

# **GFX**

## **HEPCO GUIDANCE SYSTEM FOR BECKHOFF XTS**

**BECKHOFF**

**EXPERTLY DESIGNED, DELIVERED TO PERFORM**

Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

**PRT2**

# ***EXPERTLY DESIGNED, DELIVERED TO PERFORM***

Powered by nearly 70 years of relentless problem-solving and steadfast reliability, Bishop-Wisecarver delivers innovative motion solutions around the world that thrive in harsh and extreme conditions. Our linear and rotary motion solutions, custom complex assemblies, and embedded intelligence systems lead the manufacturing industry, and they are backed by The Signature Experience promise of expert guidance, confidence and customer satisfaction.

## ***PERFECT FOR HARSH AND EXTREME ENVIRONMENTS***

When you purchase from Bishop-Wisecarver, you aren't just getting a product that works; you're getting products, systems and industry-leading expertise you can trust, especially in harsh and extreme environments—always exceeding our customers' reliability requirements. When the motion gets tough, we keep you in motion.

### ***Our Motion Products and Solutions Are Also Perfect For:***



COMPACT



LONG LIFE



MULTI-AXIS  
CAPABILITIES



HIGH SPEED



LONG LENGTH



SMOOTH



LOW NOISE



HIGH/LOW  
TEMPERATURE



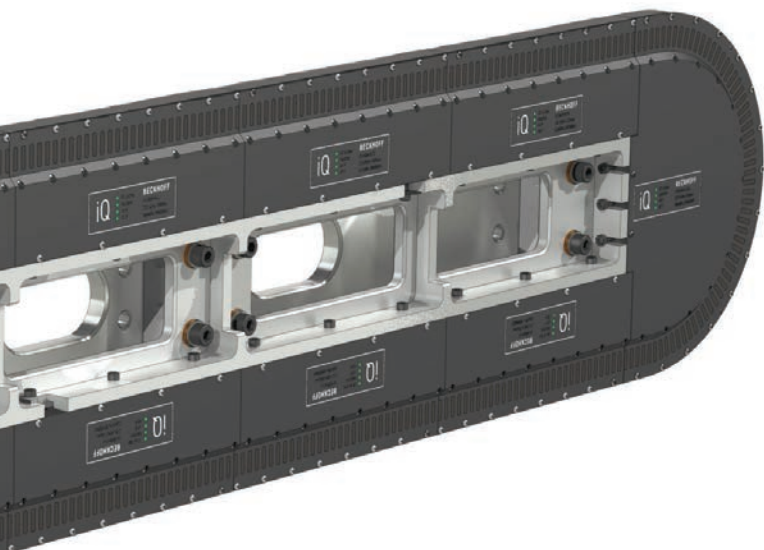
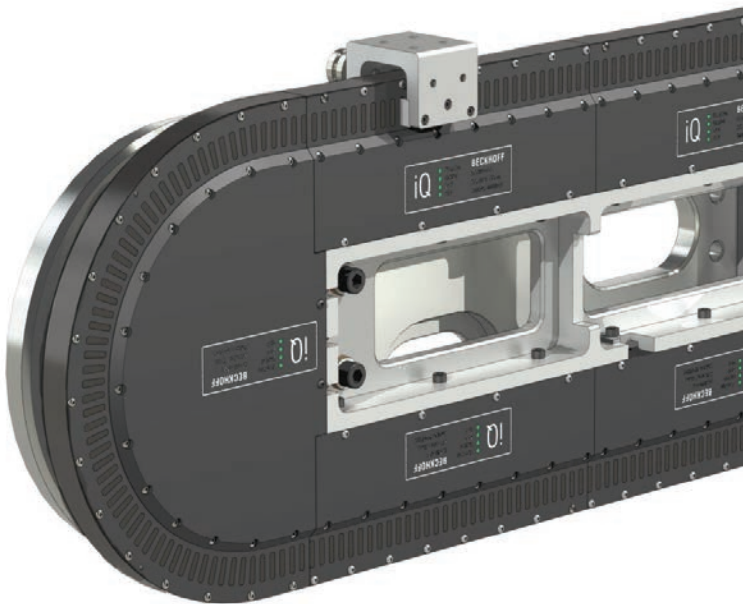
DIRTY  
ENVIRONMENT



CUSTOMIZABLE

# 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

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#### 3D Modeling + CAD Drawing

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# INTRODUCTION

## HEPCOMOTION GUIDANCE SYSTEM FOR BECKHOFF XTS SYSTEMS

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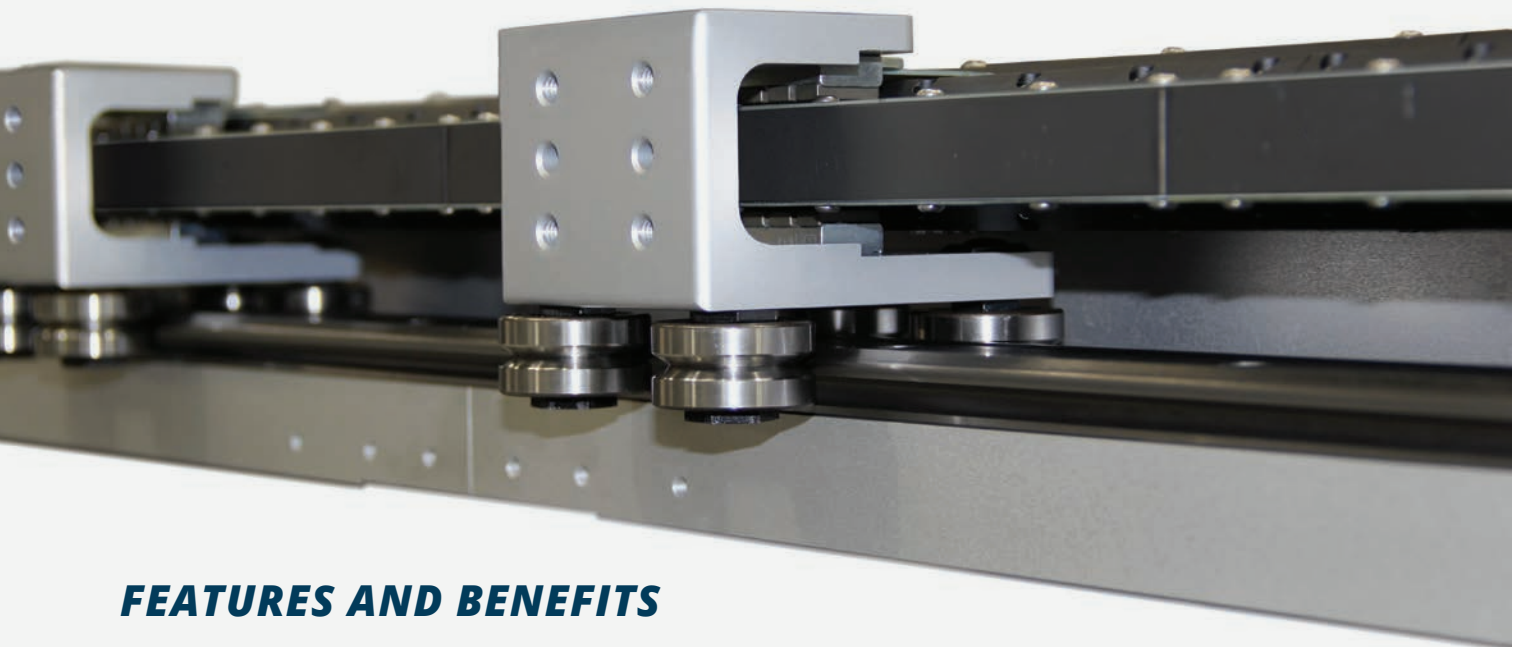
Linear motion experts HepcoMotion have worked with Beckhoff to develop specialized versions of the PRT2 and 1-Trak guidance systems to work with the Beckhoff eXtended Transport System (XTS). This option meets the needs of higher duty XTS applications where motion profiles and long term durability requirements are particularly demanding.

The Beckhoff XTS uses mechatronics technology to drive independently controlled movers around a linear motor track. This provides a solution for complex, high speed motion profiles up to 4m/s, without compromising positional accuracy.

The system integrates Hepco's patented 1-Trak guidance system and lightweight three bearing mover, providing the optimum mover path for Beckhoff's 180° motor modules. 1-Trak systems consist of an aluminum base plate with 1-Trak end segments and custom ground straight slides attached, providing rigidity and the highest level of accuracy and precision.

Hepco's PRT2 systems are compatible with motor module segment sizes 22.5° and 45°, offering solutions for larger applications. Based on Hepco's standard PRT2 range, track solutions can be configured into circular, oval and rectangular systems as standard, and can be supplied as complete factory assembled systems, semi-assembled track systems or components.

Stainless steel versions are available for all track solutions and can be adapted to suit customers' needs. Please contact Bishop-Wisecarver for more information on specialist requirements.



## FEATURES AND BENEFITS

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- Hardened Vee guidance maintains accuracy over long periods
- Low maintenance bleed lubrication system
- All systems available in stainless steel
- Available with food compatible grease
- High rigidity
- Removable track section for easy maintenance

# GFX 1-TRAK LITE 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 optimum mover path for 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 kit of parts for custom installation. Its length is only limited by the number of motors and movers supported by a Beckhoff control system. Please see [page 10](#) or contact Bishop-Wisecarver for information on these limitations.



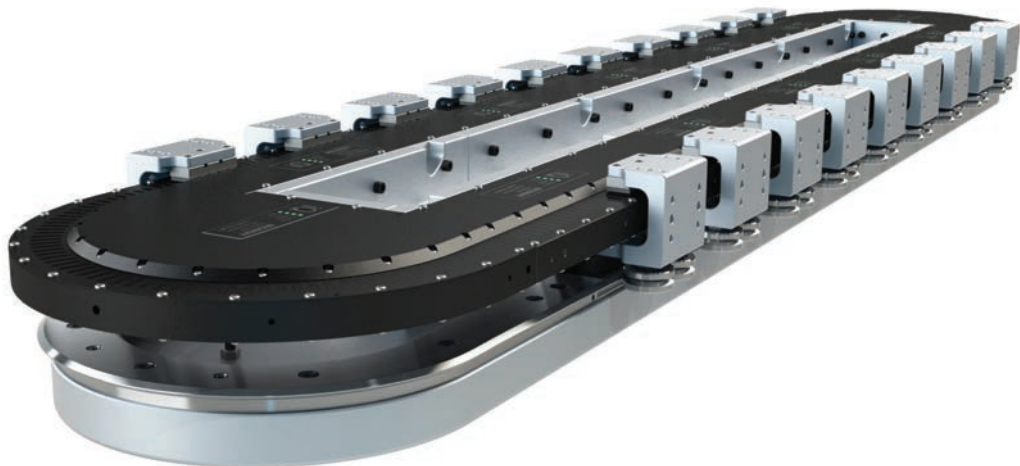
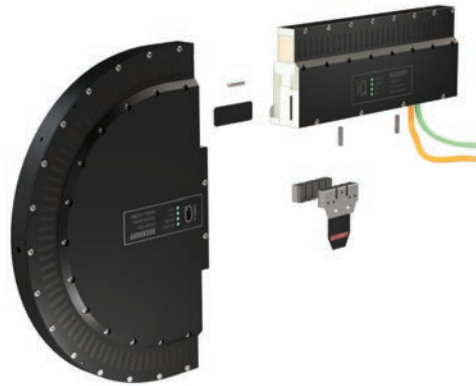
1-Trak Lite systems use a three bearing mover design. Movers are available in various bearing and length combinations, providing a range of load, moment and acceleration capabilities.



All Hepco guidance systems can be supplied fully assembled, with Beckhoff motor modules, mover magnets and mover encoder flags, partially assembled, or as a kit of components.

Customers should provide their own Beckhoff components for assembly at Hepco.

If you wish to re-use motors predating 2016, please check compatibility with Bishop-Wisecarver's technical department.



# GFX PRT2 SYSTEM COMPOSITION

## PRT2 Ring and Track Systems

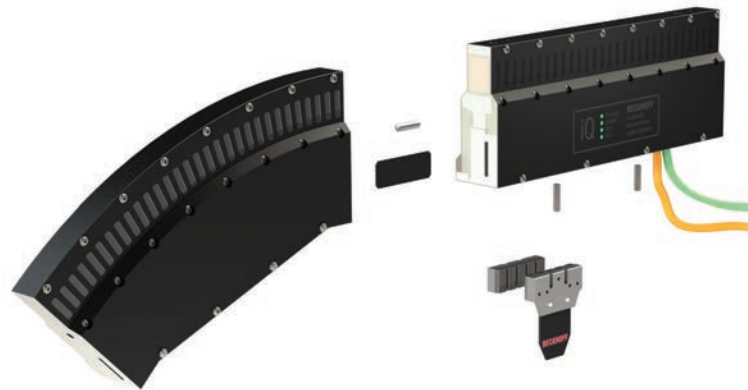


GFX PRT2 track systems can be configured into oval or rectangular systems.

## PRT2 Ring Systems



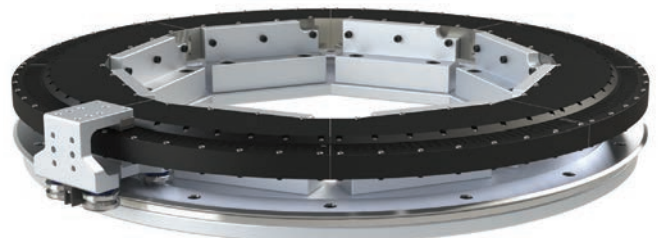
GFX PRT2 ring and track systems use four bearing fixed center movers. Please see the PRT2 catalog for more information on fixed center carriages.



All Hecco guidance systems can be supplied fully assembled, with Beckhoff motor modules, mover magnets and mover encoder flags, partially assembled, or as a kit of components.

Customers should provide their own Beckhoff components for assembly at Bishop-Wisecarver.

If you wish to re-use motors predating 2016, please check compatibility with Bishop-Wisecarver's technical department.



## ADDITIONAL INFORMATION

### Mover Options

Various mover sizes and capabilities are available to suit XTS applications. Below is a list of the key parameters and how they vary with mover size and bearing type:

#### Three bearing 1-Trak Mover

- 25mm outer bearings
- Most compact mover
- Lowest mover mass
- Suitable for light moment loads
- Available in standard lengths: 52mm and 72mm



- 34mm outer bearings
- Compact mover
- Low mover mass
- Suitable for medium moment loads
- Available in standard lengths: 70mm and 80mm

#### Four bearing PRT2 Mover

- All 25mm bearings
- Compact high moment mover
- Low mover mass
- Suitable for medium moment loads
- 55mm long as standard



- All 34mm bearings
- Longer bearing life
- Lubricator option
- Suitable for heavier moment loads
- 85mm long as standard

### Defining System Requirements

When specifying a guidance system for the Beckhoff XTS, the following factors are considered:

- Payload, fixture mass and position relative to mover
- Speed and acceleration profile of the application
- Duty cycle
- Precision requirement
- Required system life
- Machine size - system length
- Orientation
- Additional process loads
- Servicing and maintenance requirements
- Required mover pitch
- Environmental conditions (temperature, humidity, pollutants, variation etc.)

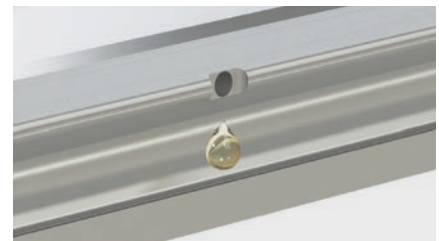
### Bleed Lubrication

Sufficient lubrication is essential for all Hepco guidance systems for the Beckhoff XTS. All systems incorporate a bleed lubrication facility, which channels lubricant directly to the vee 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 once every 3 meters of track. For more information on lubrication requirements, flow rates and food grade lubricants, please contact Bishop-Wisecarver for more information and technical assistance.

Please see the PRT2 catalog page 52 for more information on bleed lubrication and positioning lubrication ports on a PRT2 track system.

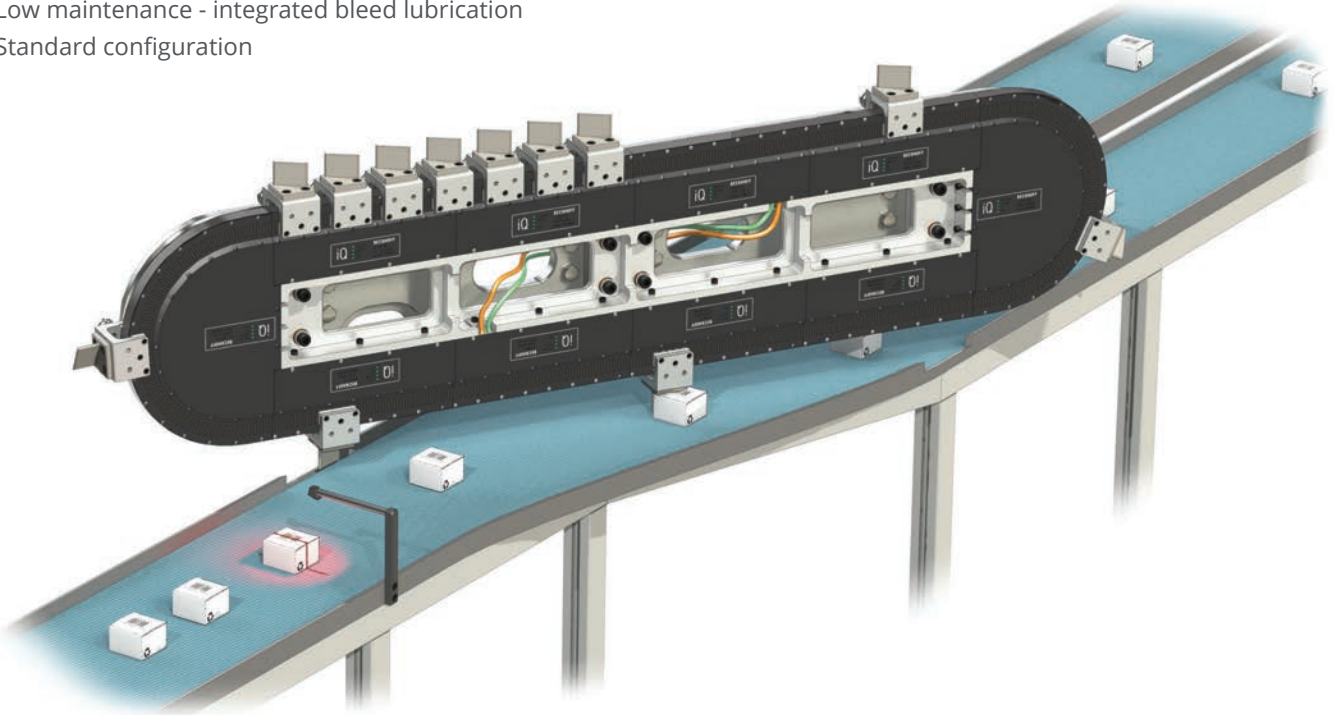


# APPLICATION EXAMPLES - FEATURES AND BENEFITS

## 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.

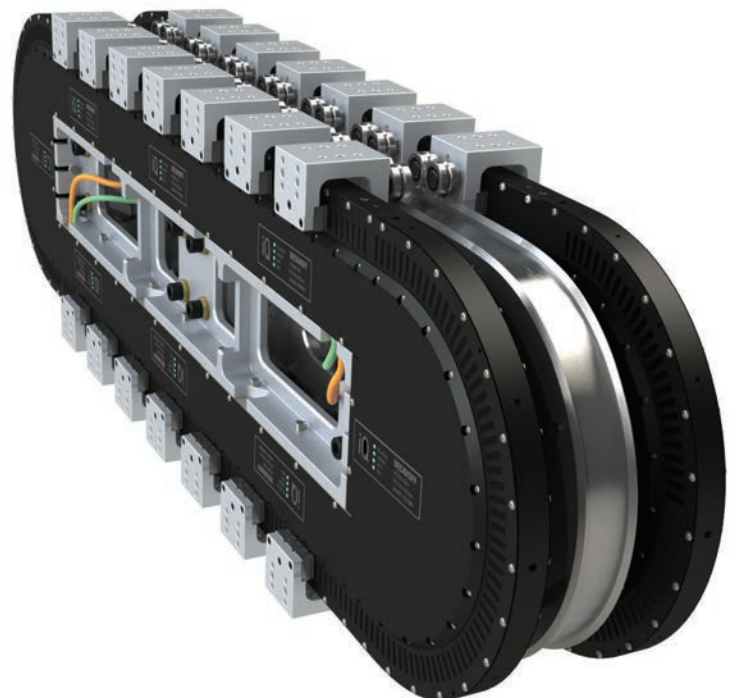
- High rigidity - solid steel base plate
- Positional repeatability
- Durable - hardened guidance system
- Low maintenance - integrated bleed lubrication
- Standard configuration



## Double Sided System

Two GFX 1-Trak systems manufactured with a single 'back to back' base provide a compact and accurate assembly.

- High rigidity - solid steel back plate
- Excellent parallelism - ground back plate
- Positional accuracy
- Compact
- Customizable - designed to suit a specific application



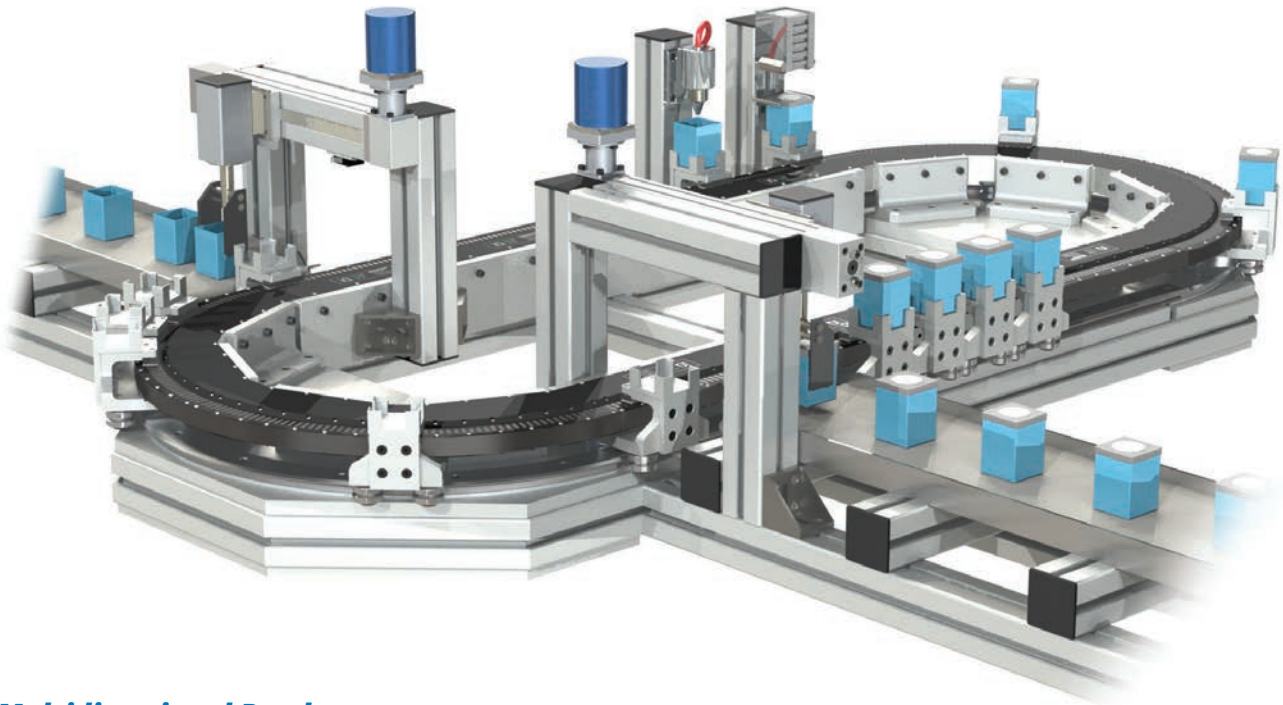


# APPLICATION EXAMPLES - FEATURES AND BENEFITS

## Multi-Operation and Variable Speed Application

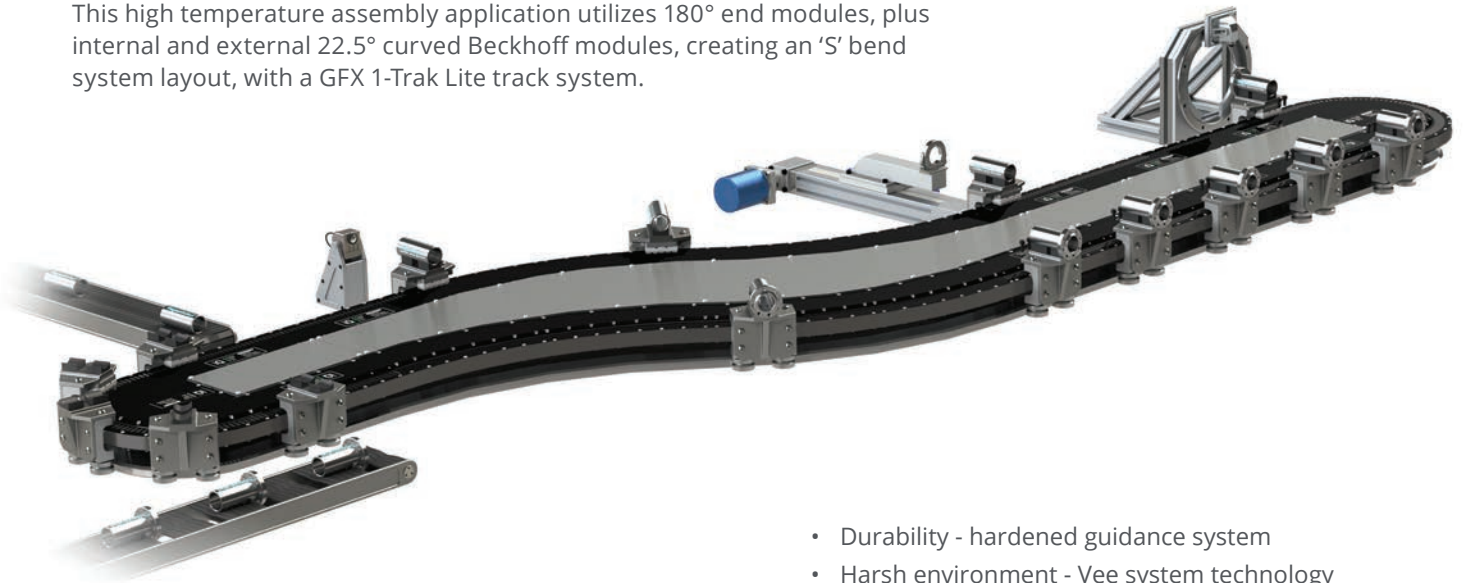
The horizontally mounted system shown below is comprised of a GFX PRT2 track system mounted on a customizable Hepco MCS support structure.

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



## Multidirectional Bend

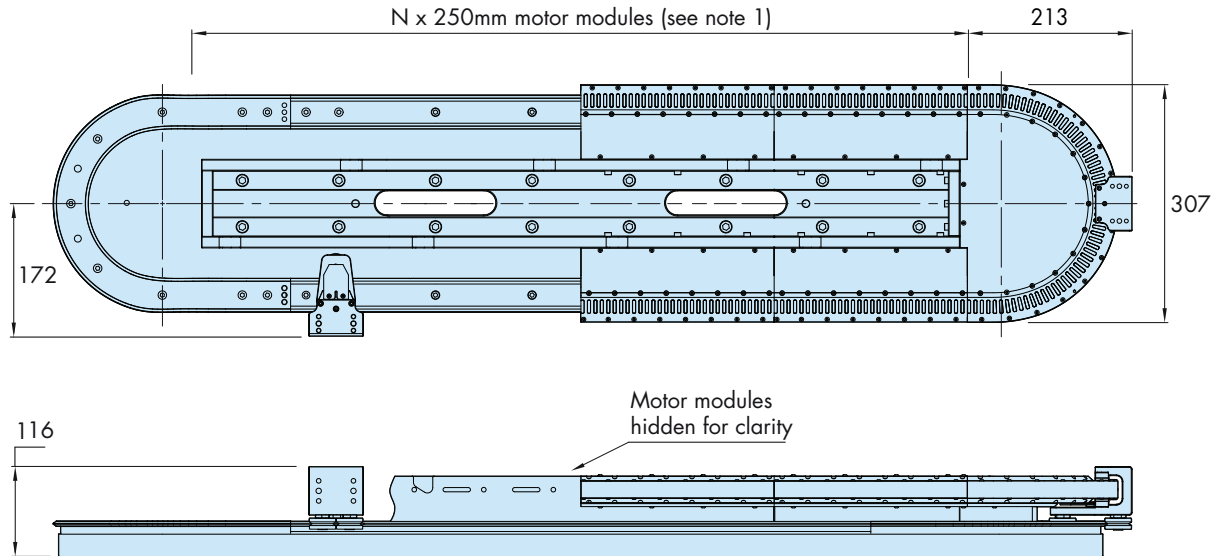
This high temperature assembly application utilizes 180° end modules, plus internal and external 22.5° curved Beckhoff modules, creating an 'S' bend system layout, with a GFX 1-Trak Lite track system.



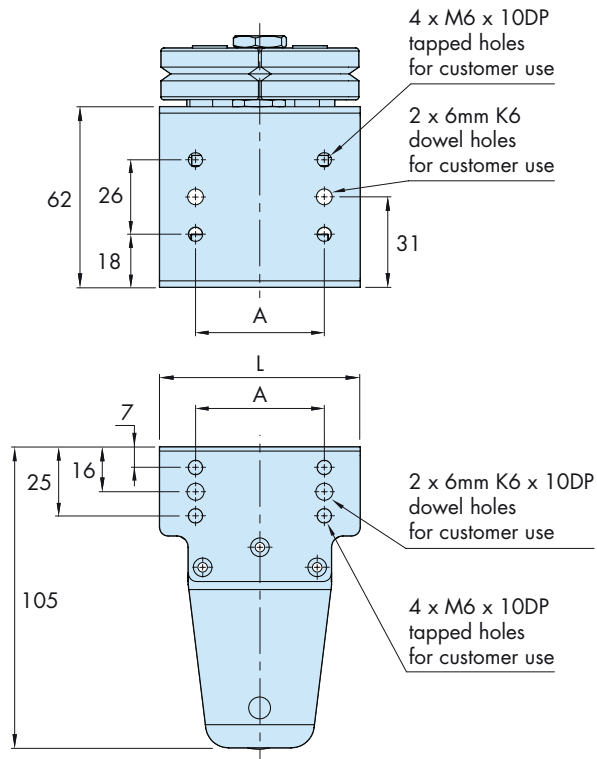
- Durability - hardened guidance system
- Harsh environment - Vee system technology
- Positional repeatability
- High load capacity
- Flexible layout - patented track geometry
- Customizable - designed to suit a specific application
- Special mover designed to overcome temperature variation.
- Low maintenance - integrated bleed lubrication
- High load capacity

# TECHNICAL DATA - GFX 1-TRAK LITE 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 motor modules. External dimensions are shown below. For more information please contact Bishop-Wisecarver's technical department.



	MOVER PART NUMBER			
	GFX-1TC-C25	GFX-1TC-S25	GFX-1TC-C34	GFX-1TC-M34
<b>L</b>	52	72	70	80
<b>A</b>	26	45	45	55
<b>OUTER BEARING DIAMETER</b>	25	25	34	34
<b>TYPICAL MAX PAYLOAD*2</b>	0.5kg	1.5kg	4kg	5kg
<b>MASS*3</b>	610g	680g	790g	820g

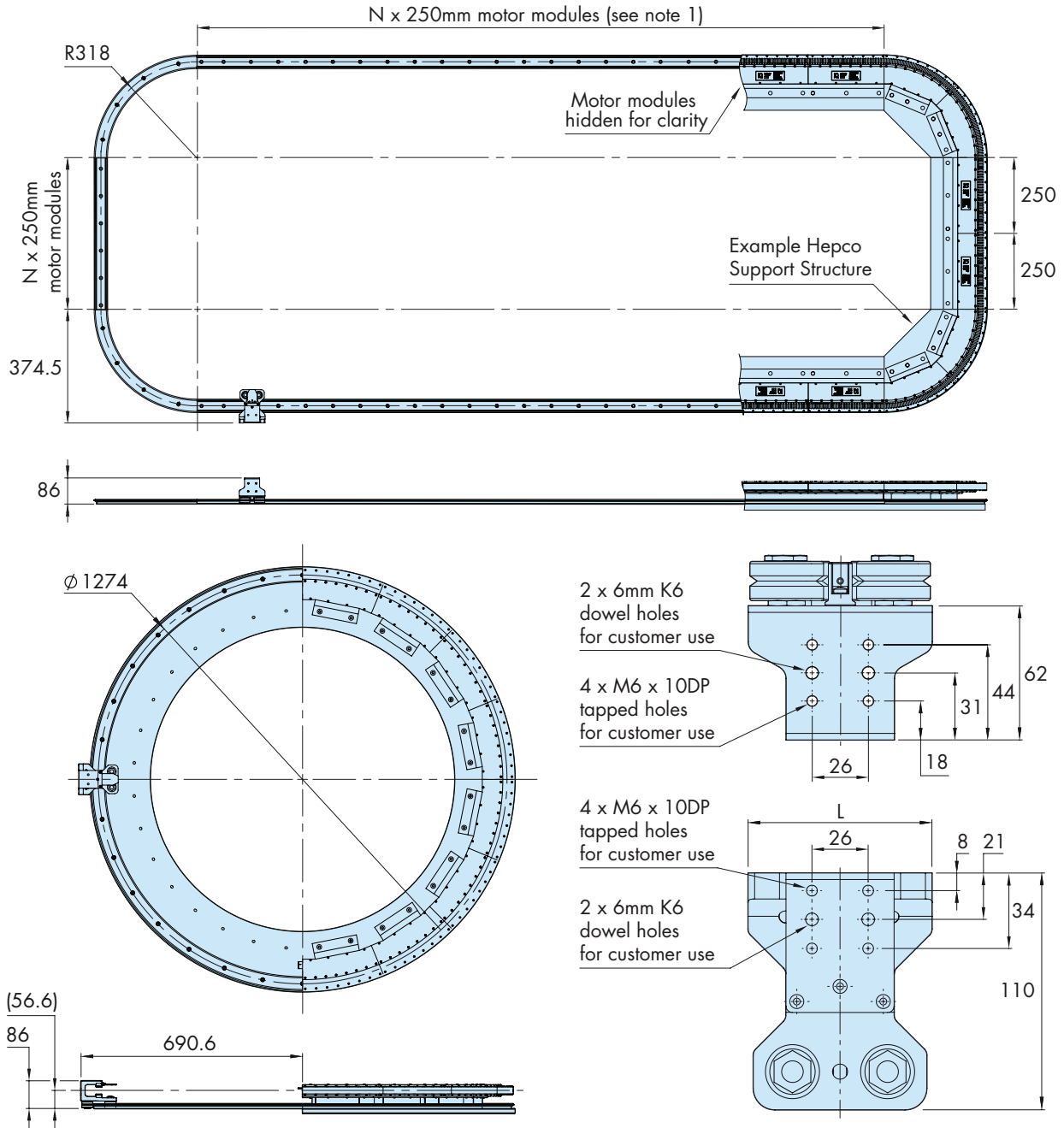


## Notes:

1. GFX 1TL is restricted to the capacity of the Beckhoff motor control system which is greater than 100 meters total track length and up to 200 movers.
2. Please contact Bishop-Wisecarver's technical department for more information on mover load and moment capacity.
3. Mass of movers includes Beckhoff magnet and encoder flag assembly.
4. See [page 12](#) for system designations.

# TECHNICAL DATA - GFX PRT2 SYSTEMS

Guidance systems for the 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.



MOVER PART NUMBER	L	BEARING DIAMETER	TYPICAL PAYLOAD*2	MASS*3
<b>GFX-FCC-C25</b>	55	25	0.5kg - 5kg	600g
<b>GFX-FCC-M34</b>	85	34	2kg - 10kg	950g

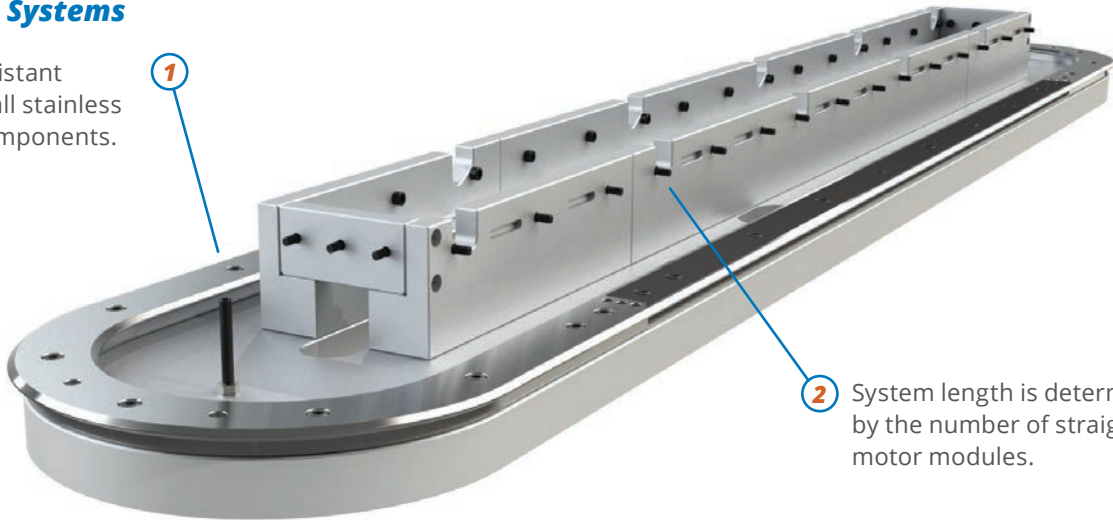
**Notes:**

- GFX PRT2 system length is restricted to the capacity of the Beckhoff motor control system, which is greater than 100 meters total track length and up to 200 movers.
- Please contact Bishop-Wisecarver's technical department for more information on mover load and moment capacity.
- Mass of movers includes Beckhoff magnet and encoder flag assembly.

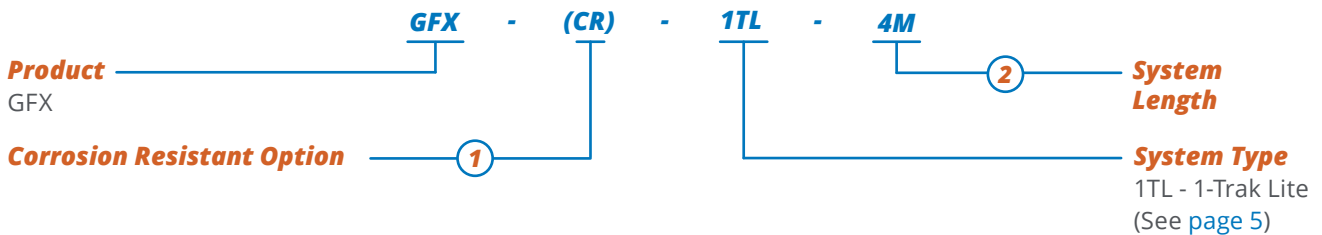
# SYSTEM AND COMPONENT SPECIFICATION - GFX 1-TRAK SYSTEMS

## GFX 1-Trak Systems

Corrosion resistant systems use all stainless steel track components.

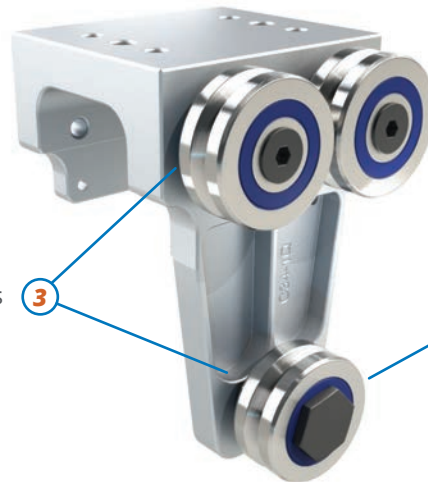


2 System length is determined by the number of straight motor modules.



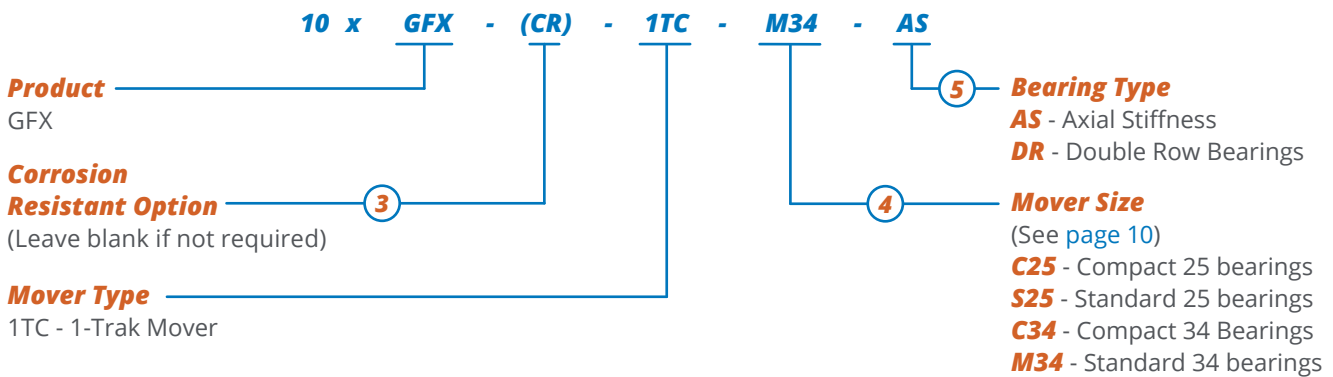
## Movers

Corrosion resistant movers are supplied with stainless steel bearings.



4 Outer bearing size also determines the size of the mover. Please see page 10 or contact Bishop-Wisecarver for more information and technical assistance.

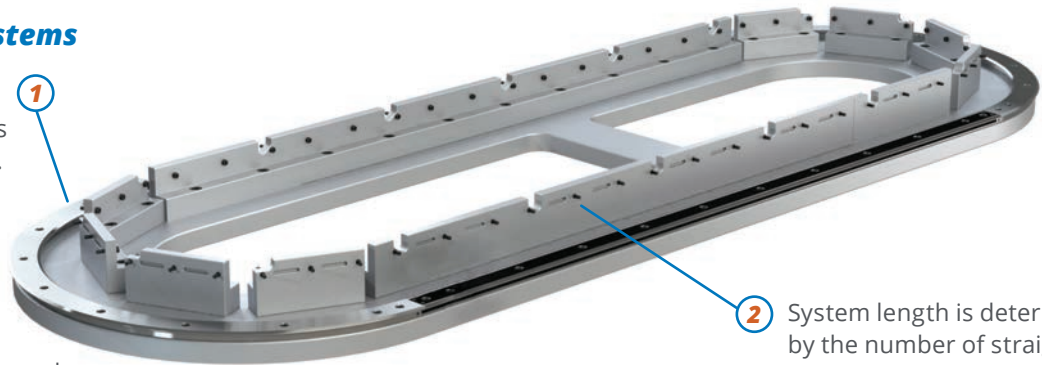
5 Bearings are axial stiffness as standard. -DR movers incorporate double row bearings. Please contact Bishop-Wisecarver for more information and technical assistance.



# SYSTEM AND COMPONENT SPECIFICATION - GFX PRT2 SYSTEMS

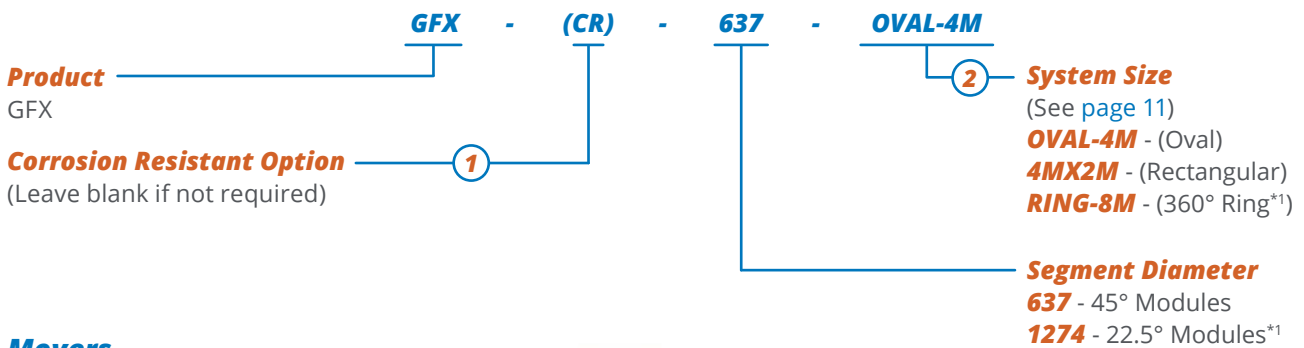
## GFX PRT2 Track Systems

Corrosion resistant systems use all stainless steel track components.



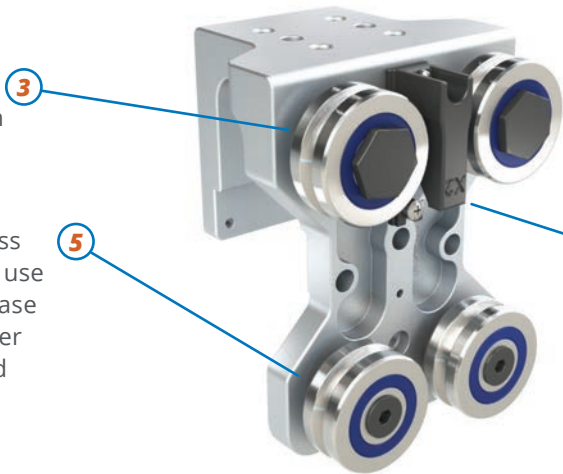
Optional support structure shown. Contact Bishop-Wisecarver's Technical Sales Department for more information.

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



## Movers

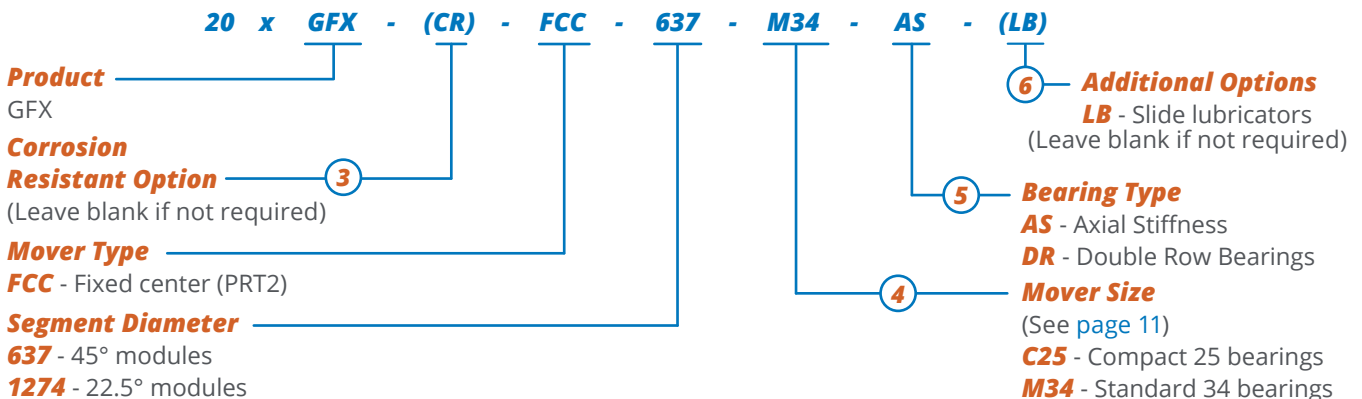
Corrosion resistant movers are supplied with stainless steel bearings.



Outer bearing size also determines the size of the mover. Please see page 11 or contact Bishop-Wisecarver for more information and technical assistance.

Bearings are axial stiffness as standard. **-DR** movers use double row bearings. Please contact Bishop-Wisecarver for more information and technical assistance.

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.



## Notes

- 360° GFX ring systems using 22.5° motor modules and 1274mm diameter rings require 16 motor modules.
- All movers are supplied fully assembled and adjusted to a system, unless requested otherwise.

# 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.

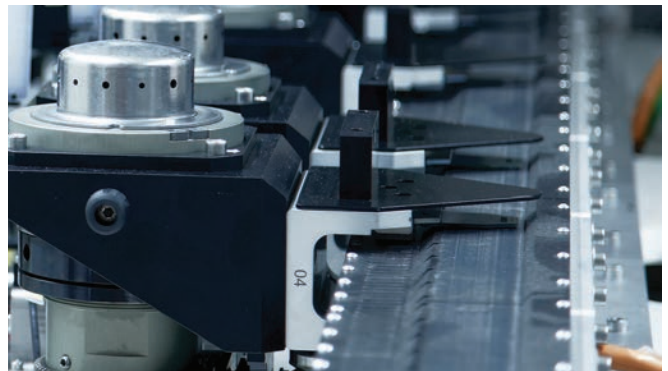
### Solution

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

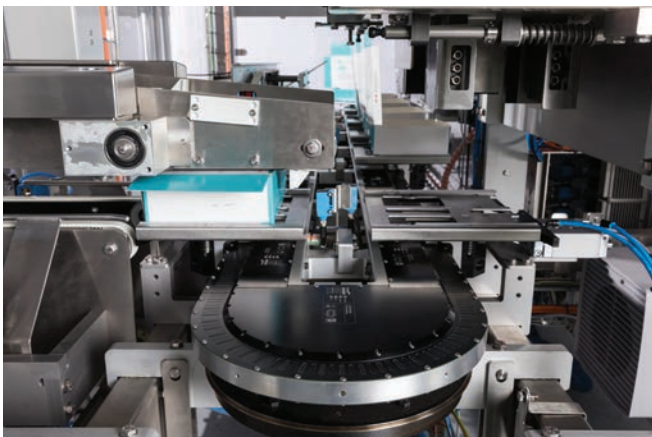
The final configuration allows a cycle time of 1.9 seconds per unit, exceeding the customer's design parameter, while providing a maintenance schedule that works for the customer in their three-shift operation environment.

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.

# MOTION SOLUTIONS FROM BISHOP-WISECARVER ARE LIMITED ONLY BY YOUR IMAGINATION.

## **Components & Accessories**

DualVee®  
MadeWell®  
GV3  
SL2  
PRT2  
HDS2  
HDRT  
Hepco High Temp and Vacuum Bearing  
MCS  
Motor Mounts  
Gantry Brackets  
Wrenches

## **Manual Linear Guide Systems**

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UtiliTrak®  
MinVee®  
QuickTrak®  
SteadyRail  
GV3  
Simple Select  
SL2  
HDS2  
MHD  
HTS

## **Actuated Linear Guide Systems**

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Eco60™  
SlickStick™  
SteadyRail  
HDLS  
HDCS  
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SBD  
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PRT2  
DTS2  
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HDRT  
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## **Custom Solutions**

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