BS 376-2:2015

BSI Standards Publication

Railway signalling symbols –

Part 2: Specification for symbols for circuit diagrams

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Contents

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 40, an inside back cover and a back cover.

Foreword

Publishing information

This part of BS 376 is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 30 April 2015. It was prepared by Technical Committee GEL/9/1, *Signalling and communications,* under the Technical Committee GEL/9, *Railway electrotechnical applications*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This part of BS 376 supersedes BS 376-2:1954 *Railway Signalling Symbols – Part 2: Wiring symbols and written circuits,* which is withdrawn.

Relationship with other publications

BS 376 is issued in two parts, namely:

- BS 376, Railway signalling symbols – Part 1: *Specification for schematic symbols*

  Part 1 shows schematic symbols designed for use on railway layout plans to show the signalling requirements.

- BS 376, Railway signalling symbols – Part 2: *Symbols for circuit diagrams – Specification*

  Part 2 (this part) shows the actual apparatus used, with its electrical connections and simplified wiring diagrams.

Information about this document

This is a full revision of the standard, updated to current practice.

This standard has its origins in a specification published by the Railway Signal Association in the USA in 1911, by which date a scheme of symbols and nomenclature for electrically operated apparatus had evolved, using both written circuits and wiring symbols. Subsequent issues of the standard have sought to be backward-compatible with the original scheme, since signalling documentation is maintained for the whole life of the signalling.

A standard system of nomenclature and labelling of wires is specified.

Typical applications are illustrated in Annex A.

If a symbol required for railway signalling purposes does not appear in this standard, the symbol should be taken from an appropriate British Standard or International Standard.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Requirements in this standard are drafted in accordance with *The BSI guide to standardization – Section 2: Rules for the structure, drafting and presentation of British Standards*, subclause **11.3.1**, which states, "Requirements should be expressed using wording such as: 'When tested as described in Annex A, the product shall ...'". This means that only those products that are capable of passing the specified test will be deemed to conform to this standard.

This part of BS 376-2 shows railway signalling symbols for written circuits and the traditional wiring symbols in tables side by side.

When necessary, to avoid confusion, diagrams may be marked with the following reference:

Symbols to BS 376-2:2015

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

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1 Scope

This British Standard specifies the symbols to be used on railway signalling circuit diagrams but does not provide guidance on their application.

It also gives a standard system of nomenclature and labelling of wires such that each wire can be readily identified with that shown on the circuit diagram.

This British Standard does not cover symbols for high voltage power distribution, telecommunications or electronic products. These are covered in IEC 60617 or an appropriate British Standard.

This British Standard does not include proprietary systems and specialized applications.

NOTE 1 The symbols in this British Standard provide for apparatus in general use. Wiring symbols have been designed so that they can be combined together where one does not represent the complete device. In this British Standard, where certain elements are added for illustrative purposes, they are shown by dashed lines. If additional information is required to support the symbol, a "#" may be used to reference a note on the diagram.

NOTE 2 The size of symbols as drawn are in proportion but are not necessarily relative to one another; nor do they give the specific size to be used. The relative thickness of lines may also be varied, e.g. for contact elements.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 7645, *Code for designation of colours*

BS 8586, *Pin codes for BR 930 series relays – Specification*

3 Terms and definitions

For the purposes of this part of BS 376, the following terms and definitions apply.

3.1 biased (relay, device)
two-position electromagnetic device, being either:

a) a polar device in which the armature in the de-energized state is driven in a specified direction (normal or reverse) by magnetism, gravity or spring; or

b) a neutral device operating only when current flows through the coil in a specified direction (known as "d.c. biased")

3.2 normal (state)
display or position of a piece of apparatus in a designated state (usually its quiescent state)

3.3 polar (relay, device)
two- or three-position electromagnetic device with two energized states (normal and reverse) depending upon the direction or phase of the current flowing through the coil

NOTE A two-position device can either stick in its last operated position, or be biased in the de-energised state.

3.4 polarized
circuit or armature in which the resulting operation is dependent on the polarity or phase of the current

NOTE A polarized circuit can either operate a polar device or a pair of d.c. biased devices wired in opposition.

3.5 stick (relay)
two-position electromagnetic device which is maintained in an operated state, being either:

a) a polar device held in its last operated position by magnetism, gravity or spring, until operated in the opposite sense; or

b) a neutral relay held energized over its own front contact until de-energized by other circuit conditions

4 Signalling relays and circuit diagrams

4.1 Circuit diagrams

Signalling circuit diagrams shall follow one of three types of representation:

a) the now commonly used straight line diagram, also known as a written circuit, in which the symbols, with abbreviated designations, are drawn in a straight line, the two ends of which represent the terminals of the source of supply;

b) the traditional method using wiring symbols in which, generally, each complete piece of apparatus is represented by a symbol, for example a direct current relay comprising a coil and at least one moving contact;

c) a hybrid circuit plan, no longer widely used, by which internal wiring or analysis is shown with wiring symbols, in conjunction with written circuits representing through circuits.

NOTE 1 The symbols for each type of circuit diagram are given in Table 2 to Table 10.

*NOTE 2 The intended nomenclature for the circuits is shown opposite each symbol. Further details of nomenclature are given in Clause **7**.*

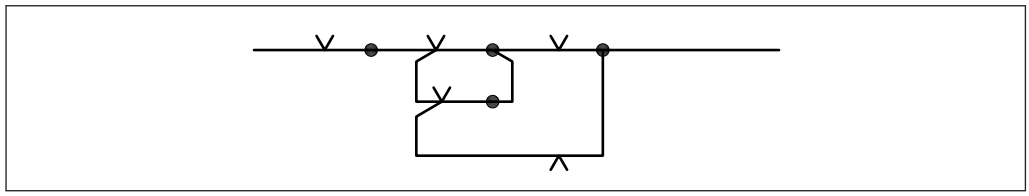
NOTE 3 For comparison, examples of circuit diagrams using written circuits and wiring symbols are illustrated in Annex A.

4.2 Written circuits

For written circuits, the following conventions shall be conformed to, as appropriate:

a) Wires shall be clearly drawn in straight lines irrespective of the relative positions of the apparatus, as shown in Figure 1.

Figure 1 **Drawing of wires in written circuits**



b) Unless otherwise indicated, the left, or upper, termination of the line shall be considered to be positive, or feed of supply.

*NOTE 1 This is in accordance with the general convention given in **7.3**.*

NOTE 2 Orientation of the symbols may be varied to suit.

*NOTE 3 Electrical supply nomenclature is given in **5.2**.*

c) The number of each contact in the relay shall be indicated by a numeral or an alphanumeric under the circuit line in accordance with **7.3**. This shall also apply to lever bands, circuit controllers and other contacts.

d) Because constituent components, such as relay coils and contacts, are separated in written circuits, a schedule shall be provided for each apparatus to analyse the terminals used.

NOTE 4 Such an analysis may incorporate circuit diagram sheet number and number of wires on each terminal. It may be applied to terminal and fuse racks, as well as relays, lever bands and circuit controllers.

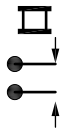
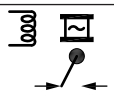
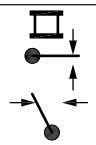
4.3 Wiring symbols

For wiring symbols, the following conventions shall be conformed to, as appropriate:

a) Relays shall be shown by combining the symbols given in Table 2 and Table 3, as illustrated in Table 1.

NOTE 1 Wiring symbols may be laid out so as to depict the relative positions of the apparatus, as shown in Figure A.4.

Table 1 **Combination of wiring symbols examples**

Description	Combined symbol
D.C. neutral relay, fitted with one independent front contact and one independent back contact, and shown energized	
A.C. relay, double element with three-position armature fitted with one N and one R dependent contact	
D.C. neutral polar relay with neutral armature fitted with one front and one back dependent contacts and polarized armature, fitted with one N and one R dependent contacts	

NOTE 2 Wiring symbols may be drawn to show the quiescent state of the circuit.

b) The sign ~ shall be used to indicate alternating current. Unless so indicated, direct current shall be assumed, for example:

Electromagnet a.c. 

Bell a.c. 

4.4 Symbols for relay coils and relay contacts

On circuit diagrams the symbols for relay coils given in Table 2 and the symbols for relay contacts given in Table 3 shall be used, as appropriate.

Table 2 **Relay coils (electromagnets)**

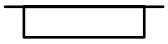
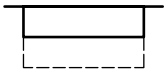
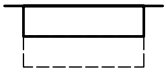
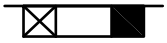
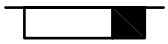
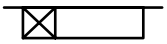
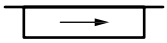
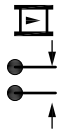
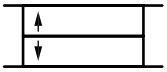
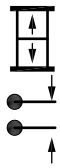
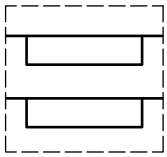
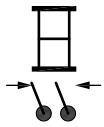
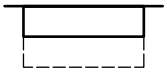
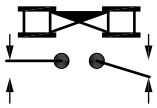
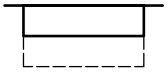
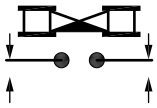
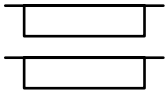
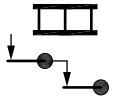
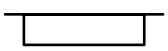
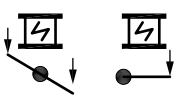
Symbol No.	Nomen-clature	Description	Written circuit	Wiring Symbol
2.1	L, R, V, W	Electromagnet, polar or non-polar [A)]		
2.2	R	Electromagnet, with double winding[B)]	 C)	
2.3	R Q	Electromagnetic system, requiring two energized windings (a.c.)	 C)	
2.4	R	Electromagnet, slow acting[D)]		
2.5	R	Electromagnet, slow release[D)]		
2.6	R	Electromagnet, slow pick-up[D)]		
2.7	R	D.C. biased relay, operating only when current flows through coil in direction of arrow		
2.8	R	Magnetically latched non-polar relay, the single armature remaining in its last operated position until relay is next energized or released	 C)	
2.9	R	Magnetic stick polar relay, the single armature remaining in its last operated position until relay is energized in the opposite sense	 C)	
2.10	R	Interlocked relay, mechanical interlocking preventing both armatures assuming fully energized position at the same time	 C)	
2.11	R	Interlocked relay, mechanical interlocking preventing both armatures assuming fully de-energized position at the same time	 C)	
2.12	R R	Relay with twin independent coils and armatures		 E)
2.13	R	Flasher relay		

Table 2 **Relay coils (electromagnets)**

Symbol No.	Nomen-clature	Description	Written circuit	Wiring Symbol

[A)] General symbol to be used for lock, relay, trainstop, point valve, etc.

[B)] Add note if differentially wound.

[C)] Each winding shown separately or together. A dotted line shows that reference to the other circuit is required.

[D)] Typically 150 ms or greater.

[E)] Example shows coils wired in parallel for integrity.

Table 3 **Relay contacts**

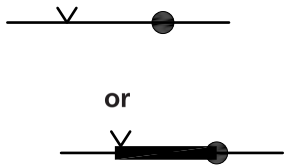
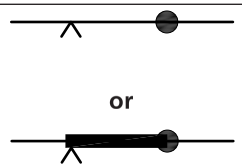
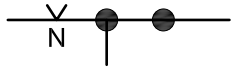
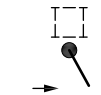
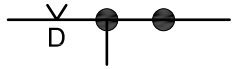
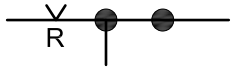
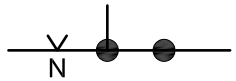
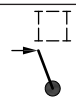
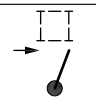
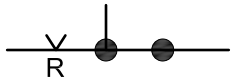
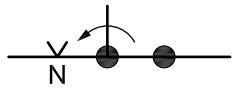
Symbol No.	Nomen-clature	Description	Written circuit	Wiring symbol [A)]		
3.1	F & A	Contact on non-polarized armature. Front contact closed when relay is energized		**energized** 	**de-energized** 	–
3.2	B & A	Contact on non-polarized armature. Back contact closed when relay is de-energized				–
3.3	N & A	Contact on three-position polarized armature. N contact closed only when relay is energized to N position		**energized N** 	**de-energized** 	**energized R** 
3.4	D & A	Contact on three-position polarized armature. D contact closed only when relay is de-energized				
3.5	R & A	Contact on three-position polarized armature. R contact closed only when relay is energized to R position				
3.6	N & A	Contact on two-position polarized armature, N contact remaining closed until relay is energized to R position			–	
3.7	R & A	Contact on two-position polarized armature, R contact remaining closed until relay is energized to N position			–	
3.8	N & A	Contact on two-position polarized armature, biased by magnetism, gravity or spring in direction of arrow. N contact biased to normal [B)]				

Table 3 **Relay contacts**

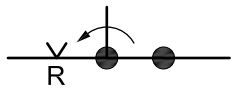
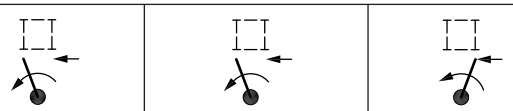
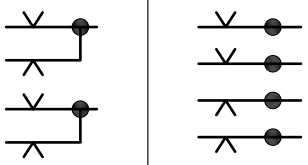
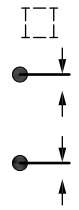
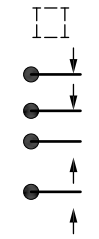
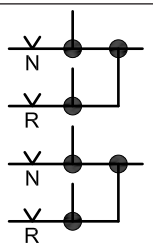
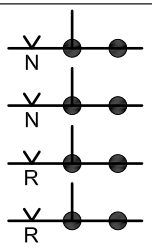
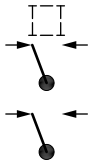
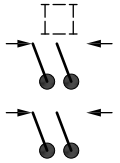
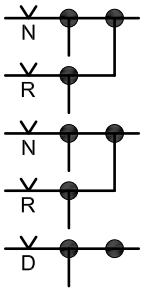
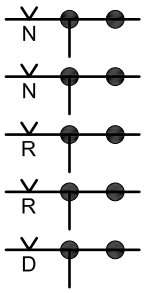
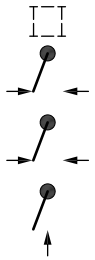
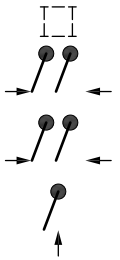
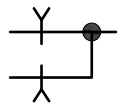
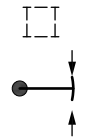
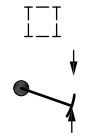
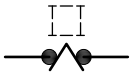
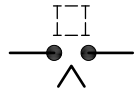
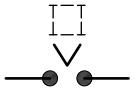
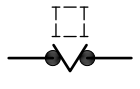
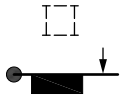
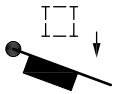
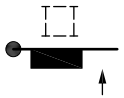
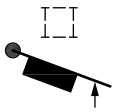
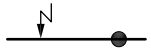
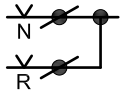
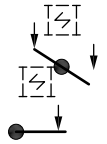
Symbol No.	Nomen-clature	Description	Written circuit		Wiring symbol [A)]	
3.9	R & A	Contact on two-position polarized armature, biased by magnetism, gravity or spring in direction of arrow. R contact biased to normal [B)]				
3.10	F, A, B	Contact examples: contacts on non-polarized armature, normally energized	**dependent** 	**independent** 	**dependent** 	**independent** 
3.11	N, A, R	Contact examples: contacts on two-position polarized armature				
3.12	N, A, R D & A	Contact examples: contacts on three-position polarized armature				

Table 3 **Relay contacts**

Symbol No.	Nomen-clature	Description	Written circuit	Wiring symbol [A]	
				energized	de-energized
3.13	F, A, B	Bridging contacts on non-polarized armature, both contacts closed during movement of armature			
3.14	F	Double break contacts on non-polarized armature. Front contact closed when magnet energized			
3.15	B	Double break contacts on non-polarized armature. Back contact closed when magnet de-energized			
3.16	JR [C] F & A	Time controlled contact. Front contact makes a specified time after relay energized (delayed operation) or breaks a specified time after relay de-energized (delayed release)		delayed release timer 	delayed operation timer 
3.17	JR [C] B & A	Time controlled contact. Back contact breaks a specified time after relay energized (delayed operation) or makes a specified time after relay de-energized (delayed release)			
3.18	F & A	Contact fitted with magnetic blow-out			
3.19	–	Contacts on flasher relay		or 	

[A] Showing the quiescent state of the circuit as energized or de-energized.
[B] Arrow always points left for biased to normal; right for biased to reverse.
[C] Time to be specified beside JR name.

5 Electrical supply to railway signalling apparatus

5.1 Symbols for low voltage supply arrangements

Where low voltage (LV) or extra-low voltage electrical supply arrangements are to be shown on a railway signalling circuit diagram, the symbols given in Table 4 shall be used, as appropriate.

NOTE For high voltage or three-phase supply and power schematics, see also IEC 60617.

Table 4 **Transformers, switchgear, earthing and other LV supply arrangements**

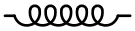
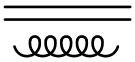
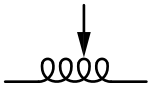
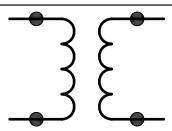
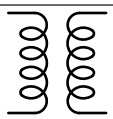
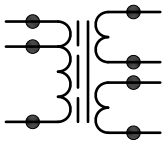
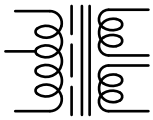
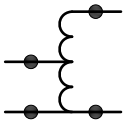
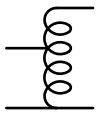
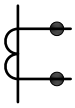
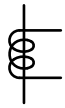
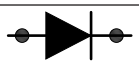
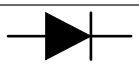
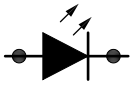
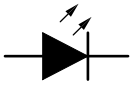
Symbol No.	Nomen-clature	Description	Written circuit	Wiring symbol
4.1	I	Inductor, choke, general symbol [A)]	 B)	
4.2	I	Inductor with magnetic core	 B)	
4.3	I	Inductor, variable	 B)	
4.4	T	Transformer, general symbol	 B)	
4.5	T	Transformer with magnetic core, screen, multiple windings and tappings	 B)	
4.6	T	Auto-transformer	 B)	
4.7	T	Current transformer	 B)	
4.8	J	Half wave rectifier, diode, general symbol		
4.9	–	Light emitting diode (LED)		

Table 4 **Transformers, switchgear, earthing and other LV supply arrangements**

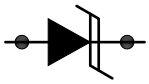
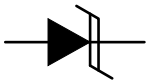
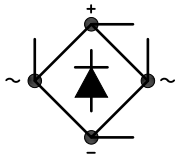
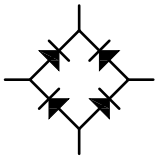
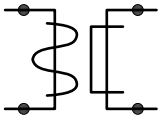
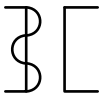
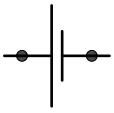
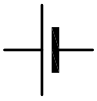
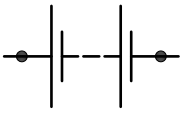
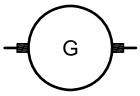
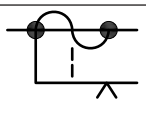
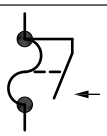
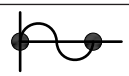
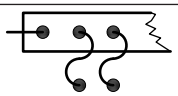
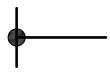
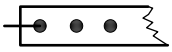
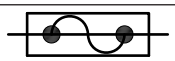
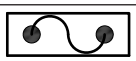
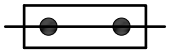
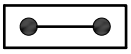
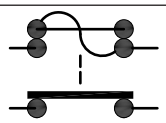
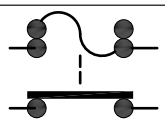
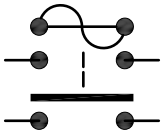
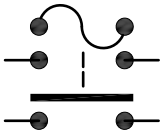
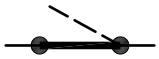
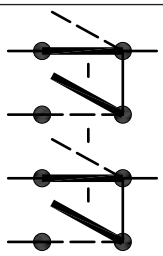
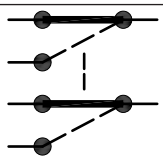
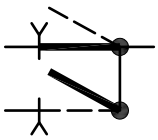
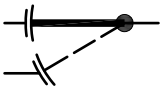
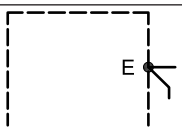
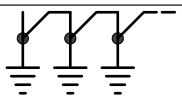
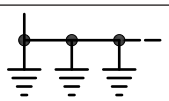
Symbol No.	Nomen-clature	Description	Written circuit	Wiring symbol
4.10	J	Transient voltage suppression diode, unidirectional avalanche breakdown diode		
4.11	J	Transient voltage suppression diode, bidirectional avalanche breakdown diode		
4.12	J	Diode bridge rectifier, full wave		
4.13	T/J	Rectifier set, transformer-rectifier or battery charger, single phase to d.c.		
4.14	–	Primary cell or secondary cell [C]	 B)	
4.15	–	Battery of primary or secondary cells [C]		
4.16	–	Generator, general symbol [D]	 B)	
4.17	–	Hand generator		
4.18	–	Circuit breaker, general symbol		
4.19	f	Fuse, general symbol		
4.20	f	Fuse with alarm contact		
4.21	f	Fuse, affixed to busbar		
4.22	t	Busbar terminal		
4.23	f	Fuse, individual, enclosed		
4.24	t	Link, individual, enclosed		

Table 4 **Transformers, switchgear, earthing and other LV supply arrangements**

Symbol No.	Nomen-clature	Description	Written circuit	Wiring symbol
4.25	N	Switch isolator, fused, normally closed, hand operated		
4.26	N	Switch isolator, fused, normally open, hand operated		
4.27	N	Switch isolator, double break, double pole or interlocked, fused in one pole, normally closed, hand operated		
4.28	N	Switch isolator, double break, double pole or interlocked, fused in one pole, normally open, hand operated		
4.29	N	Switch isolator, double break, non-fused, normally open, hand operated		
4.30	N	Switch, one way, normally closed, hand operated		
4.31	N	Switch, one way, normally open, hand operated		
4.32	N	Switch, two way, double pole or interlocked, hand operated		
4.33	N	Switch, two way, make before break contact, hand operated		
4.34	–	Enclosure with double or reinforced insulation		
4.35	–	Enclosure, screened and earthed [E)]		
4.36	E	Connection to earth, general symbol		
4.37	E	Main earthing terminal (MET)		
4.38	E	Independent earth electrode		
4.39	E	Earth electrode system		

[A)] This symbol may also be used for the windings of machines and apparatus.

Table 4 **Transformers, switchgear, earthing and other LV supply arrangements**

Symbol No.	Nomen-clature	Description	Written circuit	Wiring symbol

[B] Symbol taken from IEC 60617 (except terminals).

[C] The long line represents the positive pole and the short line represents the negative pole.

[D] For method of indicating particular types of d.c. and a.c. generators, see IEC 60617.

[E] Earth connection point indicated by "E".

5.2 Electrical supply nomenclature

The particulars of the supply for any circuit shall be indicated by the following nomenclature at the origin of the circuit.

The nominal voltage of the supply shall be indicated by numerals in the nomenclature, which follow the letters.

NOTE 1 Use of this nomenclature allows separation of transformer or battery details from the functional circuits.

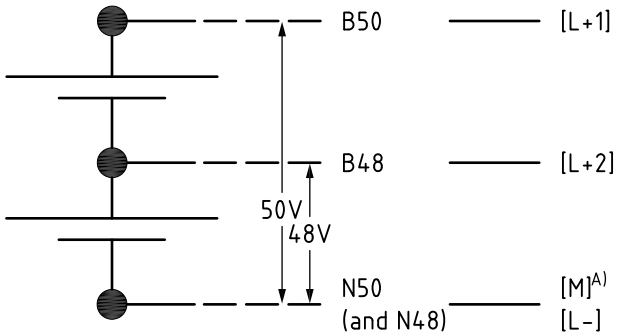
B (or +)	Indicates connection by an individual conductor to the busbar or supply terminal of a direct current system (positive side). See examples in Figure 2.
N (or –)	Indicates connection by an individual conductor to the busbar or supply terminal of a direct current system (negative side). See examples in Figure 2.
BN	Indicates connection by an individual conductor to the busbar or supply terminal of a direct current system at an intermediate point. See example in Figure 2b).
BX	Indicates connection by an individual conductor to the busbar or supply terminal of an alternating current system (feed side). See examples in Figure 3.
NX	Indicates connection by an individual conductor to the busbar or supply terminal of an alternating current system (return side). See examples in Figure 3.
BNX	Indicates connection by an individual conductor to the busbar or supply terminal of an alternating current system at an intermediate point of a single phase system. See examples in Figure 3.
1BX 2BX 3BX	Phase conductors in a polyphase system (with neutral indicated by NX). See examples in Figure 4.
CR	Indicates connection to a conductor common to other circuits with separate sources of energy and insulated from earth (common return). See example in Figure A.1.
CRE	Indicates connection to a conductor common to other circuits with separate sources of energy and connected to earth (common return earthed).
(X)	Suffix indicates external supply.
(L)	Suffix indicates local or internal supply.
F	Prefix indicates flashing supply (usually shown only on positive side).
S	Prefix indicates steady supply (where necessary to distinguish from flashing supply).

NOTE 2 The nomenclature should be shown on each circuit diagram instead of the battery or transformer details which may be shown elsewhere. They are illustrated in Figure 2 to Figure 4 for explanatory purposes.

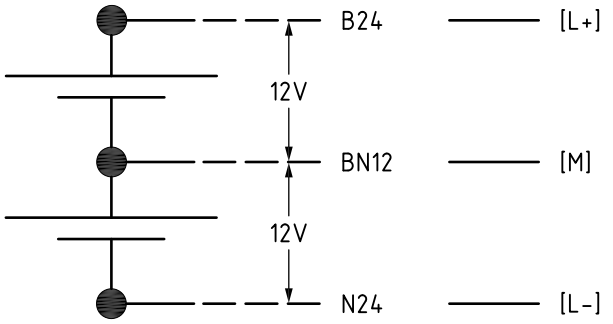
NOTE 3 In Figure 2 to Figure 4 the equivalent BS 7671 notation is shown in brackets, e.g. [L], [N], to facilitate interconnection of systems designed to different standards.

Figure 2 **Typical battery supply with intermediate terminal**

a) with common negative connection and alternative voltages (e.g. to suit variations in equipment)



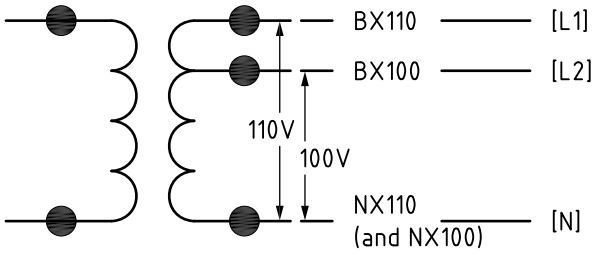
b) with common midpoint connection and opposing polarities (e.g. block instrument battery)



A)[M] applies if earthed; [L-] applies if not earthed.

Figure 3 **Typical transformer supply with intermediate tapping**

a) single phase supply with common neutral connection and alternative voltages



b) single phase supply with midpoint connection for protective / earthing purposes

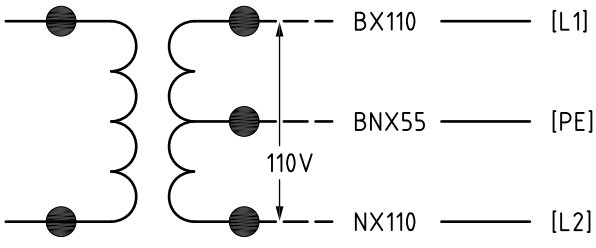


Figure 3 **Typical transformer supply with intermediate tapping**

c) two phase supply with common neutral connection and opposing phases

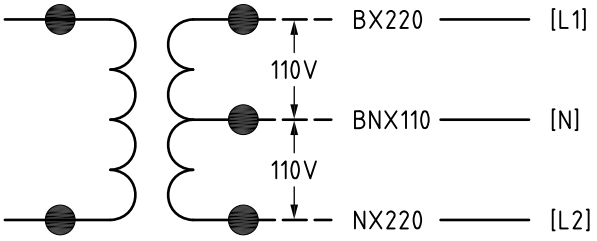
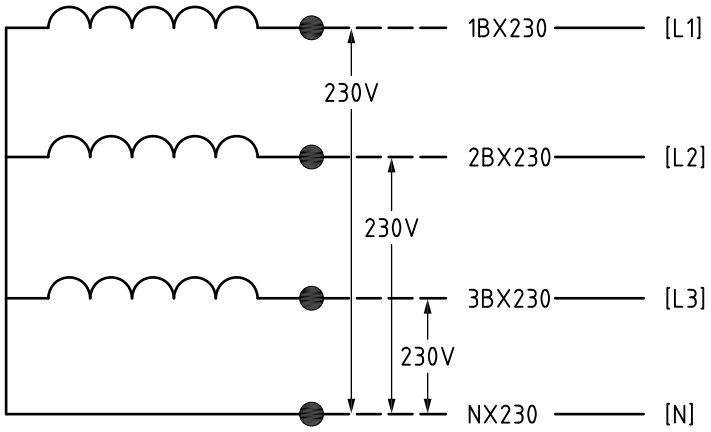
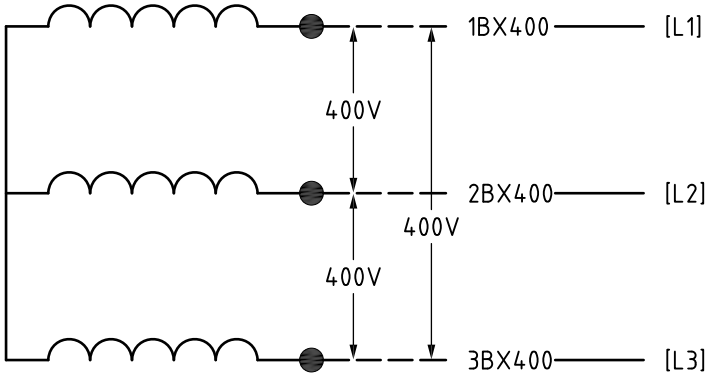


Figure 4 **Typical three phase supply**

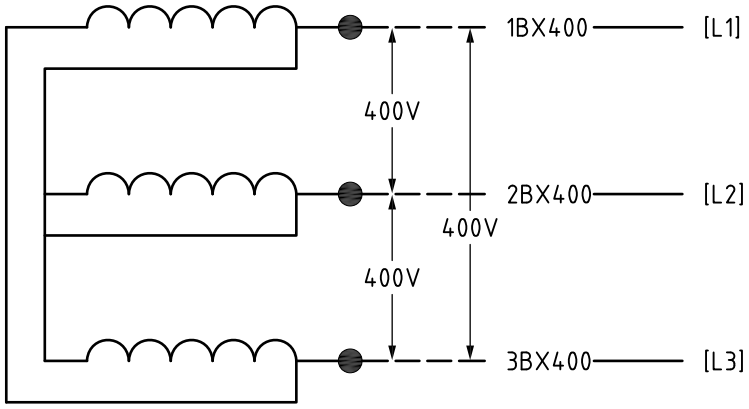
a) star-connected four-wire supply (e.g. for domestic 230V single phase supplies)



b) star-connected three-wire supply



c) delta-connected three-wire supply



NOTE A phase to neutral voltage of 230V represents a nominal phase to phase voltage of 400V (i.e. 1:√3).

6 Other apparatus

The symbols given in Table 5 to Table 10 shall be used, as appropriate:

a) Table 5 – Signal box apparatus;

b) Table 6 – Signals and indicators;

c) Table 7 – Warning, protection and miscellaneous apparatus;

d) Table 8 – Point operating mechanisms, point detectors and combined mechanisms;

e) Table 9 – Train detection apparatus;

f) Table 10 – Conductors and circuit components.

NOTE 1 Symbols are shown in the Table relating to the primary function of the apparatus, but other functions are not excluded.

NOTE 2 For electronic components, measuring instruments and optical fibre cabling see IEC 60617.

Table 5 **Signal box apparatus**

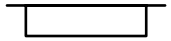
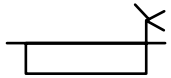
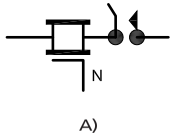
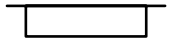
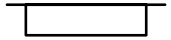
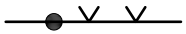
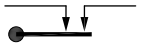
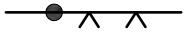
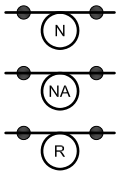
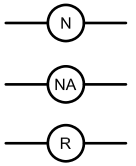
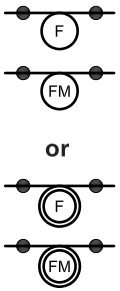
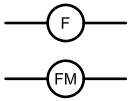
Symbol No.	Nomen-clature	Description	Written circuit	Wiring Symbol
5.1	(N)L, (R)L, etc. [A)]	Electric lever lock, without built in economiser contacts		
5.2	(N)L, (R)L, etc. [A)]	Electric lever lock, with built in economiser contacts		
5.3	L	Electric lock for other purposes, normally de-energized [B)]		
5.4	L	Electric lock for other purposes, normally energized [B)]		
5.5	LCC	Lock proving contact, made when lock out		
5.6	LCC	Lock proving contact, made when lock in		
5.7	–	Lever contacts, examples (see Figure 5 for explanation of letters)		
5.8	–	Push button contacts, examples (see Figure 5 for explanation of letters)		
5.9	–	Thumb switch, 2-position, normal contact		

Table 5 **Signal box apparatus**

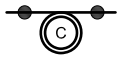
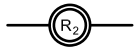
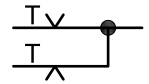
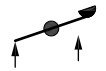
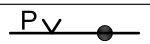
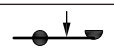
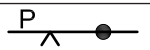
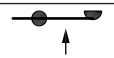
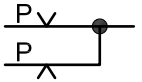
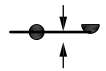
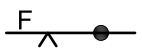
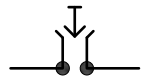
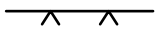
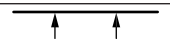
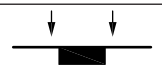
Symbol No.	Nomen-clature	Description	Written circuit	Wiring Symbol
5.10	–	Thumb switch, 2-position, reverse contact		
5.11	–	Thumb switch, 3-position, left contact, anti-clockwise		
5.12	–	Thumb switch, 3-position, centre contact		
5.13	–	Thumb switch, 3-position, right contact, clockwise		
5.14	–	Thumb switch, multi-position, normal contact		
5.15	–	Thumb switch, multi-position, reverse position 1 contact		
5.16	–	Thumb switch, multi-position, reverse position 2 contact		
5.17	–	Thumb switch, multi-position, reverse position 3 contact		
5.18	N [C]	Switch, hand operated	See symbols **4.33**, **4.34** and **4.35**	
5.19	N [C]	Key ‘break’ and ‘make’		
5.20	N [C]	Push button or plunger, ‘push to break’ [D]		
5.21	N [C]	Push button or plunger, ‘push to make’ [D]		
5.22	N [C]	Push button or plunger, ‘break’ and ‘make’ [D]		
5.23	N [C]	Floor push or floor plunger contact, push to ‘make’		
5.24	JN [C]	Time release, manual, normal contact		
5.25	JN [C]	Time release, manual, made after release time		

Table 5 **Signal box apparatus**

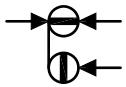
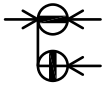
Symbol No.	Nomen-clature	Description	Written circuit	Wiring Symbol
5.26	BN	Contact on signal box closing or block switch, made when box open		
5.27	BN	Contact on signal box closing or block switch, made when box closed		
5.28	BN	Contact on signal box closing or block switch, intermediate position		
5.29	BN	Contacts on signal box closing or block switch, dependent contacts		
5.30	P [C)]	Catch handle contact, one way, made when lever normal and handle released	 **or**  E)	
5.31	P [C)]	Catch handle contact, one way, made when lever reverse and handle released	 **or**  E)	

Table 5 **Signal box apparatus**

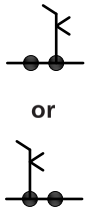
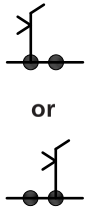
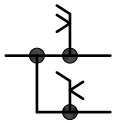
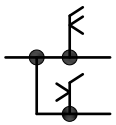
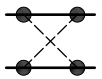
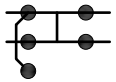
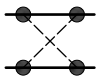
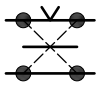
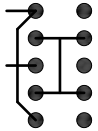
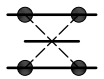
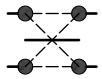
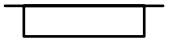
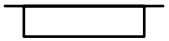
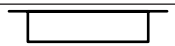
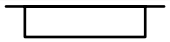
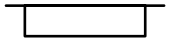
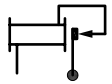
Symbol No.	Nomen-clature	Description	Written circuit	Wiring Symbol
5.32	P [C)]	Catch handle contact, one way, made when lever normal and handle grasped	 E)	
5.33	P [C)]	Catch handle contact, one way, made when lever reverse and handle grasped	 E)	
5.34	P [C)]	Catch handle two way dependent contacts, made when lever normal (changeover when handle grasped)	 E)	
5.35	P [C)]	Catch handle two way dependent contacts, made when lever reverse (changeover when handle grasped)	 E)	
5.37	C	Pole changing contacts, showing normal position		 or 
5.38	C	Pole changing contacts with open position		 normally closed  normally open 

Table 5 **Signal box apparatus**

Symbol No.	Nomen-clature	Description	Written circuit	Wiring Symbol
5.39	C	Special contact, requiring reference to notes (add numerals if necessary: #1, # 2, etc.)		
5.40	KE	Electric lamp or LED used as indicator		
5.41	X	Bell, general symbol		
5.42	X	Bell, single stroke		
5.43	X	Magneto bell		
5.44	X	Buzzer		
5.45	K [F]	Indicator, electromagnetic type		

[A] Showing locking position by letters as in Figure 5.

[B] Function to be indicated.

[C] It is necessary for the basic letter N or P to be preceded by a descriptive letter, e.g. GN = signal switch.

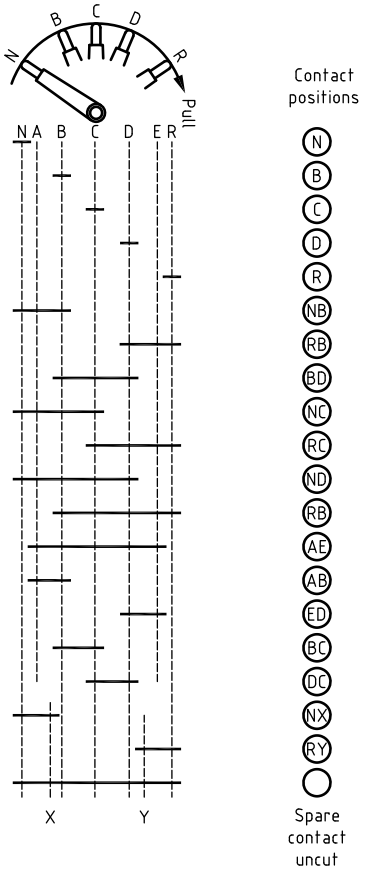
[D] Any toggle feature, stay-put or lock button to be indicated.

[E] The isolated dot represents the arm.

[F] Details of type may be added. The letter K to be preceded by a descriptive letter, e.g. G = signal, Y = slot, T = track circuit, etc.

Figure 5 **Lever, thumb switch and push button contacts**

a) **levers with end position as normal**



Key

N Full normal position of lever

B Normal indication position

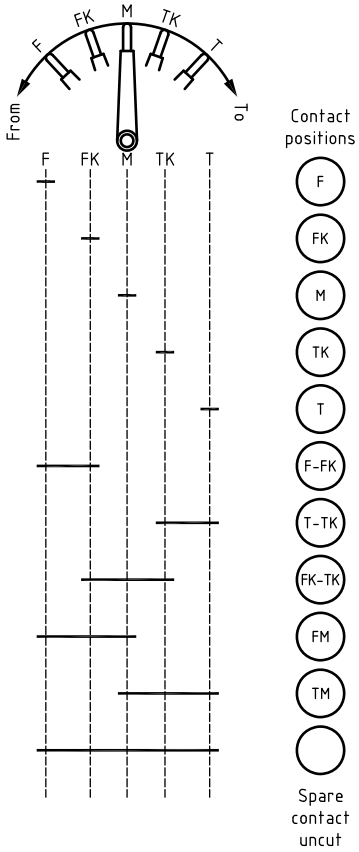
C Centre position

D Reverse indication position

R Full reverse position.

A, X, Y, E positions, contacts are just broken at N, B, D, R, respectively.

b) **contacts with centre position as normal (push-pull movement)**



Key

M Middle position

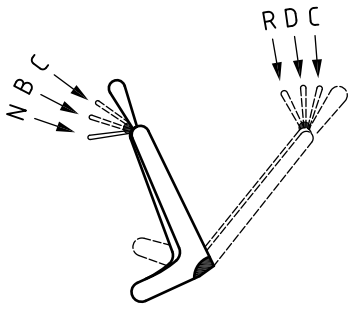
F Full push position

FK Push indication position

TK Pull indication portion

T Full pull position.

c) **lever positions with catch handle locking**



NOTE 1 Contacts for other positions may be used as required.
NOTE 2 Heavy horizontal lines indicate portion of cycle of lever/switch through which circuit is closed.

Table 6 **Signals and indicators**

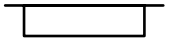
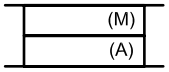
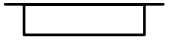
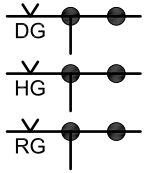
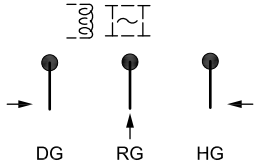
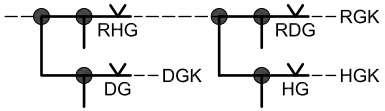
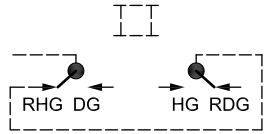
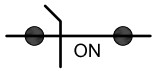
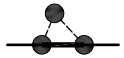
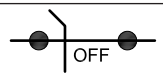
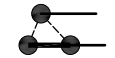
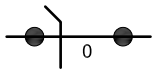
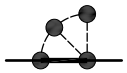
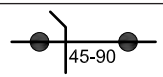
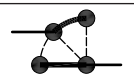
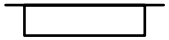
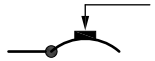
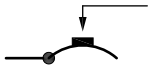
Symbol No.	Nomen-clature	Description	Written circuit	Wiring symbol
6.1	E [A)]	Electric lamp, double pole, including light emitting diode (LED) module		
6.2	E	Electric lamp, triple pole	 B)	
6.3	M [C)]	Motor, general symbol		
6.4	G	Polar searchlight signal mechanism with independent proving contacts		 D)
6.5	G	Polar searchlight signal mechanism with two sets of dependent proving contacts [E)]		 F)
6.6	GC, YC	Arm or slot contact for 2-position signal, ON contact		**normally ON** 
6.7	GC, YC	Arm or slot contact for 2-position signal, OFF contact		
6.8	GC	Arm contact for 3-position signal, ON contact (0^{O})		
6.9	GC	Arm contact for 3-position signal, extended contact, made from 45^{O} to 90^{O} [G)]		

Table 6 **Signals and indicators**

Symbol No.	Nomen-clature	Description	Written circuit	Wiring symbol	
6.10	Y	Electric disengager, or slot, for mechanically operated signal		**energize to disengage** 	**energize to engage** 
6.11	C	Heat operated contact, externally heated		**normally hot** 	**normally cold** 

[A)] Type to be stated, together with appropriate nomenclature, e.g. GE = signal lamp.

[B)] (M) = main; (A) = auxiliary.

[C)] With appropriate nomenclature, e.g. GM = signal motor; WM = point motor.

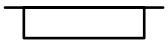
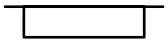
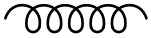
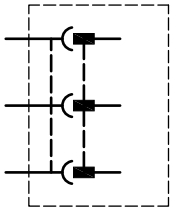
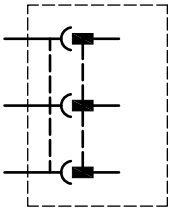
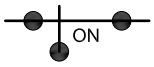
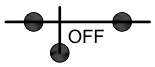
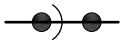
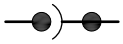
[D)] Example shows a.c. mechanism.

[E)] Showing typical signal repeating circuit.

[F)] Example shows a.c. mechanism.

[G)] Other inclusive angles of contact may also be shown below the symbol.

Table 7 **Warning, protection and miscellaneous apparatus**

Symbol No.	Nomenclature	Description	Written circuit	Wiring symbol
7.1	X	Electrically-operated horn		
7.2	X	Bell	See symbol **5.41**	
7.3	I; (SUPP)I	Automatic warning system (AWS) inductor; AWS suppressor coil		
7.4	–	Multipole plug and socket fitted to apparatus [A)]		
7.5	V	Electromagnet, trainstop	See symbol **2.1**	
7.6	VC	Trainstop, arm ON contact		**normally ON** 
7.7	VC	Trainstop, arm OFF contact		
7.8	C	Moving bridge, circuit coupler contacts, made when bridge set for railway		**normally made**  **normally broken** 

[A)] Symbol taken from IEC 60617. Function to be stated, e.g. train protection and warning system (TPWS) overspeed system (OSS) or trainstop system (TSS) loop

Table 8 **Point operating mechanisms, point detectors and combined mechanisms**

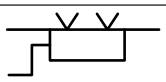
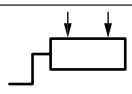
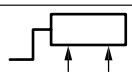
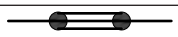
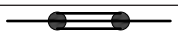
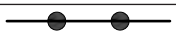
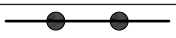
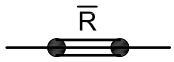
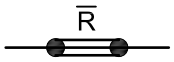
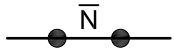
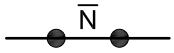
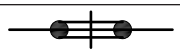
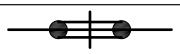
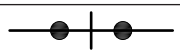
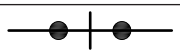
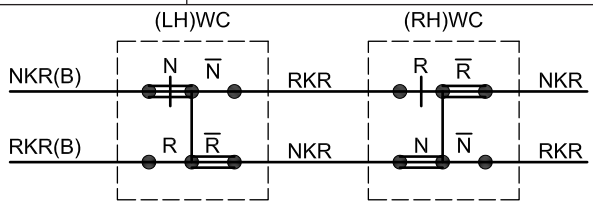
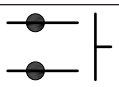
Symbol No.	Nomenclature	Description	Written circuit	Wiring symbol
8.1	WM	Motor, point operating mechanism	See symbol **6.3**	
8.2	WV	Point valve, electropneumatic, or electrohydraulic	See symbol **2.1**	
8.3	C	Switch contacts made by insertion of detachable hand crank or lever		
8.4	C	Switch contacts broken by insertion of detachable hand crank or lever		
8.5	WC	Detector contacts, points only, contact made when points normal		
8.6	WC	Detector contacts, points only, contact made when points reverse		

Table 8 **Point operating mechanisms, point detectors and combined mechanisms**

Symbol No.	Nomenclature	Description	Written circuit	Wiring symbol
8.7	WC	Detector contacts, points only, contact made when points NOT reverse		
8.8	WC	Detector contacts, points only, contact made when points NOT normal		
8.9	WC	Detector contacts, for both points and bolts/facing point locks (FPLs), contact made when points normal and bolt in		
8.10	WC	Detector contacts, for both points and bolts/FPLs, contact made when points reverse and bolt in		
8.11	(LH)WC, (RH)WC	Mechanisms with two sets of dependent detector contacts [A]		
8.12	WC	Detector contacts, for bolt only, bolt in		**bolt normally in**  **bolt normally out** 
8.13	WC	Detector contacts, for bolt only, bolt out		 

[A] Example shows part of a clamp lock detection circuit with two mechanisms.

Table 9 **Train detection apparatus**

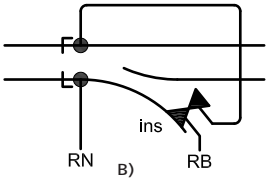
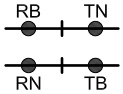
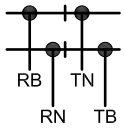
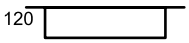
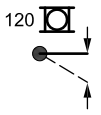
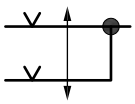
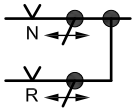
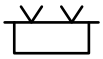
Symbol No.	Nomenclature	Description	Written circuit	Wiring symbol
9.1	TR, TQ, TRO, TRH, TRJ, TRg, TFT, TFH, TFI, TFg	Track circuit components	See symbols **2.1**, **2.3**, **4.1**, **4.4**, **4.11**, **10.23**, **10.27**,**10.31**	
9.2	(INT)	Track section interrupter, at trap / catch points, or buffer stops		
9.3	RB, RN, TB, TN [C]	Track cable connections at insulating rail joints		

Table 9 **Train detection apparatus**

Symbol No.	Nomenclature	Description	Written circuit	Wiring symbol
9.4	TCTx	Coded track circuit, code transmitter [D]		
9.5	–	Coding contacts, non-polarized		
9.6	–	Coding contacts, polarized		
9.7	C	Treadle contact , made when clear		
9.8	C	Treadle contact, made when occupied		
9.9	C	Depression bar contact, made when clear		
9.10	C	Depression bar contact, made when occupied		

[A] Hatching denotes insulated mounting to rail.

[B] "ins" indicates insulated interrupter (example shows series bonding).

[C] "TB" indicates supply connection to rail (positive or feed side)
"TN" indicates supply connection to rail (negative or return side)
"RB" indicates track circuit relay connection to rail (positive or feed side)
"RN" indicates track circuit relay connection to rail (negative or return side)
(example shows electrical staggering of adjacent track circuits)

[D] Number indicates frequency.

Table 10 **Conductors and circuit components**

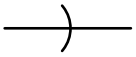
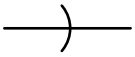
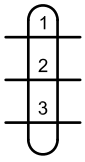
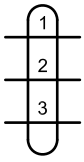
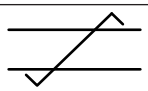
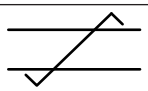
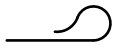
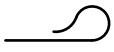
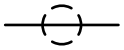
Symbol No.	Nomen-clature	Description	Written circuit	Wiring symbol
10.1	–	Conductor [A]		
10.2	–	Demarcation between internal and external wiring (concave side = internal)		
10.3	–	Multicore cable, with conductor identification [A] [B]		
10.4	–	Conductors, twisted [A] [B]		
10.5	–	Conductor, not connected and specially insulated [A] [B]		
10.6	–	Conductor, screened [A] [B]		

Table 10 **Conductors and circuit components**

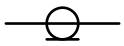
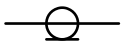
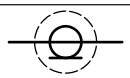
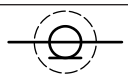
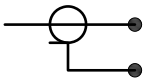
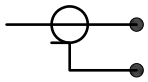
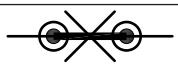
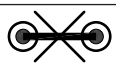
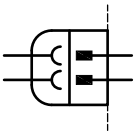
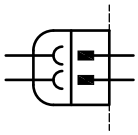
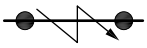
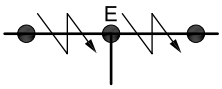
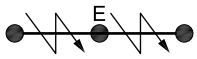
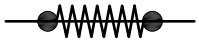
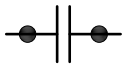
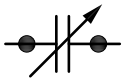
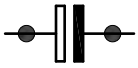
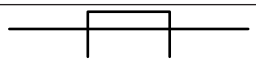
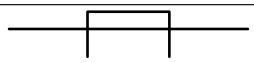
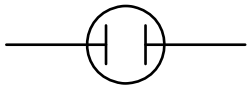
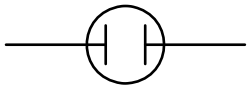
Symbol No.	Nomen-clature	Description	Written circuit	Wiring symbol
10.7	–	Coaxial cable, pair [A) B)]		
10.8	–	Coaxial pair, screened [A) B)]		
10.9	–	Coaxial pair, connected to terminals [A) B)]		
10.10	t	Terminal, single, or soldered connection, general symbol		
10.11	t	Terminal, double, or solder / solder connector		
10.12	t	Terminal or connector, blade / solder		
10.13	t	Terminal or connector, solder / screw		
10.14	t	Terminal, single, screw		
10.15	t	Terminal, double, screw, with disconnecting link		
10.16	t	Terminal, double, disconnected		
10.17	t	Terminal, double, with link preventor		
10.18	–	Connector, male contact [B)]		
10.19	–	Connector, female contact [B)]		
10.20	–	Connector, plug and socket [B)]		
10.21	–	Connector (example with female contacts in movable plug and male contacts in fixed receptacle) [B)]		
10.22	g	Lightning arrester, surge protector, 2 pole		
10.23	g	Lightning arrester, surge protector, 3 pole [C)]		
10.24	–	Spark gap [B)]		
10.25	O	Resistor, general symbol, inductive or non-inductive [D)]		
10.26	O	Resistor, practically non-inductive for the purpose for which it is used		

Table 10 **Conductors and circuit components**

Symbol No.	Nomen-clature	Description	Written circuit	Wiring symbol
10.27	O	Resistor, variable (irrespective of the means of variation)		
10.28	O	Resistor, voltage dependent		
10.29	I	Inductor	See Table 4.	
10.30	H	Capacitor, general symbol	 B)	
10.31	H	Capacitor, adjustable	 B)	
10.32	H	Capacitor, polarized	 E)	 E)
10.33	–	Ferrite bead, or ferrite core	 B)	 B)
10.34	–	Neon, for spark quenching		

A) Nomenclature used to identify the colour of individual cores shall conform to BS 7645.

B) Symbol taken from IEC 60617 (except terminals).

C) Earth connection point indicated by "E".

D) Though primarily intended to represent a non-inductive resistor, this symbol may be used to represent resistive circuit which in general are more or less inductive, and to represent windings of machines and apparatus when no confusion may be caused by its use.

E) Open plate is positive.

7 Nomenclature for circuit diagrams

7.1 General

The following two-part nomenclature shall be used in connection with written circuits and the labelling of wires.

NOTE 1 It may also be used to advantage with wiring symbols.

a) Numerical prefix. The number of the principal lever or signalling function, such as signal, track circuit, etc. affecting the control of, or controlled by, the apparatus.

NOTE 2 To avoid confusion, lever numbers should not be used for other devices, as this would create duplication of numbers.

NOTE 3 Where a signalling function operates multiple apparatus, each should be distinguished by the use of suffix letters. This includes, for example, multiple-ended points or push-pull levers with centre position as normal.

NOTE 4 Where necessary,to avoid confusion, the control number may be prefixed by an alphabetic signal box code. (If letters are used instead of numbers, e.g. for track circuit identity, the two parts of the designation should be clearly separated.)

b) Alphabetical term. Consisting of one or more letters, the final letter is used as a noun and constitutes the generic term for the apparatus, whilst any preceding letters, used as adjectives, denote the purpose of the apparatus. The assigned letters are listed in Table 11.

NOTE 5 As far as practicable, the letters in Table 11 are prescribed either because they form the initial of the words they represent, for example: B, Block; or because of usage: D, Clear, or H, Caution. However, many other letters are arbitrarily chosen, such as J, Rectifier, or U, Route. Some of the letters present several different meanings, depending on their relative position in the name, but, if the nomenclature is used consistently, there should be no mistake in the meaning.

NOTE 6 In the case of apparatus with no letter designation, a descriptive word should be included in brackets, such as 10(RESET)R, but, if no confusion would result, the brackets may be omitted.

Where reference is to be made to the position of levers, switches, push buttons or any other device operated by the signalman, as in the case of a lever lock or a relay repeating a lever position, the letters which appear in Table 5, symbols **5.7** to **5.17** shall be used in brackets immediately before the final letter.

NOTE 7 Combinations of nouns are acceptable separated by a "/" where different types of apparatus are combined, e.g. T/J for transformer-rectifier.

NOTE 8 Lower case terms, such as "f" (fuse) and "t" (terminal), may follow the final letter.

Where it is necessary to provide more than one relay for a particular function due to insufficient contacts on a single relay, numerals shall be used in conjunction with the descriptive letter "P", or the letter "P" repeated, e.g. for cascaded repeat relays.

NOTE 9 Practices vary both in the position of the numeral and in the method of distinguishing between parallel repeat and cascaded repeat relays. Consistency should be maintained in such situations.

The number of characters shall be kept to a minimum, commensurate with the need to uniquely define the purpose of the apparatus.

Nomenclature used to identify the colour of apparatus, or individual cores in a cable, shall conform to BS 7645.

Table 11 **Assigned letters**

Letter	Descriptive term (Preceding letters)	Letter	Apparatus generic term (Last letter)
A	Approach; Arrived; Automatic	A	Axle counter
B	Block; Bolt	B	Block instrument
C	Checking or proving; Coding	C	Contact; Detection apparatus
D	Clear (green); Decoding	D	–
E	Light; Heat (externally applied); Emergency; Earth	E	Electric lamp (lighting); Earth
F	Fog; Flashing; Feed	F	Fogging apparatus (e.g. detonator placer)
f	Frequency	f	Fuse
G	Signal	G	Signal apparatus

Table 11 **Assigned letters**

Letter	Descriptive term (Preceding letters)	Letter	Apparatus generic term (Last letter)
		g	Lightning or surge arrester
H	Caution (yellow)	H	Capacitor
HH	Preliminary caution (double yellow)		
I	Automatic warning system (AWS)	I	Inductor
J	Time (delayed action)	J	Rectifier; Diode
K	Indicating or detecting	K	Indicator (visual)
L	Locking; Left	L	Lock
M	Marker; Magnetic	M	Motor
N	Normal	N	Release; Hand-operated switch; Push button or key
O	Retarder	O	Resistor; Heater
P	Repeating	P	Lever catch handle, latch or trigger contact
Q	Treadle or bar	Q	Local coil of double element relay; Treadle or bar
R	Reverse; Right; Danger (red)	R	Relay or contactor (control coil of double element relay)
Rx	Receiving	Rx	Receiver
S	Stick	S	–
T	Track circuit; Train	T	Transformer; Transmitter
		t	Terminal
Tx	Transmitting	Tx	Transmitter
U	Route	U	Train description apparatus
V	Trainstop (including TPWS)	V	Trainstop (including TPWS) apparatus
W	Points	W	Points operating apparatus
X	Audible indicator (such as bell, buzzer, horn) Level Crossing; Wrong direction	X	Audible indicator (such as bell, buzzer, horn)
Y	Slotting or disengaging	Y	Slot or disengaging apparatus
Z	Special (to be explained on plan)	Z	Special unit (to be explained on plan)
Up	Up (direction of traffic)		
Dn	Down (direction of traffic)		

7.2 Clarification and examples

If "10" is the number of a signal, when used to refer to the signal the term shall be "10G", but when the Figure is used alone, it shall refer to the lever or other device operated by the signalman for the control of the signal. Thus "10(N)R" shall indicate a relay repeating the normal position of the lever, thumb switch, etc.

Likewise, "10HR" shall indicate a relay controlling the caution (yellow) aspect of signal 10. The complete designation of the apparatus shall therefore be made up as follows:

(numerical prefix)	(prefix letter)	(final letter)		
10	H	R	=	10HR

NOTE Other examples are given in Table 12, in the order of the generic term.

Table 12 **Examples of the use of assigned letters**

Generic term	Example	Explanation
B	DnB	Block instrument, down (direction of traffic)
C	***LCC	Lock proving contact for Lever ***
	***WC	Detection apparatus for Points ***
E	***GE	Electric lamp lighting all aspects of Signal ***
	***DE	Electric lamp lighting clear aspect of Signal ***
	***(6)UE	Electric lamp lighting 6 indication of route indicator working in connection with Signal ***
F	***TF	Feed for Track Circuit ***
G	***G	Apparatus for operating Signal ***
	***DG	Apparatus for operating clear aspect of Signal ***
	***HG	Apparatus for operating caution aspect of Signal ***
	***(6)UG	Route signal apparatus working in conjunction with Signal ***, displaying the indication "6"
	***(Sdg)UG	Route signal apparatus working in conjunction with Signal ***, displaying the indication for siding
I	***I	AWS inductor for Signal ***
K	***EK	Indicator (visual) for light on Signal ***
	***G/EK	Indicator (visual) for aspect and light on Signal ***
	***GK	Indicator (visual) showing aspect of Signal ***
	***HHGK	Indicator (visual) showing preliminary caution aspect of Signal ***
	***RGK	Indicator (visual) showing red aspect of Signal ***
	***LK	Indicator (visual) for lock on Lever ***
	***TK	Indicator (visual) for Track Circuit ***
	***NWK	Indicator (visual) showing normal position of Points ***
	***YK	Indicator (visual) in connection with slot on Lever ***
		*NOTE Where the indicator is of the lamp type, add the letter "E", e.g. ***DGKE*
L [A)]	***(B)L	Lock effective in normal indication (backlock) position of Lever ***
	***(F)L	Lock effective in push position of push-pull Lever ***
	***(N)L	Lock effective in normal position of Lever ***
	***(M)L	Lock effective in mid position of push-pull Lever ***
	***(R)L	Lock effective in reverse position of Lever ***
	***(NB)L	Lock effective in normal, also in normal indication, position of Lever ***
	***(NBDR)L	Lock effective in normal, normal indication, reverse indication and reverse positions of Lever ***
M	***GM	Motor operating Signal ***
	***WM	Motor operating Points ***
Q	***TQ	Local winding on track relay ***

Table 12 **Examples of the use of assigned letters**

Generic term	Example	Explanation
R	***GASR [B)]	Stick relay for approach control of Signal ***
	***DECR	Relay proving the light for the clear aspect of Signal ***
	***VCR	Relay proving the position of Trainstop ***
	***DR	Relay controlling the clear aspect of Signal ***
	***HR	Relay controlling the caution aspect of Signal ***
	***HHR	Relay controlling the preliminary caution aspect of Signal ***
	***JR	Time delay relay in connection with Lever ***
	***PGR	Relay controlling repeating signal of Signal ***
	***WKR	Relay for indicating or detecting position of points worked by Lever ***
	***NWKPR	Relay repeating the normal detection relay of Points ***
	***TPR	Relay repeating the relay of track circuit ***
	***SR	Stick relay working in conjunction with Lever ***
	***TR	Relay of Track Circuit ***
	***WR	Relay or contactor controlling Points ***
	***XNSR	Stick relay operating when Level Crossing *** is normal
	***YR	Relay controlled by Slot *** or disengaging Lever ***
U	DnU	Train description apparatus, for down traffic
V	***V	Trainstop apparatus associated with Signal ***
W	***NW	Apparatus for operating Points *** to the normal position
	***BRW	Apparatus for operating the B end of Points *** to the reverse position
Y	***GY	Disengaging apparatus associated with Signal ***

[A)] Letters in brackets preceding letter "L" refer to lever position (see Figure **5**).

[B)] As the lever will generally be used for one piece of apparatus only, the first letter may be omitted if desired.

7.3 Designation of circuits, contacts and terminals

To enable labelling to be applied in a clear and concise manner, the following rules shall be followed for the designation of circuits and terminals:

a) Each circuit shall have a name suggested by the function of the circuit, usually the number and name of the apparatus that the circuit operates.

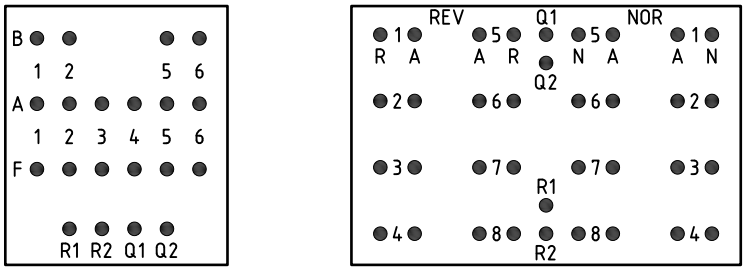
b) Every apparatus shall have a number (or letter) and name.

c) Fuses and terminal blocks shall be consecutively numbered and/or lettered according to the housing in which they are located.

d) Where it is necessary to indicate polarity, the left-hand or upper terminal shall be the positive. The general convention is that the feed wire goes to the left or top apparatus terminal and the return goes to the right or bottom terminal.

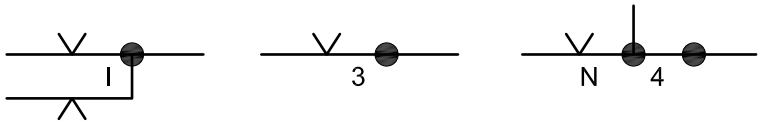
e) Where not otherwise identified, the terminals connected to the operating coil of a single element relay shall be marked R1, R2. In the case of a double element relay, the local coil shall be marked Q1, Q2, and the control coil R1, R2, as shown in Figure 6.

Figure 6 **Marking of terminals on typical non-polar and polar relays**



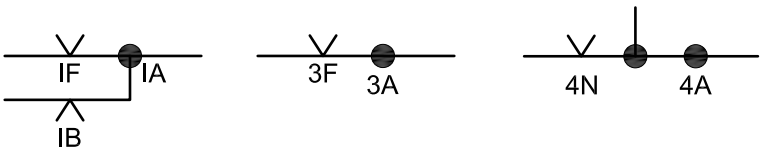
f) Relay arms shall be numbered on the circuit diagram, as shown in Figure 7. Where not otherwise identified, the left, top, or remote position shall be given the lowest number.

Figure 7 **Numbering of relay arms**



g) Where not otherwise identified, individual terminals shall, where practicable, be distinguished on the circuit diagram by the letters given in Table 13, with the arm number preceding the contact letter, as shown in Figure 8. However, for relays that conform to BS 8586, the nomenclature of BS 8586 shall be used instead.

Figure 8 **Identification of individual relay terminals**



NOTE These relate to the typical relays and examples given in Figure 6 and Figure 7.

Table 13 **Contacts of relays that are hinged at the arm**

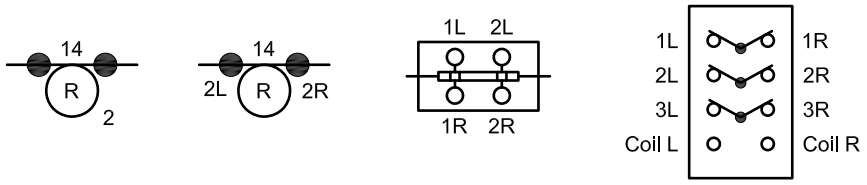
Non-polar relays	**Polar relays**
F – front or top contact, made when relay energized	N – N position contact
	R – R position contact
B – back or bottom contact, made when relay de-energized	D – de-energized position contact
A – arm	A – arm

h) Likewise, lever contacts shall be numbered on the circuit diagram, the left, top, or remote position, being given the lowest number, as shown in Figure 9. Where practicable, the individual terminal shall be distinguished by letters with the contact number preceding the terminal letter:

L – left or top

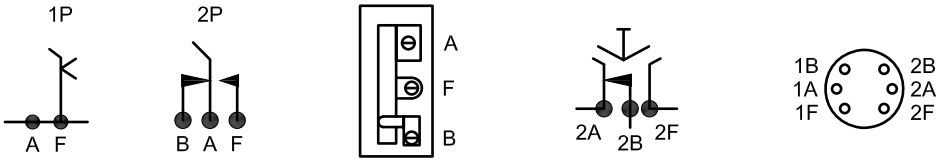
R – right or bottom.

Figure 9 **Examples of terminals for lever contacts and lock proving contacts**



i) Where practicable, manual devices shall be distinguished in a similar manner. Some examples are given in Figure 10.

Figure 10 **Examples of terminals for catch handle contacts and foot plungers**



7.4 Labelling of wires

Wires shall be sufficiently identified to enable them to be connected to the correct terminal.

NOTE Recommendations are given in Annex B.

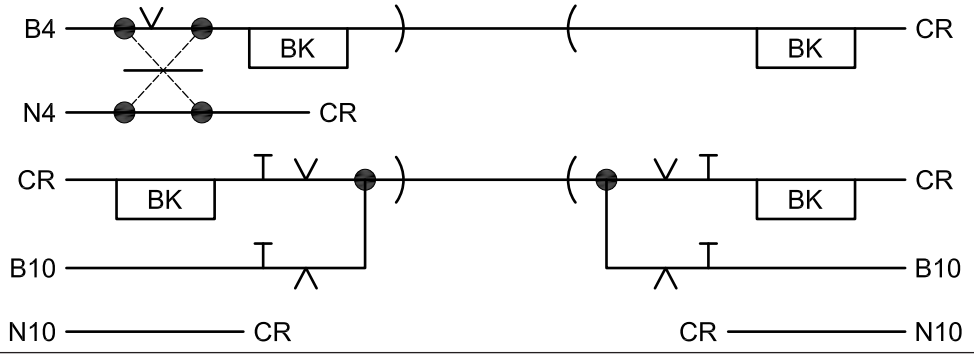
Annex A (informative)

Examples of written circuits and wiring symbols

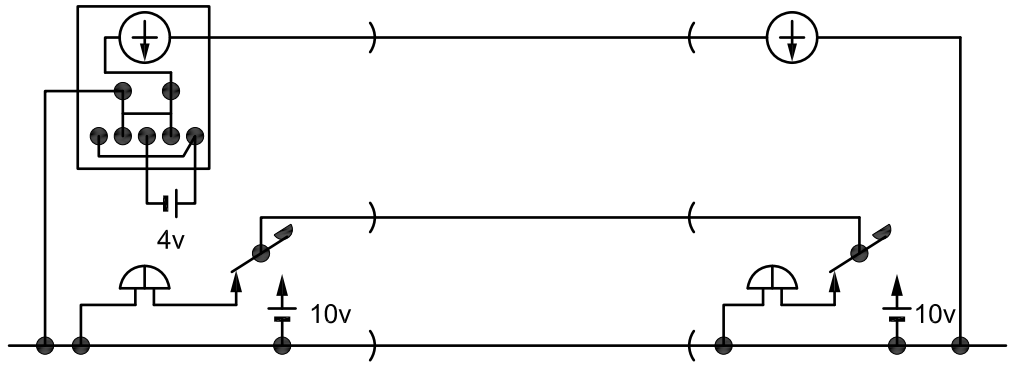
The following examples are typical as regards the application of the symbols but do not necessarily represent standard signalling or wiring practice.

Figure A.1 **Block indicator and bell**

a) Written circuit



b) Wiring symbols



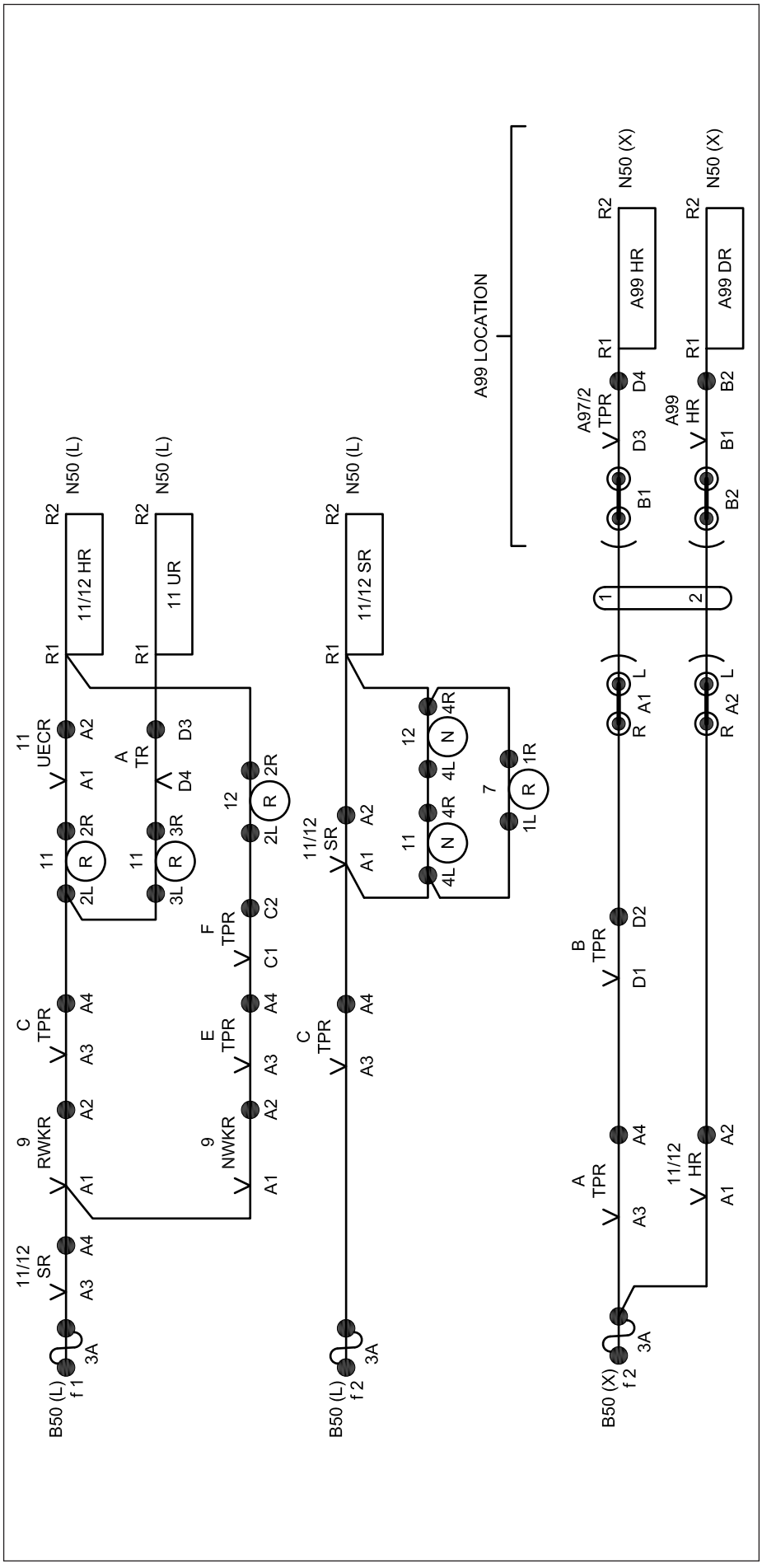


Figure A.2 **Signal controls (written circuit)**

Figure A.3 **Point controls (written circuit)**

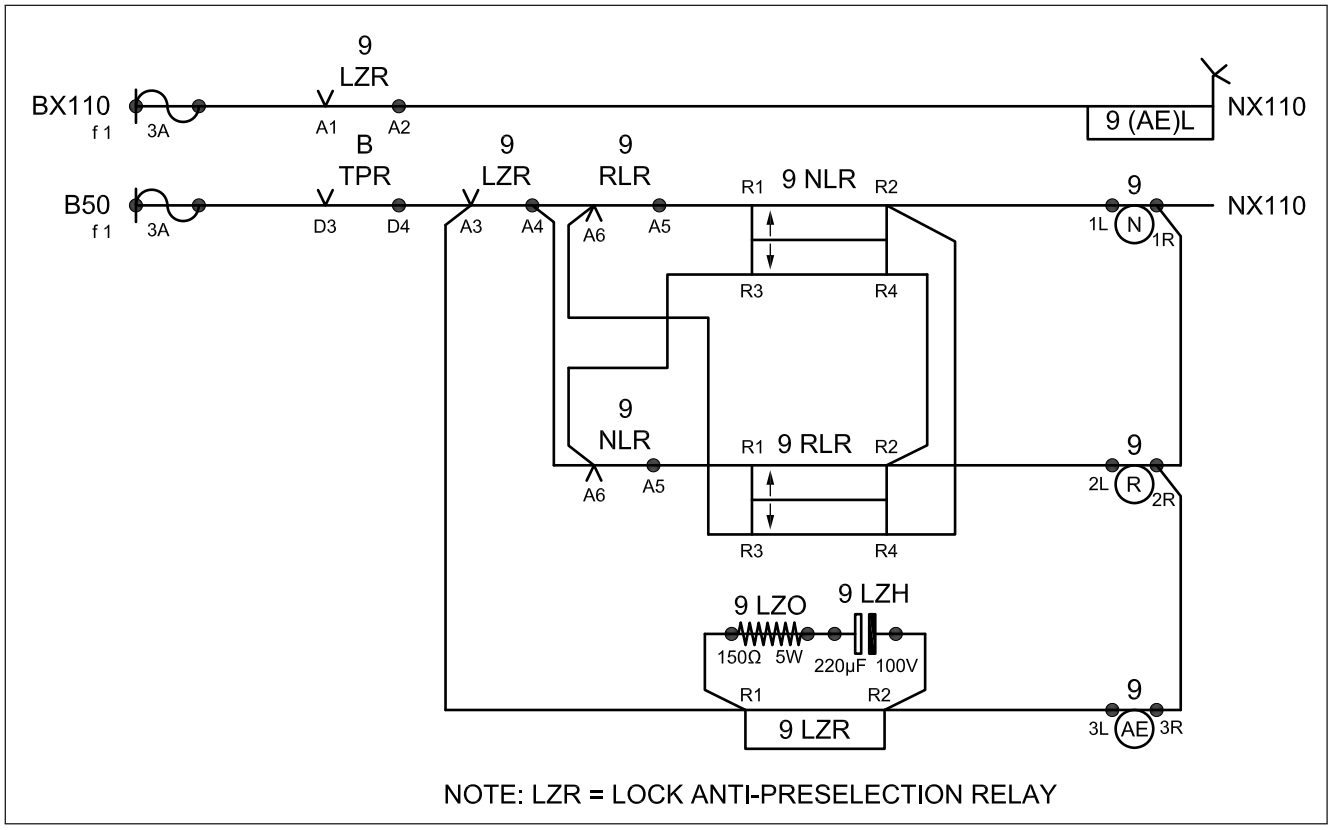
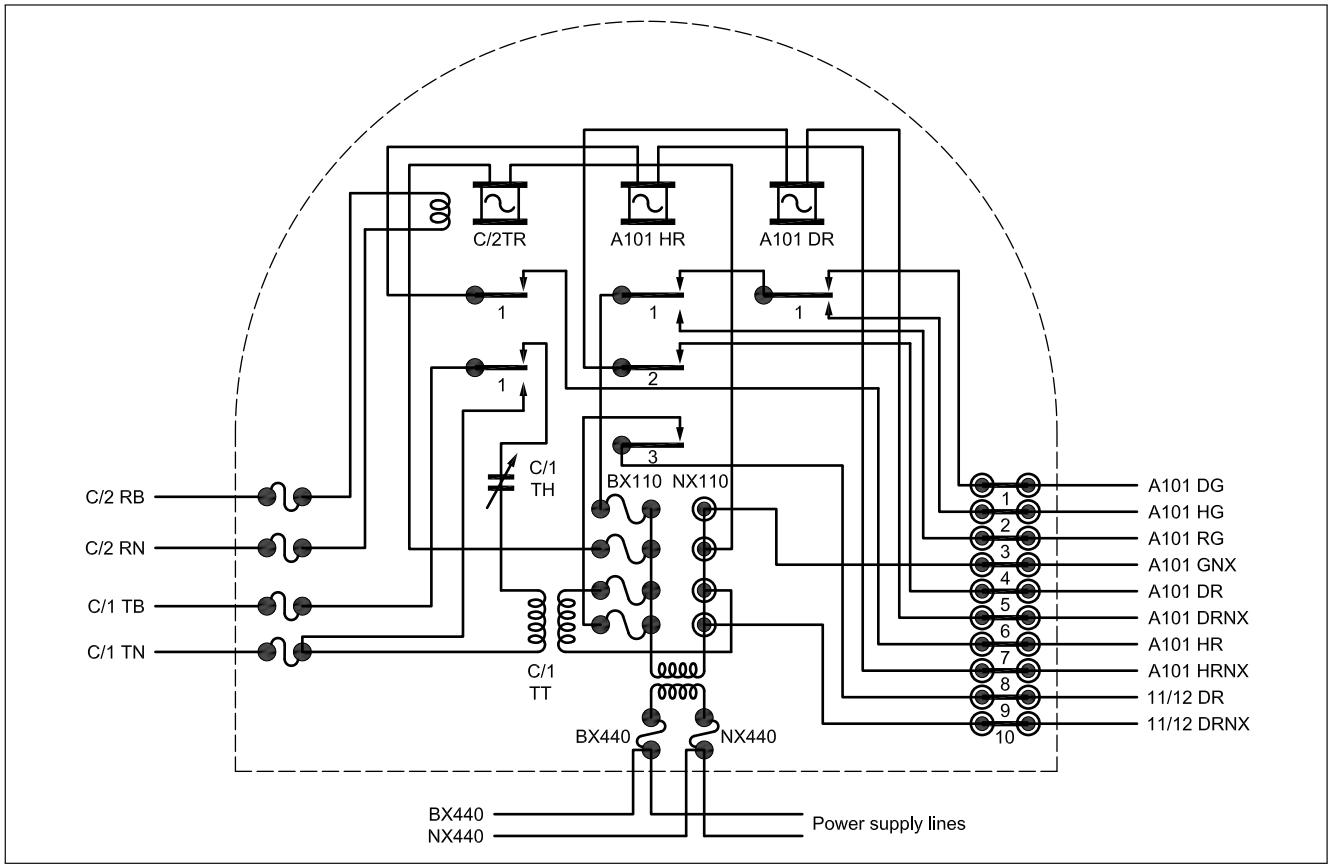


Figure A.4 **Signal location (wiring symbols)**



Annex B (informative)

Labelling wires

In installing wiring from a circuit diagram, the installer should be able to clearly understand how the wires are to be run and should be able to name and label each wire so that it can be identified with the corresponding line on the diagram. This applies to both written circuits and wiring symbols.

NOTE It is not necessary, as a general rule, to insert any wire nomenclature on the circuit diagram, as once the system is understood, a name can be given to the wire by reference to the apparatus to which it is connected and the circuit of which it forms a part, but testing will be facilitated if every wire is labelled at both ends.

The wire label should bear the name of the circuit and underneath this the name and/or number of the terminal to which that end of the wire is attached followed by the name and/or number of the terminal to which the other end of the wire is attached.

Example: 11/12SR

11/12SR(A1) – 11(N) (4L)

Explanation: A wire in 11/12SR circuit (see Figure A.2) going from A1 contact on 11/12SR to the left or top terminal of Lever 11 Normal contact 4.

The name of the destination terminal may be omitted from the label, provided that this is done consistently and no confusion will result.

Bibliography

Standards publications

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 7671, *Requirements for electrical installations*

IEC 60617:2012, *Graphical symbols for diagrams*

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