80 Ampere Miniature Direct Current Contactors

PC60, MB60 & SW60

Albright INTERNATIONAL
The “PC60”, “MB60” & “SW60” are a new family of miniature direct current contactors and solenoid switches which are designed to fill the gap between 30 ampere relays and 100 ampere contactors.

The family is divided into two distinct branches, PC60/MB60 for printed circuit board mounting and SW60 free standing contactors and each has its own selection of variations and options.

These are unique designs for printed circuit board mounting and the following variations and configurations are available:

<table>
<thead>
<tr>
<th>TYPE NO.</th>
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<tr>
<td>PC60</td>
<td>Single Pole On/Off Normally Open Contactor (SP ST NO)</td>
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<tr>
<td>PC61</td>
<td>Single Pole Changeover Contactor (SP DT)</td>
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<tr>
<td>PC63</td>
<td>Single Pole On/Off Normally Closed Contactor (SP ST NC)</td>
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Magnetic Blowouts  PC60B, PC61B & PC63B

The contactors can be fitted with magnetic blowouts for switching current at higher dc voltages (guide: >60V for resistive loads and >48V for inductive loads).

If the application calls for frequent switching under these conditions, it is recommended that a contact housing with open apertures is specified. This is available as a no cost option.

When fitted with magnetic blowouts it is important that the correct polarity for the main terminal connections is observed.

Auxiliary Contacts  PC60A, PC61A & PC63A

A double circuit changeover 5 ampere microswitch auxiliary contact can be provided.

This is fitted in a purpose designed holder with gold plated pickups for the microswitch terminals and pins for soldering direct to a printed circuit board.
Protected Versions PC60.P, PC61.P & PC63.P

These have closed contact housings, and are assembled with rubber gaskets to inhibit the ingress of moisture or other contamination. They are protected to IP66.

These versions can be washed after soldering to the board and may be used in dirty or wet environments.

Washable Contactors with Auxiliary Contacts
PC60A.W, PC61A.W & PC63A.W

Normally the auxiliary contacts are supplied already fitted to the contactor but if the printed circuit boards are to be washed after soldering, the auxiliary contact is supplied separately and the contactor is temporarily sealed with a rubber plug which is removed after washing and the auxiliary contact is then fitted.

The contactors are not therefore fully protected against the environment to the same degree as the PC60.P, PC61.P and PC63.P.

Installation

To accommodate the “PC” contactors, printed circuit boards should be drilled in accordance with the drawing on page 4.

Prior to soldering, the PC60, PC61 and PC63 can be secured to the circuit board by means of a M4 bolt which protrudes from the underside of the contactor.

If the full current ratings of the contactors are to be utilised, circuit board tracks should have the appropriate thickness and width of copper.

Conventional hand or wave soldering techniques can be used and if the circuit board is to be washed the appropriate PC60.P, PC61.P, PC63.P or PC60A.W, PC61A.W, PC63A.W should be specified.

Please note:
Contactors fitted with auxiliary contacts cannot be fully protected against unfriendly environments.
All versions of “PC” contactors can be supplied with a separate mounting base which can be soldered to the circuit board. After soldering and washing the printed circuit board, the “PC” contactor can be plugged into the base and secured by means of a nut on the underside of the board. Removal for servicing or replacement is possible by removal of the nut and unplugging the “PC” contactor from the base.

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<tr>
<td>MB60</td>
<td>PC60 with Mounting Base Normally Open Contactor (SP ST NO)</td>
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<tr>
<td>MB61</td>
<td>PC61 with Mounting Base Changeover Contactor (SP DT)</td>
</tr>
<tr>
<td>MB63</td>
<td>PC63 with Mounting Base Normally Closed Contactor (SP ST NC)</td>
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**MB SERIES MB 60/61/63**

**TYPE NO. DESCRIPTION**

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<td>PC63 with Mounting Base Normally Closed Contactor (SP ST NC)</td>
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**PC/MB MOUNTING DETAILS**

80 Ampere Miniature DC Contactors from Albright International
These are freestanding contactors and are more conventionally configured: they have M6 main terminals, 0.25" (6.3mm) coil terminals and a selection of alternative mountings are available.

**Magnetic Blowouts**

SW60B, SW61B, SW63B & SW64B

The contactors can be fitted with magnetic blowouts for switching current at higher DC voltages (guide: >60V for resistive loads and >48V for inductive loads).

If the application calls for frequent switching under these conditions it is recommended that a contact housing with open apertures is specified. This is available as a no cost option.

When fitted with magnetic blowouts it is important that the correct polarity for the main terminal connections is observed.

**Auxiliary Contacts**

SW60A, SW61A, SW63A, SW64A & SW66A

A double circuit changeover 5 Ampere microswitch auxiliary contact can be provided.

This is fitted in a purpose designed holder mounted between the main terminals and has 2mm spade connections.

**Protected Versions**  SW60.P, SW63.P & SW64.P

These contactors have closed contact housings and are sealed to inhibit the ingress of moisture or other contamination.

They can therefore be used in environments which require protection to IP66.

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<td>SW60</td>
<td>Single Pole On/Off Normally Open Contactor (SP ST NO)</td>
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<tr>
<td>SW61</td>
<td>Single Pole Changeover Contactor (SP DT)</td>
</tr>
<tr>
<td>SW63</td>
<td>Single Pole On/Off Normally Closed Contactor (SP ST NC)</td>
</tr>
<tr>
<td>SW64</td>
<td>Paired Single Pole On/Off Contactor (2 x SP ST NO)</td>
</tr>
<tr>
<td>SW66</td>
<td>Paired Single Pole Changeover Contactor (2 x SP DT)</td>
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</tbody>
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**Please note:**

Contactors fitted with auxiliary contacts cannot be fully protected against unfriendly environments.
Magnetically Latched PC60, MB60 and SW60

PC60M, MB60M & SW60M

The contactors can be supplied with magnetic latching - one short pulse to close the main contacts - one short pulse to reopen them again. The result is a bi-stable device, the coil of which consumes no power except during the closing and opening strokes, and because there is in effect no heating of the coil, the contactors can be engineered in the first place with more powerful coils and springs than with conventional contactors.

Contact ratings and all external dimensions are identical to those of the equivalent types which have conventionally energised coils.

Similarly all the additional features which are available with the other PC60 and SW60 types can be found with the magnetically latched versions, eg auxiliary contacts, magnetic blowouts for the main contacts, protected, etc.

Installation

Mounting is by M4 tapped holes in the contactor frame together with a selection of mounting brackets.

Standard arrangement is for the contactors to be supplied with two M4 holes on each side of the contactor frame to allow direct attachment to panels etc.

For other options see left.

Paired Contactors SW64 & SW66

The contactors can be supplied in assembled pairs with the appropriate connecting links. In the case of the SW66, the contactor is configured with links for motor reversing. The resultant circuit is failsafe so that if both coils are energised simultaneously, an open circuit results.

Please Note. Very Important:

Magnetically latched contactors do not fail safe.

If there is a power failure, or if the supply to the contactor coil is broken, the contactor contacts will not open or close, ie the contactor will not change state.

These devices should not therefore be used in applications where the failure of contacts to open or close could result in a hazardous situation for persons or equipment.

Magnetically Latched PC60, MB60 and SW60

PC60M, MB60M & SW60M

The contactors can be supplied with magnetic latching - one short pulse to close the main contacts - one short pulse to reopen them again.

The result is a bi-stable device, the coil of which consumes no power except during the closing and opening strokes, and because there is in effect no heating of the coil, the contactors can be engineered in the first place with more powerful coils and springs than with conventional contactors.

Contact ratings and all external dimensions are identical to those of the equivalent types which have conventionally energised coils.

Similarly all the additional features which are available with the other PC60 and SW60 types can be found with the magnetically latched versions, eg auxiliary contacts, magnetic blowouts for the main contacts, protected, etc.

For more details of the operation of the “M” versions, please see the Albright publication: “Power Consumption Reduction for Albright Contactors”.

Dimensions in mm (inches).
### Printed Circuit Board Versions

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<tr>
<th>PC60 Single Pole On/Off Normally Open Contactor</th>
<th>PC61 Single Pole Changeover Contactor</th>
<th>PC63 Single Pole On/Off Normally Closed Contactor</th>
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<tbody>
<tr>
<td>PC60</td>
<td>SP ST NO</td>
<td>PC61</td>
</tr>
<tr>
<td>PC60A</td>
<td>SP ST NO with 5A SP DT auxiliary contact fitted</td>
<td>PC61A</td>
</tr>
<tr>
<td>PC60B</td>
<td>SP ST NO with magnetic blowouts</td>
<td>PC61B</td>
</tr>
<tr>
<td>PC60P</td>
<td>SP ST NO protected against the environment</td>
<td>PC61P</td>
</tr>
<tr>
<td>PC60A.W</td>
<td>SP ST NO washable with separately supplied auxiliary contact</td>
<td>PC61A.W</td>
</tr>
<tr>
<td>PC60M</td>
<td>SP ST NO with magnetic latching</td>
<td></td>
</tr>
</tbody>
</table>

The options ‘A’, ‘B’ & ‘M’ may be mixed, as may ‘B’, ‘P’ & ‘M’; but note ‘A’ & ‘P’ are not possible. ‘A’ & ‘W’ can however be mixed (see text).

### “PC” Contactors with Mounting Bases

<table>
<thead>
<tr>
<th>MB60 Single Pole On/Off Normally Open Contactor with Mounting Base</th>
<th>MB61 Single Pole Changeover Contactor with Mounting Base</th>
<th>MB63 Single Pole On/Off Normally Closed Contactor with Mounting Base</th>
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<tbody>
<tr>
<td>MB60</td>
<td>SP ST NO</td>
<td>MB61</td>
</tr>
<tr>
<td>MB60A</td>
<td>SP ST NO with 5A SP DT auxiliary contact fitted</td>
<td>MB61A</td>
</tr>
<tr>
<td>MB60B</td>
<td>SP ST NO with magnetic blowouts</td>
<td>MB61B</td>
</tr>
<tr>
<td>MB60A.W</td>
<td>SP ST NO washable with separately supplied auxiliary contact</td>
<td>MB61A.W</td>
</tr>
<tr>
<td>MB60M</td>
<td>SP ST NO with magnetic latching</td>
<td></td>
</tr>
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The options ‘A’, ‘B’ & ‘M’ may be mixed, as may ‘B’, ‘P’ & ‘M’; but note ‘A’ & ‘P’ are not possible. ‘A’ & ‘W’ can however be mixed (see text).

### Free Standing Versions

<table>
<thead>
<tr>
<th>SW60 Single Pole On/Off Normally Open Contactor</th>
<th>SW61 Single Pole Changeover Contactor</th>
<th>SW63 Single Pole On/Off Normally Closed Contactor</th>
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<tbody>
<tr>
<td>SW60</td>
<td>SP ST NO</td>
<td>SW61</td>
</tr>
<tr>
<td>SW60A</td>
<td>SP ST NO with 5A SP DT auxiliary contact fitted</td>
<td>SW61A</td>
</tr>
<tr>
<td>SW60B</td>
<td>SP ST NO with magnetic blowouts</td>
<td>SW61B</td>
</tr>
<tr>
<td>SW60P</td>
<td>SP ST NO protected against the environment</td>
<td></td>
</tr>
<tr>
<td>SW60M</td>
<td>SP ST NO with magnetic latching</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>SW64 Paired Single Pole On/Off Normally Open Contactor</th>
<th>SW66 Paired Single Pole Changeover Contactor</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW64</td>
<td>2 x SW60</td>
</tr>
<tr>
<td>SW64A</td>
<td>2 x SW60A</td>
</tr>
<tr>
<td>SW64B</td>
<td>2 x SW60B</td>
</tr>
</tbody>
</table>

The options ‘A’, ‘B’ & ‘M’ may be mixed, as may ‘B’, ‘P’ & ‘M’; but note ‘A’ & ‘P’ are not possible.
Thermal Current Ratings (100%)
(a) When main contacts are connected to well ventilated conductors having adequate cross sectional areas and when switching of main contacts is infrequent, continuous currents up to 80 Amperes DC may be carried.
(b) When more arduous switching duties are required and when main conductors are reduced in size or are insulated, some reduction of thermal current may be necessary.

The Following Direct Currents May Be Carried on Reduced Duty Cycles:

Duty | 80 Ampere Rating |
-----|------------------|
30%  | 150 Amperes      |
40%  | 125 Amperes      |
50%  | 115 Amperes      |
60%  | 105 Amperes      |
70%  | 95 Amperes       |

Typical Inductive Fault Currents Which Can Be Ruptured (5ms Time Constant):

- Without Blowouts: 500 Amperes at 48V DC
- With Blowouts: 500 Amperes at 96V DC

Typical Voltage Drop Across New Contacts: 40mV at 80A

Mechanical Life: $>3 \times 10^6$

Coil Power Dissipation
- Intermittently Rated Types (50% Duty Cycle): 10 - 14 Watts
- Continuously Rated Types: 5 - 7 Watts
- Magnetically Latched Types: Initially 12 Watts (0.5 Sec.) Then 0 Watts

Maximum Pull-in Voltage (Coil At 20°C)
- Intermittently Rated Types: 60%V
- Continuously Rated Types: 66%V

Typical Drop-Out Voltage: 10 - 25%

Typical Pull-in Time (N/O Contacts to Close): 15ms

Typical Drop-out time (N/O Contacts to Open)
- Without Suppression: 6ms
- With Diode Suppression: 35ms

Typical Main Contact Changeover Time (PC61 and SW61)
- Normally Closed to Normally Open: 6ms
- Normally Open to Normally Closed: 4ms

Typical Contact Bounce Period: 3ms

Auxiliary Contact Thermal Current Rating: 5 Amperes

Auxiliary Contact Switching Capacity (Resistive Load)
- 5 at 24V DC
- 1 at 60V DC
- 0.5 at 120V DC
- 0.25 at 240V DC

The information contained within this section applies to all PC, MB & SW contactors unless otherwise stated.

Please Note:
All the performance data given here should be used as a guide only. Some derating or variation from these figures may be necessary according to type and application.

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