Motor protection and control

Lovato electric
100% electricity
Innovative design and concepts: the ideal solution for your industrial automation
LOVATO Electric present the innovative system for motor starting, power control and protection, result of the most advanced technology in the field of electromechanical gear for industrial automation.

This new complete range of products and accessories is compatible with the earlier series of LOVATO Electric equipment, fully compliant with recent standards and directives related to environment security.

The ease and rapidity of assembly and mounting, together with modern and compact design, place the this system at the top of the components market for industrial automation.

Each detail and feature of the motor protection circuit breakers, contactors, thermal overload relays and electromechanical starters have been developed and designed to provide excellent performance for operability, reliability and safety.

- Simplicity
- Safety
- Compactness
- Continuity
- Completeness

Just browse through the next few pages of this publication in order to appreciate this excellent advanced system for motor protection and control.
Size 1 contactors, 9 to 25A in AC3, can be possibly mechanically and electrically interlocked with size 2 contactors, 26 to 38A AC3. The new BFX50 02 mechanical interlock comprises two built-in NC auxiliary contacts to make the electrical interlock as well.

35mm DIN rail mounting and fixing
Contactor mounting and demounting on a 35mm DIN rail are tool-less operations and are done by simply applying pressure on the contactor.

Side add-on fourth pole
For the 45A and 55A AC1 ratings, a side-mount fourth power pole can be snapped on the three-pole contactor. This solution consents to optimise inventory control.

Effortless thermal overload relay link
During the connection of the thermal overload relay to the contactor, its auxiliary contact is simultaneously linked to the contactor coil terminal, by rigid connector. The complete overload relay fixing is obtained with one single operation and without other connections.

Terminal adaptability
Terminals are suitable for every type of cable: flexible, rigid, according to AWG standards and with any type of cable terminal. Power pole, auxiliary and coil screws can be tightened using one single type of screwdriver.

Snap-on installation
Mounting and demounting of the add-on auxiliary contacts and accessories, along with contactor coil replacement, are quick and easy operations and done with no tools.

Four-terminal coil
Connecting cables can be coupled to the coil, both on the line and load ends of the contactor.
The products this modern system are designed according to innovative concepts, which simplify manipulation and assembly. The installation of products and accessories is extremely quick excludes committing errors: each element is firmly fixed with a simple click.
Safety

Front protection cover for breaker - contactor connections
The front cover, fixed between breaker and contactor, provide protection to the connections.

Mirror contact function
It is an important safety feature that impedes the auxiliary NC contacts to close whenever power contacts weld because of a failure. Abnormal machinery operation, potentially dangerous for operators, thereby is excluded.

Front protection cover for contactors
A transparent sealable front protection cover can be applied to exclude manual activation of contacts.

Highly conductive contacts
The continuous diffusion of electronic systems and programmable logic controls require auxiliary contacts to be able to transmit signals with very low voltage and current values. The combination of manufacturing technologies and special materials provides for extremely reliable auxiliary contact operation in low energy load conditions.

Front protection cover for thermal overload relays
A sealable protection cover is available to protect the overload relay, when fixed in place, from all possibly adjuster tampering and involuntary activation of the Reset and Stop buttons.

Connection security - IP20
The ease of terminal access and space is combined with IP20 finger safety, to prevent accidental touching of live parts.

Sealable cover for thermal overload relays
A handy closing flap feature precludes any adjuster tampering of the thermal overload relay.

Clear identification of thermal overload relay manual or automatic resetting
The RF38 thermal overload relay is supplied configured for manual resetting. By breaking the two tabs, the Reset button can be rotated to automatic resetting. The broken tabs and the index indicator provides for immediate and distinct identification of the selected configuration.

Rubber pad insert for no DIN rail sliding
A rubber insert prevents the contactors from sliding on the 35mm DIN rail even when out of tolerance or mounted vertically.
The new products meet the most stringent safety requirements. Accurate design of each minimal detail consents to offer maximum reliability and security in every sort of installation.
Direct-on-line starters are available, up to 38A in AC3, in compact plastic enclosures.

The surge suppressor is compact and can be inserted with no tools. It is fitted in the slot on the contactor without protruding or increasing overall dimensions.

Ratings up to 38A, 18.5kW, in AC3, merely 45mm wide: exceptional benefit for electric panel dimensions.

Using the rigid connecting kits and specific adapter plates, direct-on-line and star-delta starters, reversing and changeover contactor assemblies can be easily and quickly assembled, without committing errors, having compact size and streamlined structure.

Contactor and thermal overload relay, only 127mm high
The height of the contactor, up to 25A in AC3, coupled with the thermal overload relay, is merely 127mm. This permits the use of compact sized enclosures, resulting in reduced costs.

The reversing and changeover contactor assemblies, of the up to 38A, 18.5kW in AC3, have rigid electrical connections that do not increase the size of the two side-by-side contactors. The presence of the connecting elements consent to have, in any case, access case to all terminals.

Direct-on-line starters are available, up to 38A in AC3, in compact plastic enclosures.

Enclosed starters

Only 110mm deep, with 3 auxiliary contacts
Contactors, up to 25A in AC3, equipped with one auxiliary contact block, are just 110mm deep.

The second frame size includes 3 contactors.

Compact sized reversing and changeover contactor assemblies

45mm wide contactors

Two single contactor sizes up to 38A 18.5kW, in AC3

Ratings up to 38A, 18.5kW, in AC3, merely 127mm high.
Up to 38A, 18.5kW in AC3 in compact and small size: 45mm.
The new system combines concepts of both aesthetics and performance, in a modern design.

18.5kW in just 45mm
The withstand to impacts, vibrations, shock and extreme temperature conditions warrants correct operation in the most severe applications, such as naval, railway, shipyard installations, etc.

The thermal overload relays of the earlier series, RF25 type, are compatible with the new contactors. As a result, they can be used in electrical installations with the new contactors.

The accessories, including auxiliary contacts, mechanical interlocks and so on, of the earlier series, can be mounted on the new contactors. The new BFX auxiliary contacts can be fitted on the earlier types of contactors.

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The manufacture of these system products fully meet environmental directives and standards concerning the use of certain raw materials. Particular reference is made to the compliance with European directives 2002/95/EC, RoHS: Restrictions of the use of certain Hazardous Substances in electrical and electronic equipment.

Contactors will be standard supplied with 50/60Hz coil. In this way, an easy standardising of electrical equipment for machinery intended for the world market and fewer products to stock can be warranted.

The wide coil operating limits, more than those required by international standards, guarantee safe and reliable operation in installations where there are considerable supply voltage fluctuations.

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Continuity

Compatibility of thermal overload relays

Compatibility of accessories

Dual frequency 50/60Hz coils

Use of compliant materials

Ambient conditions

RoHS 2002/95/EC
Compatibility of the new generation with the earlier series

The products are state-of-the-art in the constant technological evolution of the field and in the application of the relative reference standards.

The products of the new generation are compatible with the earlier series.
Three-pole contactors

Up to 630A at 440V in AC3.

<table>
<thead>
<tr>
<th>Series</th>
<th>Ratings</th>
<th>B series</th>
<th>BF series</th>
</tr>
</thead>
<tbody>
<tr>
<td>BG</td>
<td>6A - 9A - 12A</td>
<td>9A</td>
<td>12A</td>
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Four-pole contactors

Up to 1600A in AC1.

<table>
<thead>
<tr>
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<th>BF series</th>
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</thead>
<tbody>
<tr>
<td>BG</td>
<td>20A</td>
<td>25A</td>
<td>28A</td>
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Special contactors

2NO+2NC power pole contactors (AC1). 4NC power pole contactors (AC1).

<table>
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<tbody>
<tr>
<td>BG</td>
<td>20A</td>
<td>25A</td>
<td>32A</td>
</tr>
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Contactors for power factor correction

Up to 60kvar at 400V.

<table>
<thead>
<tr>
<th>Series</th>
<th>Ratings</th>
<th>B series</th>
<th>BF series</th>
</tr>
</thead>
<tbody>
<tr>
<td>4NO / 3NO+1NC, 2NO+2NC / 4NC</td>
<td>7.5 kvar</td>
<td>12.5 kvar</td>
<td>15 kvar</td>
</tr>
</tbody>
</table>

Control relays

Ith=10A.

<table>
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<th>BF series</th>
</tr>
</thead>
<tbody>
<tr>
<td>4NO / 3NO+1NC, 2NO+2NC / 4NC</td>
<td>4NO</td>
<td>3NO+1NC</td>
<td>2NO+2NC</td>
</tr>
</tbody>
</table>

Thermal overload relays

For B series

<table>
<thead>
<tr>
<th>Series</th>
<th>Ratings</th>
<th>B series</th>
<th>BF series</th>
</tr>
</thead>
<tbody>
<tr>
<td>For types BF09-38</td>
<td>0.1-38A</td>
<td>0.09-15A</td>
<td>14-110A</td>
</tr>
</tbody>
</table>

Motor protection circuit breakers

Up to 100A.

<table>
<thead>
<tr>
<th>Series</th>
<th>Ratings</th>
<th>B series</th>
<th>BF series</th>
</tr>
</thead>
<tbody>
<tr>
<td>For types BF50-110</td>
<td>0.1-32A</td>
<td>0.1-32A</td>
<td>22-100A</td>
</tr>
</tbody>
</table>
This modern system is composed of a complete range of products, capable of satisfying the most demanding needs of the marketplace.

A complete system of winning pieces

### Accessories

<table>
<thead>
<tr>
<th>Instantaneous auxiliary contacts with centre mounting</th>
<th>Instantaneous auxiliary contacts with front lateral mounting</th>
<th>Surge suppressors</th>
<th>Protection cover breaker + contactor</th>
<th>Contactor protection cover</th>
<th>Overload relay protection cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical interlocks for contactors</td>
<td>Rigid connecting kits</td>
<td>Independent mounting base for thermal overload relays</td>
<td>Front protection covers</td>
<td></td>
<td></td>
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</tbody>
</table>

### Electromechanical starters

<table>
<thead>
<tr>
<th>Direct-on-line starters</th>
<th>Enclosed starters</th>
<th>Reversing and changeover contactor assemblies</th>
<th>Star-delta starters</th>
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</thead>
</table>
Direct-on-line starters in enclosure

Direct-on-line starters

Reversing and changeover contactor assemblies

Motor starting

Star-delta Starters
LOVATO Electric offer a vast range of reliable and competitive solutions for industrial automation. LOVATO Electric products are a reference point on the international electrical equipment market, due to the company’s commitment to technical innovation.