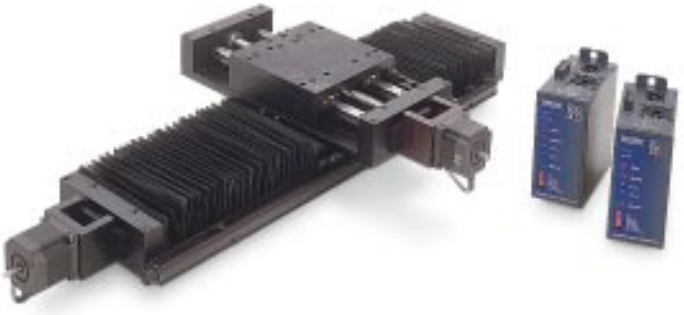
Specifications



Typical Applications

- Pick and Place
- Inspection
- Assembly
- Deposition
- Contouring
- Laser Cutting
- Dispensing
- Light Machining

Note: Two RB6 tables are shown in a typical X-Y configuration.

General Specifications

Materials	Top and base — black anodized aluminum alloy (6061 and cast tool plate); Ballscrew and guideways — DIN 1.6523 and 1.3505 steel
Cross Section	152.4mm x 88.9mm (8 inches x 3.5 inches)
Travel Lengths (including limits and covers)	**Standard** — 152.4mm (6 inch), 304.8mm (12 inch), 457.2mm (18 inch) and 609.6mm (24 inch) **Extended** — 762.0mm (30 inch), 914.4mm (36 inch), 1066.8mm (42 inch), and 1219.2mm (48 inch)
Drive Screw	Preloaded precision ground ballscrew — JIS C3 and C5 (zero backlash) Nominal diameter 20mm (0.7874 inch)
Ballscrew Lead Options	5.08mm (0.2 inch), 10mm (0.3937 inch), or 20mm (0.7874 inch) (please refer to Travel Dependent Specifications for maximum speeds)
Bearings	Matched precision grade recirculating linear guideways Nominal coefficient of friction 0.008 Special high precision assembly option available for standard travels only
Couplings	Bellows, Oldham, or Stainless Steel Beam (please refer to Coupling Section)
Motors	Stepper (standard, T or V options) or Servo; Nominal NEMA 23 or NEMA 34 frame sizes (please refer to Stepper Section G-1, Servo Section H-1 and Motor section)
Limit Switches	Internal Hall Effect switches — non-adjustable 3 position or 2 position — normally closed (please refer to Limit Switch Section)
Linear Encoder Resolution	1 micron (0.000039 inch) or 2 microns (0.000079 inch) (please refer to Linear Encoder Section)
Covers	Neoprene bellows (Nominal IP 53)
Environment	General industrial, clean room, or vacuum (please refer to Environmental Section)
Normal Ambient Temperature	20°C ± 15°C (68°F ± 27°F) — special high or low temperature preparation also available
Normal Ambient Pressure	760 torr — 10^{-3} torr (standard preparation) — up to 10^{-7} torr (special preparation)
Normal Cleanliness	Class 1000 (standard preparation) — up to Class 100 (special preparation)
Audible Noise (max.)	70 dB at top speed (1m away from positioning system)
Maximum Input Torque	300 oz-in

Industrial Devices Corporation
707-789-1000 • 800-747-0064 • E-mail: info@idcmotion.com

Specifications

Global Specifications

Ballscrew Accuracy Tolerances[1,2] (maximum lead error tolerance)	**Travel of 600mm (24 inches) or less — JIS C3** 8 microns per 300mm — 6 microns per revolution 0.00032 inch per foot — 0.00024 inch per revolution **Travel of 600mm (24 inches) or less — JIS C1** 5 microns per 300mm — 4 microns per revolution 0.00020 inch per foot — 0.00016 inch per revolution **Travel greater than 600mm (24 inches) — JIS C5** 18 microns per 300mm — 8 microns per revolution 0.00072 inch per foot — 0.00032 inch per revolution
Unidirectional Repeatability (max.)[1,2] (without linear encoder)	**Travel 600mm (24 inches) or less** 3 microns (0.00012 inch) **Travel greater than 600mm (24 inches)** 4 microns (0.00016 inch)
Bi-directional Repeatability (max.)[1,2] (without linear encoder)	**Travel 600mm (24 inches) or less** 6 microns (0.00024 inch) **Travel Greater than 600mm (24 inches)** 8 microns (0.00032 inch)
Limit Switch Repeatability[2]	50 microns (0.002 inch) (please refer to Limit Switch Section)
Breakaway Torque (max.)[2]	0.141 Nm (20 oz-in)
Running Torque (max.)[2]	0.127 Nm (18 oz-in)
Nominal Acceleration (max.)[2]	2.0 g
Duty Cycle	100%
Normal Load Capacity (max.)[2,3]	±193 kg(f) (425 lbs.) (please refer to stiffness specifications)
Side Load Capacity (max.)[2,3]	±141 kg(f) (310 lbs.) (please refer to stiffness specifications)
Axial Load Capacity (max.)[2,3]	±47 kg(f) (110 lbs.) (please refer to stiffness specifications)
Roll Moment Capacity (max.)[2,3]	±133 Nm (96 ft-lb) (please refer to stiffness specifications)
Pitch Moment Capacity (max.)[2,3]	±106 Nm (77.5 ft-lb) (please refer to stiffness specifications)
Yaw Moment Capacity (max.)[2,3]	±71 Nm (52 ft-lb) (please refer to stiffness specifications)
Nominal Straightness[2,3] (horizontal straightness) Precision Option (standard travels only)	2 microns per 25mm (0.00008 inch per inch) Not to exceed travel dependent specifications 1 micron per 25mm (0.00004 inch per inch) Not to exceed travel dependent specifications
Nominal Flatness[2,3] (vertical straightness) Precision Option (standard travels only)	2 microns per 25mm (0.00008 inch per inch) Not to exceed travel dependent specifications 1 micron per 25mm (0.00004 inch per inch) Not to exceed travel dependent specifications
Normal Load Stiffness[2,3]	5.5 kg(f) per micron (300,000 lbs. per inch)
Side Load Stiffness[2,3]	4.0 kg(f) per micron (225,000 lbs. per inch)
Axial Load Stiffness[2,3]	0.65 kg(f) per micron (35,000 lbs. per inch)
Roll Moment Compliance[2,3]	0.75 arc-sec per Nm (1 arc-sec per ft-lb)
Pitch Moment Compliance[2,3]	0.75 arc-sec per Nm (1 arc-sec per ft-lb)
Yaw Moment Compliance[2,3]	1.5 arc-sec per Nm (2 arc-sec per ft-lb)
Precision X-Y Mounting Orthogonality (XYP)[2,3]	15 arc-sec
Moving Mass (carriage and bearing)	2.75 kg(f) (6 lbs.)

1 For applications requiring higher specification, interferometer testing, a higher accuracy ballscrew or a linear encoder may be necessary. Please refer to the Performance Verification Section and the Linear Encoder Section.

2 Please consult IDC if your application requirements exceed catalog specifications.

3 Based on the centerline of the table top.

All specifications are based on ISO 230-2 measurements of an unloaded, bolted down Precision Table with optimized motor tuning. These specifications were generated by measuring the peformance of a complete motion system that utilized IDC motors, drives and controls.

Note: IDC accuracy measurements are based on a stable 20°C environment. Thermal variations can affect application results significantly.

Specifications

Travel Dependent Specifications

Standard Travels — Precision Assembly Option Available

(Travel includes space for limit switches and bellows)

	RB6-6	RB6-12	RB6-18	RB6-24
Travel — mm (inches)	152.4 (6)	304.8 (12)	457.2 (18)	609.6 (24)
Accuracy (error max.) — microns (inches)	12 (0.00048)	14 (0.00056)	16 (0.00064)	18 (0.00072)
Inertia — kgm^2x10^{-6} ($oz\text{-}in\text{-}s^2x10^{-3}$)	71.6 (10.1)	94.3 (13.4)	117.0 (16.6)	139.7 (19.8)
Total Table Weight (without motors) — kg(f) (lbs.)	10.9 (24)	12.3 (27)	15.0 (33)	16.3 (36)
Top Speed — 5G screw — mm/s (inches/s)	322 (12.7)	322 (12.7)	268 (10.6)	183 (7.2)
Top Speed — 10MG screw — mm/s (inches/s)	635 (25.0)	635 (25.0)	528 (20.8)	361 (14.2)
Top Speed — 20MG screw — mm/s (inches/s)	1270 (50.0)	1270 (50.0)	1056 (41.6)	722 (28.4)
Roll Deviation (max.) [2,3] — arc-sec (precision)	16 (8)	18 (9)	20 (10)	24 (12)
Yaw Deviation (max.) [2,3] — arc-sec (precision)	16 (8)	18 (9)	20 (10)	24 (12)
Pitch Deviation (max.) [2,3] — arc-sec (precision)	16 (8)	18 (9)	20 (10)	24 (12)
Nominal Straightness (max.) [2,3] — microns (inches) Precision Assembly Option	12 (0.00048) 6 (0.00024)	16 (0.00064) 8 (0.00032)	20 (0.00080) 10 (0.00040)	24 (0.00096) 12 (0.00048)
Nominal Flatness (max.) [2,3] — microns (inches) Precision Assembly Option	12 (0.00048) 6 (0.00024)	16 (0.00064) 8 (0.00032)	20 (0.00080) 10 (0.00040)	24 (0.00096) 12 (0.00048)

Standard Travels — Precision Assembly Option Not Available

(Travel includes space for limit switches and bellows)

	RB6-30	RB6-36	RB6-42	RB6-48
Travel — mm (inches)	762.0 (30)	914.4 (36)	1086.8 (42)	1219.2 (48)
Accuracy (error max.) — microns (inches)	24 (0.00096)	28 (0.00112)	32 (0.00128)	36 (0.00144)
Inertia — kgm^2x10^{-6} ($oz\text{-}in\text{-}s^2x10^{-3}$)	153.9 (21.8)	176.6 (25.0)	199.3 (28.2)	222.0 (31.4)
Total Table Weight (without motors) — kg(f) (lbs.)	19.0 (42)	20.4 (45)	23.1 (51)	24.5 (54)
Top Speed — 5G screw — mm/s (inches/s)	149 (5.9)	112 (4.4)	87 (3.4)	69 (2.7)
Top Speed — 10MG screw — mm/s (inches/s)	294 (11.6)	220 (8.7)	171 (6.7)	139 (5.4)
Top Speed — 20MG screw — mm/s (inches/s)	588 (23.3)	440 (17.3)	341 (13.4)	272 (10.7)
Roll Deviation (max.) [2,3] — arc-sec	40	45	50	55
Yaw Deviation (max.) [2,3] — arc-sec	40	45	50	55
Pitch Deviation (max.) [2,3] — arc-sec	40	45	50	55
Nominal Straightness (max.) [2,3] — microns (inches)	28 (0.00112)	32 (0.00128)	36 (0.00144)	40 (0.00160)
Nominal Flatness (max.) [2,3] — microns (inches)	28 (0.00112)	32 (0.00128)	36 (0.00144)	40 (0.00160)

Ballscrew Data

	Diameter mm (inches)	Efficiency	Direction	Duty Cycle	Contouring Thrust Load (max.) kg(f) (lbs.)
5G	20 (0.7874)	87%	Right Hand	100%	10.0 (22.0)
10MG	20 (0.7874)	90%	Right Hand	100%	7.0 (15.4)
20MG	20 (0.7874)	93%	Right Hand	100%	5.0 (11.0)

Life Calculation Constants (Dynamic Load Capacity)

(please refer to Bearing and Drivescrew Section)

Bearings	640 kg(f)
5G Ballscrew	317 kg(f)
10MG Ballscrew	232 kg(f)
20MG Ballscrew	136 kg(f)

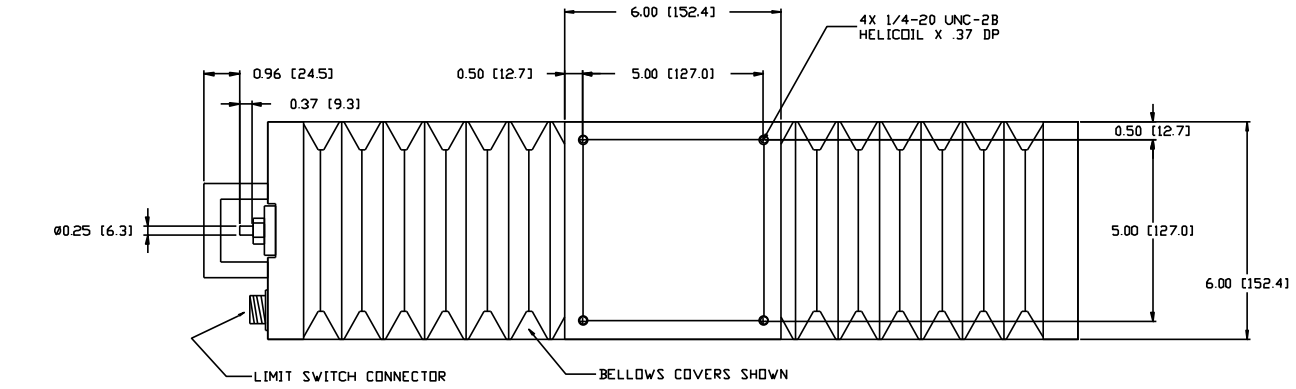
2 Please consult IDC if your application requirements exceed catalog specifications.

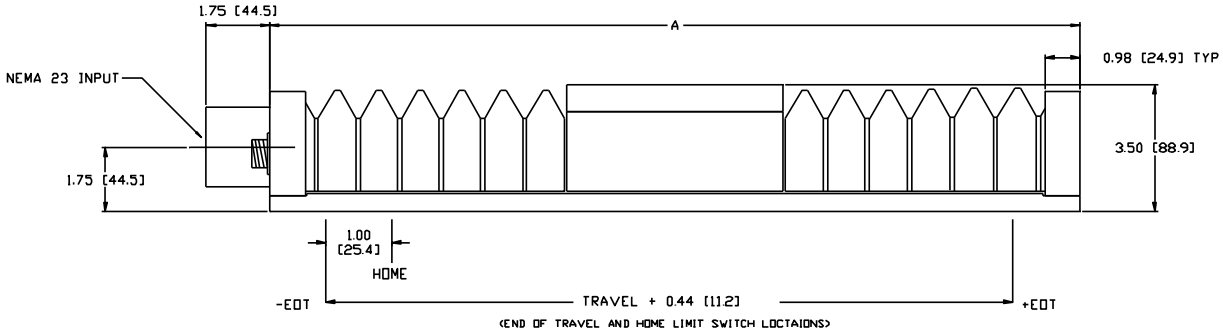
3 Based on the centerline of the table top.

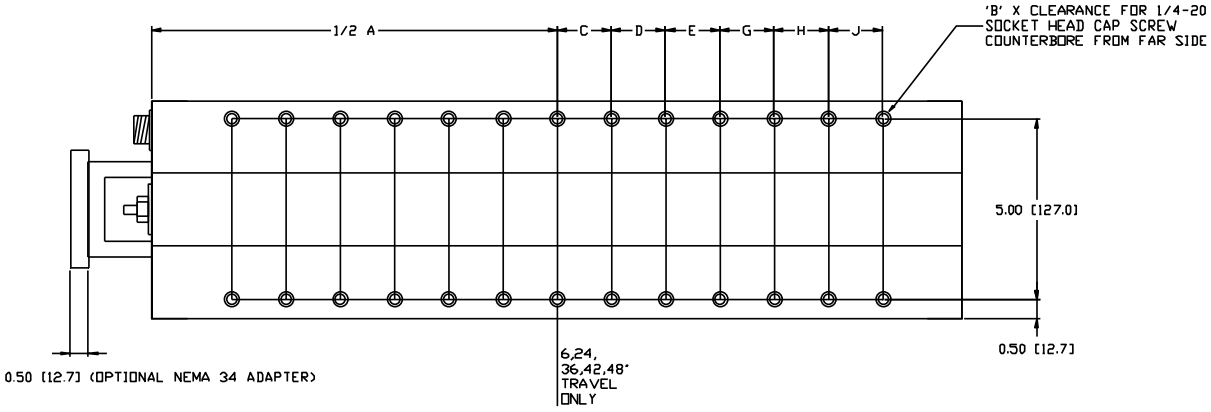
Note: IDC accuracy measurements are based on a stable 20°C environment. Thermal variations can affect application results significantly.

Industrial Devices Corporation
707-789-1000 • 800-747-0064 • E-mail: info@idcmotion.com

Specifications







Travel	A	B	C	D	E	G	H	J
6.00 (152.4)	16.32 (414.5)	10	2.50 (63.5)	2.50 (63.5)	—	—	—	—
12.00 (304.8)	22.40 (881.9)	8	2.50 (63.5)	5.00 (127.0)	—	—	—	—
18.00 (457.2)	29.14 (740.2)	12	2.50 (63.5)	5.00 (127.0)	5.00 (127.0)	—	—	—
24.00 (609.6)	36.18 (919.0)	14	5.00 (127.0)	5.00 (127.0)	5.00 (127.0)	—	—	—
30.00 (762.0)	43.18 (1096.8)	16	2.50 (63.5)	5.00 (127.0)	5.00 (127.0)	5.00 (127.0)	—	—
36.00 (914.4)	50.15 (1273.8)	18	5.00 (127.0)	5.00 (127.0)	5.00 (127.0)	5.00 (127.0)	—	—
42.00 (1066.8)	56.91 (1445.5)	22	5.00 (127.0)	5.00 (127.0)	5.00 (127.0)	5.00 (127.0)	5.00 (127.0)	—
48.00 (1219.2)	63.65 (1616.7)	26	5.00 (127.0)	5.00 (127.0)	5.00 (127.0)	5.00 (127.0)	5.00 (127.0)	5.00 (127.0)

Specifications

Basic Stepper Configuration

RB6-___-5G-OE4-P22T-LI3-E0-CV1

Standard Precision Assembly	High Performance Step Motor (P22T)
Precision Ground Ballscrew (5G)	3 Position Internal Limit Switches (LI3)
Travel (inches) 6, 12, 18, and 24	No Linear Encoder (E0)
0.25 inch Oldham Coupling (OE4)	Neoprene Bellows Covers (CV1)

(please refer to How to Order page for additional standard options)

Basic Servo Configuration

RB6-___-5G-BE4-BN23-LI3-E0-CV1

Standard Precision Assembly	High Performance Servo Motor (BN23)
Precision Ground Ballscrew (5G)	3 Position Internal Limit Switches (LI3)
Travel (inches) 6, 12, 18, and 24	No Linear Encoder (E0)
0.25 inch Bellows Coupling (BE4)	Neoprene Bellows Covers (CV1)

(please refer to How to Order page for additional standard options)

Make it an IDeal System

Include an IDC drive or control that is preconfigured for and tested with each Precision Table axis.
Stepper Choices: NextStep, SmartStep23, SmartStep, S6961 or S6962
Servo Choices: B8001, B8961 or B8962
(order as a separate line item)

Example:	RB6-18-5G-OE4-P22T-L13-EO-CV1	2
	RB6 XYP	1
	SMART STEP23	2
	IDEAL SYSTEM	2

(please refer to the IDeal System Section for further details)

Standard Multi-Axis Configuration

Standard Precision X-Y Mounting (XYP) — 15 arc-sec Orthogonality — (dowel pinned assembly)
(ordered as a separate line item to assemble 2 separate tables)

Example:	RB6-12-5G-BE4-BN23-LI3-E0-CV1	2
	RB6 XYP	1

(for applications requiring more complicated assemblies than XYP, please refer to the Multi-Axis Section)

Standard Environmental Preparations

All standard IDC precision tables are designed to operate in general industrial environments.
Standard environmental preparation for Class 100 Clean Room or 10^{-7} Vacuum environments is also available.
(ordered as a separate line item per axis)

Example:	RB6-18-5G-BE4-BN23-LI3-E0-CV0	2	Example:	RB6-6-5G-BE4-BN23-LI3-E0-CV0	2
	CLEAN 100	2		VACUUM	2
	RB6 XYP	1		RB6 XYP	1

(for applications requiring other non-standard environments, please refer to the Environmental Section)

Performance Verification and Testing

(ordered as separate line item per axis)

Example:	RB6-24-5G-OE4-P22V-LI3-E0-CV1	1
	TEST 1-1	1

(for applications requiring testing, please refer to the Performance Verification Section)

More Info?

More information, including a copy of the Owner's Manual is available by visiting IDC's web site or by contacting IDC.

Industrial Devices Corporation
707-789-1000 • 800-747-0064 • E-mail: info@idcmotion.com

How To Order

Ordering Example

RB6	–	24	–	5G	–	BE4	–	BN23	–	LI3	–	E0	–	CV1
Model		Travel		Drive Screw		Coupling		Motor		Limit Switches		Linear Encoder		Covers

Product Model

RB6	Standard Assembly
RB6P	Precision Assembly (lower angular errors) (Standard travels only)

Travel (Inches)

6, 12, 18, 24, 30, 36, 42, 48

Drive Screws (see Drive Screw Section)

5G	5.08mm (0.2 inch) JIS C3 Precision Ground Ballscrew Preloaded — Zero Backlash (JIS C5 for travel over 24 inches)
10MG	10mm (0.3937 Inch) JIS C3 Precision Ground Ballscrew Preloaded — Zero Backlash (JIS C5 for travel over 24 inches)
20MG	20mm (0.7874 Inch) JIS C3 Precision Ground Ballscrew Preloaded — Zero Backlash (JIS C5 for travel over 24 inches)
5GP	5.08mm (0.2 inch) JIS C1 Precision Ground Ballscrew Preloaded — Zero Backlash (JIS C5 for travel over 24 inches)
10MGP	10mm (0.3937 Inch) JIS C1 Precision Ground Ballscrew Preloaded — Zero Backlash (JIS C5 for travel over 24 inches)
20MGP	20mm (0.7874 Inch) JIS C1 Precision Ground Ballscrew Preloaded — Zero Backlash (JIS C5 for travel over 24 inches)

Coupling — Type and Input Shaft *(see Coupling Section)*

BE4	Stainless Steel Bellows 0.25 inch shaft diameter
BE5	Stainless Steel Bellows 0.3125 inch shaft diameter
BE6	Stainless Steel Bellows 0.375 inch shaft diameter
OE4	Oldham 0.25 inch shaft diameter
OE5	Oldham 0.3125 inch shaft diameter
OE6	Oldham 0.375 inch shaft diameter
SE4	Stainless Steel Beam 0.25 inch shaft diameter
SE5	Stainless Steel Beam 0.3125 inch shaft diameter
SE6	Stainless Steel Beam 0.375 inch shaft diameter

Motors — Stepper (see Stepper Section on page G-1 and Motor Section)

P21n	Performance NEMA 23	(0.25 inch coupling)
P22n	Performance NEMA 23	(0.25 inch coupling)
S21n	Standard NEMA 23	(0.25 inch coupling)
S22n	Standard NEMA 23	(0.25 inch coupling)
S23n	Standard NEMA 23	(0.25 inch coupling)
S32n	Standard NEMA 34	(0.375 inch coupling)
S33n	Standard NEMA 34	(0.375 inch coupling)

n = T (Series), V (Parallel), N (Flying leads)

Motors — Servo (see Servo Section on page H-1 and Motor Section)

BN21	Performance NEMA 23	(0.25 inch coupling)
BN23	Performance NEMA 23	(0.25 inch coupling)
B22	Standard NEMA 23	(0.3125 inch coupling)
B23	Standard NEMA 23	(0.3125 inch coupling)
B23H	Standard NEMA 23	(0.3125 inch coupling)
BN31	Performance NEMA 34	(0.375 inch coupling)
BN32	Performance NEMA 34	(0.375 inch coupling)

Motors — Customer Supplied *(see Motor Section)*

X23n	Standard NEMA 23 Motor Mount
X34n	Standard NEMA 34 Motor Mount

n = X Customer Supplied and Mounted
n = C Customer Supplied and IDC Mounted

Limit Switches *(see Limit Switch Section)*

L0	No Limit Switch
LI2	2 Position Internal Hall Effect Limit Switch (2 over travel limit switches)
LI3	3 Position Internal Hall Effect Limit Switch (2 over travel limits & 1 home limit switch)

Encoders *(see Linear Encoder Section)*

E0	No Linear Encoder
EM1	1 Micron Resolution
EM2	2 Micron Resolution
EMR	Standard Motor Mounted Rotary Encoder
EMKR	1000 Line Encoder (where available)

Covers *(see Cover Section)*

CV0	No Covers
CV1	Neoprene Bellows Cover

Special Features *(see preceding page)*

(ordered as a separate line item)

Please contact IDC for non-standard applications or components.

Lead-times for complete positioning systems are determined by the lead-times of the individual components (precision tables, motors, gearmotors, drives and controls, etc.). Standard precision table lead-times apply to basic configurations and standard catalog options. Extended travels, environmental preparations, special components, special testing, special modifications and custom systems may require additional lead-time. Please contact IDC for further details.