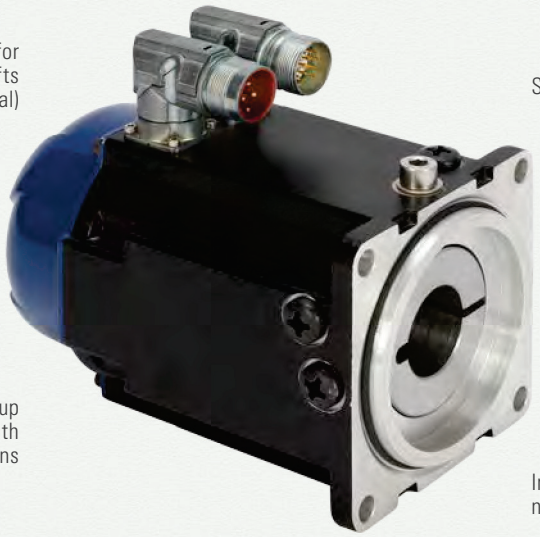
Cartridge DDR Rotary Direct Drives

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.



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)

Practical Test: Retrofitting a Roll Feeding Machine with a Cartridge DDR Motor

The Background:

The feed accuracy of a roll feeding machine needs to be improved and the maintenance costs and machine downtimes reduced. A drive solution was sought which enabled higher precision and higher throughput with lower operating and maintenance costs.

The Solution:

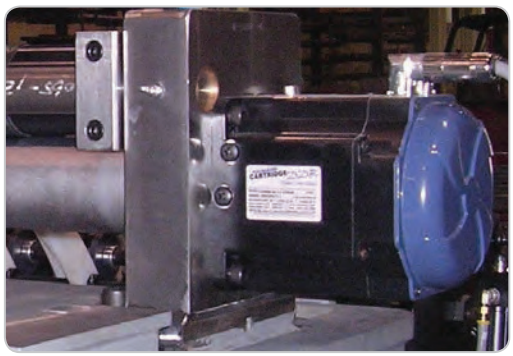
The drive solution consisting of motor and gearhead was replaced with a Kollmorgen Cartridge DDR direct drive. Due to the brief installation time and quick start-up, the machine was ready for operation within just a few hours.

The Result:

Significantly improved feed accuracy, considerably higher throughput, substantially lower maintenance costs, greater overall equipment effectiveness. The machine users are pleased with much quieter machinery, the operations managers pleased with disappearing maintenance costs, the production planners pleased with increased machine capacity, and the customers obtain products with better quality thanks to more precise production methods.

The Facts

	Old drive with motor/gearhead combination	Drive with Kollmorgen Cartridge DDR motor	Improvement with the Cartridge DDR motor
Required parts	2 holders 12 screws 2 belt pulleys 2 adjusting screws 2 wedges 1 timing belt 1 clamping system for the belts 1 motor-gearhead combination 1 protective housing	4 bolts 1 Kollmorgen DDR motor CDDR	24 parts vs. 5 parts: 19 fewer parts!
Installation time	4 hours	Approx. 5 mins	3 hours 55 minutes less!
Feed accuracy	±0.005 mm	±0.0013 mm	4 times better feed accuracy!
Throughput	Factor 1	Factor 2	Half the cycle time = double the throughput!
Drive service life	10000 hrs	Almost unlimited because wear-free	No more regular maintenance!
Maintenance work	2000 hrs	None	No more regular maintenance!
Noise development			20 dB lower sound pressure level!



Cartridge DDR Rotary Direct Drives

240 V AC Performance Data

Cartridge drive	Servo drive		Frame size	Continuous Torque	Peak Torque	Maximum Speed	Weight	Moment of inertia
	AKD	S700	mm	Nm	Nm	rpm^{-1}	kg	kg·cm^2
C041A	P00306	S703	108	4.57	12.3	1750	4.08	5.86
C041B	P00606	S706	108	4.52	12.2	2500	4.08	5.86
C042A	P00606	S706	108	8.25	22.2	1700	5.67	8.87
C042B	P01206	S712	108	8.45	22.8	2500	5.67	8.87
C043A	P00606	S706	108	11,1	30.0	1250	7.26	11.9
C043B	P01206	S712	108	11,2	30.2	2500	7.26	11.9
C044A	P00606	S706	108	13.9	37.4	1050	8.84	14.9
C044B	P01206	S712	108	14.1	37.9	2150	8.84	14.9
C051A	P00606	S706	138	11,7	30.2	1200	8.39	27.4
C051B	P01206	S712	138	11.9	30.6	2450	8.39	27.4
C052C	P00606	S706	138	16.9	43.1	950	10,7	35.9
C052D	P01206	S712	138	16.5	42.3	2050	10.7	35.9
C053A	P01206	S712	138	21.0	54.1	1350	13.2	44.3
C053B	P02406	–	138	20.2	50.1	2500	13.2	44.3
C054A	P01206	S712	138	24.9	63.8	1200	15.4	52.8
C054B	P02406	–	138	23.8	61.2	2500	15.4	52.8
C061A	P01206	S712	188	33.8	86.8	900	18.6	94.1
C061B	P02406	–	188	32.6	75.6	1950	18.6	94.1
C062C	P01206	S712	188	48.4	117	700	23,6	126
C062B	P02406	–	188	44.6	102	1400	23,6	126
C063C	P01206	S712	188	61.8	157	550	29,0	157
C063B	P02406	–	188	59.0	136	1050	29,0	157
C091A	P02406	S712	246	50.2	120	600	27,7	280
C092C	P02406	–	246	102	231	450	41.3	470
C093C	P02406	–	246	139	317	350	54.4	660
C131C	P02406	–	350	189	395	250	63.5	1240
C131B	P04806	–	350	190	396	450	63.5	1240
C132C	P02406	–	350	362	818	120	101	2250
C132B	P04806	–	350	361	759	225	101	2250
C133C	P02406	–	350	499	1070	100	132	3020
C133B	P04806	–	350	510	1090	175	132	3020

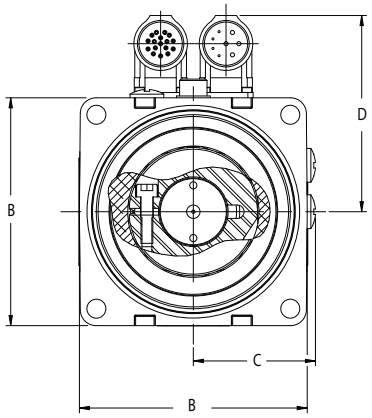
– It is also referred to as Commutation Alignment and Pole Locking.

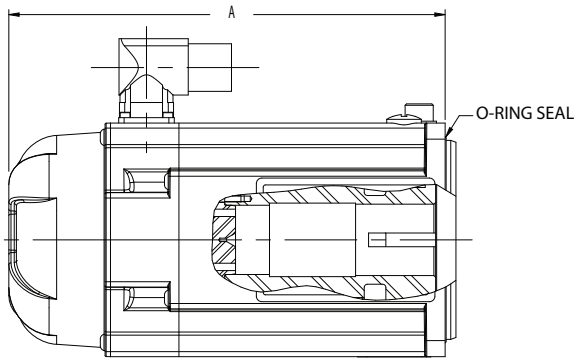
400/480 V AC Performance Data

Cartridge drive	Servo drive		Frame size	Continuous Torque	Peak Torque	Maximum Speed		Weight	Moment of inertia
	AKD	S700	mm	Nm	Nm	rpm^{-1}		kg	kg-cm^2
						400 V AC	480 V AC		
CH041A	P00307	S703	108	4.56	11.3	2500	2500	4.08	5.86
CH042A	P00607	S706	108	8.26	19.0	2500	2500	5.67	8.87
CH043A	P00607	S706	108	11,1	25.3	2250	2500	7.26	11.9
CH044A	P00607	S706	108	13.9	31.6	1850	2250	8.84	14.9
CH051A	P00607	S706	138	11.7	28.0	2100	2500	8.39	27.4
CH052C	P00607	S706	138	16.9	43.1	1750	2100	10,7	35.9
CH053A	P01207	S712	138	21.0	54.1	2350	2500	13.2	44.3
CH054A	P01207	S712	138	24.9	63.8	2100	2500	15.4	52.8
CH061A	P01207	S712	188	33.8	86.8	1600	1900	18.6	94.1
CH062C	P01207	S712	188	48.4	117	1250	1550	23.6	126
CH063C	P01207	S712	188	61.8	157	950	1150	29.0	157
CH063B	P02407	S724	188	59.0	136	1850	2200	29,0	157
CH091A	P02407	S712	246	50.2	120	1200	1500	27,7	280
CH092C	P02407	S724	246	102	231	800	1000	41.3	470
CH093C	P02407	S724	246	139	317	700	800	54.4	660
CH131C	P02407	S724	350	189	395	500	600	63.5	1240
CH131B	P04807	S748	350	190	396	800	1000	63.5	1240
CH132C	P02407	S724	350	362	818	250	300	101	2250
CH132B	P04807	S748	350	361	759	400	500	101	2250
CH133C	P02407	S724	350	499	1070	200	250	132	3020
CH133B	P04807	S748	350	510	1090	350	400	132	3020

Cartridge DDR C04, C05, and C06 – Dimensions

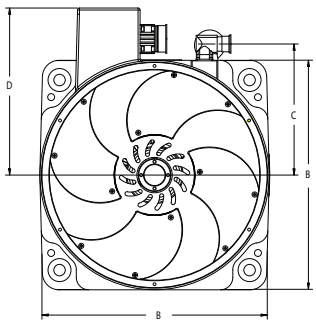
Cartridge drive	A mm	B mm	C mm	D mm
C(H)041	171	108	59	93
C(H)042	202	108	59	93
C(H)043	233	108	59	93
C(H)044	264	108	59	93
C(H)051	195	138	76	108
C(H)052	220	138	76	108
C(H)053	245	138	76	108
C(H)054	270	138	76	108
C(H)061	226	188	99	133
C(H)062	260	188	99	133
C(H)063	294	188	99	133

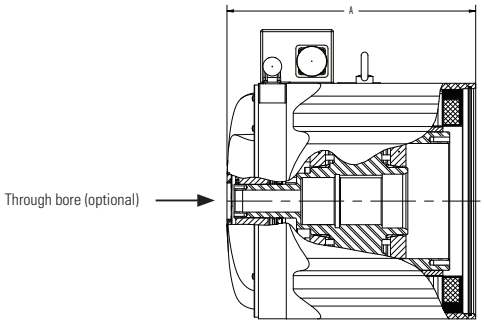




Cartridge DDR C09 and C13 – Dimensions

Cartridge drive	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





Model Nomenclature

Cartridge DDR Rotary Direct Drives

C 09 1 A – 1 1 – 1 1 0 5 ( ) (-)

Cartridge DDR Range

C = 230 V AC winding
CH = 400/480 V AC winding

Frame Size

04 = 4.25" square housing
05 = 5.43" square housing
06 = 7.40" square housing
09 = 9.68" square housing
13 = 13.78" square housing

Motor Length

1 = short motor length
2 = medium motor length
3 = long motor length
4 = extra long motor length
(only frame sizes 04 and 05)

Winding Type

A, B, C, D

Mounting

1 = Standard flange mounting

Connector

1 = Option with side connector (only frame sizes 09 and 13)
2 = Option with connectors behind (only frame sizes 09 and 13)
3 = Connectors rotatable by 90° (only frame sizes 04, 05, and 06)

xxx

Intended for standard motor
Omitted for standard motor.

Certifications

No specification = UL/CE approval
S = No UL approval

Seal

5 = Sealed
(Shaft option "1" – protection class IP64 with interface side sealed by the customer)
(Shaft option "2" or "3" – protection class IP65 with interface side sealed by the customer)

Storage Option

0 = Version without bearings (with integrated transport protection)

Feedback System

1 = ENDAT 2.1 (C04, C05, C06, C09, C13)
3 = BiSS B (C04, C05, C06)

Shaft

1 = Hollow shaft with clamp coupling and feather key (only frame sizes 09 and 13)
2 = Massive shaft with clamp coupling and feather key (only frame sizes 09 and 13)
3 = Massive shaft with slot ring coupling and without feather key (only frame sizes 04, 05, and 06)

Note: Options in blue type refer to standard products.