

L.T. Control Switches

Type 3LA0 upto 63A, 500V, 50Hz

Introduction

3LA0 switches are hand operated switches for direct switching and control of three phase AC motors. These are available in standard designs (see wiring diagrams) and as programme switches to suit any other switching sequence.

Switch 3LA0 2 in standard design is supplied with a black moulded plastic ball handle.

Switch 3LA0 6 is supplied with machine handle.

The handles are supplied loose in the packing box of the switch. The handle engages with the indicating dial by means of serrations and after the cheese head screw has been loosened, can be fixed in any one of the 16 different positions. In this way the position of the handle can be adjusted to the mounting requirement in each individual case.



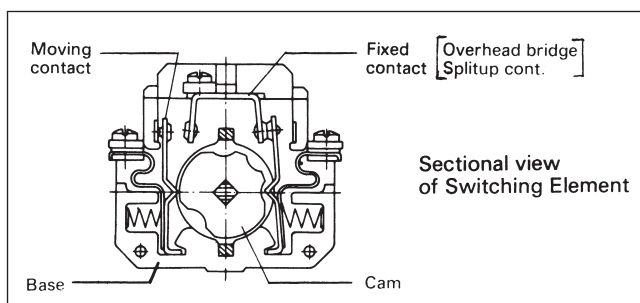
Depending on the switching programme the fixed contacts of each switching element are either made of one piece and have a common terminal, (see sectional view) or are designed in the form of separate contacts with separate terminals.



Various switching packets are stacked in series on two stacking bolts and on the operating shaft. They are held in position by two end plates.

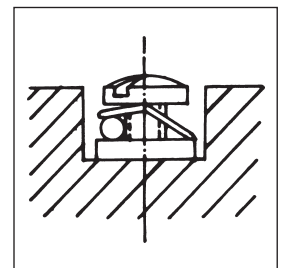
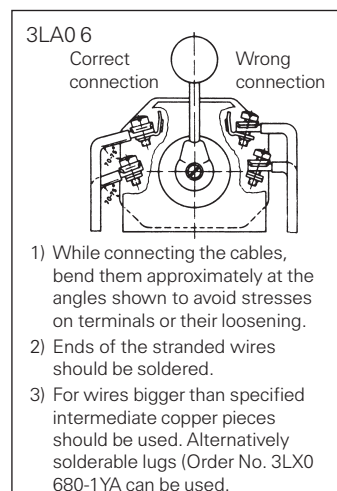
Construction

The switches are made of uniform switching packets assembled to form a stack. Each packet consists of two switching elements whose moving contacts are operated by moulded plastic cams when the operating shaft is turned.



Connections

The terminals are of straight end wire type. Wires of two different cross sectional areas can be connected to one terminal. 3LA0 2 can accept maximum upto 4 sq. mm. cables and 3LA0 6 can accept conductor sizes from 6 to 16 sq.mm. or 25 sq.mm. in case of



flat bar connections. Bending of wires to form eyelets for connection is not required. Earthing wires must be connected to the terminal marked ⊕

Short Circuit protection

Maximum permissible fuse rating for short circuit protection of

- 3LA0 2 : 25 A HRC fuse type 3 NA1
- 3LA0 6 : 63 A HRC fuse type 3 NA1

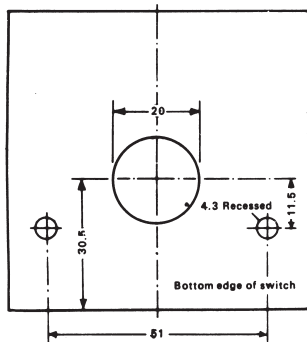
Installation

3LA0 2

a) **In open execution** – Behind switchboard or front plate of maximum 5 mm. thickness (standard execution of switch)

Set the switch to the zero position.

Remove the indicator dial by loosening the front screw. Drill the holes in the front plate of the machine or the switchboard using template shown below.



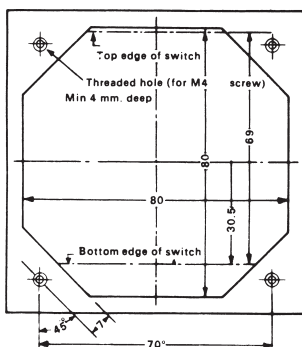
20mm. dia. for switch axle and two 4.3mm. dia for fixing screws

Fasten the switch with 2 countersunk screws M4 x 10 supplied with each switch. Push the indicator dial and ball handle taking care that the dial is at zero position. Screw the front screw tight using the spring washer supplied.

b) **In open execution** – On base plate, wall or bracket. There are 5 holes provided for fixing, using M4 screws. At least 2 holes on the handle sides and one (middle hole) at the rear should be used.

5 mm. thickness spacer washers (to be procured outside) must be inserted under the switch. Take care that spacers do not obstruct smooth functioning of the mechanism. Otherwise mount exactly as under (a).

c) **With front plate** – Drill the holes in the switchboard sheet metal using the drilling template, shown below (octagonal hole and four threaded holes, minimum 4 mm. long suitable for M4 screws)



Remove the indicator dial by loosening the front screw. Push in the front plate. Fasten the switch with 2 countersunk screws M4 x 10 supplied. Set the indicator dial at the zero position and fix the handle by screwing the front screw tight using the spring washer supplied.

Now insert the switch inside the panel cutout and fix the front plate on the switchboard by four M4 screws.

d) **In sheet steel housing** – Open the cover by partly unscrewing the four screws arranged at the two sides. The screws need not be opened fully.

Fix the base (with the built in switch) using four M4 bolts on a plain surface so that the handle is arranged on the top or bottom or one side (preferably on the right side).

Replace the cover and retighten all four screws.

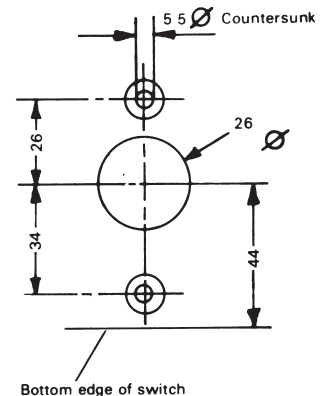
Note: The sheet steel housings are available in two sizes. Smaller housing is suitable for 2 and 3 packet switches and bigger housing is suitable for 4 packet switches besides 3 packet switches.

For cable or conduit entry, in smaller housing two 20 φ holes are provided on the rear plate and one 20 φ knockout at the bottom.

In bigger housings there are two 20 φ and two 26 φ holes on the rear and one 20 φ knockout at the bottom. The through holes are blocked by rubber stoppers.

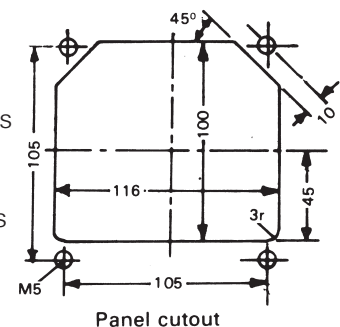
3LA0 6

e) **In open execution** – While installing the switch behind the panel, front plates etc. it is necessary to provide 3 mm. thick washers between the switch and the mounting surface or to drill countersunk holes of approximately 12 mm. dia and 3 mm. deep to prevent tilting of the switch.



f) **With front plate** – The procedure for mounting is the same as in the case of 3LA0 2 with front plate. Fixing screw size, in this case, is M5.

Drilling template is given below)



g) **3LA0 6 in sheet steel housing** – The procedure for mounting is the same as for 3LA0 2 in sheet steel housing.

Fixing bolt size is M6

For cable entry using cable glands or conduit entry, the following facility is provided

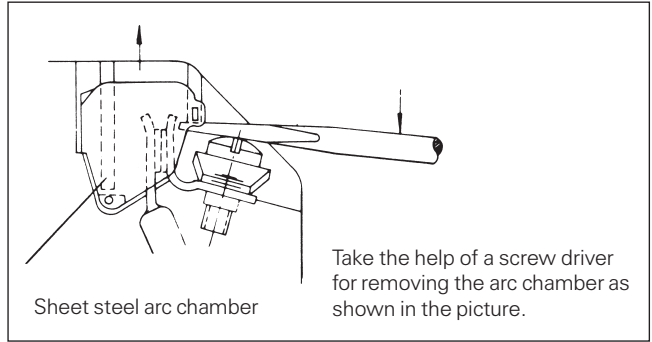
Size I housing 2 Nos. holes size 27 φ & 32 φ at top and bottom of the housing. In addition, there are 2 Nos. knockouts of size 21 φ & 27 φ on the rear of the housing

Size II housing 1 No. hole of size 27φ and
 (For 3LA0 2, 2 Nos. holes of size 40φ at
 5 to 8 pkts & top and bottom of
 3LA0 6, the housing.
 4 to 7 pkts)

Maintenance

Switches require no maintenance.

Note: When the removing the sheet steel arc chambers of 3LA0 6, use a screwdriver as shown in the sketch.



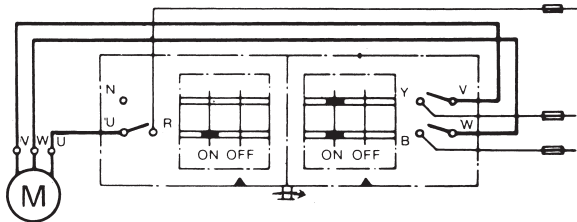
Sheet steel arc chamber

Take the help of a screw driver for removing the arc chamber as shown in the picture.

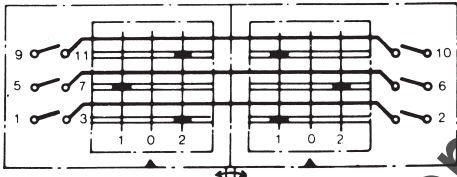
Wiring Diagrams

3LA0 2

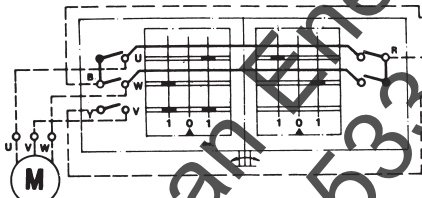
Typical Wiring Diagrams Heavy Duty Switch 3LA0 201-1YA



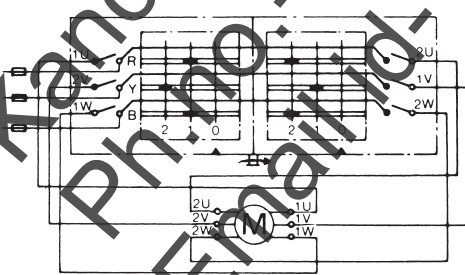
System selector switch 3LA0 202-1YA



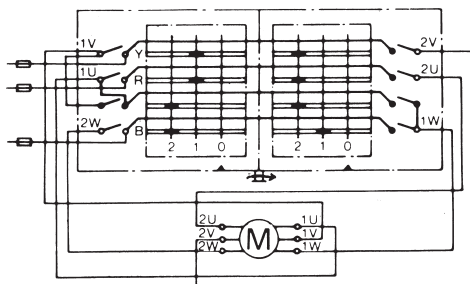
Reversing switch: 3LA0 203-1YA



Pole-changing switch: 3LA0 205-2YA



Pole-changing switch: 3LA0 205-1YA



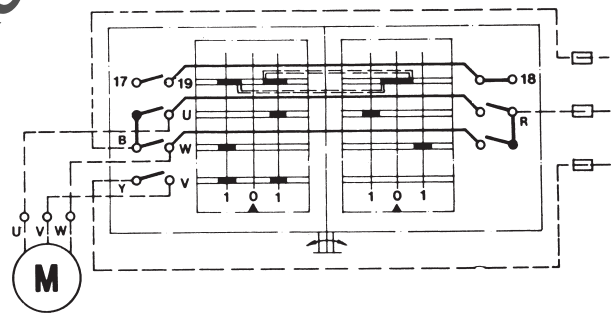
Connection Table

Terminals	1	2	3	5	6	7	9	10	11
System Selector Switch 1 Load 2 System	B1	B	W	Y	Y1	V	R1	R	U
System Selector Switch 2 Loads 1 System	W1	W	B	V	V1	U1	U	R	
Pole-changing Reversing Switch (1) 2 Speeds 2 Directions	2U	1W	B	1V	2V	Y	2W	1U	R
Pole-changing Switch (2) 2 Speeds 1 Direction	2U	1W	B	1V	2V	Y	2U	1U	R

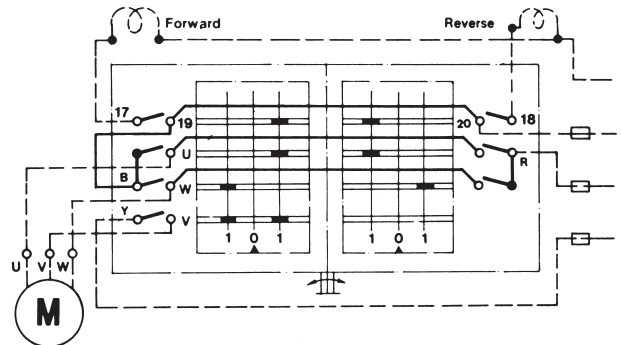
(1) For motor with 2 separate windings, e.g. 1000 r.p.m. in anti clockwise direction and 1500 r.p.m. clockwise direction of rotation

(2) For motor with 2 separate windings, e.g. 1000 r.p.m. and 1500 r.p.m. in clockwise direction

Reversing switch with make before break auxiliary contact: 3LA0 203-2YA

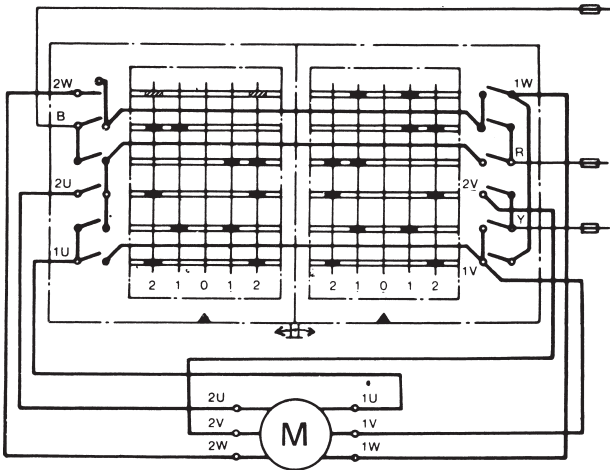


Reversing switch with maintained auxiliary contacts: 3LA0 203-3YA

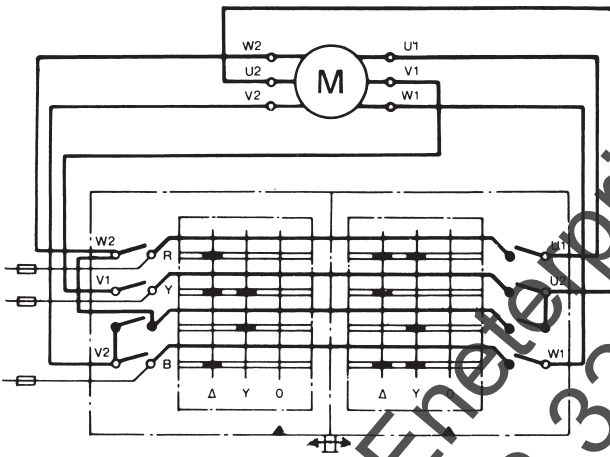


3LA0 2

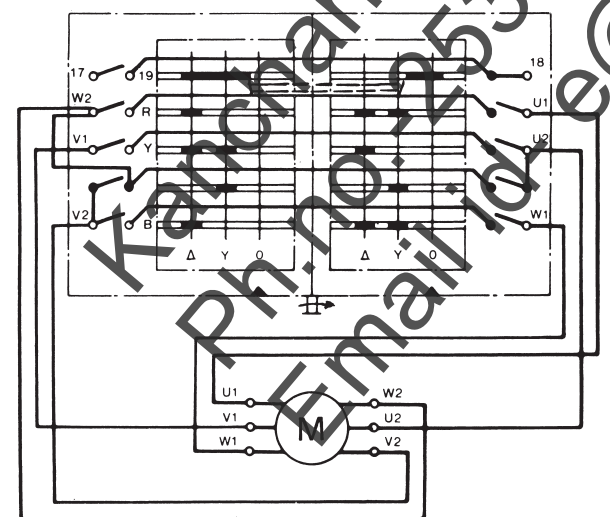
Reversing Pole-changing switch
3LA0 205-3YA



Star/Delta switch: 3LA0 204-5YA



Star/Delta switch: 3LA0 204-6YA



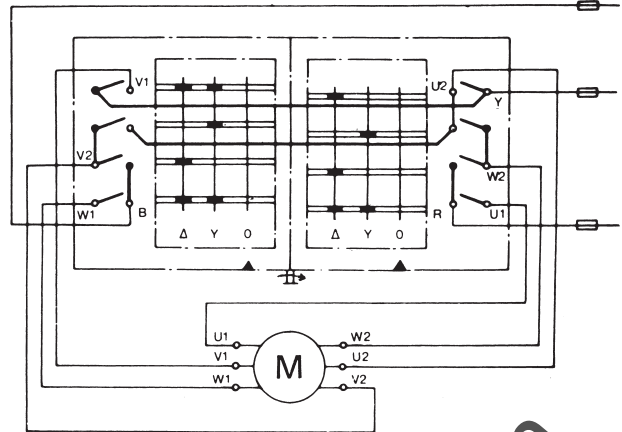
*Switch on slowly from '0' to star position
Switch on quickly from star to '0' position

The auxiliary contact for the switches type 3LA0 204-6YA are meant for interlocking and energizing the contactor coil

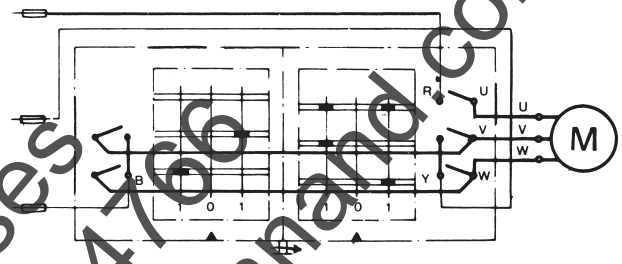
- Contacts closed in position shown
- Change-over contact closed.
- Contacts open

3LA0 6

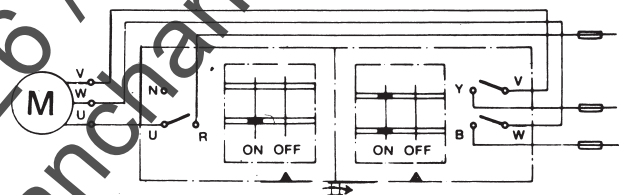
Star/Delta switch: 3LA0 604-1YB



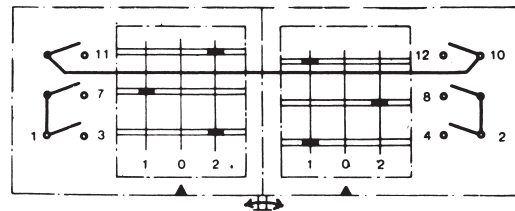
Reversing switch: 3LA0 603-1YB



ON-OFF switch: 3LA0 601-1YB



System selector switch: 3LA0 602-1YB



Connection Scheme for 3LA0 602-1YB

Terminals	10	1	2	12	7	4	11	3	8
System Selector Switch 1 Load 2 Systems	U	V	W	R	Y	B	R1	Y1	B1
System Selector switch 1 System 2 Loads	R	Y	B	U	V	W	U1	V1	W1
Pole Changing Switch (I) 2 Speeds 1 Direction	R	Y	B	1U	1V	1W	2U	2V	2W
Pole Changing Reversing Switch (2) 2 Directions 2 Speeds	R	Y	B	1U	1V	1W	2U	2V	2W

- (1) For motor with 2 separate windings, e.g. 1000 r.p.m. and 1500 r.p.m. in clockwise direction of rotation.
- (2) For motor with 2 separate windings, e.g. 1000 r.p.m. in anti-clockwise and 1500 r.p.m. in clockwise direction or rotation.

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