

Cartridge DDR Rotary Direct Drives

High Performance in Small Spaces

Less spatial requirements and huge performance benefits: Compared to conventional servo motors, the Cartridge DDR motors offer a power density of up to 50% higher, yet are just as easy to install as housing motors. The rotor of the Cartridge DDR motor rests on the machine's bearings and is connected to the machine shaft through an innovative clamp coupling. Mechanical components for power transmission which limit performance and reliability and increase operating costs are omitted completely.



Up to 50% higher torque density than conventional servo motors

Hollow shaft opening for continuous motor shafts (optional)

Simple attachment with 4 bolts

Simple machine shaft connection due to patented clamp coupling

Repeatability improved by up to 60 times compared with motor/gearhead combinations

Installation onto machine flange, no bearings

Advantages of the Cartridge DDR Motors

- Quick assembly within 5 minutes
- Direct power transmission without mechanical components reduces operating and maintenance costs
- Low cogging and thus smooth running at low speeds
- The backlash-free design improves the system's response characteristics

Performance Overview

- 5 frame sizes from 108 to 350 mm
- 17 different lengths and 52 standard windings
- Continuous torques of 4.57 Nm to 510 Nm
- Speeds up to 2500 rpm
- Integrated, high-resolution sinus encoder (optional)

The Cartridge DDR™ Advantage – Press Feed Machine

Consider how Cartridge DDR technology improves a Press Feed machine:

Reduced Assembly Time

The assembly time for the original mechanical transmission system was 4 hours. In contrast, the Cartridge DDR motor is installed in less than 5 minutes, resulting in a significant cost savings in labor.

Reduced Parts Count

The original mechanical transmission system comprises 2 bracket pieces, 12 bolts, 2 pulleys, 2 set screws, 2 keys, a timing belt, a housing to protect operators from the timing belt, a tension system for the timing belt, and motor/gearbox. With the Cartridge DDR system, this is all replaced by the motor and 4 mounting bolts, resulting in fewer parts to maintain and cost savings.

Improved Accuracy

The best planetary gearboxes have a backlash between 1 and 2 arc-minutes. Over the life of the gearbox, the backlash will increase. The Cartridge DDR system has an absolute accuracy of 26 arc-seconds and a repeatability of 0.7 arc-seconds. The Press Feed machine with the Cartridge DDR has a feed accuracy of +/- 0.0127 mm where the Press Feed machine with the mechanical transmission has a feed accuracy of 0.051 inch. Therefore, there was an overall four times improvement in machine accuracy with the Cartridge DDR system.

Increased Throughput

The cycle rate of the Cartridge DDR system is two times better than the mechanical transmission. This results in an increase in throughput of 100 percent.

Improved Reliability and Simplified Maintenance

The Cartridge DDR system eliminates parts that wear, change over time, or fail. Gearboxes are prone to wear, and backlash increases over time. Belts and pulleys stretch and require maintenance to maintain proper belt tension. By eliminating these components, the Cartridge DDR system delivers greater system reliability.

Press Feed Example

Gearboxes have a finite life span, especially in a demanding cyclic application such as a Press Feed. On this machine, the gearbox must be replaced every 10,000 hours and the belt must be tensioned every 2,000 hours. By contrast, the Cartridge DDR motor has no wear components and requires no maintenance thus simplifying the maintenance schedule for the machine, including operating costs.

Reduced Audible Noise

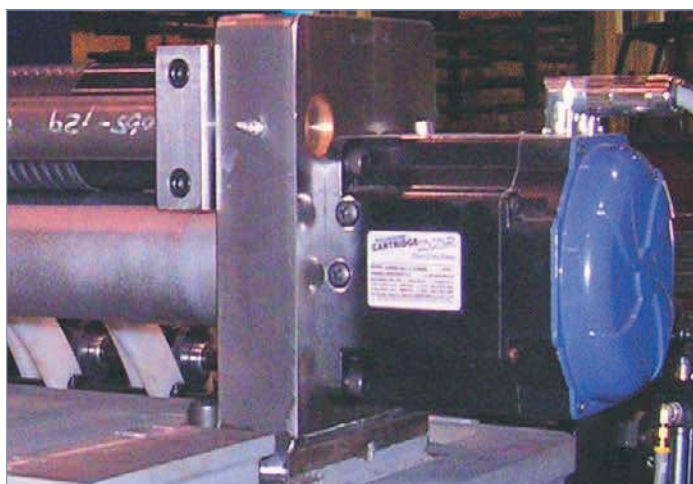
The Cartridge DDR system has as much as a 20 dB reduction in noise compared to a mechanical transmission servo system. This can dramatically reduce the overall noise level of the machine. A quieter machine gives the perception of quality. This is rightfully so as the noise emitted by gears and belts is caused by the wearing of the parts.

Total Reduced Cost

A Cartridge DDR motor typically costs 20 percent more than a comparable motor/gearbox combination. However, the elimination of parts and assembly time typically results in a lower total cost for the Cartridge DDR solution.



Press feed machine built with a conventional servo motor, gearbox, belt and pulleys.



Same machine with a Cartridge DDR motor installed. Here, the shaft of the driven roll is extended into the Cartridge DDR motor and the motor applies torque directly to the driven roll.

Cartridge DDR Rotary Direct Drives

240 Vac Performance Data

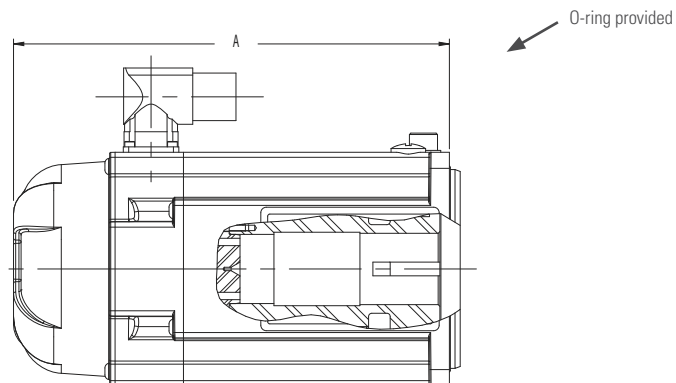
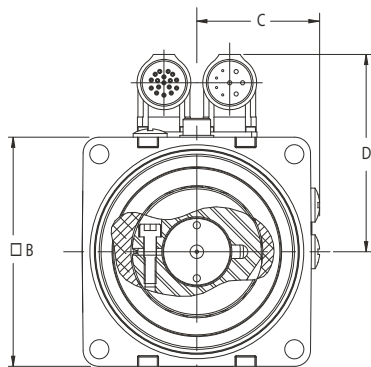
Cartridge DDR Motor	Servo Drive	Frame Size	Continuous Torque	Peak Torque	Maximum Speed	Weight	Inertia (Jm)
		mm	Nm	Nm	RPM	kg	kg-cm ²
C041A	AKD-X00306	108	4.57	12.3	1750	4.08	5.86
C041B	AKD-X00606	108	4.52	12.2	2500	4.08	5.86
C042A	AKD-X00606	108	8.25	22.2	1700	5.67	8.87
C042B	AKD-X01206	108	8.45	22.8	2500	5.67	8.87
C043A	AKD-X00606	108	11.1	30.0	1250	7.26	11.9
C043B	AKD-X01206	108	11.2	30.2	2500	7.26	11.9
C044A	AKD-X00606	108	13.9	37.4	1050	8.84	14.9
C044B	AKD-X01206	108	14.1	37.9	2150	8.84	14.9
C051A	AKD-X00606	138	11.7	30.2	1200	8.39	27.4
C051B	AKD-X01206	138	11.9	30.6	2450	8.39	27.4
C052C	AKD-X00606	138	19.0	43.1	950	10.7	35.9
C052D	AKD-X01206	138	16.5	42.3	2050	10.7	35.9
C053A	AKD-X01206	138	21.0	54.1	1350	13.2	44.3
C053B	AKD-X02406	138	20.2	50.1	2500	13.2	44.3
C054A	AKD-X01206	138	24.9	63.8	1200	15.4	52.8
C054B	AKD-X02406	138	23.8	61.2	2500	15.4	52.8
C061A	AKD-X01206	188	33.8	86.8	900	18.6	94.1
C061B	AKD-X02406	188	32.6	75.6	1950	18.6	94.1
C062C	AKD-X01206	188	48.4	117	700	23.6	126
C062B	AKD-X02406	188	44.6	102	1400	23.6	126
C063C	AKD-X01206	188	61.8	157	550	29.0	157
C063B	AKD-X02406	188	59.0	136	1050	29.0	157
C091A	AKD-X02406	246	50.2	120	600	27.7	280
C092C	AKD-X02406	246	102	231	450	41.3	470
C093C	AKD-X02406	246	139	317	350	54.4	660
C131C	AKD-X02406	350	189	395	250	63.5	1240
C132C	AKD-X02406	350	362	818	120	101	2250
C133C	AKD-X02406	350	499	1070	100	132	3020

400/480 Vac Systems Performance Data

Cartridge DDR Motor	Servo Drive	Frame Size	Continuous Torque	Peak Torque	Maximum Speed		Weight	Inertia (Jm)
		mm	Nm	Nm	RPM		kg	kg-cm ²
					400 Vac	480 Vac		
CH041A	AKD-X00307	108	4.56	11.3	2500	2500	4.08	5.86
CH042A	AKD-X00607	108	8.26	19.0	2500	2500	5.67	8.87
CH043A	AKD-X00607	108	11.1	25.3	2250	2500	7.26	11.9
CH044A	AKD-X00607	108	13.9	31.6	1850	2250	8.84	14.9
CH051A	AKD-X00607	138	11.7	28.0	2100	2500	8.39	27.4
CH052C	AKD-X00607	138	16.9	43.1	1750	2100	10.7	35.9
CH053A	AKD-X01207	138	21.0	54.1	2350	2500	13.2	44.3
CH054A	AKD-X01207	138	24.9	63.8	2100	2500	15.4	52.8
CH061A	AKD-X01207	188	33.8	86.8	1600	1900	18.6	94.1
CH062C	AKD-X01207	188	48.4	117	1250	1550	23.6	126
CH063C	AKD-X01207	188	61.8	157	950	1150	29.0	157
CH063B	AKD-X02407	188	59.0	136	1850	2200	29.0	157
CH091A	AKD-X02407	246	50.2	120	1200	1500	27.7	280
CH092C	AKD-X02407	246	102	231	800	1000	41.3	470
CH093C	AKD-X02407	246	139	317	700	800	54.4	660
CH131C	AKD-X02407	350	189	395	500	600	63.5	1240
CH131B	AKD-X04807	350	190	396	800	1000	63.5	1240
CH132C	AKD-X02407	350	362	818	250	300	101	2250
CH132B	AKD-X04807	350	361	759	400	500	101	2250
CH133C	AKD-X02407	350	499	1070	200	250	132	3020
CH133B	AKD-X04807	350	510	1016	350	400	132	3020

Cartridge DDR C04, C05 and C06 Dimensions

Cartridge DDR Motor	A mm	B mm	C mm	D mm
C(H)041	171	108	59	93
C(H)042	202	108	59	93
C(H)043	233	108	59	93
C(H)044	264	108	59	93
C(H)051	195	138	76	108
C(H)052	220	138	76	108
C(H)053	245	138	76	108
C(H)054	270	138	76	108
C(H)061	226	188	99	133
C(H)062	260	188	99	133
C(H)063	294	188	99	133



Cartridge DDR C09 and C13 Dimensions

Cartridge DDR Motor	A mm	B mm	C mm	D mm
C(H)091	204	246	149	182
C(H)092	253	246	149	182
C(H)093	302	246	149	182
C(H)131	231	350	200	256
C(H)132	301	350	200	256
C(H)133	370	350	200	256

