

**PURCHASE SPECIFICATION**  
**FOR**  
**PROGRAMMABLE ROTARY SWITCH**  
**FOR**  
**OIL RIG APPLICATION**



**SPECIFICATION NO** : **OR 12361**  
**REVISION NO** : **REV 01**  
**DATE** : **11.5.12**

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**CONTROL EQUIPMENT ENGINEERING DIVISION**  
**BHARAT HEAVY ELECTRICALS LIMITED- BHOPAL**

## Specification for Rotary Switches (Cam Type)

### 01 Introduction

This specification covers the requirement of programmable rotary cam switches for use in generator control & driller's assignment control application for oil rig application. The switch should be suitable for operation at an ambient temperature of 55 degree C and high degree of saline atmospheric condition with relative humidity of 95% as applicable to oil rig application.

The specification includes following programmable rotary switches.

Item No	Item Description	BHEL Style code
Item 01	Synchronizing Switch 5 Position, 18 Pole	BP9048095786
Item 02	Assignment Switch for SCR-1 4 Position, 8 Pole	BP9048121787
Item 03	Assignment Switch for SCR-4 4 Position, 8 Pole	BP9048121795
Item 04	Ammeter Selector Switch 5 Position, 9 Pole	BP9048128536
Item 05	Voltmeter Selector Switch 5 Position, 6 Pole	BP9048128544
Item 06	Engine Control Switch 3 Position, 9 Pole	BP9048124697
Item 07	Field Supply Selector Switch 3 Position, 13 Pole	BP9048132053
Item 08	Hand-Off-Auto Switch 3 Position, 2 Pole	BP9048132061
Item 09	Synchronizing Switch 2 Position, 6 Pole	BP9048124700

### 02. General Requirement

The basic rotary cam switch assembly shall complete with contact block assembly, operator/handle (**without legend plate**). The number of contacts shall be as per switch program given in the specification. The switch assembly shall be flush type suitable for panel mounting. The switching angle shall be 45 degree.

Contact Rating	:	10A, 230VAC & DC
Rated insulation voltage	:	500VAC
Switch type	:	Stay put type
Operator/Handle	:	Metallic knob as per attached Drg-47211010262 R00
Angle of Rotation	:	45 Degree

The switches shall be stay put type with make before break contacts on changeover ie. the contact shall not open while switching from one position to another.

### 03. Brief description of Various Program Switches

1. **Item 01 : Synchronizing Switch (Common switch in Feeder panel)**

The switch is a 5 position, 18 pole program switch used in feeder panel for synchronization of generators with main bus voltage & frequency. The switch assembly shall be complete with contact block assembly & operator (metallic knob). The switching angle shall be 45 degree. The switch assembly shall be as per enclosed program and suitable for panel mounting on single hole of dia 10 mm (suitable for Siemens 3ST1 switch mounting)

Party to furnish the drawing of the offered switch assembly showing the mounting details & overall dimension.

2. **Item 02 : Assignment Switch for SCR-1 (mounting hole 30.5mm)**

The switch is a 4 position, 8 pole program switch used in driller's console for selection/assignment of drive motor with SCR-1 panel in E1400 rigs with IRD. The switch assembly shall be complete with contact block assembly & operator (metallic knob). The switching angle shall be 45 degree. The switch assembly shall be as per enclosed program and suitable for panel mounting on single hole of dia 30.5mm. The switch assembly shall be oil tight assembly suitable for hazardous area application and shall meet IP-65 protection degree.

Party to furnish the drawing of the offered switch assembly showing the mounting details & overall dimension.

3. **Item 03 : Assignment Switch for SCR-4 (mounting hole 30.5mm)**

The switch is a 4 position, 8 pole program switch used in driller's console for selection/assignment of drive motor with SCR-4 panel in E1400 rigs with IRD. The switch assembly shall be complete with contact block assembly & operator (metallic knob). The switching angle shall be 45 degree. The switch assembly shall be as per enclosed program and suitable for panel mounting on single hole of dia 30.5mm. The switch assembly shall be oil tight assembly suitable for hazardous area application and shall meet IP-65 protection degree.

Party to furnish the drawing of the offered switch assembly showing the mounting details & overall dimension.

4. **Item 04 : Ammeter Selector Switch**

The switch is a 5 position, 9 pole program switch used in generator panels for selection of current reading in various phases ie. A, B or C phase. The switch assembly shall be complete with contact block assembly & operator (metallic knob). The switching angle shall be 45 degree. The switch assembly shall be as per enclosed program and suitable for panel mounting on single hole of dia 10 mm (suitable for Siemens 3ST1 switch mounting)

Party to furnish the drawing of the offered switch assembly showing the mounting details & overall dimension.

5. **Item 05 : Voltmeter Selector Switch**

The switch is a 5 position, 6 pole program switch used in generator panels for selection of voltage reading between various phases ie. AB, BC or CA or Bus voltage. The switch assembly shall be complete with contact block assembly & operator (metallic knob). The switching angle shall be 45 degree. The switch assembly shall be as per enclosed program and suitable for panel mounting on single hole of dia 10 mm (suitable for Siemens 3ST1 switch mounting)

Party to furnish the drawing of the offered switch assembly showing the mounting details & overall dimension.

6. **Item 06 : Engine Control Switch**

The switch is a 3 position, 9 pole program switch used in generator panels for control of engine speed in idle & run mode. The switch assembly shall be complete with contact block assembly & operator (metallic knob). The switching angle shall be 45 degree. The switch assembly shall be as per enclosed program and suitable for panel mounting on single hole of dia 10 mm (suitable for Siemens 3ST1 switch mounting)

Party to furnish the drawing of the offered switch assembly showing the mounting details & overall dimension.

7. **Item 07 : Field Supply Selector Switch**

The switch is a 3 position, 13 pole program switch used in field panel for selection of A, A+B or B motor shunt field supply. The switch assembly shall be complete with contact block assembly & operator (metallic knob). The switching angle shall be 45 degree. The switch assembly shall be as per enclosed program and suitable for panel mounting on single hole of dia 10 mm (suitable for Siemens 3ST1 switch mounting)

Party to furnish the drawing of the offered switch assembly showing the mounting details & overall dimension.

8. **Item 08 : Hand-Off-Auto Selector Switch**

The switch is a 3 position, 2 pole program switch used in field panel for selection of field supply in Hand or Auto mode. The switch assembly shall be complete with contact block assembly & operator (metallic knob). The switching angle shall be 45 degree. The switch assembly shall be as per enclosed program and suitable for panel mounting on single hole of dia 10 mm (suitable for Siemens 3ST1 switch mounting)

Party to furnish the drawing of the offered switch assembly showing the mounting details & overall dimension.

**9. Item 09 : Synchronizing Switch (Independent switch in each Gen. panel)**

The switch is a 2 position, 6 pole program switch used in generator panels for synchronization of engine with main bus voltage & frequency. The switch assembly shall be complete with contact block assembly & operator (metallic knob). The switching angle shall be 45 degree. The switch assembly shall be as per enclosed program and suitable for panel mounting on single hole of dia 10 mm (suitable for Siemens 3ST1 switch mounting)

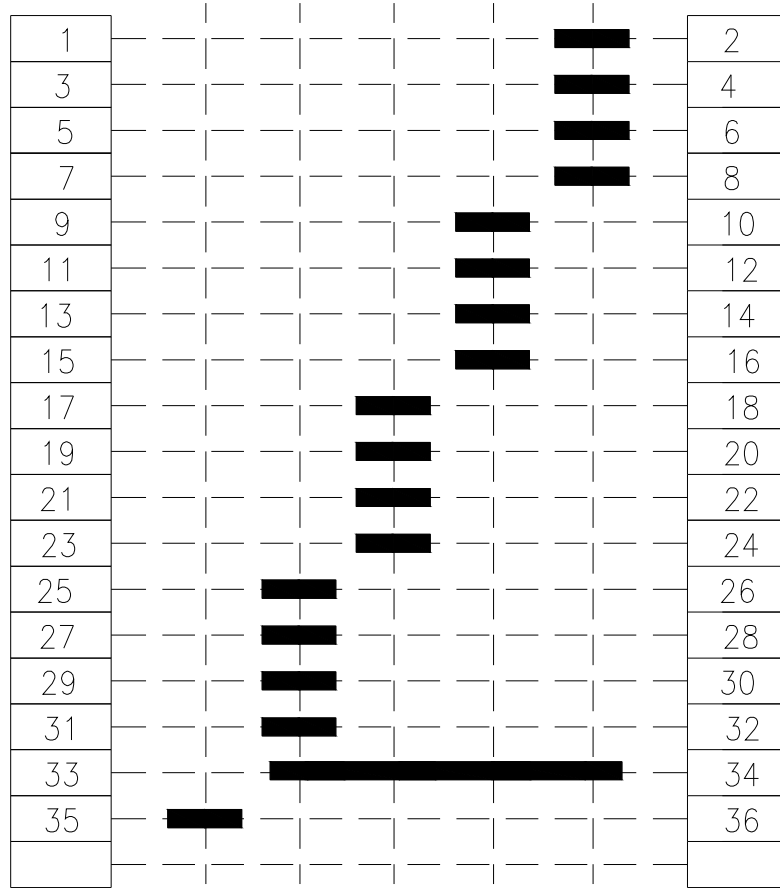
Party to furnish the drawing of the offered switch assembly showing the mounting details & overall dimension.

**04. General Term & Conditions**

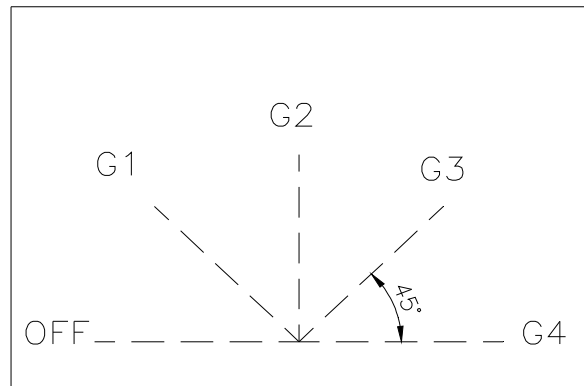
01. All the items to be supplied as per delivery mentioned in delivery schedule. However, the delivery schedule should not be more than 10-12 weeks from the date of firm purchase order.
02. **Important :**  
**Label on switch :** each switch to be provided with a label with description of the switch.  
**Packing** – Each switch to be packed in bubbled polythene packing material and then to be individually packed in a corrugated cartoon box. Each switch box to be provided with printed label having following details :
  1. BHEL style Code
  2. Switch description
  3. PO No & PO item No.
03. Party to furnish the drawing of the offered switch assembly showing mounting details and overall dimension of the switch.
04. Supplier to provide warranty of 18 months from date of supply or 12 months from the date of commissioning against failure of any item/system due to design/manufacturing deficiencies or quality lapses.
05. The supplier shall furnish 3 sets of test & guarantee certificates for each item along with the supply.
06. All other terms & conditions shall be as per standard BHEL terms & conditions.

GENERATOR SYNC SWITCH PROGRAM

OFF G1 G2 G3 G4

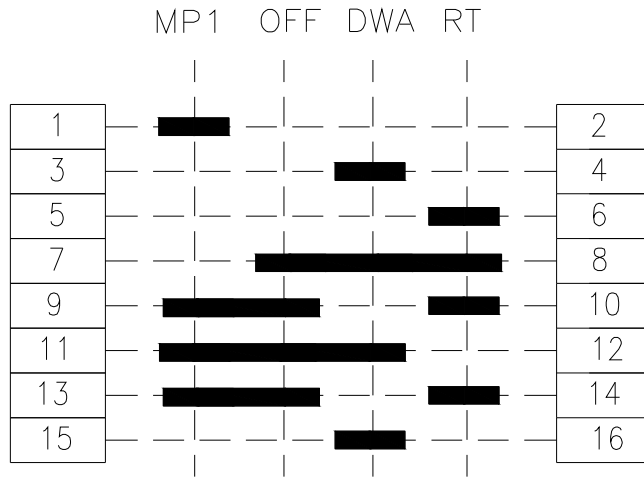


SWITCHING POSITIONS

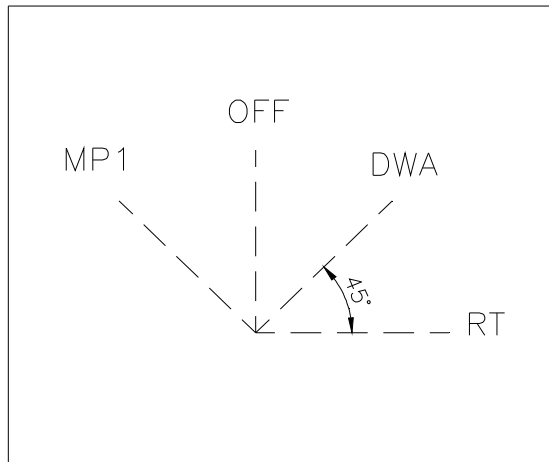


ITEM NO. : 01  
 STYLE CODE : BP9048095786

SCR-1 ASSIGNMENT SWITCH PROGRAM

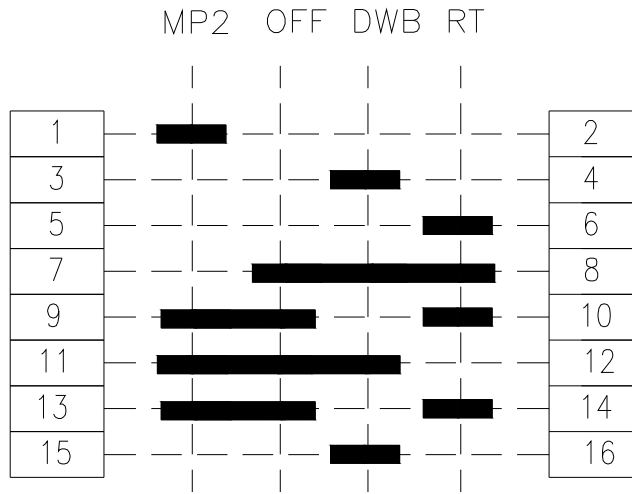


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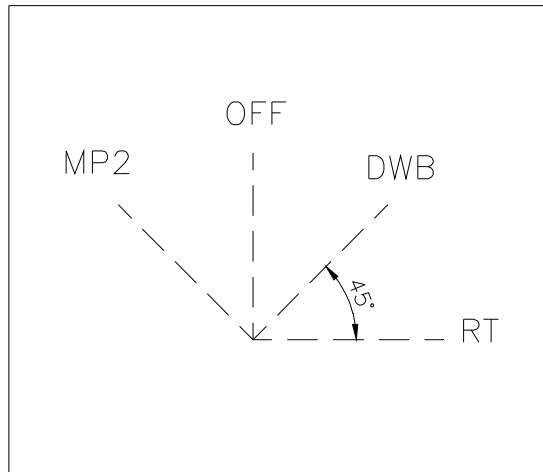


ITEM NO. : 02  
STYLE CODE : BP9048121787

SCR-4 ASSIGNMENT SWITCH PROGRAM



SWITCHING POSITIONS

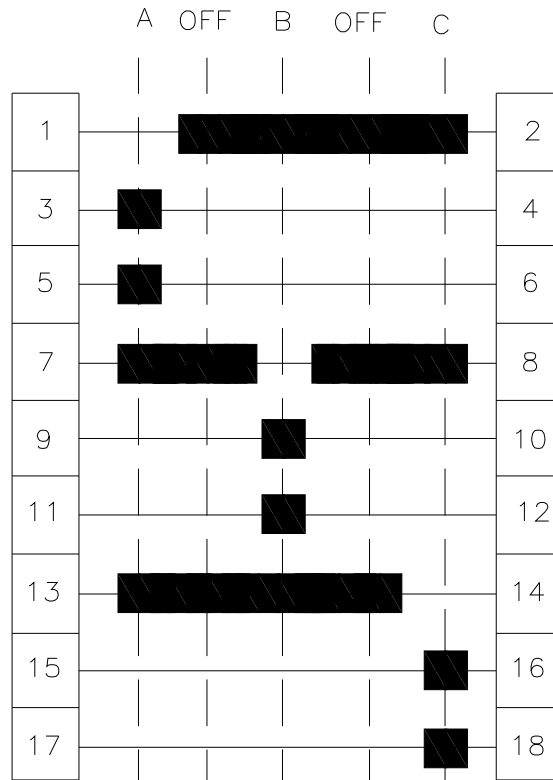


ITEM NO. : 03

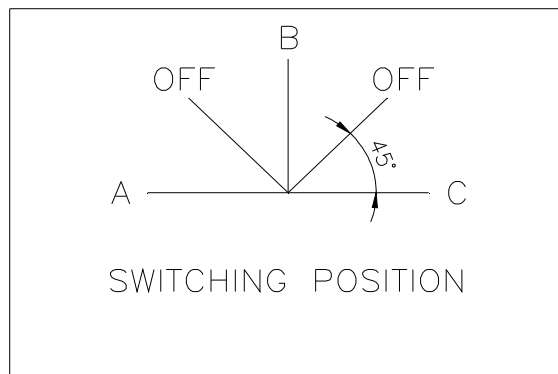
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AMMETER SELECTOR SWITCH



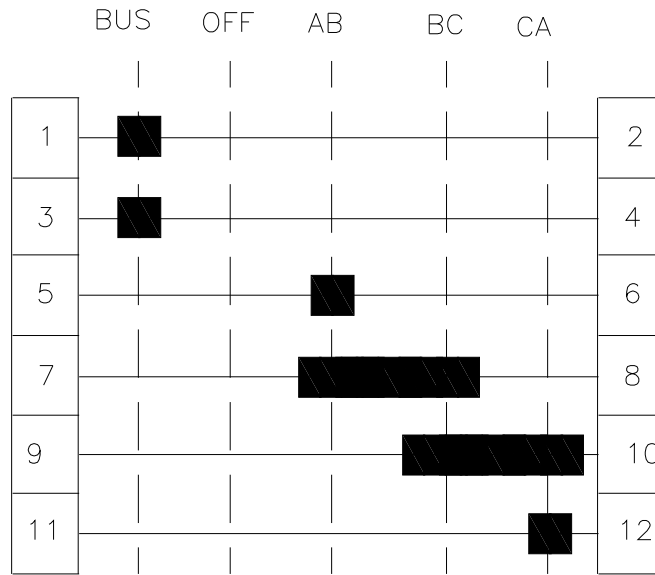
SWITCHING POSITIONS



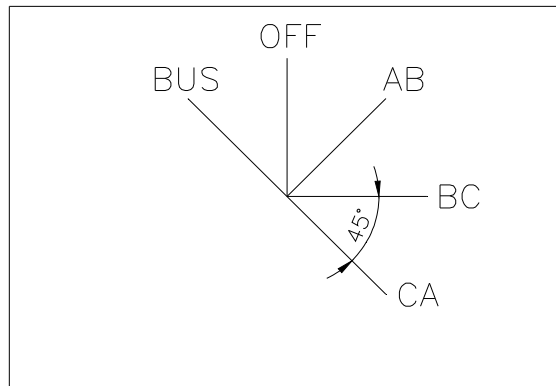
ITEM NO. : 04

STYLE CODE : BP9048128536

VOLTMETER SELECTOR SWITCH



SWITCHING POSITIONS

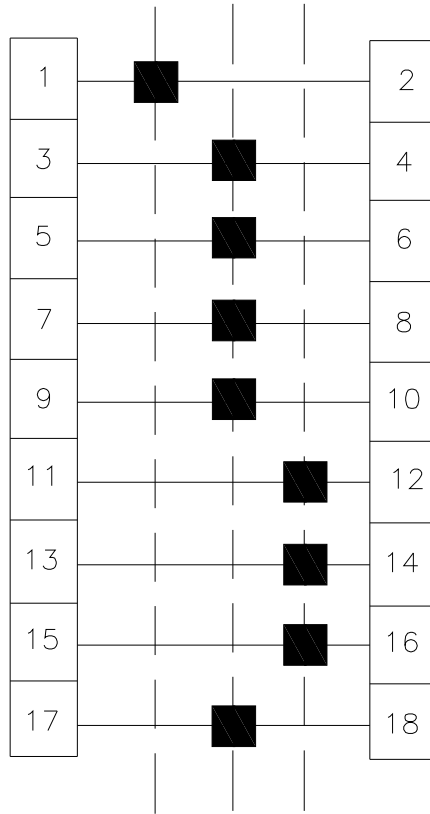


ITEM NO. : 05

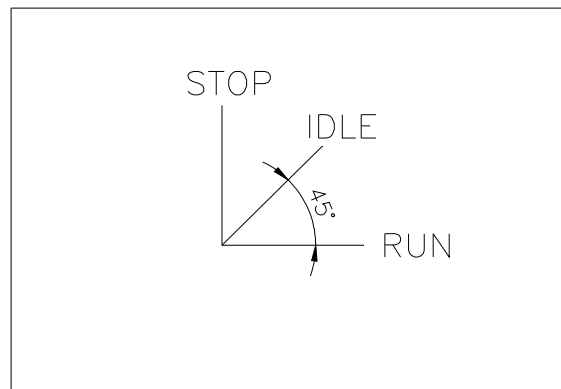
STYLE CODE : BP9048128544

ENGINE CONTROL SWITCH

STOP IDLE RUN



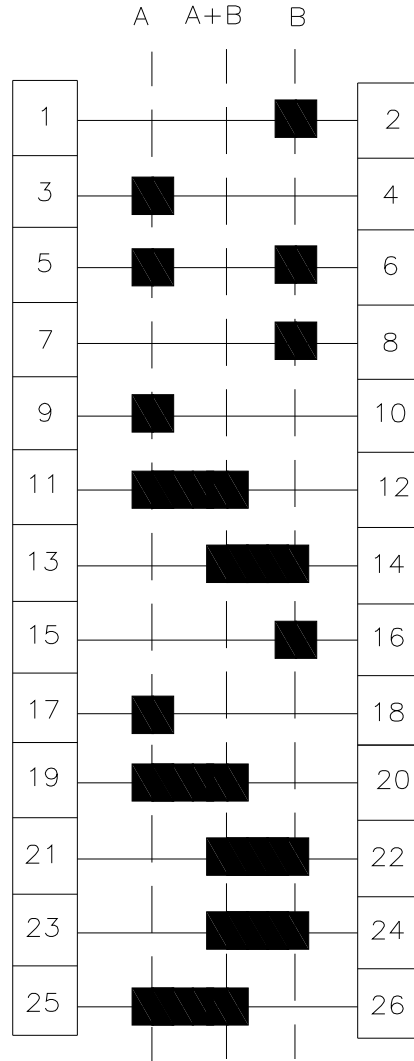
SWITCHING POSITIONS



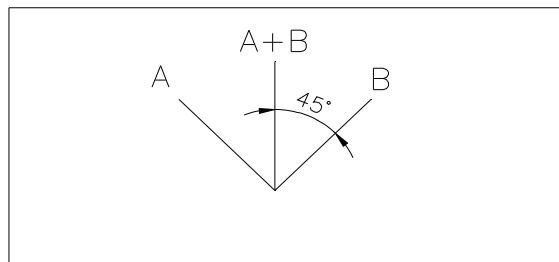
ITEM NO. : 06

STYLE CODE : BP9048124697

FIELD SELECTOR SWITCH



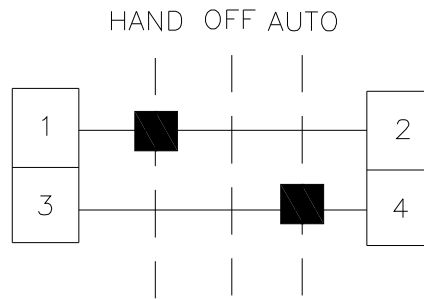
SWITCHING POSITIONS



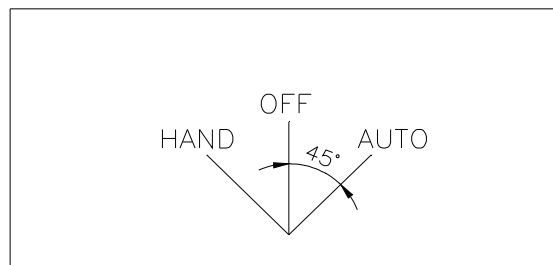
ITEM NO. : 07

STYLE CODE : BP9048132053

HANDS OFF AUTO SWITCH



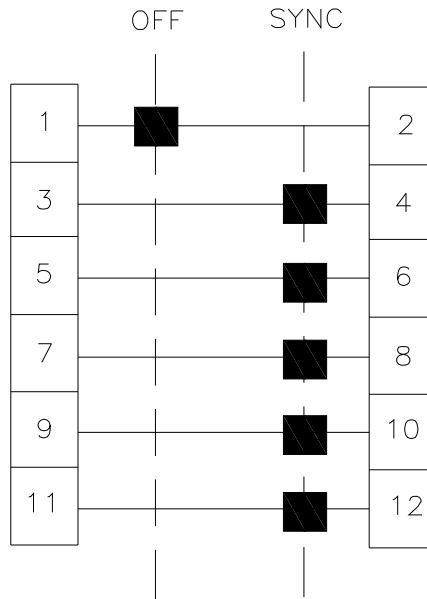
SWITCHING POSITIONS



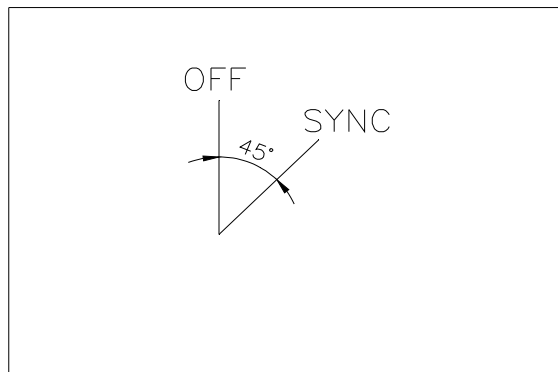
ITEM NO. : 08

STYLE CODE : BP9048132061

SYNCHRONISING SWITCH



SWITCHING POSITIONS



ITEM NO. : 09  
STYLE CODE : BP9048124700

FIRST ANGLE PROJECTION				(ALL DIMENSIONS ARE IN mm)				
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			CHECKED			CHECKED	STATUS OF DRAWING M	
			APPROVED			APPROVED		
							DISTRIBUTION O/C - 1 , OF PRINTS	
<p><b>FINISH:- CHROMIUM PLATED.</b></p> <p><b>NOTE:-</b>KNOB SHOULD BE SUITABLE FOR DRILLER CONSOLE ASSIGNMENT SWITCHES &amp; GEN. PANEL SWITCHES FOR 3 ST1 (SIEMENS DESIGN).</p>								
	REF.	DRG. NO.	001	BRASS ROD				
REMARKS	ITEM NO.	DESCRIPTION	STD	MATL. CODE	A	UNIT	UNIT WT.	
				MATL. SPECN.	C		QTY.	
INVENTORY NO.	SIGN. & DATE	<b>भारत हेवी इलेक्ट्रिकल्स लिमिटेड</b> <b>BHARAT HEAVY ELECTRICALS LTD.</b> <b>BHOPAL</b>			नाम / NAME DSS	हस्ताक्षर /SIGN RKA	दि. /DATE 05.06.07	वेरि की संख्या /NO.OF VAR. -
कोड /CODE 425	विभाग /DEPT. ओरि /ORE 425	उत. टोल. नाप की श्रेणी /UNTOL. DIMS. GR. REF. CG 06503	अनुपात /SCALE 1:1	भार (कि.ग्रा.) /WEIGHT(KG)	उसे. ड्राईंग का संदर्भ /REF.TO ASSY.DRG. -	मद क्र. /ITEM NO. -	मद संख्या /NO.OF ITEM -	पुन. /REV 00
<b>KNOB</b> (FOR 3 ST SWITCHES)					ड्राईंग क्र. /DRAWING NO. <b>4 721 10 10262</b>		पुन. /REV 00	
					शीट क्र /SHT.NO 01	शीटों की सं./NO.OF.SHT. 01		