Note Coating

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BRITISH ELECTRICITY BOARDS

SPECIFICATION
FOR
STANDARD NUMBERING
FOR
SMALL WIRING
FOR
SWITCHGEAR AND TRANSFORMERS TOGETHER WITH THEIR ASSOCIATED RELAY AND CONTROL PANELS
1964

This document is issued by the British Electricity Boards following collaboration with the Switchgear and Transformer Sections of BEAMA

STANDARD NUMBERING FOR SMALL WIRING FOR SWITCHGEAR AND ASSOCIATED RELAY AND CONTROL PANELS

Rules for Application

1. GENERAL

1.1. Each wire shall have a letter to denote its function, e.g. control of circuit breaker, current transformer for primary protection, voltage for instruments, metering and protection. The function letter shall be followed by a number identifying the individual wire. Every branch of any connection shall bear the same identification mark. Where it is necessary to identify branches which are commoned (e.g. current transformer leads), different identification marks for the branches may be employed only if they are commoned through links, or are connected to separate terminals which are then commoned by removable connections. Suffix letters shall be used as indicated in section 4.

1.2. Numbering shall read from the terminals outwards on all wires.

2. PREFIX LETTERS

2.1. Where part of a circuit is common to more than one function, the first in alphabetical order of the appropriate function letters in the table, shall be used for the common part. Where the circuits split at a separable contact (e.g. fuse, link, switch or relay contact) the function letter shall change if necessary from the splitting point onwards.

2.2. Circuits having functions not included in the function letter table shall not have prefix letters. For example, circuits of devices which provide a continuous indication, such as remote winding temperature indicators or resistance thermometers, shall not have a prefix letter unless the circuit of the particular indication already has a function letter. Where, however, an indication or alarm is initiated by the opening or closing of an auxiliary contact, prefix 'L' or 'X' should be used as appropriate.

2.3. Where the manufacturer has been unable to ascertain from the purchaser the function letters and numbering to be assigned to equipment wiring by the time that wiring is required, the manufacturer shall himself provide wire numbers preceded by the letter 'O'. Where the appropriate function letter only can be determined, it shall be preceded by an 'O' and followed by the manufacturer's own number. The same procedure may be applied to equipment or parts of equipment not assigned to specific contracts at the time of manufacture, subject to the purchaser's approval and to the use of ferruling in accordance with approved standard diagrams as far as these are applicable.

2.4. Where relays are employed, the coil and the contact circuits do not necessarily bear the same function letter; this should be determined by the function of the individual circuit, e.g. the coil circuit of a series flag relay may be 'K' but the contact circuits may bear letters such as 'X', 'L' or 'N' as appropriate.

2.5. The following rules shall apply to current and voltage transformer function letters.

2.5.1. **Current Transformers for Protection**

Prefix 'C' shall be used for all types of over-current protection (whether used as primary or back-up protection), standby earth fault, generator negative phase sequence, transformer winding temperature protection, and instruments fed from separate current transformers. Where duplicate primary protection is applied prefix 'A' shall be used for both, the second line being distinguished by adding 300 to the number.

2.5.2. **Interposing and Auxiliary Transformers**

The function letters shall follow through any interposing and auxiliary current and voltage transformers, including such transformers when used for light current circuits, provided that these are not used as isolating transformers to couple circuits which have differing functions.

Where an a.c. supply, reflecting the primary quantities and derived from a current or voltage transformer, is rectified for the operation of instruments or relays, the d.c. circuit shall carry the same function letter as the a.c. circuit.

2.5.3. **Current Transformer Connections for Line Drop Compensation or Compounding**

Prefix 'D' shall be used for these circuits, including the current side of the isolating transformer. The connections to the voltage circuit from this transformer shall have prefix 'F'.

2.5.4. **Voltage Transformer Connections for Automatic Voltage Control**

Prefix 'F' shall be used for these circuits.

2.6. Light current equipment may require numbering schemes differing from the above for complete identification. In such cases, where connections from such equipment are associated with power equipment wired in accordance with this Recommendation, the numbering of such connections shall include the appropriate prefix letter (J, W, X or Y) to distinguish them. The letter 'W' is generally used for the light current side of interposing relays for control purposes.

3. WIRE NUMBERS

The wire number may consist of one or more digits as required. For functions A-G, H, J and M, the numbers shall be as given in the column under "Wire Numbers". D.C. supplies from a positive source shall bear odd numbers and d.c. supplies from a negative source shall bear even numbers. Where coils or resistors are connected in series the change from odd to even shall be made at the coil or resistor lead nearest to the negative supply.

4. SUFFIX LETTERS

Where similarly numbered leads from separate primary equipments are taken to a common panel (e.g. bus zone protection, summation metering, banked transformers, etc.), suffixes A, B and C, etc., should be used to distinguish them. Where similarly numbered leads from different parts of a unit of primary equipment are taken to a common panel (e.g. generator and unit transformers, H.V. and L.V. sides of a transformer, etc.), the leads of the subsidiary or lower voltage equipment shall be distinguished by adding 500 to the wire numbers. When more than two sets of leads require to be distinguished, specific wire numbering schemes appropriate to the case shall be issued by means of a standard diagram showing the scheme to be adopted. The method of distinguishing between sets of leads shall be shown on the individual schematic (circuit) and wiring diagrams.

The distinguishing suffixes or numbers apply only in the common panel and at each end of the interconnecting cores.

CIRCUIT FUNCTION LETTERS		WIRE NUMBERS* (See Rule 3)
A	Current transformers for primary protection excluding overcurrent.	10–29 Red phase.
B	Current transformers for busbar protection.	30–49 Yellow phase.
C	Current transformers for overcurrent protection (including combined earth-fault protection) and instruments.	50–69 Blue phase. 70–89 Residual circuits and neutral current transformers.
D	Current transformers for metering and voltage control.	90 Earth wires directly connected to the earth bar.
E	Reference voltage for instruments, metering and protection.	91–99 Test windings, normally inoperative.
F	Reference voltage for voltage control.	
G	Reference voltage for synchronising.	
H	A.C. and A.C./D.C. supplies.	1–69 Switchgear and generators.
J	D.C. supplies.	70–99 Transformers.
K	Closing and tripping control circuits.	
L	Alarms and indications initiated by auxiliary switches and relay contacts, excluding those for remote selective control and for General Indication equipment.	Any number from 1 upwards.
M	Auxiliary and control motor devices, e.g. governor motor, rheostat motor, generator AVR control, spring charging motors, transformer cooler motor control, motors for isolator operation.	1–19 Switchgear. 20–69 Generators. 70–99 Transformers.
N	Tap change control, including AVC, tap position and progress indications.	
O	An indication that the ferruling is not in accordance with the general scheme and that if it is not altered double ferruling will be required for co-ordination with the remaining equipment in the station (see Rule 2.3).	
P	D.C. tripping circuits used solely for busbar protection.	Any number from 1 upwards.
R	Interlock circuits not covered above.	
S	D.C. instruments and relays, exciter and field circuits for generators.	
T	Pilot conductors (including directly associated connections) between panels, independent of the distance between them, for pilot-wire protection, for intertripping or for both.	
U	Spare cores and connections to spare contacts.	Spare cores shall be numbered from 1 upwards in each cable, and shall be so arranged that they can be readily identified on site with the cable containing them. This shall be achieved by suitable grouping, and unless the location of each group is clear from the diagram, the groups shall be labelled. Alternatively the core number shall be preceded by the cable number.
W	Light current control connections (See Rule 2.6)	Any number from 1 upwards.
X	Alarms and indications to and from General Indication and remote selective control equipments.	
Y	Telephones.	

**If, for functions A–G and for functions H, J and M, more numbers are required, add multiples of one hundred (e.g. 10–29 may be extended to 110–129, 210–229, etc.)*

NOTE : The term "remote selective control" denotes "control at a point distant from the switchgear by the transmission of electrical signals through common communication channels using selective means to operate one of a number of switching devices."