



Time-overcurrent protection of AC circuits and apparatus.

Features and Benefits

- 6 inverse time/current operating curves
- Target seal-in units available
- Instantaneous units available
- Drawout case

Applications

- Feeder, AC machines & transformers
- Applications where operating time is inverse to operating current

Protection and Control

- Ground and f time O/C and U/C
- Overload motor protection
- Instantaneous overcurrent (optional)



Introduction

The listing of IAC Models, on pages 310 through 314 is organized by time/ current characteristics into fourteen tables.

To find a known model number:

1. See WHERE TO FIND IAC MODELS on this page to determine correct table and page.
2. Turn to that table for sequential listing of models.

To find a model number for a known application:

1. See APPLICATION, to determine time/current characteristics and/or specific application desired.
2. See WHERE TO FIND IAC MODELS to determine correct table and page.
3. Use the rating and comment columns of that table to determine Model Number with desired features.

Description

IAC relays are used in the protection of industrial and utility power systems against either phase or ground overcurrent. They are single phase (although some models contain more than one unit), non-directional, current sensitive, ac devices. The basic operating mechanism (the time unit) produces one of several available operating characteristics. The operating time is inversely related to operating current which permits close coordination with other protective devices. It consists of a magnetic core operating coil, an induction disc, damping magnet, and a mechanical target. The IAC relay

may also include one or more hinged armature instantaneous overcurrent units, with integral target.

The IAC relay is mounted in a drawout case, permitting front access to the relay for testing and maintenance. Testing can be accomplished, without removing the relay, by using XLA test plugs.

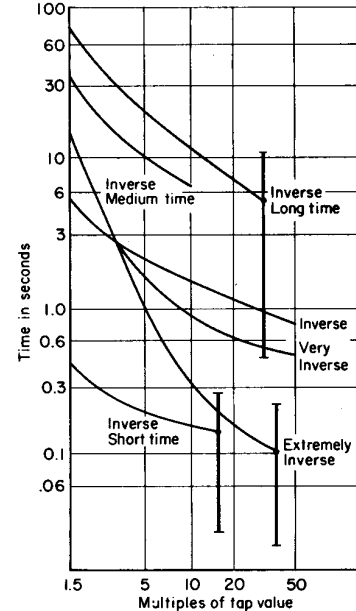
Applications

IAC relays are used for protection of feeders, transmission lines, alternating current machines, transformers, and for numerous other applications where a relay is required whose operating time is inversely related to operating current.

Available Inverse Time/Current Characteristics

Six inverse time/current operating characteristics are available for the time unit of the IAC (see Figure 1).

Fig. 1. Typical operating characteristics of 60 Hz IAC relays. The No. 5 time-dial setting is shown for each curve, and the range of time adjustment from 0.5 to 10 time-dial settings is shown for the extremely inverse, the inverse short time, and the inverse long time relays.



The three standard time characteristics are as follows:

INVERSE TIME relays (see Table 1) are generally applied where the short-circuit current magnitude is dependent largely upon the system generating capacity at the time of the fault.

VERY INVERSE TIME relays (see Table 2) are best applied on systems where the magnitude of the short circuit current flowing through any given relay is dependent mainly upon the relative location of the fault with respect to the relay and only slightly or not at all upon the system generating capacity.

EXTREMELY INVERSE TIME relays (see Table 3) are intended for applications, such as on utility distribution feeders, where sufficient time delay must be provided to allow a re-energized circuit to pick up without unnecessary tripping during the inrush period, and at the same time coordinate properly with power fuses and fuse cutouts.

Where to find IAC models

Models of These Designs	Time/Current Characteristics	60 Hz	50 Hz
IAC 51, 52, 60	Inverse Time	Table 1	Table 8
IAC 53, 54, 80	Very Inverse Time	Table 2	Table 9
IAC 77, 78, 90	Extremely Inverse Time	Table 3	Table 10
IAC 55, 56, 68, 85, 95	Inverse, Short Time	Table 4	Table 11
IAC 57	Inverse, Medium Time	Table 5	Table 12
IAC 66	Inverse, Long Time	Table 6	Table 13
IAC 59	Inverse, Over- and Undercurrent	Table 7	Table 14

Three additional time characteristics are available as follows:

INVERSE SHORT TIME relays (see Table 4) are used on equipment where tripping must be relatively fast but should not approach the operating time of an instantaneous unit. Protection of power rectifiers is an example of such an application.

INVERSE MEDIUM TIME relays (see Table 5) are used as generator or transformer neutral relays or as backup protection for feeder ground faults. Also, the inverse medium time relay may be used where a slower relay is required to obtain coordination.

INVERSE LONG TIME relays (see Table 6) are designed for applications requiring long time delay. The major area of usefulness is in the protection of motors against overloads under conditions where the customary thermal devices are not applicable.

Instantaneous Unit

Instantaneous units are used to provide tripping with no intentional time delay for currents exceeding a predetermined value. Typically, if the fault current magnitude under maximum generating conditions triples as a fault is moved toward the relay location from the far end of the line, then an instantaneous unit is desirable.

High dropout instantaneous units are available and are used together with other devices to obtain time-delay tripping. One application is motor protection, where the high dropout unit supervises the time unit for tripping during starting and overload conditions. For special feeder applications, the high dropout unit can supervise the time unit to prevent the overtravel from causing undesired tripping and to permit shorter coordination margins.

Specific Applications

MOTOR PROTECTION RELAYS provide overcurrent protection for starting, overload, and fault conditions. The IAC66K relay has an inverse long time characteristic (as described above), which approximates the motor thermal limit, and two instantaneous overcurrent units. The first instantaneous unit is set above the maximum motor starting current and protects for fault conditions only. The second, a special high dropout unit, is customarily used for supervising the time overcurrent unit to permit tripping for stall and heavy overload conditions. Operation of only the time unit indicates a light or moderate overload condition and can be used as an alarm. The IAC66M relay is similar except that the high dropout instantaneous unit is used in conjunction with a 0.1 sec time delay telephone relay which blocks operating during initial inrush conditions, allowing the unit to be set more sensitively.

LOAD CENTER PROTECTION The IAC66T relay, which has a static timer unit used with a high dropout instantaneous unit, is designed to protect medium voltage circuits supplying low voltage load centers. This relay coordinates with the short time and long time overcurrent trip characteristics of 600 V air circuit breakers.

OVER- AND UNDERCURRENT RELAYS (see Table 7) are used where an indication of the variation of a current between maximum and minimum limits is required. These relays do not have a time dial. The time characteristics are determined by the contact settings.

TORQUE CONTROLLED RELAYS have wound shading coils connected to terminal studs. Operation of the time-overcurrent unit thus depends on the closing of an external contact across those terminals. The overcurrent relay can be supervised by some

external device, such as a directional relay.

Features

Time-Overcurrent

Time-overcurrent units are available in several ranges to meet current pickup settings of from 0.1 to 16 A. Sensitivity is determined by discrete tap-plug settings, and a time dial provides a continuously adjustable time delay over the entire range. IAC model numbers which end in "8__A", such as IAC51B801A, provide an extended range of settings with a ratio of maximum setting to minimum setting of 8:1. Most other IAC relays have a ratio of 4:1. The available tap settings are listed below for the common time overcurrent units:

AVAILABLE SETTINGS

Time overcurrent units with 8:1 range of settings:

- 0.5-4.0 A unit: 0.5, 0.6, 0.7, 0.8, 1, 1.2, 1.5, 2, 2.5, 3, and 4 A taps
- 1.5-12 A unit: 1.5, 2, 2.5, 3, 4, 5, 6, 7, 8, 10, and 12 A taps
- 2-16 A unit: 2, 2.5, 3, 4, 5, 6, 7, 8, 10, 12 and 16 A taps

Other common IAC time overcurrent units:

- 0.5-2.0 A: 0.5, 0.6, 0.8, 1, 1.2, 1.5 and 2 A
- 0.6-1.8 A: 0.6, 0.8, 1.0, 1.2, 1.4, 1.6 and 1.8 A
- 1.5-4.5 A: 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, and 4.5 A
- 1.5-6.0 A: 1.5, 2, 2.5, 3, 4, 5, and 6 A
- 2.5- 5.0 A: 2.5, 2.8, 3.1, 3.5, 4, 4.5 and 5 A
- 2.5-7.5 A: 2.5, 3.0, 3.5, 4.0, 5.0, 6.0, and 7.5 A
- 4.0-8.0 A: 4, 4.5, 5, 5.6, 6, 6.3, 7.1 and 8 A
- 4.0-12.0 A: 4, 5, 6, 7, 8, 10 and 12 A
- 4.0-16.0* A: 4, 5, 6, 8, 10, 12 and 16 A

* Some 4-16 A units also have 7 A tap.

IAC Relays With 8:1 Range Units

TIME OVERCURRENT UNIT

Tap Setting	IAC51 and 52		IAC53 and 54		IAC77 and 78	
	Taps 0.5-4.0 (A)	Taps 2-16 (A)	Taps 0.5-4.0 (A)	Taps 1.5-12 (A)	Taps 0.5-4.0 (A)	Taps 1.5-12 (A)

CONTINUOUS-CURRENT RATING

0.5	1.6		4.0		3.5	
0.6	1.8		4.5		3.7	
0.7	2.0		5.0		4.0	
0.8	2.1		5.5		4.5	
1.0	2.3		6.0		5.0	
1.2	2.7		7.0		5.5	
1.5	3.0		7.5	10.0	6.0	9.5
2.0	3.5	8	9.0	11.5	7.0	10.5
2.5	4.0	9	10.0	13.0	8.0	11.5
3.0	4.5	10	11.0	14.5	9.0	12.5
4.0	5.0	12	12.0	17.0	10.0	14.0
5.0		14		19.0		15.5
6.0		15		20.0		17.0
7.0		16		20.0		18.0
8.0		17.5		20.0		19.0
10.0		20		20.0		20.0
12.0		20		20.0		20.0
16.0		20				20.0

ONE SEC RATING

All	70 A	260 A	140 A	260 A	125 A	260 A
-----	------	-------	-------	-------	-------	-------

INSTANTANEOUS UNIT

Instantaneous Unit Range	Connection of Instantaneous Unit — High or Low Range		Continuous Rating (A)	One Sec Rating (A)
0.5-4.0	Low	0.5-2.0	0.75	25
	High	1.0-4.0	1.5	50
2-16	Low	2-8	3.0	130
	High	4-16	6.0	260
10-80	Low	10-40	15.0	400
	High	20-80	25.0	600
20-160	Low	20-80	25.0	600
	High	40-160	25.0	600

Low range refers to coils connected in series. High range refers to coils connected in parallel.

IAC Relays With 4:1 Range Units

TIME-OVERCURRENT UNIT

Time Unit Range	One Sec Rating (A)	Continuous Rating ^{①②} (A)
4-16 A		
IAC51, 52, 53, 54, 77, 78	260	10
1.5-6 A		
IAC51, 52	215	5
IAC53, 54	260	5
IAC77, 78	200	6
0.5-2 A		
IAC51, 52	70	1.5
IAC53, 54	130	1.5
IAC77, 79	65	3

① The continuous rating of the coil circuit applies to all Time Unit taps up to, and including, the value of the rating. For taps above this value, the rating is the same as the tap value.

② Continuous ratings of relays having instantaneous units is the value shown or 1.5 times the minimum setting of the instantaneous units, whichever is the lower of the two values.

Instantaneous Overcurrent

Instantaneous overcurrent units are available in several ranges to meet current settings between 1.0 and 160 A. The instantaneous unit in IAC relays with model numbers ending in "8_A" has a maximum setting to minimum setting ratio of 8:1. It uses two separate windings which can be connected either in series (for low range) or in parallel (for high range) with pickup continuously adjustable over each range. The instantaneous unit used in most other IAC relays uses a single winding with a ratio of maximum to minimum setting of 4:1, with continuously adjustable pickup. These instantaneous units drop out at 40 percent or more of setting at minimum setting and 50 percent at maximum setting. High dropout units are also available which drop out at 80 percent or more of setting at minimum setting and 90 percent at maximum setting.

Except as noted in the tables, the TOC unit operating coil is connected in series with the instantaneous unit operating coil if both are present, and each is set independently.

Target and Seal-in

Target and seal-in units, which are included with all time units except as noted in the tables of relay models, are dual rated. 0.2 and 2.0 A taps are standard; contact factory for form numbers of other ratings available. The seal-in unit picks up to bypass the contacts of the time unit during trip circuit energization. The 2 A tap is generally used, except where the relay contacts are used to energize auxiliary relays or other low-current devices.

Contacts

Each unit, time or instantaneous, has one or two output contacts (if two contacts per unit, those contacts will have one side common). Contacts of a relay

with more than one unit are generally not electrically separate except as noted in the tables. An exception is the high-dropout instantaneous unit, whose contacts are electrically separate from other contacts in the relay.

The current closing rating of the contacts is 30 A for voltage not exceeding 250 V. The current carrying rating of the relay is limited by the tap being used on the target and seal-in units as indicated in the following table:

Ratings of Target Seal-In Units, High Seismic (HI-G)

	Dual Rated			
	0.2/2.0 A		0.6/2.0 A	
	0.2	2.0	0.6	2.0
Carry 30 A for (sec)	0.05	2.2	0.5	3.5
Carry 10 A for (sec)	0.45	20.0	5.0	30
Carry continuously (A)	0.37	2.3	1.2	2.6
Min. Operating (A)	0.2	2.0	0.6	2.0
Min. Drop-out (A)	0.05	0.5	0.15	0.5
DC resistance (Ohms)	8.3	0.24	0.78	0.18
DC resistive Interrupting rating (A)	2.5 A @ 125 VDC			

If the total tripping current exceeds 30 A, an auxiliary relay must be used in conjunction with IAC relays.

After tripping occurs, the tripping circuit of these relays must be opened by an "a" auxiliary switch on the circuit breaker or by other external automatic means, because the circuit is sealed closed while tripping current is flowing. The contacts will open in 6 cycles (1/10 sec) with normal adjustment of "wipe", permitting use of the relay in instantaneous reclosing schemes.

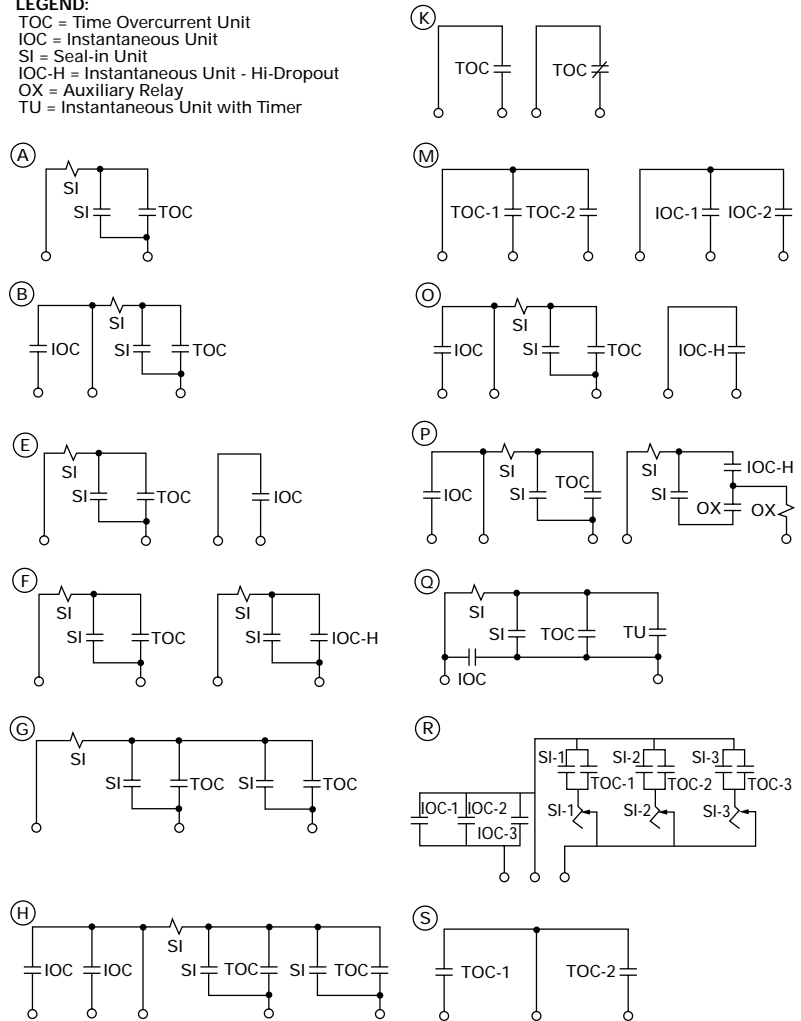
Operating Coil Ratings

Note that relays with both time overcurrent and instantaneous units are limited to the lesser of the respective current ratings, since the operating coils are connected in series.

Simplified Output Contact Arrangements

Fig. 2. As referenced in tables

LEGEND:
 TOC = Time Overcurrent Unit
 IOC = Instantaneous Unit
 SI = Seal-in Unit
 IOC-H = Instantaneous Unit - Hi-Dropout
 OX = Auxiliary Relay
 TU = Instantaneous Unit with Timer



Ordering

To order select the basic model and the desired features from the Selection Guide.

IAC	**	*	*	*	*	A			
IAC							IAC time-overcurrent relay		
							Time Curve	60 Hz	50Hz
51							Inverse, 1 NO	Refer to: Table 1	Table 8
52							Inverse, 2 NO	Refer to: Table 1	Table 8
60							Inverse, torque control	Refer to: Table 1	Table 8
53							Very inverse, 1 NO	Refer to: Table 2	Table 9
54							Very inverse, 2 NO	Refer to: Table 2	Table 9
80							Very inverse, torque control	Refer to: Table 2	Table 9
77							Extremely inverse, 1 NO	Refer to: Table 3	Table 10
78							Extremely inverse, 2 NO	Refer to: Table 3	Table 10
90							Extremely inverse, torque control	Refer to: Table 3	Table 9
55							Inverse, short time	Refer to: Table 4	Table 11
95							Inverse, short time, low burden	Refer to: Table 4	Table 11
57							Inverse, medium time	Refer to: Table 5	Table 11
66							Inverse, long time	Refer to: Table 6	Table 12
59							Inverse, over and undercurrent	Refer to: Table 7	Table 14
	*						Features (see Tables 1- 14)		
		*	*	*			TOC/IOC current ranges and others (see Tables 1- 14)		



60 Hz Models

Model Number	Time Over-Current Unit Range (A)	Instant. Unit Range (A)	No. of Contacts Per Unit	Comments	Model Number	Time Over-Current Unit Range (A)	Instant. Unit Range (A)	No. of Contacts Per Unit	Comments
IAC51A801A A802A	0.5-4 2-16	---- ----	1 N.O. See Fig. 2-A		IAC52A801A A802A	0.5-4 2-16	---- ----	2 N.O. See Fig. 2-G	
IAC51B801A B802A B803A B804A B805A B806A B807A B808A	0.5-4 2-16 0.5-4 2-16 0.5-4 2-16 0.5-4 2-16	0.5-4 0.5-4 2-16 2-16 10-80 10-80 20-160 20-160	1 N.O. See Fig. 2-B		IAC52B801A B802A B803A B804A B805A B806A B807A B808A	0.5-4 2-16 0.5-4 2-16 0.5-4 2-16 0.5-4 2-16	0.5-4 0.5-4 2-16 2-16 10-80 10-80 20-160 20-160	2 N.O. See Fig. 2-H	
IAC51N7A N8A N13A N14A N16A N17A N101A N102A N111A	1.5-6 1.5-6 0.5-2 0.5-2 1.5-6 1.5-6 4-16 4-16 4-16	---- ---- ---- ---- ---- ---- ---- ---- ----	1 N.O. See Fig. 2-A	Control VDC 125 250 125 250 24 48 125 250 48 Includes auxiliary relay for bus differential protection and for checking CT secondary circuit.	IAC60A12A A15A A111A IAC60B11A B13A B15A B16A B20A B21A B112A B114A B115A	1.5-6 0.5-2 4-16 1.5-6 1.5-6 0.5-2 1.5-6 2-8 4-16 2-8 4-16 4-16 4-16 4-16	---- ---- ---- 4-16 10-40 2-8 4-16 20-80 10-40 20-80 10-40 4-16	1 N.O. See Fig. 2-A 1 N.O. See Fig. 2-B	Torque controlled time unit will operate only when an external contact (wired to shading coil) is closed. Similar to IAC60A with instantaneous unit.
IAC51V2A V3A V5A V6A V101A V104A V105A V106A	1.5-6 1.5-6 0.5-2 1.5-6 4-16 4-16 4-16 0.5-2	10-30 4-12 2-6 2-6 10-30 4-12 20-60 10-30	1 N.O. See Fig. 2-F	High dropout instantaneous unit. Two target seal-in units.	IAC60T1A T2A T3A	2 Units 0.5-4 2-16 0.5-4	2 Units 2-50 2-50 2-50	1 N.O. See Fig. 2-M	Control VDC 48/125 48/125 125/250 Has two PJC instantaneous units. No target seal-in units.

60 Hz Models

Model Number	Time Over-Current Unit Range (A)	Instant. Unit Range (A)	No. of Contacts Per Unit	Comments	Model Number	Time Over-Current Unit Range (A)	Instant. Unit Range (A)	No. of Contacts Per Unit	Comments
--------------	----------------------------------	-------------------------	--------------------------	----------	--------------	----------------------------------	-------------------------	--------------------------	----------

TABLE 2. VERY INVERSE TIME CHARACTERISTIC RELAYS

IAC53A10A	0.1-0.4	----	1 N.O. See Fig. 2-A		IAC53T801A	0.5-4	0.5-4	1 N.O. See Fig. 2-E	Time unit and instantaneous unit contacts are electrically separate.			
A19A	0.15-0.6	----			T802A	0.5-4	2-16					
A801A	0.5-4.0	----			T803A	0.5-4	10-80					
A803A	1.5-12	----			T804A	0.5-4	20-160					
IAC53B32A	0.1-0.4	1-4	1 N.O. See Fig. 2-B		T805A	1.5-12	0.5-4					
B34A	0.15-0.6	10-40			T806A	1.5-12	2-16					
B38A	0.1-0.4	0.5-2			T807A	1.5-12	10-80					
B50A	0.1-0.4	4-16			T808A	1.5-12	20-160					
B54A	0.1-0.4	10-40			IAC54A10A	0.1-0.4	----			2 N.O. See Fig. 2-G		
B76A	0.1-0.4	2-8			A801A	0.5-4	----					
B78A	0.1-0.4	20-80			A803A	1.5-12	----					
B801A	0.5-4	0.5-4			2 N.O. See Fig. 2-H		IAC54B801A	0.5-4	0.5-4			
B803A	0.5-4	2-16					B803A	0.5-4	2-16			
B805A	0.5-4	10-80					B805A	0.5-4	10-80			
B807A	0.5-4	20-160					B807A	0.5-4	20-160			
B809A	1.5-12	0.5-4					B809A	1.5-12	0.5-4			
B810A	1.5-12	2-16	B810A	1.5-12			2-16					
B811A	1.5-12	10-80	B811A	1.5-12			10-80					
B812A	1.5-12	20-160	B812A	1.5-12			20-160					
B812A	1.5-12	20-160	B813A	0.1-0.4			4-16					
IAC53M3A	1.5-6	10-30	1 N.O. See Fig. 2-F	High dropout instantaneous unit. Two target seal-in units.	IAC80L1A	4-16	----	1 N.O. See Fig. 2-A	Torque controlled time unit will operate only when an external contact (wired to shading coil) is closed.			
M4A	0.5-2	1-3			L2A	1.5-6	----					
M5A	0.5-2	2-6			L3A	0.5-2	----					
M6A	1.5-6	4-12			2 Units		IAC80P1A	4-16	----	1 N.O. per unit See Fig. 2-S	Control VDC 125/250 Similar to IAC80L except two units. 48/125	
M7A	1.5-6	2-6						P2A	1.5-6			----
M9A	0.5-2	4-12						P3A	4-16			----
M10A	0.5-2	0.5-1.5						2 Units	2 Units			IAC80T1A
M11A	1.5-6	0.5-1.5	T2A	1.5-12	2-50							
IAC53M101A	4-16	4-12	1 N.O. See Fig. 2-F	High dropout instantaneous unit. Two target seal-in units.								
M102A	4-16	10-30										
M103A	4-16	20-60										

Case Sizes and Approximate Weights

IAC Relay Model	Case Size	Approx. Wt. in lbs (kg)	
		Net	Ship
51N, 66T	S2	12 (5.4)	18 (8.2)
66M, 80P	M1	18 (8.2)	28 (12.7)
60T, 80T, 90T	L2	18 (8.2)	28 (12.7)
All others listed	S1	12 (5.4)	18 (8.2)

60 Hz Models

Model Number	Time Over-Current Unit Range (A)	Instant. Unit Range (A)	No. of Contacts Per Unit	Comments	Model Number	Time Over-Current Unit Range (A)	Instant. Unit Range (A)	No. of Contacts Per Unit	Comments
--------------	----------------------------------	-------------------------	--------------------------	----------	--------------	----------------------------------	-------------------------	--------------------------	----------

TABLE 3. EXTREMELY INVERSE TIME CHARACTERISTIC RELAYS

IAC77A15A	0.1-0.4	----	1 N.O. See Fig. 2-A		IAC78A7A	0.1-0.4	----	2 N.O. See Fig. 2-G							
A801A	0.5-4	----			A801A	0.5-4	----								
A803A	1.5-12	----			A803A	1.5-12	----								
IAC77B55A	0.1-0.4	4-6	1 N.O. See Fig. 2-B		IAC788801A	0.5-4	0.5-4	2 N.O. See Fig. 2-H							
B57A	0.1-0.4	0.5-2			B803A	0.5-4	2-16								
B60A	0.1-0.4	2-8			B805A	0.5-4	10-80								
B69A	0.1-0.4	20-80			B807A	0.5-4	20-160								
B71A	0.1-0.4	1-4			B809A	1.5-12	0.5-4								
B73A	0.1-0.4	10-40			B810A	1.5-12	2-16								
B801A	0.5-4	0.5-4			B811A	1.5-12	10-80								
B803A	0.5-4	2-16			B812A	1.5-12	20-160								
B805A	0.5-4	10-80			IAC90B1A	1.5-6	10-40			1 N.O. See Fig. 2-B	Torque controlled time unit will operate only when an external contact (wired to shading coil) is close.				
B807A	0.5-4	20-160			B2A	0.5-2	4-16								
B809A	1.5-12	0.5-4			IAC90T1A	2 Units	2 Units			1 N.O. See Fig. 2-M	Control VDC 48/125 48/125				
B810A	1.5-12	2-16										T2A	0.5-4	2-50	Has two PJC instantaneous units. No target seal-in units.
B11A	1.5-12	10-80											T2A	1.5-12	
B812A	1.5-12	20-160													
IAC77M3A	4-16	4-12	1 N.O. See Fig. 2-F	High dropout instantaneous unit. Two target seal-in units.											
M4A	4-16	10-30													
M5A	1.5-6	2-6													

TABLE 4. INVERSE, SHORT TIME CHARACTERISTIC RELAYS

IAC55A2A	1.5-6	----	1 N.O. See Fig. 2-A		IAC55B104A	4-16	20-80	1 N.O. See Fig. 2-B	Time unit and instantaneous unit coil leads are brought out to separate studs.
A3A	0.5-2	----			B115A	4-16	4-16		
A101A	4-16	----			B121A	4-16	40-160		
IAC55B2A	1.5-6	10-40	1 N.O. See Fig. 2-B		IAC55F1A	4-16	4-16	1 N.O. See Fig. 2-B	
B3A	0.5-2	10-40			F2A	1.5-6	4-16		
B9A	1.5-6	4-16			F3A	4-16	0.5-2		
B10A	0.5-2	4-16			F4A	1.5-6	1.5-6		
B17A	0.5-2	2-8			F6A	0.5-2	0.5-2		
B19A	1.5-6	20-80			F7A	1.5-6	2-8		
B20A	1.5-6	2-8			IAC95F1A	1.5-6	1.5-5		
B25A	0.5-2	1-4							
B101A	4-16	10-40							

TABLE 5. INVERSE, MEDIUM TIME CHARACTERISTIC RELAYS

IAC57A2A	1.5-6	----	1 N.O. See Fig. 2-A		IAC57B2A	1.5-6	10-40	1 N.O. See Fig. 2-B	
A3A	0.5-2	----			B3A	0.5-2	10-40		
A101A	4-16	----			B10A	1.5-6	20-80		
			B13A	1.5-6	4-16				
			B101A	4-16	10-40				
			B104A	4-16	20-80				

60 Hz Models

Model Number	Time Over-Current Unit Range (A)	Instant. Unit Range (A)	No. of Contacts Per Unit	Comments	Model Number	Time Over-Current Unit Range (A)	Instant. Unit Range (A)	No. of Contacts Per Unit	Comments
--------------	----------------------------------	-------------------------	--------------------------	----------	--------------	----------------------------------	-------------------------	--------------------------	----------

TABLE 6. INVERSE, LONG TIME CHARACTERISTIC RELAYS

Model Number	Time Over-Current Unit Range (A)	Instant. Unit Range (A)	No. of Contacts Per Unit	Comments	Model Number	Time Over-Current Unit Range (A)	Instant. Unit Range (A)	No. of Contacts Per Unit	Comments		
IAC66A51A	0.6-1.8	----	1 N.O. See Fig. 2-A		IAC66M51A	1.5-4.5	2-16		Hi Dropout Instantaneous	Control VDC	
A52A	1.5-4.5	----									
A53A	4-12	----									
IAC66B51A	0.6-1.8	2-16	1 N.O. See Fig. 2-B		M52A	1.5-4.5	10-80	1 N.O. See Fig. 2-P	4-16	48/ 125/ 250	Two instantaneous units; one standard, one high dropout. Two seal-in units. Aux. telephone relay for 0.1 sec time delay pickup of high dropout unit.
B52A	1.5-4.5	2-16			M53A	1.5-4.5	10-80		2-8		
B53A	4-12	2-16			M54A	1.5-4.5	10-80		7-28		
B54A	0.6-1.8	10-80			M55A	1.5-4.5	10-80		10-40		
B55A	1.5-4.5	10-80			M56A	1.5-4.5	20-160		20-80		
B56A	4-12	10-80			M57A	4-12	2-16		20-80		
B57A	4-12	20-160			M58A	4-12	10-80		4-16		
IAC66C51A	0.6-1.8	2-16			1 N.O. See Fig. 2-E	Time unit and instantaneous unit contact leads are brought out separately.	M59A		4-12		
C52A	1.5-4.5	2-16	M60A	4-12			10-80	7-28			
C53A	4-12	2-16	M61A	4-12			10-80	10-40			
C54A	0.6-1.8	10-80	M62A	4-12			20-160	20-80			
C55A	1.5-4.5	10-80	IAC66T51A	1.5-4.5			10-80	7-28			
C56A	4-12	10-80	T52A	1.5-4.5			20-160	4-16			
C57A	1.5-4.5	0.5-4	T53A	2.5-7.5			10-80	7-28			
IAC66K51A	0.6-1.8	2-16	1 N.O. See Fig. 2-O	Hi Dropout Instantaneous	T54A	2.5-7.5	10-80	10-40	See Fig. 2-Q	48/ 110- 125/ 220-250	Two instantaneous units; one standard and one high dropout.
K52A	0.6-1.8	2-16			T55A	4-12	10-80	10-40			
K53A	0.6-1.8	10-80			T56A	4-12	10-80	4-16			
K55A	1.5-4.5	2-16			T57A	4-12	20-160	10-40			
K56A	1.5-4.5	2-16									
K57A	1.5-4.5	10-80									
K58A	1.5-4.5	10-80									
K59A	1.5-4.5	10-80									
K60A	1.5-4.5	20-160									
K64A	4-12	2-16									
K65A	4-12	10-80									
K67A	4-12	10-80									
K68A	4-12	10-80									
K69A	4-12	10-80									
K70A	4-12	20-160									

TABLE 7. INVERSE TIME, OVER- AND UNDERCURRENT RELAYS

IAC59C1A	0.5-2	---	1 N.O. & 1 N.C. See Fig. 2-K	No target seal-in unit.
C2A	1.5-6	---		
C103A	4-16	---		

50 Hz Models

Model Number	Time Over-Current Unit Range (A)	Instant. Unit Range (A)	No. of Contacts Per Unit	Comments	Model Number	Time Over-Current Unit Range (A)	Instant. Unit Range (A)	No. of Contacts Per Unit	Comments
--------------	----------------------------------	-------------------------	--------------------------	----------	--------------	----------------------------------	-------------------------	--------------------------	----------

TABLE 8. INVERSE TIME CHARACTERISTIC RELAYS

IAC51A804A	0.5-4	----	1 N.O. See Fig. 2-A		IAC51V102A	4-6	10-30	1 N.O. See Fig. 2-F	High dropout instantaneous unit. Two target seal-in units.
A805A	2-16	----							
IAC51B821A	0.5-4	0.5-4			IAC52A804A	0.5-4	----	2 N.O. See Fig. 2-G	
B822A	2-16	0.5-4			A805A	2-16	----		
B823A	0.5-4	2-16	1 N.O. See Fig. 2-B		IAC52B821A	0.5-4	0.5-4		
B824A	2-16	2-16			B822A	2-16	0.5-4		
B825A	0.5-4	10-80			B823A	0.5-4	2-16	2 N.O. See Fig. 2-H	
B826A	2-16	10-80			B824A	2-16	2-16		
B827A	0.5-4	20-160			B825A	0.5-4	10-80		
B828A	2-16	20-160			B826A	2-16	10-80		
				Control VDC	B827A	0.5-4	20-160		
IAC51N9A	1.5-6	----		125	B828A	2-16	20-160		
N10A	1.5-6	----		250					
N18A	0.5-2	----	1 N.O. See Fig. 2-A	125	IAC60A14A	0.5-2	----	1 N.O. See Fig. 2-A	Torque controlled time unit will operate only when an external contact (wired to shading coil) is closed.
N103A	4-16	----		125	A16A	1.5-6	----		
N104A	4-16	----		250	A113A	4-16	----		
N119A	4-16	----		48					
					IAC60B117A	4-16	10-40	1 N.O. See Fig. 2-B	Similar to IAC60A with instantaneous unit.
					B118A	4-16	4-16		
					B119A	4-16	20-80		

TABLE 9. VERY INVERSE TIME CHARACTERISTIC RELAYS

IAC53A801A	0.5-4	----	1 N.O. See Fig. 2-A		IAC54A801A	0.5-4	----	2 N.O. See Fig. 2-G	
803A	1.5-12	----			A803A	1.2-12	----		
IAC53B61A	0.1-0.4	4-16			IAC54B801A	0.5-4	0.5-4		
B801A	0.5-4	0.5-4	1 N.O. See Fig. 2-B		B803A	0.5-4	2-16	2 N.O. See Fig. 2-H	
B803A	0.5-4	2-16			B805A	0.5-4	10-80		
B805A	0.5-4	10-80			B807A	0.5-4	20-160		
B807A	0.5-4	20-160			B809A	1.5-12	0.5-4		
B809A	1.5-12	0.5-4			B810A	1.5-12	2-16		
B810A	1.5-12	2-16			B811A	1.5-12	10-80		
B811A	1.5-12	10-80			B812A	1.5-12	20-160		
B812A	1.5-12	20-160			B813A	0.1-0.4	4-16		
IAC53T801A	0.5-4	0.5-4			IAC80L4A	4-16	4-16	1 N.O. See Fig. 2-A	Torque controlled time unit will operate only when an external contact (wired to shading coil) is closed.
T802A	0.5-4	2-16							
T803A	0.5-4	10-80	1 N.O. See Fig. 2-E	Time unit and instantaneous unit contacts are electrically separate.					
T804A	0.5-4	20-160							
T805A	1.5-12	0.5-4							
T806A	1.5-12	2-16							
T807A	1.5-12	10-80							
T808A	1.5-12	20-160							

50 Hertz Models

Model Number	Time Over-Current Unit Range (A)	Instant. Unit Range (A)	No. of Contacts Per Unit	Comments	Model Number	Time Over-Current Unit Range (A)	Instant. Unit Range (A)	No. of Contacts Per Unit	Comments
--------------	----------------------------------	-------------------------	--------------------------	----------	--------------	----------------------------------	-------------------------	--------------------------	----------

TABLE 10. EXTREMELY INVERSE TIME CHARACTERISTIC RELAYS

IAC77A804A	0.5-4	----	1 N.O. See Fig. 2-A		IAC78A804A	0.5-4	----	2 N.O. See Fig. 2-G	
A805A	1.5-12	----			IAC78A805A	1.5-12	----		
IAC77B58A	0.02-0.08	0.04-0.16	1 N.O. See Fig. 2-B		IAC78B821A	0.5-4	0.5-4	2 N.O. See Fig. 2-H	
B821A	0.5-4	0.5-4			B822A	1.5-12	0.5-4		
B822A	1.5-12	0.5-4			B823A	0.5-4	2-16		
B823A	0.5-4	2-16			B824A	1.5-12	2-16		
B824A	1.5-12	2-16			B825A	0.5-4	10-80		
B825A	0.5-4	10-80			B826A	1.5-12	10-80		
B826A	1.5-12	10-80			B827A	0.5-4	20-160		
B827A	0.5-4	20-160			B828A	1.5-12	20-160		
B828A	1.5-12	20-160							
	3 Units	3 Units							
IAC77S823A	0.5-4	2-16	1 N.O. See Fig. 2-R						
S826A	1.5-12	10-80							

TABLE 11. INVERSE, SHORT TIME CHARACTERISTIC RELAYS

IAC55A5A	1.5-6	----	1 N.O. See Fig. 2-A		IAC55F5A	4-16	4-16	1 N.O. See Fig. 2-B	Time unit and instantaneous unit coil leads are brought out to separate studs.
A6A	0.5-2	----							
A104A	4-16	----							
IAC55B6A	1.5-6	10-40	1 N.O. See Fig. 2-B		IAC95F2A	1.5-6	1.5-5	1 N.O. See Fig. 2-E	Moderately short-time characteristic. Low burden.
B7A	0.5-2	10-40							
B14A	0.5-2	4-16							
B22A	0.5-2	2-8							
B105A	4-16	10-40							
B108A	4-16	20-80							
B122A	4-16	4-16							

TABLE 12. INVERSE, MEDIUM TIME CHARACTERISTIC RELAYS

IAC57A6A	0.5-2	----	1 N.O. See Fig. 2-A		IAC57B6A	1.5-6	10-40	1 N.O. See Fig. 2-B	
A8A	1.5-6	----							
A104A	4-16	----							

50 Hertz Models

Model Number	Time Over-Current Unit Range (A)	Instant. Unit Range (A)	No. of Contacts Per Unit	Comments	Model Number	Time Over-Current Unit Range (A)	Instant. Unit Range (A)	No. of Contacts Per Unit	Comments
--------------	----------------------------------	-------------------------	--------------------------	----------	--------------	----------------------------------	-------------------------	--------------------------	----------

TABLE 13. INVERSE, LONG-TIME CHARACTERISTIC RELAYS

IAC66A54A	0.6-1.8	----	1 N.O. See Fig. 2-A		IAC66K54A	0.6-1.8	10-80	1 N.O. See Fig. 2-O		Hi-Dropout Instantaneous	
A55A	1.5-4.5	----			K61A	1.5-4.5	10-80			2-8	Two instantaneous units: one standard and one high dropout.
A56A	4-12	----			K62A	1.5-4.5	10-80			2-8	
IAC66B58A	0.6-1.8	2-16	1 N.O. See Fig. 2-B		K63A	1.5-4.5	20-160	4-16			
B59A	1.5-4.5	10-80			K71A	4-12	10-80	4-16			
B60A	4-12	10-80			K72A	4-12	20-160	4-16			
IAC66C58A	0.6-1.8	2-16	1 N.O. See Fig. 2-E	Time unit and instantaneous unit coil leads are brought out to separate studs.	DC Control Voltage 48/125/250			1 N.O. See Fig. 2-P		Hi-Dropout Instantaneous	
C59A	1.5-4.5	10-80			IAC66M63A	1.5-4.5	10-80			20-80	Two instantaneous units: one standard and one high dropout. Two seal-in units. Aux. Telephone relay for 0.1 sec time delay pickup of high dropout.
C60A	4-12	10-80			M64A	1.5-4.5	20-160			20-80	
			M65A	4-12	10-80	20-80					
			M67A	4-12	20-160	20-80					

TABLE 14. INVERSE TIME OVER- AND UNDERCURRENT RELAYS

IAC59C4A	0.5-2	----	1 N.O. & 1 N.C. See Fig. 2-E	No target seal-in unit.
C5A	1.5-6	----		
C106A	4-16	----		