Medium voltage AC drives
Product overview

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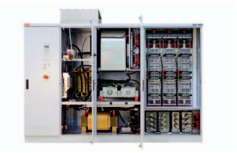
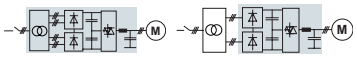
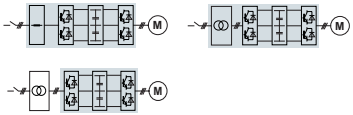
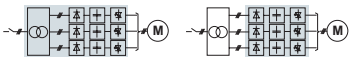
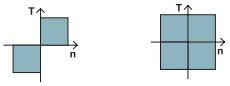
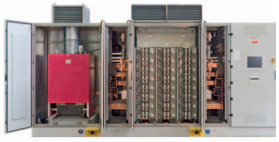
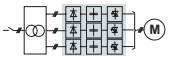
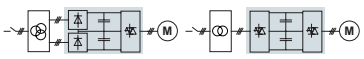
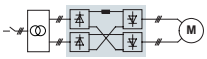
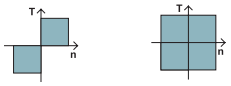
General purpose drives

General purpose medium voltage drives are used to control standard motors. Typically these motors are used to drive applications such as pumps, fans, compressors, mixers, mills and conveyors.

Product	ACS 1000	ACS 2000	ACS 5000 air cooled
			
Type of converter	VSI – Voltage Source Inverter	VSI – Voltage Source Inverter	VSI – Voltage Source Inverter
Typical applications	Pumps, fans, conveyors, extruders, mixers, compressors, grinding mills, suitable for retrofit of existing motors	Pumps, fans, conveyors, extruders, mixers, compressors, grinding mills, suitable for retrofit of existing motors	Compressors, extruders, pumps, fans, grinding mills, conveyors, blast furnace blowers, gas turbine starters
Typical system diagram			
Converter cooling	Air (A) / Water (W)	Air (A)	Air (A)
Power range	A: 315 kW – 2 MW W: 1.8 – 5 MW	A: 250 – 1,600 kW	A: 2 – 7 MW
Input section	Diodes: 12/24-pulse rectifier	High-voltage IGBTs: Active Front End (AFE)	Diodes: 36-pulse rectifier
Output section	IGCTs: 3-level VSI, sinusoidal output	High-voltage IGBTs: 5-level VSI, 9-level output waveform	IGCTs: 5-level VSI, 9-level output waveform
Output voltage	2.3 / 3.3 / 4.0 / 4.16 kV Optional: 6.0 / 6.6 kV with step-up transformer	4.0 – 6.9 kV	6.0 – 6.9 kV Optional: 4.16 kV
Maximum output frequency	66 Hz (optional 82.5 Hz)	75 Hz	75 Hz (optional 250 Hz)
Field weakening	> 45 Hz (max. 1:1.5)	> 15 Hz (max. 1:5)	> 35 Hz (max. 1:2, higher optional)
Speed-torque quadrants			
Special features and benefits	– Sinusoidal output – Constant network power factor over whole speed range – DTC (Direct Torque Control) – Fuseless	– AFE for minimized harmonics – Constant network power factor over whole speed range – DTC (Direct Torque Control) – Fuseless	– Constant network power factor over whole speed range – DTC (Direct Torque Control) – Fuseless
Examples of options	– Integrated input transformer – Braking chopper – Synchronous bypass – Redundant cooling fan / pump	– Available for direct-to-line connection, for connection to a separate two-winding transformer or with an integrated transformer – Reactive power compensation and regeneration – Redundant cooling fan – Extended I/Os for supervision functions – Various fieldbus interfaces	– Integrated input transformer – Synchronous bypass – Extended I/Os for supervision functions – Redundant cooling fan
Type of motor	Induction motor	Induction motor	Induction, synchronous and / or permanent magnet motor

Special purpose drives

Special purpose medium voltage drives are engineered drives, typically used for high power, high speed or special performance applications such as test stands, marine propulsion and thrusters, rolling mills, SAG and ball mills, large pumps, fans and compressors.

Product	ACS 5000 water cooled	ACS 6000	MEGADRIVE-LCI
			
Type of converter	VSI – Voltage Source Inverter	VSI – Voltage Source Inverter	LCI – Load Commutated Inverter
Typical applications	Compressors, extruders, pumps, fans, grinding mills, conveyors, blast furnace blowers, gas turbine starters	Rolling mills, marine propulsion, mine hoists, pumps, fans, compressors, grinding mills, extruders, conveyors	Compressors, pumps, fans, blast furnace blowers, pump storage plants
Typical system diagram			
Converter cooling	Water (W)	Water (W)	Air (A) / Water (W)
Power range	W: 5 – 32 MW (higher on request)	W: 3 – 27 MW	A: 2 – 31 MW W: 7 – 72 MW (higher on request)
Input section	Diodes: 36-pulse rectifier	Diodes: 12/24-pulse rectifier (LSU) or IGCT: Active rectifier (ARU)	Thyristors: 6/12/24-pulse rectifier
Output section	IGCTs: 5-level VSI, 9-level output waveform	IGCTs: 3-level VSI, 5-level output waveform	Thyristors: 6/12-pulse inverter
Output voltage	6.0 – 6.9 kV Optional: 4.16 kV	3.0 – 3.3 kV Optional: 2.3 kV	2.1 – 10 kV
Maximum output frequency	75 Hz (optional 250 Hz)	75 Hz (higher on request)	60 Hz (optional 120 Hz)
Field weakening	> 35 Hz (max. 1:2, higher optional)	> 3 Hz (max. 1:4.5)	Customized
Speed-torque quadrants			
Special features and benefits	– Constant network power factor over whole speed range – DTC (Direct Torque Control) – Fuseless	– Constant network power factor over whole speed range – Optimized pulse pattern to minimize network harmonics (with IGCT) – DTC (Direct Torque Control) – Multi-motor drive with common DC bus – Fuseless	– Soft start of large synchronous motors and generators – Fuseless
Examples of options	– Synchronous bypass – Extended I/Os for supervision functions – Redundant cooling pump	– Reactive power compensation and regeneration (ARU) – Extended I/Os for supervision functions – Braking chopper – Customized	Customized
Type of motor	Induction, synchronous and / or permanent magnet motor	Induction, synchronous and / or permanent magnet motor	Synchronous motor

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