New Generation ABB Contactors

A New Contactor Range from ABB
New Generation ABB Contactors

The ABB range of A contactors

A 9, A 12, A 16
A 26, A 30, A 40
A 50, A 63, A 75
A 95, A 110

A145, A185
A210, A260, A300
AF400, AF460
AF580, AF750

ABB Control
New Generation ABB Contactors

New range developed from customer requirements

QFD - Quality Function Deployment
• a systematic way to ensure that the customers’ needs are met
• customers are involved throughout the whole process

- Questionnaire
- Interviews
- Analysis
- Feedback/follow-up

Final product
New Generation ABB Contactors

Example of QFD - Analysis

D System components/co-ordination

D1 Critical dimensions
D2 Co-ordination with other system components

E User friendliness

E1 Personal safety
E2 Easy to install
E3 Easy maintenance
E4 Aesthetic design
E5 Low noise level

Blue bar is customers preference
Green bar is the rating of EH range
New Generation ABB Contactors

Participating customers

OEM

AirCond: Carrier, Trane
Comp: Atlas Copco, Kaeser, Ingersoll Rand
Crane: Liebherr
Drive: ABB Strömberg Industry, Robicon
Genset: Elcat, Tranudis, Exide
Lift: Kone, OTIS, Schindler Elevator
Pump: Grundfos, Weir, Firetrol, Hubbel
Wind: Micon

Industry

RockWool, Holmegaards glaesverker,
Wisa Forest, Saugbrugsforeningen,
Brunvoll, Union, Korsnäs, STORA Billerud

Panel Builders

ABB Installation Neutral, Schubert, Demas,
ABB Electric, Circuit Electric, DanControl,
ABB FIDIS, Vahva Sähkö, Nuova Esi,
George Kontoulis, ABB Distribusjon,
Storm Elektro, UME, ABB Installation,
Delta Electrical Systems, GEC, S&I, Kontex
ABB Gebäudetechnik, Cegelec, TCS,
ABB Installasjon, Rolls Royce IPG
New Generation ABB Contactors

ABB contactors

- ABB-line - a system concept
- Easy to install
- Safe and simple to work with
- Improved performance
- A comprehensive range of accessories
- ABB offer
New design of large contactors

- Terminals at the same level as other system components
- Contactor fits perfectly with ABB breakers, switch fuses and overload relays
ABB contactors - a compact range

• The most compact contactor range on the market
• Low built-in depth (no safety clearance needed to door)
• Built-in terminals
Complete system co-ordination

• Contactors
• Breakers
• Switch fuses
• Electronic overload relays
• Thermal overload relays

ABB-line - a system concept
ABB-line - a system concept

Co-ordination contactors - Isomax breakers

In line

Side by side

ABB Control
**ABB-line - a system concept**

**Co-ordination contactors - Isomax breakers**

<table>
<thead>
<tr>
<th>Breaker</th>
<th>S3/S4</th>
<th>S5</th>
<th>S6</th>
<th>S7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contactor</td>
<td>A145-A185</td>
<td>A210-A300</td>
<td>AF400-AF580</td>
<td>AF750</td>
</tr>
</tbody>
</table>
ABB-line - a system concept

A complete motor starter solution

MCCB with built-in advanced motor protection (SACE PR212/MP)

• Trips contactor at
  – Overload
  – Phase loss or unbalance
  – Locked Rotor

• Trips breaker at short circuit
Co-ordination contactors - switch fuses/overload relays

Contactor - switch fuse

Contactor - electronic overload relay

ABB Control
ABB-line - a system concept

ABB system provides savings

- Installation time
- Installation material
- Panel space
Easy to install

Easy access to auxiliary circuits

Front access to auxiliary circuits facilitates cabling
Easy to install

Clear indications on front

All technical data clearly marked on the front
Easy to install

Snap-on accessories

- Snap-on surge suppressors
- Snap-on auxiliary blocks
Easy to install

Inserts-holder to facilitate cabling

3-pole device to hold inserts in place while tightening the bolts
Safe and simple to work with

A focus on safety

• Touch safe - IP 20 from front
• Unintentional manual operation prevented
• Clear visual indication of status
• High safety even without optional shrouds
Safe and simple to work with

Safe and easy inspection of contacts

Operation of the contactor is impossible while inspecting the contacts

ABB Control
Safe and simple to work with

Easy to change coil on installed contactor

No need to remove power cables
Coil interface (AF contactors)

A new technology integrated into a "traditional" contactor!
Improved performance

Electronic coil control

- Always DC current over the coil
- Controlled current levels at pull-in and holding
- Integrated circuit developed by ABB
Improved performance

Coil interface

The solution to problems such as:

• Sensibility to voltage variations
  – Chattering contactors
  – Welding
  – Humming contactors

• A wide variety of coils needed to cover customer needs

• High energy consumption

• Voltage transients at opening
Distinct opening and closing

Improved performance

- Contactor closed
- Contactor open

Nominal range
- 100 V
- 250 V

Accepted range
- 77% of lower voltage range level
- 55% of lower voltage range level
**Improved performance**

**Coil voltages (AF contactors)**

| AF145-AF300 | 20-60VDC | 48-130VAC/DC | 100-250VAC/DC | 200-500VAC/DC |
| AF400-AF750 | 24-60VDC | 48-130VAC/DC | 100-250VAC/DC | 200-500VAC/DC |

**Coil codes AF145-AF750**

<table>
<thead>
<tr>
<th>Voltage Range</th>
<th>Code</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>20…60VDC</td>
<td>72</td>
<td>(For AF145-AF300)</td>
</tr>
<tr>
<td>24…60VDC</td>
<td>68</td>
<td>(For AF400-AF750)</td>
</tr>
<tr>
<td>48…130VAC/DC</td>
<td>69</td>
<td></td>
</tr>
<tr>
<td>100…250VAC/DC</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>200…500VAC/DC</td>
<td>71</td>
<td></td>
</tr>
</tbody>
</table>
Improved performance

Reduced energy consumption

- At holding, the current through the coil is minimised
- Energy consumption reduced by 65%
Improved performance

No voltage transient at opening

- Conventional contactors cause a voltage peak at opening which may harm surrounding electronic equipment.
- Using a coil interface reduces the voltage peak considerably since the energy is consumed in a controlled way.

![Diagram of an integrated circuit, rectifier, coil, and transistor showing the absence of a voltage transient at opening.](image-url)
AF400-AF750 can be controlled with low voltage signals (24V DC), i.e. directly from a PLC.
**Improved performance**

**Low voltage signal control**

- 24V +

On

Off

Supply Voltage

A1 A2

ON

OFF_N

COMMON
Coil interface

- Standard on AF400-AF750
- Option on A50-A300

Improved performance
A comprehensive range of accessories

A wide range of accessories

ABB offers a wide range of accessories to facilitate installation and use of our contactors
A comprehensive range of accessories

Wide range of accessories

- Electronic overload relays
- Thermal overload relays
- Auxiliary contact block
- Mechanical interlock (Horizontally mounted contactors)
- Mechanical interlock (vertically mounted contactors)
- Surge suppressor, type RC
A comprehensive range of accessories

Wide range of accessories

- Cable connector for Cu cables
- Cable connector for Al and Cu cables
- Terminal shrouds
- Double connector
- Connection sets for Y-D and reversing starters
- Terminal extensions
- Adapter plate for easy changeover from EH range
Contact blocks

- Snap-on for easy mounting
- The same block fits the whole range
- Up to 4 contact blocks per contactor
- Wiping function improves performance
A comprehensive range of accessories

Connection set for Y-D starter

- Completely protected connections
- IP20 from front

ABB Control
A comprehensive range of accessories

Connection set for reversing starter
A comprehensive range of accessories

Cable connectors

Double connector

Single connector for Cu cables

ABB Control
A comprehensive range of accessories

Terminal shrouds

Easy-to-fit terminal shrouds for connectors and compression lugs

ABB Control
A comprehensive range of accessories

Mechanical interlock

- Vertical
- Horizontal

ABB Control
A comprehensive range of accessories

Terminal enlargement

ABB Control
A comprehensive range of accessories

Conversion EH to A-range

Adapter plate available for easier changeover from EH range to new large A-range
The ABB offer

ABB Offer

- Documentation
- Quality and environment
- Certificates and approvals
- World wide presence
The ABB offer

Documentation

• Complete co-ordination tables elaborated through extensive testing
The ABB offer

Co-ordination tables available

- 400 V MCCB Isomax up to 50kA
- 500 V and 690 V MCCB Super limiting Isomax up to 50kA
- 400 V and 690 V Fuses aM and gG up to 80kA
- 415 V BS Fuses
- 480 V MCP and MCCB Isomax up to 85kA (UL)
- 600 V MCP and MCCB Isomax up to 35kA (UL)
- 600 V Fuses up to 80kA (UL)
The ABB offer

Dimension drawings available on file
(PDF, DWG and DXF format)
The ABB offer

Quality and environment

All products made in ISO9001 and ISO14001 certified factories
Reduced environmental impact

- Easy recycling - no combined material (metal and plastic)
- Low LCA index thanks to choice of material (in contacts and plastic)
- Cadmium and silicone free
- No ozone depleting halogens

The ABB offer
The ABB offer

Certifications and Approvals

ABB Control
The ABB offer

ABB - a world wide supplier

ABB is represented in over 140 countries