

Water-cooled motors

Efficient cooling technology in a power dense design



ABB's water-cooled motors are quite and versatile, and they excel in the harshest environments. The water-jacket cooling technology extends motor life while saving space, energy and maintenance costs.

Features:

- Offered in NEMA and IEC frame designs
- Continuous full load torque from zero to base speed when used with ABB DTC (Direct Torque Control) or other high-performance vector control inverters
- Wider constant power ranges available with custom base speeds
- 200% minimum overload torque starting at base speed and below for 1 minute
- Compact, power dense design
- Quiet operation
- Lower maintenance costs because bearings and windings are protected from overheating. In dirty environments, traditional cast iron TEFC frame fins fill with debris and require additional cleaning and maintenance.

DOL & variable speed electrical designs:

- ABB's NEMA and IEC water-cooled product line includes induction, synchronous reluctance (SynRM) & IPM (Interior Permanent Magnet) designs. Induction designs are suitable for DOL (direct on line) & variable speed use. SynRM and IPM designs are for variable speed use exclusively
- Lower inertia rotors provide fast dynamic response

Main specifications	
Output power:	60 - 2682 Hp (45 - 2000 kW)
Frame sizes:	NEMA 360, 400, 440 and 5800
	IEC 225, 250, 280, 315, 355, 400, and 500
Efficiency:	NEMA Premium® efficiency with induction rotor (IE3)
	Ultra premium (IE5) with permanent magnet or SynRM rotor
Electrical design:	DOL & variable speed
Material design:	No dust-collecting cooling ribs - corrosion resistant fabricated steel frame
Protection:	IP55 (optionally IP56)
Bearings:	PLS (Positive Lubrication System) for prolonged bearing life
Insulation:	Class F (optionally Class H)
Inverter duty:	Withstands voltage spikes requirements of MG1 Part 31.4.4.2
Mounting:	Horizontal with F1/F2 conduit box options
	Class I Division 2 certifications (Class A,B,C,D)
Ex protection types:	Class II Division 2 Group F and G, T4*
	Ex ec IIC T3 Gc acc. IEC/EN 60079-7 with certificates*
Thermal protection:	3 (one per phase) thermostats or PTC thermistors
Fully customizable:	Power ratings, base speeds, constant power speeds available upon request
Optional condition monitoring:	Mounting provisions for ABB Ability™ Smart sensor

*for IEC design only

Water-cooling technology for power density

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01 Comparison of 360 frame TEWC vs. 447 TEFC NEMA frame motors.

The water-cooled motor uses a highly efficient cooling method to transfer heat away from the motor without the use of fans by circulating water through the water jacket. Cooling efficiency is maintained even at lower speeds, making this motor ideal for constant torque applications.

Water-cooled motors offer a power dense solution for the most compact and demanding applications found in marine, mining and other process industries.

Commitment to quality

All water-cooled motors are available with UL component recognition, CE mark and CSA approval.

Power density



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- (1) 2:1 CT; 4:1 VT
- (2) 1000:1 CT
- (3) Permanent magnet (PM) and Synchronous Reluctance (SynRM) designs available
- (4) Suitable for across the line (DOL) operation
- * HydroCool XT is the Baldor-Reliance NEMA frame water-cooled motor

Hp (kW)	NEMA frame			IEC frame		
	Std. NEMA TEFC IE3 induction/ 1800 RPM ⁽¹⁾	HydroCool XT* IE3 induction/ 1800 RPM ⁽²⁾	HydroCool XT* IE5 IPM/ 1200 RPM ⁽²⁾	Water-cooled M3LP IE3 induction ⁽³⁾ 60 Hz/3600 RPM ⁽⁴⁾	Water-cooled M3LP IE3 induction ⁽³⁾ 60 Hz/1800 RPM ⁽⁴⁾	Water-cooled M3LP IE3 induction ⁽³⁾ 60 Hz/1200 RPM ⁽⁴⁾
60 (45)	360					-
75 (56)						
100 (75)	400	360		-	-	
125 (93)			360			
150 (112)						
175 (130)		400				
200 (149)						315
225 (168)						
250 (186)	440		400			
275 (205)		440		315	315	
300 (224)						
325 (242)						
350 (261)						
375 (280)			440			355
400 (298)	L449	L449				
500 (373)				355		
600 (447)	5000		L449		355	
700 (552)						
800 (597)						400
900 (671)						
1000 (746)	5800		5810		400	
1250 (932)	6800					
1341 (1000)		-			450	450
1475 (1100)				-		
1609 (1200)						
1878 (1400)		-	-			500
2146 (1600)						
2414 (1800)					500	
2682 (2000)						-

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