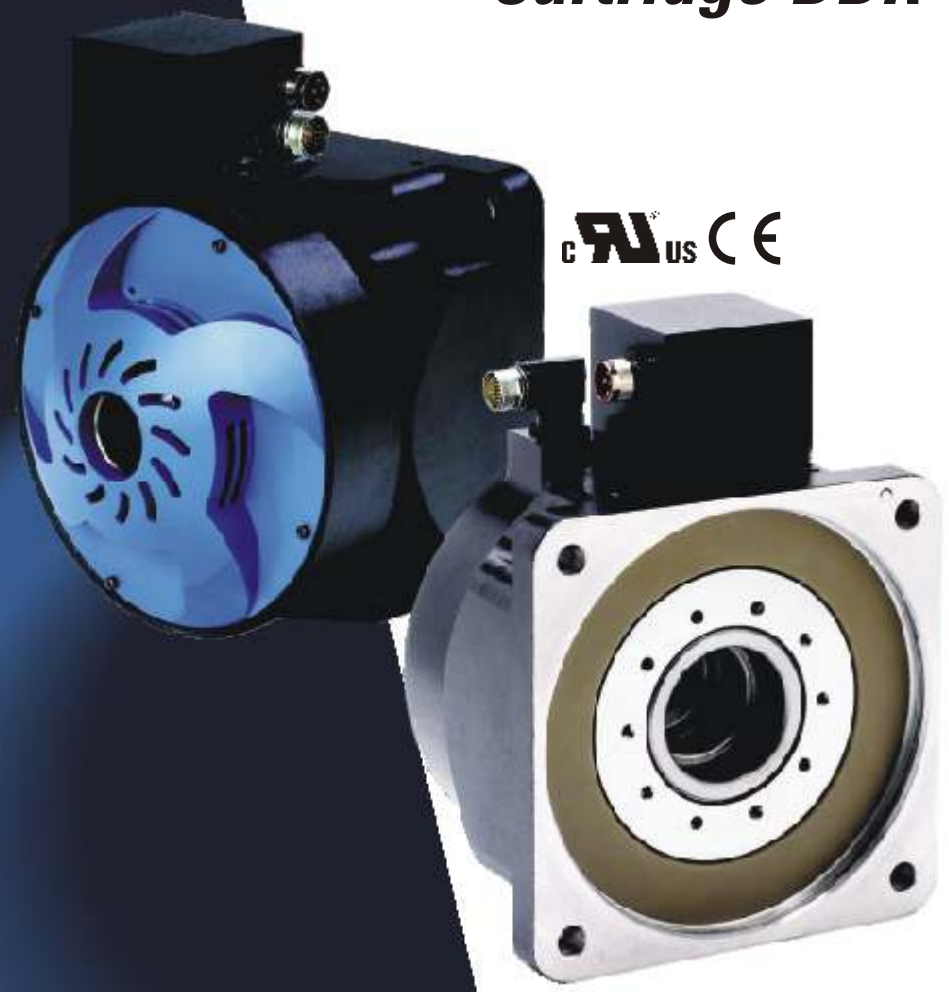
motor technology
servo + automation solutions

KOLLMORGEN

www.DanaherMotion.net

Rotary Direct Drive Motor Cartridge DDR™



Driven by SERVOSTAR®

Solutions by DANAHER MOTION

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DDR (Direct Drive Rotary)

What is direct drive? Very simply it is the direct coupling of a torque motor to the driven load. This configuration results in a very stiff mechanical connection to the load, thus, eliminating problems associated with couplings, belts and gearboxes.

The DDR Benefits:

- Zero maintenance
- No belts / pulleys, no belt adjustment / replacement
- No gearboxes, no lubrication required
- Zero backlash and compliance
- Flat, compact drive solution
- One part number for mechanical drive motor (clean mechanical assembly)
- Very quiet
- Hollow shaft option
- Reduced down time
- Improved servo performance
- Up to 50 times more accurate
- No inertia matching requirement

Driven by SERVOSTAR®

What is a CARTRIDGE DDR™ Motor?

The CARTRIDGE DDR™ motor does not have bearings. It mounts to a machine using the machine's existing bearings to support the motor's rotor. The frame of the CARTRIDGE DDR™ motor mounts to a pilot and bolt circle on the machine frame much like a conventional motor.
The rotor engages to the load using an innovative compression coupling, which effectively makes the motor's rotor and the load one piece, eliminating any compliance between the motor and the load.
The CARTRIDGE DDR™ motor has a shipping clamp to hold the rotor in place during transportation.
The motor brings a quantum leap in cost effectiveness and ease of application when compared to any other direct drive configuration. Compared to the months of engineering and days of installation of a frameless motor and feedback device, the CARTRIDGE DDR™ requires a simple shaft and pilot configuration and less than 30 minutes from shipping container to operation. Thanks to the CARTRIDGE DDR™ motor, a significantly broader range of motion applications will benefit from the performance and reliability advantages of direct drive.

Inertia matching
Since the CARTRIDGE DDR™ motor is directly connected to the machine, inertial matching is not required as it is on a conventional motor. With direct drive, inertia miss match of 250 to 1 is common and miss match of 800 to 1 has been implemented.

Mounting Orientation
The CARTRIDGE DDR™ motor can be mounted with any orientation including either a horizontal or vertical shaft.

Features / Options

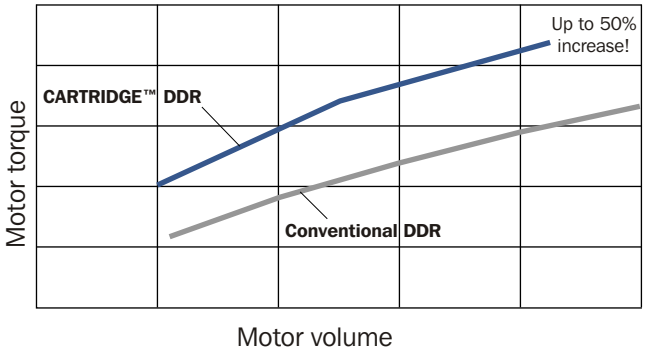
Standard Features

- Two frame sizes, 246mm and 350mm
- Three stack lengths in each frame size
- Continuous torque from 50 to 504 Nm
- Peak torque from 120 to 1016 Nm
- Absolute position sine encoder with maximum resolution of 2,097,152 counts per revolution
- One drive amplifier, the SERVO**STAR®** drives the standard CARTRIDGE DDR™ product line
- UL and CE agency certifications are standard
- High energy permanent magnet brushless DC configuration utilizing a proprietary electromagnetic design gives CARTRIDGE DDR™ motors more torque per volume than conventional DDR technology.

Options

- 480 VAC high voltage option expands the speed range. 230 VAC windings available, too.
- High speed winding option for the 13 frame size connected to the SERVO**STAR®** 640 drive amplifier extends the speed range of the larger frame motor.
- Hollow shaft option provides a 32mm through bore to allow process or wiring to run through the center of the motor. Provision for mounting a rotary union to the shaft and housing is included. Available July 2004.

Torque Density



Proprietary electromagnetic design gives CARTRIDGE DDR™ motors up to 50% more torque per motor volume than conventional DDR technology.

How does the CARTRIDGE DDR™ mount to a Machine?

It is a simple and quick procedure to mount a CARTRIDGE DDR™ motor to a machine:

- Slide the CARTRIDGE DDR™ motor onto the shaft
- Bolt the housing to the machine frame
- Torque the compression coupling
- Unbolt the shipping clamp hardware and store it in the provided slots
- Connect cables between the CARTRIDGE DDR™ and the SERVO**STAR®** series drive amplifier
- Commence operation

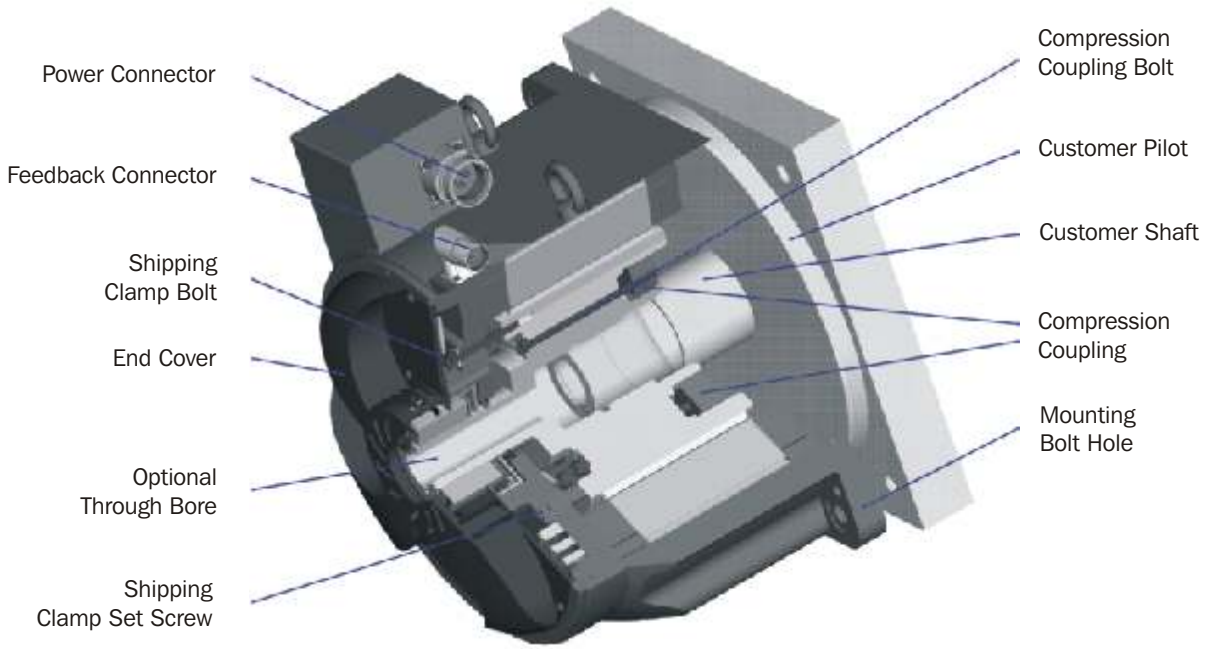
The CARTRIDGE DDR™ motor can easily go from the shipping container to full operation in less than 30 minutes. This innovative design represents a quantum leap over the days of engineering, installation, and alignment required for Frameless DDR motors.

Technical Data

Nominal values at 40°C ambient temperature and 110 K temperature rise in the windings motor mounted to a reference mounting plate. Modern motors with compact designs may exhibit high surface temperatures, requiring a derating from the nominal values in some applications.

Type	Continuous Torque Mc [Nm]	Continuous Motor Current Ic [A] rms	Peak Torque Mp [Nm]	Peak Motor Current Ip [A] rms	Rotor Inertia J [kgm²]	max. Speed at 400V n_{max} [rpm]	Weight G [kg]
CH091A	50	12,8	120	40	0,028	1200	27,7
CH092A	101	15,3	231	40	0,047	700	41,3
CH093A	145	17,4	309	40	0,066	550	54,4
CH131A	188	15,6	389	40	0,124	400	63,5
CH132A	361	13,9	806	40	0,225	200	101,0
CH133A	504	16,8	1016	40	0,302	160	132,0
CH131B	190	29,2	396	80	0,124	800	63,5
CH132B	361	29,6	759	80	0,225	400	101,0
CH133B	510	32,7	1017	80	0,302	350	132,0

A smart concept



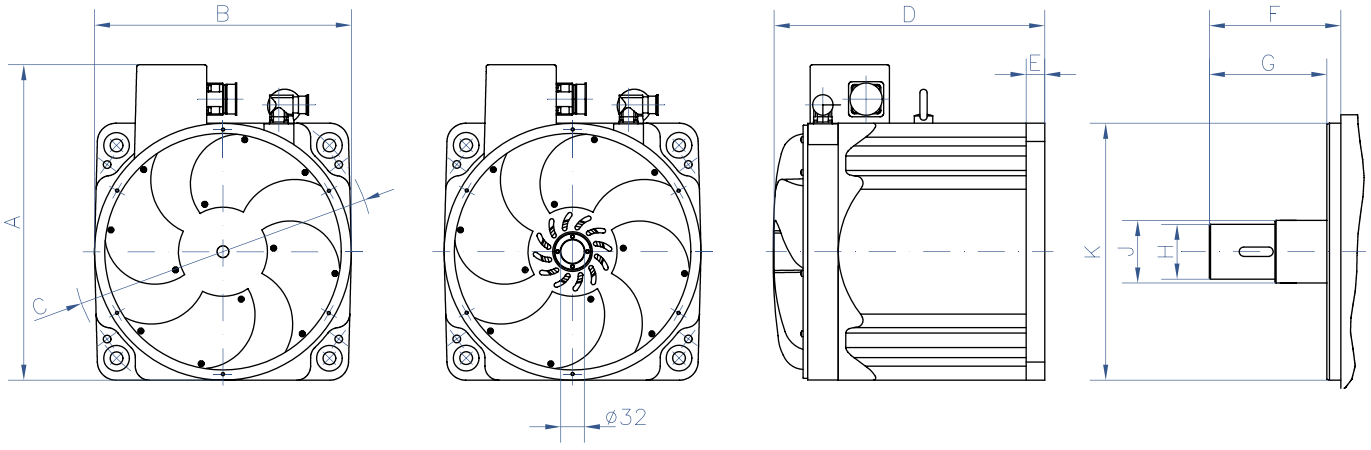
The CARTRIDGE DDR™ motor is the first in the industry to combine the space-saving and performance advantages of Frameless DDR technology with the ease of installation of a fullframe motor.
Consisting of a rotor, stator, and factory-aligned high-resolution feedback device, the CARTRIDGE DDR™ motor uses the machine's bearings to support the rotor. An innovative compression coupling engages the rotor to the load and the frame of the CARTRIDGE DDR™ mounts to the machine with a bolt circle and pilot diameter just like a conventional servo motor saving space and design time and simplifying the overall system.

Dimensions

Standard version

With through bore available from July 2004

Machine Interface



Type	A/mm	□ B/mm	Ø C/mm	D/mm	E/mm	F/mm	G/mm	Ø H/mm	Ø J/mm	Ø K/mm
CH091x	305,3	246	290	204	22,4	90	77	60	70	233
CH092x	305,3	246	290	252	22,4	134	121	60	70	233
CH093x	305,3	246	290	302	22,4	170	157	60	70	233
CH131x	431,3	350	410	231	25,4	114	96	70	80	334
CH132x	431,3	350	410	300	25,4	168	150	70	80	334
CH133x	431,3	350	410	370	25,4	253	235	70	80	334

All dimensions are rough data, detailled data can be found in the technical manual.

SERVOSTAR® 200

SERVOSTAR® 300

SERVOSTAR® 400

SERVOSTAR® 600

You'll find information to the drive series in the associated product brochures or on the internet at **www.DanaherMotion.net**

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