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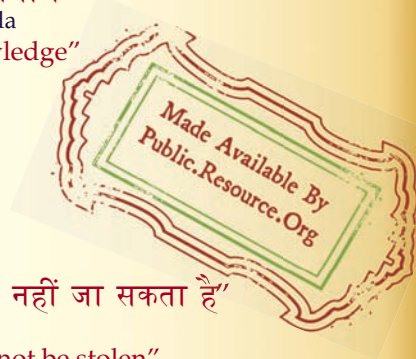
IS 12032-7 (1987): Graphical symbols for diagrams in the field of electrotechnology, Part 7: Switchgear, controlgear and protective devices [ETD 1: Basic Electrotechnical Standards]



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“Knowledge is such a treasure which cannot be stolen”



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IS : 12032 ( Part 7 ) - 1987  
IEC Pub 617 - 7 ( 1983 )

*Indian Standard*

# GRAPHICAL SYMBOLS FOR DIAGRAMS IN THE FIELD OF ELECTROTECHNOLOGY

**PART 7 SWITCHGEAR, CONTROLGEAR AND PROTECTIVE DEVICES**

( IEC Title : Graphical Symbols for Diagrams —  
Part 7 : Switchgear, Controlgear and Protective Devices )

UDC 621.3.061 : 003.62 : 621.316.3+621.316.9

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**BUREAU OF INDIAN STANDARDS**  
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*Indian Standard***GRAPHICAL SYMBOLS FOR DIAGRAMS  
IN THE FIELD OF ELECTROTECHNOLOGY****PART 7 SWITCHGEAR, CONTROLGEAR AND PROTECTIVE DEVICES**( IEC Title : Graphical Symbols for Diagrams — Part 7:  
Switchgear, Controlgear and Protective Devices )**National Foreword**

This Indian Standard ( Part 7 ), which is identical with IEC Pub 617-7 ( 1983 ) 'Graphical symbols for diagrams — Part 7 Switchgear, controlgear and protective devices', issued by the International Electrotechnical Commission ( IEC ), was adopted by the Bureau of Indian Standards on the recommendation of the Basic Electrotechnical Standards Sectional Committee and approval of the Electrotechnical Division Council.

**Cross Reference***International Standard*IEC Pub 117-3 ( 1977 ) Graphical symbols,  
Part 3 Switching and protective devicesIEC Pub 113-4 ( 1975 ) Diagrams, charts,  
tables, Part 4 Recommendations for the  
preparation of circuit diagramsISO 31 General principles concerning quan-  
tities, units and symbolsIEC Pub 27 Letter symbols to be used in  
electrical technologyIEC Pub 617-2 ( 1983 ) Graphical symbols  
for diagrams, Part 2 Symbol elements,  
qualifying symbols and other symbols  
having general application*Corresponding Indian Standard*IS : 2032 ( Part 6 )-1965 Graphical symbols  
used in electrotechnology: Part 6 Motor  
startersIS : 2032 ( Part 7 )-1974 Graphical symbols  
used in electrotechnology: Part 7 Switch-  
gear and auxiliaries ( *first revision* )IS : 8270 ( Part 4 )-1977 Guide for prepara-  
tion of diagrams, charts and tables for  
electrotechnology: Part 4 Circuit diagramIS : 3722 Letter symbols and signs used in  
electrical technologyIS : 12032 ( Part 2 )-1987 Graphical symbols  
for diagrams in the field of electrotech-  
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ing symbols and other symbols having  
general application

Adopted 18 June 1987

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## **GRAPHICAL SYMBOLS FOR DIAGRAMS**

### **Part 7: Switchgear, controlgear and protective devices**

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#### **CHAPTER I: GENERAL NOTES**

- I.1 Chapters II and III of this part give preferred symbols for contact units and switchgear. Each symbol depicts the function of a contact or a switching device, without necessarily being related to the construction of the device it represents.
  - I.2 A small circle, open or filled in, representing the hinge-point may be added to most of the symbols for contacts, switches and controlgear, see for example 07-02-02.  
For clarity this symbol must be shown on some symbols, see for example 07-02-05.
  - I.3 Some of the older symbols standardized in the 1963 edition of IEC Publication 117-3: Recommended Graphical Symbols, Part 3: Switching and Protective Devices, will be required for a considerable period of time. The relevant symbols are therefore shown in Appendix A.
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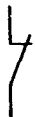






## CHAPTER II: CONTACTS

### SECTION I – QUALIFYING SYMBOLS




No.	Symbol	Description
07-01-01	ⓐ	Contactor function
07-01-02	✕	Circuit breaker function
07-01-03	—	Disconnecter (isolator) function
07-01-04	Ⓢ	Switch-disconnector (isolating-switch) function
07-01-05	■	Automatic release function
07-01-06	▽	Position switch function Limit switch function  <i>Notes 1.</i> – This qualifying symbol can be applied to simple contact symbols to indicate position or limit switches if there is no need to show the means of operating the contact. In complicated cases, where it is desirable to show the means of operation, symbols 02-13-16 to 02-13-19 should be used instead.  <i>2.</i> – This symbol is placed on both sides of the contact symbol when the contact is mechanically operated in both directions.
07-01-07	◁	Spring return function  <i>Notes 1.</i> – This symbol may be used to indicate spring return function. When this convention is invoked, its use should be appropriately referenced.  <i>2.</i> – This symbol should not be used together with qualifying symbols 07-01-01, 07-01-02, 07-01-03 and 07-01-04. In many cases, symbol 02-12-07 may be used.
07-01-08	○	Non-spring return (stay put) function  <i>Notes 1.</i> – This symbol may be used to indicate non-spring return function. When this convention is invoked, its use should be appropriately referenced.  <i>2.</i> – This symbol should not be used together with qualifying symbols 07-01-01, 07-01-02, 07-01-03 and 07-01-04. In many cases, symbol 02-12-08 may be used.






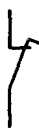
SECTION 2 - CONTACTS WITH TWO OR THREE POSITIONS

No.	Symbol	Description
07-02-01	Form 1 	Make contact <i>Note.</i> - This symbol is also used as the general symbol for a switch.
07-02-02	Form 2 	
07-02-03		Break contact
07-02-04		Change-over break before make contact
07-02-05		Two-way contact with centre-off position
07-02-06	Form 1 	Change-over make before break contact (bridging)
07-02-07	Form 2 	
07-02-08		Contact with two makes
07-02-09		Contact with two breaks

### SECTION 3 – PASSING CONTACTS WITH TWO POSITIONS

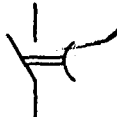

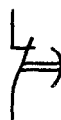

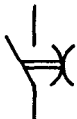
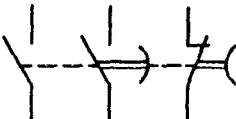
No.	Symbol	Description
07-03-01		Passing make contact closing momentarily when its operating device is actuated
07-03-02		Passing make contact closing momentarily when its operating device is released
07-03-03		Passing make contact closing momentarily when its operating device is actuated or released

### SECTION 4 – EARLY AND LATE OPERATING CONTACTS

No.	Symbol	Description
07-04-01		Make contact (of a multiple contact assembly) which is early to close relative to the other contacts of the assembly
07-04-02		Make contact (of a multiple contact assembly) which is late to close relative to the other contacts of the assembly
07-04-03		Break contact (of a multiple contact assembly) which is late to open relative to the other contacts of the assembly
07-04-04		Break contact (of a multiple contact assembly) which is early to open relative to the other contacts of the assembly





**SECTION 5 – EXAMPLES OF CONTACTS WITH INTENTIONAL  
 DELAY**

5.1 See symbols 02-12-05 and 02-12-06.

No.	Symbol	Description
07-05-01	Form 1 	Make contact delayed when closing (operating device actuated)
07-05-02	Form 2 	
07-05-03	Form 1 	Break contact delayed when reclosing (operating device released)
07-05-04	Form 2 	
07-05-05		Make contact delayed when closing and opening
07-05-06		Contact assembly with one make contact not delayed, one make contact delayed when re-opening and one break contact delayed when opening

SECTION 6 – EXAMPLES OF SPRING RETURN AND NON-SPRING  
RETURN (STAY PUT) CONTACTS

6.1 The notes with symbols 07-01-07 and 07-01-08 apply.

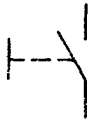

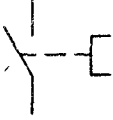

No.	Symbol	Description
07-06-01		Make contact with spring return
07-06-02		Make contact without spring return (stay put)
07-06-03		Break contact with spring return
07-06-04		Two-way contact with centre-off position with spring return from the left-hand position but not from the right-hand one (stay put)

### CHAPTER III: SWITCHES, SWITCHGEAR AND STARTERS



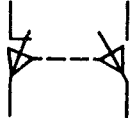
III.1 Devices with "push" or "pull" operation normally have spring return. It is therefore not necessary to show the automatic return symbol (02-12-07). On the other hand, a detent symbol (02-12-08) should be shown in the exceptional cases where locking exists.

III.2 Devices operated by turning do not usually have automatic return. It is therefore not necessary for the detent symbol (02-12-08) to be shown. On the other hand, the automatic return symbol (02-12-07) should be shown in those cases where an automatic return exists.

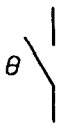
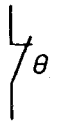
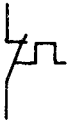
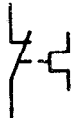

#### SECTION 7 – SINGLE-POLE SWITCHES

No.	Symbol	Description
07-07-01		Manually operated switch, general symbol
07-07-02		Push-button switch (non-locking)
07-07-03		Pull-switch (non-locking)
07-07-04		Turn-switch (locking)




SECTION 8 – POSITION AND LIMIT SWITCHES

No.	Symbol	Description
07-08-01		Position switch, make contact Limit switch, make contact
07-08-02		Position switch, break contact Limit switch, break contact
07-08-03		Position or limit switch mechanically operated in both directions with two separate circuits

SECTION 9 - TEMPERATURE SENSITIVE SWITCHES

No.	Symbol	Description
07-09-01		Temperature sensitive switch, make contact  <i>Note.</i> – $\theta$ may be replaced by the operating temperature conditions.
07-09-02		Temperature sensitive switch, break contact  The note with symbol 07-09-01 applies
07-09-03		Self-operating thermal switch, break contact  <i>Note.</i> – It is important to distinguish between a contact as shown and a contact of a thermal relay, which in detached representation may be shown as follows:  
07-09-04		Gas discharge tube with thermal element Starter for fluorescent lamp

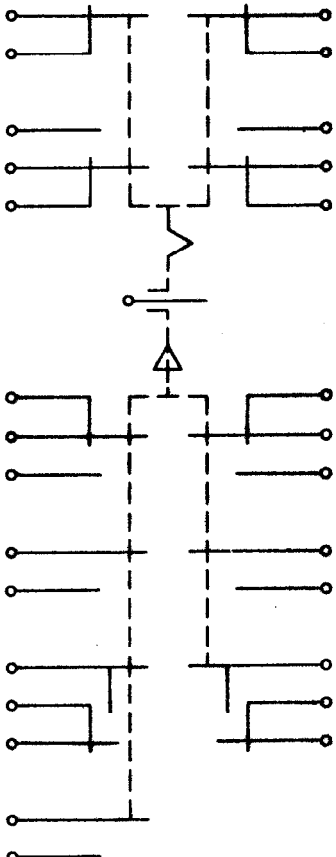
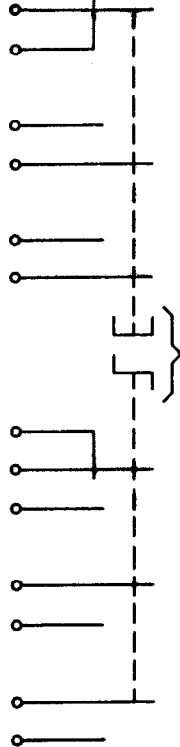
SECTION 10 - SPEED CHANGE SENSITIVE CONTACTS,  
MERCURY AND LEVELLING SWITCHES

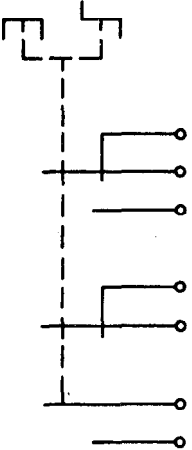
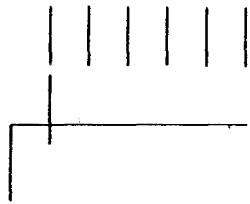
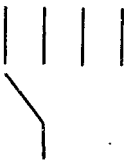
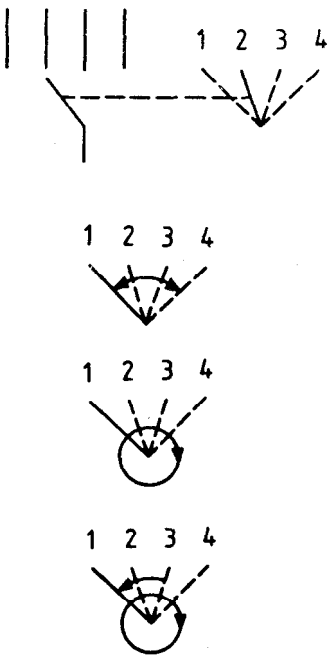
No.	Symbol	Description
07-10-01		Inertia switch (operated by sudden deceleration)
07-10-02		Mercury switch, three terminals Levelling switch, three terminals
07-10-03		Mercury switch, four terminals Levelling switch, four terminals

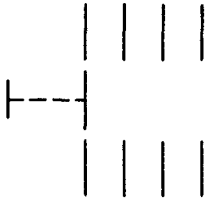

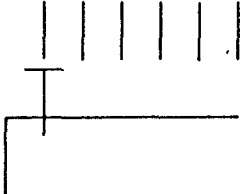
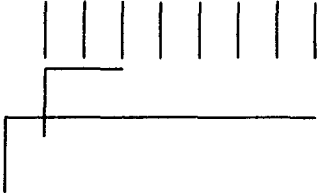
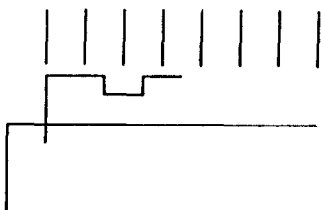


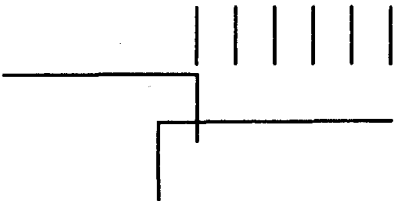
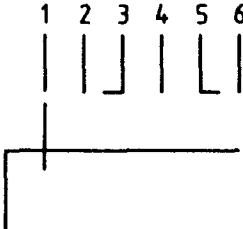
SECTION 11 – EXAMPLES OF MULTI-POLE AND MULTI-POSITION  
SWITCHES

11.1 Conventions III.1 and III.2 at the beginning of Chapter III apply.

No.	Symbol	Description
07-11-01		Three position lever-operated switch, locking in the upper position and with spring return from the lower position to the middle one, shown with terminals
07-11-02		Button-operated switch in which one set of contacts is operated by pushing the button (non-locking) and another set by turning it (locking), shown with terminals  The bracket indicates that there is only one actuator

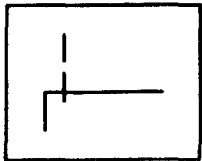
No.	Symbol	Description
07-11-03		Button-operated switch in which the same set of contacts may be operated in two different ways; either by turning (with locking) or pushing (with spring return), shown with terminals
07-11-04		Single-pole n-position switch, shown for $n = 6$
07-11-05		Single-pole n-position switch, alternative for use when $n$ is small, shown for $n = 4$
07-11-06		<p>Example with position diagram</p> <p><i>Note.</i> – It is sometimes convenient to indicate the purpose of each switch position by adding text to the position diagram. It is also possible to indicate limitations of movement of the operating device as in the examples which follow:</p> <p>The operating device (for example handwheel) can be turned only from positions 1 to 4 and back</p> <p>The operating device can be turned in the clockwise direction only.</p> <p>The operating device can be turned in the clockwise direction without limitation and may be turned in the counter-clockwise direction only between positions 3 and 1</p>

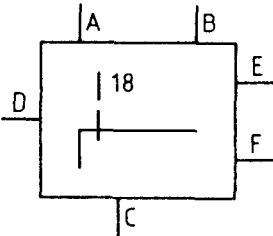
No.	Symbol	Description
07-11-07		Four-position switch, manually operated, having four independent circuits
07-11-08		Single-pole, four-position switch in which position 2 cannot be connected
07-11-09		Single-pole, six-position switch with a wiper that bridges only while passing from one position to the next
07-11-10		Single-pole multi-position switch with a wiper that bridges three consecutive terminals in each switch position
07-11-11		Single-pole multi-position switch with a wiper that bridges four terminals but omits one intermediate terminal in each switch position

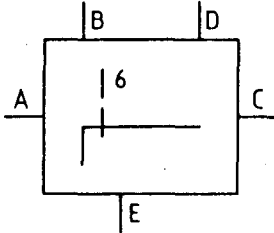
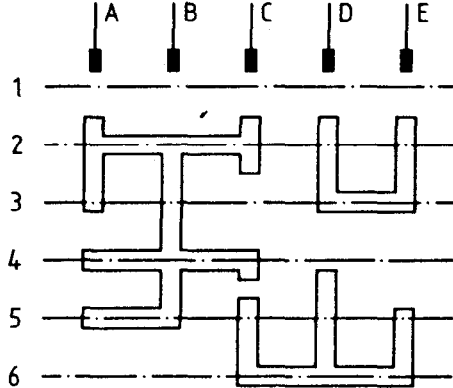
No.	Symbol	Description
07-11-12		<p><b>Single-pole multi-position switch for cumulative parallel switching</b></p>
07-11-13		<p><b>One pole of a six-position multi-pole switch</b>  The pole shown makes earlier than the other poles when the wiper moves from position 2 to 3 and breaks later than the other poles when the wiper moves from position 5 to 6. When the wiper moves in the opposite direction the early make becomes a late break and vice versa</p>

## SECTION 12 – BLOCK SYMBOLS FOR COMPLEX SWITCHES

- 12.1 There are many ways in which complex switching functions can be achieved mechanically, for example by rotary wafer switches, slide switches, drum controllers, cam-operated contact assemblies, etc. There are also many ways in which the switching functions may be symbolized on circuit diagrams (see IEC Publication 113-4: Diagrams, Charts, Tables, Part 4: Recommendations for the Preparation of Circuit Diagrams). Study has shown that there is no unique system of symbolization which is superior in every application. The system employed should be chosen with due regard to the purpose of the diagram and the degree of complexity of the switching device it is desired to symbolize. This section therefore presents one possible method of symbolizing complex switches. To facilitate understanding each example includes a constructional drawing of the device symbolized. The method shown here uses a general symbol for a complex switch which must be supplemented by a table of connections. Two examples are shown.

No.	Symbol	Description
07-12-01		Complex switch, general symbol






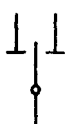


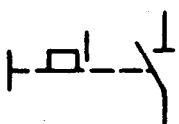
No.	Symbol	Description																																																																																																																																										
07-12-02		<p><i>Examples:</i></p> <p>18-position rotary wafer switch with six terminals, here designated A to F, constructed as shown below (switch shown in position 1)</p>																																																																																																																																										
	Table of connections																																																																																																																																											
	<table><tr><th rowspan="2">Position</th><th colspan="6">Interconnections of terminals</th></tr><tr><th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>F</th></tr><tr><td>1</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>2</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>3</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>4</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>5</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>6</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>7</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>8</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>9</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>10</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>11</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>12</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>13</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>14</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>15</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>16</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>17</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>18</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr></table>	Position	Interconnections of terminals						A	B	C	D	E	F	1	x	x	x	x	x	x	2	x	x	x	x	x	x	3	x	x	x	x	x	x	4	x	x	x	x	x	x	5	x	x	x	x	x	x	6	x	x	x	x	x	x	7	x	x	x	x	x	x	8	x	x	x	x	x	x	9	x	x	x	x	x	x	10	x	x	x	x	x	x	11	x	x	x	x	x	x	12	x	x	x	x	x	x	13	x	x	x	x	x	x	14	x	x	x	x	x	x	15	x	x	x	x	x	x	16	x	x	x	x	x	x	17	x	x	x	x	x	x	18	x	x	x	x	x	x
Position	Interconnections of terminals																																																																																																																																											
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18	x	x	x	x	x	x																																																																																																																																						

No.	Symbol	Description					
07-12-03		<p>Six-position rotary drum switch with five terminals, constructed as shown below:</p> 					
	Table of connections						
	Position		Interconnections of terminals				
			A	B	C	D	E
1	+		+	○	○		
2	+	+	+	○	○		
3	+	+		○	○		
4	+	+	+				
5	+	+	-	-	-		
6			-	-	-		

The symbols + - and ○ indicate the terminals that are connected together at any position (rest-position or intermediate position) of the switch, i.e. terminals having the same indicating symbol e.g. + are interconnected









*Note.* - Where additional symbols are required, the characters available on a typewriter should be used, e.g. x, -.

SECTION 13 – SWITCHGEAR AND CONTROLGEAR



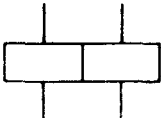
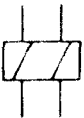
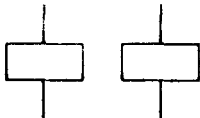
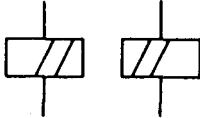
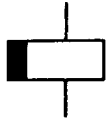
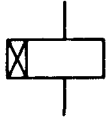
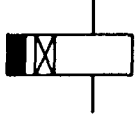
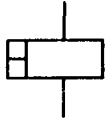
No.	Symbol	Description
07-13-01	Use symbol 07-02-01 or 07-02-02	Switch (mechanical)
07-13-02		Contactor (contact open in the unoperated position)
07-13-03		Contactor with automatic release
07-13-04		Contactor (contact closed in the unoperated position)
07-13-05		Circuit breaker
07-13-06		Disconnecter (isolator)
07-13-07		Two-way disconnecter (isolator) with centre-off position
07-13-08		Switch-disconnector (on-load isolating switch)
07-13-09		Switch-disconnector with automatic release
07-13-10		Disconnecter (isolator) with blocking device, manually operated

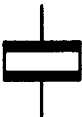
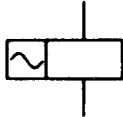
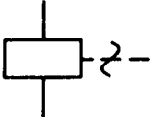
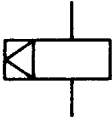

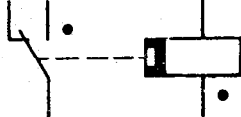
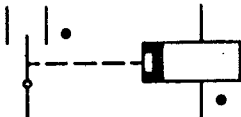
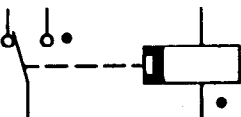


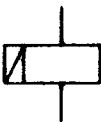
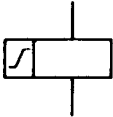
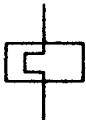
SECTION 14 – BLOCK SYMBOLS FOR MOTOR STARTERS

No.	Symbol	Description
07-14-01		Motor starter, general symbol <i>Note.</i> – Qualifying symbols may be shown inside the general symbol to indicate particular types of starters. See symbols 07-14-05, 07-14-07 and 07-14-08.
07-14-02		Starter operated in steps <i>Note.</i> – The number of steps may be indicated.
07-14-03		Starter-regulator
07-14-04		Starter with automatic release
07-14-05		Direct on line contactor starter for reversing motor Full voltage contactor starter for reversing motor
07-14-06		Star-delta starter
07-14-07		Auto-transformer starter
07-14-08		Starter-regulator with thyristors

**CHAPTER IV: ELECTROMECHANICAL**  
**ALL-OR-NOTHING RELAYS**  
**SECTION 15 – OPERATING DEVICES**


No.	Symbol	Description
07-15-01	Form 1 	Operating device, general symbol
07-15-02	Form 2 	<p><i>Note</i> – Operating devices with several windings may be indicated by inclusion of the appropriate number of inclined strokes or by repeating symbol 07-15-01 or 07-15-02.</p> <p><i>Examples</i> Operating device with two separate windings, assembled representation</p> <p>Operating device with two separate windings, detached representation</p>
07-15-03	Form 1 	
07-15-04	Form 2 	
07-15-05	Form 1 	
07-15-06	Form 2 	
07-15-07		Relay coil of a slow-releasing relay
07-15-08		Relay coil of a slow-operating relay
07-15-09		Relay coil of a slow-operating and slow-releasing relay
07-15-10		Relay coil of a high speed relay (fast operating and fast releasing)

No.	Symbol	Description
07-15-11		Relay coil of a relay unaffected by alternating current
07-15-12		Relay coil of an alternating current relay
07-15-13		Relay coil of a mechanically resonant relay
07-15-14		Relay coil of a mechanically latched relay
07-15-15		Relay coil of a polarized relay
07-15-16		<p><i>Note.</i> – Dots may be used to indicate the relationship between the direction of the current through the winding of a polarized relay and the movement of the contact arm.</p> <p>When the winding terminal identified by the polarity dot is positive with respect to the other winding terminal, the contact arm moves or tends to move towards the position marked with the dot.</p> <p><i>Examples:</i></p> <p>Polarized relay, self restoring, operating for only one direction of current in the winding</p>
07-15-17		Polarized relay with neutral position, self restoring operating for either direction of current in the winding
07-15-18		Polarized relay with two stable positions

No.	Symbol	Description
07-15-19	Form 1 	Relay coil of a remanent relay
07-15-20	Form 2 	
07-15-21		Actuating device of a thermal relay

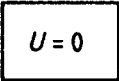
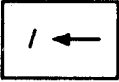
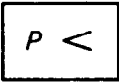

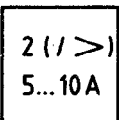
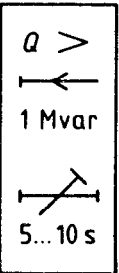
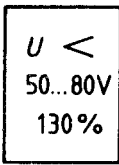

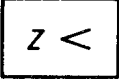
## CHAPTER V: MEASURING RELAYS AND RELATED DEVICES



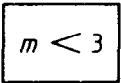
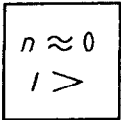
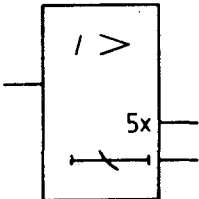
### SECTION 16 – BLOCK SYMBOL AND QUALIFYING SYMBOLS

No.	Symbol	Description
07-16-01		<p><b>Measuring relay or related device</b></p> <p>The asterisk must be replaced by one or more letters or qualifying symbols indicating the parameters of the device, in the following order: characteristic quantity and its mode of variation; direction of energy flow; setting range; re-setting ratio; delayed action; value of time delay</p> <p><i>Notes 1.</i> – Letter symbols for characteristic quantities should be in accordance with established standards, for example ISO Standard 31: Quantities and Units, IEC Publication 27: Letter Symbols to be Used in Electrical Technology, etc.</p> <p>Qualifying symbols will be found in IEC Publication 617-2: Graphical Symbols for Diagrams, Part 2: Symbol Elements, Qualifying Symbols and Other Symbols Having General Application.</p> <p>Symbols 07-16-02, 07-16-04 and 07-16-07 show how letter and qualifying symbols may be combined.</p> <p>2. – A figure giving the number of similar measuring elements may be included in the symbol as shown in example 07-17-05.</p> <p>3. – The symbol may be used as a functional symbol representing the whole of the device, or as a symbol representing only the actuating element of the device.</p>

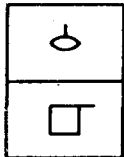
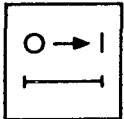
No.	Symbol	Description
07-16-02	$U_{\perp}$	Voltage failure to frame (frame potential in case of fault) <i>Note.</i> – $U_{\perp}$ may be replaced by V.
07-16-03	$U_{rsd}$	Residual voltage The note with symbol 07-16-02 is applicable
07-16-04	$I \leftarrow$	Reverse current
07-16-05	$I_d$	Differential current
07-16-06	$I_d/I$	Percentage differential current
07-16-07	$I \perp \text{ground symbol}$	Earth fault current
07-16-08	$I_N$	Current in the neutral conductor
07-16-09	$I_{N-N}$	Current between neutrals of two polyphase systems
07-16-10	$P_{\alpha}$	Power at phase angle $\alpha$
07-16-11	$\text{---} \diagup \text{---}$	Inverse time-lag characteristic

SECTION 17 – EXAMPLES OF MEASURING RELAYS

No.	Symbol	Description
07-17-01		No voltage relay
07-17-02		Reverse current relay
07-17-03		Underpower relay
07-17-04		Delayed overcurrent relay
07-17-05		Overcurrent relay with two current elements and a setting range from 5 A to 10 A
07-17-06		Maximum reactive power relay: – energy-flow towards the busbars – operating value 1 Mvar – time-lag adjustable from 5 s to 10 s
07-17-07		Undervoltage relay: – setting range from 50 V to 80 V – resetting ratio 130%
07-17-08		Current relay operating above 5 A and below 3 A
07-17-09		Under-impedance relay

No.	Symbol	Description
07-17-10		Relay detecting interturn short-circuits
07-17-11		Divided-conductor detection relay
07-17-12		Phase-failure detection relay in a three-phase system
07-17-13		Locked-rotor detection relay operating by current sensing
07-17-14		Overcurrent relay with two outputs, one active at current above five times the setting value, the other with inverse time-lag characteristic


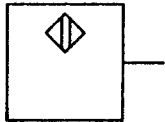
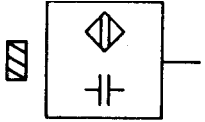

## SECTION 18 – OTHER DEVICES

No.	Symbol	Description
07-18-01		Buchholz protective device (gas relay)
07-18-02		Auto-reclose device

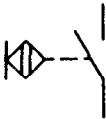
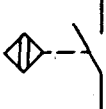
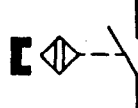
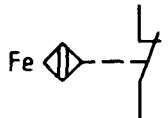


CHAPTER VI: PROXIMITY AND TOUCH-SENSITIVE DEVICES

SECTION 19 – SENSORS AND DETECTORS



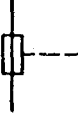

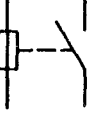
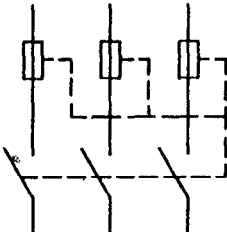
No.	Symbol	Description
07-19-01		Proximity sensor
07-19-02		Proximity sensing device, block symbol <i>Note.</i> – The method of operating may be indicated.
07-19-03		<i>Example:</i> Capacitive proximity detector operating on the approach of solid material
07-19-04		Touch sensor




SECTION 20 – SWITCHES

No.	Symbol	Description
07-20-01		Touch sensitive switch, make contact
07-20-02		Proximity switch, make contact
07-20-03		Proximity switch, operated on the approach of a magnet, make contact
07-20-04		Proximity switch, operated on the approach of iron, break contact




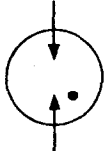
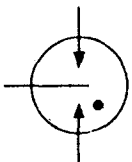
CHAPTER VII: PROTECTIVE DEVICES

SECTION 21 – FUSES AND FUSE-SWITCHES


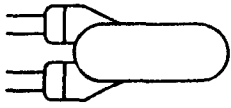
No.	Symbol	Description
07-21-01		Fuse, general symbol
07-21-02		Fuse with the supply side indicated by a thick line
07-21-03		Fuse with mechanical linkage (striker fuse)
07-21-04		Fuse with alarm contact, three terminals
07-21-05		Fuse with separate alarm circuit
07-21-06		Three-phase switch with automatic release by any one of the striker fuses

No.	Symbol	Description
07-21-07		Fuse-switch
07-21-08		Fuse-disconnector (fuse isolator)
07-21-09		Fuse switch-disconnector (on-load isolating fuse switch)

SECTION 22 – GAPS AND ARRESTORS


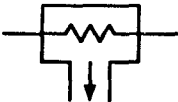
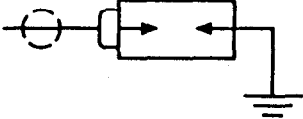

No.	Symbol	Description
07-22-01		Gap
07-22-02		Double spark gap
07-22-03		Lightning arrester
07-22-04		Protective gas discharge tube
07-22-05		Symmetric protective gas discharge tube

SECTION 23 – FIRE-EXTINGUISHERS

No.	Symbol	Description
07-23-01		Fire-extinguisher: single head with connector
07-23-02		Fire-extinguisher: double head with connectors

**CHAPTER VIII: MISCELLANEOUS SYMBOLS**

**SECTION 24 – IGNITERS AND FLAG-INDICATORS**


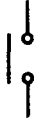


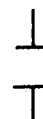

No.	Symbol	Description
07-24-01		Ignition unit, high energy
07-24-02		Squib igniter
07-24-03		Igniter plug (typical)
07-24-04		Coil-operated flag indicator




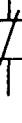
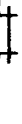




# APPENDIX A: OLDER SYMBOLS FOR CONTACTS, SWITCHGEAR AND PROTECTIVE DEVICES

A.1 This appendix gives a selection of symbols drawn from the 1963 edition of Publication 117-3.

These symbols will be required for a prolonged changeover period, but they should be superseded as soon as practicable by the preferred symbols in Chapters II, III and VII above.







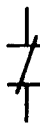
## SECTION A1 – CONTACTS


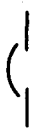
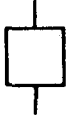
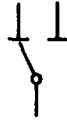
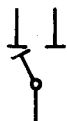
No.	Symbol	Description
07-A1-01		Make contact
07-A1-02	Autres formes Other forms 	
07-A1-03		
07-A1-04		
07-A1-05		
07-A1-06		

No.	Symbol	Description
07-A1-07		Break contact
07-A1-08	Autres formes Other forms 	
07-A1-09		
07-A1-10		
07-A1-11		
07-A1-12		Change-over contact, break-before-make (USA: Transfer contact) <i>Note.</i> - In symbol 07-A1-12, the fixed contacts may be placed at any angle except at 90°. In order to facilitate the work of the draughtsman, the contacts may be arranged differently.
07-A1-13	Autre forme Other form 	
07-A1-14		Two-way contact with neutral position
07-A1-15		Make-before-break contact

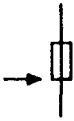



SECTION A2 – SWITCHGEAR

No.	Symbol	Description
07-A2-01		Switch
07-A2-02	Other form 	
07-A2-03		Contactor, normally open
07-A2-04	Other form 	
07-A2-05		Contactor with protective device
07-A2-06		Contactor, normally closed
07-A2-07	Other form 	

No.	Symbol	Description
07-A2-08		Circuit-breaker <i>Note.</i> - The rectangle of symbol 07-A2-10 should contain some indication that a circuit-breaker is concerned.
07-A2-09	Autres formes Other forms 	
07-A2-10		
07-A2-11		Two-way isolator with interruption of circuit
07-A2-12		Two-way isolator without interruption of circuit

### SECTION A3 - FUSES

No.	Symbol	Description
07-A3-01		Cut-out with alarm contact
07-A3-02	Other form 	

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