BECK®

ELECTRONIC CONTROL DRIVES FOR DAMPERS

RESPONSIVE CONTROL FOR DEMANDING APPLICATIONS

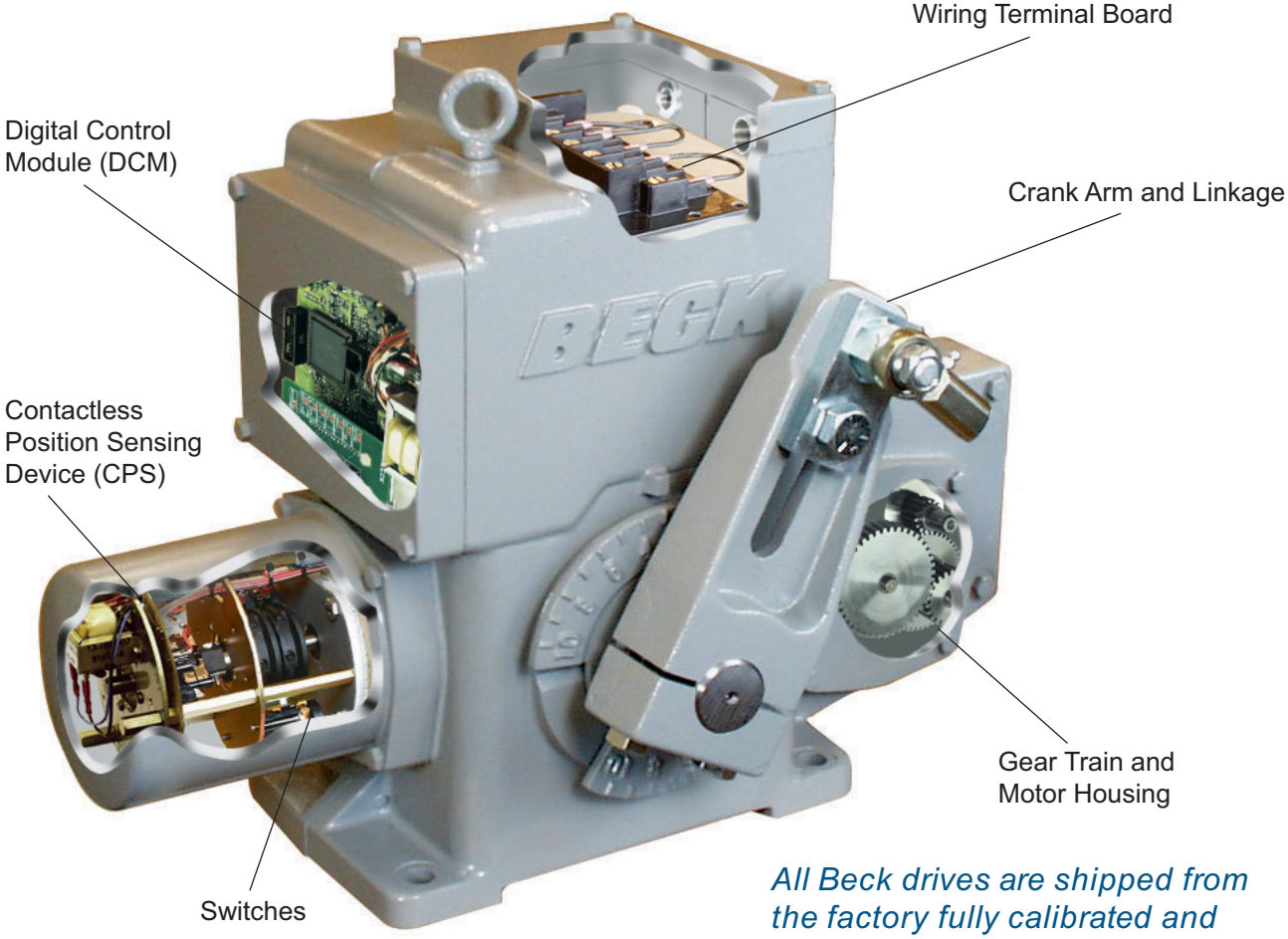
GROUP 11

ELECTRONIC CONTROL DRIVES FOR DAMPERS

Engineered for precise, reliable control

Beck drives are installed on thousands of applications throughout the world, and have earned a reputation for unmatched durability and accurate control. Ideally suited for hot, dusty or high-humidity environments, Beck drives operate continuously without burning-out or over-heating. The precision motor and gear train provide instantaneous response to control signal changes to match the capabilities of modern control systems. These features maximize process efficiency and availability, and also reduce maintenance costs.

The many outstanding features of Beck drives are explained throughout this brochure. To find out more about these and other features, contact Beck for a first-hand product demonstration.



All Beck drives are shipped from the factory fully calibrated and ready for immediate installation.

Drive Motor Provides 100% Availability

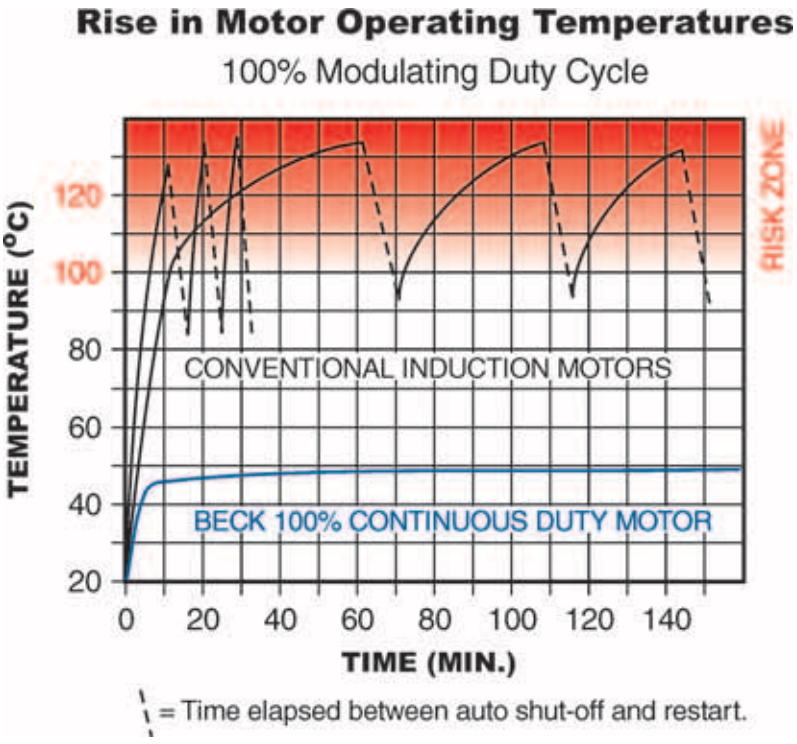
Beck motors provide precise, reliable operation consistent with modern control loop performance. The Beck motor:

- Reaches full speed and torque in milliseconds and stops in milliseconds, eliminating dead time.
- Provides extremely accurate and repeatable positioning for modulating applications.
- Will not coast or overshoot the desired position.
- Draws low current (0.16 A to 3.0 A). The low power consumption permits easy use with uninterruptible power supplies.
- Uses double-lipped, grease-sealed bearings for maintenance-free operation.

And . . .

- Never overheats or burns-out; even under demanding modulating control or stalled conditions. Thermal overloads and torque switches are not included in Beck drives because they are not required.

Tested in an active modulating loop, conventional motors rose rapidly in temperature, tripping thermal overload devices and becoming unavailable for extended time intervals. Only the Beck motor remained stable for continuous operation.



Digital Electronics: Repeatable Control, Simple Operation, and Diagnostic Capabilities

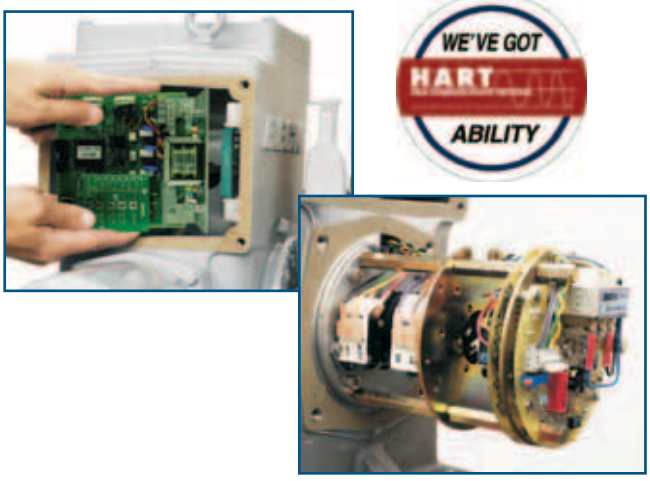
Beck control drives are equipped with field-proven electronics that provide excellent position control in response to modulating control signals. This maximizes control loop performance by ensuring that the drive and damper respond exactly as the control loop requires.

The DCM is equipped with a local interface panel for pushbutton calibration functions without the need for external devices or software. A bank of LED diagnostic lights are provided to display a number of status conditions.

The DCM is also equipped with a HART® communications interface to provide bidirectional digital communications with the DCM over the existing analog demand wiring—facilitating access to the added functions and information without interfering with control or requiring new wiring. Communications can be accomplished either remotely or locally using any standard HART®-based Handheld Communicator. In addition, the DCM is compatible with common asset management systems.

A serial interface also allows for drive configuration changes, drive information reporting and assistance in troubleshooting.

Beck's Contactless Position Sensor (CPS) also resides within the drive, and provides reliable internal position feedback to the DCM for position control. The DCM also uses the sensor signal to source a 4–20 mA external position signal for remote monitoring of drive position. Unlike typical position sensors, the CPS does not wear due to its contactless design.



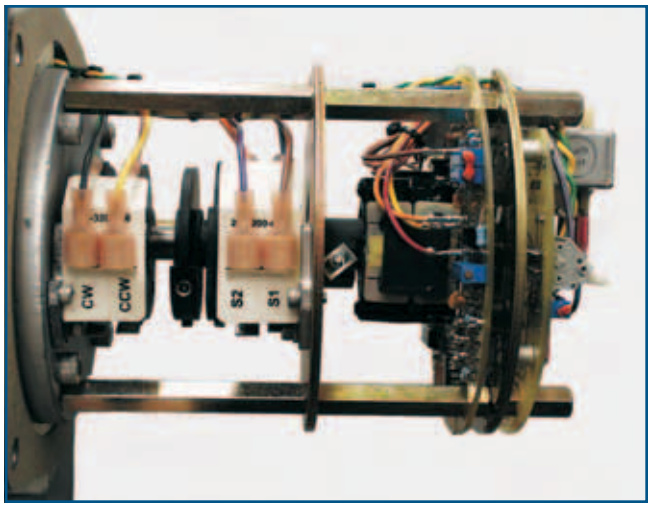
Over-travel Limit Switches

Beck drives include heavy-duty, single-pole, double-throw (SPDT) switch mechanisms for electrical over-travel protection. Switch cams will not slip because each is mounted to the shaft by an integral, tangential clamping means—with no set screws to mar the shaft.

Every drive is equipped with two over-travel limit switches. Optionally, drives can be equipped with up to four auxiliary switches that can be set to operate at any desired point of drive travel, thus providing discrete inputs for control or indication.

Common throughout most Beck drive models, the SPDT switches provide the following:

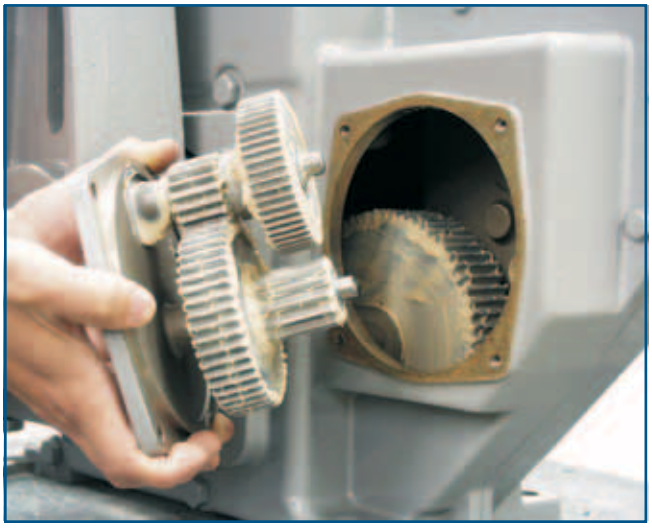
- A maximum rating of 6 A at 120 V ac (three times the maximum motor current for most models) to ensure long life.
- Auxiliary switches are field-adjustable with infinite positioning throughout the drive's travel range.
- May initiate secondary functions or provide remote indication of drive position.



Drive Train: Power and Durability

Beck's durable gear train maintains accurate, consistent positioning even under the demanding conditions of an active control loop.

- Gear trains employ a unique, all spur gear construction using only heat-treated alloy steels and ductile iron.
- Efficient, wide-faced spur gears ensure long life and eliminate wear-induced backlash and positioning inaccuracies common in worm gear and "Scotch-yoke" designs.
- Integral self-locking mechanism ensures that drives hold a minimum of 200% of rated torque with the motor de-energized.
- Durable design provides up to 4 days of protection against intermittent or extended accidental stalls.
- Stall protection is provided by the DCM. If the motor tries to run in one direction for more than 300 seconds, the DCM will shut off power to the motor and a status indication LED will activate indicating a stall.



Electric Handswitch: Timesaving Local Operation

The built-in electric Handswitch allows simple operation of the driven device. This saves time during installation and troubleshooting, allowing on-line adjustments to be made quickly and easily by bypassing the electronics in the drive and control system.

The Handswitch also serves as an electrical backup in the event of control system failure.

Manual Handwheel: Convenient Manual Control Without Declutch

An easy-to-turn spoke-free Handwheel is incorporated into the design to allow manual operation during installation or power outages.

- Handwheel can be used to move dampers to any position smoothly and easily—even under full load conditions.
- Mechanical stops in the housing prevent manual overtravel.
- The motor / Handwheel operates at 72 or 120 RPM and therefore poses no safety hazard.
- The Handwheel does not require excessive turning to move the load.

Housing: Superior Protection and Convenient Access to Components

Beck drives feature a cast aluminum body with individual compartments to protect components from moisture and dirt, and allow easy access for installation and calibration.

- Precision-machined aluminum alloy castings with corrosion-resistant polyurethane paint provide a rugged, dust-tight, weatherproof NEMA-4X enclosure.
- Individual compartments protect all major components: Motor, DCM, CPS, gear train and installation wiring terminal board.
- Gasketed covers provide extra protection for abusive indoor environments and harsh outdoor climates.
- Each compartment can be accessed without exposing other components to the environment.
- Output and Handwheel shafts are sealed with weatherproof, double-lip cartridge seals.

Linkage: Beck Linkage Kits and Link-Assist™ Program Ensure the Best Connection

Beck drives include the crank arm and rod end. The unique design of the crank arm allows infinite position adjustment to simplify installation.

Engineered linkage kits are available to complete the connection from the crank arm to the damper. Once the connection is made, the linkage may be adjusted ±1 1/2"—simplifying the final mechanical calibration. Also, Beck rod ends incorporate a bearing to compensate for some lateral misalignment.

Beck's Link-Assist™ program provides a printout showing the optimum drive and linkage configuration for the application. The linkage arrangement can be characterized to match the torque profile of the application. Request this free service to save time, simplify installation and ensure the best performance at the lowest possible cost.

New Beck replacement

Old pneumatic actuator

Upgrading Dampers with Beck Drives Maximizes Control and Virtually Eliminates Maintenance

Unlike pneumatic actuators, Beck drives provide unparalleled reliability and precise damper control. Pneumatic actuators inherently suffer from positioning problems caused by friction, varying loads and environmental conditions. Maintaining an acceptable level of performance requires frequent and substantial maintenance procedures. Because Beck drives are insensitive to load and frictional changes, they eliminate pneumatic performance problems such as stick-slip response and poor positioning resolution. Additionally, since Beck drives are not dependent on air systems, are completely weatherproof, and can withstand a wide range of operating temperatures, they eliminate air system related failures and performance degradation characteristic of pneumatic technology. Beck drives virtually eliminate maintenance.

The design of traditional electric actuators also causes performance compromises. Typically these devices have limited modulating duty-cycles and temperature limitations. Additionally, motor overshoot and worm gear wear cause poor positioning resolution and reliability. The unique design of Beck drives completely eliminates these traditional electric actuator problems.

The consistent, accurate performance Beck drives provide allows for improved process control performance, while eliminating the need to re-tune control loops due to deteriorating actuator performance.

Beck drives are also configured and lubricated so that they may be mounted in any convenient orientation. This flexibility allows drives to be installed in hard-to-fit locations.

Contact a Beck Sales Engineer at 215-968-4600 to find out more about the best drives for your installations.
Visit our website at www.haroldbeck.com.
E-mail: sales@haroldbeck.com

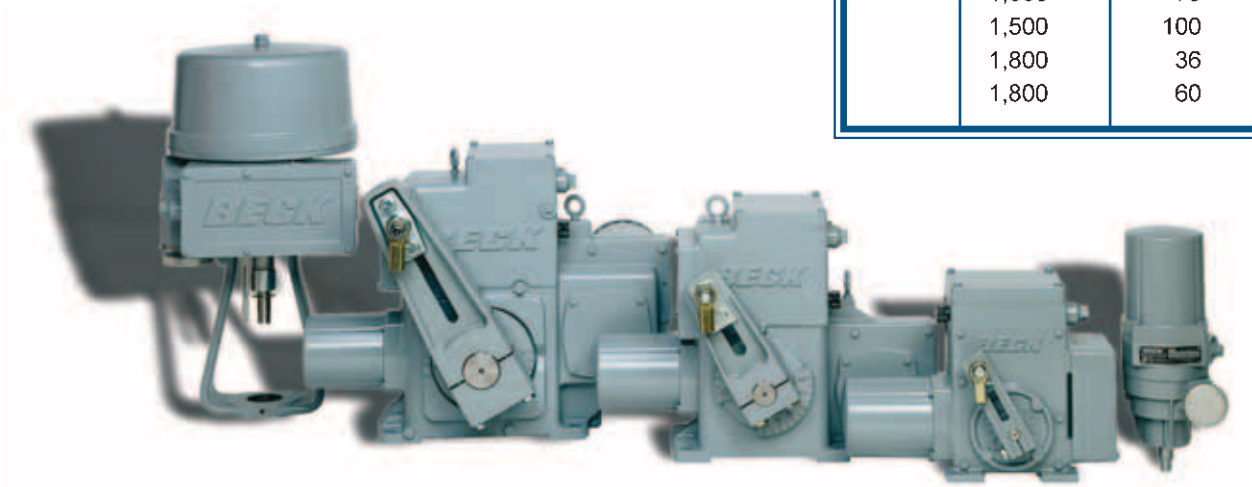
Group 11 Control Drives

General Specifications

Input Power	120 V ac single-phase 50 or 60 Hz. 240 V ac single-phase 50 or 60 Hz.
Operating Conditions	-40° to 185° F (-40° to +85° C). 0 to 99% relative humidity.
Input Signal Options Digital Control Module	4–20 mA or 1–5 V dc.
Position Feedback Signal for Remote Indication (Optional)	4–20 mA.
Action on Loss of Input Signal	Stays in place (all models) or moves to preset position (some models).
Action on Loss of Power	Stays in place.

Torque and Timing Options

Basic Model	Torque (lb-ft)	Timing (sec/100°) @ 60 Hz
11-150	15	11
	20	20
	40	20
	40	40
	60	60
	80	40
	80	90
11-200	125	20
	125	40
	175	60
	250	40
	250	75
11-300	300	40
	300	100
	400	60
	550	75
	650	100
11-400	350	24
	550	40
	650	24
	800	60
	1,000	24
	1,000	40
	1,000	75
	1,500	100
	1,800	36
	1,800	60



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