

Phase-sequence and Undervoltage Relays

For Undervoltage, Open or Reverse Phase-starting Protection for A-c Machines.
Also Used in Automatic Throw-over Equipments

APPLICATION

MOTOR RUNNING:

Undervoltage or complete loss of voltage on the armature circuit of a-c motors and synchronous condensers requires disconnection from the power source to prevent damage to the machines. The closing of the normally closed (right) contacts can be adjusted within 75 to 90 per cent of the closing calibration of the normally open left contact.

MOTOR STARTING:

Closing-voltage Control is necessary for reduced voltage-started machines in unattended stations for undervoltage protection to be effective on both starting and running connections. The normally open (left) contacts are electrically separate and may be set to close at any value between 75 and 100 per cent of rated 3-phase voltage except for the ICR51A whose range is 65 to 95 per cent.

Open-phase Conditions because of a

blown fuse or a defective circuit breaker will initiate relay operation and prevent motor starting. However, usually the relay will not disconnect a running motor, if one phase of the supply is open circuited, because the motor will supply three-phase potential to the relay.

Reverse-phase-sequence starting causing motor rotation reversal is prevented by proper relay action preventing the starting circuit from being energized. Such protection is recommended in automatic throw-over equipments where it is desired to check the presence of 3-phase voltage of correct sequence.

Time Delay of contact operations are dictated by circuit requirements. Some delay may be necessary to prevent shut-down on temporary dips in voltage or delay may be necessary to attain proper sequential operation with other devices in the control circuit. Timing is determined by the calibration settings of the right and left contacts for all relays ex-



(Photo 8014333)

Fig. 1. Type ICR53A phase-sequence and undervoltage relay

cept the ICR51A which has one normally open contact and has a time dial adjustment.

RATINGS

Ratings Volts	Closing Volts Factory Setting		Target Seal in 0.2/2 Amp	60 Cycle Model No.	★50 Cycle Model No.	* Case Size	Approx Wt in Lb	
	Normally Closed †Right Contacts	Normally Open ‡Left Contacts					Net	Ship.

ADJUSTABLE TIME (10 SECONDS MAXIMUM TO CLOSE CONTACTS AT RATED VOLTAGE) TIME DIAL

120	...	90	No	12ICR51A1A	12ICR51A5A	S1	10	19
240	...	180	No	A2A	.....			
480	...	360	No	A3A	.....			

LONG TIME (1.2 SECONDS TIME DELAY ON LOSS OF VOLTAGE)

			S.I. Unit on NC Contact Only					
120	96	108	Yes	12ICR53A1A	12ICR53A4A			
240	191	216	Yes	A2A		S2	10	19
480	384	432	Yes	A3A	.....			
★208	166	187	Yes	A8A	.....			
120	96	108	No	12ICR53B1A	12ICR53B4A	S2	10	19
240	191	216	No	82A	.....			
480	384	432	No	83A	.....			
★208	166	188	No	86A	.....			
			S.I. Unit on NO. and NC Contacts					
★120	96	108	Yes	12ICR53C1A	.....			

SHORT TIME (0.17 SECOND TIME DELAY ON LOSS OF VOLTAGE)

120	96	108	Yes	12ICR54A1A	12ICR54A7A	S2	10	19
240	191	216	Yes	A2A	.....			
480	384	432	Yes	A3A	.....			

† The right contacts are opened when the relay is energized, and will close when the voltage drops to values equal to, or less than, those listed in this column. (See ordering directions.)

‡ The left contacts, which are closed when the relay is energized, will open when undervoltage occurs. If single-phase or reverse-phase sequence exists, these contacts will not close when the relay is energized. (See ordering directions.)

ORDERING DIRECTIONS

See Section 7211.

If operating volts other than the normal factory setting are required, specify desired values when ordering.

PRICES

See Section 7210.

DIMENSIONS

*See Section 7340, page 1.

Publications:

Descriptive.....GEA-2524

Instructions:

ICR51A, 53A, 53B, 54A.....GEH-1783

ICR53C.....GEI-39023

Formerly Section 7235, page 5, dated Sept. 4, 1956. ★Added.

RA 700, 701, 702, 711-713, 721-723, 731-737