ERH direct drive

The latest innovation in HVAC

ABB's ERH external rotor motor for HVAC applications offers a highly efficient, compact, and lightweight solution that is easy to install and operate. Designed for flexibility, it provides a plug-and-play, user-friendly experience, making it the perfect choice for fan equipment.

Trust ABB to provide the latest and most innovative solutions to meet your needs.

Scan for video

New solutions for HVAC
Synchronous brushless EC motor

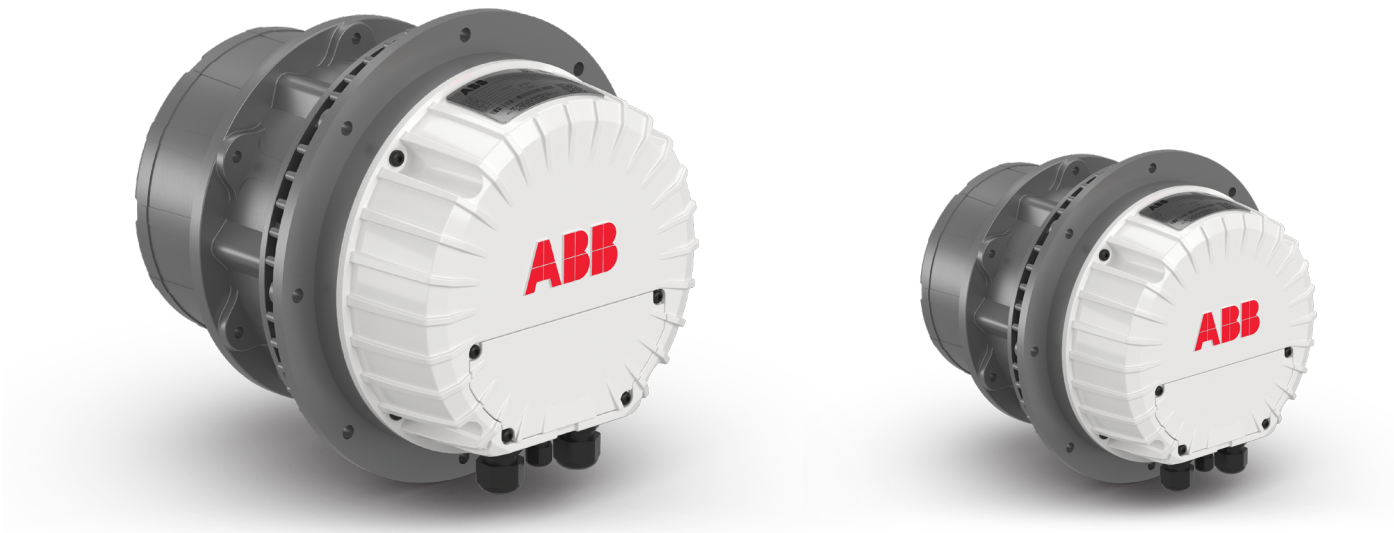
ERH's compact configuration and light weight simplifies fan system installation, reducing assembly time and minimizing errors. The efficient design and quality components provide optimal energy utilization and reduced maintenance, resulting in cost savings throughout the life of the system.

Variable speed operation
- Ideal for high-torque, low-speed applications
- Match motor to impeller speed for optimized performance
- Efficiency improvement when not operating at full power of motor

Plug-and-play, ready to go
- No programming, no set up necessary
- Start/stop configuration
- Speed pot design that allows for controllable speed
- Motor health shown with LED indicator

Eco-friendly design
- High system efficiency
- Innovative and practical way to turn a fan – without unnecessary wear components
- Independently tested and verified performance data

Reliable and quiet operation
- Extremely low starting current and less cogging reduces mechanical stress, increases reliability
- Ultra-quiet operation
- Permanent sealed and greased for life bearings
- Enhanced bearing protection against EDM



Engineered to outrun.
Cleaner and leaner operations

ABB is your trusted partner in the adoption of innovative technologies designed to enhance system efficiency and optimize design. We empower our OEM customers to establish themselves as industry leaders by integrating cutting-edge solutions that drive operational excellence. Whether it's for buildings, data centers or other air-handling solutions – ERH is a new opportunity to position your operation for improvement.

ERH not only streamlines footprint management and reduce operating costs, but also play a critical role in lowering CO_2 emissions, contributing to a more sustainable future.

With ABB, you can leverage the latest advancements to stay ahead of the competition while meeting the growing demands for environmental responsibility and operational performance. New technologies for new opportunities.

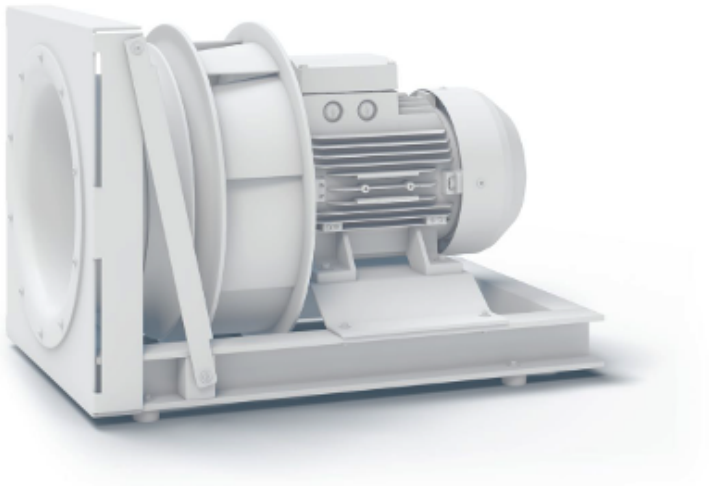
ERH – The latest inovation in HVAC

New design. New possibilities.

- Designed and assembled in the U.S.
- IES5 per IEC 61800-9-2 that defines efficiencies for a Power Drive System (PDS)
- Available as a package ready for integration by fan manufacturers
- Local service and support
- Compact and lower weight than traditional induction motor solutions

Traditional motor technology
- Fan bearing reliability
- More wear components
- Drive located in cabinet nearby
- Setup can be time consuming

New direct drive technology
- No coupling
- Reduced maintenance components
- Less structural support
- Quieter operation
- Compact design

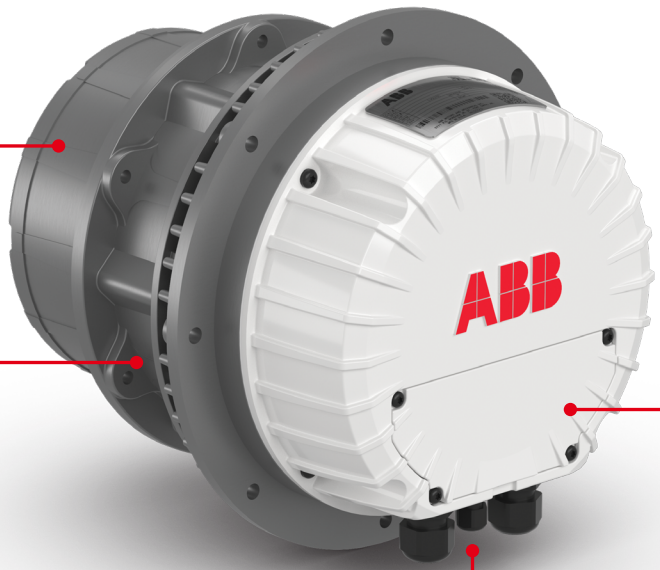


ERH solution
The details that make a difference

This cutting-edge technology is built and designed for practical operation, making it the perfect solution for centrifugal fans. With an IP65 rating for durability, it can operate in a wide variety of environments. The permanent magnet motor runs cooler and more efficiently than traditional AC induction motor designs, resulting in a structurally stable and safer option with less vibration issues. Get ready to experience a more efficient and reliable solution with the ERH integrated motor and drive.

Output power: up to 7.5Hp (5.5 kW)
Rotational speed: 1800 to 3000 RPM
Rated torque: up to 30 Nm
Insulation: Class F
Operating temperature: -20 to 40 °C
Ingress protection: IP65

- Integrated controls
- Plug-and-play solution / no programming required
- Quick disconnect terminal strip
- LED indicator for motor health
- Automatic cut-off safety feature
- Ceramic coated shaft for bearing current mitigation



Exterior rotor flange mount allows for compact, torque-dense designs that save space

Cable glands for quick connect / disconnect to fans

ERH solution
Ordering Information

Product series	Frame	Product code						
ERH	110	E	4	H	5	C	E	5
		1	2	3	4	5	6	7

Product series	
ER	Exterior Rotor
H	HVAC

Frame	Description
11x	Aluminum
xx0	Standard BLE Version

Position 1	Version
E	Axial Mount (TEAO)

Position 2		Voltage
8	208 / 230V	1-phase
2	208 / 230V	3-phase
4	280 / 480V	3-phase

Position 3	Power type
H	Horsepower
K	Kilowatt

Position 4	Power Rating (HP)
1	1
2	2
3	3
5	5
7	7.5

Position 5	Frame
A	130
C	178

Position 6	Mounting
E	ERH

Position 7	Base Speed (r/min)
3	3000
4	1800
5	2400
7	2700

ERH ordering information
Catalog numbers and ratings

			Power		Base	Base Torque		Input Rating	
Catalog Number	Size	Weight lbs. (kg.)	HP	kW	RPM	lb-ft	N-m	Voltage*	Phase
ERH110E8H1AE3	130-25	14.3 (6.49)	1	0.75	3000	1.8	2.4	208-230	1
ERH110E2H1AE3	130-25	14.3 (6.49)	1	0.75	3000	1.8	2.4	208-230	3
ERH110E4H1AE3	130-25	14.3 (6.49)	1	0.75	3000	1.8	2.4	380-480	3
ERH110E2H2AE3	130-45	16.8 (7.62)	2	1.5	3000	3.5	4.7	208-230	3
ERH110E2H5CE5	178-35	32 (14.51)	2	4	2400	7.9	10.7	208-230	3
ERH110E4H3AE3	130-45	19.8 (8.98)	3	2.2	3000	5.3	7.1	380-480	3
ERH110E4H5CE5	178-35	32 (14.51)	5	4	2400	10.9	14.8	380-480	3
ERH110E4H7CE7	178-45	34.5 (15.65)	7.5	5.5	2700	14.4	19.8	380-480	3
ERH110E4H7CE4	178-70	44.5 (20.18)	7.5	5.5	1800	21.9	29.7	480	3

* 208-230V drive units include power factor correction (PFC) and 380-480V drive units incorporate EMI filtering

Values shown are of ERH working at +40°C environment temperature. In these operating conditions the units reach their maximum performance before derating occurs. Units are “air over” during operation; performance and typical operating conditions are strongly influenced by the cooling action of the impeller.

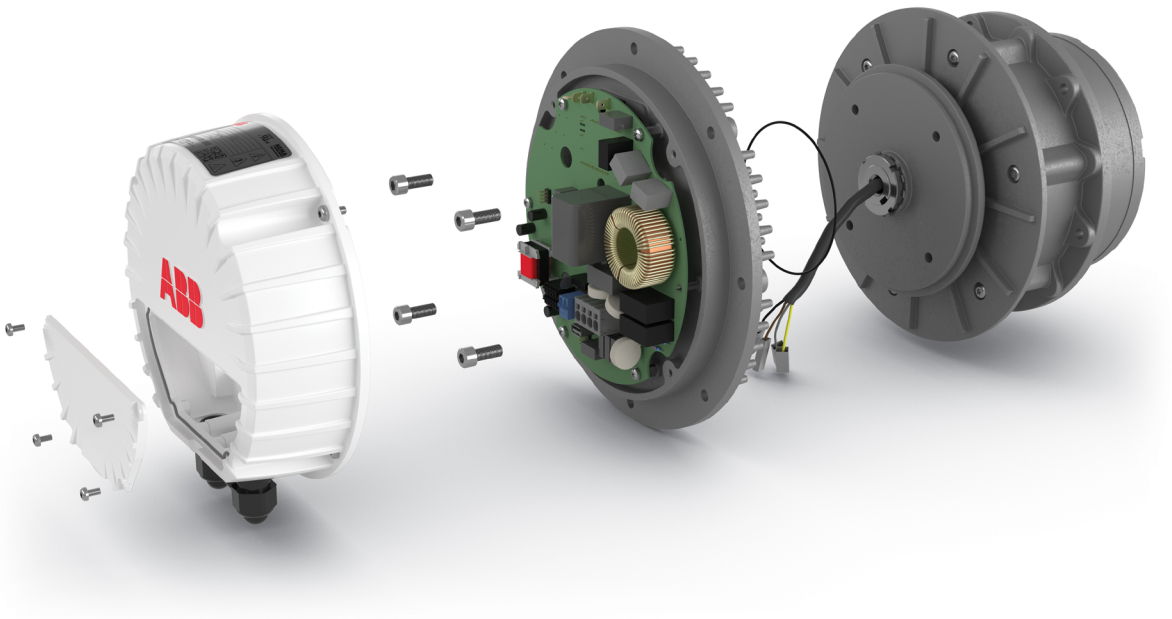
Some torque deratings could be necessary in application, depending on the ability of the impeller to effectively cool the electronic driver and the electric motor.

Maximum environment temperature expected in the application is to be carefully considered during tests, as it adds to the temperature of motor and driver influencing the maximum torque deliverable within acceptable temperature limits for motor and electronic driver.

ERH solution
Technical data

Environmental	
Enclosure	IP65
Operating temperature (full power)	-20 to 40°C
Operating temperature (reduced power)	up to 50°C
Storage temperature	-20 to 80°C
Max shaft axial load	50 kg
Bearings	Permanently sealed
Bearing current protection	Ceramic coated shaft

Temperature limits for motor	
Motor insulation class	F
Maximum motor temperature	110°C



ERH solution
Technical data

Three phase solution

Power supply data

Number of phases	3
Nominal supply voltage	480 V rms
Line voltage (absolute min – max)	187 V rms … 528 V rms
Line frequency range	50 Hz … 60 Hz
Maximum line current	13 A rms
Power factor correction	Not available
Ground leakage current	< 3.5 mA @ 400 V ms

Driver output data

Number of phases	3
Maximum current	15.6 A peak
PWM pulse frequency	4-14 KHz

Interface signal wire data

Wires number	6
Analog input voltage	0 … 10 Vdc
Analog output voltage	+10 Vdc (5 mA max current)
Input impedance	200 kOhm
Communication interface	EIA RS-485
Communication protocol	ModBus RTU
Relay Outputs	1 at 5A resistive, 2A inductive

Single phase solution

Power supply data

Number of phases	1
Nominal supply voltage	230 V rms
Line voltage (absolute min – max)	187 V rms … 253 V rms
Line frequency range	50 Hz … 60 Hz
Maximum line current	5.9 A rms
Power factor correction	Not available
Ground leakage current	< 3.5 mA @ 230 V ms

Driver output data

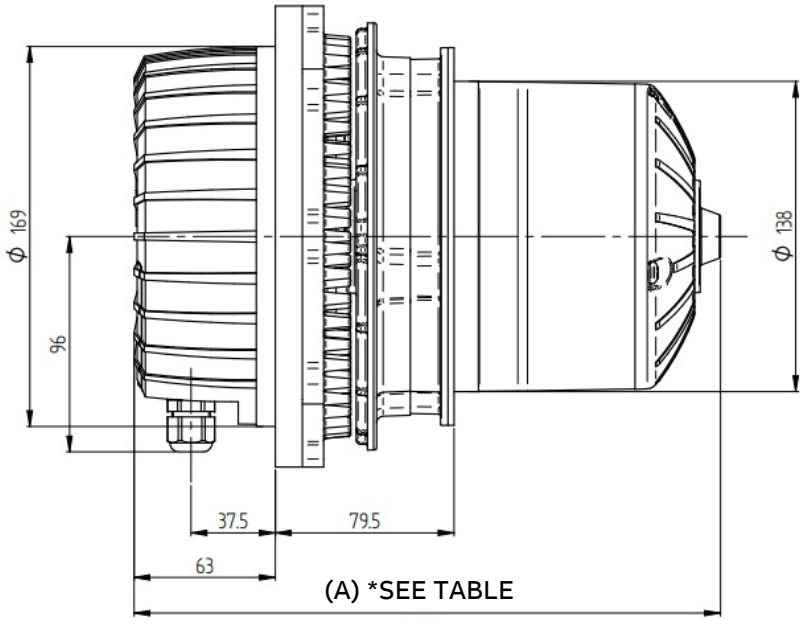
Number of phases	3
Maximum current	15.7 A peak
PWM pulse frequency	4-14 KHz

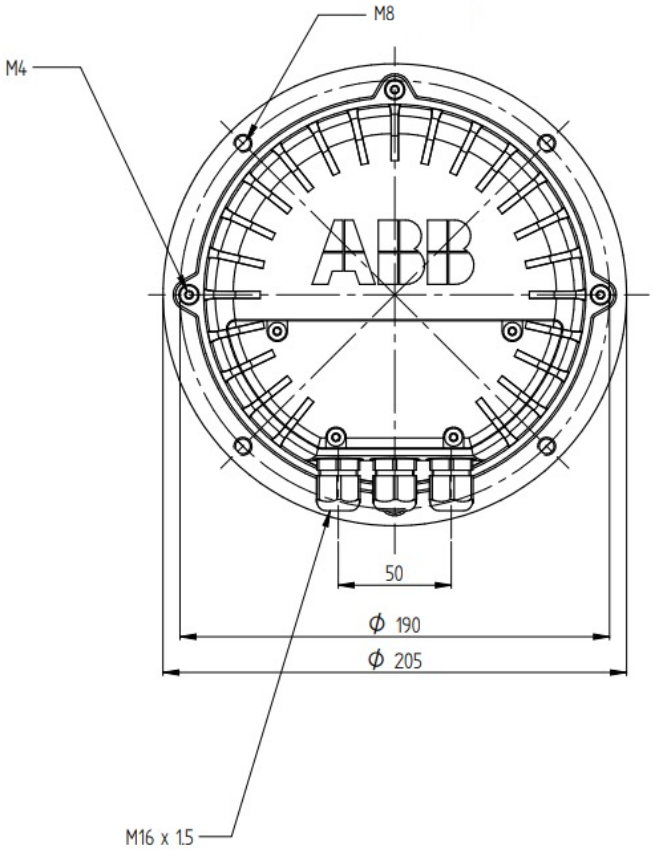
Interface signal wire data

Wires number	10
Analog input voltage	0 … 10 Vdc
Analog output voltage	+10 Vdc (5 mA max current)
Input impedance	200 kOhm
Communication interface	EIA RS-485
Communication protocol	ModBus RTU
Relay Outputs	1 at 5A resistive, 2A inductive

ERH dimensions
Size 130

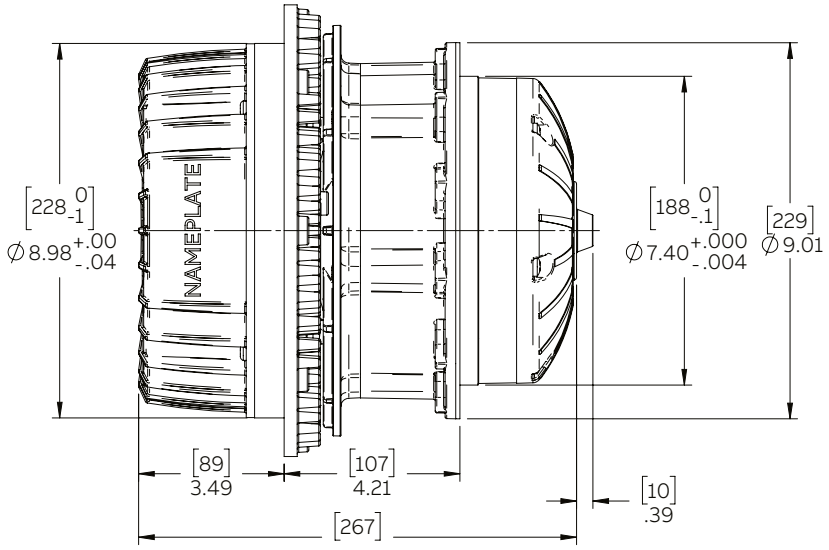
Model	A (inch	A (mm)
130-25	10.0"	254
130-45	10.89"	276.6

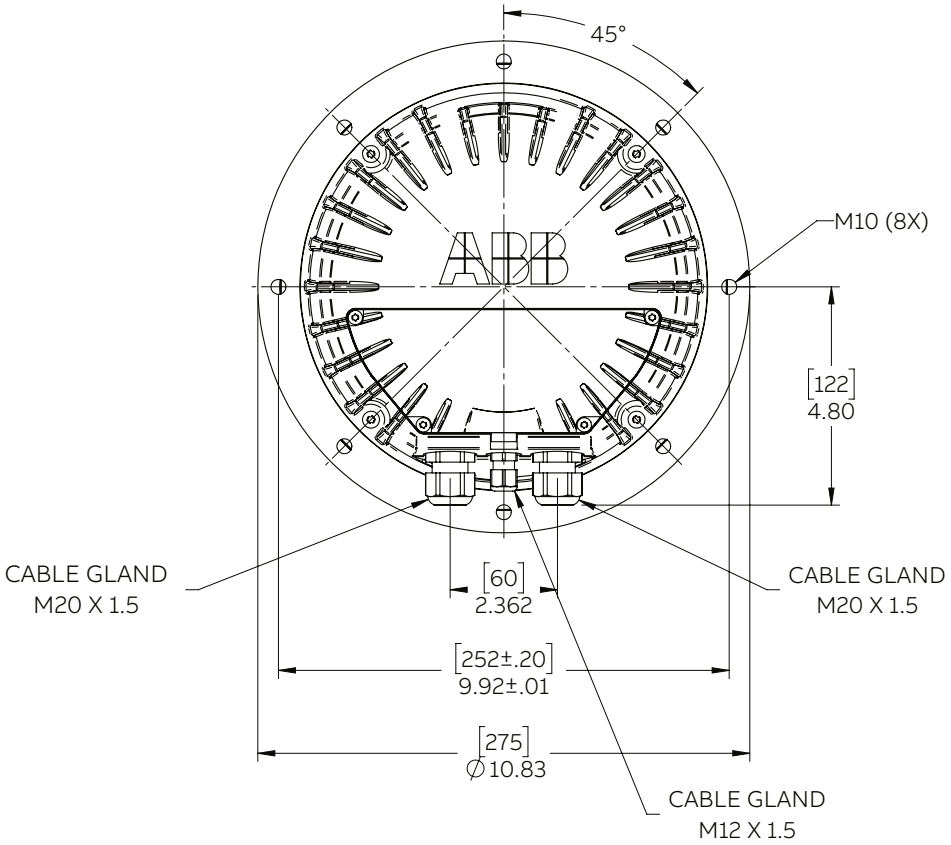




ERH dimensions
Size 178

Model	A (inch	A (mm)
178-35	10.49"	266.45
178-45	10.89"	276.6
178-70	11.87"	301.5

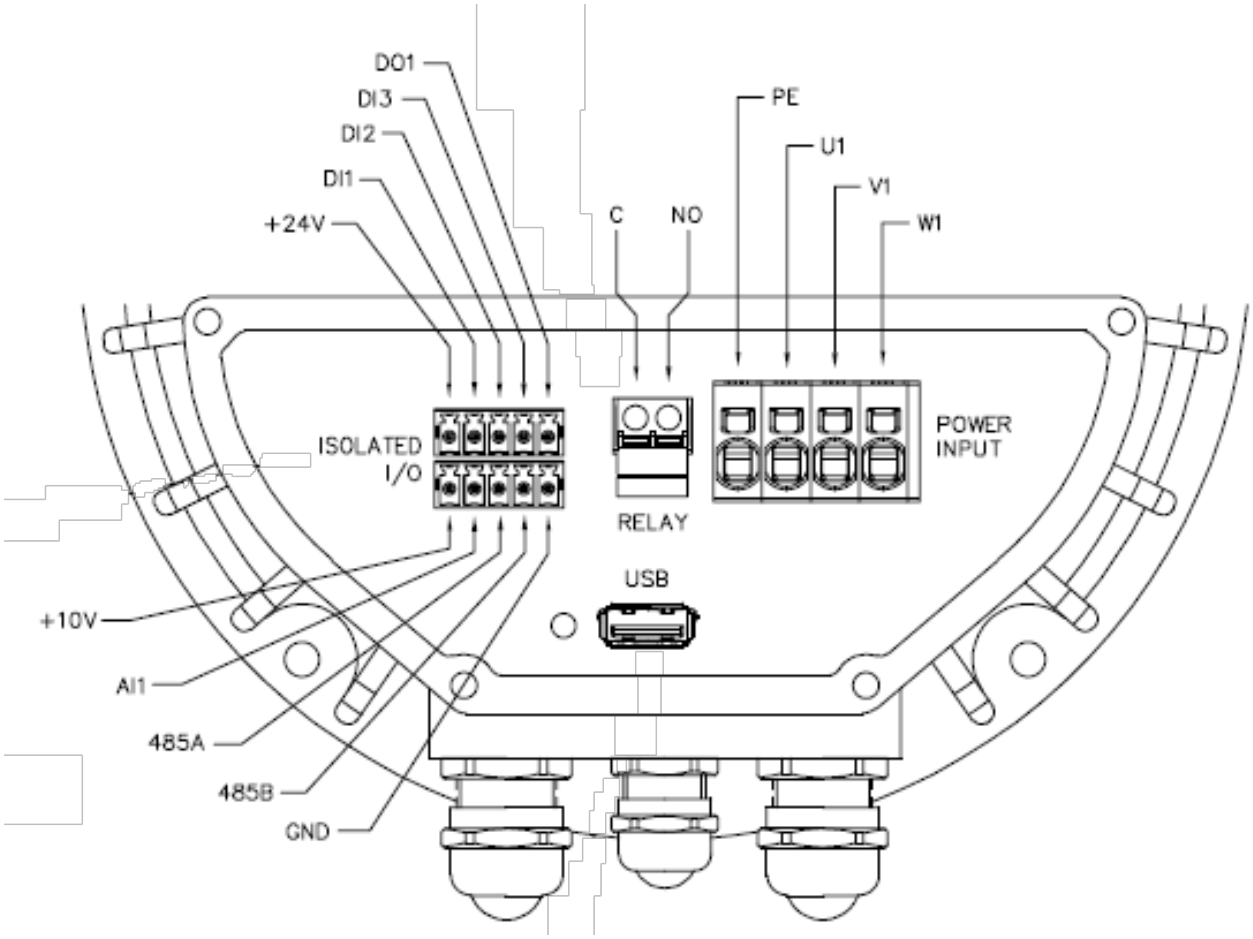




ERH controls

Control features:

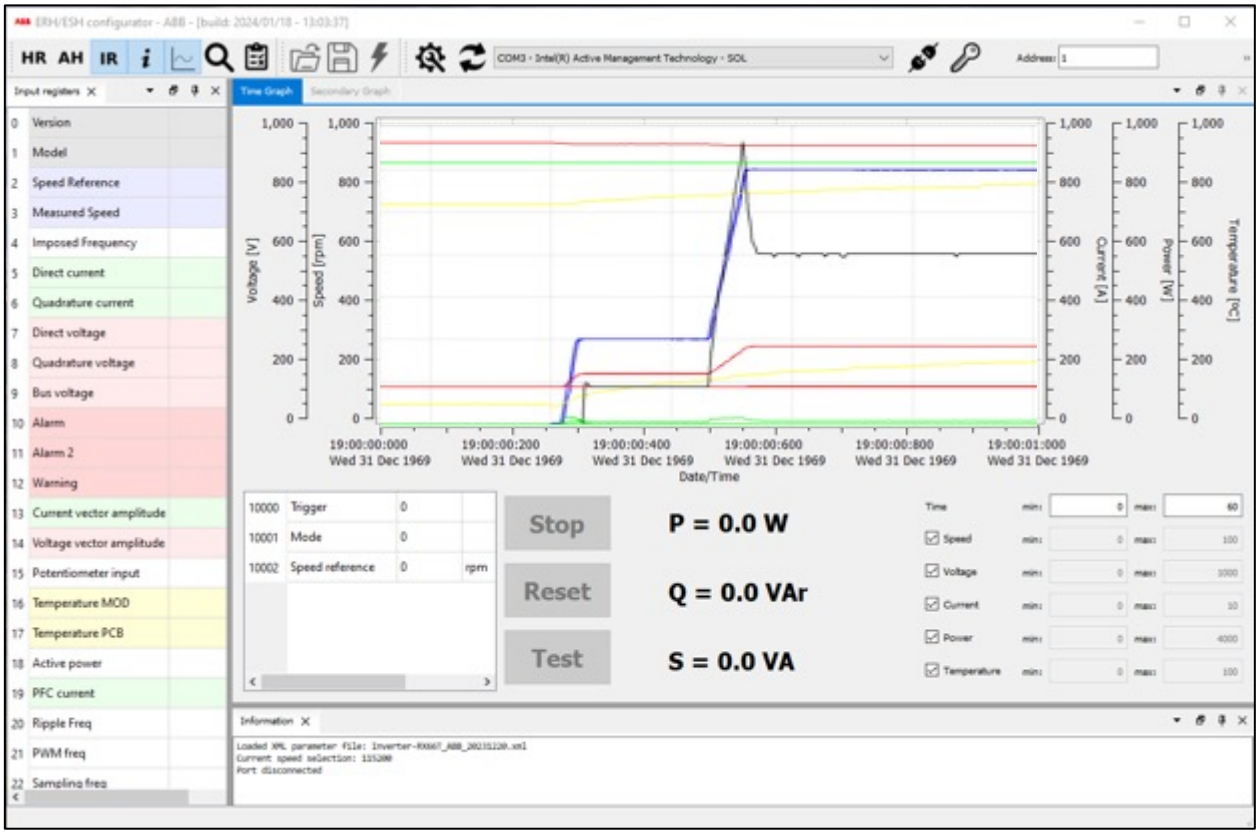
- Programmable digital inputs for Start/Stop, Direction and Enable (DI1: Start, DI2: Reverse, DI3: Enable)
- Digital Output configurable proportional PWM speed, alarm indication, speed above/below threshold and speed inside/ outside range
- Programmable Relay Output
- Analogue speed input, 0-10V signal
- Modbus RTU, RS-485 communications
- Protection from over-current, short circuit, over-temperature, overvoltage and undervoltage
- Optional USB for programming and BLE interface



ERH PC programing tool

Control features:

- Modbus RTU, RS-485 communications
- Upload / Download and Parameter group editing
- Real time trending and data recorder
- Control and monitor capability

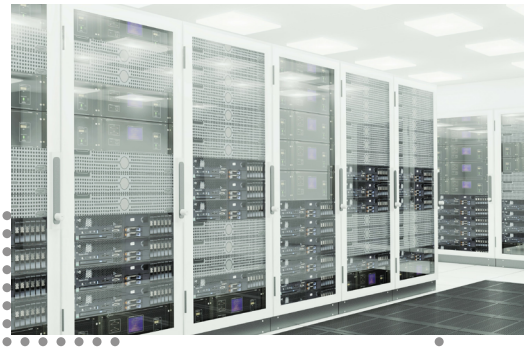


ABB, your global value partner

Partnering with ABB gives you access to some of the world's most innovative technology and thinking.

ABB is committed to delivering top-quality service and support to clients all over the world, and right in your local markets. We provide your business with technical know-how and key industry problem-solving skills. Our IMD team are experts in the HVACR industry and on ABB products, tools and processes and deliver a trusted, accessible experience, wherever you are in the world.

Quality service support is a critical element for operating reliable and sustainable industries and maintaining optimal efficiency. ABB provides its extensive service expertise globally to do just that, helping the HVACR industry to outrun – leaner and cleaner. Our experts serve you, our partners, helping you to maximize uptime, extend product lifecycle, and enhance the performance and energy efficiency of your equipment by providing tailored services and digital solutions.



—
ABB Motors and Mechanical Inc.
5711 R.S. Boreham, Jr. Street
Fort Smith, AR 72901
Ph: 1.479.646.4711

new.abb.com/motors-generators

Questions? Contact your local CBT representative for more information.
Visit cbtcompany.com/locations for locations and hours.