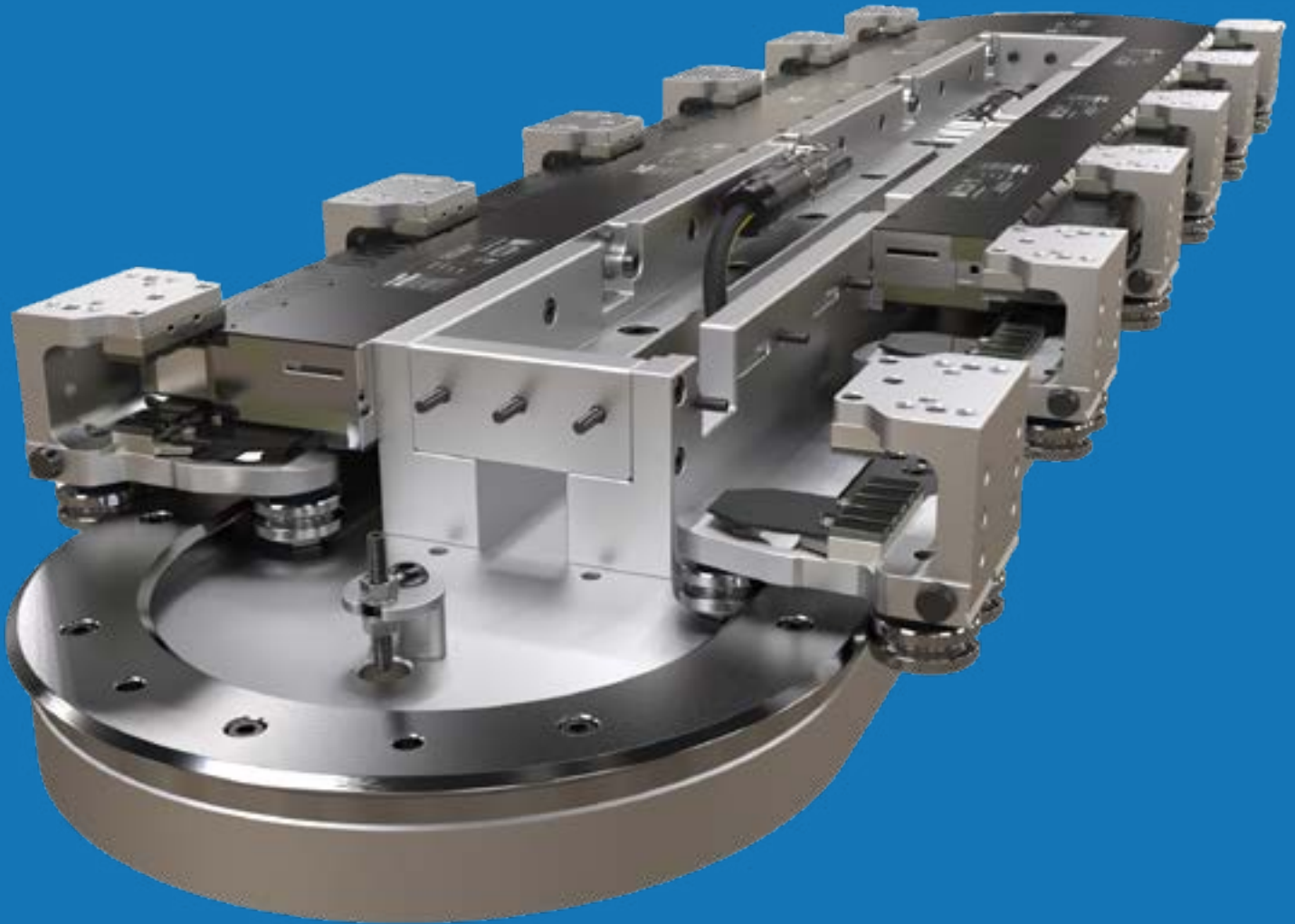




HepcoMotion® GFX

BECKHOFF

**HEPCO GUIDANCE SYSTEM
FOR BECKHOFF XTS**

HEPCOMOTION AND BISHOP-WISECARVER

Bishop-Wisecarver is proud to be the exclusive North American distributor of HepcoMotion products since 1984. Together we are the pioneers and inventors of guide wheel-based vee technologies. With both companies being family-owned and operated, we are aligned not only technically but culturally. Together our companies are the world leaders in guide-wheel based designs, manufacturing, and innovation.

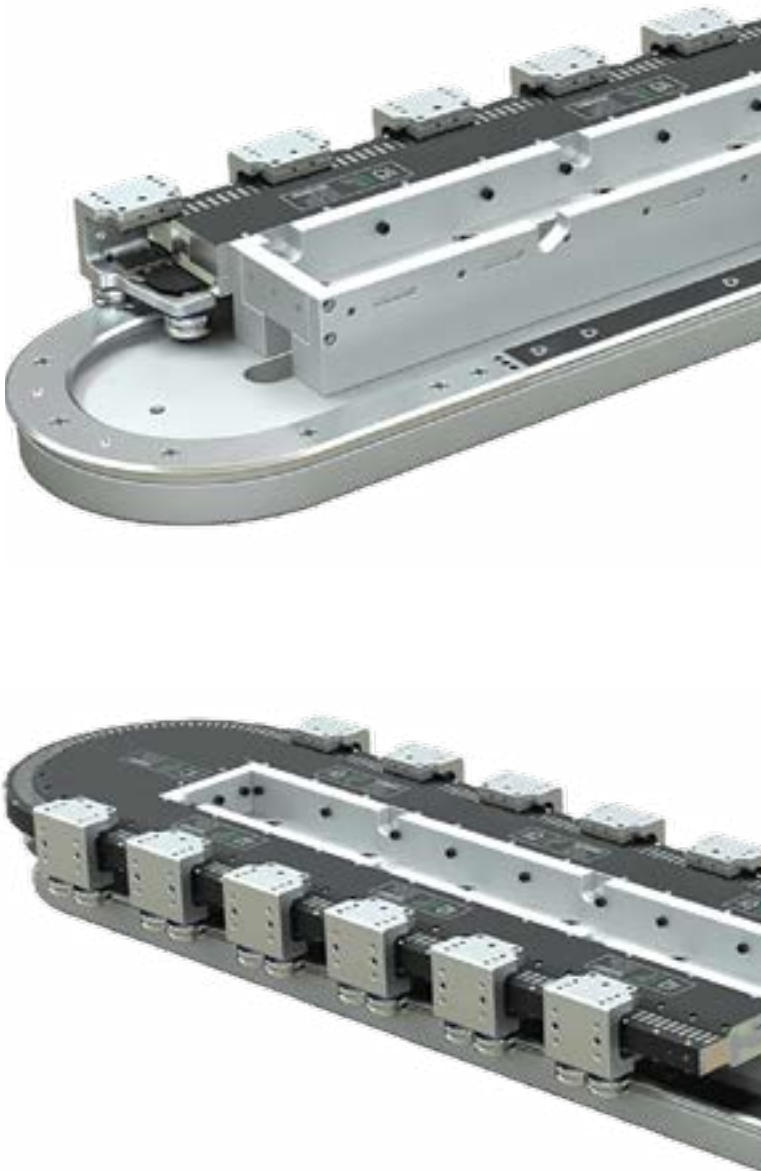


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Need Help

Application + Design Assistance
925.439.8272

3D Modeling + CAD Drawing
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INTRODUCTION

HEPCOMOTION GUIDANCE SYSTEM FOR BECKHOFF XTS SYSTEMS

HepcoMotion and Beckhoff – HepcoMotion works in partnership with Beckhoff to create the GFX system, a high-end track system that provides the support and rigidity required for precise XTS applications.

Flexible – The Beckhoff XTS Transport System uses linear motor technology to independently drive movers around a track. This allows work processes of different duration to be combined, on the fly product changes, and the addition or removal of work stations as needed.

Precise and Reliable – GFX provides the transport path and mechanically guides the movers along the motor modules at the defined speed, with great precision, ensuring accurate alignment and resistance to deflection.

Long System Life – GFX is designed to accommodate complex, high-speed motion profiles requiring extended duty cycles.

Increased Load Capacity – GFX Strong Mover designed to accommodate press load applications.

Hepco's GFX Guidance System for Beckhoff XTS meets the needs of higher duty cycle XTS applications, providing a precise, robust and durable guidance solution.



FEATURES AND BENEFITS



Speeds up to 4m/s



Long System Life



Quiet & Smooth Running



Low Maintenance



Unlimited Lengths



Works in Dirty Environments

GFX 1TL SYSTEM COMPOSITION

GFX 1TL Systems

GFX 1-Trak Lite is a spacer slide version of Hepco's 1-Trak guidance system, including a patented curved track form, providing the minimum acceleration path around a tight curve of the 180° motor modules. The track system is mounted on an aluminum baseplate along with a set of motor support brackets, or can be supplied as a track system only for custom installation. Its length is only limited by the number of motors and movers supported by a Beckhoff control system. Please see [page 12](#) or contact Bishop-Wisecarver for information on these limitations.



1-Trak Lite systems use three bearing mover designs.



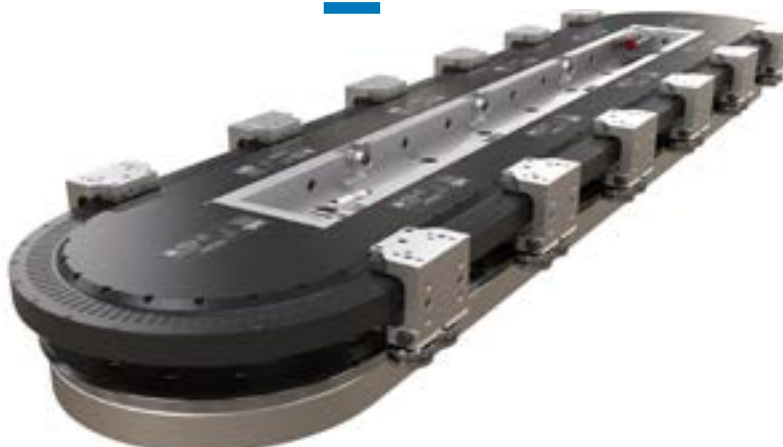
- 25mm outer bearing
- Most compact mover
- Lowest mover mass
- Suitable for light moment loads
- Available in standard lengths: 54mm and 74mm



- 34mm outer bearing
- Compact mover
- Low mover mass
- Suitable for medium moment loads
- Available in standard lengths: 72mm and 82mm



All Hepco guidance systems can be supplied fully assembled, with Beckhoff motor modules, mover magnets and mover encoder flags. Please contact Bishop-Wisecarver's technical department to discuss your requirement.



GFX PRT2 SYSTEM COMPOSITION

PRT2 Ring and Track Systems



GFX PRT2 track systems can be configured into oval or rectangular systems.

PRT2 Ring Systems



GFX PRT2 ring and track systems use four bearing fixed center movers.



- All 25mm bearings
- Compact high moment mover
- Low mover mass
- Suitable for medium loads
- 52mm long as standard



- All 34mm bearings
- Longer bearing life
- Lubricator option
- Suitable for heavier loads
- 80mm long as standard



- **NEW** Strong Mover
- 34mm or 40mm bearings
- Longer bearing life
- Suitable for very heavy loads
- 100mm long as standard



On request, Hepco guidance systems can be supplied fully assembled, with Beckhoff motor modules, mover magnets and mover encoder flags. Please contact Bishop-Wisecarver's technical department to discuss your requirement.

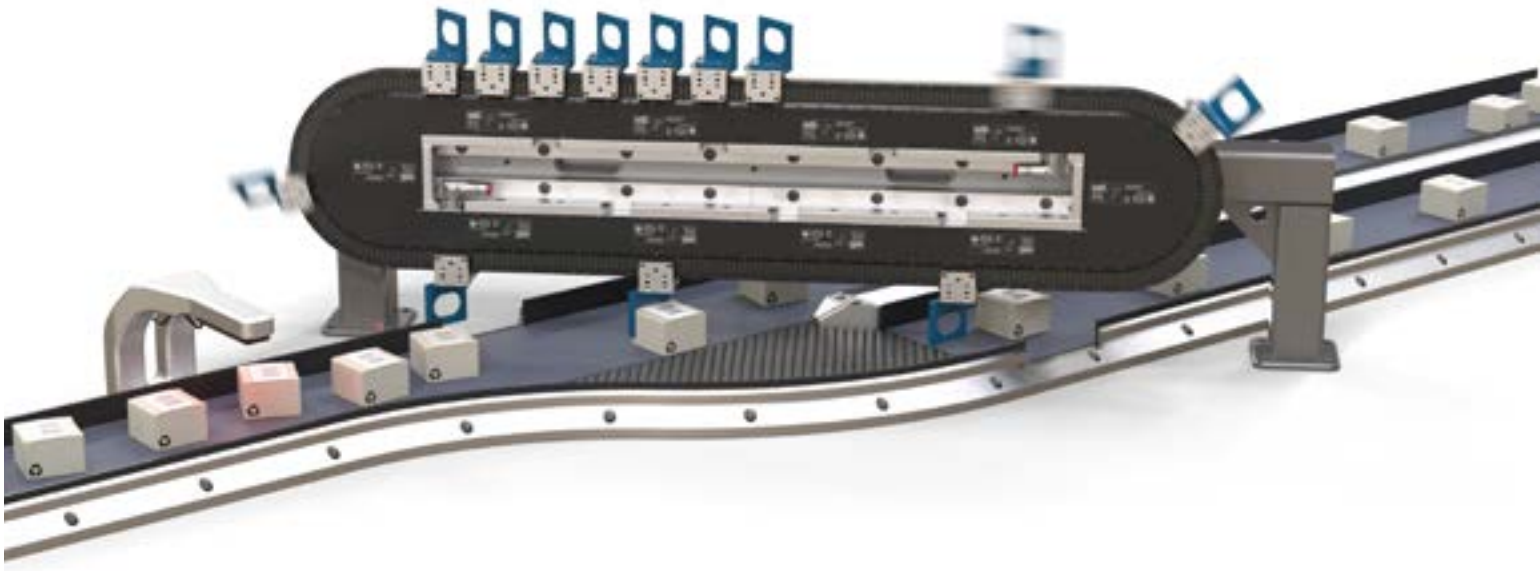


APPLICATION EXAMPLES - FEATURES AND BENEFITS

High Speed Lane Divider

This example shows a vertically mounted, lightly loaded, high speed and high duty GFX 1-Trak system being used to sort randomly positioned items into two separate lanes.

- High rigidity
- Positional repeatability
- Durable - hardened guidance system
- Low maintenance - integrated bleed lubrication
- Standard configuration



Double Sided System

Two GFX 1-Trak systems manufactured with a single 'back to back' base provide a precision assembly and accurate parallelism for applications where the relevant positions on track systems must be closely controlled.

- High rigidity
- Excellent parallelism
- Positional accuracy
- Compact
- Customizable - designed to suit a specific application



APPLICATION EXAMPLES - FEATURES AND BENEFITS

Multi-Operation and Variable Speed Application

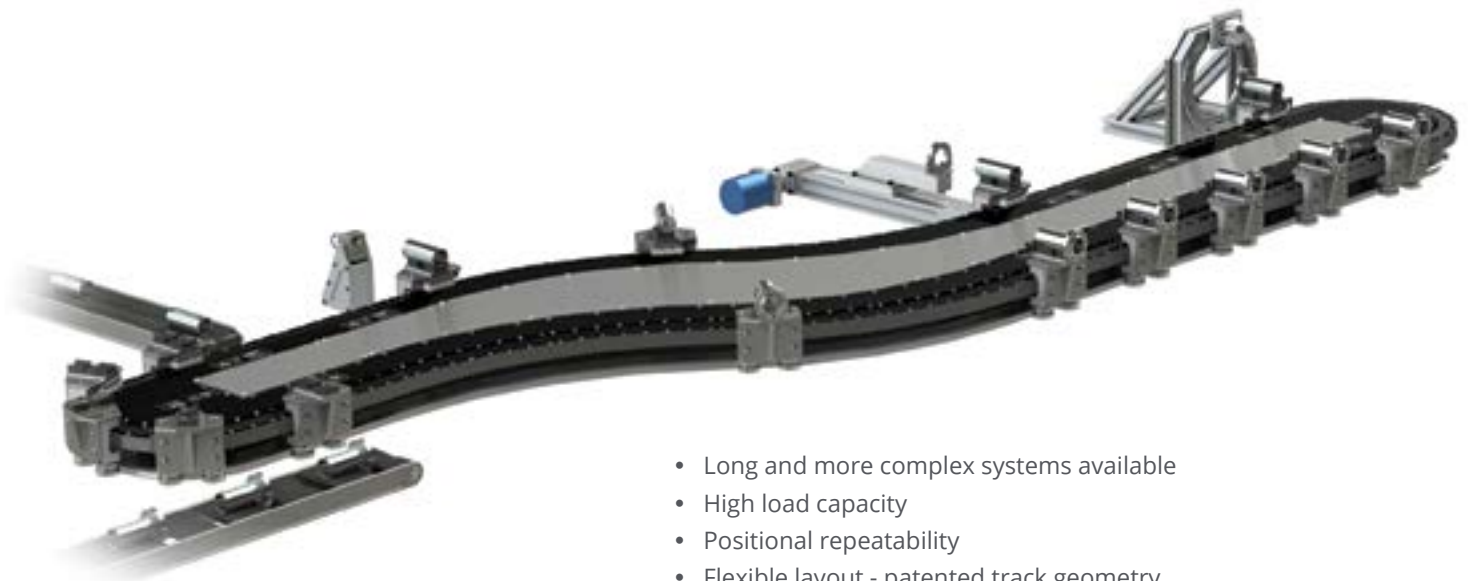
The horizontally mounted system shown below comprises of a GFX PRT2 track system used in a multi operation application.

- Durability - hardened guidance system
- High moment capacity - for higher process forces
- Low maintenance - integrated bleed lubrication
- Machine integration - Hepco MCS support structure
- Precision ring and track technology (PRT2)
- Standard configuration



Multi-directional Bend

This high temperature assembly application utilizes 180° end modules, plus internal and external 22.5° curved Beckhoff modules, creating an 'S' bend system layout, with a GFX 1-Trak Lite track system.



- Long and more complex systems available
- High load capacity
- Positional repeatability
- Flexible layout - patented track geometry
- Customizable - designed to suit a specific application

GFX PRODUCT FAMILY

GFX-a

GFX Agile is a low mass variant of the standard GFX track system for Beckhoff XTS products. It is specified for overall payloads (product and tooling combined) of less than 250g, with little or no process loading. It is capable of a maximum velocity of 4m/s and acceleration in excess of 100m/s². It offers very high throughput rates in excess of 700ppm.



GFX Strong Mover

GFX Strong Movers are exclusively designed for the GFX-PRT2 ring and track systems for use with 45° and 22.5° XTS motors. They accept press loads and robotic assembly forces up to 2500N. This is 10 times higher than the standard mover.

This increase in press load capacity is at minimal cost to the dynamic capability of the XTS drive system. Dynamic payload capacity (tooling and payload) is around twice that of the standard mover.

GFX TMS - Track Management System

GFX Track Management (TMS) facilitates the transition of movers between GFX systems whether they are open or complete circuits. Track Management can be utilized in many ways to increase system functionality, including the removal of movers for maintenance, system re-configuration or for the transfer of movers between systems to accommodate extra processes.

The precision ballscrew driven transfer slide section can achieve cycle times as quick as 0.4 seconds to micron precision. The TMS assembly is designed to be integrated into standard 1-Trak and PRT2 assemblies. TMS Systems require rigid support structures which will be tailored to suit specific customer applications.



GFX PRODUCT FAMILY

GFX-h

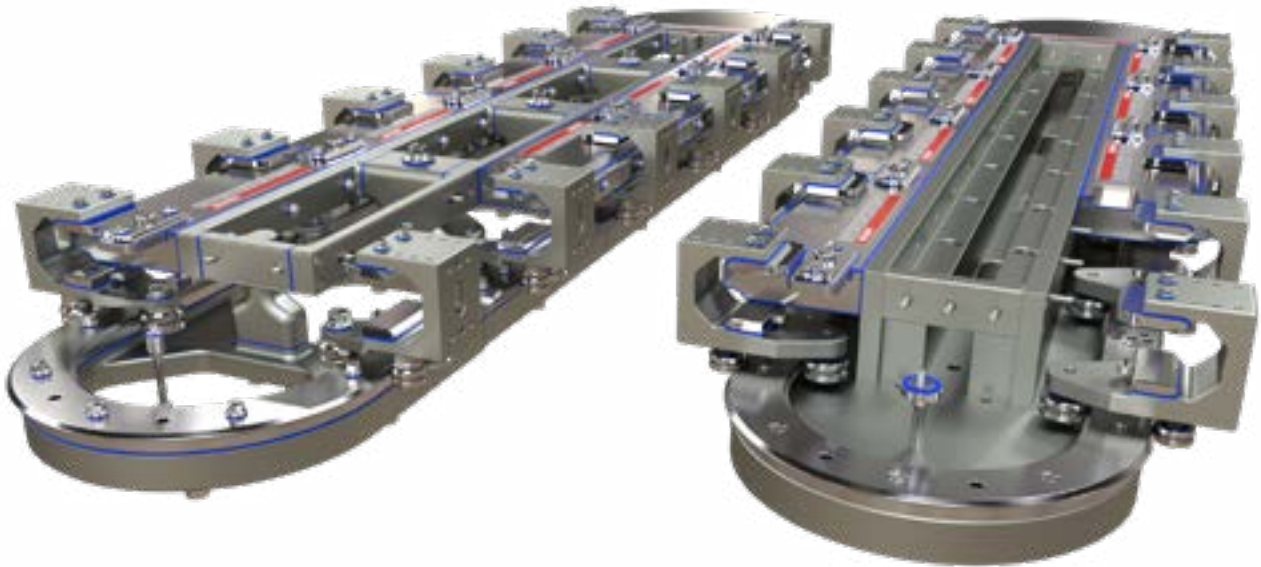
GFX Hygienic Design comprises track system variations that are suitable for use with the Beckhoff “HD” hygienic design XTS motors and magnets. There are three systems which are applicable to differing customer needs:

GFX-hW Washdown

Designed for cleaning in place (CIP) operations that include foaming agents, hot washing and pressure washing. The construction allows complete access to all surfaces, pooling traps are removed, joints between all components are sealed and the bearings are protected against lubricant egress and “flushing” with a solid cover and labyrinth seals. All fasteners are sealed and designed to ease cleaning processes.

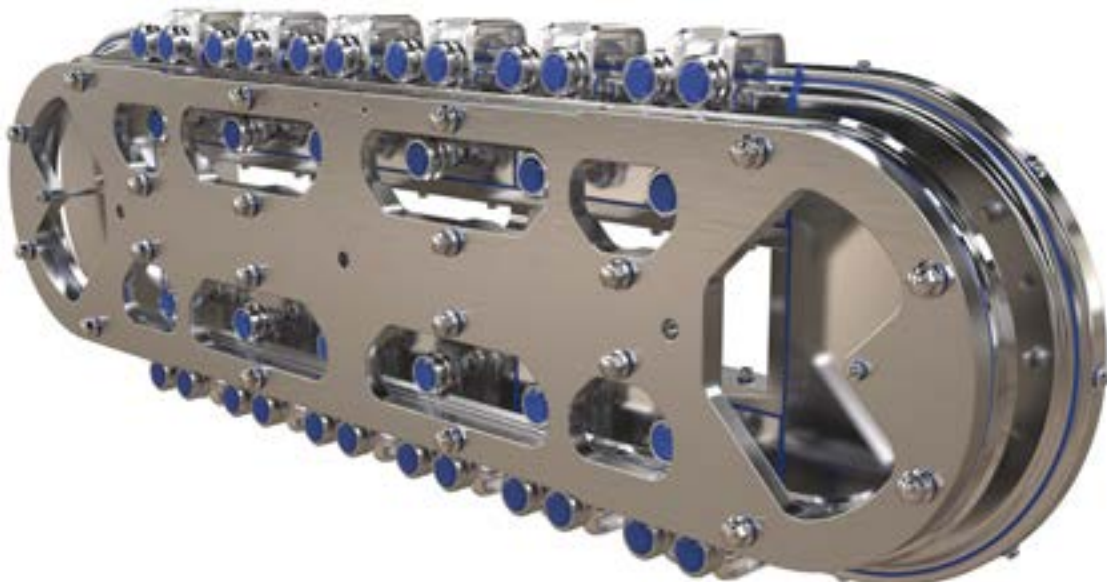
GFX-hC Cleandown

Suitable for “wet” cleaning and uses a structure that is very similar to a standard GFX, but modified to fit the HD (Hygienic Design) motors. Ideally suited for applications in pharmaceutical, food and other processes that require wet cleaning with benign liquids or wet wipes to remove surface contamination. Fasteners are grade A2 stainless steel.



GFX-hA Aseptic

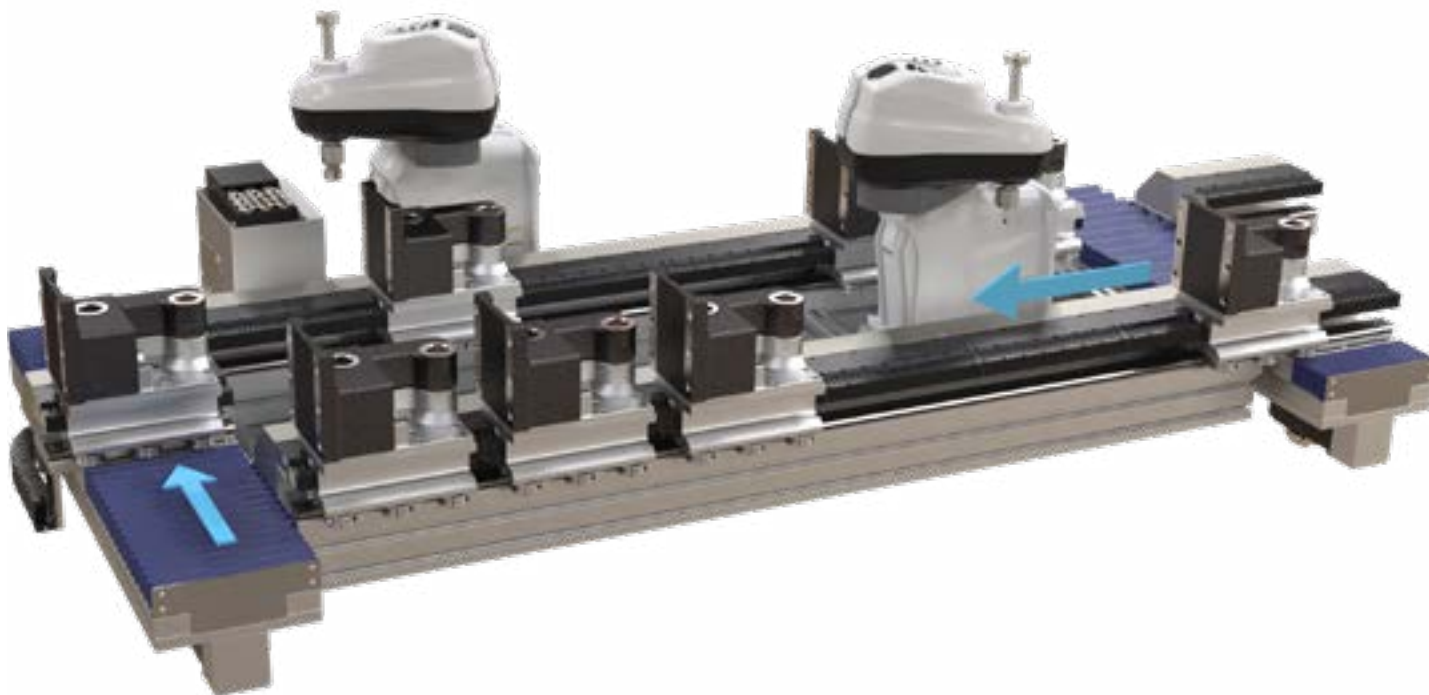
Fully stainless steel construction, has applications in pharmaceutical and other processes where aggressive cleaning chemicals are used.



GFX PRODUCT FAMILY

GFX-r

GFX-r provides the hardware for machine movements in rectangular paths. The absence of curved motor sections allows movers to be much stronger, more powerful and with a larger mounting platform, while maintaining accuracy, durability and agility. Mover speeds of 4m/s, payloads up to 100kg and up to 3600N unsupported process loads are possible. Movers with longer magnet arrays can also reduce heating losses by up to 60%.

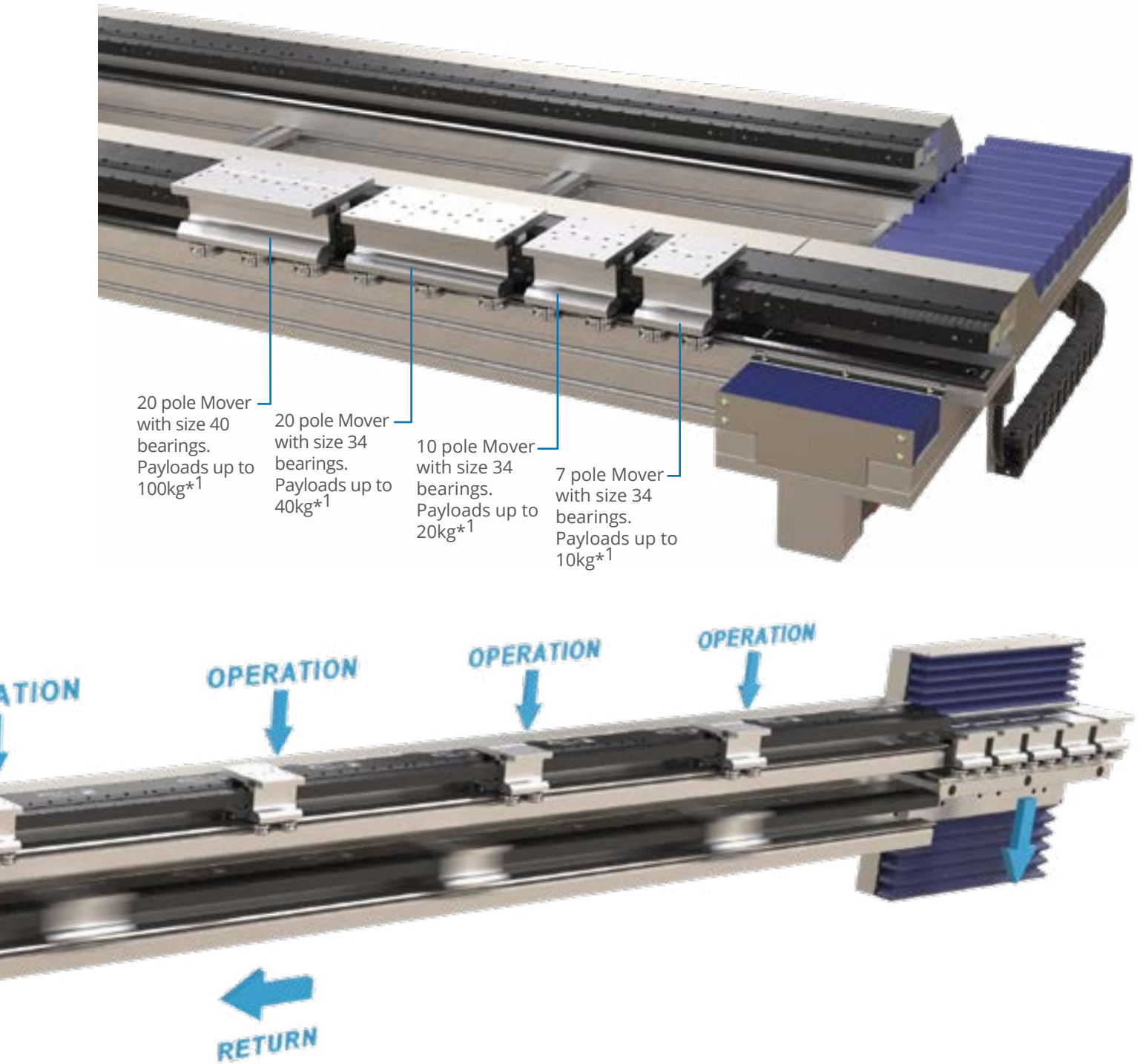


GFX-r systems will often be used in machine cells incorporating robots, power tools and sensors for automated assembly and inspection systems. The illustration below shows an example application to give an idea of what can be achieved.



GFX PRODUCT FAMILY

GFX-r is available with a range of mover sizes. These are tailored to a specific range of payloads from 10kg up to 100kg*¹. 4 or 6 bearing movers available for increased strength and stability.

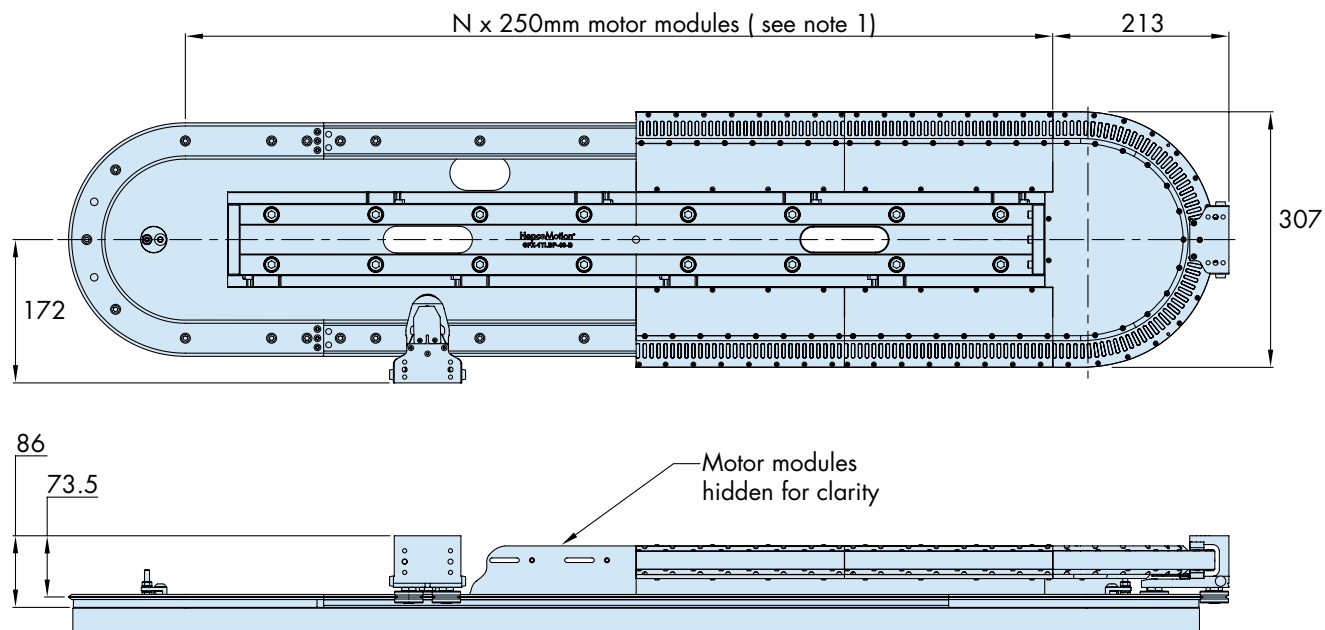


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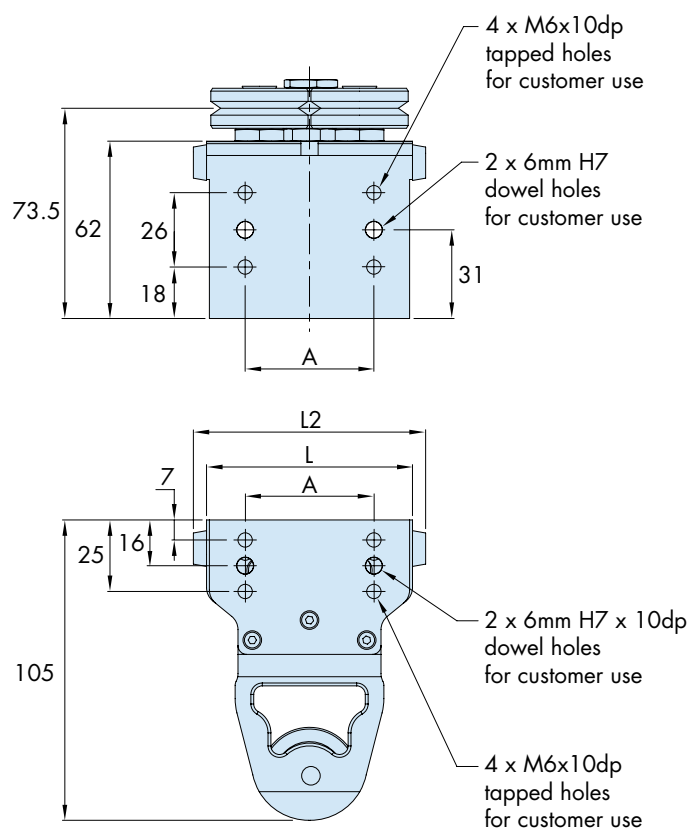
1. Depending on application. Please discuss your requirements with Bishop-Wisecarver's technical department.

TECHNICAL DATA - GFX 1TL SYSTEMS

GFX 1TL systems are comprised two 1-Trak end segments and ground GV3 or SL2 spacer slides. These can be supplied as a set of components or assembled to a solid aluminum baseplate. Assembled systems can be supplied with motor support structures and all the required fasteners for motor connection or fully assembled with Beckhoff XTS motors. External dimensions are shown below for more information please contact Bishop-Wisecarver's technical department.



	MOVER PART NUMBER				
	GFX2-1TC-C25	GFX2-1TC-S25	GFX2-1TC-C34	GFX2-1TC-M34	GFX2-1TC-M34-7P
L2	63	83	81	91	91
L	54	74	72	82	82
A	26	45	45	55	55
OUTER BEARING DIAMETER	25	25	34	34	34
TYPICAL PAYLOAD*2	1.6kg	1.6kg	2.7kg	2.7kg	2.7kg
MASS*3	565g	610g	705g	735g	785g

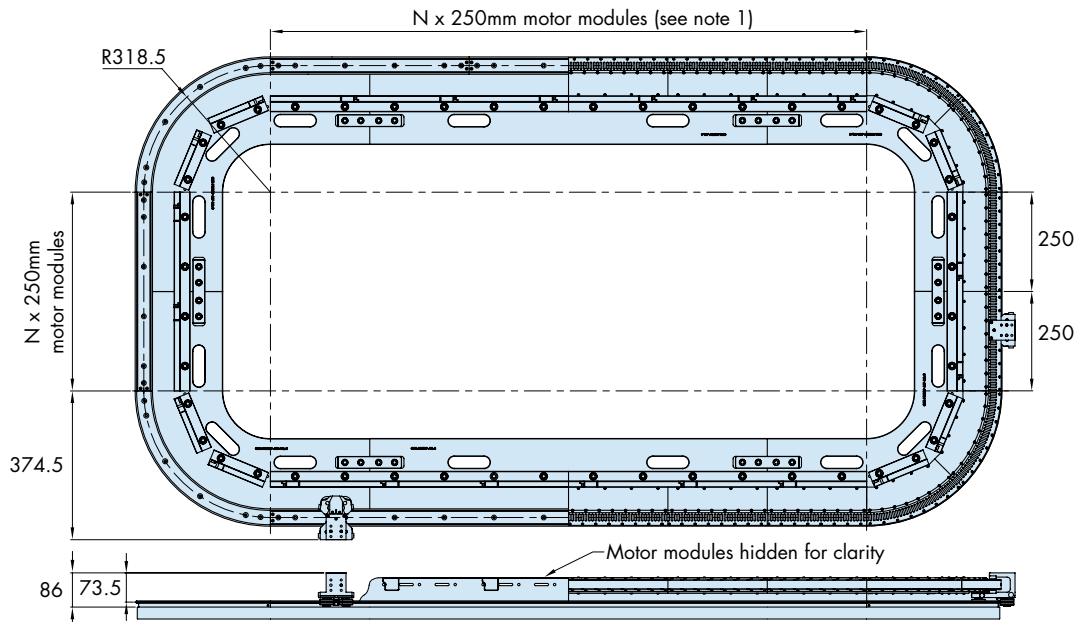


Notes:

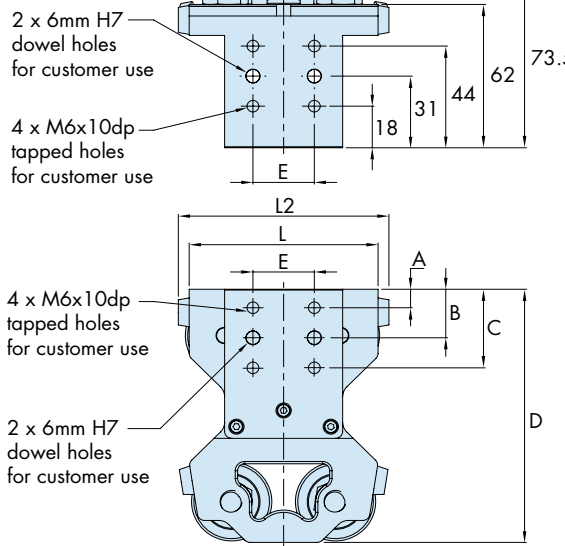
1. GFX 1TL is available with almost unlimited movers and almost unlimited lengths, please contact Bishop-Wisecarver's technical department to discuss your application.
2. Typical payload will achieve life in excess of 100,000km. Higher payloads with lower speed/acceleration are possible.
3. Mass of movers includes Beckhoff magnet and encoder flag assembly.
4. See [page 14](#) for system designations.

TECHNICAL DATA - GFX PRT2 SYSTEMS

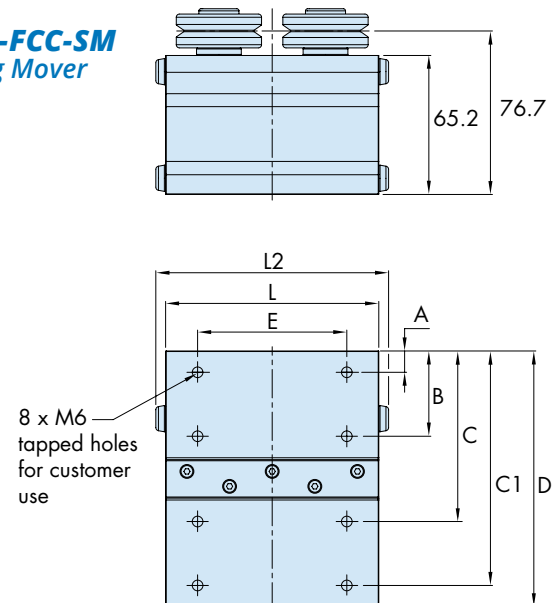
Guidance systems for Beckhoff XTS can also be supplied as PRT2 ring and track assemblies, which can be configured into oval, rectangular and circular systems. Motor modules are supplied in 45° or 22.5° segments. PRT2 systems require a four bearing fixed center carriage (FCC) mover.



GFX2-FCC-C/M



GFX2-FCC-SM Strong Mover



MOVER PART NUMBER	A	B	C	C1	D*4	E	L	L2	BEARING DIAMETER	TYPICAL PAYLOAD*2	MASS*3
GFX-FCC-C25	7	18	29	—	91.5	26	52	61.2	25	1.6kg	600g
GFX2-FCC-M34	8	21	34	—	109.5	26	80	89	34	3.2kg	835g
GFX2-FCC-M34-7P						50					945g
GFX2-FCC-M34-10P	8	21	34	—	109.5	70	102	111	34	3.2kg	1045g
GFX2-FCC-SM34-10P	14	40	80	106	120	60	100	109.2	34	7kg	1260g
GFX2-FCCM40-10P	8	21	34	—	121.5	70	102	111	40	8.2kg	1485g
GFX2-FCC-SM40-10P	10	40	80	110	120	70	100	109.2	40	15kg	1550g

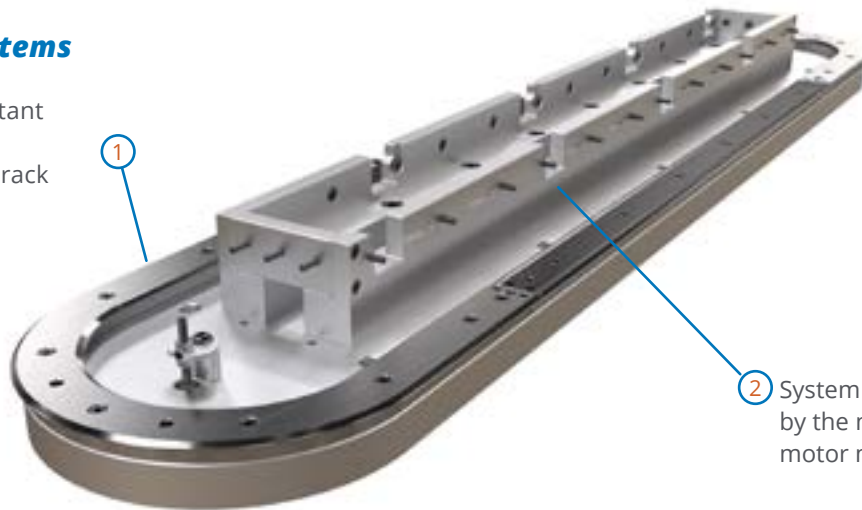
Notes:

1. GFX PRT2 systems are available with almost unlimited movers and almost unlimited lengths, please contact Bishop-Wisecarver's technical department to discuss your application.
2. Typical payload will achieve life in excess of 100,000km. Higher payloads with lower speed/acceleration are possible.
3. Mass of movers includes Beckhoff magnet and encoder flag assembly.
4. Size 25 and 34 mover profiles vary slightly, please see [page 5](#) for a visual comparison.

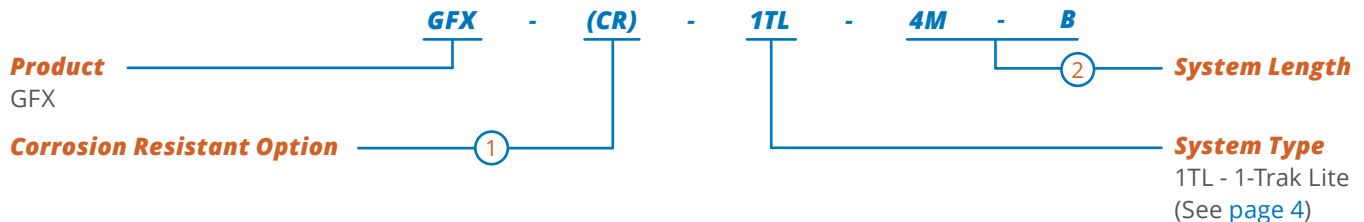
SYSTEM AND COMPONENT SPECIFICATION - GFX 1-TRAK SYSTEMS

GFX 1-Trak Systems

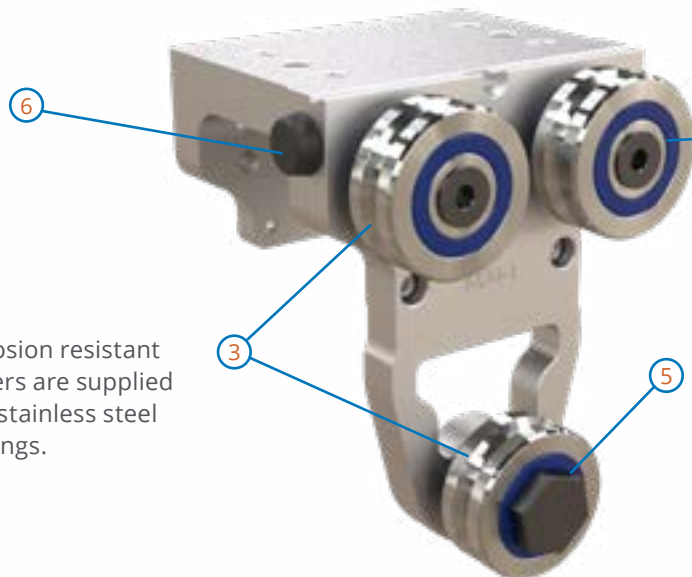
Corrosion resistant systems use all stainless steel track components.



2 System length is determined by the number of straight motor modules.



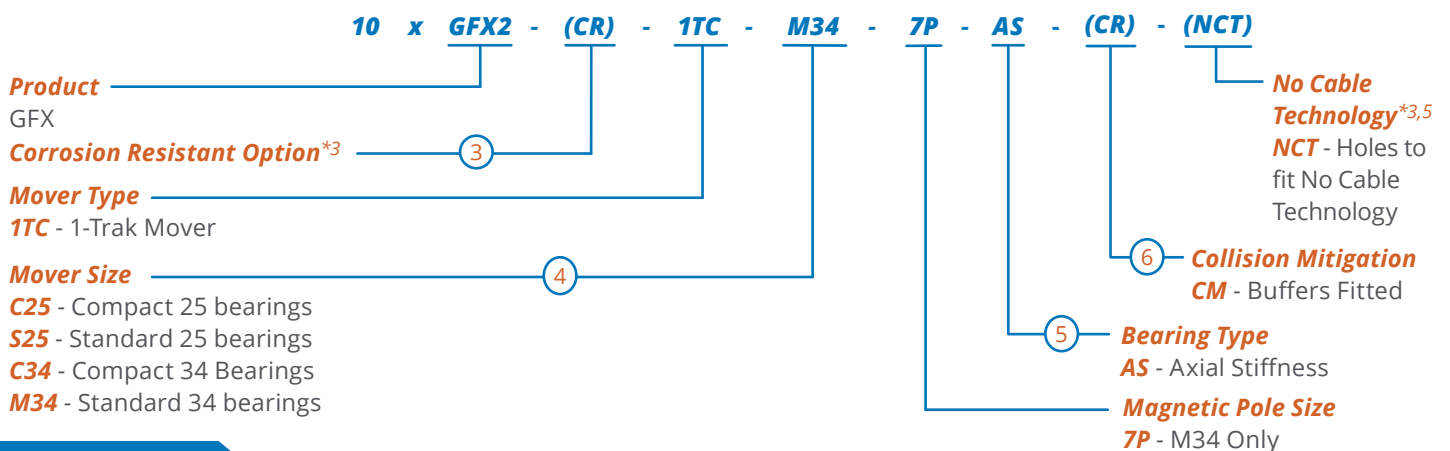
Movers



Outer bearing size also determines the size of the mover. Please see page 12 for more mover information.

Corrosion resistant movers are supplied with stainless steel bearings.

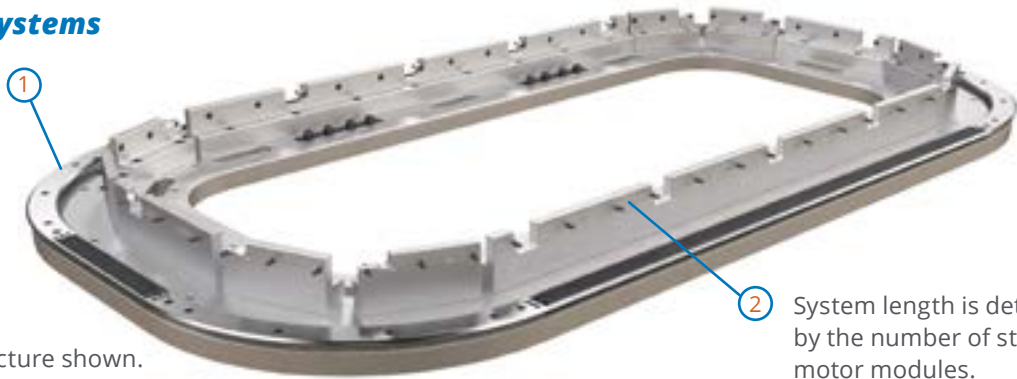
Bearings are axial stiffness as standard.



SYSTEM AND COMPONENT SPECIFICATION - GFX PRT2 SYSTEMS

GFX PRT2 Track Systems

Corrosion resistant systems use all stainless steel track components.



Optional support structure shown.
Contact Bishop-Wisecarver's Technical Sales Department for more information.

Product _____ **GFX** - **(CR)** - **637** - **OVAL-4M** - **GFX**

GFX

Corrosion Resistant Option _____ **(1)**
(Leave blank if not required)

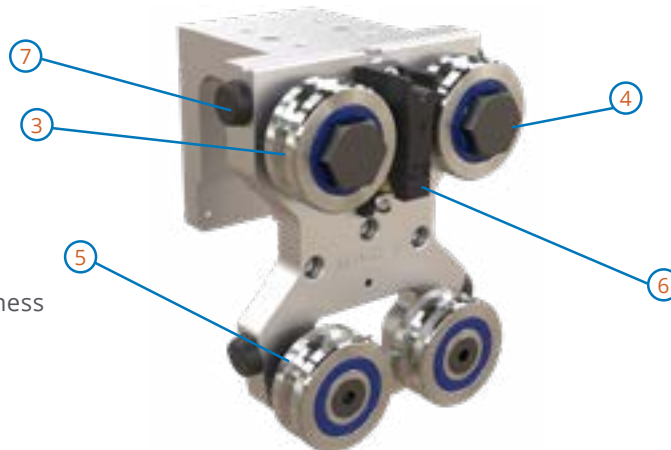
System Size
(See page 13)
OVAL-4M-B - (Oval)
4MX2M-B - (Rectangular)
RING-8M-B - (360° Ring*1)

Segment Diameter
637 - 45° Modules
1274 - 22.5° Modules*1

Movers

Corrosion resistant movers are supplied with stainless steel bearings.

Bearings are axial stiffness as standard.



Outer bearing size also determines the size of the mover. Please see page 13 for more mover information.

Fixed center movers (FCC) can be supplied with slide lubricators. One lubricator is supplied per carriage on alternating sides of the carriage to minimize friction.

20 x GFX2 - (CR) - FCC - 637 - M34 - 7P - AS - (LB) - (CM) - (NCT)

Product _____ **GFX**

Corrosion Resistant Option^{*3} _____ **(3)**

Mover Type _____ **FCC** - Fixed center (PRT2)

Segment Diameter _____ **637** - 45° modules
1274 - 22.5° modules

Mover Size _____ **(4)**
C25 - Compact 25 bearings
M34 - Standard 34 bearings
SM34 - Strong 34 bearings
M40 - Standard 40 bearings*⁴
SM40 - Strong 40 bearings*⁴

No Cable Technology^{*3*5}
NCT - Holes to fit No Cable Technology

Collision Mitigation^{*3}
CM - Buffers Fitted

Additional Options^{*3}
LB - Slide lubricators

Bearing Type
AS - Axial Stiffness

Magnetic Pole Size
7P - 7 Pole Magnet
10P - 10 Pole Magnet
Leave Blank for standard

Notes

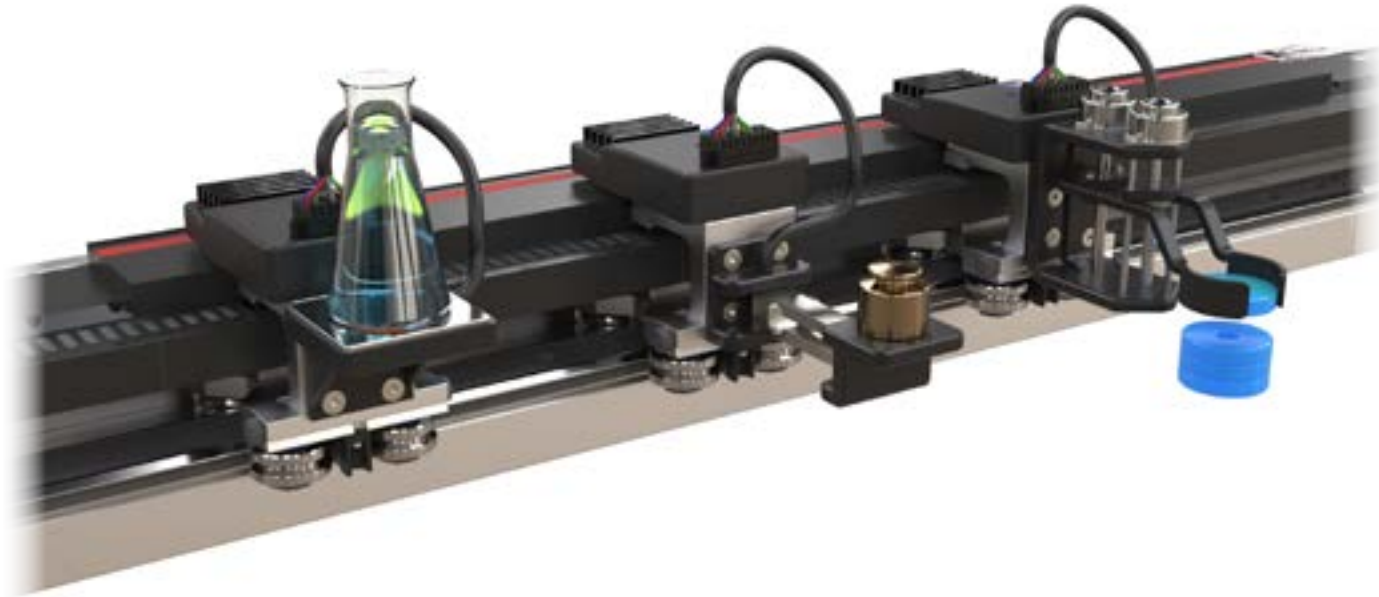
1. 360° GFX ring systems using 22.5° motor modules and 1274mm diameter rings require 16 motor modules.
2. All movers are supplied fully assembled and adjusted to a system, unless requested otherwise.
3. Leave blank if not required.
4. Corrosion resistant version not available on M40 bearing option.
5. Please see page 16 for more details on NCT.

SYSTEM AND COMPONENT SPECIFICATION

NCT - No Cable Technology

NCT enables contactless, continuous power and data transmissions to the GFX mover (with NCT fitted). This allows functions to take place directly on the mover, for example scanning bar codes, measurements of weights, stacking options as shown below.

Please discuss with Bishop-Wisecarver's technical department before ordering to check it is compatible with your application.



Bleed Lubrication

Sufficient lubrication is essential for all Hepco guidance systems for Beckhoff XTS. All systems incorporate a bleed lubrication facility, which channels lubricant directly to the V faces of the slide.

Lubricant is then distributed around the system by the movers. This process can be aided with lubricators mounted on movers (PRT2 systems only).

It is highly recommended that lubrication ports are situated approximately every 3 meters of track. For more information on lubrication requirements, flow rates and food grade lubricants, please see the Hepco GFX Lubrication datasheet.

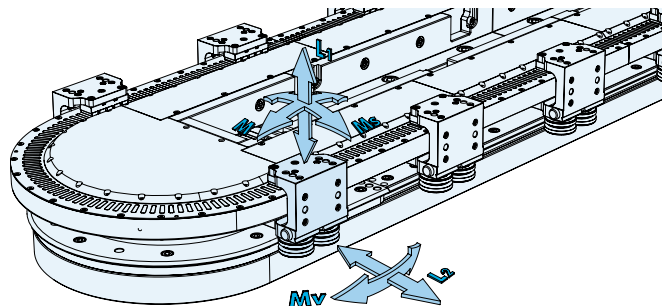
For more information please contact Bishop-Wisecarver's technical department.



System Loading

Fundamental GFX mover geometry determines the life of the system. The loads applied both directly (L1 & L2), size and position of the payload combined with the acceleration (M, Ms & Mv) allow for an accurate and reliable life calculation to be obtained.

Please contact Bishop-Wisecarver's technical department for more detailed information on system loading to suit a specific application.



Further Information

Please visit bwc.com to access more information on the GFX product range or alternatively contact Bishop-Wisecarver's technical department who will be happy to discuss your requirement.

TECHNICAL SPECIFICATION

Ring Slides & Segments

Material and finish:

Standard version: High carbon steel, hardened on V faces.
Ground on all main surfaces to N5 finish.

Stainless steel version: Special martensitic stainless steel generally conforming to 420 series, hardened on V faces. Ground on all main surfaces to N5 finish.

Track System Slides

Material and finish:

Standard version: High carbon-chromium steel, hardened on V faces.

Ground on all main surfaces to N5 finish, other faces chemically blacked.

Stainless steel version: Special martensitic stainless steel generally conforming to 420 series, hardened on V faces. Ground on all main surfaces to N5 finish.

Bearings

Bearing rings, balls, rollers:

Standard version: Bearing steel AISI 52100 hardened and tempered.

Stainless steel version: AISI 440C stainless bearing steel, hardened and tempered.

Seals:

Standard version: Nitrile rubber.

Hygienic hW &hA: FKM (Flouroelastomer)

Cages:

Plastic.

Studs:

Standard version: High tensile steel with chemical black finish.

Stainless steel version: AISI 303 series stainless steel.

Movers & Support Structures

Material:

High strength aluminum alloy

Finish:

Clear anodized

Lubricators

Material:

Impact resistant plastic with felt wiper.

Frictional Resistance for 'V' Slide Systems

Coefficient of friction (without **Lubricators**) = 0.02

Lubricators add friction as follows:

One Lubricator per Carriage, SSLB34 = 1.5N.

External Lubrication

Lubricators should be oiled using 68 cSt viscosity or similar oil. Food compatible lubricants can also be used.

APPLICATION STORIES

OPTICAL INSPECTION TEST SYSTEM



Challenge

Inspection system needed to complete 15 processes with an average cycle time of 2 seconds. Traditional systems had difficulty achieving the timing needed.

Critical Factors

Each mover weighing 4 Kg needed to be able to manipulate the diffusers for all around inspection. This means that each mover would need to be equipped with lifting and rotating mechanisms.

Solution

The HepcoMotion® GFX Guidance System for the Beckhoff XTS was selected and includes 11 meters of track and 35 movers that all travel simultaneously through the 15 inspection stations. Upon start-up of the system, the tools are initialized at an RFID station that identifies the position of each mover.

Results

The final configuration allows a cycle time of 1.9 seconds per unit, exceeding the customer's design parameter, while providing a maintenance schedule that works for the customer in their three-shift operation environment. HepcoMotion® GFX Guidance for the Beckhoff XTS is a very adaptable solution that is becoming widely used in the auto industry for many applications. Manufacturers are looking for improved cycle times and the ability to make quick changes as the need arises.



APPLICATION STORIES

PRODUCT TRANSFER



Challenge

Product transfer system with a need to form 80 cartons per minute and move at speeds of up to 2.5 meters per second while having a high duty cycle and operating in a food grade environment

Critical Factors

The system needed to package flow-wrapped products such as snacks, cereal bars, candy bars and roll-wrapped products. With a large variety of products, the system needs to accommodate different sizes quickly and efficiently. The movers can be easily programmed to move closer together or further apart to suit the different sized cartons.

Solution

The HepcoMotion® GFX Guidance System for the Beckhoff XTS was selected and then specialized versions of the PRT2 and 1-Trak guidance systems were developed to ensure the customer's requirements were met along with providing long term durability.

Results

The combination of the Beckhoff XTS and HepcoMotion's GFX Guidance System has enabled the customer to develop a revolutionary product, boasting one of the highest speeds available for a solution with such a small footprint. HepcoMotion® GFX Guidance for the Beckhoff XTS is a highly versatile product that is rapidly being adopted in the packaging industry for applications such as this, where users are looking to benefit from vastly improved production rates with the ability to make changes on the fly.

Bishop-Wisecarver® is proud to be the exclusive North American distributor of HepcoMotion® products since 1984.

Components & Accessories

DualVee®
MadeWell®
GV3
SL2
PRT2
HDS2
HDRT
MCS
Motor Mounts
Gantry Brackets
Wrenches

Manual Linear Guide Systems

DualVee®
UtiliTrak®
MinVee®
GV3
Simple Select®
SL2
HDS2
MHD
HTS

Actuated Linear Guide Systems

LoPro®
XLA™
ECO60™
SlickStick™
SteadyRail™
HDLS
HDCS
PDU2
DAPDU2
SBD
PSD
SDM
DLS

Rotary Guide Systems

PRT2
DTS2
DTS
ALR
HDRT
1-Trak
GFX

Robot Transfer Units

LoPro® RTU
DualVee® RTU

Custom Solutions

Extruded Profile Guides
Custom Bearings
Custom Subassemblies
Engineering Services
Large Diameter Ring Guides and Track



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Quality Certifications



- Certified Bay Area Green Business
- Certified Evergreen

Certifications & Compliance

- EN 9100:2018
- JISQ 9100:2016
- ISO 13485 & GMP Compliance
- Responsible Minerals Initiative
- RoHS
- International Traffic in Arms Regulations Compliant