

MotorPro[®] Training RESCUE[®] Select

“The OEM ECM Replacement Blower Motor”



ECM Motors

- The designation ECM is usually reserved for smaller variable speed motors that operate from a single-phase power source and have the electronic controller mounted in or on the motor
- Electronically commutated motors can have other features that also may be used in addition to ECM in their name

- A permanent magnet rotor
- Some are made to run directly from a DC power source.
- Others are made to run from an AC power source, but they rectify the AC to DC in their controllers before it is pulsed or commutated

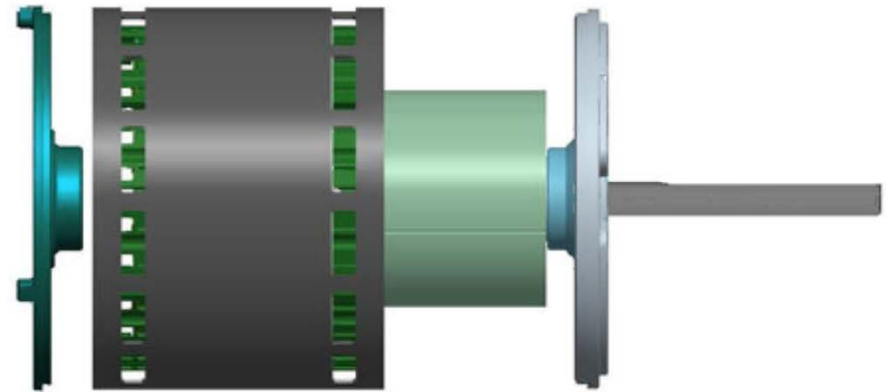
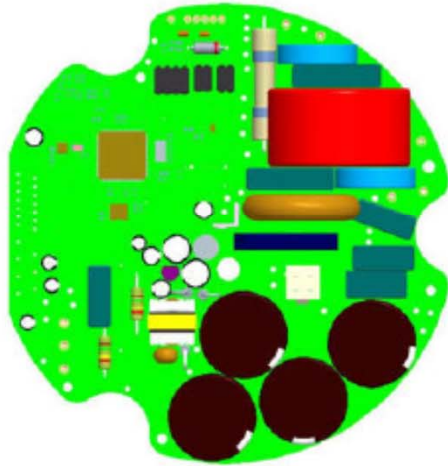


ECM Motors

- Power is pulsed on and off electronically with semi-conductor devices, sometimes called electronic switches or transistors
- The pulsed signals power three or more circuits or coil groups within the motor
- By varying the timing and duration of pulses, the electronic controller can accomplish speed control and maintain high torque at start and over a broad speed range



Nidec's Advanced ECM Design



Electronic Control Module

- Sensorless, Sine Wave Control
- Thermal/Power Limit Software Protection
- Smooth Starting

Brushless Permanent Magnet Motor

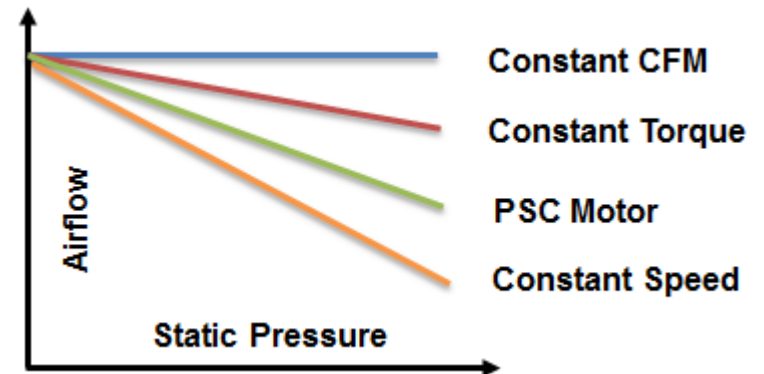
- 3 Phase Chain Winding Design
- 12 Slot 10 Pole Motor Configuration
- Ferrite Magnet Rotor
- Ball Bearing



ECM Motor Technologies

There are three main ECM motor types

- Constant Torque
 - Constant CFM
 - Constant Speed
- **Constant CFM** motors react to system static pressure changes by adjusting motor RPM up or down to maintain system design airflow performance
 - **Constant Torque** motors react to system static pressure changes by adjusting motor RPM up or down to maintain a pre-programmed torque setting for each speed tap
 - **Constant Speed** motors do not react to system static pressure changes, continue to run at the pre-programmed RPM, and are not commonly found in indoor blower applications



ECM Technologies



| | SelectTech® & X13®* | 16x4w & ECM 2.3 | PerfectSpeed® & ECM 3.0 |
|------------------------|------------------------------------|---|------------------------------------|
| Constant CFM | | ✓ | ✓ |
| Constant Torque | ✓ | ✓ | ✓ |
| Constant Speed | | ✓ | ✓ |
| Control Method | (2-5) programmable Speed Taps | Non-communicating 16 Pin 24v Analog & PWM | 2- Way Serial Communication & PWM |

Note: SelectTech and PerfectSpeed are trademarks of Nidec Motor Corporation

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ECM Technologies



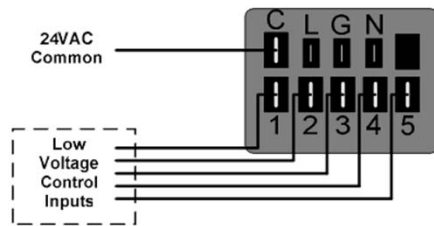
| | SelecTech® & X13®* | 16x4w & ECM 2.3 | PerfectSpeed® & ECM 3.0 |
|-----------------|-------------------------------|---|-----------------------------------|
| Constant CFM | | ✓ | ✓ |
| Constant Torque | ✓ | ✓ | ✓ |
| Constant Speed | | ✓ | ✓ |
| Control Method | (2-5) programmable Speed Taps | Non-communicating 16 Pin 24v Analog & PWM | 2- Way Serial Communication & PWM |

- RESCUE® Select replaces U.S. MOTORS® SelecTech® and the Regal™* X13 motors.
- It does **NOT** replace the U.S. MOTORS 16x4w and PerfectSpeed® or the Regal™* ECM 2.3 and ECM 3.0

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How to Identify an X13[®]*



- The X13[®]* motor is a different body
- It is typically referred to as a “one piece” because controls are internal
- Has a unique connector with 5 programmable speed/torque taps
- The X13[®]* trademark is typically found on motor nameplate
- **Primary Applications**
 - Air Handlers #1
 - Heat Pumps #2
 - Furnaces #3
 - Primarily 208-230V
 - 115V volume increasing

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The ECM Aftermarket Motor That Replaces OEM Constant Torque Blower Motors!

- Replaces SelecTech[®] and X13^{®*} constant torque ECM motors
 - Do not have to purchase the OEM ECM motor from the OEM
 - Programmed at the point of sale to meet the performance of the OEM ECM motor
 - Replace X13 motors from any brand of equipment
- 2 year warranty from time of programming
 - 6000V surge protection!
 - Almost double the protection of most OEM ECM motors
 - Fully potted electric module for superior moisture protection
 - Warranty can be tracked by serial number on motor and is stored in web tool database
- Wires to the OEM equipment using the OEM equipment's existing connections
 - No modifications needed to install!
 - Can be mounted using existing OEM belly band mounting system
 - Kits available for mounting adaption for flex and rigid mounting systems



A Drop In Replacement for the X13^{®*}



Constant Torque Technology

X13^{®*}



- 1
- 2
- 3
- 4
- 5

RESCUE[®] Select



- 1
- 2
- 3
- 4
- 5



RESCUE[®] Select

- 6 “unprogrammed” motor ratings may be used to replace hundreds of OEM motors
 - HP ranges from 1/3 HP to 1 HP
 - 115 & 208-230 Volt
- Profiles (1500+ ratings)
 - New ratings continually being added to the programming database
 - Loading ratings from all equipment manufactures
 - Email notification sent to us if an OEM part number is not in database



Air Conditioning & Heating



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Construction: OEM vs. RESCUE® Select

- RESCUE® Select is a 2 piece motor



Construction: OEM vs. RESCUE® Select

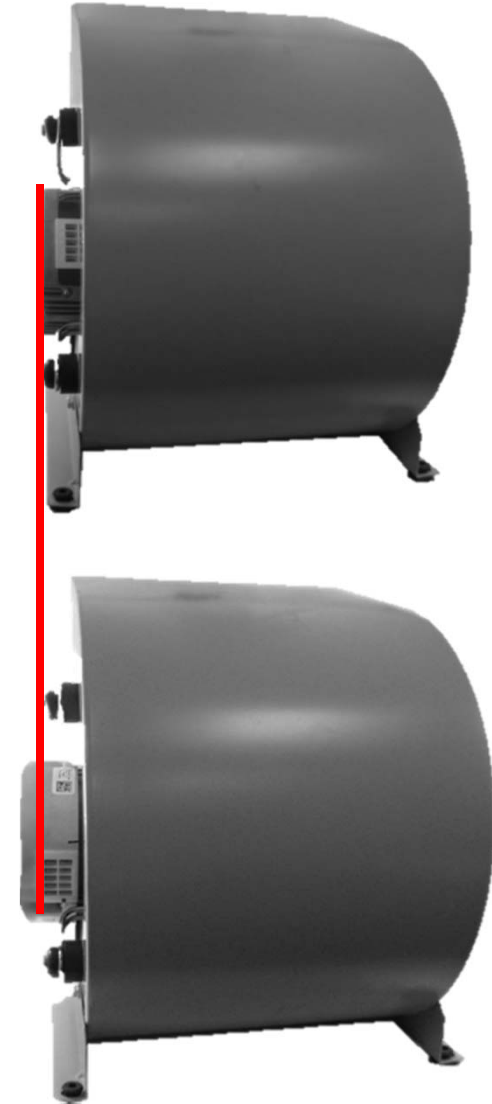
The RESCUE® Select motor is slightly longer than some of the other OEM motors that it replaces

| RESCUE® Select | | X13®* | |
|----------------|--------|------------|--------|
| Horsepower | Length | Horsepower | Length |
| 1/3 | 6.25 | 1/3 | 5.25 |
| 1/2 | 6.25 | 1/2 | 5.75 |
| 3/4 | 6.75 | 3/4 | 6.5 |
| 1 | 7.25 | 1 | 7.25 |



Construction: OEM vs. RESCUE® Select

- The RESCUE Select motor is slightly longer than some of the other OEM motors that it replaces
- Since the belly band is able to be positioned directly next to the RESCUE Select motor's module, the difference in length for mounting purposes is only ½”.
- This additional length should not create any issues with the RESCUE Select motor being able to fit in the blower equipment.



Mounting

- Most OEM ECM motors use a belly band mounting system
 - The RESCUE[®] Select motor can use the original belly band mounting system
- Belly band kits are available
- Use Kits 17, 23, 24, 29, 39 & 44



Kit 17 &
23



Kit
39



Kit 24 &
29



Kit 44





Summary

You should now:

- Understand the difference between the various ECM motor technologies.
- See the key features and benefits of the RESCUE® Select motor.
- Recognize which EC motors the RESCUE Select motor replaces.

Thank You !

