Technical Data

Original Instructions

iTRAK 5730 System

Bulletin Number 2198T

Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

Topic	Page
Corrected the DC bus input current unit label from rms to DC.	10
Corrected the DC bus output current unit label from rms to DC.	10
Added a callout for mover mounting holes.	21
Added mover mounting hole location dimensions.	21
Replaced the Number of Motor Modules Connected to a Single Input Cable table with the Maximum Number of Motor Modules Connected to a Single Kinetix 5700 iTRAK Power Supply table.	25
Added the Number of Motor Modules Supported By a Kinetix 5700 iTRAK Power Supply graph.	26
Added references in the Lubrication System section.	30
Changed the section on lubrication pump wiring.	31
Added the Servo Drive Installation Best Practices, publication MOTION-AT004, to the Additional Resources section.	37

iTRAK 5730 System Overview

The iTRAK® 5730 system is a modular, scalable, linear motor system. This system provides independent control of multiple movers on straight or curvilinear paths. The iTRAK 5730 system is built from a combination of the following modules and components:

- Straight motor modules
- Curved motor modules
- Connector modules
- Mounting rings
- Rectangular and flat rails
- Movers with mover and position magnets

A complete iTRAK 5730 system uses these components:

- Programmable logic controller (PLC)
- Input power components (branch circuit protection, disconnect, line filter, and functional safety)
- 24V SELV or PELV control power supply
- Kinetix® 5700 DC-bus power supply
- Kinetix 5700 iTRAK power supply
- Power cable (DC-bus and 24V control)
- Ethernet cable
- Lubrication system
- Infield covers (optional)

You can combine straight and curved motor modules to build multiple machine shapes and manage a wide variety of dynamic processes. Motor modules, movers, and connectors are modular and designed to accommodate system growth and varied power demands. The system can be expanded to more than 19 meters (62.3 feet).

The motor modules are integrated drive and motor coil units with feedback capability. Each motor module can operate and control multiple movers. Power and network communication connections to the motor modules are provided by the connector modules.

Movers provide the platform for your application effectors. Movers can be synchronized or independently controlled and positioned accurately on any point of the track.

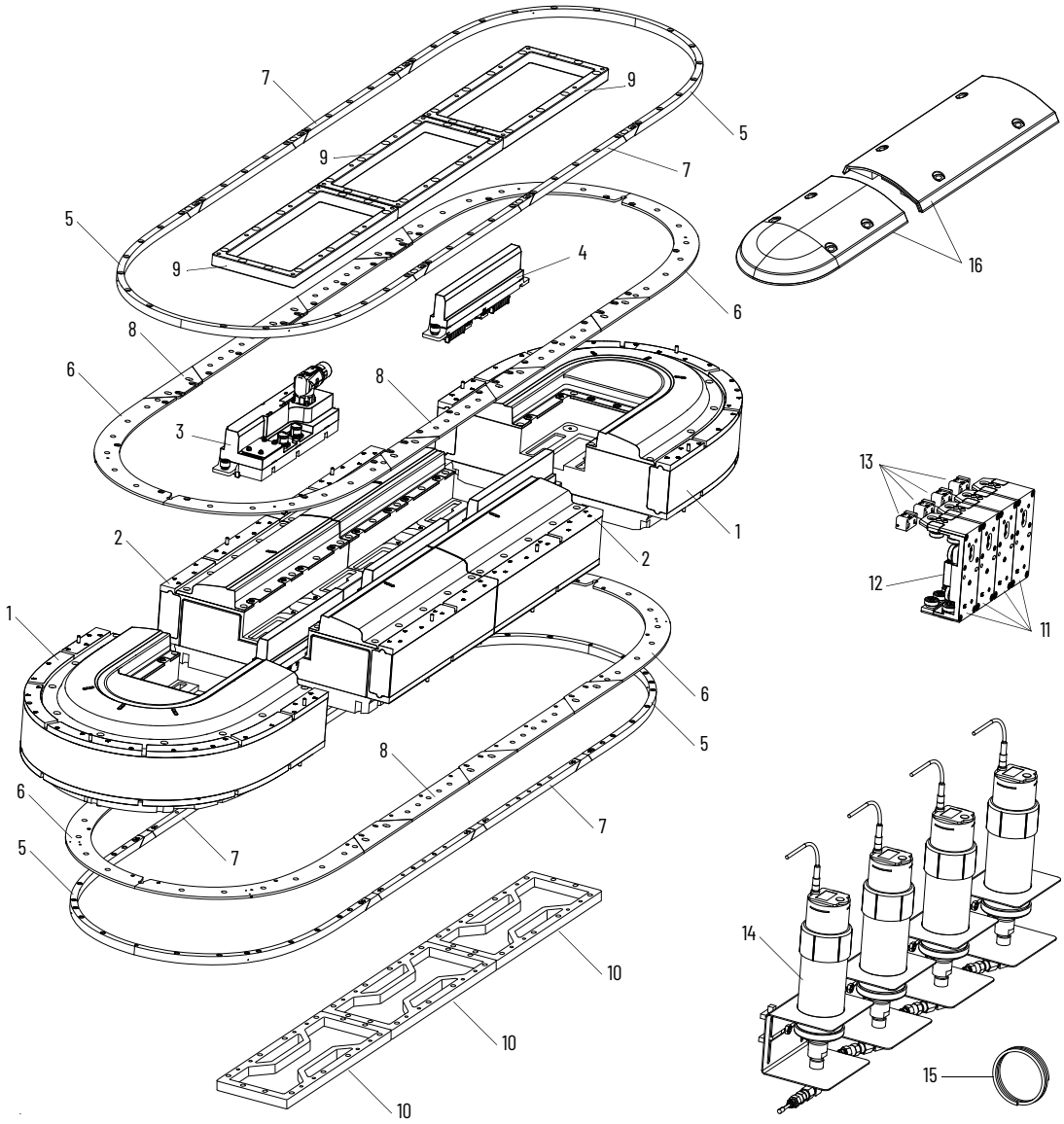
You can mount the iTRAK 5730 system in many configurations, including horizontal carousel, vertical over-under, and stand-up. A customer-sourced mounting system is required to mount the iTRAK 5730 in the desired position and location.

The lubrication system supplies a continuous flow of lubricant to the rail system, which is distributed around the track by the mover track rollers. The lubrication system helps to prevent wear on the track and mover components and provides a smoother, quieter system and is required.

The infield covers fit over the connection modules and connection wires and provide a level of protection against water, dirt, and debris.

System Components

Exploded View of the Servo and Mechanical Components of an iTRAK 5730 System



Item	Component
1	Curved motor module
2	Straight motor module
3	Power and control input connector module
—	Power with pass-through control connector module (not shown)
4	Power and control pass-through connector module
5	Top and bottom curved rectangular rail w/wedges
6	Top and bottom curved flat rail w/wedges
7	Top and bottom straight rectangular rail w/wedges
8	Top and bottom straight flat rail w/wedges

Item	Component
9	Mounting ring (top)
10	Mounting ring (bottom)
11	Mover
12	Mover magnet
13	Position magnets
14	Lubrication system pump (x4)
15	Lubrication system tube
16	Infield cover (straight and curved)

Electromechanical Components of an iTRAK 5730 System

iTRAK 5730 Component		Length [mm (in.)]	Cat. No.
Motor module • Integrated drive and motor coil unit • Feedback capability	straight	–	2198T-L20-T0303-A00-S2
	curved	–	2198T-L20-T0309-D18-S2
Mounting ring • Provides rigidity to the system • Connects motor modules	top	–	2198T-AS-01
	bottom		2198T-AS-02
Rail system • Provides high-precision guidance for the mover track rollers • Attaches to the motor frame	straight	300 (11.8)	2198T-BE-ST03
		600 (23.6)	2198T-BE-ST06
		900 (35.4)	2198T-BE-ST09
	curved (180°)	900 (35.4) nom	2198T-BE-ED18
Mover • passive magnetic components • move along the track in response to the magnetic fields • Includes mover magnet		–	2198T-VT0304-E
Mover magnet • Replacement part only • Used to build your own movers • Optimizes weight or bearing solutions		–	2198T-M0304-A000-SS
Position magnet • Actuate sensors in the track	south pole	–	2198T-N1-0304
	north pole	–	2198T-NN-0304

Power and Control Components of an iTRAK 5730 System

iTRAK 5730 Component		Length [m (ft.)]	Cat. No.
Power circuitry and components • Provide the DC bus voltages that are required for the iTRAK 5730 motor modules	DC-bus	–	2198-P*xxx*
	iTRAK	–	2198T-W25K-ER
Power and control input connector module • Provides the power connection between the iTRAK power supply and a motor module and a communication connection from an EtherNet/IP™ network and a motor module		–	2198T-CT-CP
Power input with pass-through control connector module • Provides the power connection between the iTRAK power supply and a motor module		–	2198T-CT-P(1)
Power and control pass-through connector module • Provides continuous power between the motor modules and communication with the EtherNet/IP network		–	2198T-CT
Power cable • Provides DC-bus and control power from the iTRAK power supply to the connector modules		6 (19.7)	2198T-CHBFLS8-12AA06
		9 (29.5)	2198T-CHBFLS8-12AA09
		12 (39.4)	2198T-CHBFLS8-12AA12
		15 (49.2)	2198T-CHBFLS8-12AA15
		30 (98.4)	2198T-CHBFLS8-12AA30
EtherNet/IP communication cable • Provides EtherNet/IP communication to the power and control connector module and connected motor modules	M12 X-code cable	1 (3.3)	1585D-E8TGJM-1
		2 (6.6)	1585D-E8TGJM-2
		3 (9.8)	1585D-E8TGJM-3
		5 (16.4)	1585D-E8TGJM-5
		10 (32.8)	1585D-E8TGJM-10

(1) This module provides a pass-through Ethernet connection only.

Accessory Components of an iTRAK 5730 System

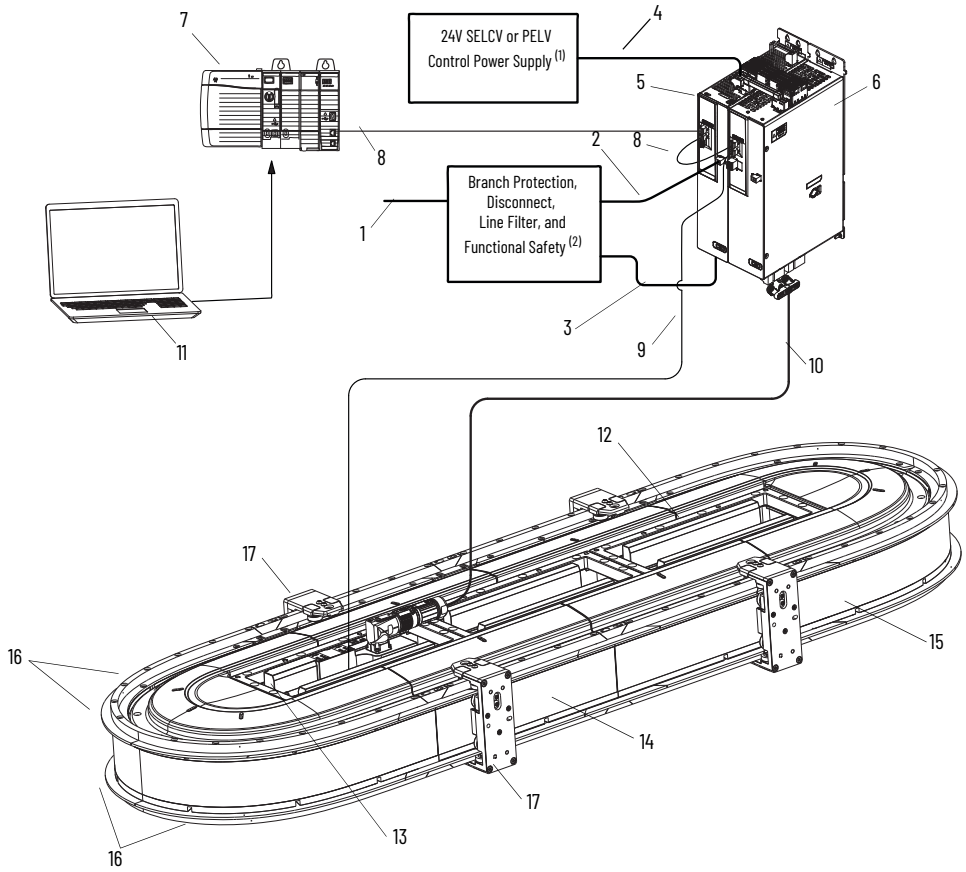
iTRAK 5730 Component	Cat. No.
Lubrication system • Supplies lubricant to the rail system	2198T-AL-SYS-4

Accessory Components of an iTRAK 5730 System

iTRAK 5730 Component		Cat. No.
Infield cover • Provide limited protection	curve (two)	2198T-AS-CD18-U
	straight	2198T-AS-CA03-U
	curve (two, with Allen-Bradley® logo)	2198T-AS-CD18
Rail alignment tool • Align the rectangular rail segments during installation		2198T-A08
Mover loader tool • Install and remove a mover from the rail system		2198T-A09

Typical iTRAK 5730 System

Typical iTRAK System with an iTRAK Power Supply



Item	Description
1	Mains power (480V nom)
2	Contactor enable signal line
3	Kinetix 5700 line voltage
4	24V control power
5	Kinetix 5700 DC-bus power supply
6	Kinetix 5700 iTRAK power supply (number of power supplies vary by system)
7	Programmable logic controller (PLC)
8	Machine Ethernet
9	Ethernet cable from the iTRAK power supply to connector module
10	Power cable (DC-bus and 24V DC)
11	Studio 5000® Programming Interface (not supplied with system)
12	Power and control pass-through connector module
13	Power and control input connector module
14	Straight motor module
15	Curved motor module
16	Rectangular and flat rail system
17	Mover

(1) In this example, 24V DC control power uses a shared-bus connection system between the Kinetix 5700 power supply and the Kinetix 5700 iTRAK power supply.
(2) See Kinetix 5700 Servo Drives User Manual, publication 2198-UM002, for more information on these components.

System Requirements and Limitations

Attribute	Requirement
Studio 5000 Logix Designer® software	Version 33.00 or later
Number of movers, max	128
Motor module sections, max[1]	64
Number of modules connected on one power cable, max	Maximum number of cascaded motor modules is 18[2]

(1) 2198T-L20-T0309-D18 curved motor modules contain three motor module sections.
(2) The maximum number of modules per cable can be less depending on power consumption. See the table and graph in the section Maximum iTRAK Power Supply to Motor Module Cable Length on page 25. For help with system sizing, you can contact Application Engineering.

Programmable Controllers

The iTRAK 5730 is designed to work with these programmable controllers.

Compatible Controllers

Platform	Controller	Compatible Firmware Revision
ControlLogix®	5580	33.001 or later
CompactLogix™	5380 [1]	33.001 or later
	5480	33.001 or later
GuardLogix®	5580	33.001 or later
Compact GuardLogix	5380[1]	33.001 or later

(1) The memory requirements and CPU utilization of typical iTRAK applications can reduce the possible catalog numbers available in these families. Work with Rockwell Automation application engineering to determine suitability.

Mounting Options

You can mount the iTRAK 5730 system in many configurations, including horizontal carousel, vertical over-under, and stand-up. A customer-sourced mounting system is required to mount the iTRAK 5730 in the desired position and location.

Motor Modules

The motor modules are integrated drive and motor coil units with feedback capability. Each motor module can operate and control multiple movers.

Kit Description	Kit Contents	Weight [kg (lb)]	Quantity Required	Cat. No.
Straight motor module	Straight motor module 300 mm (11.8 in.) long	8.0 (17.6)	As required for the application	2198T-L20-T0303-A00-S2
Curved motor module	Curvilinear motor module 350 mm (13.8 in.) long in track length dimension, 900 mm (35.4 in.) total mover travel distance along curve	17.0 (37.5)	As required for the application	2198T-L20-T0309-D18-S2

Motor Module (Section) Catalog Numbers

For example: 2198T-L20-T0303-A00-S2

2198T	-	L	20	-	T	03	03	-	A	00	-	S2
a		b	c		d	e	f		g	h		i

a	
Bulletin Number	
Code	Description
2198T	iTRAK Intelligent Track System

b	
Module Type	
Code	Description
L	Motor module (section)

c	
Nominal Voltage	
Code	Description
20	200/400V bus

d	
Motor Orientation	
Code	Description
T	Transverse

e	
Motor Coil Width	
Code	Description
03	30 mm (1.2 in.)

f	
Motor Length	
Code	Description
03	300 mm (11.8 in.) (1)
09	900 mm (35.4 in.) (2)

g	
Radius Type	
Code	Description
A	Linear
D	Narrow spline

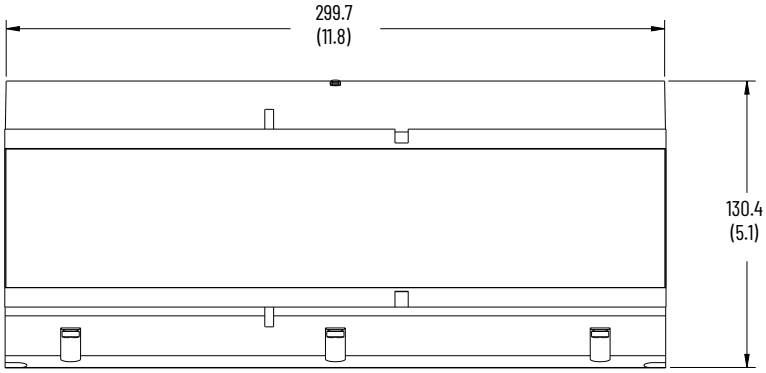
h	
Arc Angle	
Code	Description
00	Linear (1)
18	180° (diameter varies) (2)

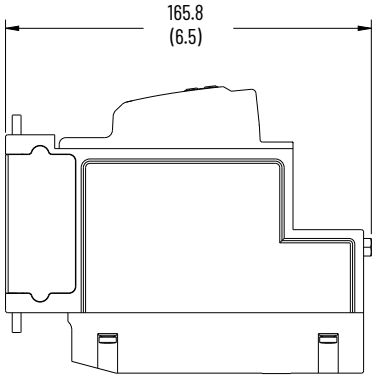
i	
Functional Safety	
Code	Description
S2	Integrated Network Safe Stop 1

(1) Only available for position g, code A.
(2) Only available for position g, Code D.

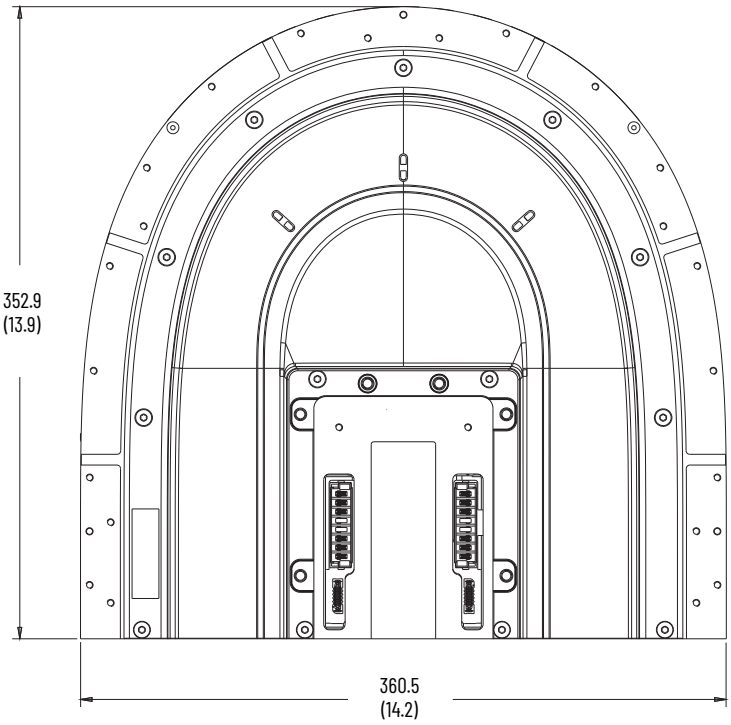
Dimensions

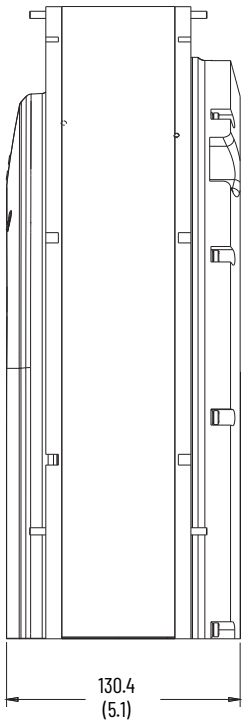
2198T-L20-T0303-A00-S2, Dimensions in mm (in.)





2198T-L20-T0309-D18-S2, Dimensions in mm (in.)





Material Specifications

Description	Material[1]	Finish
Bottom cover	Aluminum 6061-T6	Black anodize
Motor frame	Aluminum extrusion 6061-T6	Black anodize
Motor cover	316 stainless-steel	None
Position sensor cover	Valox 5534	None
Position sensor cover lightpipe	Estane pellethane 2102-90ANAT	Inkset printed
Screws, flathead, top cover	A2 stainless-steel	None
Screws, bottom cover	18-8	None
Frame end plate	C1018 Steel	Electroless nickel
Label	Lexan	None

(1) Straight and curved motor modules use the same materials.

Technical Specifications

2198T-L20 Straight and Curved Motor Modules

Attribute	2198T-L20-T0303-A00-S2	2198T-L20-T0309-D18-S2
Power inputs		
DC bus input voltage	400V DC	
DC bus input current	12.5 A DC	
Control power DC input voltage	17…28V DC	
Control power DC input current	16 A DC	
Control power DC current consumption	0.65 A DC	1.6 A DC
Cascaded outputs		
DC bus output voltage	400V DC	
DC bus output current	12.5 A DC	
Control power DC output voltage	17…28V DC	
Control power DC output current	16 A DC	
Temperature, operating	0…40 °C (32…104 °F) 0…50 °C (32…122 °F) when motor capacity is limited to 90%	
Motor stator insulation class	Class B, 130 °C (266 °F)	

Precision

All specifications assume the following:

- The mover is catalog number 2198T-VT*xxxx-x* and has no additional mass attached.
- Temperature has reached steady state.
- Movers maintain a pitch of >100.0 mm (3.94 in.) (measured from the center of one mover to the center of the next mover along the motor face).

Static Unidirectional Repeatability

Attribute	**Single Mover to Any Single Point** mm (in.)	**Any Mover to Any Single Point** mm (in.) [1]
2198T-L20-T0303-A00-S2	± 0.01 (0.0004)	± 0.2 (0.008)
2198T-L20-T0309-D18-S2	± 0.02 (0.0008)	± 0.2 (0.008)

(1) Any mover to any single point performance can be improved by applying a per-mover position offset to compensate for mover-to-mover mechanical variations.

Static Accuracy

Attribute	**Absolute Accuracy** [1][2] mm (in.)
2198T-L20-T0303-A00-S2	± 0.4 (0.02)
2198T-L20-T0309-D18-S2	± 0.8 (0.03)

(1) Accuracy specifications are for any mover within any section.
(2) Static operation on a transition is not recommended.

Connector Modules

Connector modules connect and supply DC-bus and 24V DC control power to the iTRAK 5370 system. There are three connector modules available:

- 2198T-CT-CP

  The power and control input connector module provides the power connection between the iTRAK power supply and a motor module and a communication connection from an EtherNet/IP network and a motor module. This module is used for the primary power and ground and Ethernet connections for your iTRAK 5730 system.

- 2198T-CT-P

  The power input with pass-through control connector module provides the power connection between the iTRAK power supply and a motor module. This module is used to provide additional power for larger systems (see Maximum Number of Motor Modules Connected to a Single Kinetix 5700 iTRAK Power Supply on page 25). This module provides a pass-through Ethernet connection only.

- 2198T-CT

  The power and control pass-through connector module provides continuous power between the motor modules and communication with the EtherNet/IP network.

Kit Description	Kit Contents	Weight [kg (lb)]	Quantity Required	Cat. No.
Power and control input connector module	Connector module with power and Ethernet connection ports	0.8 (1.6)	1 per system	2198T-CT-CP
Power input with pass-through control connection module	Connector module with power connection port	0.7 (1.5)	As required for the application	2198T-CT-P
Power and control pass-through connection module	Connector module (pass-through only, no ports)	0.3 (0.7)	Enough to connect all motor sections	2198T-CT

Catalog Number Explanation

Example: 2198T-CT-CP

2198T	-	CT	-	CP
a		b		c

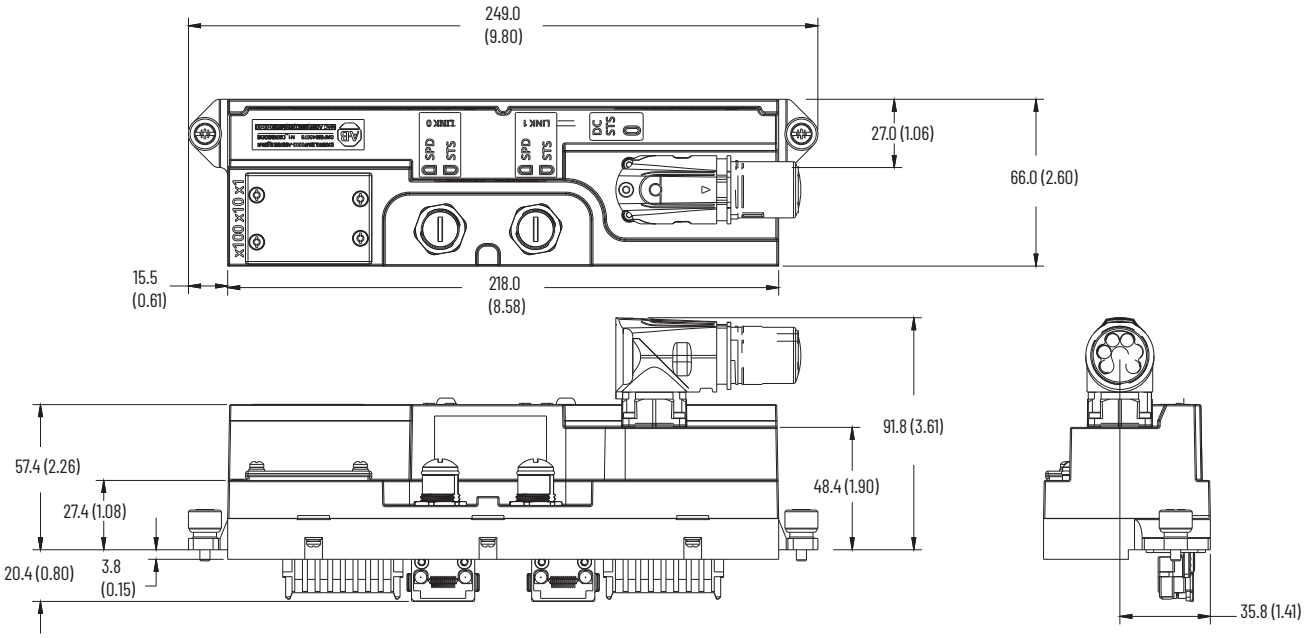
a	
Bulletin Number	
Code	Description
2198T	iTRAK intelligent track system

b	
Module Type	
Code	Description
CT	Connector terminal (between motor modules)

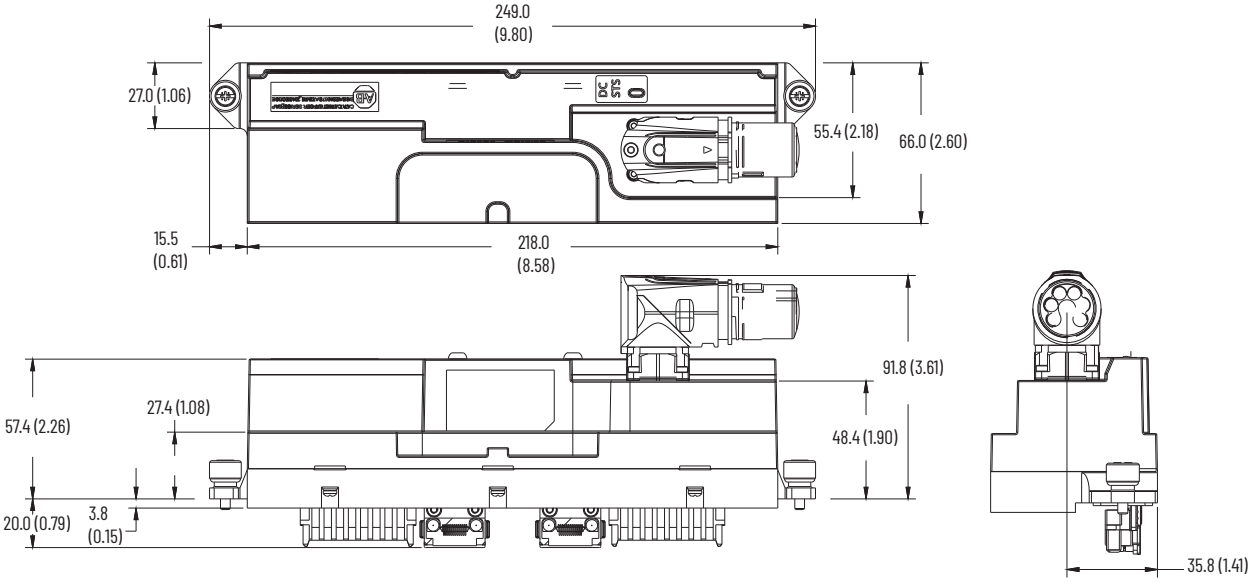
c	
Input Option	
Code	Description
CP	Communication and power inputs
P	Power input with communication pass-through
<blanks>	Communication and power pass-through

Dimensions

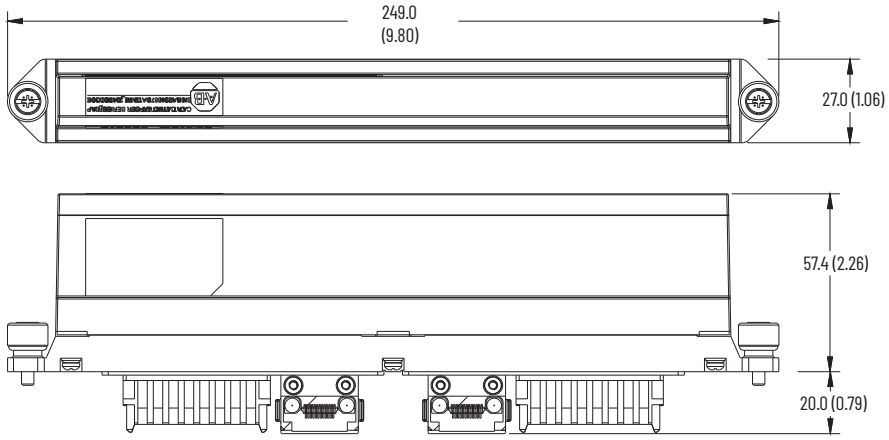
2198T-CT-CP, Dimensions in mm (in.)



2198T-CT-P, Dimensions in mm (in.)



2198T-CT, Dimensions in mm (in.)



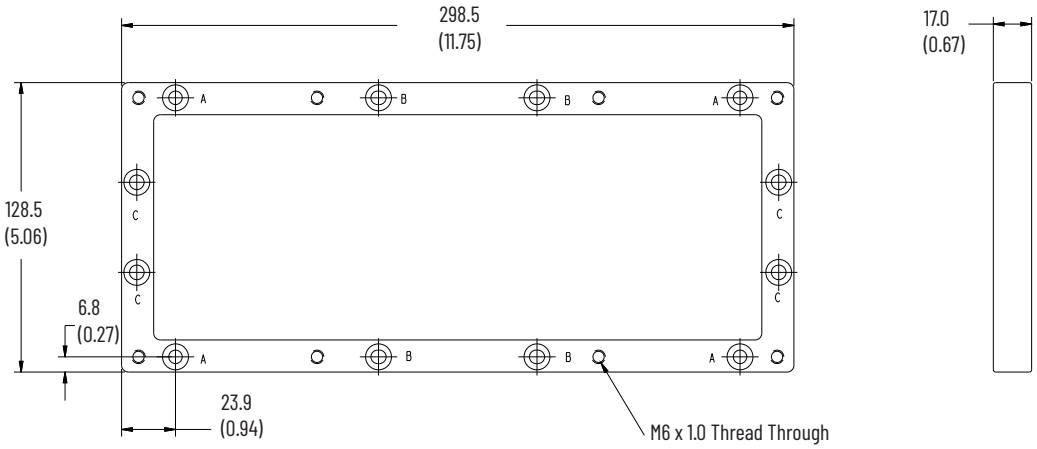
Mounting Rings

The mounting rings are used to connect motor modules and provide rigidity to the iTRAK system. The mounting ring includes the hardware that is required to connect to a motor module.

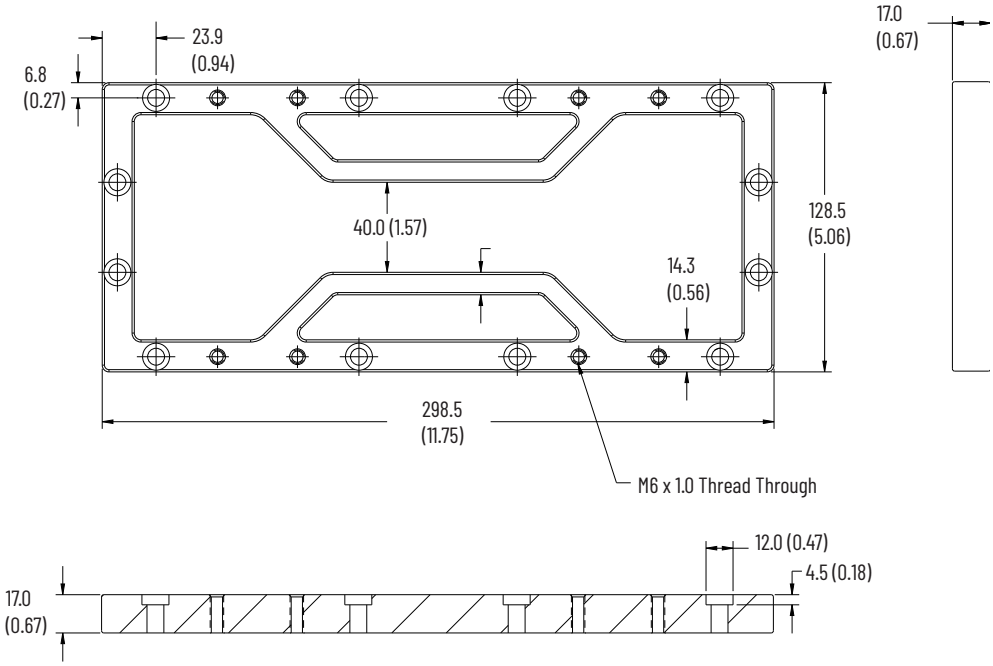
Kit Description	Kit Contents	Weight [kg (lb)]	Quantity Required	Cat. No.
Structural mounting ring kit (top)	1 stainless-steel ring 10 - M6 x 20 mm, hex head reamer screws 1 tube Loctite 243	1.4 (3.0)	1 top and one bottom ring for every two straight sections in the system, plus an additional pair of top and bottom rings	2198T-AS-01
Structural mounting ring kit (bottom)	1 stainless-steel ring 10 - M6 x 20 mm, hex head reamer screws 1 tube Loctite 243	1.8 (4.0)		2198T-AS-02

Dimensions

2198T-AS-01, Dimensions in mm (in.)



2198T-AS-02, Dimensions in mm (in.)



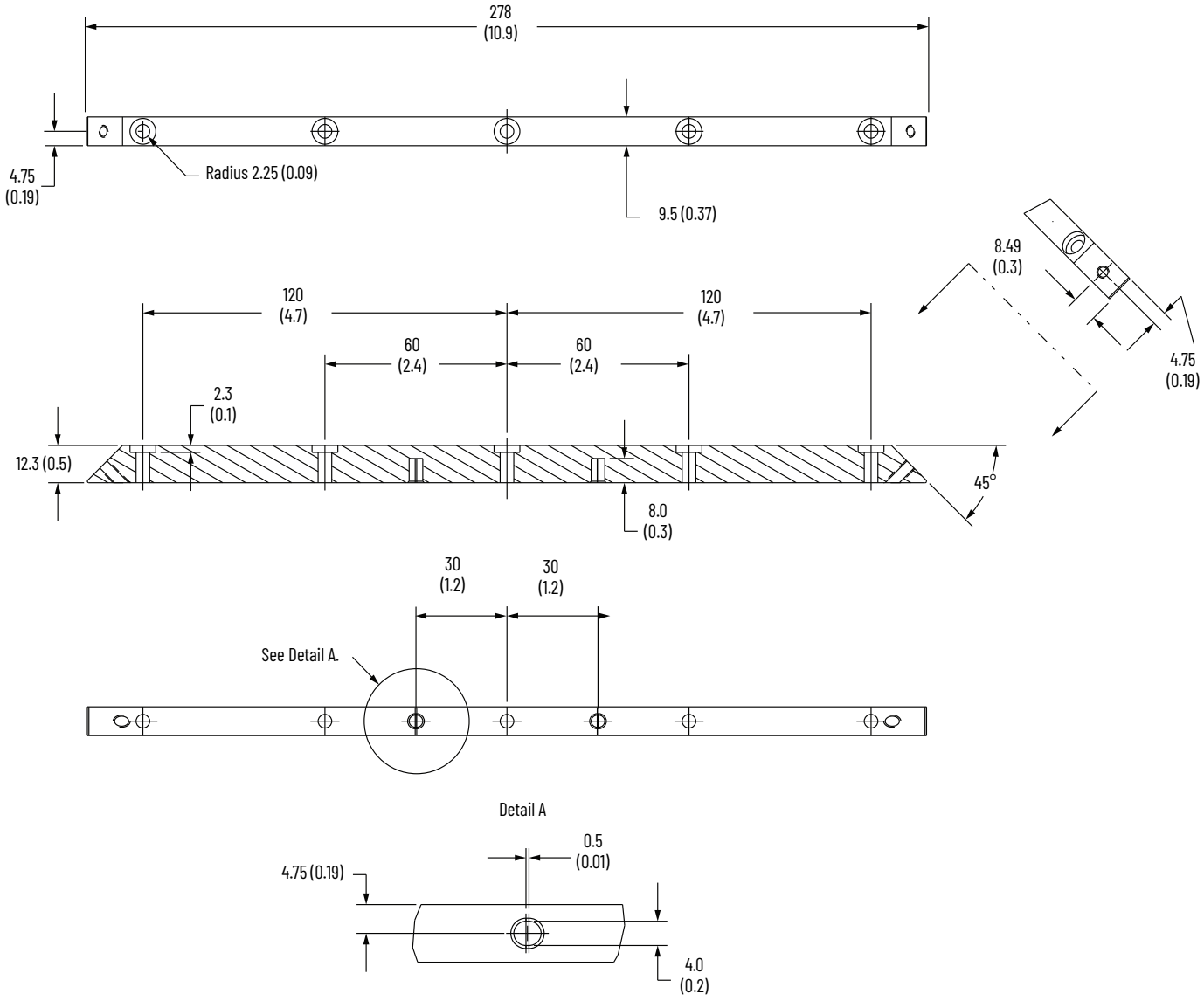
Bearing Rails

The flat and rectangular rails attach to the motor frame. This system of rails provides high-precision guidance for the mover track rollers.

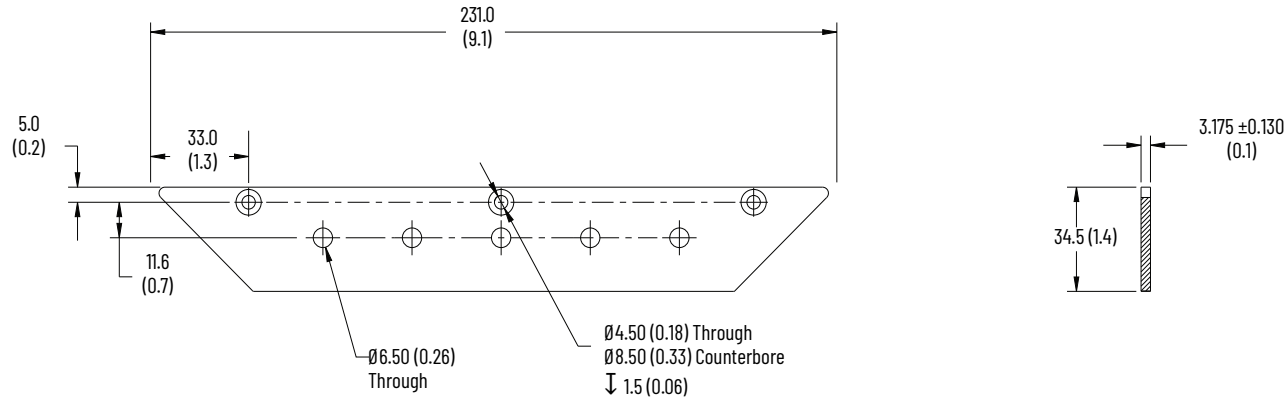
Kit Description	Kit Contents	Weight [kg (lb)]	Quantity Required	Cat. No.
300 mm (11.8 in.) Straight rail kit	300 mm (11.8 in.) long: • 2 straight rectangular rails • 2 straight rectangular wedges • 2 straight flat rails • 2 straight flat wedges • 14 - M4 x 8 mm Torx screws • 10 - M4 x 20 mm Torx screws	1.0 (2.2)	At least one per system (recommended)	2198T-BE-ST03
600 mm (23.6 in.) Straight rail kit	600 mm (23.6 in.) long: • 2 straight rectangular rails • 2 straight rectangular wedges • 2 straight flat rails • 2 straight flat wedges • 20 - M4 x 8 mm Torx screws • 20 - M4 x 20 mm Torx screws	2.0 (4.4)	As required for the application	2198T-BE-ST06
900 mm (35.4 in.) Straight rail kit	900 mm (35.4 in.) long: • 2 straight rectangular rails • 2 straight rectangular wedges • 2 straight flat rails • 2 straight flat wedges • 26 - M4 x 8 mm Torx screws • 30 - M4 x 20 mm Torx screws	3.0 (6.6)	As required for the application	2198T-BE-ST09
Curved rail kit	900 mm (35.4 in.) long x 35 mm (1.4 in.) diameter: • 2 curved rectangular rails • 2 curved rectangular wedges • 2 curved left, flat rails • 2 curved right, flat rails • 2 curved flat wedges • 4 lubrication system O-rings • 20 - M4 x 8 mm Torx screws • 28 - M4 x 20 mm Torx screws	2.9 (6.4)	1 per curved motor section	2198T-BE-ED18

Dimensions

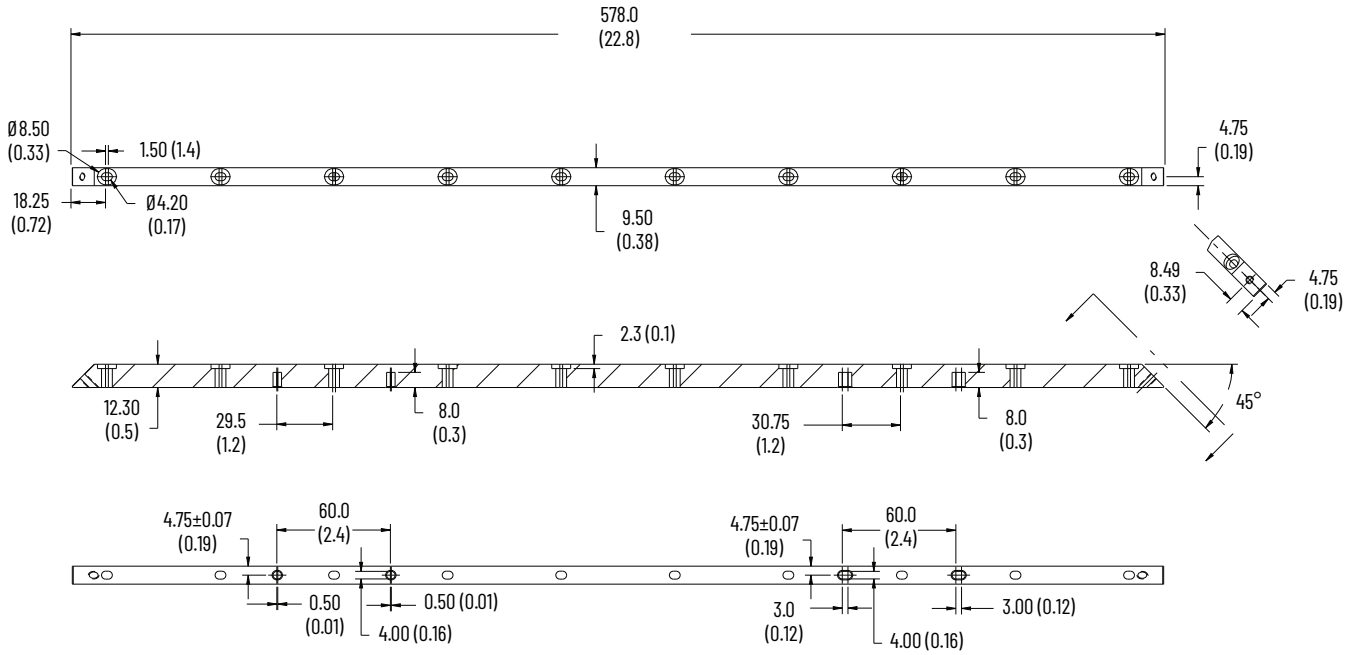
2198T-BE-ST03 Rectangular Rail, Dimensions in mm (in.)



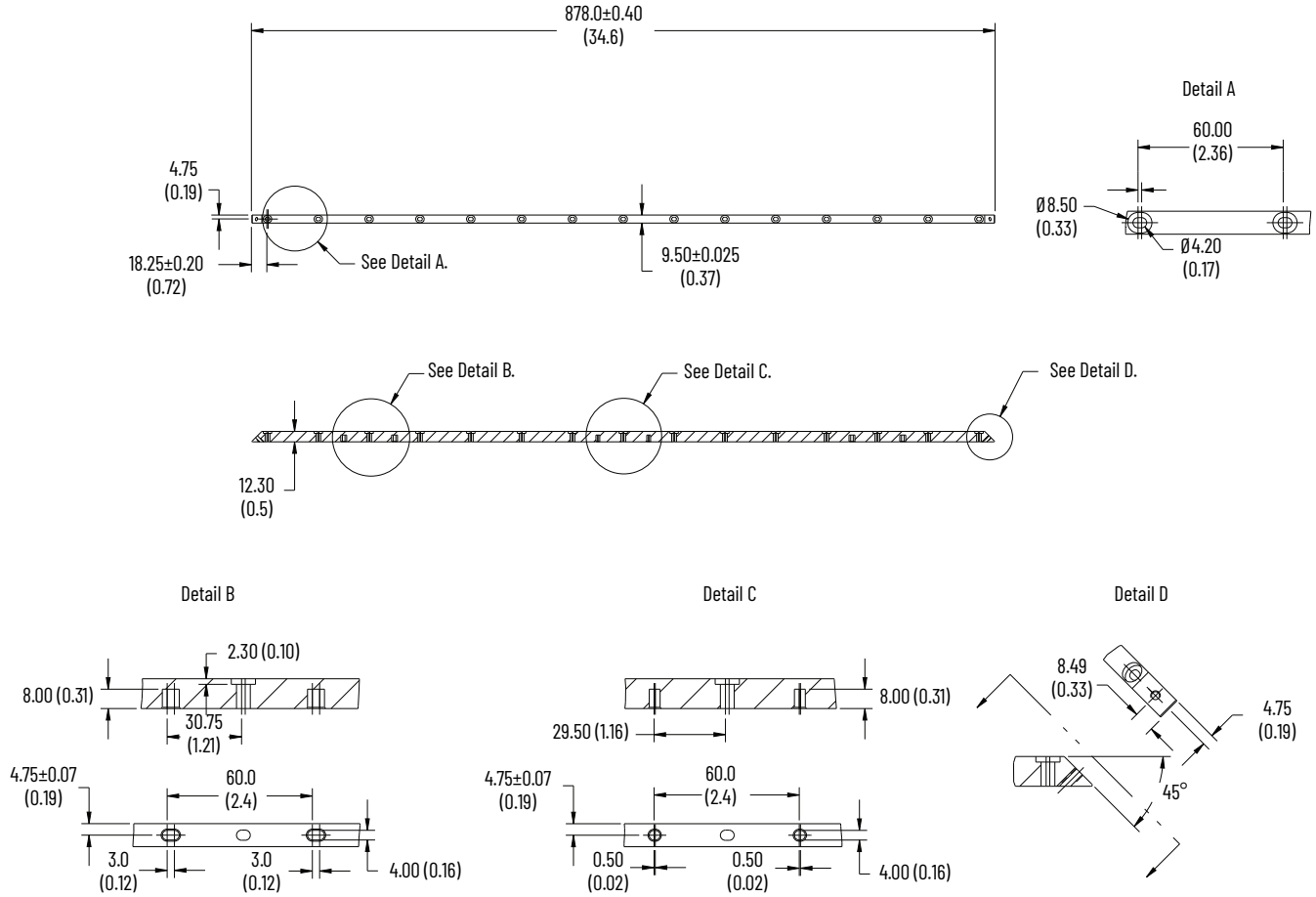
2198T-BE-ST03 Flat Rail, Dimensions in mm (in.)



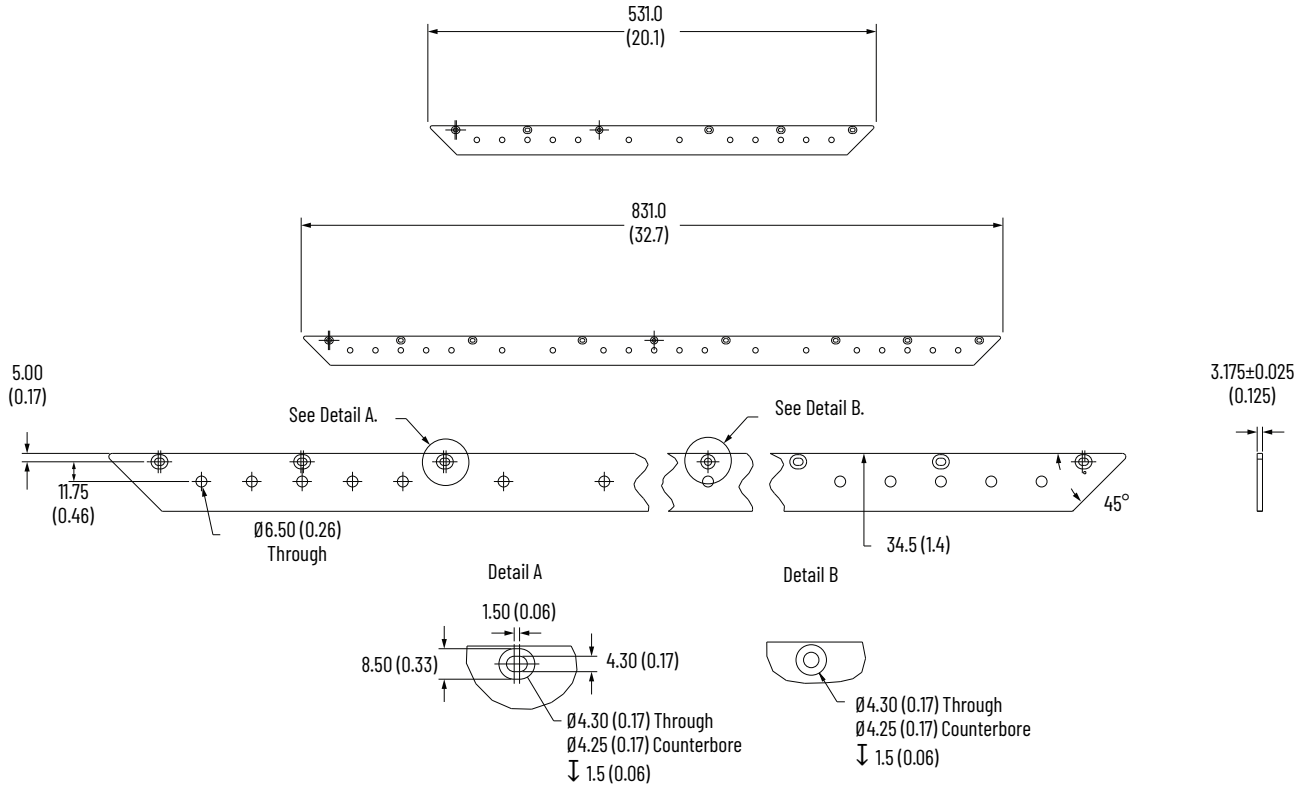
2198T-BE-ST06 Rectangular Rail, Dimensions in mm (in.)



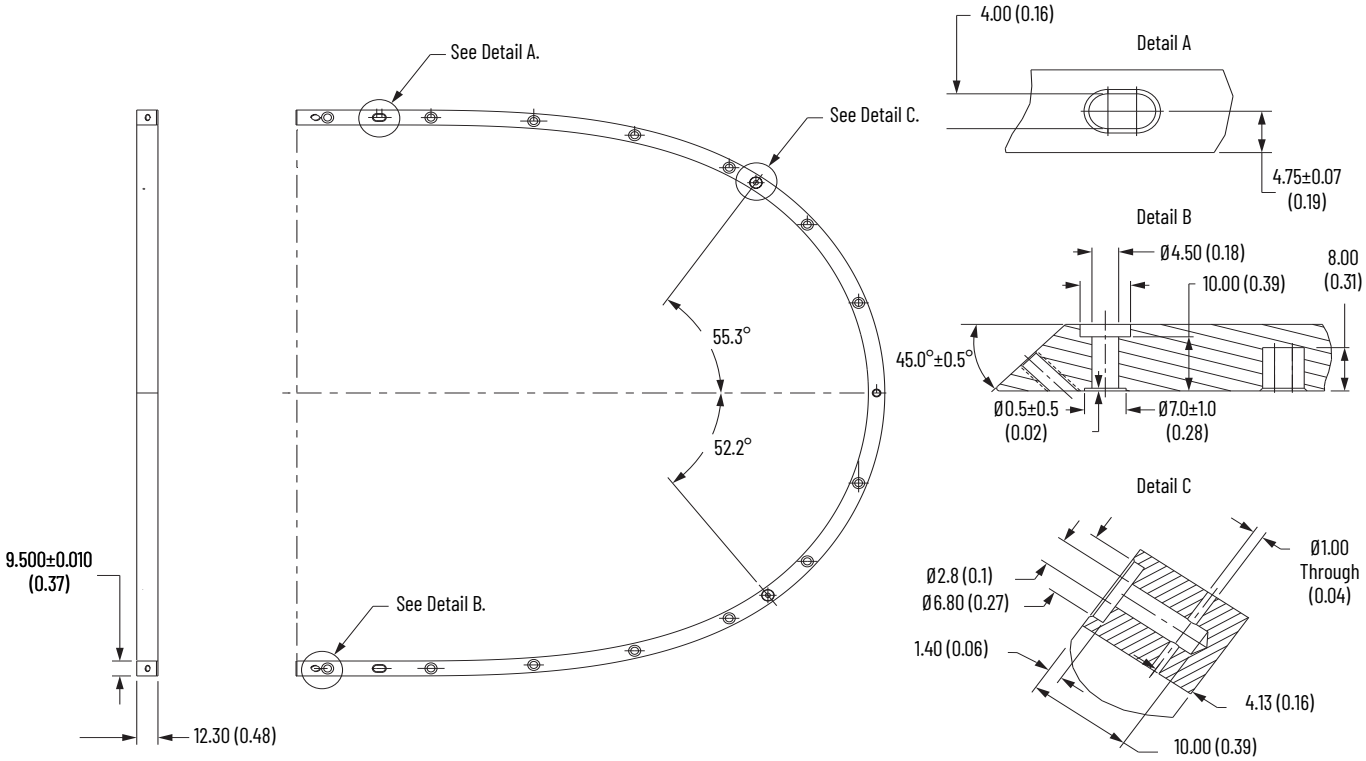
2198T-BE-ST09 Rectangular Rail, Dimensions in mm (in.)



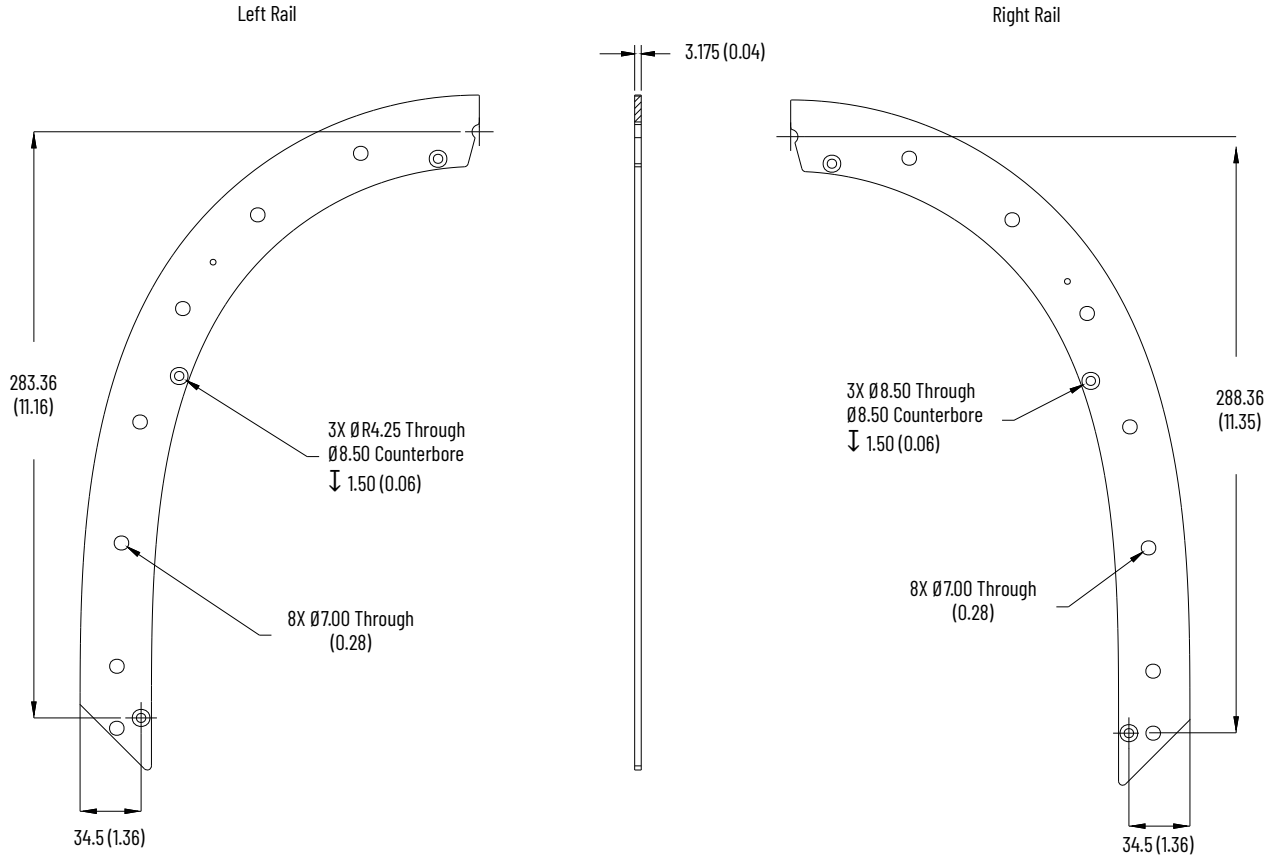
2198T-BE-ST06 and 2198T-BE-ST09 Flat Rail, Dimensions in mm (in.)



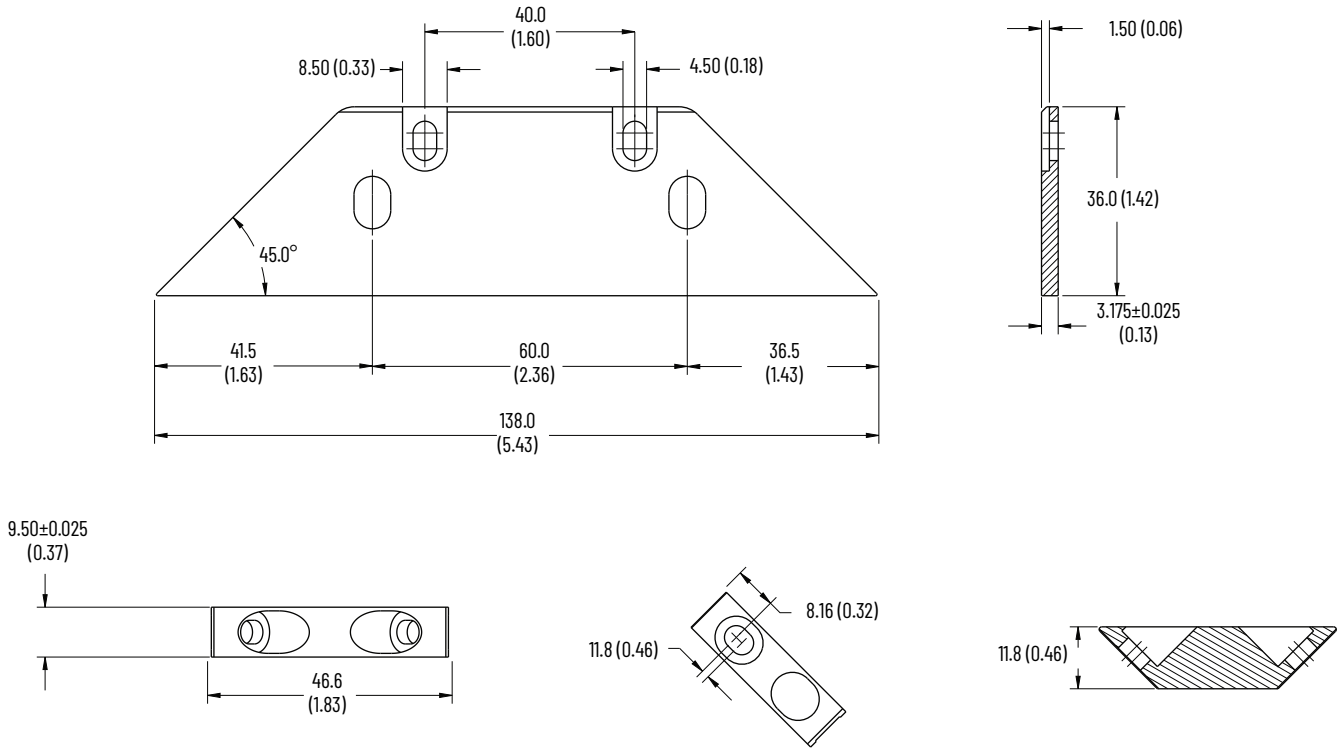
2198T-BE-ED18 Rectangular Rail, Dimensions in mm (in.)



2198T-BE-ED18 Flat Rail, Dimensions in mm (in.)



Flat and Rectangular Wedges, Dimensions in mm (in.)



Movers

The movers are passive magnetic components. They move along the track in response to the magnetic fields generated by the motor modules. You attach your application end effector to the mover. Movers can be synchronized or independently controlled and positioned accurately on any point of the track.

Kit Description	Kit Contents	Weight [kg (lb)]	Quantity Required	Cat. No.
Mover	Fully assembled mover with mover magnet	0.7 (1.5)	As required for the application	2198T-VT0304-E

Catalog Number Explanation

These tables provide an example catalog number explanation for an assembled mover.

For example: 2198T-VT0304-E

2198T	-	V	T	03	04	-	E
a		b	c	d	e		f

a	
Bulletin Number	
Code	Description
2198T	iTRAK Intelligent Track System

b	
Module Type	
Code	Description
V	Assembled mover

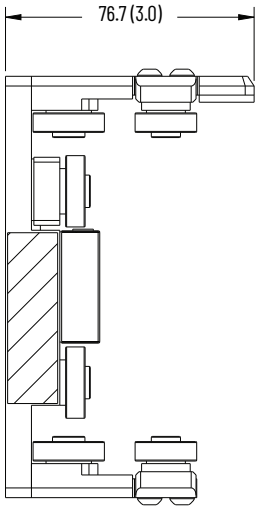
c	
Coil Orientation	
Code	Description
T	Transverse

d	
Coil Length	
Code	Description
03	30 mm (1.2 in.)

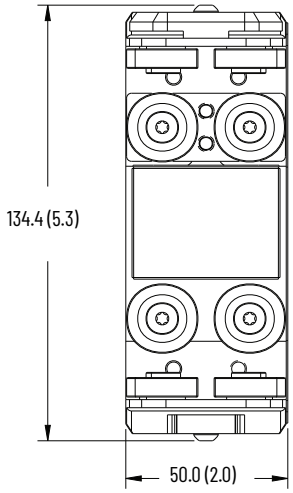
e	
Magnet Length	
Code	Description
04	38 mm (1.5 in.) (approx)

f	
Mover Identification	
Code	Description
E	57xx Design

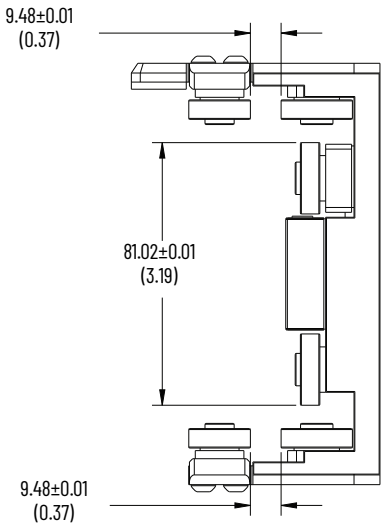
Dimensions in mm (in.)



Left View

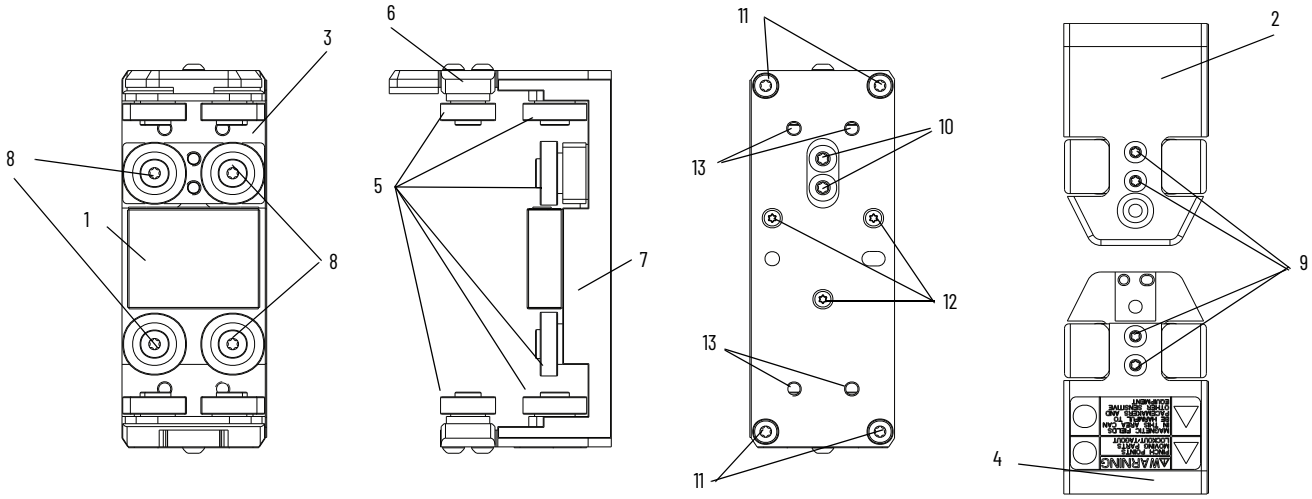


Front View



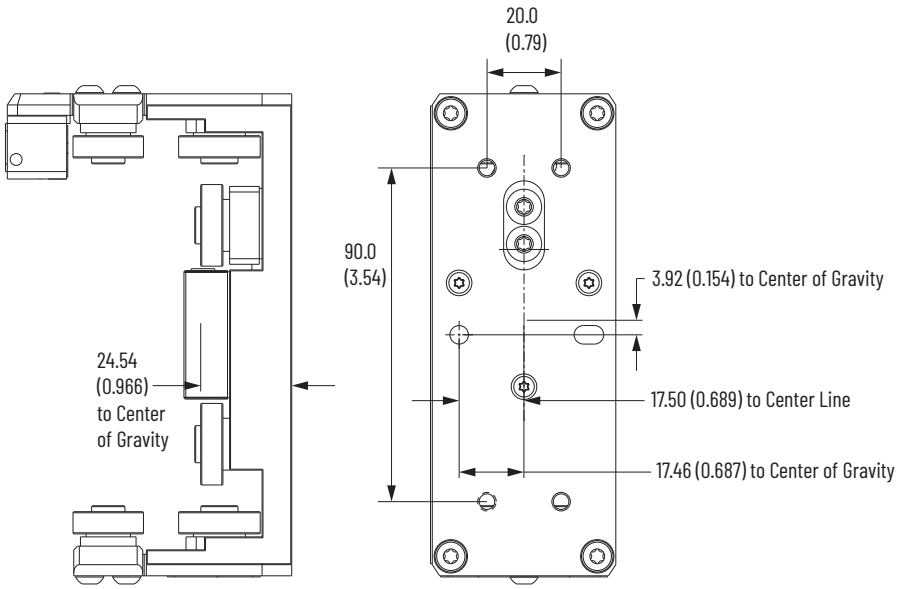
Right Side

Material Specifications



Item	Description	Material	Finish
1	Motor magnet assembly	316 stainless-steel	–
2	Chassis top	Aluminum	Anodized clear
3	Chassis middle		
4	Chassis bottom		
5	Bearing	Alloy steel	–
6	Bearing block	Carbon steel	Black oxide
7	Bumper	Polypropylene	–
8	Shoulder screw	18-8 stainless-steel	
9	Position magnet/H-bearing block screw		
10	V-bearing block screw		
11	Chassis screw		
12	Motor magnet screw	Stainless-steel	
13	Mounting holes M5 x 0.8	–	

Center of Gravity and Mounting Hole Location Dimensions in mm (in.)



Mover Motor Magnet Plate

The mover motor magnet plate propels the mover along the track in response to electrical fields generated by the motor modules. If you build your own movers to optimize weight or bearing solutions, the mover motor magnet plate can be used in your custom movers.

Kit Description	Kit Contents	Weight [kg (lb)]	Cat. No.
Mover motor magnet plate	One mover motor magnet plate	0.13 (0.27)	2198T-M0304-A000-SS

Catalog Number Explanation

These tables provide an example catalog number explanation for a mover magnet plate.

For example: 2198T-M0304-A000-SS

2198T	-	M	03	04	-	A	000	-	SS
a		b	c	d		e	f		g

a	
Bulletin Number	
Code	Description
2198T	iTRAK Intelligent Track System

b	
Module Type	
Code	Description
M	Magnet plate

c	
Coil Length	
Code	Description
03	35 mm (1.4 in.)

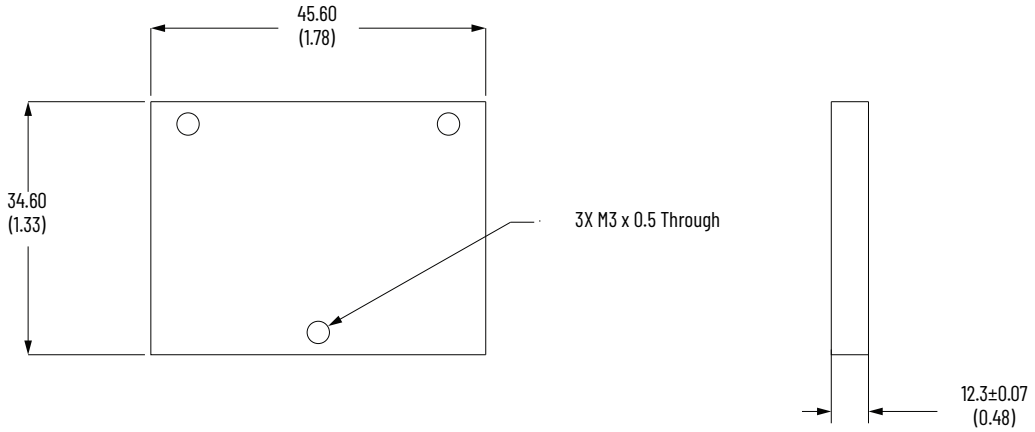
d	
Magnet Length	
Code	Description
04	45 mm (1.8) (approx)

e	
Direction of Curvature	
Code	Description
A	Outside of Neutral

f	
Radius of Section Curvature	
Code	Description
000	Flat

g	
Magnet Material	
Code	Description
SS	Stainless-steel cover with potted interior

Dimensions in mm (in.)



Position Magnet

Position magnets are used to actuate sensors in the track, providing information about the location of the movers. These magnets are sold separately from the mover.

Kit Description	Kit Contents	Weight [kg (lb)]	Quantity Required	Cat. No.
Position magnet	Mover position sensor magnet (south polarity)	0.02 (0.04)	One per system, when a reference mover is specified.	2198T-N1-0304
Position magnet	Mover position sensor magnet (north polarity)	0.02 (0.04)	As required for the application, or one less than the total number of movers, when the position magnet cat. no. 2198T-N1-0304 is used.	2198T-NN-0304

Catalog Number Explanation

These tables provide an example catalog number explanation for a position magnet.

For example: 2198T-N1-0304

2198T	-	N	1	-	0304
a		b	c		d

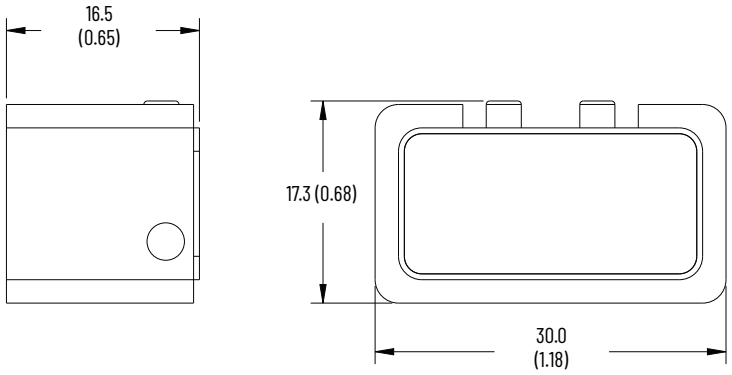
a	
Bulletin Number	
Code	Description
2198T	iTRAK Intelligent Track System

b	
Module Type	
Code	Description
N	Position magnet

c	
Magnet Type	
Code	Description
1	South pole magnet
N	North pole magnet

d	
Mounting Hardware	
Code	Description
0304	Pairs with 35 x 45 mm (1.4 x 1.8 in.) motor magnet plates

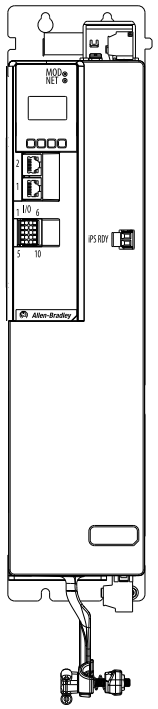
Dimensions in mm (in.)



Kinetix 5700 iTRAK Power Supply

The Kinetix 5700 iTRAK power supply with 458...747V DC input provides continuous output power and current to iTRAK motor modules by using two controlled DC outputs with continuous current of 12.5 A and peak current of 25 A. The two sets of output power cable connectors are connected internally and are interchangeable. They let you connect two power cables to the iTRAK system so that the iTRAK power supply can deliver control power to more iTRAK motor modules.

Kinetix 5700 iTRAK Power Supply
2198T-W25K-ER



See Kinetix 5700, 5500, 5300, and 5100 Servo Drives Specifications Technical Data, publication KNX-TD003, for complete specifications for the iTRAK power supply and additional Kinetix 5700 Servo Drive system information.

Description	Cat. No.
Kinetix 5700 iTRAK power supply	2198T-W25K-ER

Determine the Number iTRAK Power Supplies Required

The number of iTRAK power supplies can be scaled to match the power needs of the iTRAK system closely. Additional iTRAK power supplies can be added to the system as needed. The following factors impact the number of iTRAK power supplies required for a system.

- Output bus current
- 24V control current
- Cable length

Output Bus Current

Sizing is the process of determining the required size and quantity of power hardware components and motor modules for an application. Sizing an iTRAK system involves many variables. Contact your local Rockwell Automation representative.

24V Control Power

The following criteria must be met for the operation of the system.

- Sufficient current can be delivered.
- The required voltage is maintained at the input to the iTRAK power supply.
- The maximum iTRAK power supply input current is never exceeded.
- Maintain an acceptable voltage drop from the iTRAK power supply to the iTRAK motor modules, see the Maximum Number of Motor Modules Connected to a Single Kinetix 5700 iTRAK Power Supply.

The iTRAK power supply uses 24V control power to run all low voltage circuits and it distributes 24V control power to the connected iTRAK motor modules.

24V Current Requirements

Determine the amount of current required; add the current draw of the iTRAK power supply to the current used by each of the motor modules that are connected to that iTRAK power supply. Make sure that you include all iTRAK motor modules that are connected to both the A and B outputs. When designing the system, be sure to account for the 16 A pass through limit of the iTRAK power supply to the iTRAK motor modules.

Input Voltage

See 24V DC Control Power Input (CP) Specifications for the control-power input voltage requirements. The table shows the voltage that is required at the input connector on the iTRAK power supply. You must account for all voltage drops in wiring from the 24V power supply to the iTRAK power supply and the motor modules.

24V DC Control Power Input (CP) Specifications

Connector	Input Voltage, Max	Input Voltage, Min	iTRAK Power Supply Consumption, Max	Pass Through to Motor Modules, Max	Total at Input, Max
24V DC Control Power Input (CP)	26.4V DC	21.6V DC	1 A	16 A	17 A

24V DC Control Power Output (ICP) Specifications

Connector	Pass Through to Motor Modules, Max (1)
24V DC Control Power Output to iTRAK (ICP)	16 A

(1) These ratings apply to both the total combined current from connector A and B, and also applies to the rated output for connector A or B individually.

iTRAK Power Supply Output Power Connections

The iTRAK power supply has two sets of output power cable connectors, which are referenced as A and B; they let you connect two power cables to the iTRAK system. The two sets of connectors have identical sets of signals, they are connected internally, and are interchangeable.

Maximum iTRAK Power Supply to Motor Module Cable Length

Account for the resistive losses in the 2198T-CHBFLS8-12AAxx power cable that connects the iTRAK power supply to the motor modules. Make sure that there is sufficient control power voltage at the input to all motor modules. The amount of current flow and the number of motor modules that are connected in series limits the length of this cable.

See Maximum Number of Motor Modules Connected to a Single Kinetix 5700 iTRAK Power Supply to determine the maximum length of a power cable that is based on the number of motor modules that are connected to it at the minimum control-power input voltage. This table is for 2198T-CHBFLS8-12AAxx cables, which are the only cables supported.

Cables between the iTRAK power supply and the iTRAK system are limited to 30 m (98 ft).

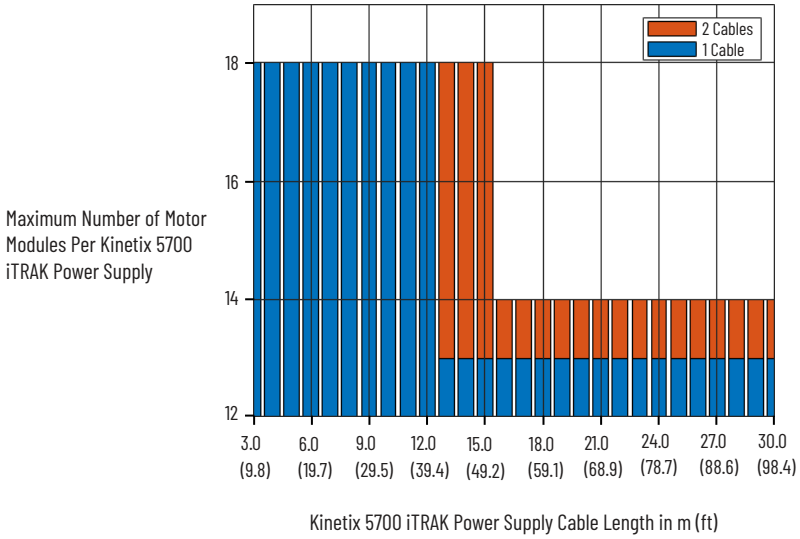
The cable length calculations are made separately for minimum, nominal, and maximum control input voltage.

Maximum Number of Motor Modules Connected to a Single Kinetix 5700 iTRAK Power Supply

Cable Length(1) m (ft)	Maximum Number of Motor Modules(2)	
	One Power Cable	Two Power Cables
3 (9.8)	18	18
6 (19.7)		
9 (29.5)		
12 (39.4)		
15 (49.2)	13	14
18 (59.1)		
21 (68.9)		
24 (78.7)		
27 (88.6)		
30 (98.4)		

(1) The cable lengths that are shown are for the cable from the iTRAK power supply to the first motor module, which is the lowest numbered motor module in the system.
(2) These numbers of motor modules are valid for control power utilization only. Bus power consumption reduces maximum motor module count.

Number of Motor Modules Supported By a Kinetix 5700 iTRAK Power Supply

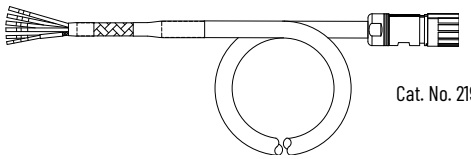


Kinetix 5700 iTRAK Power Supply Power Cable

Kinetix 5700 iTRAK Power Supply Power Cable Specifications

Length m (ft)	Control Power Conductor mm^2 (AWG)	Buss Power Conductor mm^2 (AWG)	Down Stream Connector	Upstream Connector	Cable Type	Cat. No.
6 (19.7)	2.08 (14)	3.31 (12)	M23 - Female	Flying Lead	Hybrid Main and Control Power	2198T-CHBFLS8-12AA06
9 (29.5)						2198T-CHBFLS8-12AA09
12 (39.4)						2198T-CHBFLS8-12AA12
15 (49.2)						2198T-CHBFLS8-12AA15
18 (59.1)						2198T-CHBFLS8-12AA18
21 (68.9)						2198T-CHBFLS8-12AA21
24 (78.7)						2198T-CHBFLS8-12AA24
27 (88.6)						2198T-CHBFLS8-12AA27
30 (98.4)						2198T-CHBFLS8-12AA30

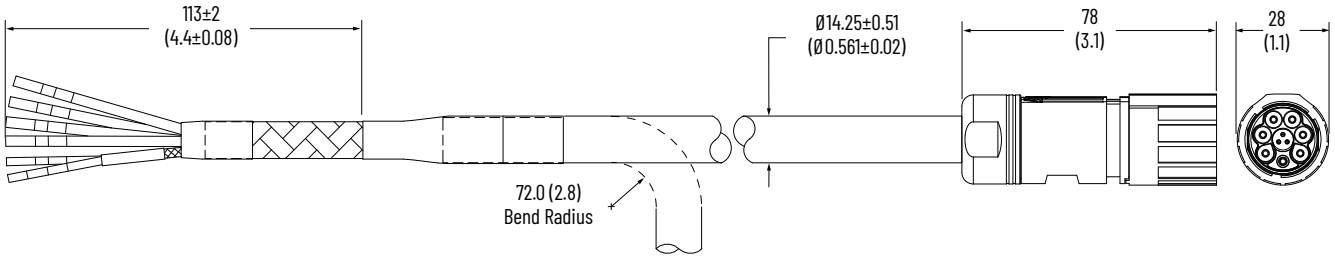
Power Cable



Cat. No. 2198T-CHBP8S8-12AA*xx* is shown.

Dimensions

2198T-CHBP8S8-12*xx* Power Cable, Dimensions in mm (in.)



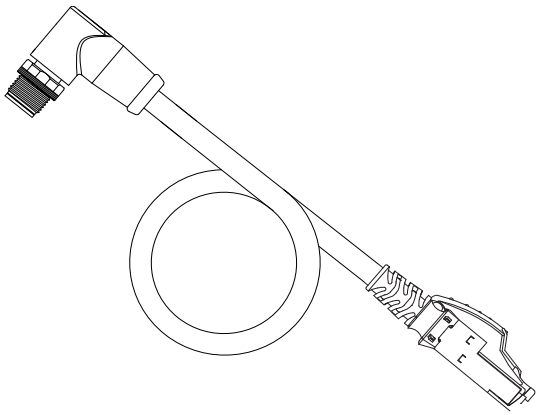
Ethernet Cables

The cord sets are terminated with RJ45 and right angle 8-wire X-Code M12 connectors. They provide EtherNet/IP communication to the power and control connector module and connected motor modules. See the Ethernet Media Specifications Technical Data, publication 1585-TD001 for further information.

The following table shows the recommended Ethernet cables for the iTRAK system.

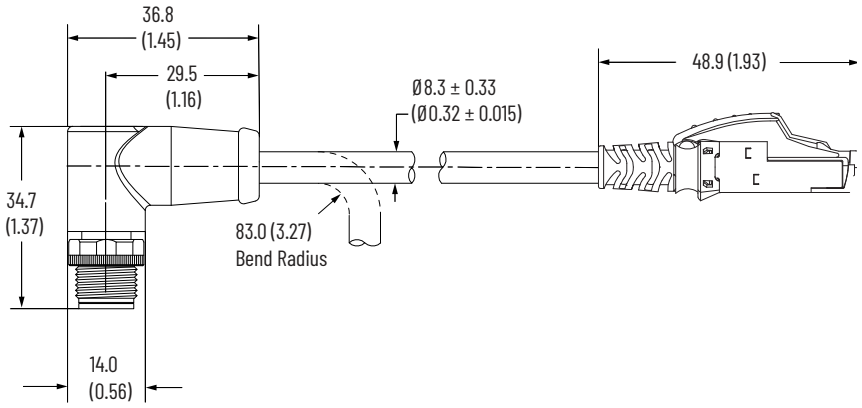
Length m (ft)	Cat. No.
1 (3.3)	1585D-E8TGJM-1
2 (6.6)	1585D-E8TGJM-2
3 (9.8)	1585D-E8TGJM-3
5 (16.4)	1585D-E8TGJM-5
10 (32.8)	1585D-E8TGJM-10

Ethernet Cable



Dimensions

1585D-E8TGJM-x Ethernet Cable, Dimensions in mm (in.)



Infield Covers

The optional infield covers fit over the connection modules and connecting wires and provide a level of protection against water, dirt, and debris.

Kit Description	Material	Cat. No.
Curved infield cover (with Allen-Bradley logo)	Lexan EXL9330 Black	2198T-AS-CD18
Curved infield cover		2198T-AS-CD18-U
Straight infield cover		2198T-AS-CA03-U

Catalog Number Explanation

These tables provide an example catalog number explanation for an infield cover.

2198T	-	AS	-	C	D	18	-	U
a		b		c	d	e		f

a	
Bulletin Number	
Code	Description
2198T	iTRAK intelligent track system

b	
Type	
Code	Description
AS	Accessory

c	
Item	
Code	Description
C	Cover

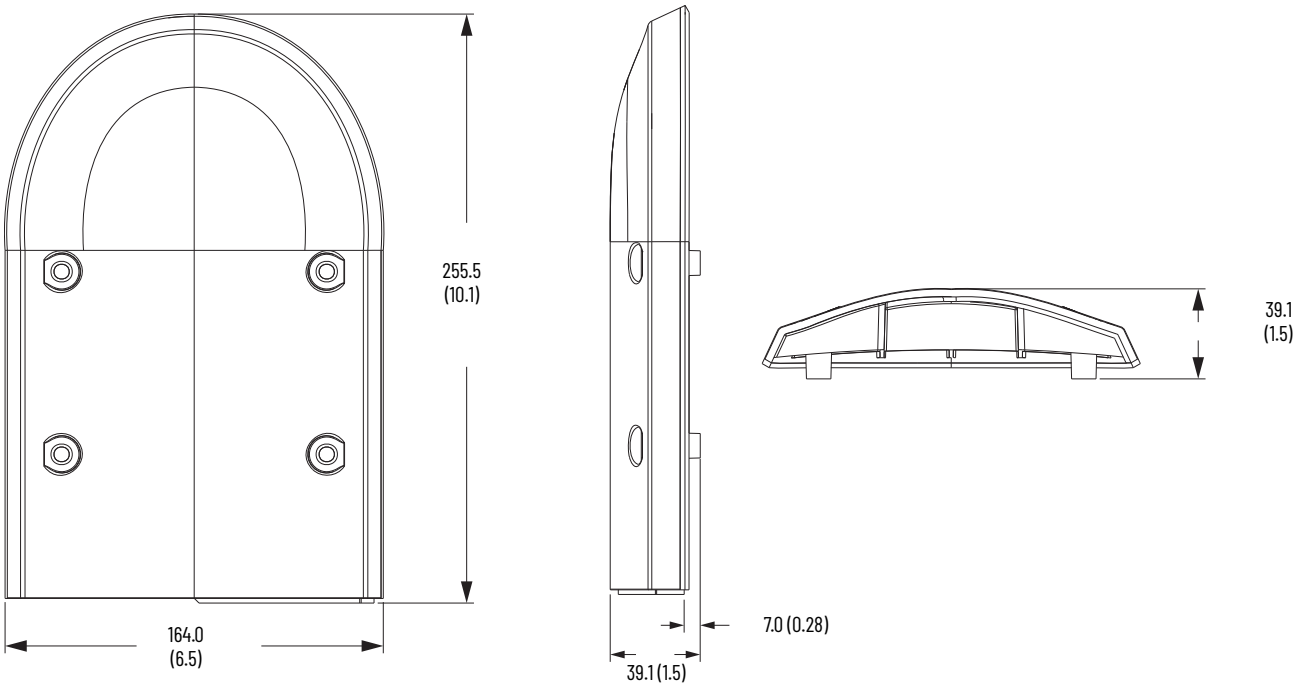
d	
Motor Module Shape	
Code	Description
A	Straight
D	Curve

e	
Motor Module Size	
Code	Description
03	300 mm (11.8 in.)
18	180°

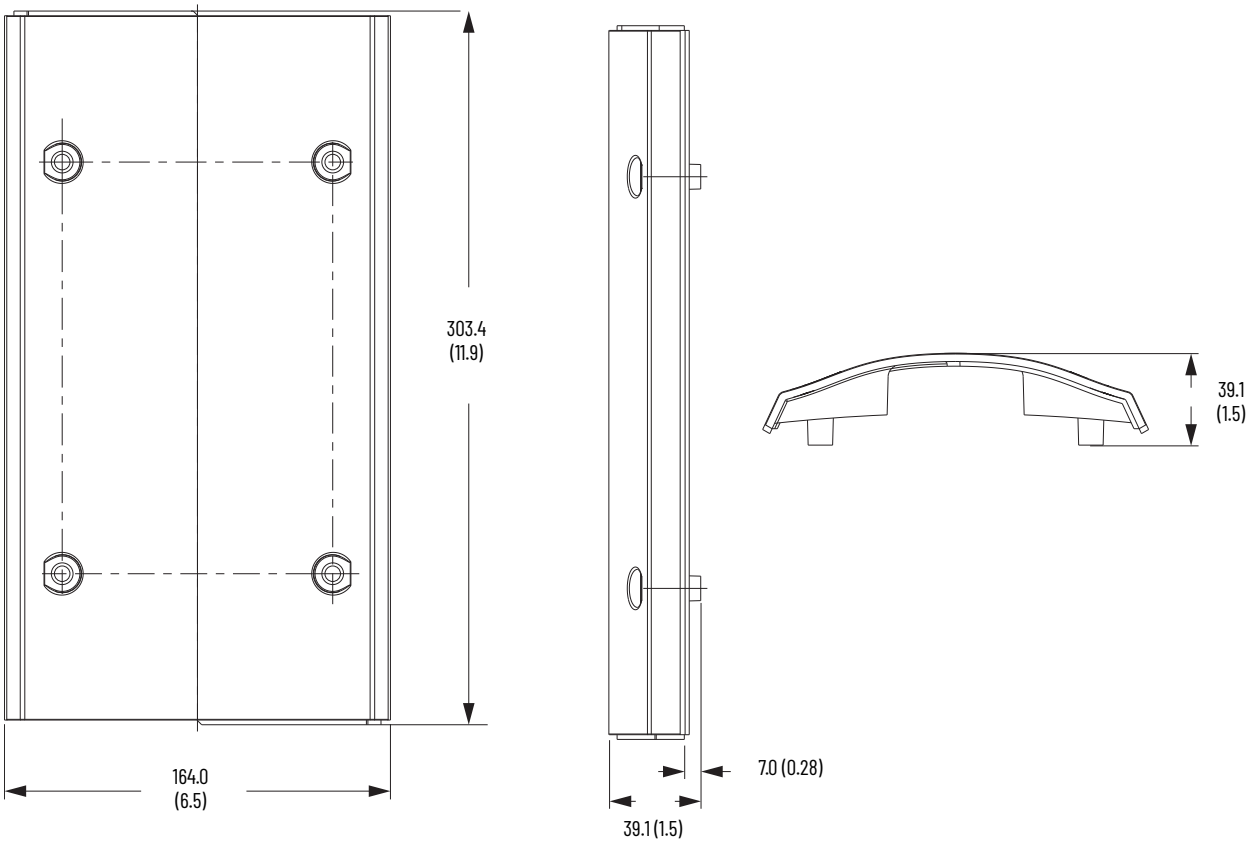
f	
Logo	
Code	Description
(blank)	Allen-Bradley
U	No logo

Dimensions

2198T-AS-CD18U or 2198T-AS-CD18 (Curved Cover with or without Allen-Bradley Logo), Dimensions in mm (in.)



2198T-AS-CA03-U, Dimensions in mm (in.)



Lubrication System

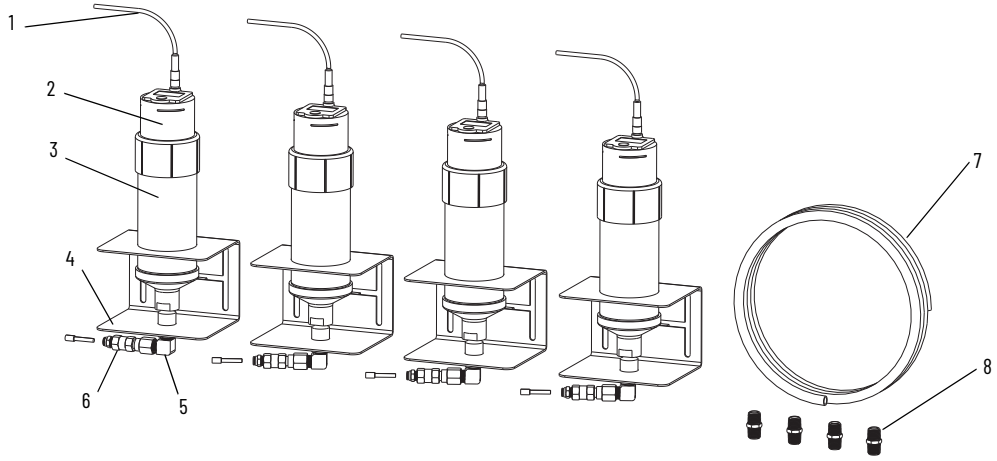
This lubrication system provides programmable lubrication pumps, mounts, and fittings to manage the lubrication that is required for your iTRAK 5730 system. The system comes with a set of straight fittings to replace the 90° angle fittings if your system design requires them. Replacement lubricant cartridges and wipers are also available. For additional information, see the iTRAK 5730 User Manual, publication 2198T-UM003, or the iTRAK Lubrication Overview.

Lubrication System Component Catalog Numbers

Component	Description	Cat. No.
iTRAK lubrication system	iTRAK lubrication system with four digitally activated pumps with mounting brackets, four lubricant cartridges, optional straight fitting, and 20 m (65.6 ft) of tubing.	2198T-AL-SYS-4
iTRAK lubrication cartridge	iTRAK lubrication system replacement cartridge containing mineral oil, 68 viscosity 250 CC (8.5 oz)	2198T-AL-RES

Lubrication System Components

2198T-AL-SYS-4 iTRAK Lubrication System Components [1]



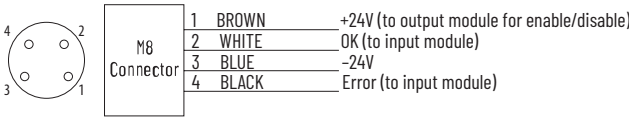
Item	Description
1	5 m (16.4 ft) Digital signal cable
2	Digitally activated pump
3	Lubricant cartridge
4	Mounting bracket
5	90° angle brass fitting
6	Check valve
7	20 m (66 ft) of tubing
8	Straight brass fitting, which can be used to replace a 90° angle fitting if your installation requires the tubing to exit the pumps vertically

Weights

Weight, Approx kg (lb)		**Cat. No.**
Each	**Set**	
1.74 (3.836)	—	2198T-AL-SYS-4
0.38 (0.838)	—	2198T-AL-RES

Lubrication Pump Digital Signal-cable Connector and Wiring

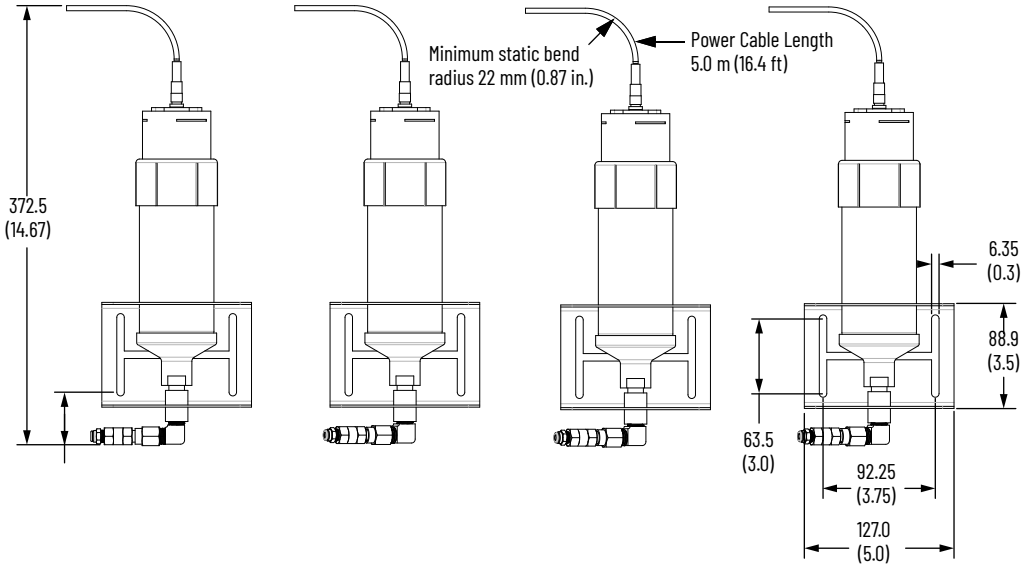
Connect the power cable conductors to an I/O module and power.



An initial coating of oil is required on the entire track before operating the iTRAK and auto lubrication systems.

Dimensions

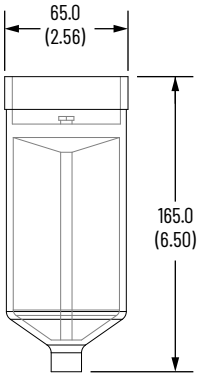
2198T iTRAK Lubrication System, Dimensions in mm (in.)



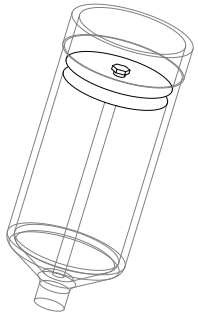
iTRAK Lubrication Cartridge

Description	Cat. No.
iTRAK lubrication system replacement cartridge containing mineral oil, 68 viscosity 250 CC (8.5 oz)	2198T-AL-RES

Dimensions in mm (in.)



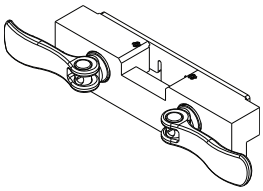
Isometric View



Tools

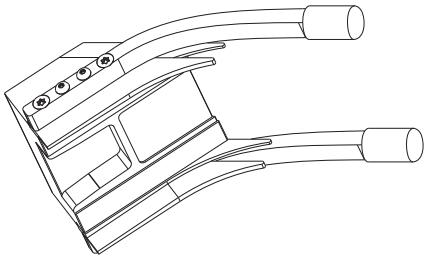
There are two main tools that are designed for the iTRAK 5730 system.

Rail Alignment Tool (2198T-A08)



The rail alignment tool is used to align the rectangular rail segments during installation to help provide an accurate transition of movers on the track.

Mover Loader Tool (2198T-A09)



The mover loader tool is used to install and remove a mover from the rail system.

iTRAK 5730 System Specifications

This section contains environmental specifications, certifications, and performance specifications.

Environmental Specifications

Assembled System Environmental Specifications

Attribute	Value
Ambient temperature	0…40 °C (32…104 °F) 0…50 °C (32…122 °F) when motor capacity is limited to 90%
Storage temperature	-40…+70 °C (-40…+158 °F)
Maximum operating altitude	• 1500 m (4921 ft) derate 3% per 300 m (984 ft) above 1500 m • 2000 m (6562 ft) max, with corner-grounded input power • 3000 m (9843 ft) max, with non corner-grounded input power

Motor Module Environmental Specifications

Attribute	Value
Liquid/dust protection	• IP65 • IP66 (when used with 2198T-AS-C*xxx* infield covers)
Vibration	5…55 Hz @ 0.35 mm (0.014 in.) double amplitude, continuous displacement; 55…500 Hz @ 2.0 g peak constant acceleration
Shock	15 g, 11 ms half-sine pulse (3 pulses in each direction of 3 mutually perpendicular directions)

Certifications

Agency Certification	Standards
c-UL-us	UL Listed to U.S. and Canadian safety standards (UL 61800-5-1, UL 2011, CSA C22.2 No 274, and CSA C22.2 No 14)
CE	European Union 2014/30/EU EMC Directive compliant with IEC 61800-3:2004 + A1:2012; Adjustable Speed Electrical Power Drive Systems Part 3; EMC Product Standard including specific test methods. European Union 2014/35/EU Low Voltage Directive compliant with IEC 61800-5-1:2007 - Adjustable Speed Electrical Power Drive Systems
TÜV	TÜV Certified for Functional Safety: up to Cat. 3 / PLe according to ISO 13849-1, SIL 3 / SILCL 3 according to IEC 61800-5-2 / IEC 61508 / IEC 62061 and can be used in applications up to these safety levels.
RCM	Australian Radiocommunications Act, compliant with: Radiocommunications Act: 1992 (including Amendments up to 2017) Radiocommunications (Electromagnetic Compatibility) Standard: 2017 Radiocommunications Labeling (Electromagnetic Compatibility) Notice: 2017
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of the Radio Waves Act, Clause 3 Registration Number: R-R-RAA-2198T
RoHS	European Union 2011/65/EU Restriction of Hazardous Substances Directive
EAC	Eurasian Economic Union (EAEU) TP TC 004/2011 Technical Regulation on Safety of Low Voltage Equipment and TP TC 020/2011 on Electromagnetic Compatibility of Technical Devices. Registration Number: ЕАЭС N RU Д-US.ГБ09.В.00266/19
Morocco	Déclaration De Conformité Du Maroc: "Arrêté ministériel n° 6404-15 du 29 ramadan 1436" Compatibilité électromagnétique des équipements NM EN 61800-5-1:2014 "Entraînements électriques de puissance à vitesse variable – Partie 5-1: Exigences de sécurité – Electrique, thermique et énergétique"
ODVA	EtherNet/IP conformance tested.
OSHA	Maximum audible noise from the servo drive system complies with OSHA standard 3074, Hearing Conservation (<85 dBA).
WEEE	European Union 2012/19/EU Directive on Waste Electrical and Electronic Equipment

Performance Specifications

All specifications are at 40 °C (104 °F) ambient unless otherwise stated.

Common Performance Specifications

Attribute	Value
Motor max surface temperature [1]	80 °C (176 °F)
Nominal air gap between motor and center line of magnet surface	1.25 ±0.25 mm (0.05 ± 0.01 in.)

(1) Measured at motor stator face (air gap).

Performance Specifications Motor Module and Mover Combination

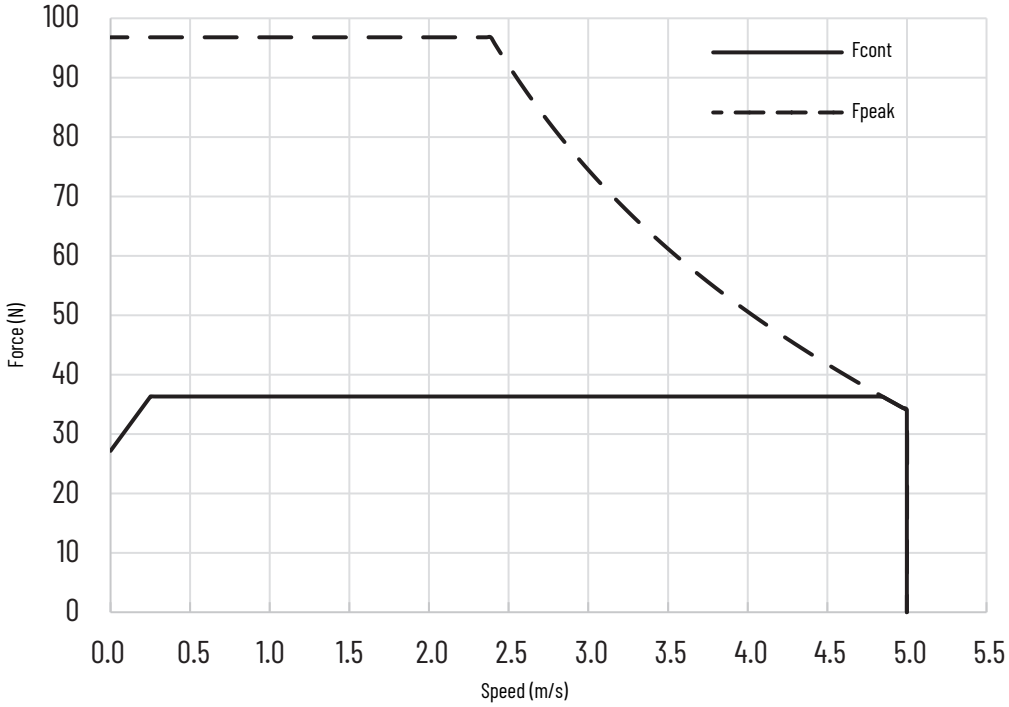
Motor Module Cat. No.	Mover Cat. No.	Magnet Length mm (in.)	Stall Force [1][2][5][6] N (lb)	Continuous Force [1][3][4][5][6] N (lb)	Peak Force [1][5][6][7] N (lb)
2198T-L20-T0303-A00-S2 (straight)	2198T-VT0304-E	30 (1.18)	27.2 (6.1)	36.3 (8.2)	96.8 (21.8)
2198T-L20-T0309-D18-S2 (curved)			24.2 (5.5)	32.3 (7.2)	81.7 (18.4)

(1) The force tolerance is ±10%.
(2) The stall speed is 250 mm/s or less.
(3) Force specifications are for one mover per section moving at 250 mm/s (0.8 ft/s) or greater.
(4) For every doubling of the number of movers per section, derate by 30%.
(5) Curve force ratings are evaluated at the motor face. The tangential force is reduced for greater center-of-gravity offsets.
(6) Curve force ratings are evaluated at the minimum radius point. Rated force approaches the straight motor performance as the radius approaches infinity.
(7) Peak force ratings are valid for up to three movers per section. For every additional mover above three, reduce the peak force by 20%.

Force Speed Curves

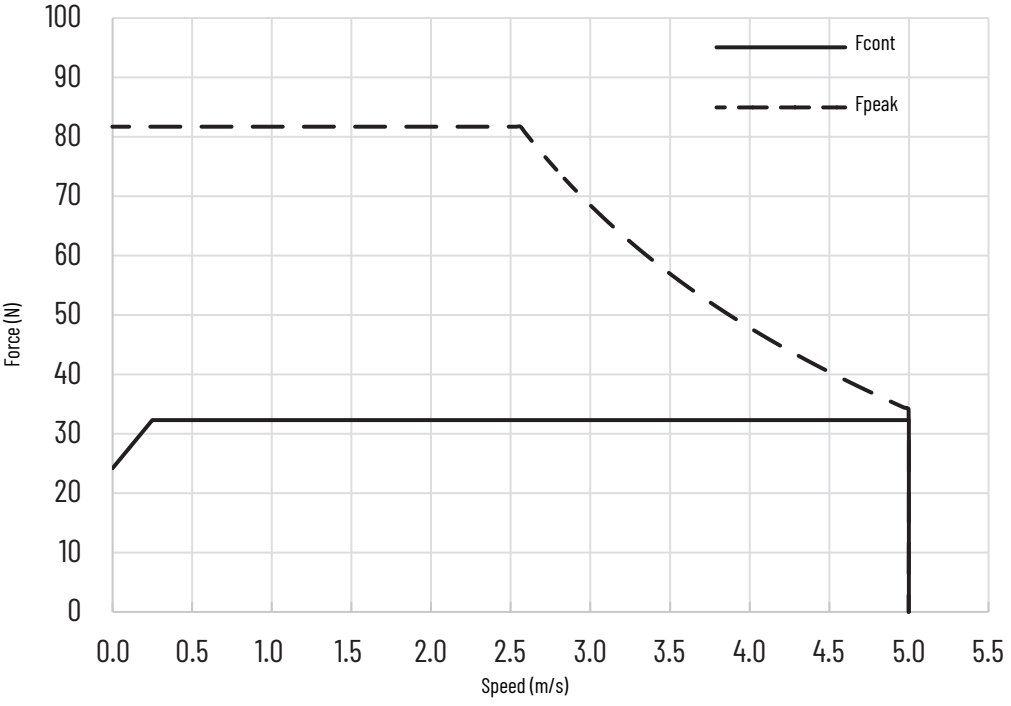
- All specifications are at 40 °C (104 °F) ambient and standard air gap unless otherwise noted.
- Maximum speed is based on mechanical bearing and voltage limitations. Consult Rockwell Automation application engineering for estimated bearing life at your application speed.
- Force specification ± 10% unless otherwise noted.
- Maximum acceleration is based on total mover weight and payload

2198T-L20-T0303-A00-S2 Straight Motor Module



Speed m/s	Force N	
0.00	27.2	96.8
0.25	36.3	
2.40		
4.80		36.3
5.00	34.0	
5.00	0.00	

2198T-L20-T0309-D18-S2 Curved Motor Module



Speed m/s	Force N	
0.00	24.2	81.7
0.25	32.3	
2.70		
5.00		34.4
5.00	0.00	0.00

Notes:

Additional Resources

These documents and other resources contain additional information about related products from Rockwell Automation.

iTRAK 5730 System and Kinetix System Resources

These resources provide information about the iTRAK® 5730 system and related Kinetix® products.

Resource	Description
iTRAK 5730 User Manual, publication 2198T-UM003	Provides information on product components, installation, configuration, troubleshooting, maintenance, safety, and firmware for the iTRAK 5730 system.
Kinetix 5700, 5500, 5300, and 5100 Servo Drives Specifications Technical Data, publication KNX-TD003	Product specifications for Kinetix Integrated Motion over the EtherNet/IP™ network, Kinetix 5700 iTRAK Power Supply, Integrated Motion over Sercos® interface, EtherNet/IP networking, and component servo drive families.
Kinetix 5700 iTRAK Power Supply and iTRAK Bus Conditioner Module Supply Installation Instruction, publication 2198T-IN001	Provides information for wiring and connecting the Kinetix 5700 iTRAK power supply to the iTRAK system.
3D CAD Models of iTRAK Components available at https://motionanalyzer.rockwellautomation.com/Products/iTrak	Provides 2D outline, assembly, and system drawings, STEP files for the movers and motor modules, and hyper links to complete system STEP files.
Servo Drive Installation Best Practices, publication MOTION-AT004	Provides a quick reference guide of installation best practices for Rockwell Automation single-axis and multi-axis servo drive systems.
System Design for Control of Electrical Noise Reference Manual, publication GMC-RM001	Information, examples, and techniques that are designed to minimize system electrical noise failures.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.
Independent Cart Technology Libraries, available on the Product Compatibility and Download Center website, rok.auto/pcdc	Provides standardized object-oriented libraries for iTRAK systems.

Programmable Controllers Resources

These resourced provide information about programmable controllers.

Resource	Description
ControlLogix 5580 and GuardLogix 5580 Controllers User Manual, publication 1756-UM543	Provides information about designing and operating a controllers system based on ControlLogix® software or GuardLogix® software, and developing applications.
GuardLogix 5580 and Compact GuardLogix 5380 Controller Systems Safety Reference Manual, publication 1756-RM012	Describes the GuardLogix 5580 and Compact GuardLogix 5380 controller systems, which are type-approved and certified for use in safety applications.
Compact GuardLogix 5380 Controllers User Manual, publication 5069-UM001	Provides information on how to install, configure, program, and use CompactLogix® controllers and Compact GuardLogix controllers.
CompactLogix 5480 Controllers User Manual, publication 5069-UM002	Provides information on how to connect, configure, program, and use CompactLogix controllers.
Integrated Motion on the EtherNet/IP Network Reference Manual, publication MOTION-RM003	Provides information on the AXIS_CIP_DRIVE attributes and the Studio 5000 Logix Designer® application control modes and methods.
Logix 5000 Controllers Motion Instructions Reference Manual, publication MOTION-RM002	Provides a programmer with details about motion instructions for use with Logix 5000® controllers.

EtherNet/IP Resources

These resourced provide information about EtherNet/IP systems.

Resource	Description
EtherNet/IP Network Devices User Manual, publication ENET-UM006	Describes how to configure and use EtherNet/IP devices to communicate on the EtherNet/IP network.
EtherNet/IP Device Level Ring Application Technique, publication ENET-AT007	Describes Device Level Ring (DLR) topologies, configuration considerations, and diagnostic methods.
Integrated Motion on the EtherNet/IP Network Configuration and Startup User Manual, publication MOTION-UM003	Provides information on configuring and troubleshooting your ControlLogix EtherNet/IP network modules, and CompactLogix EtherNet/IP network modules.

You can view or download publications at rok.auto/literature.

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, Knowledgebase, and product notification updates.	rok.auto/support
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Technical Documentation Center	Quickly access and download technical specifications, installation instructions, and user manuals.	rok.auto/techdocs
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	rok.auto/pcdc

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Rockwell Automation maintains current product environmental compliance information on its website at rok.auto/pec.

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