ABB INDUSTRIAL DRIVES

**ABB DC power supplies**
DCS880, 20 A to 5200 A / 10400 A
Simplifying your world
without limiting your possibilities!

Thyristor DC converters
With the DC power supplies ABB offers its customers thyristor based controllers for precise current and voltage control of electrolysis processes like hydrogen generation (power to gas), water treatment and many more.

Benefits
- Ideal to control electrolysis processes
- Suitable for electrolysis technologies for chlorine
- Suitable for electrolysis technologies for hydrogen including
  - PEM
  - Alkaline
  - etc.
- 300 V<sub>AC</sub> to 1200 V<sub>AC</sub>
- 500 V<sub>DC</sub> up to 1500 V<sub>DC</sub>
- up to 5200 A<sub>AC</sub> / 10400 A<sub>DC</sub> in 12 pulse configuration
- controllable DC voltage and DC current using thyristors / SCR’s
- large variety of supervision and protective functions could be implemented
  - overcurrent
  - overvoltage
  - temperature supervision
  - current slope
  - etc.
- user-friendly and flexible
- customized solutions in terms of
  - optimized reactive power
  - harmonics (THDI)
  - DC current ripple

Adaptive programming
Adaptive programming is ideal for creating simple control programs for various applications. It does not require expertise in programming and is offered as a standard in all-compatible drives.

Removable memory unit
Stores all the firmware and parameter configurations in an easily replaceable and simple-to-install module.

All typical DC configurations
DCS880 standard firmware supports all standard configurations present in DC drive applications such as 6-pulse, 12-pulse parallel, serial and serial sequential, 24-pulse, M3, M6 and field reversal.

Remote monitoring
With a built-in web server, NETA-21 makes worldwide access easy for industry applications.

Drive-to-drive link (D2D)
Allows fast communication between drives including master-follower configurations as standard.
Extended connectivity
In addition to the standard interfaces, the drive has three built-in slots for additional input/output extension modules and speed feedback interfaces.

Startup and maintenance tool
Drive composer PC tool for drive startup, configuration and daily use and process tuning. PC tool is connected to the drive via Ethernet or USB interface.

Intuitive human-machine interface
User-friendly, high-contrast and high-resolution display enabling easy navigation in multiple languages. Allows USB and Bluetooth connection.

Communication with all major automation networks
Fieldbus adapters enable connectivity with all major automation networks.

Flexible product configurations
Drives are built to order with a wide range of options. Ready made cabinets with or without transformer are available up to 20 MW.

Extended connectivity
In addition to the standard interfaces, the drive has three built-in slots for additional input/output extension modules and speed feedback interfaces.

Engineering support
• Harmonics can be reduced by appropriate selection of supply transformer (i.e. 12-, 18- and 24-pulse configuration).

<table>
<thead>
<tr>
<th></th>
<th>5th</th>
<th>7th</th>
<th>11th</th>
<th>13th</th>
<th>THD_cur</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-pulse</td>
<td>21%</td>
<td>14%</td>
<td>9%</td>
<td>7%</td>
<td>36%</td>
</tr>
<tr>
<td>12-pulse</td>
<td>1%</td>
<td>1%</td>
<td>6%</td>
<td>7%</td>
<td>11%</td>
</tr>
</tbody>
</table>

• DC current ripple depends on load current, supply voltage, DC choke and configuration (6-pulse, 12-pulse etc.) i.e. 6-pulse, 400 V, 4000 A, 0.6 mH, 10 % current ripple 12-pulse, 400 V, 4000 A, 0.15 mH, 10 % current ripple

• Power factor is dependent on dimensioning of supply transformer and converter supply voltage in relation to DC output voltage.

\[ \text{DC output voltage} = 1.35 \times \text{converter input voltage} \times 0.9 \]
\[ \text{AC current} = \text{DC current} \times 0.82 \]
\[ \text{Transformer kVA} = \text{Converter input voltage} \times \text{AC current} \times \sqrt{3} \]

\[ \text{Power factor} = \frac{\text{Converter input voltage}}{\sqrt{3}} \]

\[ \text{Tolerance supply} = \text{max - output voltage} \]

\[ \text{required - output voltage} = \text{Power-factor} \times \text{Tolerance supply} \]
Overview

- Cabinet solutions individually adaptable to customer requirements (cable connection, color, protection class, etc.)
- Protection of stacks can be realized by programming features of DCS880
- User-defined accessories like separate connection to PLC or automation systems via fieldbus available
- Transformer and/or T-reactor/DC choke can be included
- Wide range of switches and protection devices available
- Good cos phi / low harmonics (THDi) in 12-pulse configuration

Configurations

- 6-pulse (i.e. 500 V / 5,000 A)
- 12-pulse parallel (i.e. 500 V / 10,000 A)
- 12-pulse serial (i.e. 1,000 V / 5,000 A)

Ratings, types and voltages

<table>
<thead>
<tr>
<th>Unit size</th>
<th>Rated Current [DC] [A]</th>
<th>Supply voltage [Vac]</th>
</tr>
</thead>
<tbody>
<tr>
<td>H3</td>
<td>290, 315, 405, 470</td>
<td>400, 500/525, 600, 690, 800, 990, 1190</td>
</tr>
<tr>
<td>H4</td>
<td>590, 610, 740, 900</td>
<td>400, 500/525, 600, 690, 800, 990, 1190</td>
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<tr>
<td>H6</td>
<td>900, 1200, 1500, 2000</td>
<td>400, 500/525, 600, 690, 800, 990, 1190</td>
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<tr>
<td>H7</td>
<td>1900, 2050, 2500, 3000</td>
<td>400, 500/525, 600, 690, 800, 990, 1190</td>
</tr>
<tr>
<td>H8</td>
<td>2050, 2600, 3300, 4000, 4800, 5200</td>
<td>400, 500/525, 600, 690, 800, 990, 1190</td>
</tr>
</tbody>
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