablé-sur-Sarthe, France  
Tel: +33 (0) 243 92 82 00  
[sales.msf@wabtec.com](mailto:sales.msf@wabtec.com)

**Mors Smitt UK**  
Graycar Business Park,  
Burton on Trent, DE13 8EN, UK  
Tel: +44 (0)1283 357 263  
[msu\\_sales@wabtec.com](mailto:msu_sales@wabtec.com)

**Wabtec Netherlands B.V.**  
Darwinstraat 10,  
6718 XR Ede, Netherlands  
Tel: +31 (0)88 600 4500  
[wnl\\_salessupport@wabtec.com](mailto:wnl_salessupport@wabtec.com)

**Mors Smitt Technologies Ltd.**  
1010 Johnson Drive,  
Buffalo Grove, IL 60089-6918, USA

**RMS Mors Smitt**  
19 Southern Court,  
Keysborough, VIC 3173, Australia  
Tel: +61 (0)3 8544 1200  
[sales.rms@wabtec.com](mailto:sales.rms@wabtec.com)

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