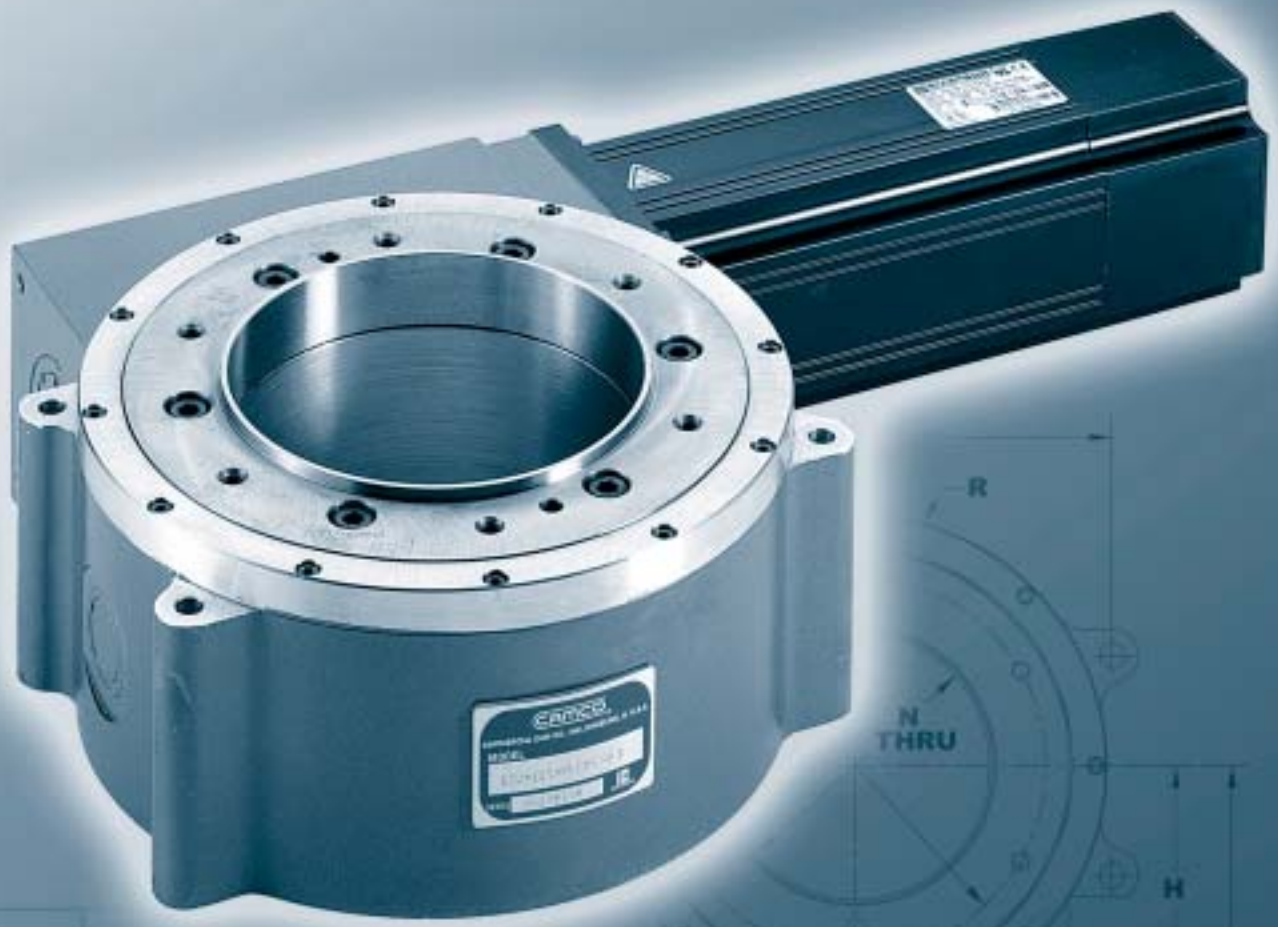
Servo-Mechanical Drives

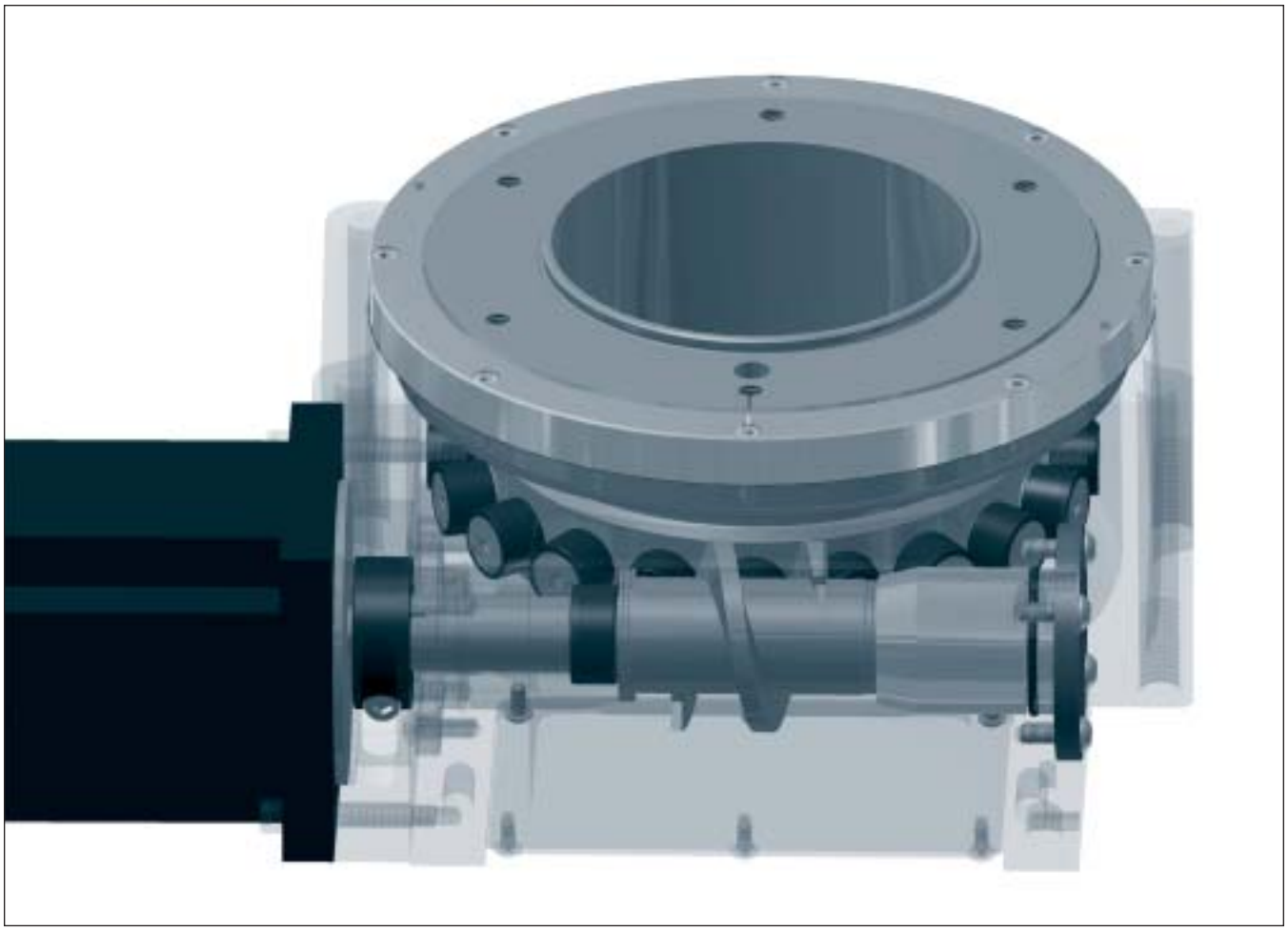
IMC
INDUSTRIAL MOTION CONTROL, LLC.
CAMCO FERGUSON



Features

IMC Servo-Mechanical Drives combine the flexibility of a servomotor with the accuracy and reliability of a cam-driven index drive. They can are ideal for dial, conveyor, or linkage applications. The drives are offered in several configurations

- The **Flex-i-Dex** drive is a dedicated Servo-Mechanical package complete with servomotor and amplifier ideal for light duty applications or short, fast movements.
- **Constant Lead** cam drives are standard RDM or Heavy Duty E-Series drives with constant lead (constant ratio) cams. Supplied with or without a reducer and servomotor package, they offer a large mounting surface, bearing support and thru-hole. Supply your own servo package or use ours.



Servo-Mechanical Drives

The Servo-Mechanical Drive is a zero-backlash, high-efficiency, long-life, low-maintenance precision rotary actuator. The actuator consists of an IMC indexer with a constant ratio cam and a servomotor. A secondary reducer may be added for applications requiring a very slow movement, extra mechanical advantage or motor inertia matching. The Servo-Mechanical Drive features:

- **Large Output Flange and Bearing** with metric or imperial tapped holes for fastening the load.
- **Large Center Hole** for a stationary center post or to run air, hydraulic or electric lines.
- **Output shaft with precision cam followers** meshes with a hardened and ground cam. The cam is made with a fixed ratio from 2:1 to 24:1. Low ratios are recommended for large angular movements while high ratios are used for small, fast movements.
- **Zero Backlash** is produced by preloading the cam followers against the cam surface.
- **High Efficiency** due to cam followers rolling (not sliding) on the cam while submerged in oil.
- **Clamped or dowel-pinned joints** eliminate backlash caused by worn keys. Keys are used for timing and assembly purposes only.
- **Servomotor mounted directly to the camshaft.** The motor shaft is inserted into the hollow bore of the split camshaft. A locking clamp collar joins the motor shaft to the camshaft.
- **Secondary reducers** have minimum backlash and NEMA or IEC frames for mounting the servomotor.

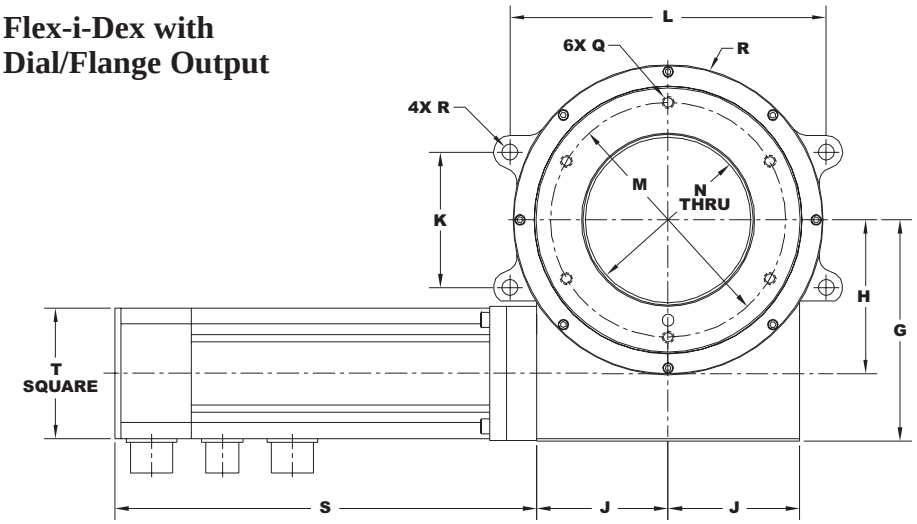
The Servo-Mechanical Drive is the ideal unit for applications where flexibility, electronic synchronization, digital communication and high accuracy and repeatability are needed.

Flex-I-Dex

The Flex-i-Dex is ideal for light duty applications or short, fast movements. The complete Flex-i-Dex package includes:

- Flex-i-Dex constant-lead (constant ratio) drive with either a large flange output or a shaft output.
- Control Techniques Servo Motor, Uni-Drive SP controller, power and logic cables and Power Tools software.

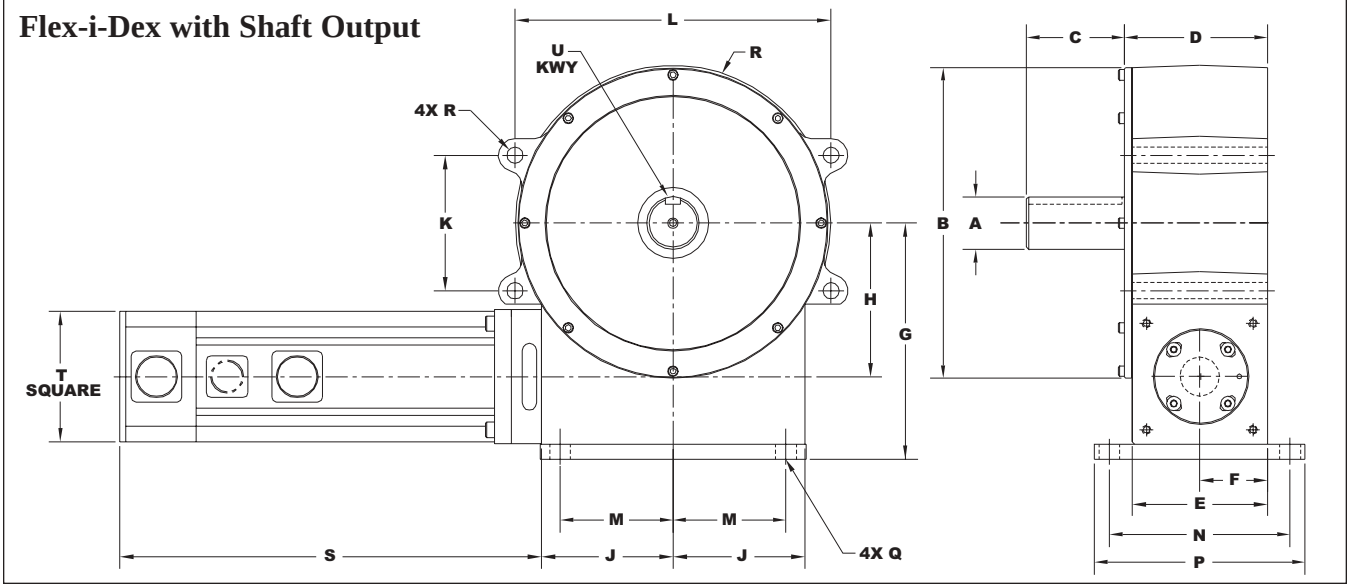
Flex-i-Dex with Dial/Flange Output



Dimensions – Flex-i-Dex with Dial/Flange Ouput

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	Q	R	S	T
DSD-102	115	176	206	105	90	45	147	102	87.5	90	210	156	110	M8x16	10.7	280	89
DSD-150	170	270	310	145	130	65	212	150	125	140	310	215	160	M10x20	12.7	287	115

Flex-i-Dex with Shaft Output



Dimensions – Flex-i-Dex with Shaft Ouput

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	Q	R	S	T	U
DSD-102S	35 h7	206	65	95	90	45	157	102	87.5	90	210	75	120	10.7	10.7	280	89	10x5 (N9)
DSD-150S	45 h6	310	85	135	130	65	227	150	125	140	310	105	160	12.7	12.7	387	115	14x5.5 (N9)

All dimensions are subject to change. For actual dimensions, please request the current drawing from IMC.

For heavier applications IMC has complete package solutions using the RDM Series or E-Series Drives with constant lead (constant ratio) cams. These are available as a complete solution including the servo package or as the mechanical platform only.

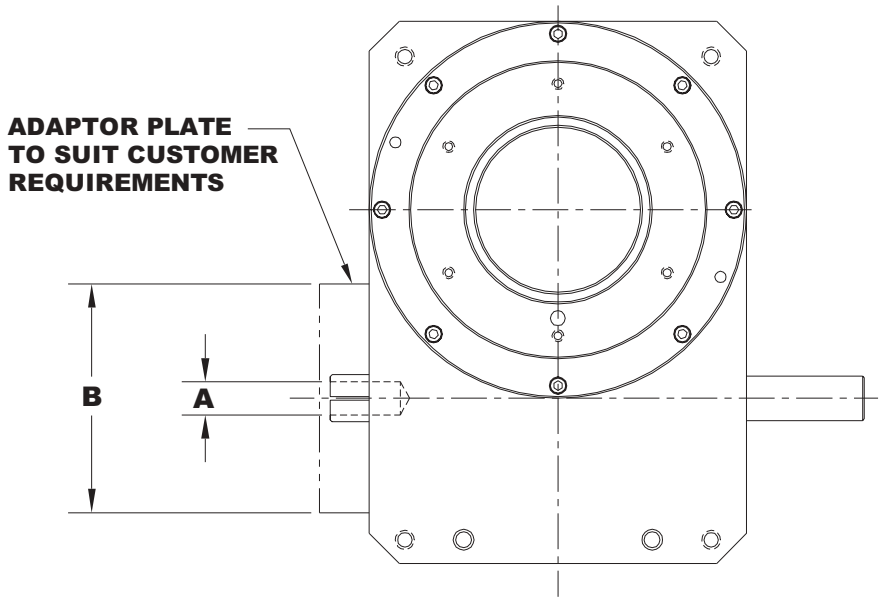
Complete Package

IMC can provide a complete servo-driven solution consisting of the mechanical assembly, servomotor and controller. All IMC complete packages are supplied with Control Techniques Servo Motors (up to 14.57 hp or 10.87 kW), Uni-Drive SP controller, power and logic cables and Power Tools software as standard.

Basic Mechanical Platform

The mechanical platform uses the RDM or E-Series cam-operated drive alone or with a reducer. You can use your preferred servomotor, amplifier and controller to drive the unit. An IMC sales or applications engineer can size and select the right cam drive for your application. As a preliminary guide for motor or reducer sizing please refer to the charts on pages K-4 and K-6 for the shaft and flange sizes as well as the minimum motor RMS torque or reducer rating required for each.

Servo-Driven RDM



RDM WITH EXTENDED
CAMSHAFT FOR MOTOR

Dimensions – Servo-Driven RDM

Model	Assembly Torque in-lb (Nm)	A Reducer or Motor Shaft Maximum Diameter in. (mm)	B Reducer or Motor Maximum Flange in. (mm)
80RDM	30 (3.4)	0.55 (14)	3.86 (98)
601RDM	30 (3.4)	0.55 (14)	3.86 (98)
902RDM	90 (10)	0.87 (22)	5.12 (130)
1100RDM	180 (20)	1.26 (32)	7.09 (180)
1305RDM	300 (34)	1.26 (32)	8.66 (220)
1800RDM	650 (73)	2.17 (55)	13.31 (338)

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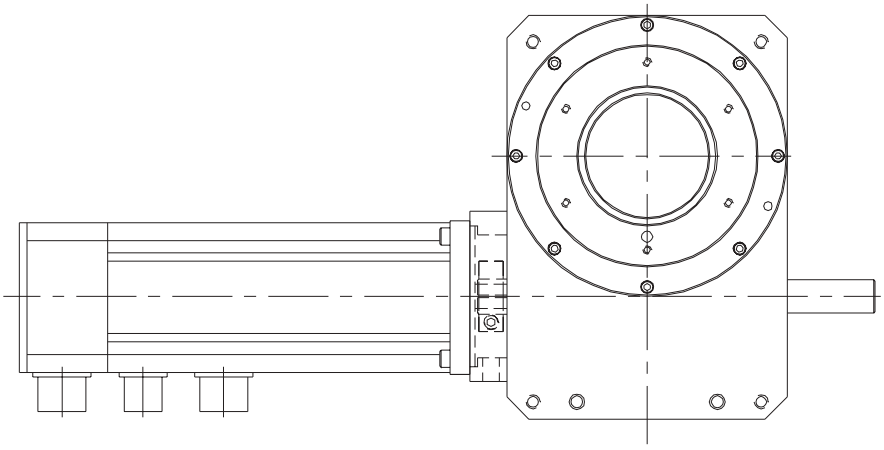
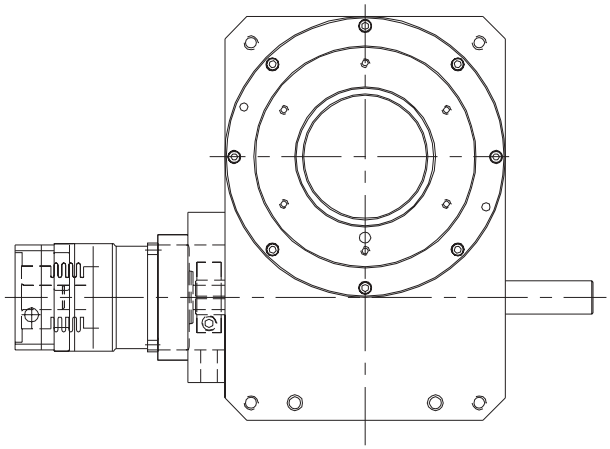
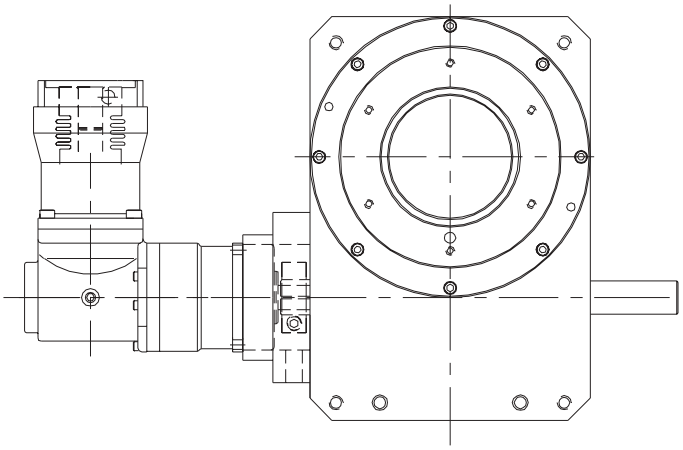
For RDM drive dimensions see section B of this catalog.



RDM WITH MOTOR
DIRECTLY CONNECTED



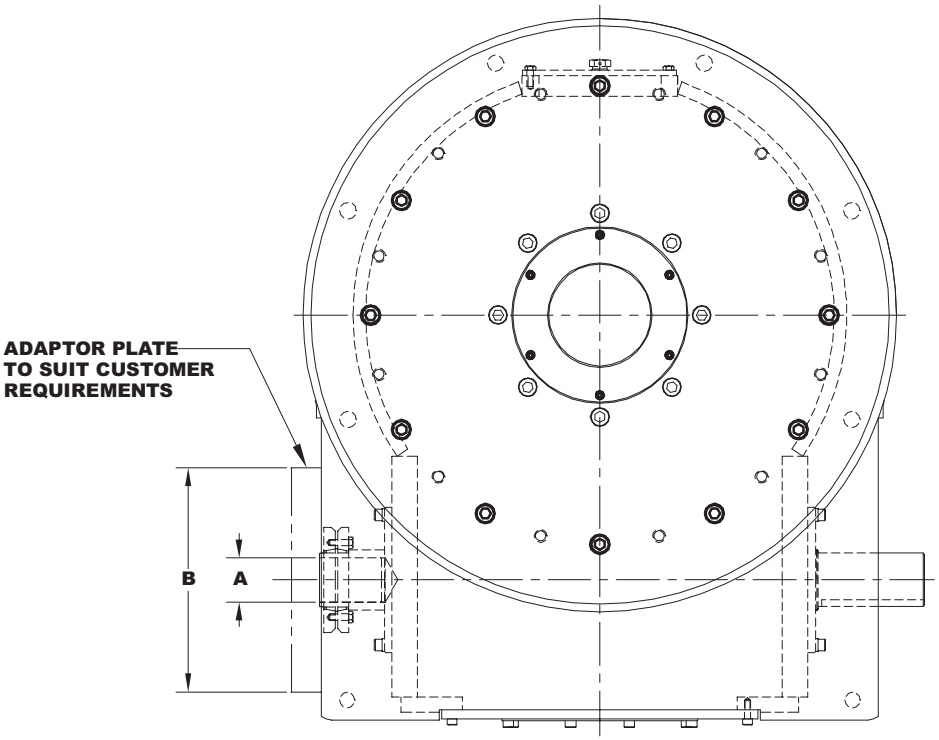
RDM WITH INLINE PLANETARY
REDUCER (NO MOTOR)



RDM WITH RIGHT ANGLE PLANETARY
REDUCER (NO MOTOR)

Servo-Driven Heavy-Duty E-Series

For heavy-duty applications, the E-Series drive can be supplied with a constant lead (constant ratio) cam, with or without the servo package.

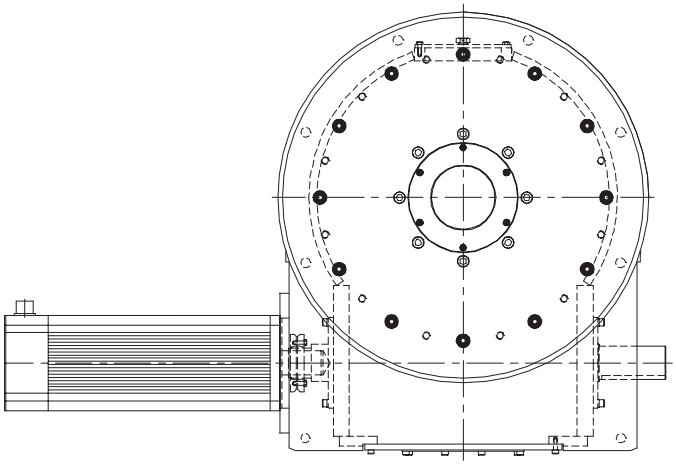


E-SERIES WITH EXTENDED CAMSHAFT FOR MOTOR

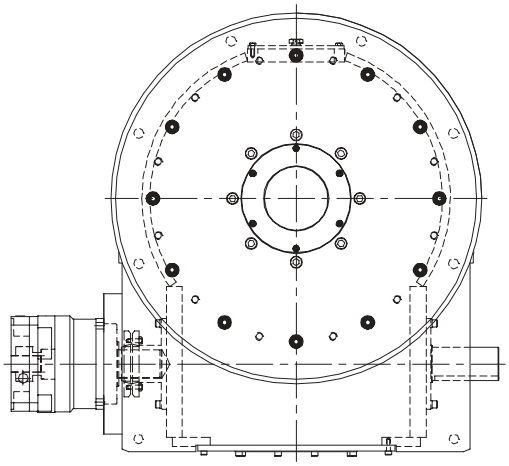
Dimensions – Servo-Driven Heavy-Duty E-Series

Model	Assembly Torque in-lb (Nm)	A Reducer or Motor Shaft Maximum Diameter in. (mm)	B Reducer or Motor Maximum Flange in. (mm)
750E	650 (73.45)	2.17 (55)	7.36 (187)
950E	650 (73.45)	2.17 (55)	6.61 (168)
1150E	1100 (124.29)	2.95 (75)	8.15 (207)
1550E	1550 (175.14)	2.95 (75)	7.24 (184)
2050E	2000 (225.99)	3.35 (85)	12.99 (330)

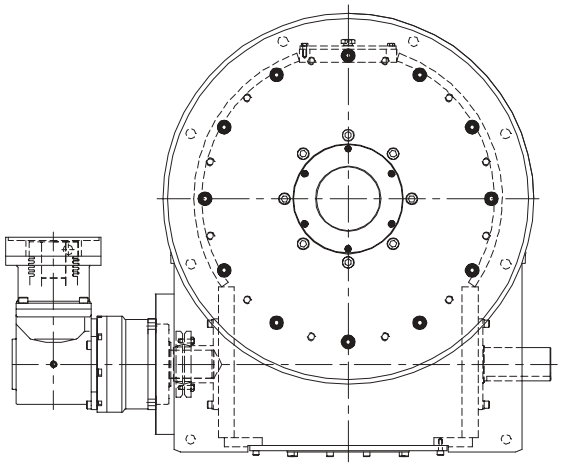
All dimensions are subject to change. For actual dimensions, please request the current drawing from IMC.
For E-Series drive dimensions see section G of this catalog.



E-SERIES WITH MOTOR DIRECTLY CONNECTED



E-SERIES WITH INLINE PLANETARY REDUCER (NO MOTOR)



E-SERIES WITH RIGHT ANGLE PLANETARY REDUCER (NO MOTOR)

Technical Specifications

Flex-i-Dex			
	Units	DSD-102 DSD-102S	DSD-150 DSD-150S
Single Reduction Ratio	Integer	20:1	24:1
Maximum Inertia on Output Dial	lb-in^2	10,000	100,000
Inertia reflected at Input Shaft	lb-in^2	1.25	5.87
Assembly Torque	in-lb	25	45
Maximum Axial Load	lbs	2,270	8,850
Maximum Radial Load	lbs	910	3,540
Maximum Offset Load	in-lb overturning moment	3,180	17,750
Dial Flatness	inches TIR	0.002	0.002
Axial Run-Out	inches	0.0015	0.0015
Accuracy	arc seconds	±30	±30
Repeatability	arc seconds	±7	±7

RDM							
	Units	80RDM	601RDM	902RDM	1100RDM	1305RDM	1800RDM
Reduction Ratio Range	Integer	2:1 to 24:1	2:1 to 24:1	2:1 to 24:1	2:1 to 24:1	2:1 to 24:1	2:1 to 24:1
Maximum Inertia on Output Dial	lb-in^2	2,000	12,000	107,000	366,000	272,000	705,000
Inertia reflected at Input Shaft	lb-in^2	3	9	15	160	297	980
Assembly Torque	in-lb	30	30	90	180	300	650
Maximum Axial Load	lbs	1,818	2,267	8,840	20,180	11,639	14,524
Maximum Radial Load	lbs	729	909	3,535	8,069	4,646	5,836
Maximum Offset Load	in-lb overturning moment	1,814	3,186	17,700	24,213	34,957	61,065
Dial Flatness	inches TIR	0.002	0.002	0.002	0.002	0.002	0.002
Axial Run-Out	inches	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Accuracy	arc seconds	±55	±39	±30	±21	±30	±17
Repeatability	arc seconds	±18	±13	±5	±5	±5	±4

E-Series						
	Units	750E	950E	1150E	1550E	2050E
Reduction Ratio Range	Integer	2:1 to 32:1	2:1 to 32:1	2:1 to 32:1	2:1 to 32:1	2:1 to 32:1
Maximum Inertia on Output Dial	lb-in^2	2,152,000	4,544,000	11,522,000	28,764,000	86,250,000
Inertia reflected at Input Shaft	lb-in^2	3,520	11,200	17,255	63,700	363,100
Assembly Torque	in-lb	650	650	1,100	1,550	2,000
Maximum Axial Load	lbs	41,934	75,742	85,351	119,850	159,724
Maximum Radial Load	lbs	29,161	52,530	58,939	82,477	109,595
Maximum Offset Load	in-lb overturning moment	419,490	977,482	1,408,920	2,903,685	4,342,695
Dial Flatness	inches TIR	0.005	0.005	0.005	0.005	0.005
Axial Run-Out	inches	0.005	0.005	0.005	0.005	0.005
Accuracy	arc seconds	±26	±23	±15	±11	±7
Repeatability	arc seconds	±6	±5	±3	±2	±1