

iTRAK System

Bulletin 2198T

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Summary of Changes

This manual contains new and updated information as indicated in this table.

Topic	Page
Added 2198T-GUSB USB Digital I/O to the example BOMs	9, 10
Added Generation 3 gateway Position Loop Update Rate table	58
Added USB Digital I/O dimension drawing	62
Restored power cables 2198T-CHBP8S8-12P3 and 2198T-CHBP8S8-12P6	69

This publication provides catalog numbers and product specifications, including performance, environmental, certifications, load force, and dimension drawings for the iTRAK® system and components.

Use this publication with the Kinetix® Motion Control Selection Guide, publication [KNX-SG001](#), to help you decide on the motion-control product families that the best suit for your system requirements.

About the iTRAK System

The iTRAK System is a highly flexible and innovative linear-motion solution with independent control of multiple movers using Studio 5000 Logix Designer® application.

The iTRAK system is composed of motor modules, mounting plates, bearing rails, and movers. The motor modules are an integrated drive motor system with feedback. Mounting plates can be attached to the sides of motor modules and bearing rails can be attached to the mounting plates. Movers have independent linear motor magnets and bearings, and multiple movers can be operated on a motor module at any time. Movers can be synchronized or independently controlled, however they are programmed.

The IP65 environmental rated motor modules are available with both straight and curved motors, and more movers can be added as the system grows. The movers can be stopped and positioned on the curves with high accuracy. When the curves are applied to create an oval, new machine shapes and dynamic performances are possible. The iTRAK system can be arranged and mounted in many configurations, including horizontal carousel, vertical over-under, and stand-up configurations. The system is modular, scalable, and can be expanded to well over 10 meters. Even on large systems, each mover still retains independent servo control. The system can be built into other geometries such as rectangles.

The iTRAK system can produce:

- speeds greater than 5 m/s (16.4 ft) with appropriate bearing design
- acceleration up to 98 m/s² (10 g) with appropriate bearing design
- stop repeatability within $\pm 30 \mu\text{m}$ (± 0.00138 in.)

The iTRAK system can produce high forces. The different combinations of magnet sizes and motor coil sizes produce nine different force speed options.

The gateway facilitates communication between the iTRAK system and controller and provides abstraction between physical and virtual mover axes. The iTRAK system requires specialized power supplies that convert three-phase AC power to the appropriate DC bus voltage. The USB I/O module provides discrete communications between the power supplies and the gateway.

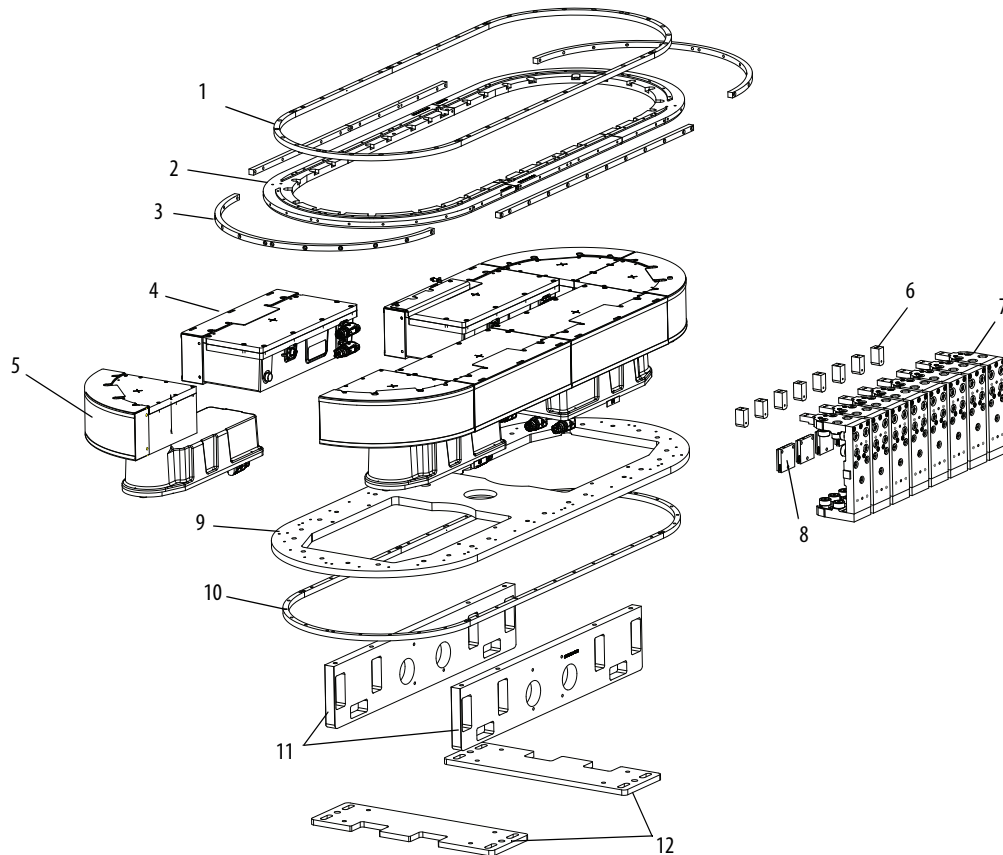
An animation of the iTRAK system can be viewed at <https://www.youtube.com/watch?v=1KA0EpQXgx8>.

Hardware Configuration

The following graphics show the servo and mechanical components of iTRAK system for TriMax and steel vee-wheel bearings.

System Components

Exploded View of the Servo and Mechanical Components with TriMax Bearings

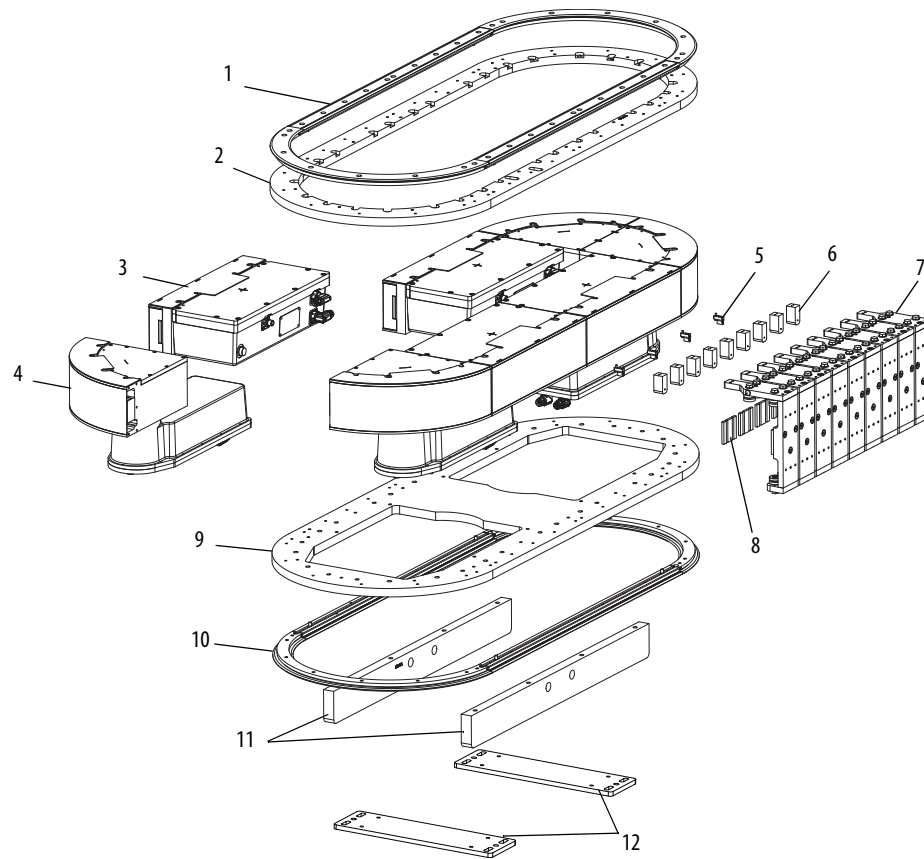


Item	Description
1	Top bearing rail
2	Top frame plate
3	Transverse bearing rail
4	Straight motor modules
5	Curved motor modules
6	Position magnets

Item	Description
7	Movers
8	Mover magnets
9	Bottom frame plate
10	Lower bearing rail
11	Spine bars
12	Mounting plate ⁽¹⁾

(1) Rockwell Automation offers the iTRAK system with these plates for all standard orders, however, if you have experience, you can opt to build the iTRAK system yourself. If you build the iTRAK system yourself, you have to develop your own plates.

Exploded View of the Servo and Mechanical Components with Steel Vee-wheel Bearings



Item	Description
1	Top bearing rail
2	Top frame plate
3	Straight motor modules
4	Curved motor modules
5	Lubrication wipers
6	Position magnets

Item	Description
7	Movers
8	Mover Magnets
9	Bottom frame plate
10	Lower bearing rail
11	Spine bars
12	Mounting plate ⁽¹⁾

(1) Rockwell Automation offers the iTRAK system with these plates for all standard orders, however, if you have experience, you can opt to build the iTRAK system yourself. If you build the iTRAK system yourself, you have to develop your own plates.

Electromechanical Components of an iTRAK System

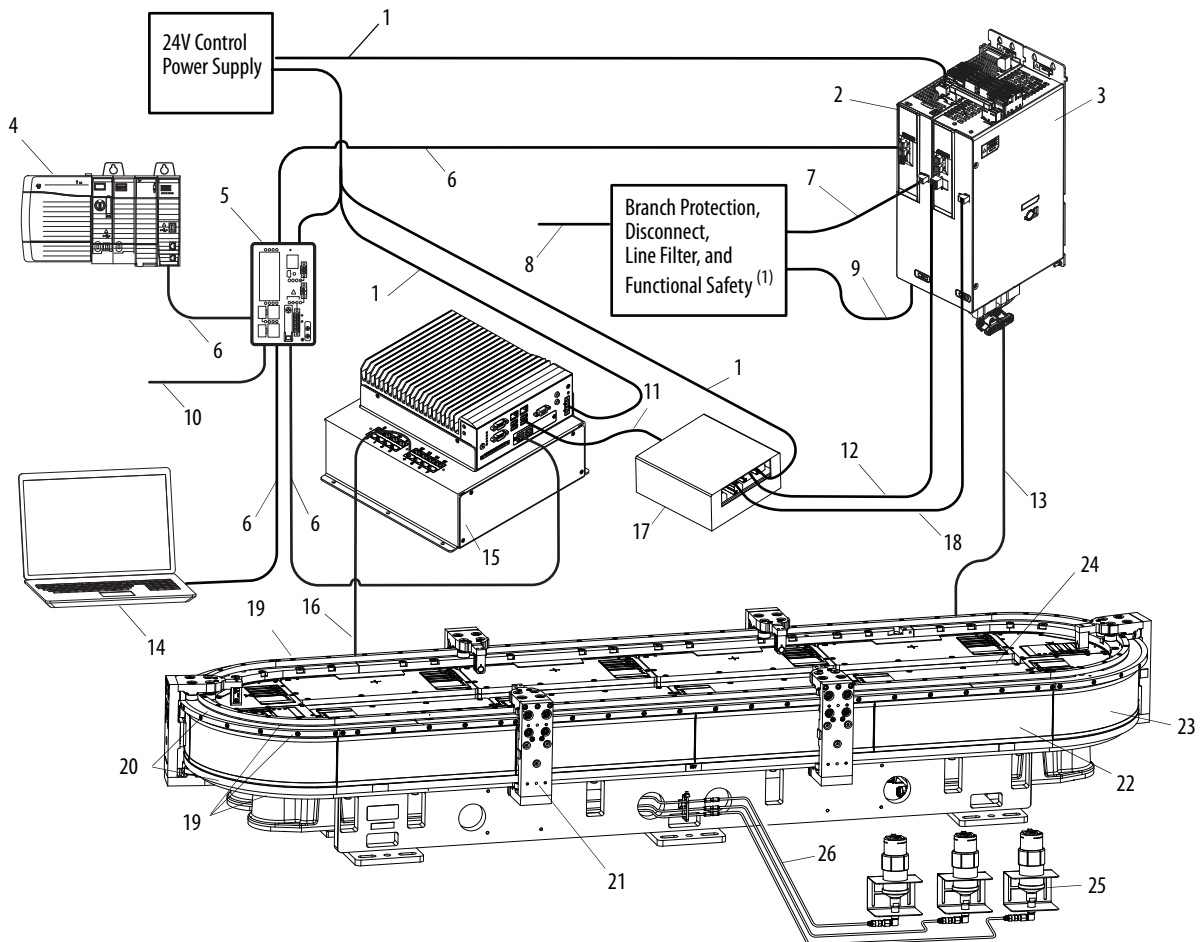
iTRAK System Component	Description
Motor module	The motor module is an integrated drive and motor coil unit; it is referred to as a section in the firmware. Motor modules are available in straight and curved shapes.
Track frame	The track frame is designed for your specific application. The track frame in combination with straight motor modules, curved motor modules, and bearing rails creates the track.
Bearing rails	The bearing rails attach to the track frame. They provide precision guidance for the movers.
Mover	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.
Mover magnets	Mover magnet plates can be used to build your own movers to optimize weight or bearing solutions. Depending on the mover catalog number, these magnet plates can be included with the mover or sold separately.
Position magnets	Position magnets are used to actuate sensors in the track. These magnets are typically sold separately from the mover, but are pre-installed on fully assembled systems.

Power and Control Components of an iTRAK System

iTRAK System Component	Description
Power circuitry and components	The iTRAK power supply connects to the Kinetix 5700 power supply and generates the voltages that are required for the iTRAK system from the full bus voltage. It is used with other Kinetix 5700 components and branch circuit protection.
Bus conditioner module	The bus conditioner module is mounted near the iTRAK for each power cable. It incorporates additional filtering and capacitance to improve dynamic servo response and increase reliability of the system.
Power cables	The power bus cables are daisy chained between the motor modules. The number of motor modules on one daisy chain is system-dependent.
Gateway	The gateway provides communication interface between the Logix controller and all motor modules. It also provides more motion processing for the motor modules.
USB I/O	Executes discrete communication between the gateway and power components.
Communication cables	Each motor module in the system has a communication cable that is connected directly to the gateway. Use only the cables that are provided with your system and referenced in this user manual.
Logix controller platform	CompactLogix™ controller or ControlLogix® controller with Ethernet connection that supports Integrated Motion on EtherNet/IP™
Studio 5000® environment	Studio 5000 Logix Designer application, version 21 or later, provides support to program, commission, and maintain the CompactLogix and ControlLogix controller families that you use with iTRAK system.

Typical iTRAK System

The following graphic shows a typical iTRAK system with TriMax bearings. Your system can vary in the quantity and layout of each component, but follows the same concept.



(1) See Kinetix 5700 Servo Drives User Manual, publication [2198-UM002](#), for more information on these components.

Item	Description	Item	Description	Item	Description
Items that are not supplied with system.					
1	24V control power	12	iTRAK power supply I/O connections	19	Bearing rails
2	Kinetix 5700 power supply	18	iTRAK ready connection	21	Mover
4	Controller	14	Studio 5000 Programming Interface	22	Straight motor module
5	Managed Ethernet Switch	Items included in quote.			
6	Machine Ethernet	3	Kinetix 5700 iTRAK power supply	23	Curved motor module
7	Contactor enable signal line	11	USB cable	24	iTRAK bus conditioner (not visible mounted between spine bars)
8	Mains power (460V nom)	13	Motor module power bus and control power (number of cables vary by system)	Item included in system sale.	
9	Kinetix 5700 line voltage	15	Gateway	20	Track frame
10	Plant Ethernet	16	Communication cable to motor module (one cable per motor module)	Recommended additional items.	
		17	Digital USB I/O module	25	Lubrication pump (x3)
				26	Lubrication tube

Catalog Number Explanation - iTRAK System

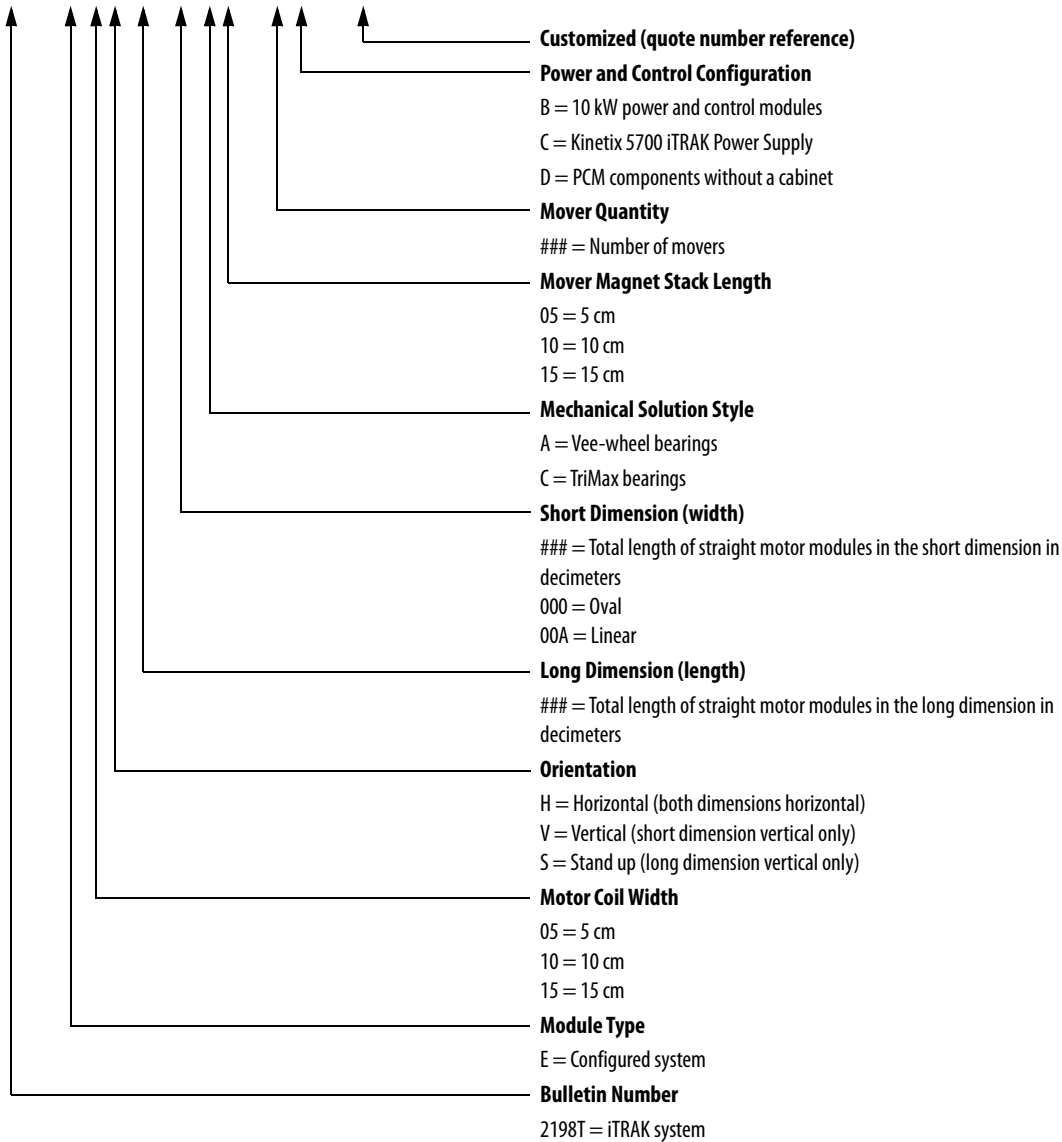
The iTRAK system can be purchased fully assembled or as individual components that you assemble. This catalog number explanation describes assembled systems. The catalog numbers consist of characters, each of which identifies a specific option for that component. Use the catalog number explanation to understand the configuration of your iTRAK system.

iTRAK System Catalog Number Example

Catalog Number	Description
2198T-E05H024000A05-020C-Qxxxx	iTRAK system, horizontal, 2.4 m (7.87 ft) oval, (20) 50 x 50 movers

System-level Catalog Number Explanation with Additional Special Order Options

2198T - E xx x xxx xxx x xx - xxx x - Qxxxx



System Level Bill of Materials for a iTRAK System with TriMax Bearings

Example of a High-level BOM for Catalog Number 2198T-E05H024000C05-020C-Qxxxx

Cat. No.	Description	Qty
2198T-L16-T0504-A00N-2E1E-NS	iTRAK linear module, 50 mm (1.99 in.) wide, 400 mm (15.7 in.) long, integral multi-phase iTRAK servo drive, integral multiple targets, absolute position sensor, IP65 with stainless steel cover, M23 connector	12
2198T-L16-T0504-B09L-2E1E-NS	iTRAK curve module, intelligent, 50 mm (1.99 in.) wide, 90-deg arc, 254 mm (10 in.) radius, integral multi-phase iTRAK servo drive, integral multiple targets, absolute position sensor, IP65 with stainless steel cover, M23 connector, left	2
2198T-L16-T0504-B09R-2E1E-NS	iTRAK curve module, intelligent, 50 mm (1.99 in.) wide, 90-deg arc, 254 mm (10 in.) radius, integral multi-phase iTRAK servo drive, integral multiple targets, absolute position sensor, IP65 with stainless steel cover, M23 connector, right	2
2198T-VT0505-C	iTRAK mover, 50 mm (1.99 in.) wide, 50 mm (1.99 in.) long (excludes position magnet and lubricator)	20
2198T-NN-318	iTRAK position magnet, 31.8 mm (1.25 in.), north	10
2198T-NS-318	iTRAK position magnet, 31.8 mm (1.25 in.), south	10
2198T-AL-SYS	iTRAK lubrication system with three digitally activated pumps with mounting brackets, three lubricant cartridges, and 20 m (66 ft) of tubing	1
2198T-W25K-ER	Kinetix 5700 iTRAK power supply	1
2198T-WBCMOD	iTRAK bus conditioner	2
2198T-G12-016-E	Gateway enclosure assembly (with 2198T-G02-016-E gateway)	1
2198T-GUSB	USB digital I/O	1
2198T-CHBFLS8-12AA06	Cable, intelligent power 6.0 m (19.7 ft), M23, Flying Lead	1
2198T-CHBFLS8-12AA09	Cable, intelligent power 9.0 m (29.5 ft), M23, Flying Lead	1
2198T-CHBP8S8-12P3	Cable, intelligent power, jumper 0.380 m (1.25 ft), M23	8
2198T-CHBP8S8-12P6	Cable, intelligent power, jumper 0.600 m (1.97 ft), M23	6
2198T-CC-08	Ethernet cord-set, M12 A-code, RJ45 plug, 8-pin, 8 m (26.2 ft)	16
626834-2400	Kit, Plate, iTRAK, standard, base, spine bars, top plates, and customer mounting plates	1

System Level Bill of Materials for a iTRAK System with Vee-wheel Bearings

Example of a High-level BOM for Catalog Number 2198T-E05H024000B05-020C

Cat. No.	Description	Qty
2198T-L16-T0504-A00N-2E1E-NS	iTRAK linear module, 50 mm (1.99 in.) wide, 400 mm (15.7 in.) long, integral multi-phase iTRAK servo drive, integral multiple targets, absolute position sensor, IP65 with stainless steel cover, M23 connector	12
2198T-L16-T0504-B09L-2E1E-NS	iTRAK curve module, intelligent, 50 mm (1.99 in.) wide, 90-deg arc, 254 mm (10 in.) radius, integral multi-phase iTRAK servo drive, integral multiple targets, absolute position sensor, IP65 with stainless steel cover, M23 connector, left	2
2198T-L16-T0504-B09R-2E1E-NS	iTRAK curve module, intelligent, 50 mm (1.99 in.) wide, 90-deg arc, 254 mm (10 in.) radius, integral multi-phase iTRAK servo drive, integral multiple targets, absolute position sensor, IP65 with stainless steel cover, M23 connector, right	2
2198T-VT0505-A	iTRAK mover, 50 mm (1.99 in.) wide, 50 mm (1.99 in.) long (excludes position magnet and lubricator)	20
2198T-NN-318	iTRAK position magnet, 31.8 mm (1.25 in.), north	10
2198T-NS-318	iTRAK position magnet, 31.8 mm (1.25 in.), south	10
2198T-AL-PAD-V	iTRAK lubrication wipers	5
2198T-AL-SYS	iTRAK lubrication system with three digitally activated pumps with mounting brackets, three lubricant cartridges, and 20 m (66 ft) of tubing	1
2198T-W25K-ER	Kinetix 5700 iTRAK power supply	1
2198T-WBCMOD	iTRAK bus conditioner	2
2198T-G12-016-E	Gateway enclosure assembly (with 2198T-G02-016-E gateway)	1
2198T-GUSB	Digital USB I/O module	1
2198T-CHBFLS8-12AA06	Cable, intelligent power 6.0 m (19.7 ft), M23, Flying Lead	1
2198T-CHBFLS8-12AA09	Cable, intelligent power 9.0 m (29.5 ft), M23, Flying Lead	1
2198T-CHBP8S8-12P3	Cable, intelligent power, jumper 0.380 m (1.25 ft), M23	8
2198T-CHBP8S8-12P6	Cable, intelligent power, jumper 0.600 m (1.97 ft), M23	6
2198T-CC-08	Ethernet cord-set, M12 A-code, RJ45 plug, 8-pin, 8 m (26.2 ft)	16
920435-2400	Kit, Plate, iTRAK, standard, base, spine bars, top plates, straight and curve rail, and customer mounting plates	1

Design Considerations

Use the following guidelines to help design the iTRAK system that includes an iTRAK power supply.

Basic System Design Requirements and Limitations

Attribute	Requirement
Studio 5000 Automation Engineering & Design Environment®	Version 21.00 or later
Number of movers per controller, max	96
Motor modules per gateway, max	64
Temperature on the surface of the motor face, max	80 °C (176 °F)
Number of modules connected on one power cable, max	Maximum number of cascaded motor modules is 16 ⁽¹⁾

(1) The maximum number of modules per cable can be less depending on power consumption. Contact Application Engineering for limitations.

Controller Compatibility

Use a CompactLogix controller or ControlLogix controller with Ethernet connection that supports Integrated Motion on EtherNet/IP with your iTRAK system. Studio 5000 Logix Designer application, version 21 or later, provides support to program, commission, and maintain the CompactLogix and ControlLogix controller families that you use with iTRAK system.

Compatible Controllers

Platform	Controller
ControlLogix system	5580 ⁽¹⁾
	5570 ⁽²⁾
CompactLogix controllers	5380 ⁽¹⁾ ⁽³⁾
	5370 ⁽³⁾
	5480 ⁽¹⁾

(1) The minimum firmware revision to use these processors is 1.103.

(2) The communication to the gateway must be through 1756-ENxT modules capable of integrated motion on the EtherNet/IP network.

(3) 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.

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

If needed, see [Using Multiple iTRAK Power Supplies](#) for information on how to connect a system with multiple iTRAK power supplies.

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. Call a Rockwell Automation application engineer to size your system.

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.
- 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 iTRAK Power Supply to Motor Module Cable Length](#).

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

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. See [Control Power Current Specifications on page 64](#) for the amount of current required for the iTRAK power supply and [2198T Straight and Curved Motor Modules on page 21](#) 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 take in 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.

By using multiple cables the iTRAK power supply can deliver control power to more iTRAK motor modules, see [Maximum iTRAK Power Supply to Motor Module Cable Length](#).

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 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 [Number of Series A Motor Modules Connected to a Single Input Cable](#) or [Number of Series B Motor Modules Connected to a Single Input Cable](#) 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 output A and B.

Number of Series A Motor Modules Connected to a Single Input Cable

Cable Length ⁽¹⁾	Motor Module Quantity										
	1	2	3	4	5	6	7	8	9	10	11
3 m (9.8 ft)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Red	Red
6 m (19.7 ft)	Green	Green	Green	Green	Green	Green	Green	Green	Red	Red	Red
9 m (29.5 ft)	Green	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red
12 m (39.4 ft)	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red
15 m (49.2 ft)	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red
30 m (98.4 ft)	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red

(1) The cable lengths that are shown are for the cable from the iTRAK power supply to the first motor module. It is assumed that the subsequent motor modules are connected using short motor module-to-motor module cables.

Number of Series B Motor Modules Connected to a Single Input Cable

Cable Length ⁽¹⁾	Motor Module Quantity																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
3 m (9.8 ft)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Red	Red
6 m (19.7 ft)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Red	Red	Red
9 m (29.5 ft)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red
12 m (39.4 ft)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red
15 m (49.2 ft)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red
30 m (98.4 ft)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red

(1) The cable lengths that are shown are for the cable from the iTRAK power supply to the first motor module. It is assumed that the subsequent motor modules are connected using short motor module-to-motor module cables.

Choose a 2198-Pxxx Kinetix 5700 Power Supply

The iTRAK power supply connects to the Kinetix 5700 DC-bus created by the 2198-Pxxx, Kinetix 5700 power supply. The Kinetix 5700 power supply must be sufficiently sized to support the iTRAK power supply load and any other servo drive load.

Sizing an iTRAK system involves many variables. Call a Rockwell Automation application engineer to size your system.

The iTRAK power supply creates two power buses that are used by iTRAK motor modules. The topology of the iTRAK motor modules uses the center voltage bus as a return, and the upper and lower as sources.

Once the output current requirements of the iTRAK power supplies are known, the amount of power that is required from the Kinetix 5700 power supply for the iTRAK power supplies is calculated by using this equation.

$$P \text{ (Watts)} = \text{Output Current} * (\text{Nominal Bus Voltage 1} + \text{Nominal Bus Voltage 2}) + \text{iTRAK Power Supply Losses}$$

See [Power Dissipation Specifications on page 65](#), for iTRAK power supply losses.

Any other Kinetix 5700 components that are connected to the Kinetix 5700 power supply bus must be added to this number, see Kinetix Servo Drives Specifications Technical Data, publication [KNX-TD003](#).

[Bus Output \(IDC\) Specifications](#) shows the nominal bus voltages and currents of the iTRAK power supply.

Bus Output (IDC) Specifications

Connector	Continuous Output Current	Peak Output Current	Nominal H to DC-Voltage	Nominal L to DC- Bus Voltage
Bus Output (IDC) ⁽¹⁾	12.5 A	25.0 A	330V DC	165V DC

(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.

The Kinetix 5700 power supply that is used must be able to deliver the total power to be consumed. The Kinetix 5700 Servo Drives User Manual, publication [2198-UM002](#), has more information.

Kinetix Servo Drives Specifications Technical Data, publication [KNX-TD003](#), contains the power ratings of the 2198-Pxxx DC-bus power supplies. Their power ratings are derived assuming 460V AC line input; based on your line voltage scale their power rating.

Verify that the shunting capacity of the system that the 2198-Pxxx Power Supply manages is not exceeded. For further details, see [Shunting Capacity](#).

Shunting Capacity

The iTRAK power supply can move regenerative energy from the iTRAK system back to the Kinetix 5700 DC bus. The Kinetix 5700 power supply turns on a shunt to limit DC bus voltage if the DC bus voltage gets too high. The amount of shunting capacity available depends on which 2198-Pxxx Kinetix 5700 power supply that is used and whether an external shunt is present. See the Kinetix 5700 Servo Drives User Manual, publication [2198-UM002](#), for more information on shunting capacity.

Kinetix 5700 System Design

When the number of iTRAK power supplies and type of 2198-Pxxx Kinetix 5700 power supplies are known, the Kinetix 5700 system design can be determined.

The important items to be determined and designed are listed here.

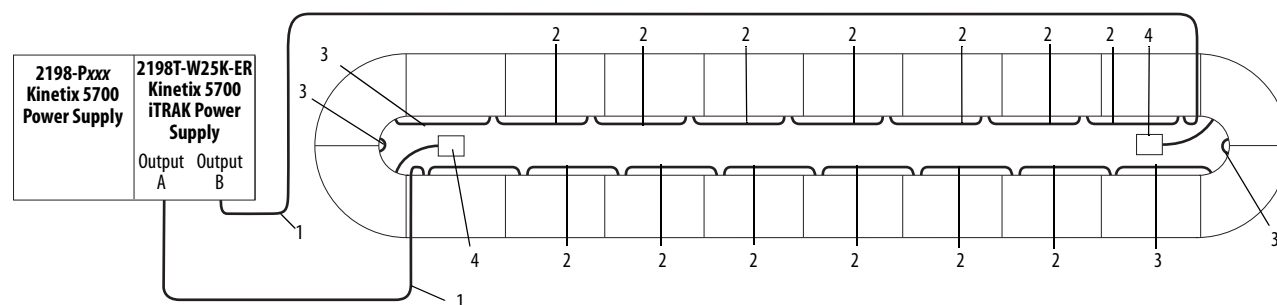
- Connections of the Kinetix 5700 components including the iTRAK power supply
- Cabinet selection
- Cabinet layout and wiring
- Other components as required such as contactor and line filter

See the Kinetix 5700 Servo Drives User Manual, publication [2198-UM002](#), for information regarding design of these Kinetix 5700 components.

Wire the iTRAK System

An iTRAK power supply can power up to 20 Series A or 32 Series B motor modules depending on current requirements. See [Wiring an iTRAK System with an iTRAK Power Supply](#) for a typical layout and how to wire a system that uses one iTRAK power supply. Detailed wiring the connections to the iTRAK power supply are shown in Kinetix 5700 iTRAK Power Supply Installation Instructions, publication [2198T-IN001](#).

Wiring an iTRAK System with an iTRAK Power Supply



Item	Description
1	2198T-CHBFLS8-12AAxx, iTRAK power supply to motor module cable
2	2198T-CHBP8S8-12P3, power cable
3	2198T-CHBP8S8-12P6, power cable
4	2198T-WBCMOD, iTRAK bus conditioner

Wiring the connections from multiple iTRAK power supplies is shown in [Connect Multiple iTRAK Power Supplies in a System on page 16](#) and [Wiring Multiple iTRAK Power Supplies to the Digital USB I/O Module on page 17](#).

See the Kinetix 5700 Servo Drives User Manual, publication [2198-UM002](#), for details on how to wire the rest of the Kinetix 5700 system. Information on how to wire to the iTRAK power supply is found in Kinetix 5700 iTRAK Power Supply Installation Instructions, publication [2198T-IN001](#).

Using Multiple iTRAK Power Supplies

Follow these guidelines when using multiple iTRAK power supplies in an iTRAK system.

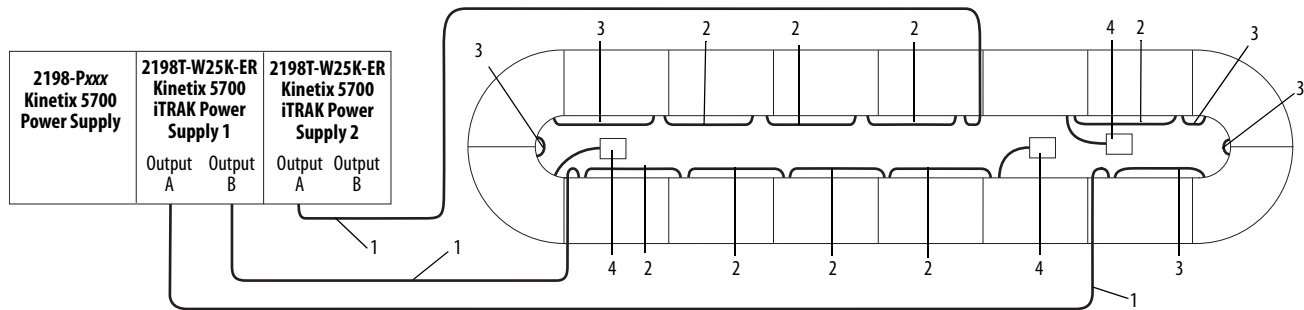
When using multiple iTRAK power supplies, the system must be parsed into separate electrical pieces for each of the iTRAK power supplies.

The iTRAK power supply is not designed to have the output buses of multiple power supplies connected together to create one bus of higher current capacity.

IMPORTANT In systems that use multiple iTRAK power supplies, make sure that the output bus of one power supply is never connected to the output bus of another power supply.

Use the following scenario to understand the use of multiple iTRAK power supplies for systems that require a higher current draw. In this example, part of the track has a high-power demand, and the rest of the track has a lower power demand. In this case iTRAK power supply 1 powers the first group of ten motor modules, while iTRAK power supply 2 provides power to the remaining six motor modules. The DC buses of these two groups are electrically isolated from each other as shown in [Connect Multiple iTRAK Power Supplies in a System](#).

Connect Multiple iTRAK Power Supplies in a System



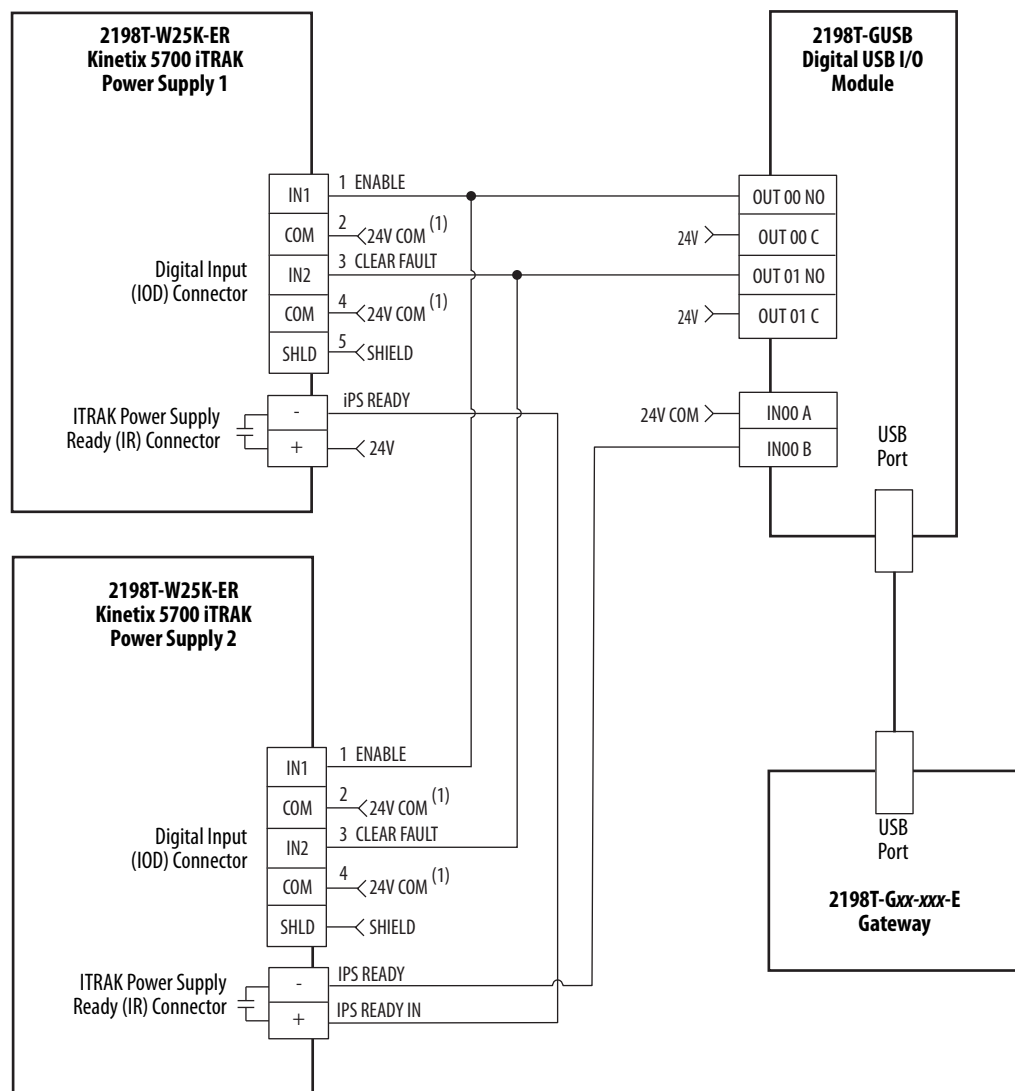
Item	Description
1	2198T-CHBFLS8-12AAxx, iTRAK power supply to motor module cable
2	2198T-CHBP8S8-12P3, power cable
3	2198T-CHBP8S8-12P6, power cable
4	2198T-WBCMOD iTRAK bus conditioner



ATTENTION: Power from iTRAK power supply 1 must not be connected to the power from iTRAK power supply 2.

One gateway can interface to multiple iTRAK power supplies through the Digital USB I/O Module. When you use this configuration, connect the Enable and Clear Fault signals in parallel, and connect the IPS Ready signal in series through all iTRAK power supplies as shown in [Wiring Multiple iTRAK Power Supplies to the Digital USB I/O Module](#).

Wiring Multiple iTRAK Power Supplies to the Digital USB I/O Module



(1) Only one connection to 24V Com is required for each iTRAK power supply. Either pin 2 or pin 4 must be connected, it is not necessary to connect both.

iTRAK System Track

The track is composed of the upper and lower frame, spine rails, motor modules, bearings, and movers. The weights that are shown here are the average weight of the track per meter (foot).

Weights

Frame Width	Weight, Approx
50 mm	123 kg/m (83 lb/ft)
100 mm	156 kg/m (105 lb/ft)
150 mm	189 kg/m (127 lb/ft)

Motor Module

The motor module is an integrated drive and motor coil unit; it is referred to as a section in the firmware and software. Motor modules are available in straight and curved shapes. The motor module includes three status indicators: control power, motor power, and communication.

Bulletin 2198T iTRAK motor modules are compatible and can be mixed mechanically, regardless of the series.

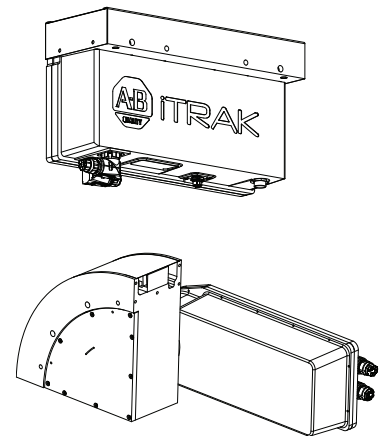
- If you have any series B modules in your system, the minimum firmware revision is 1.107 for the entire system.
- There are minor differences in labeling and appearance but the modules are functionally the same

2198T Straight and Curved Motor Modules

Cat. No.	Motor Module Type	Motor Length mm (in.)	Motor Coil Width mm (in.)
2198T-L16-T0504-A00N-2E1E-NS	Straight	400 (15.7)	50 (2.0)
2198T-L16-T0504-B09L-2E1E-NS	Curved left		
2198T-L16-T0504-B09R-2E1E-NS	Curved right		
2198T-L16-T1004-A00N-2E1E-NS	Straight		100 (4.0)
2198T-L16-T1004-B09L-2E1E-NS	Curved left		
2198T-L16-T1004-B09R-2E1E-NS	Curved right		
2198T-L16-T1504-A00N-2E1E-NS	Straight		150 (5.9)
2198T-L16-T1504-B09L-2E1E-NS	Curved left		
2198T-L16-T1504-B09R-2E1E-NS	Curved right		

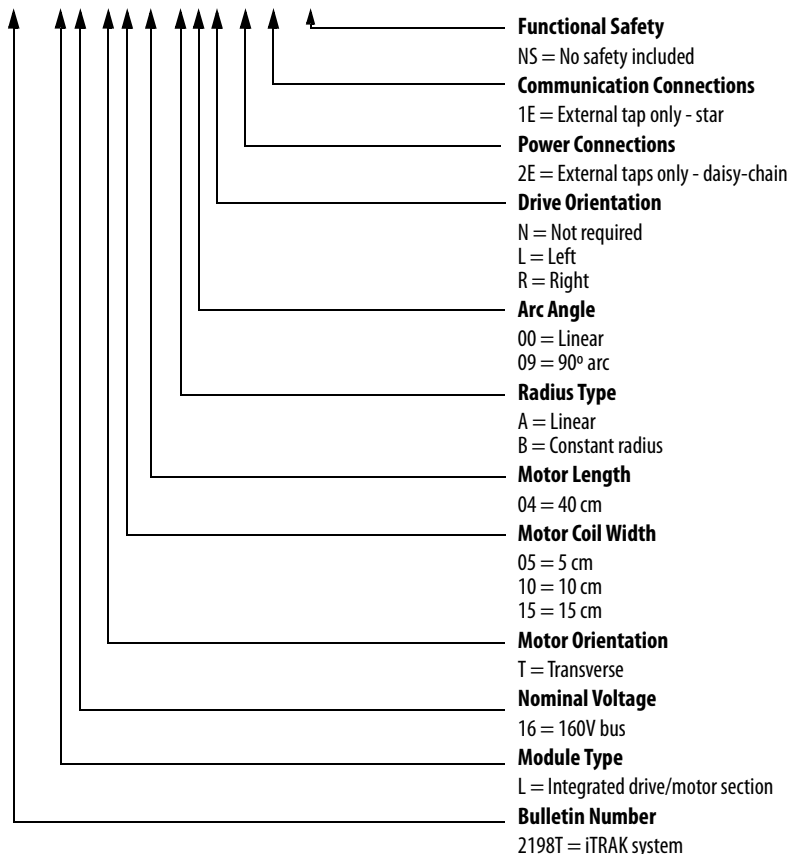
Motor Modules

(catalog numbers 2198T-L16-T0504-A00N-2E1E-NS and 2198T-L16-T0504-B09L-2E1E-NS are shown)

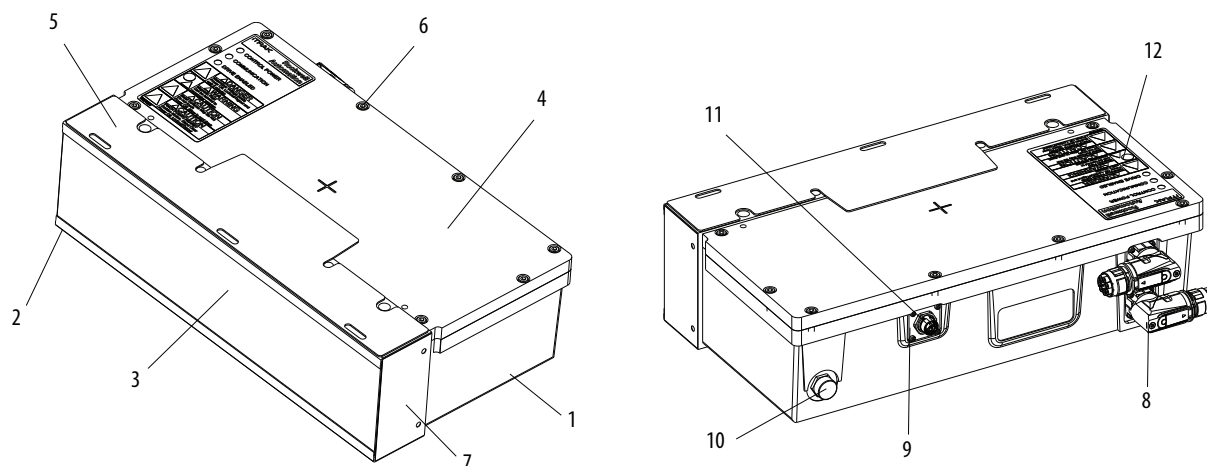


Catalog Number Explanation

2198T - L 16 - T xx 04 - x xx x - 2E 1E - NS



Material Specifications



Item	Description	Material ⁽¹⁾	Finish
1	Electronics enclosure	Aluminum 356-T6	Clear anodize
2	Motor frame	Aluminum extrusion 6063-T651	Clear anodize
3	Motor cover	316 Stainless steel	None
4	Position sensor cover	Acetal copolymer	None

Item	Description	Material⁽¹⁾	Finish
5	Assembly spacer	316 Stainless steel	None
6	Screws	A2 Stainless steel	None
7	Frame end plate	C1018 Steel	Electroless nickel
8	Power connectors	Zinc die-cast	Chromate
9	Bulkhead plate	304 Stainless steel	None
10	Air exhaust valve	316 Stainless steel	None
11	Data connector	Zinc die-cast	Nickel plated
12	Label	Lexan	None

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

Technical Specifications

2198T Straight and Curved Motor Modules

Attribute	2198T-L16-Txxxx-xxxx-2E1E-NS
DC motor module bus	
Input voltages	330V DC and 165V DC
Input current	8 A rms, max
Control power DC input voltage	24V DC
Control power DC input current	0.45 A, max
Motor stator insulation class	Class B, 130 °C (266 °F)
Cascaded input/output DC motor module power bus	
Input voltages	330V DC and 165V DC
Input current	25 A rms
Control power DC input voltage	18.6 . . . 28V DC
Control power DC input current	8 A
Number of cascaded power cables	
Series A motor modules	Eight motor modules, max
Series B motor modules	16 motor modules, max
Communication	RS-422, 7.32 MHz
Temperature, operating	0 . . . 40 °C (32 . . . 104 °F)
Module ingress protection	IP65
UL listed	Category XDNZ: Electronically Protected Motors with Integral Controllers for Industrial Use

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.

Static Accuracy

Attribute	Absolute Accuracy ⁽¹⁾ mm (in.)
Straight motor module	± 0.5 (0.02)
Curve motor module	± 2.5 (0.98)

(1) Specifications are for any mover on any section.

Static Unidirectional Repeatability

Attribute	Single Mover to Single Point mm (in.)	Any Mover to Any Point mm (in.)
Straight motor module	< 0.03 (0.001)	± 0.1 (0.004)
Curve motor module	± 0.2 (0.008)	± 0.5 (0.02)

Dynamic Performance

Attribute	Speed m/s (ft/s)	Mover to Mover Position Variation mm (in.)	Curve to Straight Transition Distance ⁽²⁾ mm (in.)
Straight module	0.05 (0.16)	±2.0 (0.08)	30.0 (1.18)
	0.25 (0.82)		100.0 (9.93)
	1.0 (3.3)		150.0 (5.91)
	2.5 (8.2)		225.0 (8.86)
	5.0 (16.0)		400.0 (15.75)
Curve module	0.05 (0.16)	±20.0 (0.8)	—
	0.25 (0.82)		—
	1.0 (3.3)		—
	2.5 (8.2)		—
	5.0 (16.0)	±30.0 (1.18)	—
At motor module to motor module transition ⁽¹⁾	0.05 (0.16)	±3.0 (0.12)	—
	0.25 (0.82)		—
	1.0 (3.3)		—
	2.5 (8.2)		—
	5.0 (16.0)		—

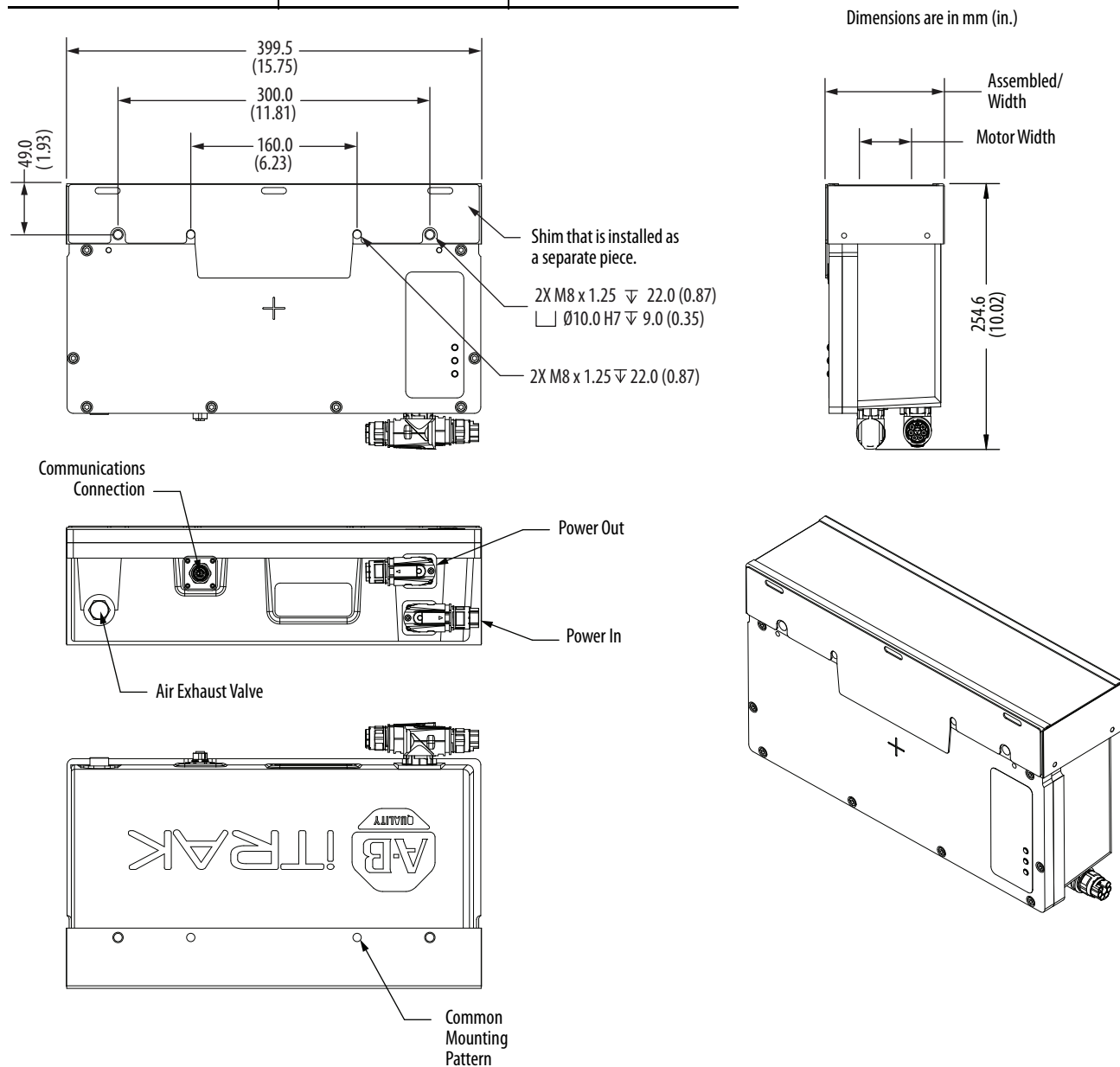
(1) Describes dynamic operation across a transition. Static operation on a transition is not recommended.

(2) Distance that is required to achieve specified following error performance when making the transition from a curve into a straight.

Dimensions

2198T-L16-Txx04-A00N-2E1E-NS Straight Motor Module

Cat. No.	Motor Width mm (in.)	Assembled Width mm (in.)
2198T-L16-T0504-A00N-2E1E-NS	50 (1.97)	114.3 (5.0)
2198T-L16-T1004-A00N-2E1E-NS	100 (3.94)	151.3 (6.0)
2198T-L16-T1504-A00N-2E1E-NS	150 (5.91)	201.3 (7.9)

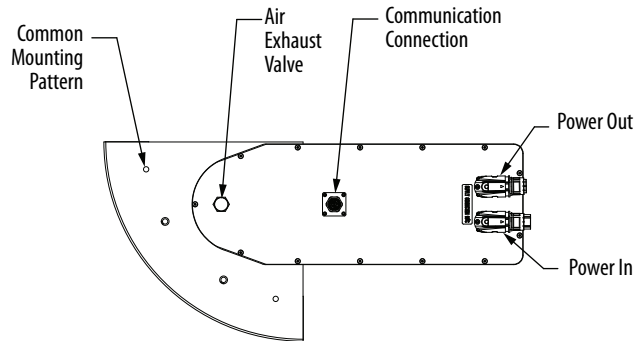
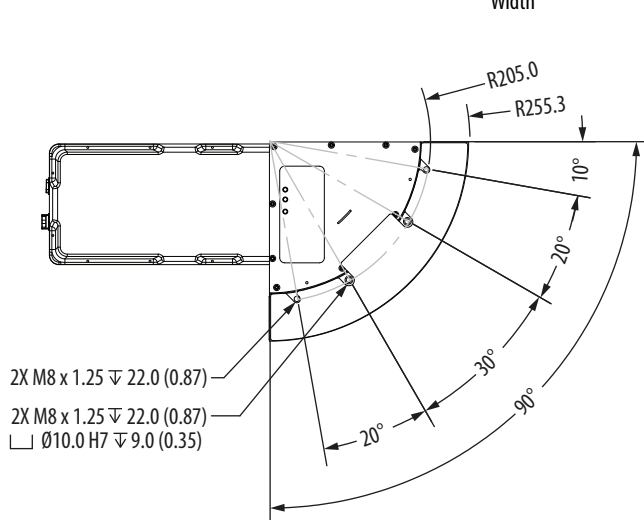
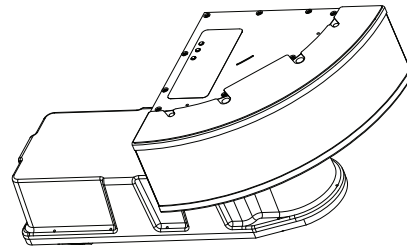
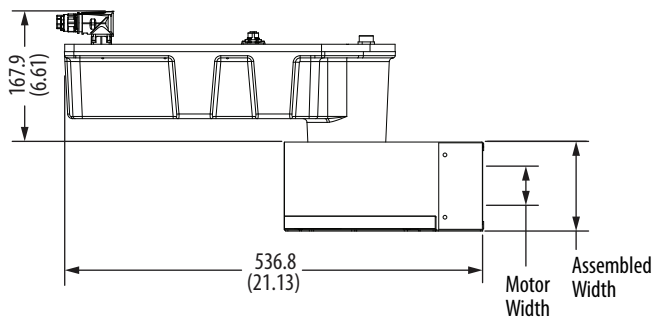


The electrical specifications are common to all motor modules. Power the motor modules with a power control module or other Rockwell Automation approved power supply.

2198T-L16-Txx04-B09x-2E1E-NS Curved Motor Module

Cat. No.	Motor Width mm (in.)	Assembled Width mm (in.)
2198T-L16-T0504-B09x-2E1E-NS	50 (1.97)	114.3 (5.0)
2198T-L16-T1004-B09x-2E1E-NS	100 (3.94)	151.3 (6.0)
2198T-L16-T1504-B09x-2E1E-NS	150 (5.91)	201.3 (7.9)

Dimensions are in mm (in.)



The electrical specifications are common to all motor modules. Power the motor modules with a power control module or other Rockwell Automation approved power supply.

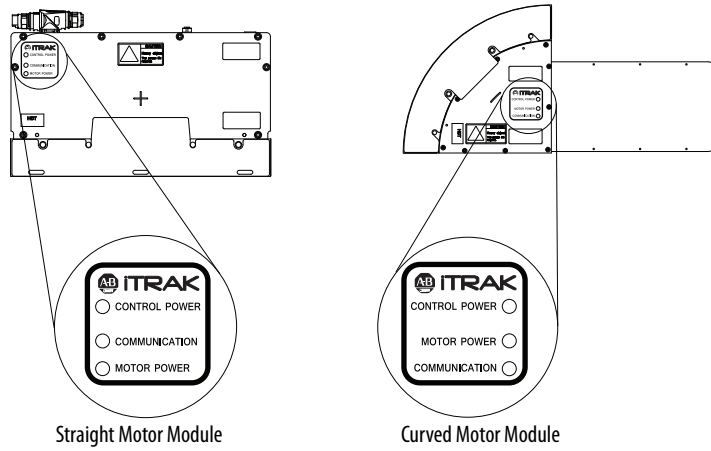
Weights

Cat. No.	Motor Modules Type	Frame Width	Weight, Approx kg (lb)
2198T-L16-T0504-A00N-2E1E-NS	Straight	50 mm	15.2 (33.51)
2198T-L16-T1004-A00N-2E1E-NS		100 mm	20.0 (44.09)
2198T-L16-T1504-A00N-2E1E-NS		150 mm	26.2 (57.76)
2198T-L16-T0504-B09x-2E1E-NS	Curved	50 mm	17.0 (37.47)
2198T-L16-T1004-B09x-2E1E-NS		100 mm	20.3 (44.75)
2198T-L16-T1504-B09x-2E1E-NS		150 mm	29.0 (63.93)

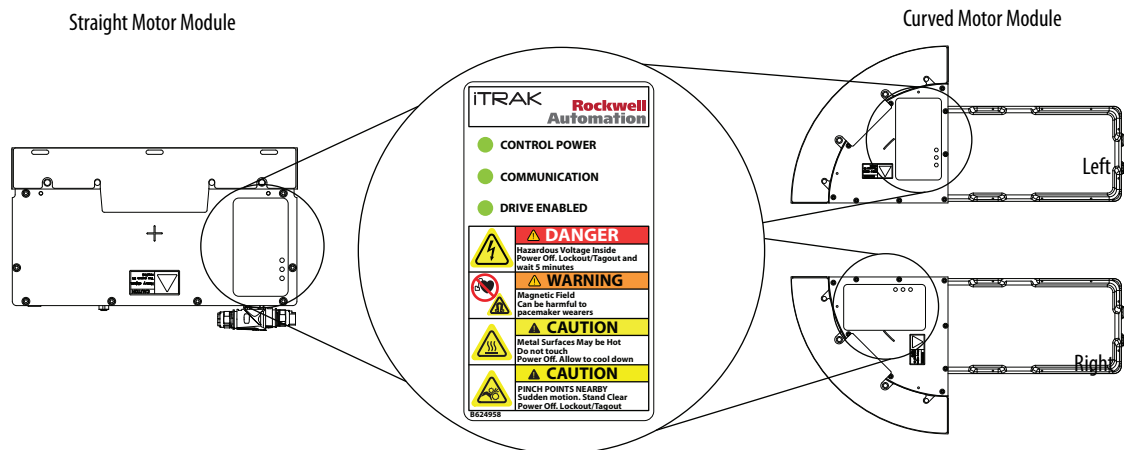
Identify Motor Module Series

To differentiate between series A and series B motor modules, examine the status indicators or nameplate.

Series A Motor Module Status Indicators



Series B Motor Module Status Indicators ⁽¹⁾



(1) If your motor module has a series B labels it is a series B motor module, however, some series B motor modules shipped with series A labels. If you have a motor module with series A labels, check the nameplate to confirm the series.

Movers

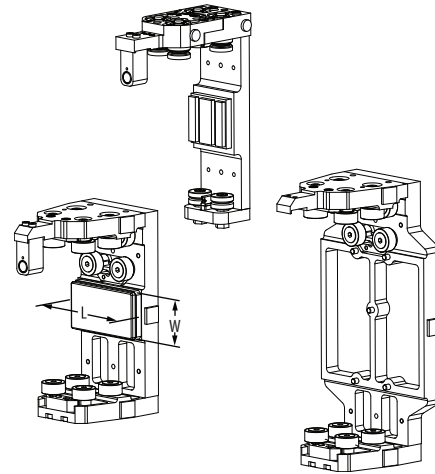
The movers are passive magnetic components. They move along the track in response to the magnetic fields generated by the motor modules. You attach your application end effector to the mover.

2198T Movers

Cat. No.	Magnet Width across Track (W) mm (in.)	Magnet Length Along Track (L) mm (in.)
2198T-xT0505-x	50 (1.97)	50 (1.97)
2198T-xT0510-x		100 (3.97)
2198T-xT0515-x		150 (5.91)
2198T-xT1005-x	100 (3.97)	50 (1.97)
2198T-xT1010-x		100 (3.97)
2198T-xT1015-x		150 (5.91)
2198T-xT1505-x	150 (5.91)	50 (1.97)
2198T-xT1510-x		100 (3.97)
2198T-xT1515-x		150 (5.91)

Mover

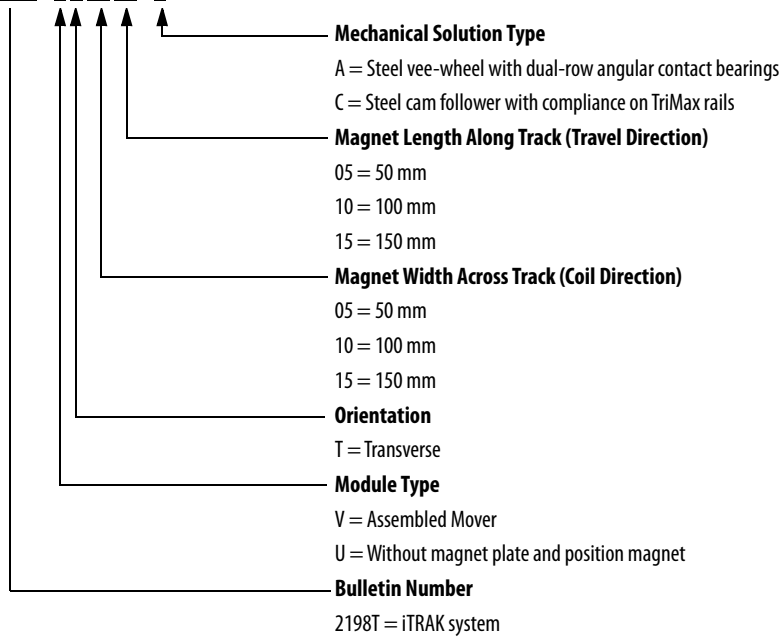
(catalog numbers 2198T-VT0505-A, 2198T-VT0510-C, and 2198T-UT1515-C are shown)



Position magnet and lubricators are shown for reference and are not included in mover assembly.

Catalog Number Explanation

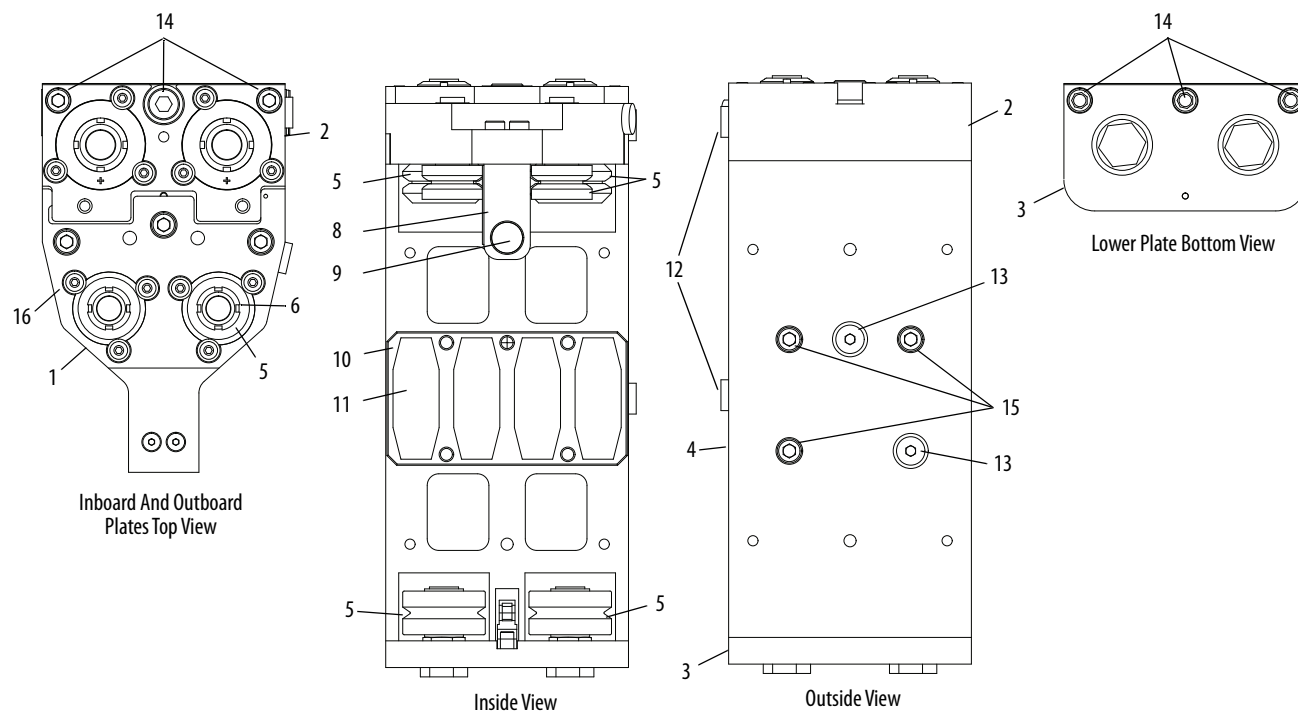
2198T - x T xx xx - x



Material Specifications

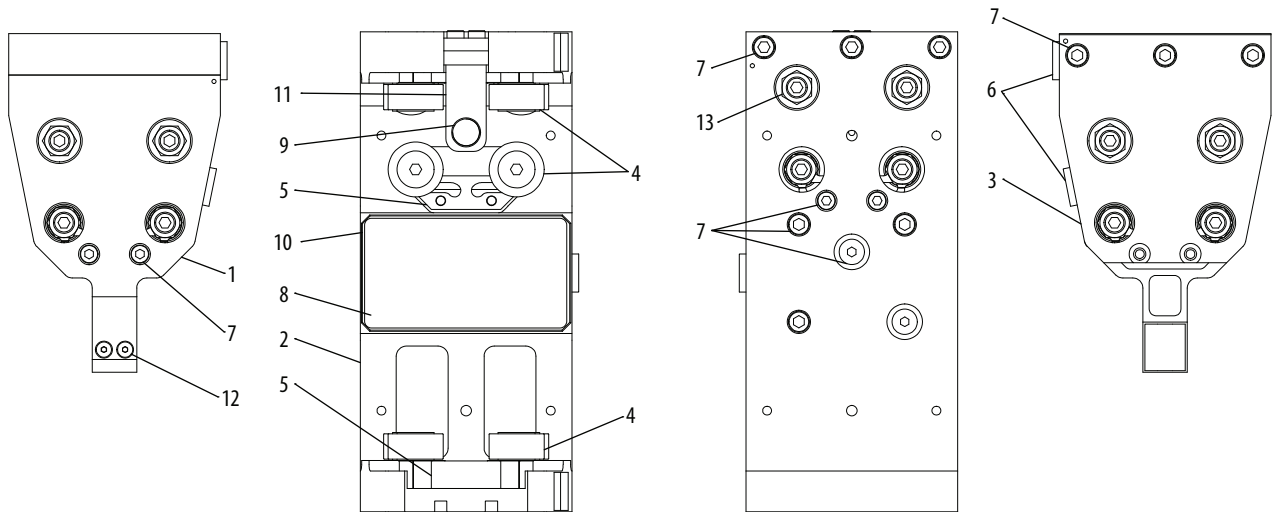
The following figures show the material that is used to assemble the mover.

2198T-VTxxxx-A Mover and Position Magnet



Item	Part	Material	Finish
1	Upper inboard plate	Aluminum	Anodized clear
2	Upper outboard plate		
3	Lower plate		
4	Base plate		
5	Bearing	Alloy Steel	—
6	Bearing cage	Polyamide	—
7	Sensor Magnet Bracket	Aluminum	Anodize Clear
8	Sensor Magnet	Neodymium	Nickel Plating
9	Magnet Plate	Carbon Steel	Nickel Plating
10	Drive Magnet	Neodymium	Nickel Plating
12	Bumper	Neoprene	—
13	Screws	Class 12.9 alloy steel	Black-oxide
14	Screws	Class 12.9 alloy steel	Black-oxide
15	Bolts	Class 12.9 alloy steel	Black-oxide
16	Screws	Class 12.9 alloy steel	Black-oxide

2198T-VTxxx-C Mover and Magnets



Item	Part	Material	Finish
1	Top Plate	Aluminum	Anodize Clear
2	Base Plate		
3	Bottom Plate		
4	Cam Follower	Alloy Steel, Polyamide, Plastic, Rubber	-
5	Cam Follower Compliance	Alloy Steel	-
6	Bumper	Polyurethane	-
7	Screw Class	12.9 Alloy Steel	Black Oxide
8	Magnet Cover	Stainless Steel	-
9	Sensor Magnet	Neodymium	Nickel Plating
10	Magnet Plate Carbon	Steel Nickel	Plating
11	Sensor Magnet Bracket	Aluminum	Anodize Clear
12	Shoulder Screw	Stainless Steel	-
13	Hex Nut	Stainless Steel	-

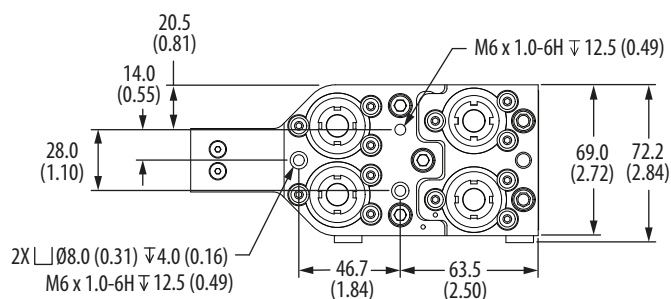
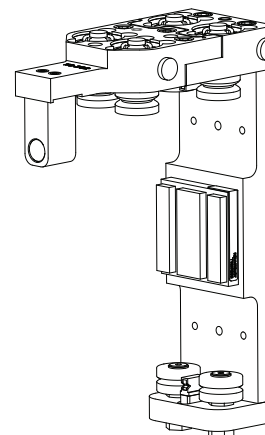
Dimensions

2198T-VTxx05-A Mover

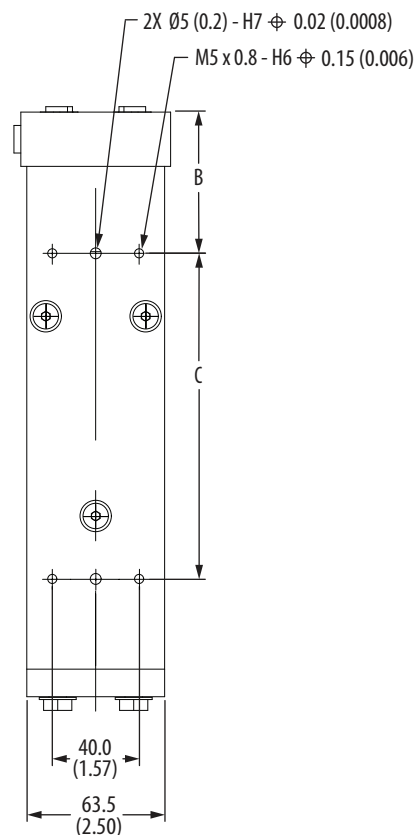
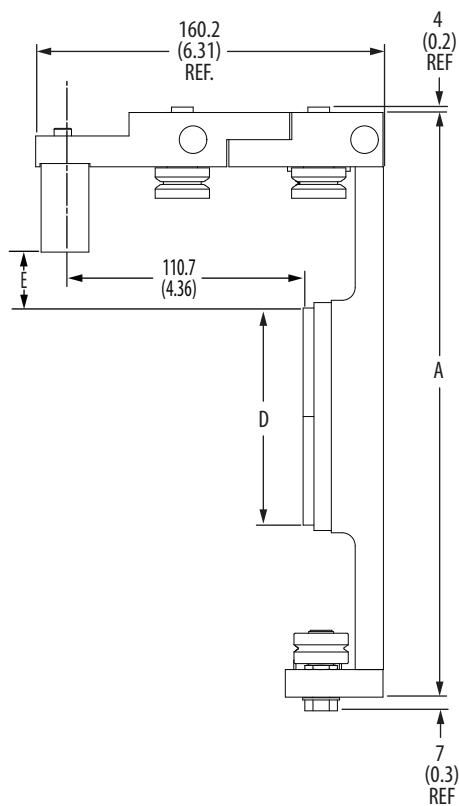
Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)
2198T-VT0505-A	232.3 (9.15)	61.56 (2.42)	120 (4.72)	50 (1.97)	32.27 (1.27)
2198T-VT1005-A	269.3 (10.60)	65.00 (2.59)	150 (5.91)	100 (3.94)	25.77 (1.015)
2198T-VT1505-A	319.3 (12.57)	75.00 (2.95)	180 (7.09)	150 (5.91)	25.77 (1.015)

All dimensions are for reference.

Dimensions are in mm (in.)



Position magnet and lubricators are shown for reference and are not included in mover assembly.

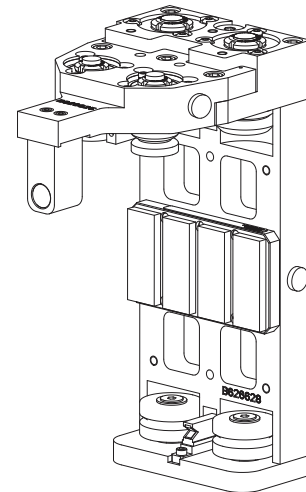


2198T-VTxx10-A Mover

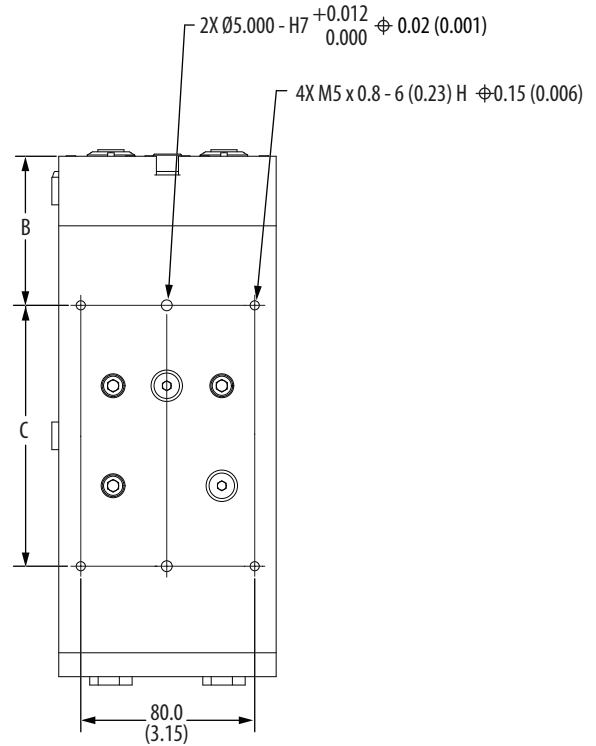
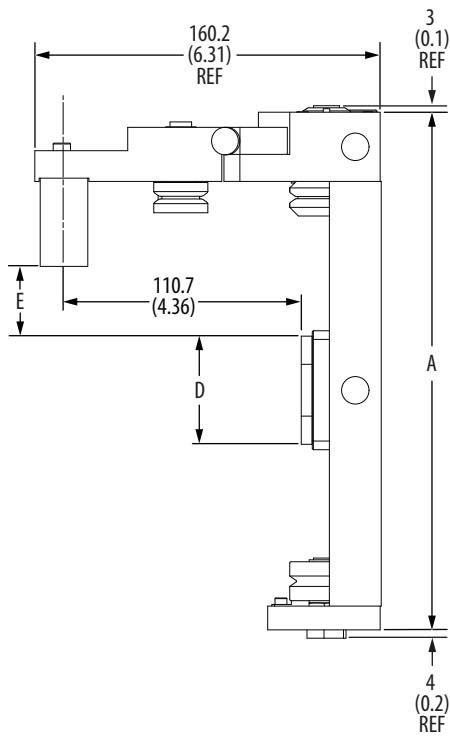
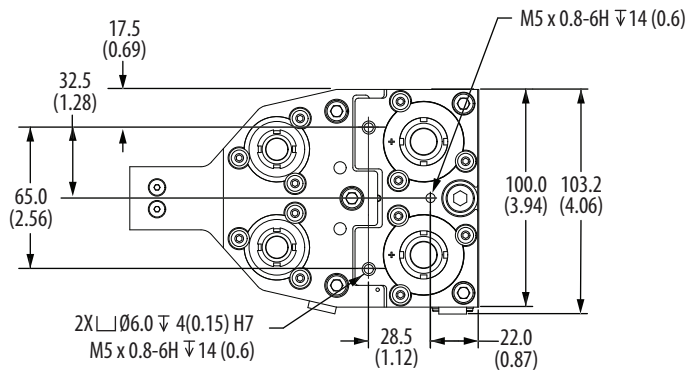
Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)
2198T-VT0510-A	239.37 (9.35)	68.56 (2.70)	120 (4.72)	50 (1.97)	32.27 (1.27)
2198T-VT1010-A	276.37 (10.88)	72.06 (2.84)	150 (5.91)	100 (3.94)	25.77 (1.015)
2198T-VT1510-A	326.37 (12.85)	82.06 (3.23)	180 (7.09)	150 (5.91)	25.77 (1.015)

All dimensions are for reference.

Dimensions are in mm (in.)



Position magnet and lubricators are shown for reference and are not included in mover assembly.

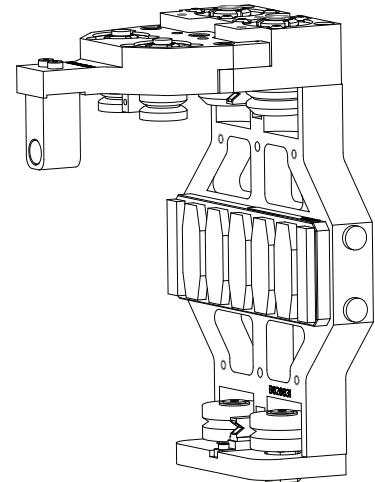


2198T-VTxx15-A Mover

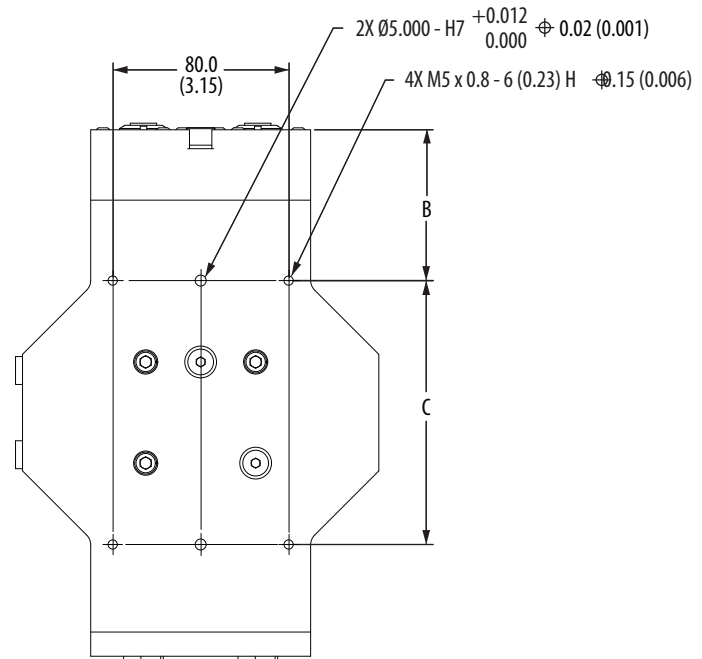
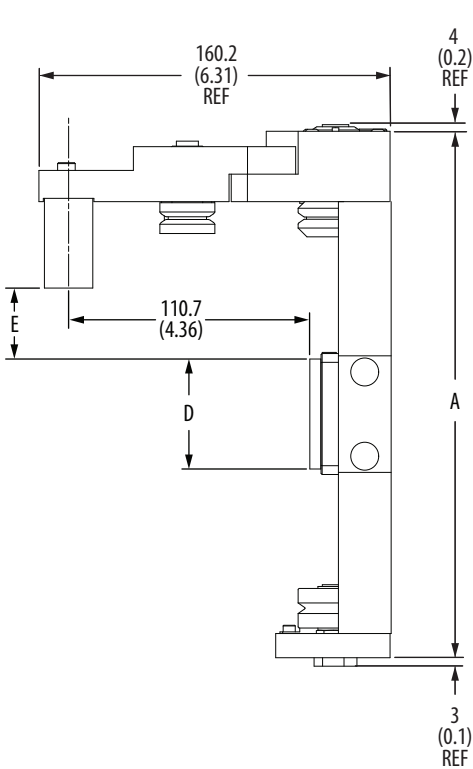
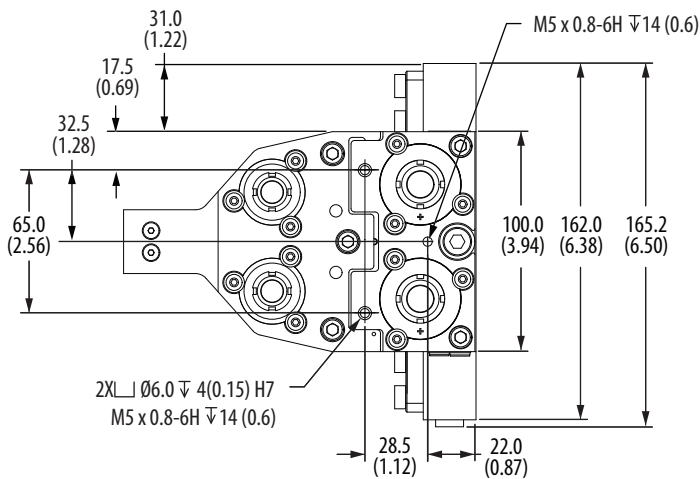
Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)
2198T-VT0515-A	239.37 (9.35)	68.56 (2.70)	120 (4.72)	50 (1.97)	32.27 (1.27)
2198T-VT1015-A	276.37 (10.88)	72.06 (2.84)	150 (5.91)	100 (3.94)	25.77 (1.015)
2198T-VT1515-A	326.37 (12.85)	82.06 (3.23)	180 (7.09)	150 (5.91)	25.77 (1.015)

All dimensions are for reference.

Dimensions are in mm (in.)

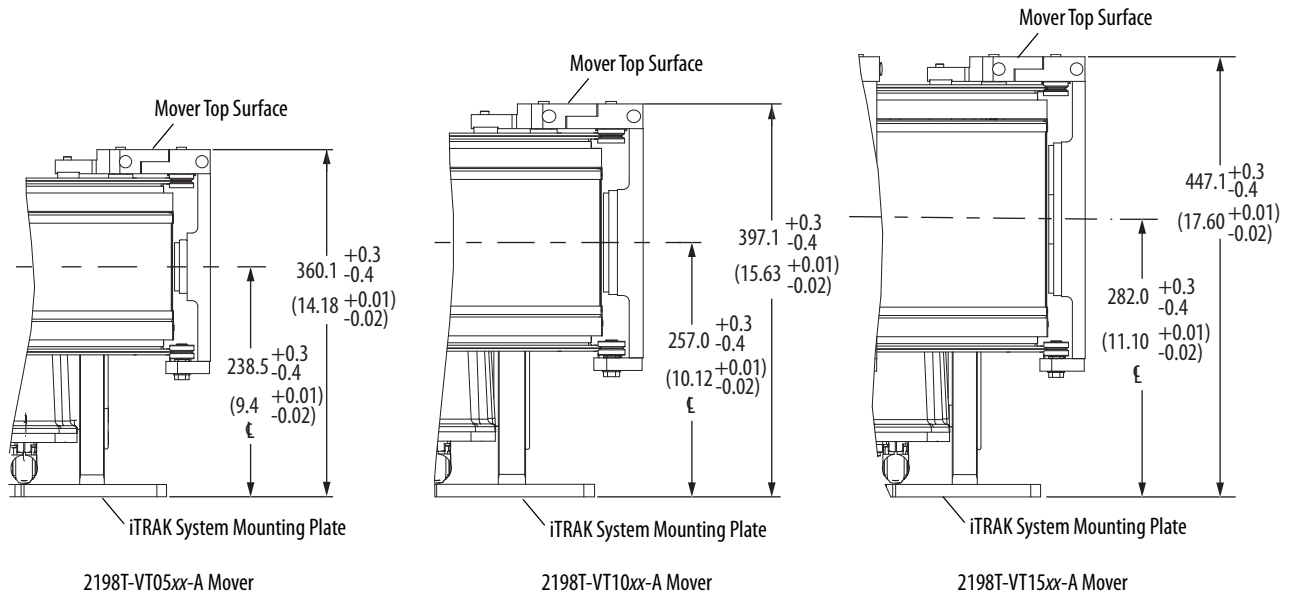


Position magnet and lubricators are shown for reference and are not included in mover assembly.



2198T-VTxxx-A Mover Dimensions from Mounting Plate

Centerlines that are shown align with mover magnet plate centerline.



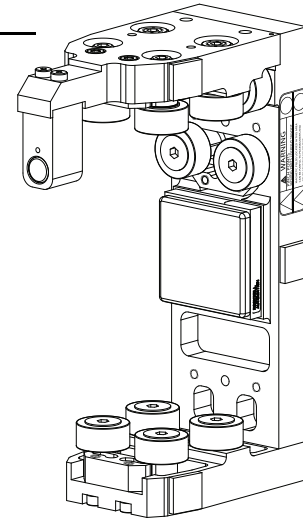
iTRAK System Side View

2198T-VTxx05-C Mover

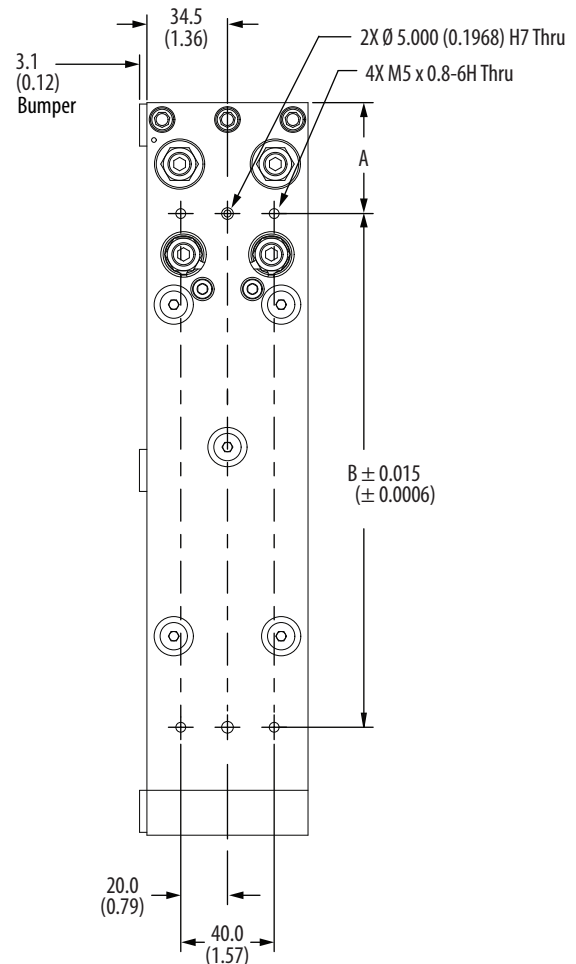
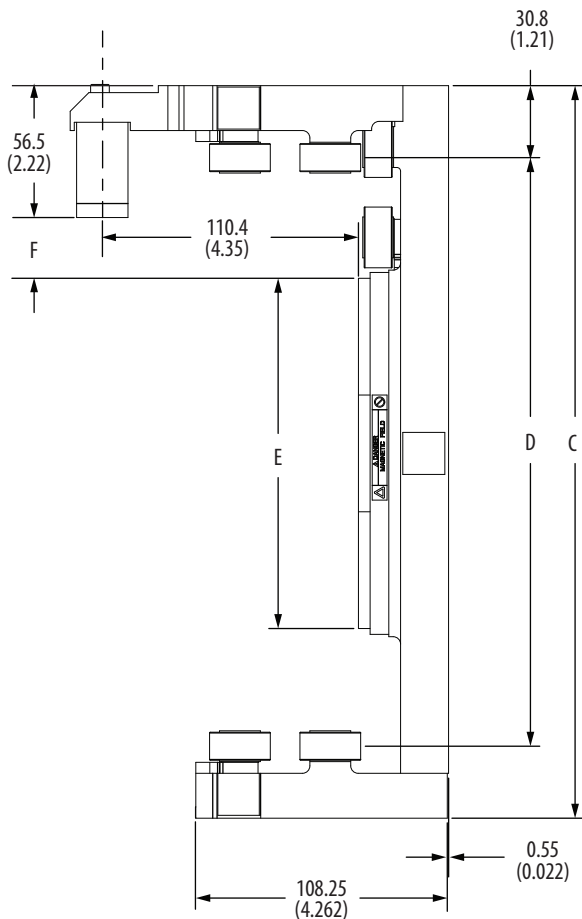
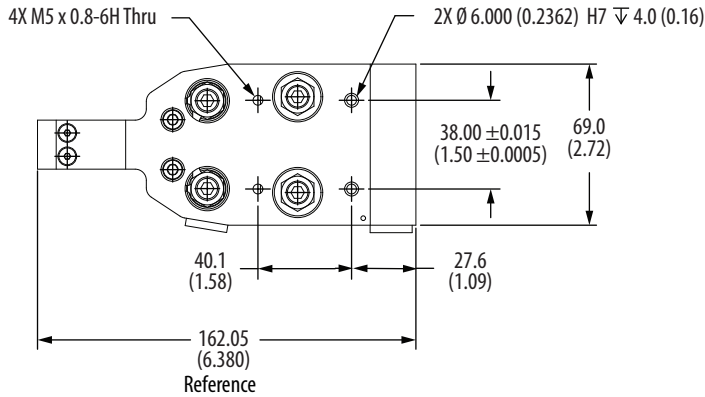
Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)
2198T-VT0505-C	49.00 (1.929)	130.00 (5.118)	226.7 (8.93)	165.1 (6.50)	50 (2.0)	32.5 (1.28)
2198T-VT1005-C	47.50 (1.870)	170.00 (6.693)	263.7 (10.38)	202.1 (7.96)	100 (4.0)	26.0 (1.02)
2198T-VT1505-C		220.00 (8.661)	313.7 (12.35)	252.1 (9.93)	150 (5.9)	

Dimensions are in mm (in.)

All dimensions are for reference.



Position magnet is shown for reference and is not included in mover assembly.

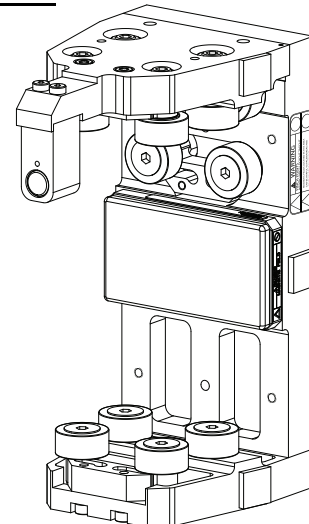
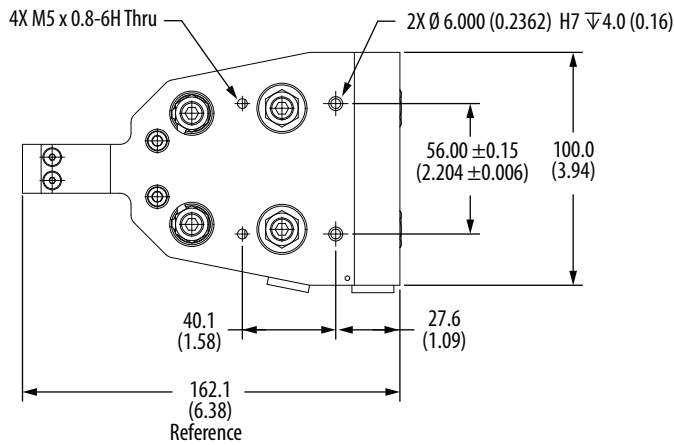


2198T-VTxx10-C Mover

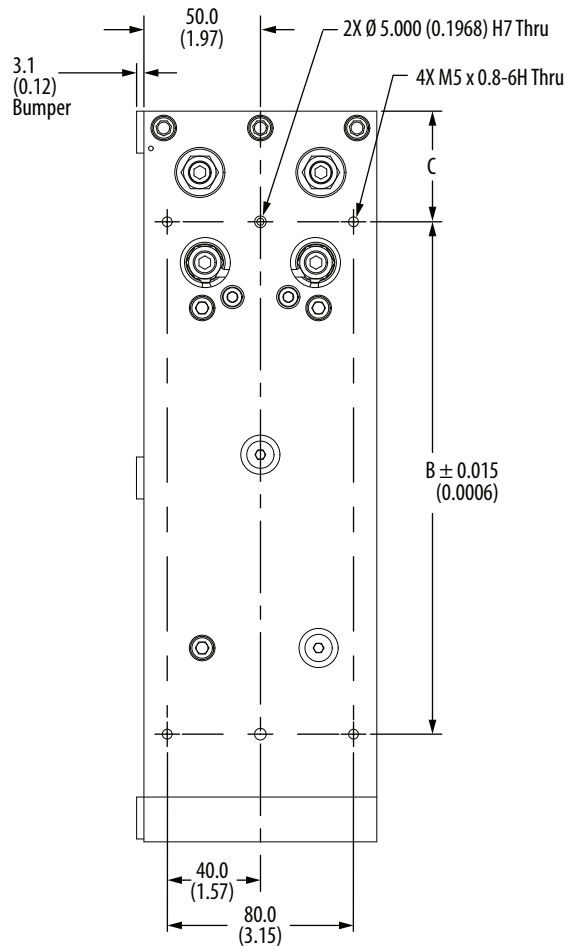
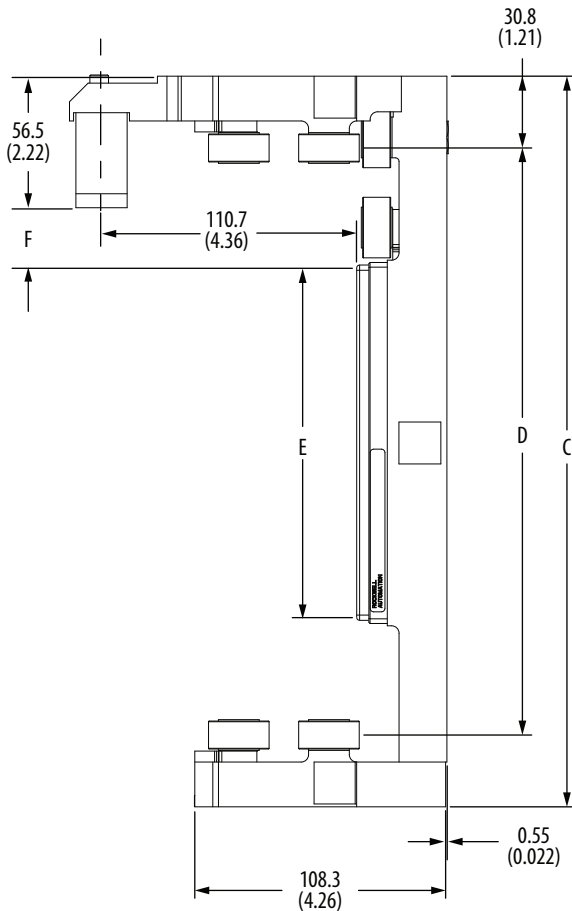
Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)	F
2198T-VT0510-C	49.00 (1.929)	130.00 (5.118)	226.7 (8.93)	165.1 (6.50)	50 (2.0)	32.5 (1.28)
2198T-VT1010-C	47.50 (1.870)	170.00 (6.693)	263.7 (10.38)	202.1 (7.96)	100 (4.0)	26.0 (1.02)
2198T-VT1510-C		220.00 (8.661)	313.7 (12.35)	252.1 (9.93)	150 (5.9)	

Dimensions are in mm (in.)

All dimensions are for reference.



Position magnet is shown for reference and is not included in mover assembly.

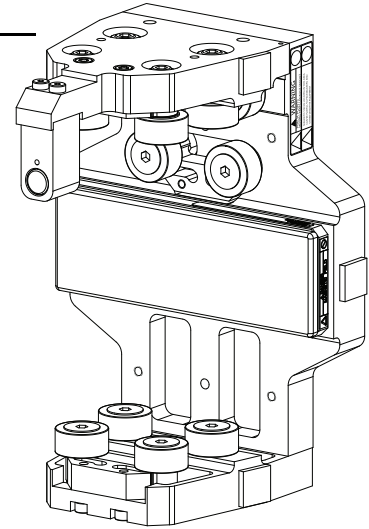
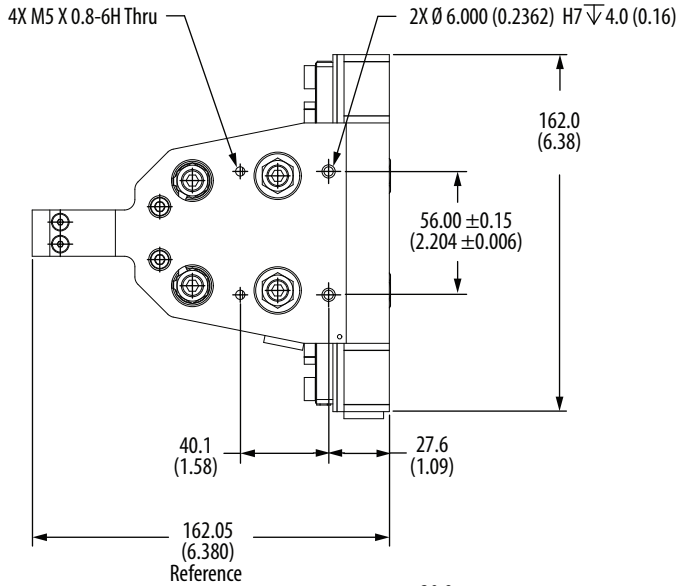


2198T-VTxx15-C Mover

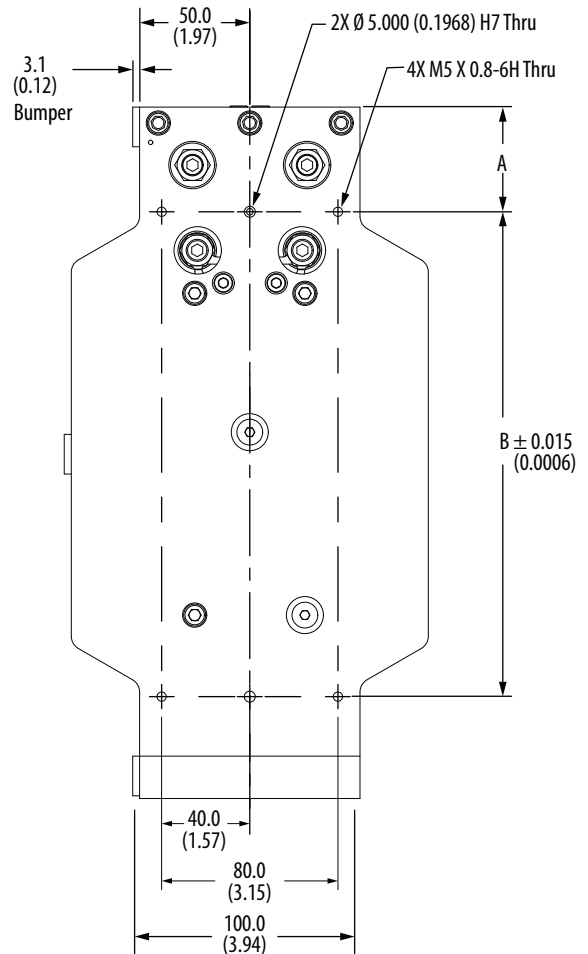
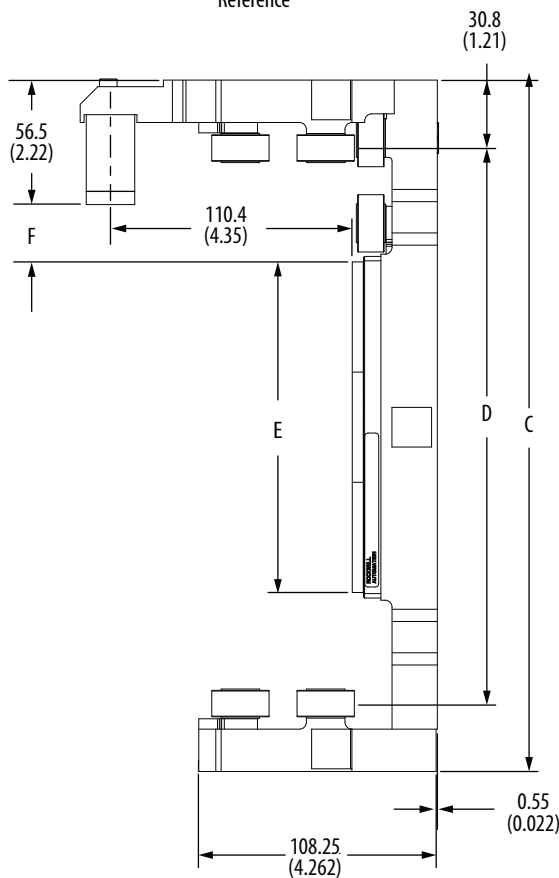
Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)
2198T-VT0515-C	49.00 (1.929)	130.00 (5.118)	226.7 (8.93)	165.1 (6.50)	50 (2.0)	32.5 (1.28)
2198T-VT1015-C	47.50 (1.870)	170.00 (6.693)	263.7 (10.38)	202.1 (7.96)	100 (4.0)	26.0 (1.02)
2198T-VT1515-C		220.00 (8.661)	313.7 (12.35)	252.1 (9.93)	150 (5.9)	

Dimensions are in mm (in.)

All dimensions are for reference.

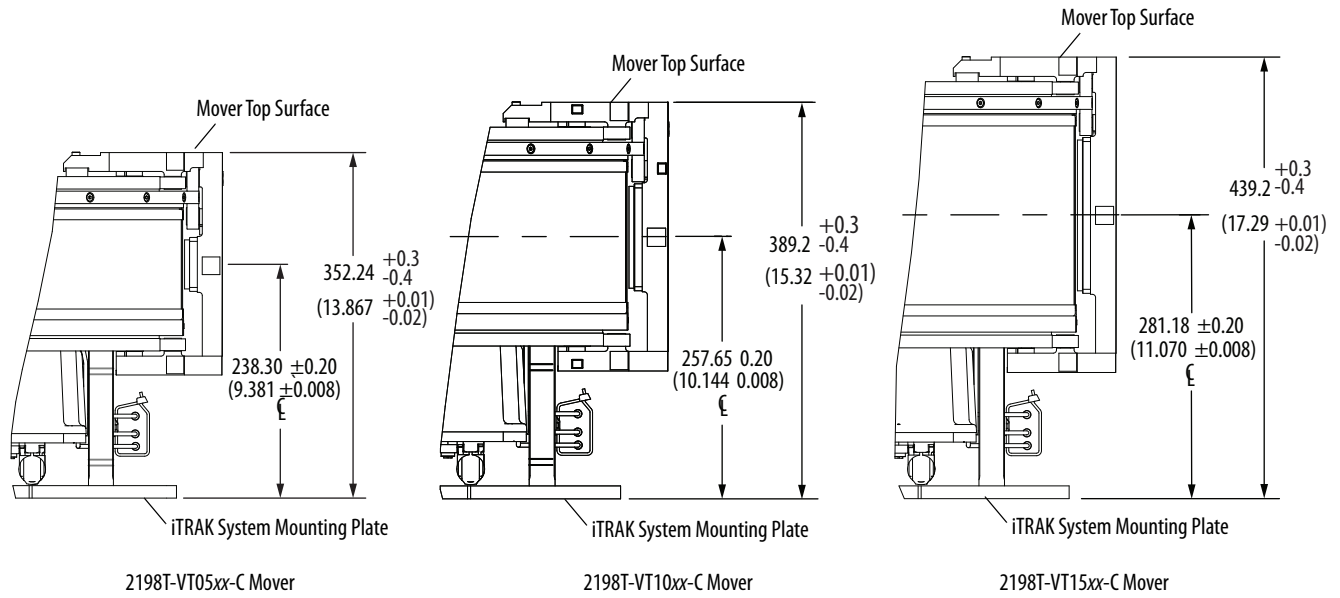


Position magnet is shown for reference and is not included in mover assembly.



2198T-VTxxx-C Mover Dimensions from Mounting Plate

Centerlines that are shown align with mover magnet plate centerline.



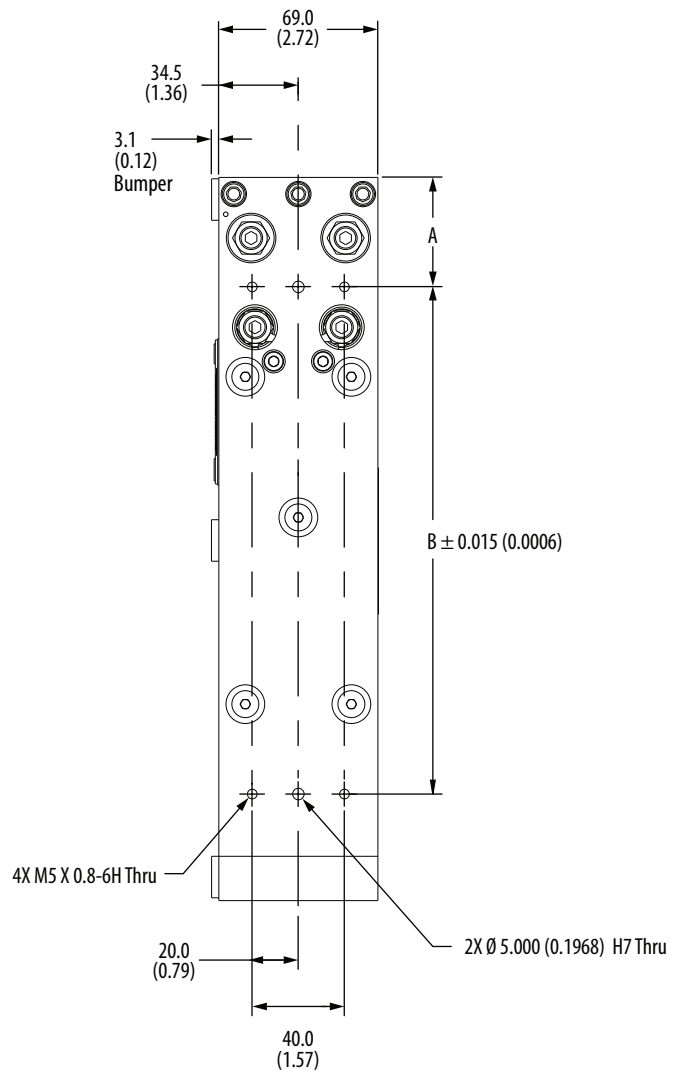
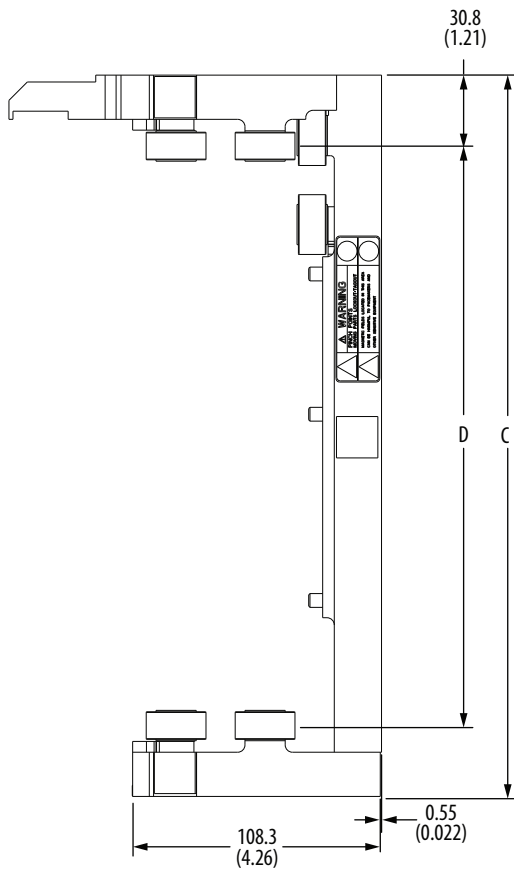
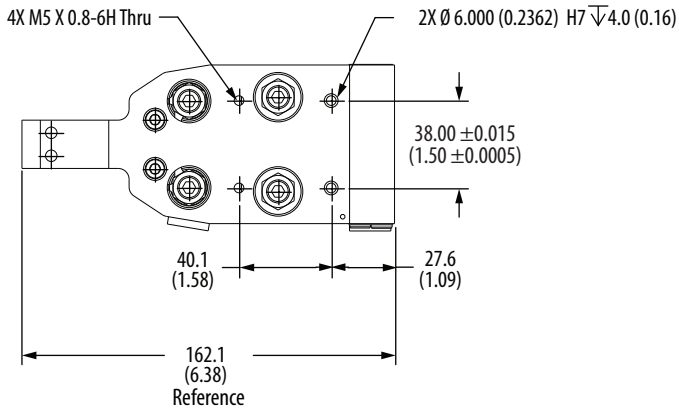
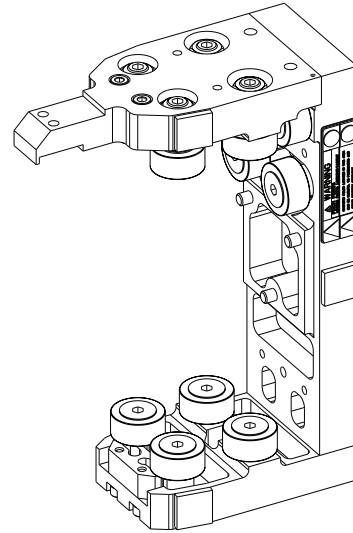
iTRAK System with TriMax Bearings Side View

2198T-UTxx05-C Mover

Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)
2198T-UT0505-C	49.00 (1.929)	130.00 (5.118)	226.7 (8.93)	165.1 (6.50)	50 (2.0)
2198T-UT1005-C	47.50 (1.870)	170.00 (6.693)	263.7 (10.38)	202.1 (7.96)	100 (4.0)
2198T-UT1505-C		220.00 (8.661)	313.7 (12.35)	252.1 (9.93)	150 (5.9)

All dimensions are for reference.

Dimensions are in mm (in.)

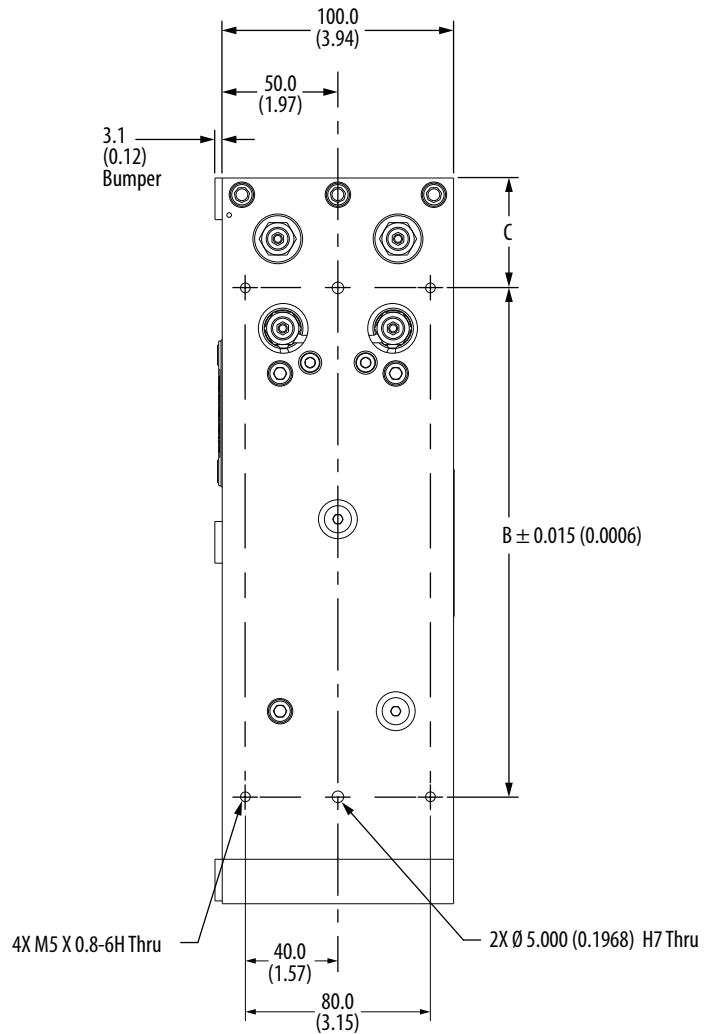
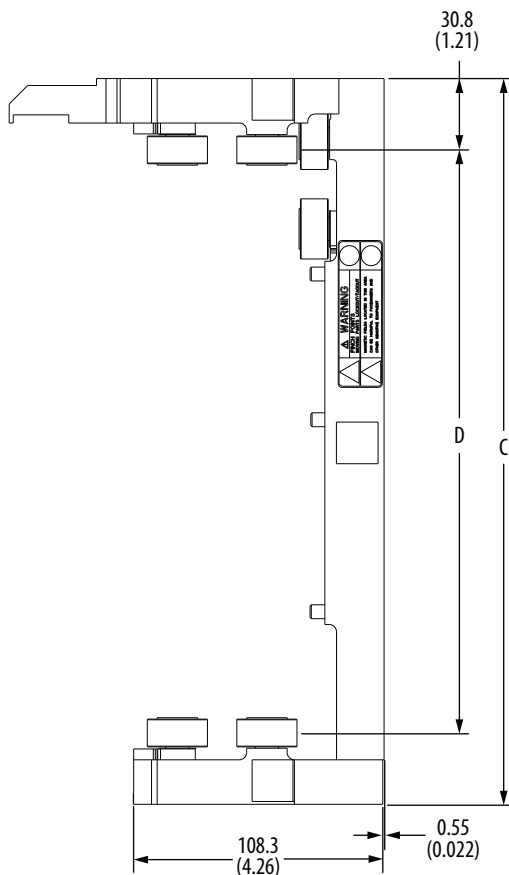
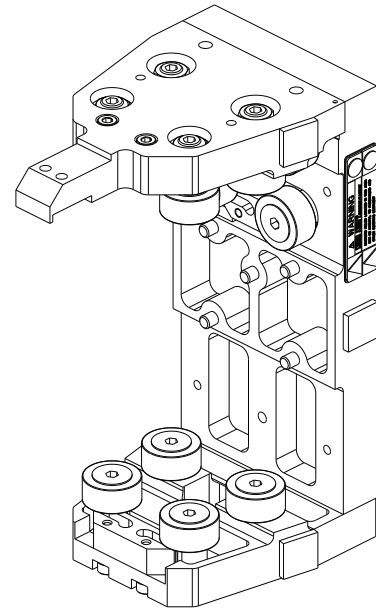
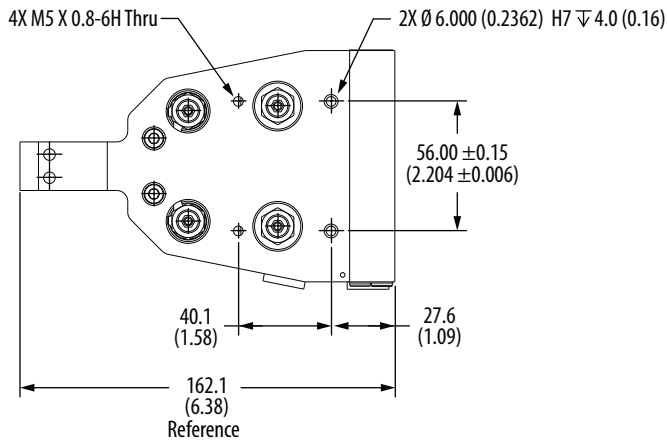


2198T-UTxx10-C Mover

Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)
2198T-UT0510-C	49.00 (1.929)	130.00 (5.118)	226.7 (8.93)	165.1 (6.50)	50 (2.0)
2198T-UT1010-C	47.50 (1.870)	170.00 (6.693)	263.7 (10.38)	202.1 (7.96)	100 (4.0)
2198T-UT1510-C		220.00 (8.661)	313.7 (12.35)	252.1 (9.93)	150 (5.9)

All dimensions are for reference.

Dimensions are in mm (in.)

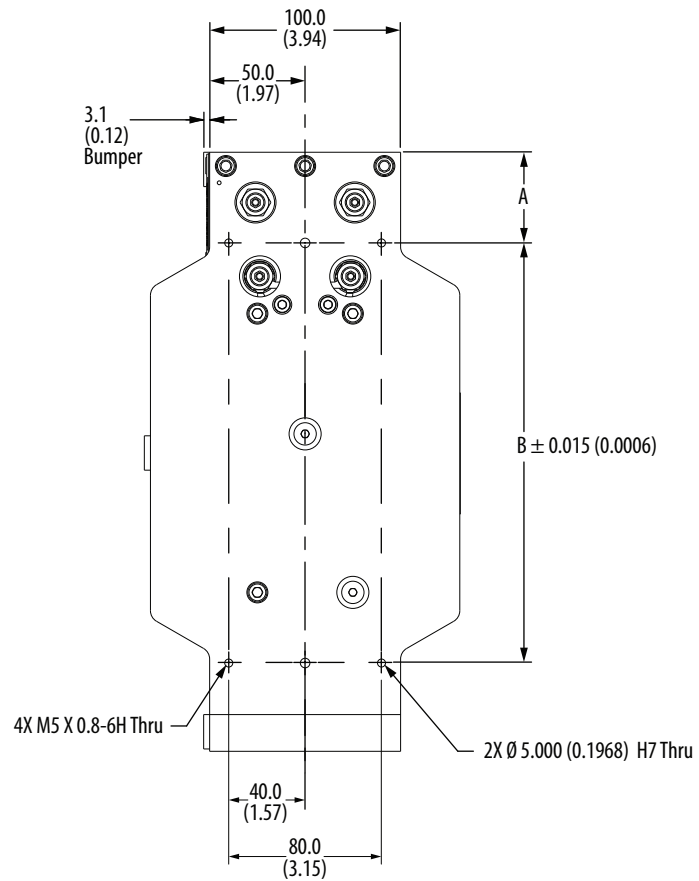
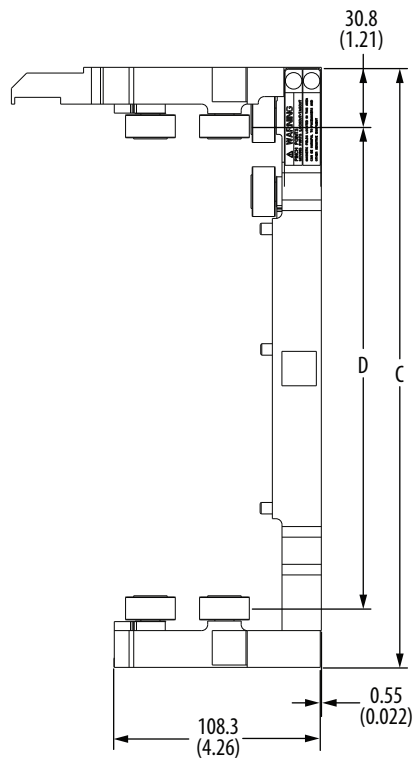
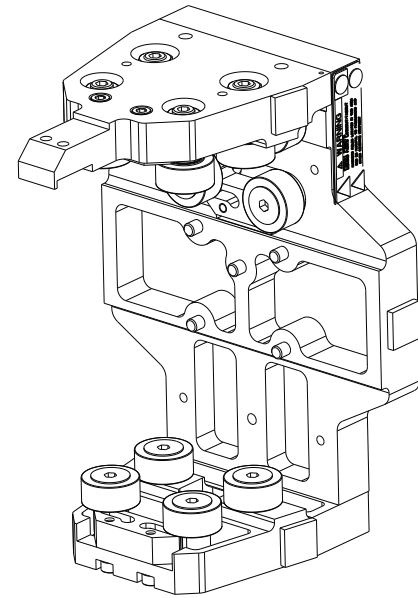
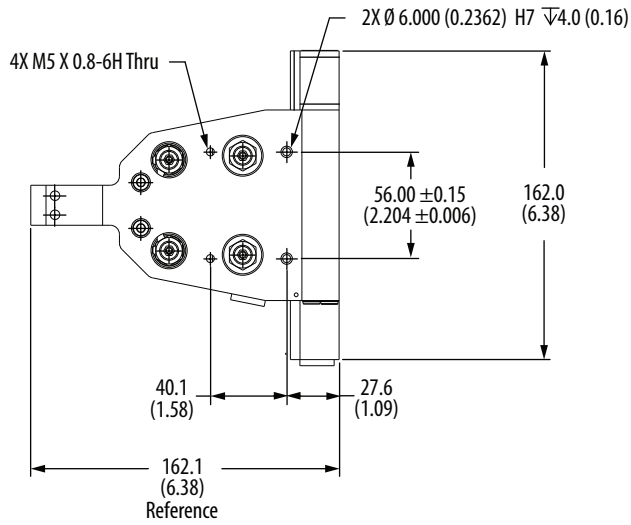


2198T-UTxx15-C Mover

Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)
2198T-UT0515-C	49.00 (1.929)	130.00 (5.118)	226.7 (8.93)	165.1 (6.50)	50 (2.0)
2198T-UT1015-C	47.50 (1.870)	170.00 (6.693)	263.7 (10.38)	202.1 (7.96)	100 (4.0)
2198T-UT1515-C		220.00 (8.661)	313.7 (12.35)	252.1 (9.93)	150 (5.9)

All dimensions are for reference.

Dimensions are in mm (in.)



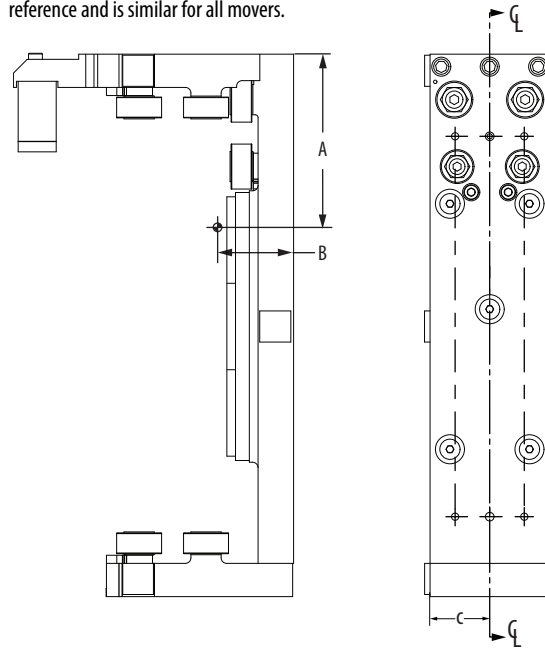
Weights and Center of Gravity

Cat. No.	Weight, Approx ⁽¹⁾ kg (lb)	A mm (in.)	B mm (in.)	C mm (in.)
2198T-VT0505-A	2.0 (4.41)	82 (3.2)	42 (1.7)	25 (0.98)
2198T-VT0510-A	3.4 (7.50)	92 (3.6)	35 (1.4)	
2198T-VT0515-A	3.9 (8.60)	98 (3.9)	33 (1.3)	
2198T-VT1005-A	2.4 (5.29)	101 (4.0)	39 (1.5)	50 (1.97)
2198T-VT1010-A	3.7 (8.16)	119 (4.7)	34 (1.3)	
2198T-VT1015-A	4.5 (9.92)	124 (4.8)	32 (1.3)	
2198T-VT1505-A	2.8 (6.17)	125 (4.9)	37 (1.5)	75 (2.95)
2198T-VT1510-A	4.3 (9.48)	143 (5.6)	33 (1.3)	
2198T-VT1515-A	5.5 (12.13)	149 (5.9)	31 (1.2)	
2198T-VT0505-C	2.3 (5.07)	100.5 (3.96)	43.9 (1.73)	34.5 (1.36)
2198T-VT0510-C	2.7 (5.95)	118.1 (4.65)	41.4 (1.63)	
2198T-VT0515-C	3.1 (6.83)	141.7 (5.58)	39.0 (1.54)	
2198T-VT1005-C	3.0 (6.61)	102.0 (4.02)	40.1 (1.58)	50 (1.97)
2198T-VT1010-C	3.6 (7.94)	120.0 (4.72)	38.0 (1.50)	
2198T-VT1015-C	4.2 (9.26)	143.9 (5.67)	36.0 (1.42)	
2198T-VT1505-C	3.6 (7.94)	103.7 (4.08)	37.4 (1.47)	81.0 (3.19)
2198T-VT1510-C	4.5 (9.92)	122.4 (4.82)	35.1 (1.38)	
2198T-VT1515-C	5.4 (11.90)	146.9 (5.78)	33.5 (1.32)	

(1) The weight and center of gravity values include the position magnets.

Center of Gravity

Catalog number 2198T-VT0505-C is shown for Dimensions reference and is similar for all movers.



TriMax Mover without Magnet Plate and Position Magnet Weights

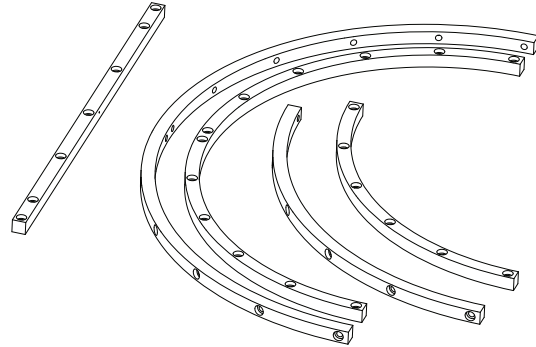
Cat. No.	Weight, Approx kg (lb)
2198T-UT0505-C	1.96 (4.321)
2198T-UT1005-C	2.10 (4.630)
2198T-UT1505-C	2.28 (5.027)
2198T-UT0510-C	2.46 (5.423)
2198T-UT1010-C	2.60 (5.732)
2198T-UT1510-C	2.74 (6.041)
2198T-UT0515-C	2.78 (6.129)
2198T-UT1015-C	2.96 (6.526)
2198T-UT1515-C	3.14 (6.923)

TriMax Bearing Rails

TriMax bearing rails are provided here for replacing worn or damaged components.

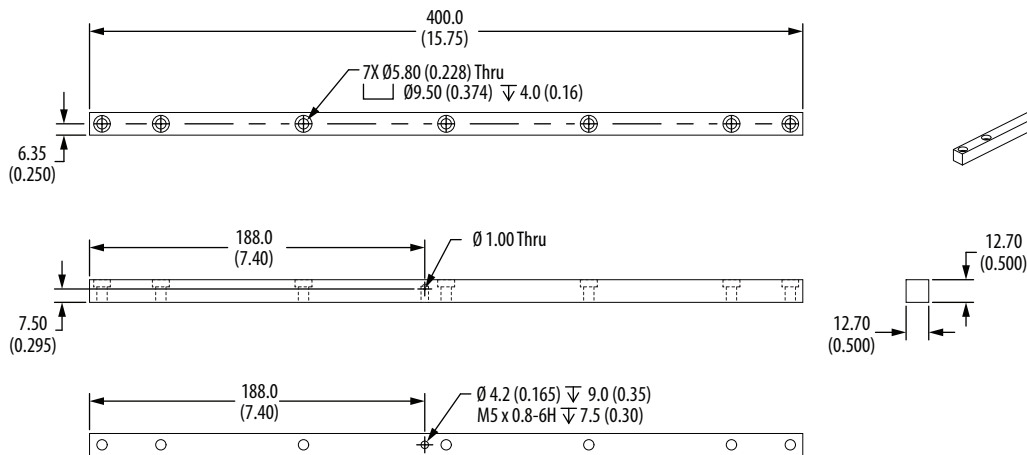
Catalog Numbers

Cat. No.	Description
2198T-BC-LU04	TriMax straight bearing rail with lubrication port.
2198T-BC-ST08	TriMax straight bearing rail.
2198T-BC-ST12	
2198T-BC-ST16	
2198T-BC-ST20	
2198T-BC-TB09	TriMax 90° transverse curved bearing rail.
2198T-BC-RB09	TriMax 90° radial curved bearing rail.
2198T-BC-TB18	TriMax 180° transverse curved bearing rail.
2198T-BC-RB18	TriMax 180° radial curved bearing rail.



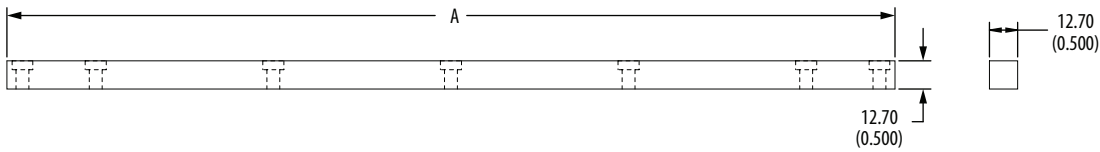
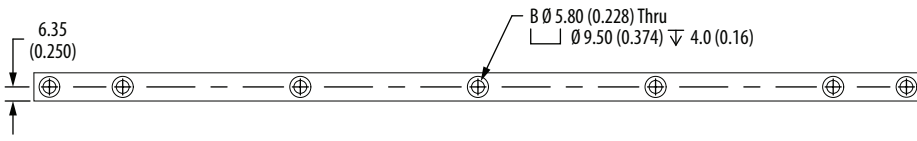
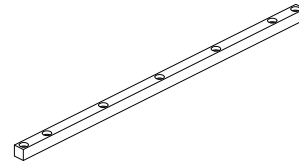
Dimensions

2198T-BC-LU04 TriMax Straight Bearing Rail with Lubrication Port

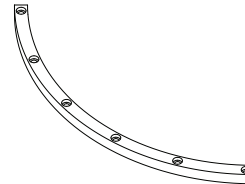
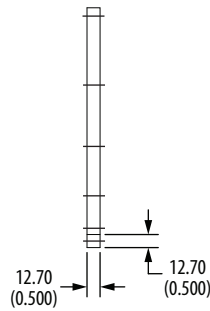
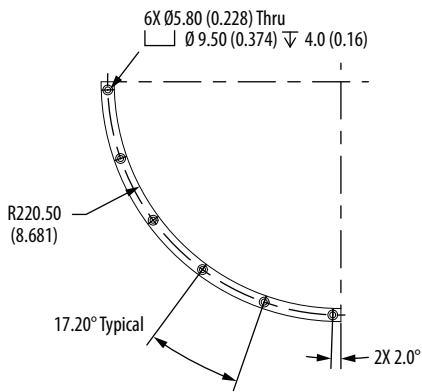


2198T-BC-STxx TriMax Straight Bearing Rail

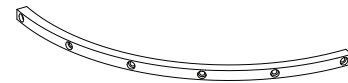
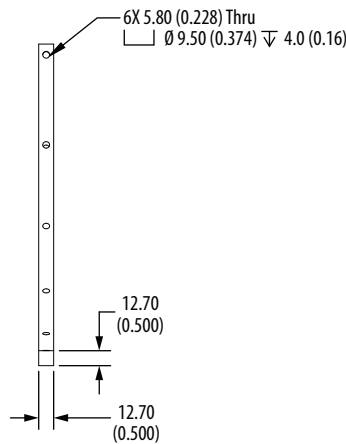
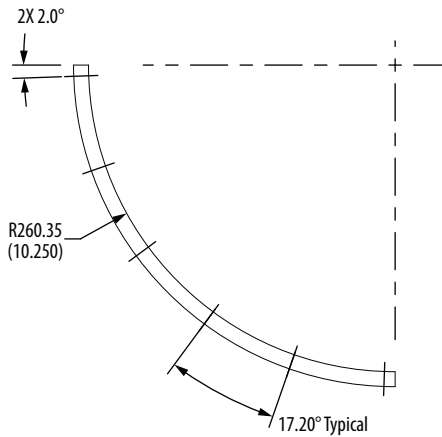
Cat. No.	A mm (in.)	B Number of Holes
2198T-BC-ST08	800 (31.5)	12
2198T-BC-ST12	1200 (47.2)	17
2198T-BC-ST16	1600 (63.0)	22
2198T-BC-ST20	2000 (78.7)	27



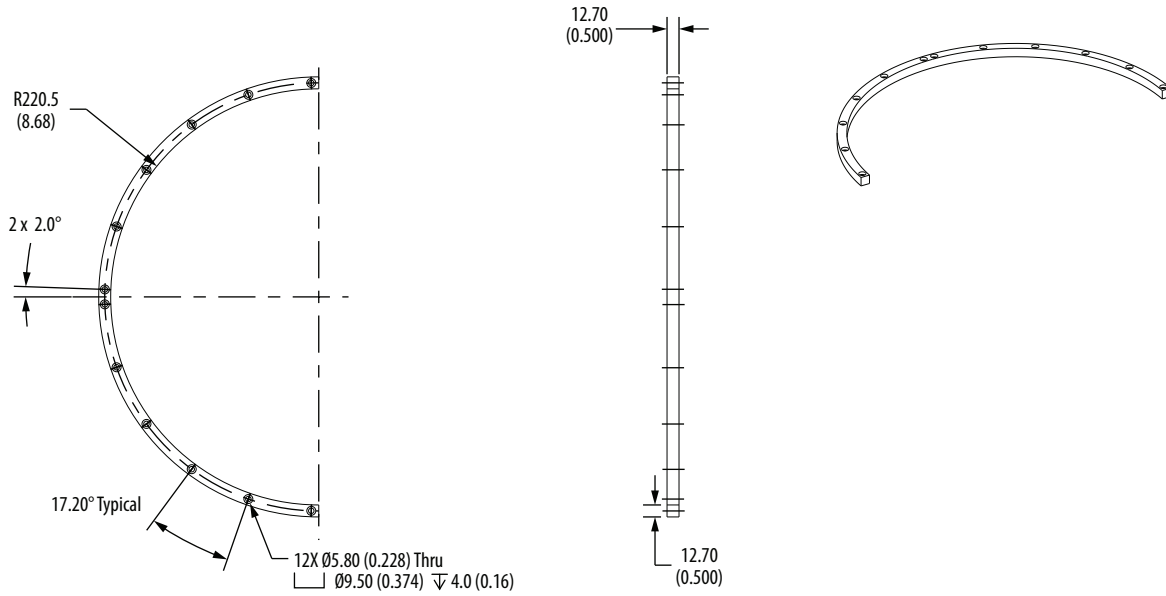
2198T-BC-TB09 TriMax 90° Radial Curved Rail



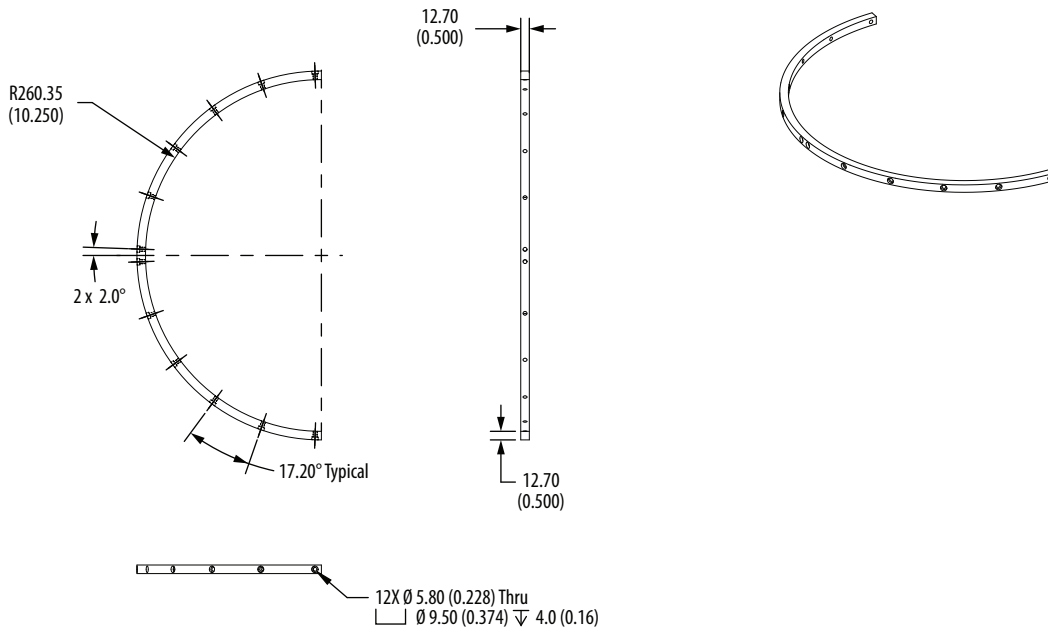
2198T-BC-RB09 TriMax 90° Transverse Curved Rail



2198T-BC-TB18 TriMax 180° Radial Curved Rail



2198T-BC-RB18 TriMax 90° Transverse Curved Rail



Weights

Cat. No.	Weight, Approx kg (lb)
2198T-BC-LU04	0.50 (1.100)
2198T-BC-ST08	1.00 (2.200)
2198T-BC-ST12	1.50 (3.300)
2198T-BC-ST16	2.00 (4.400)
2198T-BC-ST20	2.50 (5.500)

Cat. No.	Weight, Approx kg (lb)
2198T-BC-TB09	0.51 (1.124)
2198T-BC-RB09	0.43 (0.948)
2198T-BC-TB18	1.02 (2.249)
2198T-BC-RB18	0.86 (1.896)

TriMax Mover Replacement Components

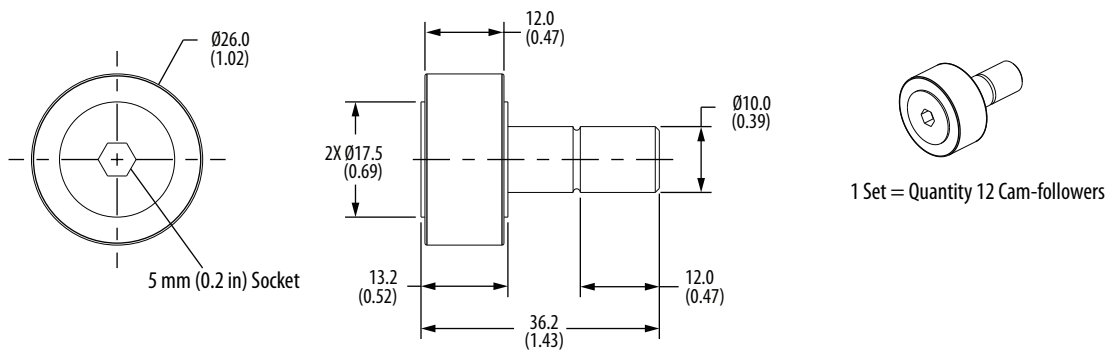
TriMax mover bearing components are provided for replacing worn or damaged components.

iTRAK TriMax Wheel Spare Kits

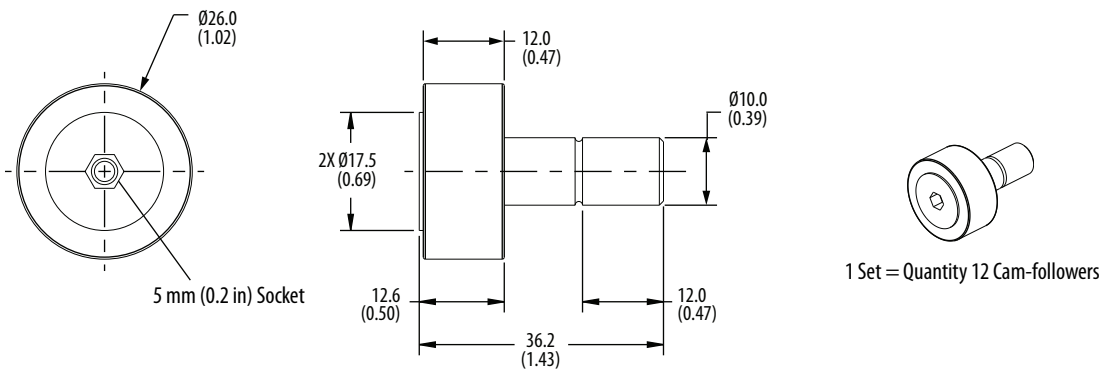
Cat. No.	Description
2198T-AV-WHL-C1	iTRAK TriMax mover wheel replacement kit has caged cam-follower wheels with mounting studs. Each set includes 12 wheels to replace the wheels on one mover. Use this kit for the following movers. <ul style="list-style-type: none"> • 2198T-xT05xx-C • 2198T-xT1050-C • 2198T-xT1015-C • 2198T-xT1505-C
2198T-AV-WHL-C2	The iTRAK TriMax mover wheel replacement kit has full-complement cam-follower wheels with mounting studs. Each set includes 12 wheels to replace the wheels on one mover. Use this kit for the following movers. <ul style="list-style-type: none"> • 2198T-xT1015-C • 2198T-xT1510-C • 2198T-xT1515-C

Dimensions

2198T-AV-WHL-C1 iTRAK TriMax Wheel Spare Kit



2198T-AV-WHL-C2 iTRAK TriMax Wheel Spare Kit

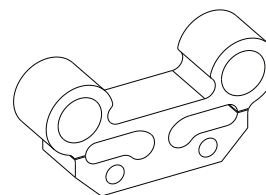
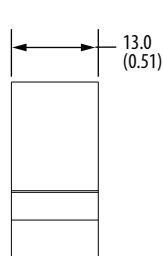
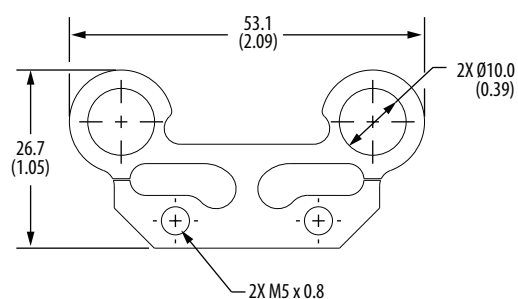


iTRAK TriMax Flexure Spare Kits

Cat. No.	Description
2198T-AV-FLX-C1	iTRAK TriMax mover flexure replacement kit, each set includes three compliant flexures to replace the flexures on one mover. Use this kit on a 2198T-xTxx05-C mover.
2198T-AV-FLX-C2	iTRAK TriMax mover flexure replacement kit, each set includes three compliant flexures to replace the flexures on one mover. Use this kit on 2198T-xTxx10-C and 2198T-xTxx15-C

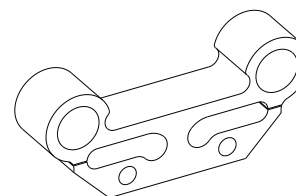
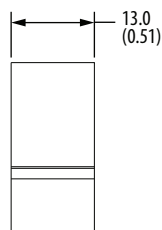
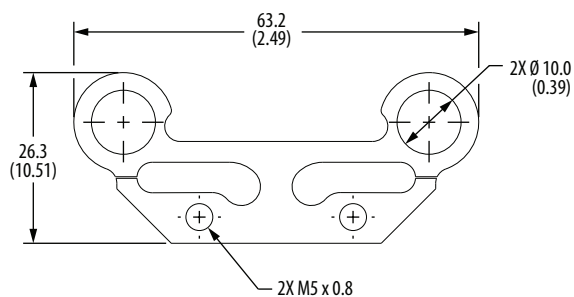
Dimensions

2198T-AV-FLX-C1 iTRAK TriMax Flexure Spare Kit



1 Set = Quantity 3 flexures

2198T-AV-FLX-C2 iTRAK TriMax Flexure Spare Kit



1 Set = Quantity 3 flexures

Weights

Cat. No.	Weight, Approx, kg (lb)	
	Each	Kit
2198T-AV-WHL-C1	0.057 (0.126)	0.68 (1.508)
2198T-AV-WHL-C2	0.059 (0.130)	0.71 (1.561)
2198T-AV-FLX-C1	0.06 (0.132)	0.18 (0.397)
2198T-AV-FLX-C2	0.07 (0.154)	0.21 (0.463)

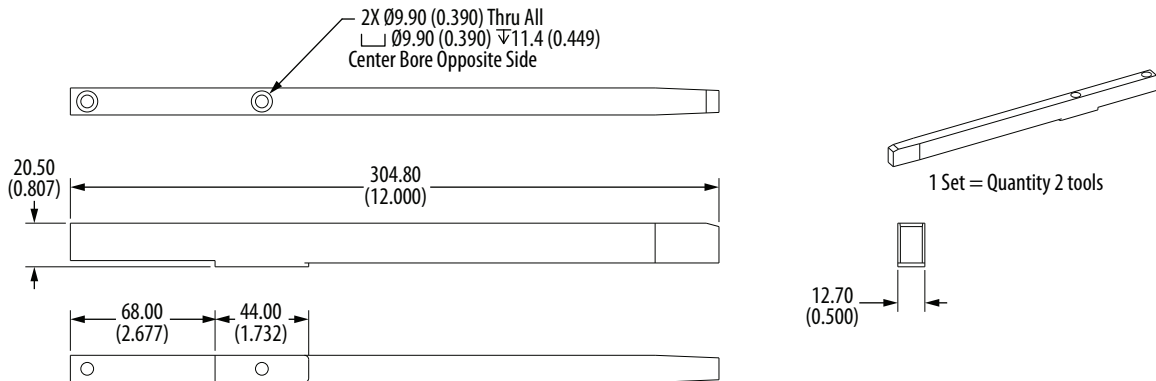
TriMax Tools

These tools are available for mover removal and installation, and the replacement of mover bearing wheel and flexure, and bearing rails.

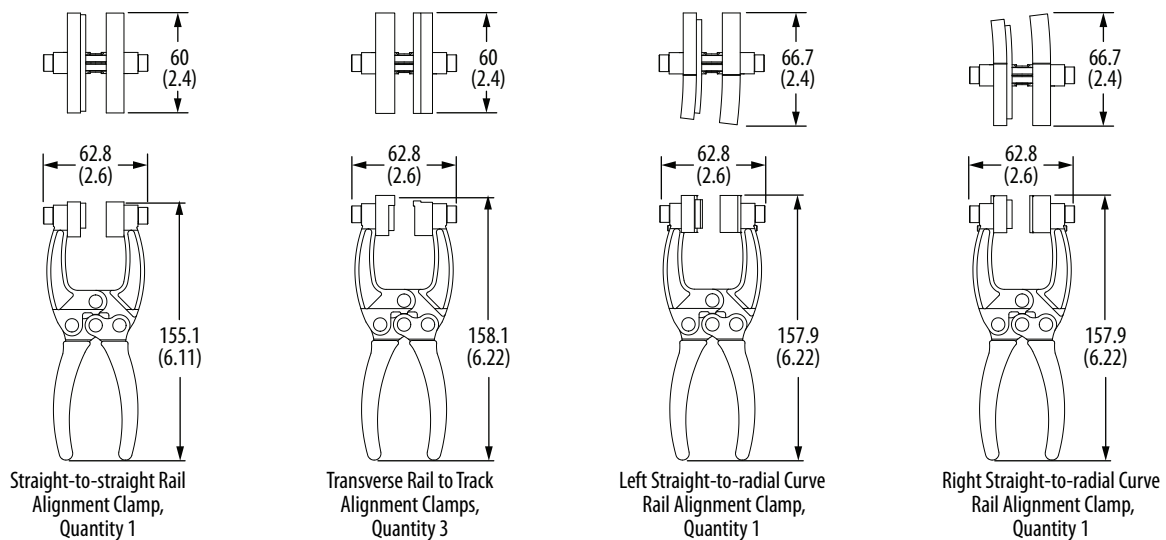
Cat. No.	Description
2198T-A03	iTRAK TriMax mover removal tools, including two straight rail stubs.
2198T-A04	iTRAK TriMax rail alignment tool kit, includes six clamps for rail location and rail joint alignment.
2198T-A05	iTRAK TriMax wheel pre-load tool, including two pieces; one for use with 2198T-AV-FLX-C1 flexure and one for the use with 2198T-AV-FLX-C2 flexure.
2198T-A06	iTRAK TriMax rail straightening tool, includes one 1.2 m (3.94 ft) straightening bar.

Dimensions

2198T-A03 iTRAK TriMax Mover Removal Tool

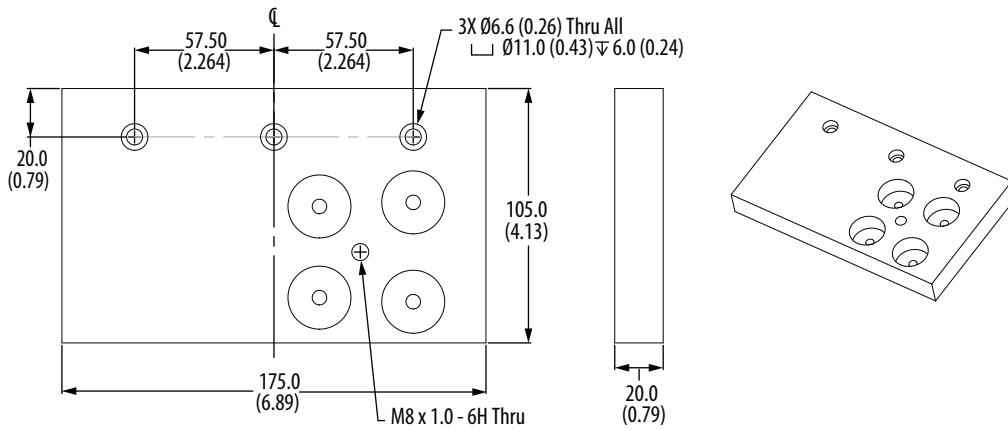


2198T-A04 iTRAK TriMax Rail Alignment Tool Kit

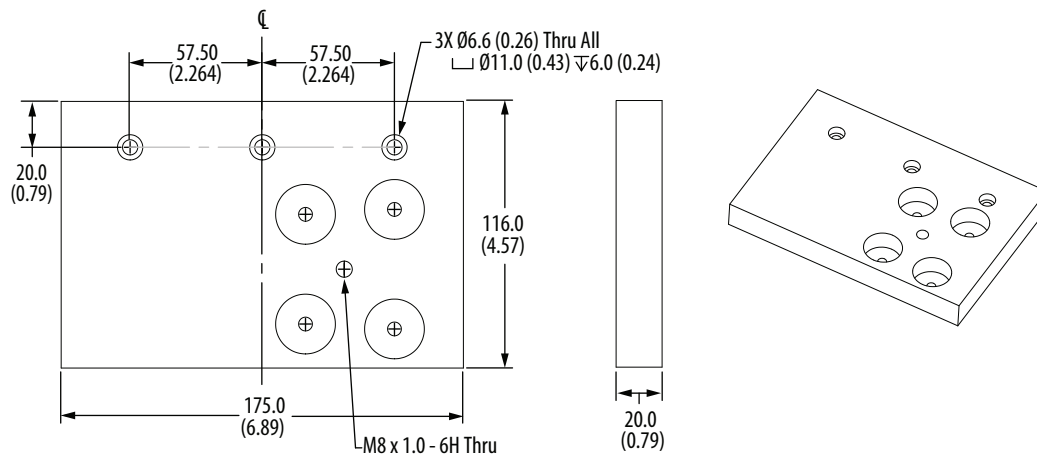


2198T-A05 iTRAK TriMax Wheel Preload Tool

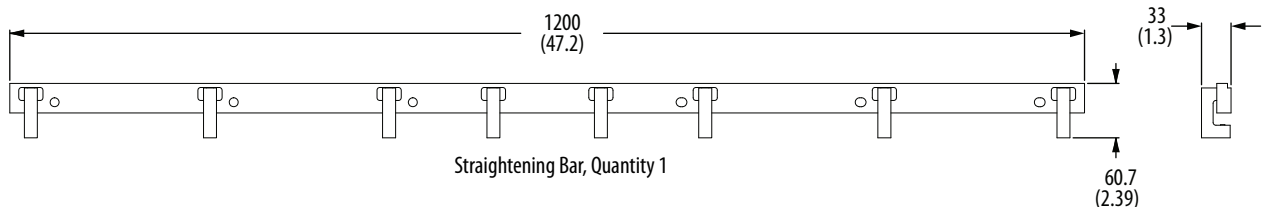
Use this wheel preload tool with on a 2198T-xTxx05-C mover with 2198T-AV-FLX-C1 flexures.



Use this wheel preload tool on 2198T-xTxx10-C and 2198T-xTxx15 movers with 2198T-AV-FLX-C2 flexures.



2198T-A06 iTRAK TriMax Rail Straightening Tool



Weights

Cat. No.	Weight, Approx kg (lb)
2198T-A03	0.36 (0.79)
2198T-A04	1.8 (3.97)

Cat. No.	Weight, Approx kg (lb)
2198T-A05	1.5 (3.31)
2198T-A06	5.2 (11.46)

Lubrication System

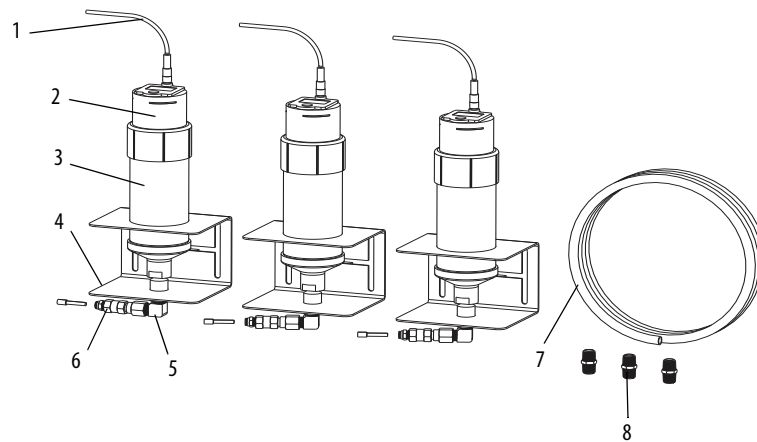
This lubrication system provides programmable lubrication pumps, mounts, and fittings to manage the lubrication that is required for your iTRAK system. The system comes with a set of straight fittings to replace the angled fittings if your system design requires them. Replacement lubricant cartridges and wipers are also available.

2198T Lubrication System

Cat. No.	Component	Description
2198T-AL-SYS	iTRAK Lubrication System	iTRAK lubrication system with three digitally activated pumps with mounting brackets, three lubricant cartridges, optional straight fitting, and 20 m (65.6 ft) of tubing.
2198T-AL-RES	iTRAK Lubrication Cartridge	iTRAK lubrication system replacement cartridges.
2198T-AL-PAD-V	iTRAK Lubrication Wiper	iTRAK lubrication wiper, vee-rail, replacement wipers for 2198T-VTxx10-A and 2198T-VTxx015-A movers, 10 pieces.
2198T-AL-PAD-V-05	iTRAK Lubrication Wiper	iTRAK lubrication wiper, vee-rail, replacement wipers for 2198T-VTxx05-A movers, 10 pieces.

Lubrication System Components

2198T-AL-SYS iTRAK Lubrication System Components ⁽¹⁾

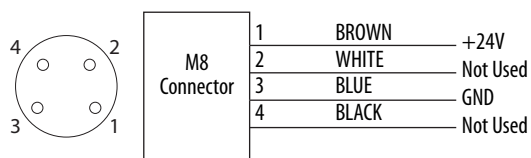


Item	Description
1	5 m (16.4 ft) Digital signal cable
2	Digitally activated pump
3	Lubricant cartridge
4	Mounting bracket
5	Brass elbow fitting
6	Check valve
7	20 m (66 ft) of tubing
8	Straight brass fitting ⁽¹⁾

(1) If your installation requires the tubing to exit the pumps vertically, you can replace the brass elbows with the three straight brass nipples that are supplied with the kit.

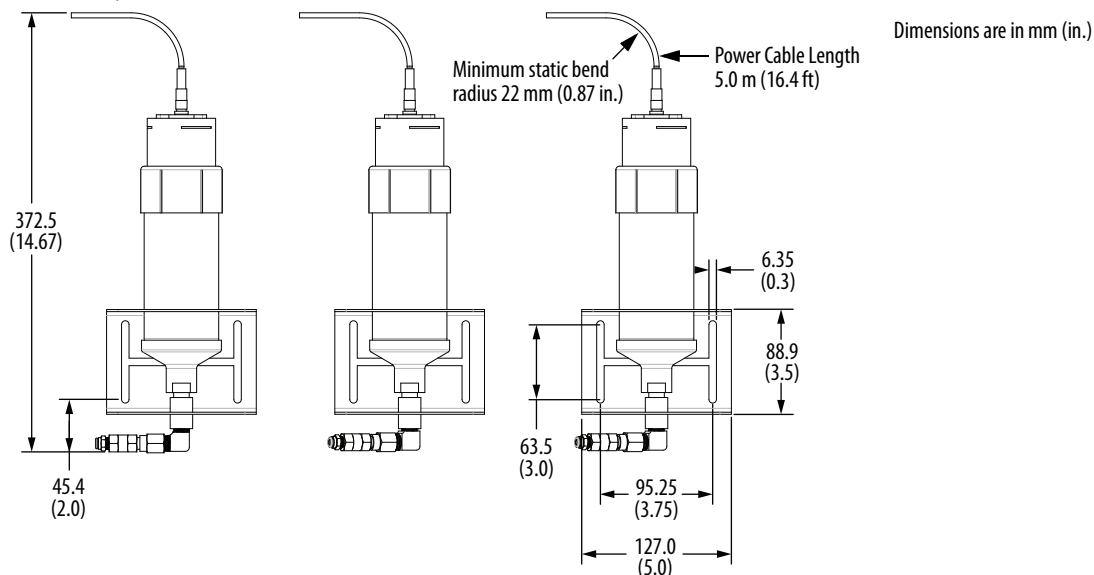
Digital Signal-cable Connector and Wiring

2198T iTRAK Lubrication System Pump Digital Signal-cable Connector and Wiring



Dimensions

2198T iTRAK Lubrication System



iTRAK Lubrication Cartridge

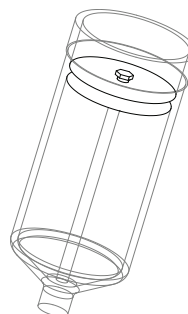
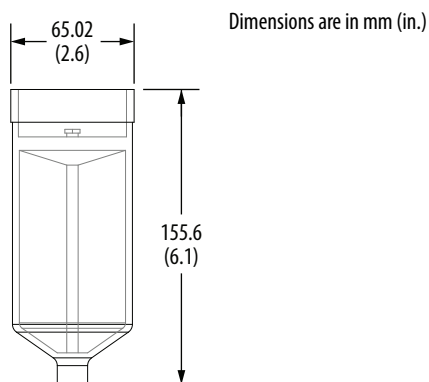
2198T Lubrication Cartridge

Cat. No.	Description
2198T-AL-RES	Mineral oil, 68 viscosity 250 cc (8.6 oz)

iTRAK Lubrication Cartridge
Catalog Number 2198T-AL-RES is shown

Dimensions

2198T Lubrication Cartridge



iTRAK Lubrication Wipers

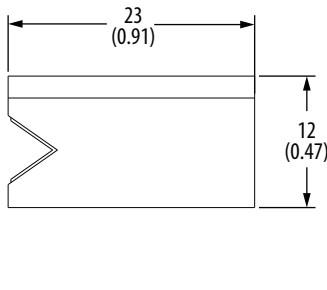
Lubrication wipers are used to spread oil around a vee-wheeled bearing track. They are typically attached to some movers, but not all. They are sold separately from the mover, but are pre-installed on fully assembled systems. Lubrication wipers are not required for cam-follower wheeled bearing tracks.

2198T iTRAK Lubrication Wipers

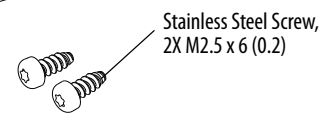
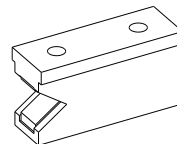
Cat. No.	Description
2198T-AL-PAD-V	iTRAK lubrication wipers are for use with 2198T-VTxx10-A and 2198T-VTxx15-A movers. Each set consists of 10 pad assemblies and 20 screws that can be mounted in either orientation on the aluminum mounts.
2198T-AL-PAD-V-05	iTRAK lubrication wipers are for use with 2198T-VTxx05-A movers. Each set consists of 10 pad assemblies and 20 screws that can be mounted in either orientation on the aluminum mounts.

Dimensions

2198T-AL-PAD-V iTRAK Lubrication Wipers

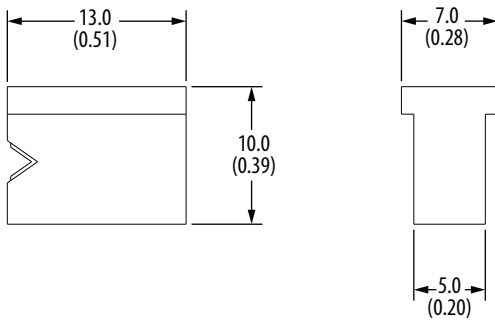


Dimensions are in mm

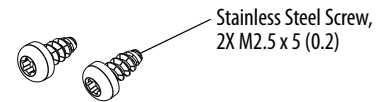
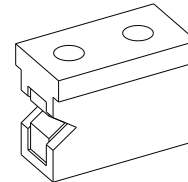


1 Set = 10 wipers and 20 screws.

2198T-AL-PAD-V-05 iTRAK Lubrication Wipers



Dimensions are in mm



1 Set = 10 wipers and 20 screws.

Weights

Cat. No.	Weight, Approx kg (lb)	
	Each	Set
2198T-AL-SYS	1.74 (3.836)	—
2198T-AL-RES	0.38 (0.838)	—
2198T-AL-PAD-V	0.04 (0.088)	0.40 (0.88)
2198T-AL-PAD-V-05	0.02 (0.044)	0.20 (0.44)

Magnet Plates

Mover magnet plates can be used to build your own movers to optimize weight or bearing solutions. They are normally included in the mover. Series B magnet plates in most cases have an additional mounting hole and all are backward compatible with series A magnet plates.

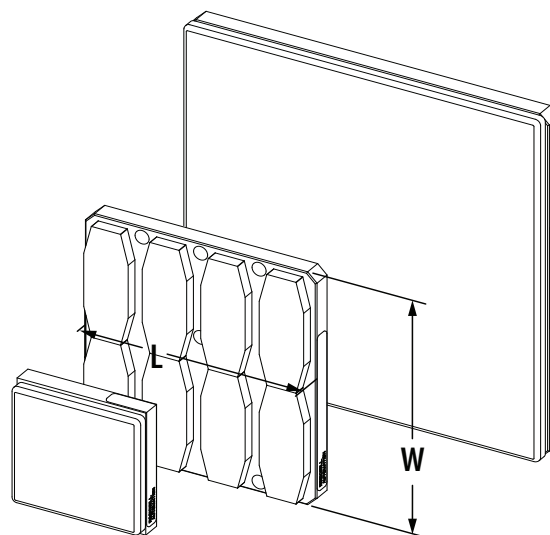
2198T Magnet Plates

Cat. No.	Plate Width mm (in.)	Plate Length ⁽¹⁾ mm (in.)
2198T-M0505-A000 2198T-M0505-A000-SS	50 (1.97)	50 (1.97)
2198T-M0510-A000 2198T-M0510-A000-SS		100 (3.97)
2198T-M0515-A000 2198T-M0515-A000-SS		150 (5.91)
2198T-M1005-A000 2198T-M1005-A000-SS	100 (3.97)	50 (1.97)
2198T-M1010-A000 2198T-M1010-A000-SS		100 (3.97)
2198T-M1015-A000 2198T-M1015-A000-SS		150 (5.91)
2198T-M1505-A000 2198T-M1505-A000-SS	150 (5.91)	50 (1.97)
2198T-M1510-A000 2198T-M1510-A000-SS		100 (3.97)
2198T-M1515-A000 2198T-M1515-A000-SS		150 (5.91)

(1) See mechanical drawings pages 51...55 for overall mover length.

Magnet Plates

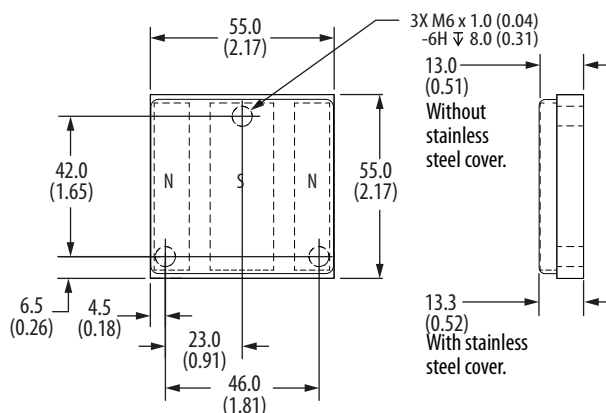
(catalog numbers 2198T-M0505-A000-SS, 2198T-M1010-A000, and 2198T-M1515-A000-SS are shown)



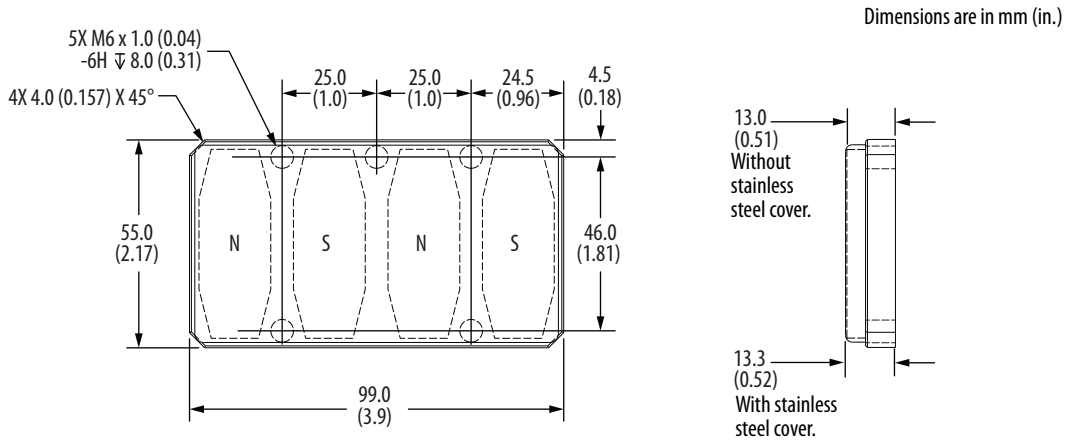
Dimensions

The magnet plate dimensions are shown with the stainless steel cover option. The mounting dimensions are the same for covered and uncovered magnet plates.

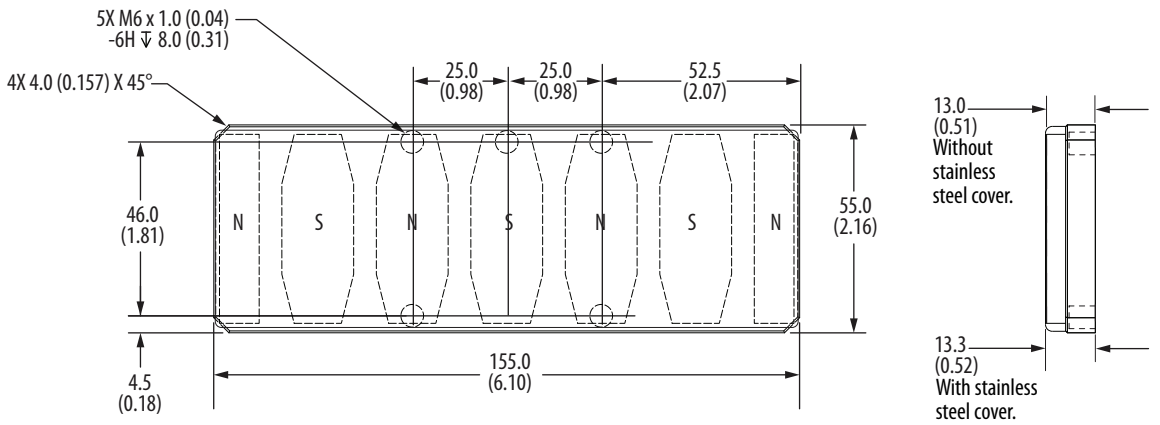
2198T-M0505-A000 Magnet Plate - Series B



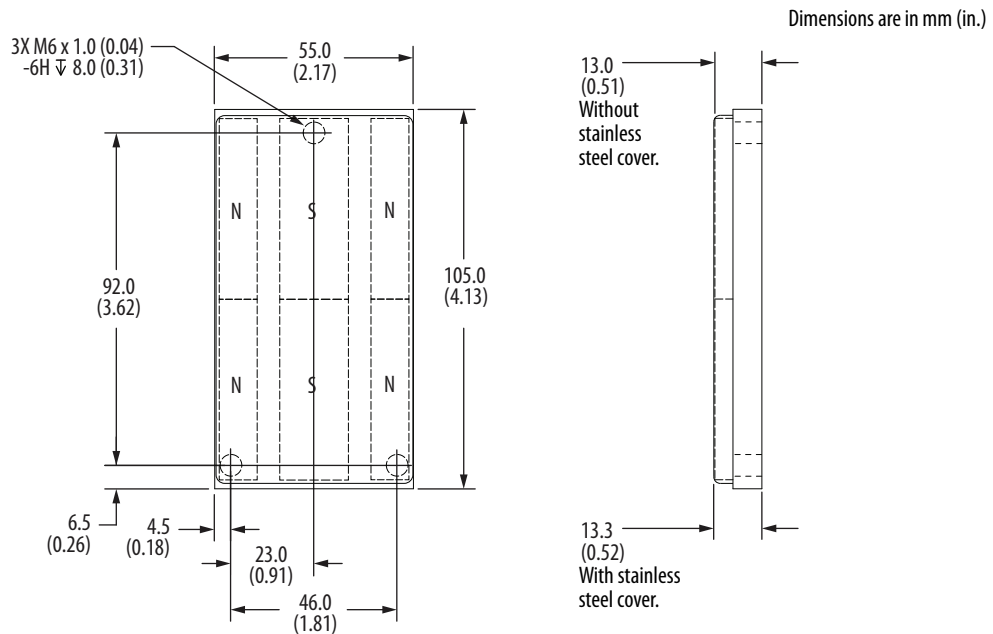
2198T-M0510-A000 Magnet Plate - Series B



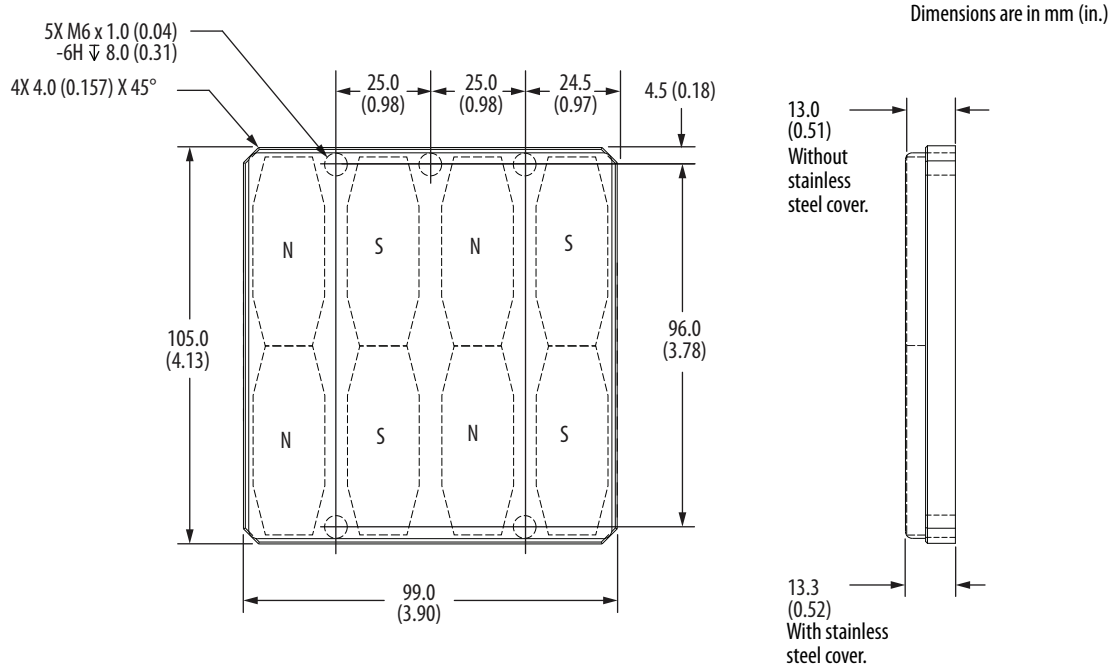
2198T-M0515-A000 Magnet Plate - Series B



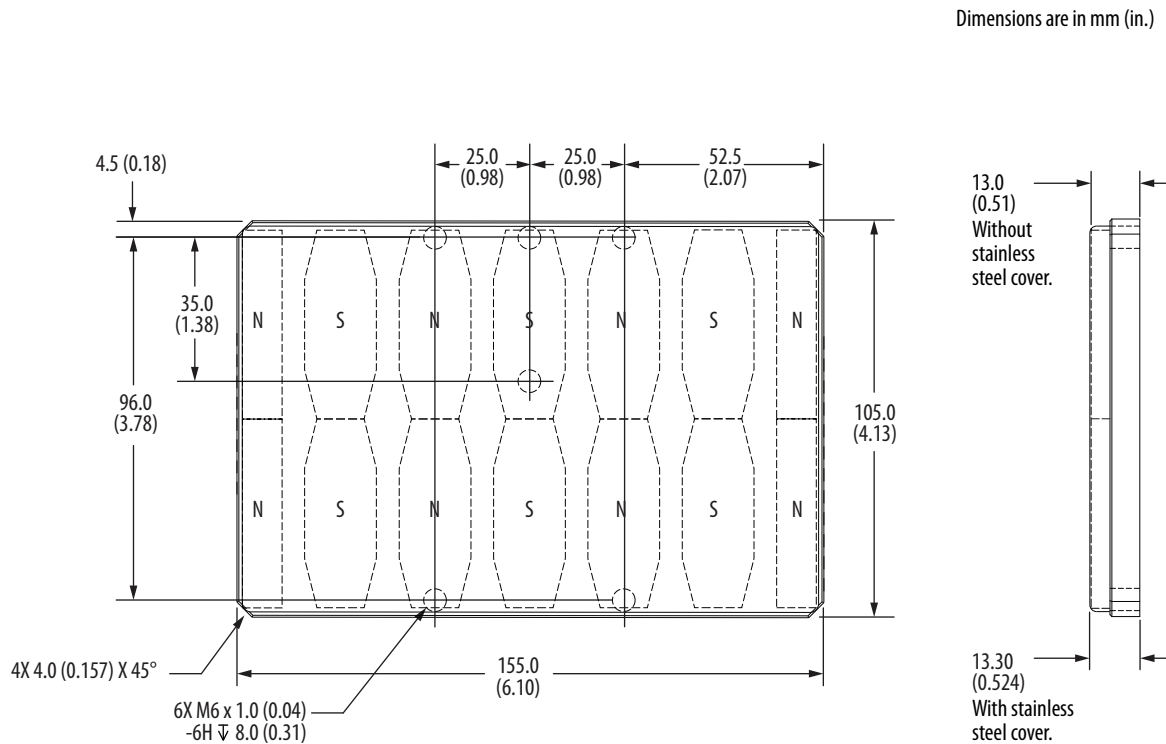
2198T-M1005-A000 Magnet Plate - Series B



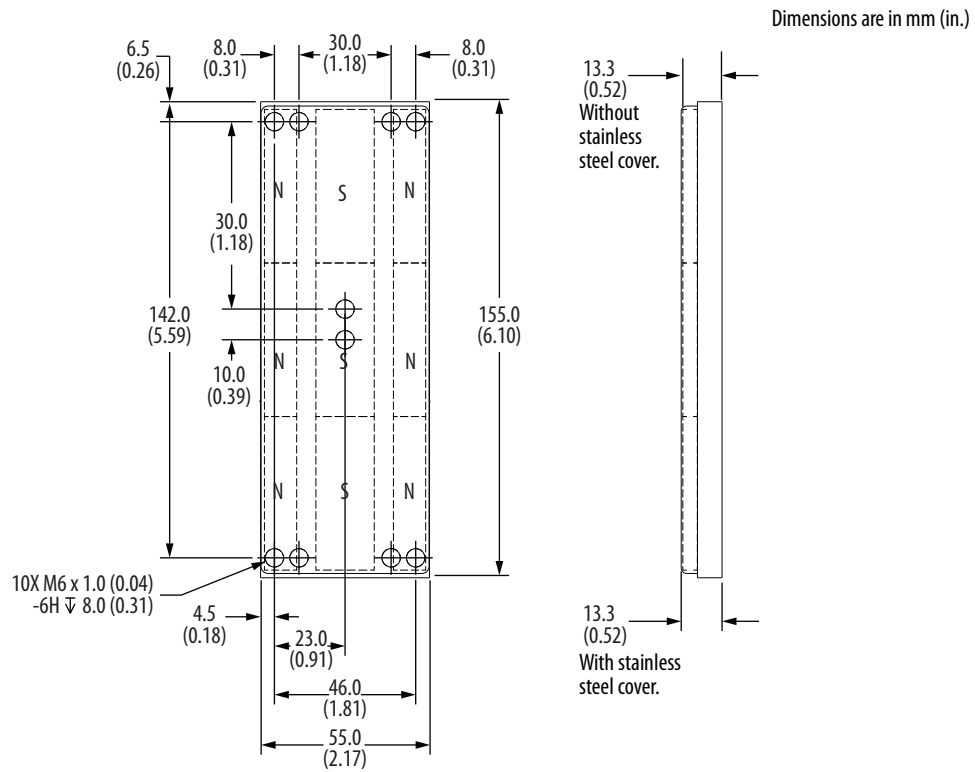
2198T-M1010-A000 Magnet Plate - Series B



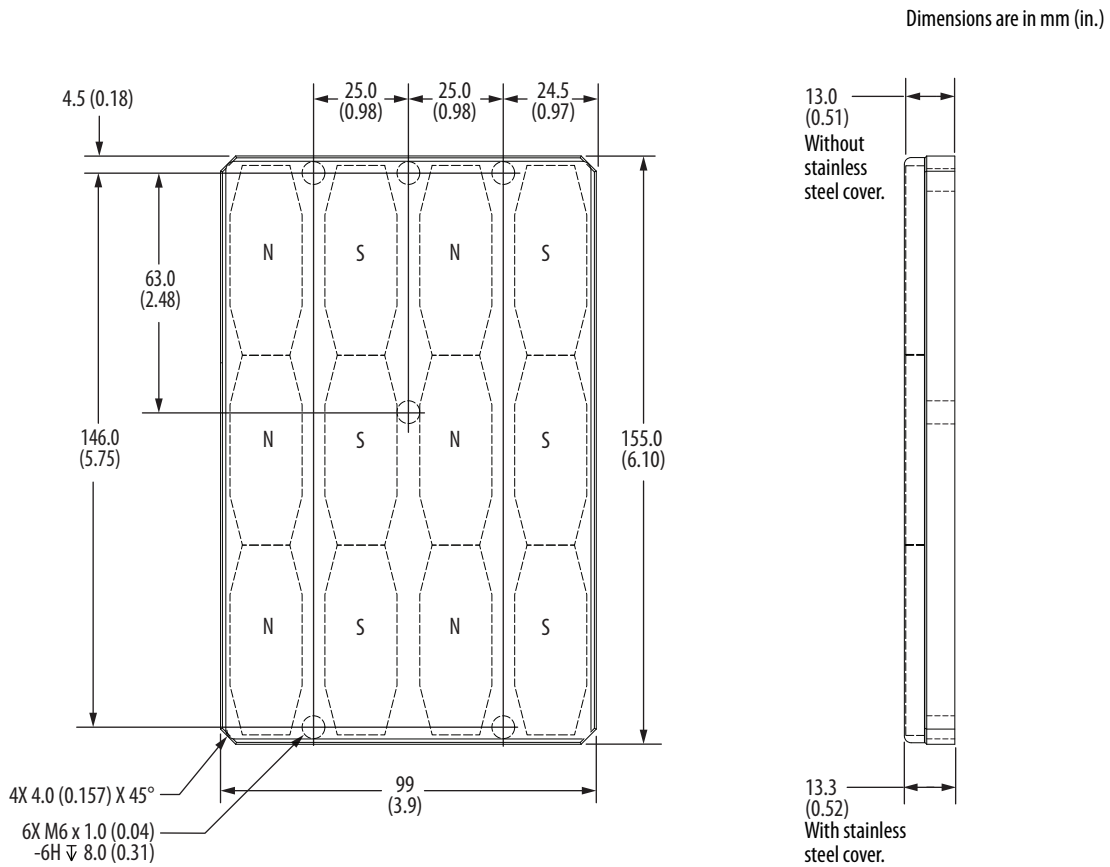
2198T-M1015-A000 Magnet Plate - Series B



2198T-M1505-A000 Magnet Plate - Series B

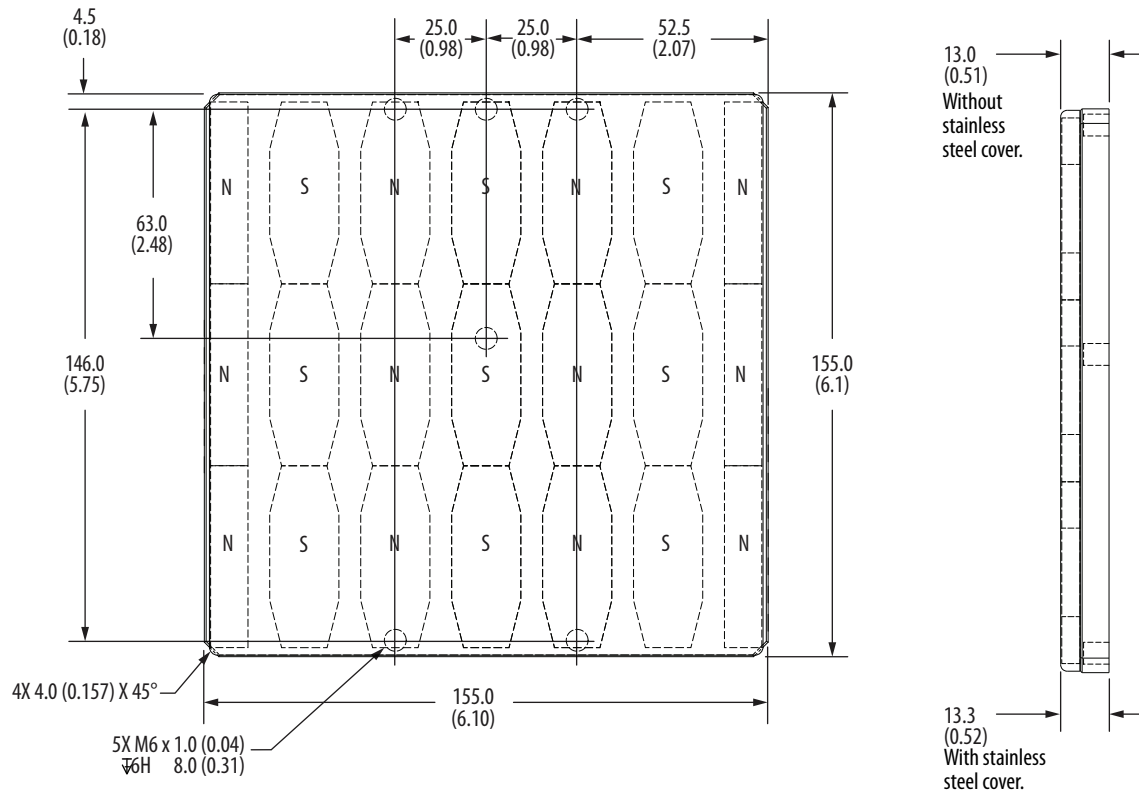


2198T-M1510-A000 Magnet Plate - Series B



2198T-M1515-A000 Magnet Plate - Series B

Dimensions are in mm (in.)



Weights

2198T Magnet Plate

Cat. No.	Weight, Approx kg (lb)
2198T-M0505-A000	0.28 (0.617)
2198T-M0510-A000	0.48 (1.058)
2198T-M0515-A000	0.76 (1.676)
2198T-M1005-A000	0.54 (1.190)
2198T-M1010-A000	0.94 (2.072)
2198T-M1015-A000	1.48 (3.263)
2198T-M1505-A000	0.76 (1.676)
2198T-M1510-A000	1.40 (3.086)
2198T-M1515-A000	2.20 (4.850)

Cat. No.	Weight, Approx kg (lb)
2198T-M0505-A000-SS	0.33 (0.728)
2198T-M0510-A000-SS	0.53 (1.168)
2198T-M0515-A000-SS	0.81 (1.786)
2198T-M1005-A000-SS	0.59 (1.301)
2198T-M1010-A000-SS	0.99 (2.183)
2198T-M1015-A000-SS	1.54 (3.395)
2198T-M1505-A000-SS	0.82 (1.808)
2198T-M1510-A000-SS	2.00 (4.409)
2198T-M1515-A000-SS	2.26 (4.982)

Position Magnets

Position magnets are used to actuate sensors in the track. These magnets are typically sold separately from the mover, but are pre-installed on fully assembled systems.

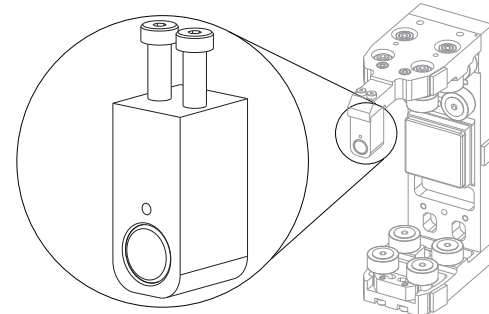
2198T Position Magnets

Cat. No.	Sensor Actuator Type ⁽¹⁾	Finish	Magnet Centerline Height mm (in.)
2198T-NN-318	North	Black anodized	31.8 (1.25)
2198T-NS-318	South	Clear anodized	

(1) North and south magnet poles must alternate on the track if movers are operating below 150 mm (5.9 in.) pitch at any place on the track.

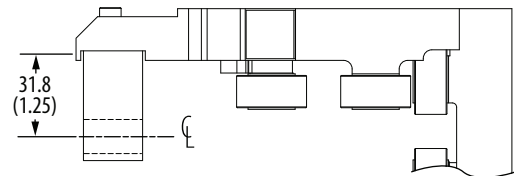
Position Magnet

(catalog number 2198T-Nx-318 shown)



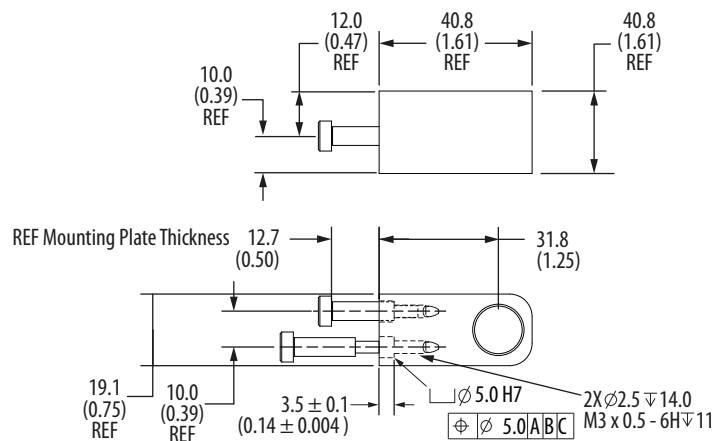
Mover Side View

Dimensions are in mm (in.)



Dimensions

2198T Position Magnet



Weights

2198T Position Magnet

Cat. No.	Weight, Approx kg (lb)
2198T-NN-318	0.06 (0.132)
2198T-NS-318	

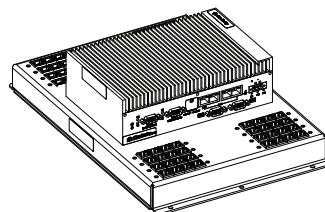
Gateway

The gateway controls and coordinates iTRAK motor modules and provides single Ethernet port for an upstream Ethernet interface to the Logix system.

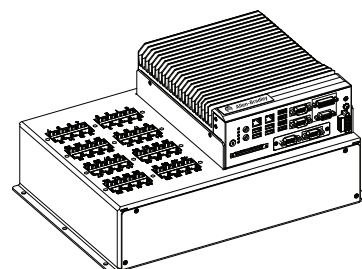
2198T Gateway

Cat. No.	Number of Ports
2198T-G02-016-E	16
2198T-G02-032-E	32
2198T-G02-048-E	48
2198T-G02-064-E	64
2198T-G03-016-E	16
2198T-G03-032-E	32
2198T-G03-048-E	48
2198T-G03-064-E	64

Gateway



2198T-G02-064-E Gateway



2198T-G03-064-E Gateway

The 2198T-G02-*xxx*-E and 2198T-G03-*xxx*-E gateways use a 3V battery (BR2032) to maintain the BIOS settings and the system clock while the power is disconnected for a short time. Replace only with a BR2032 battery, do not use CR2032 battery as a replacement.

The 2198T-G02-*xxx*-E and 2198T-G03-*xxx*-E gateways includes a 4 Gb CFast card to store the operating system and Logix Designer application interface software. The gateway does not have a hard drive, The CFast card in the only media storage device. If you require a replacement CFast card contact Rockwell Automation support.

Technical Specifications

2198T Gateway

Attribute	2198T-G02-xxx-E and 2198T-G03-xxx-E
Input voltage	19...26V DC
Power consumption	50 W
Surrounding air temperature Operating, with 0.7 m/s air flow Storage	0...50 °C (32...122 °F) -30...+60 °C (-22...+140 °F)
Relative humidity	5...95% noncondensing
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)
Certification	CE

Gateway Position Loop Update Rate

2198T-G03-xxx-E gateway supports the following Position Loop Update rates.

2198T-G03-xxx-E Gateway Position Loop Update Rate by System Size

Position Loop Update Rate	Number of Motor Modules	Number of Movers
1 ms	1...32	1...72
	33...40	1...60
	41...48	1...40
2 ms	1...32	73...96
	33...40	61...96
	41...48	41...96
	49...64	1...96

If any motor module could have five or more movers on it under servo control, the entire track must use a 2 millisecond Position Loop Update Rate.

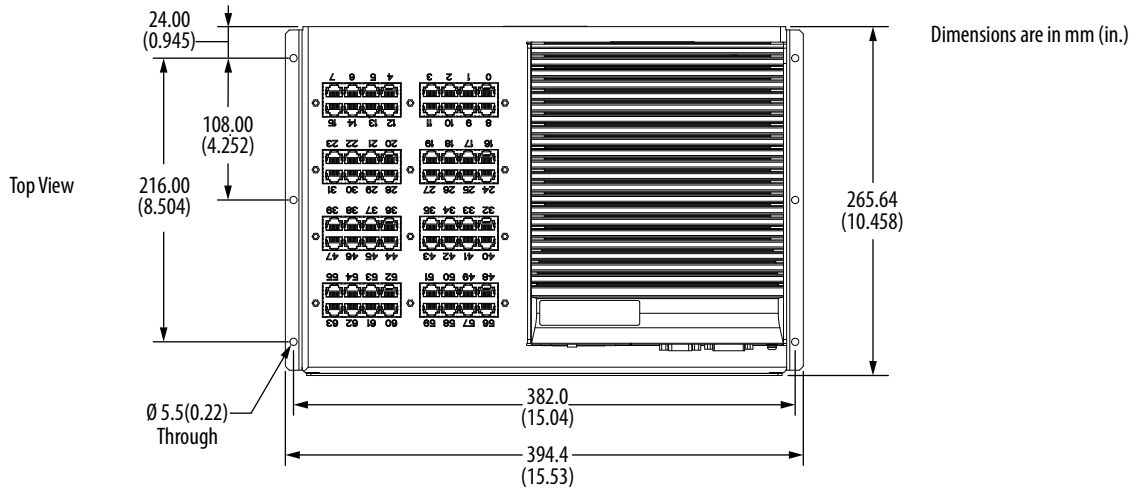
2198T-G02-xxx-E Gateway Position Loop Update Rate by System Size (ms) ^{(1) (2)}

Movers	Sections																																
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
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26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
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40	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
42	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
44	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
46	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
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56	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
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74	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
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86	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
88	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
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92	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
94	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
96	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3

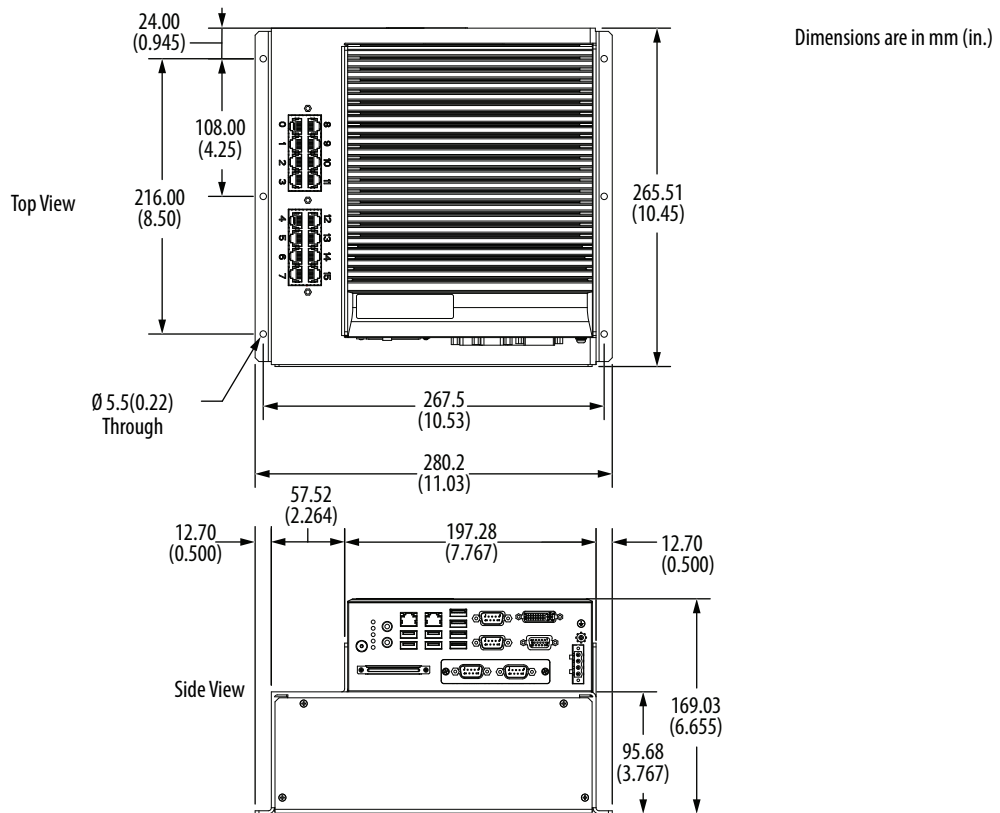
(1) Based on firmware revision 1.108 and higher.
(2) If a motor module has five or more movers on it, a 2 milliseconds Position Loop Update Rate is required.

Dimensions

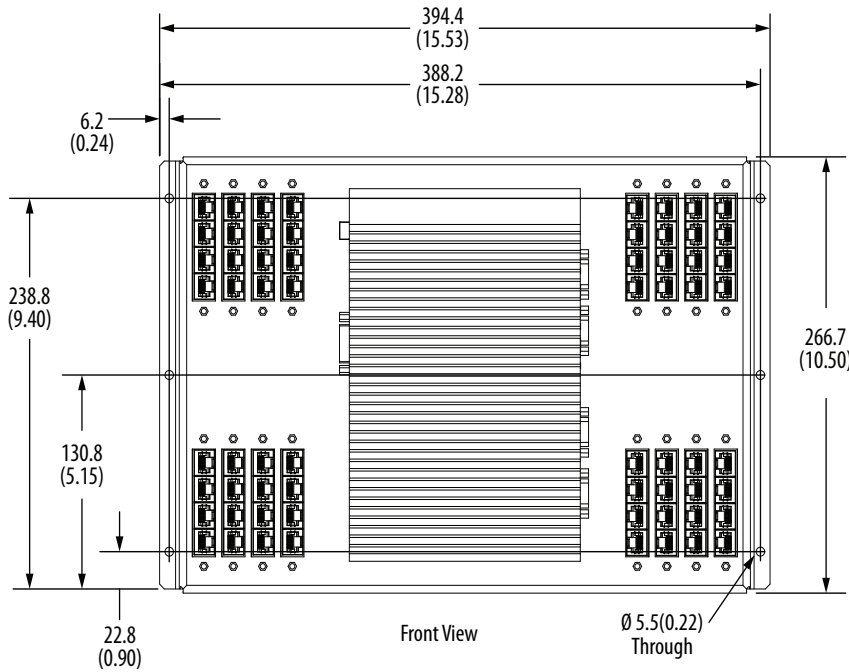
2198T-G03-032-E, 2198T-G03-048-E, and 2198T-G03-064-E Gateways



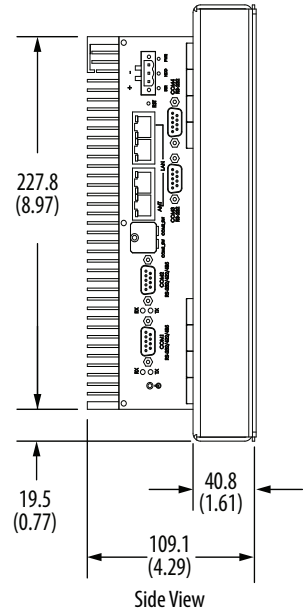
2198T-G03-016-E Gateway



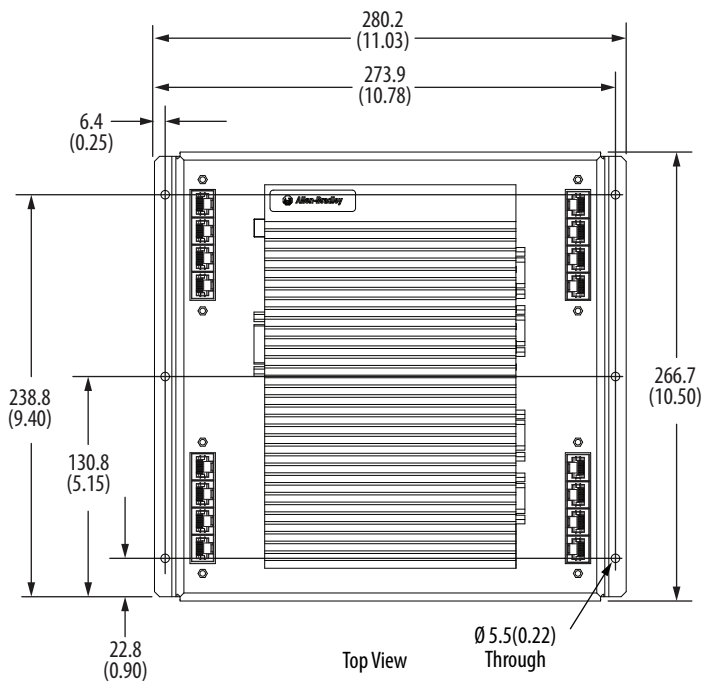
2198T-G02-032-E, 2198T-G02-048-E, and 2198T-G02-064-E Gateways



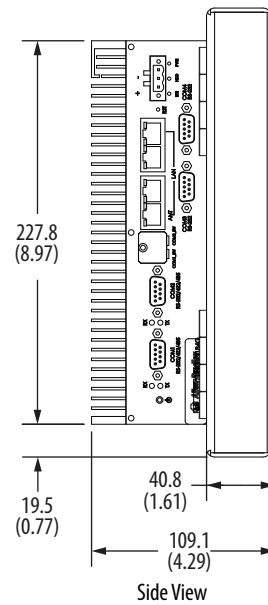
Dimensions are in mm (in.)



2198T-G02-016-E Gateway



Dimensions are in mm (in.)



Weights

2198T Gateway

Cat. No.	Weight, Approx kg (lb)
2198T-G02-016-E	3.3 (7.28)
2198T-G02-032-E	4.1 (9.04)
2198T-G02-048-E	4.2 (9.24)
2198T-G02-064-E	4.3 (9.48)
2198T-G03-016-E	4.3 (9.48)
2198T-G03-032-E	4.3 (9.48)
2198T-G03-048-E	4.9 (10.80)
2198T-G03-064-E	5.5 (12.13)

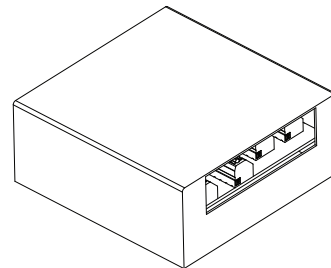
Digital USB I/O Module

The Digital USB IO module provides discrete communications between the power supplies and the gateway.

2189T Digital USB IO Module

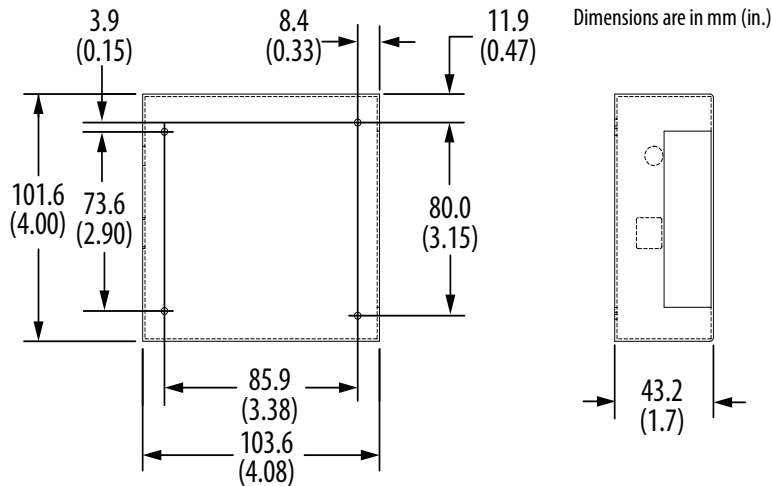
Cat. No.	Description
2198T-GUSB	Digital USB IO Module

Digital USB I/O Module
(catalog number 2198T-GUSB shown)



Dimensions

Digital USB I/O Module



Weight

Digital USB I/O Module

Cat. No.	Weight, Approx kg (lb)
2198T-GUSB	0.36 (0.8)

Kinetix 5700 iTRAK Power Supply and iTRAK Bus Conditioner Module

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 iTRAK bus conditioner module provides additional DC bus stiffness with local capacitance to the track. Use it whenever you use the iTRAK power supply unless advised by Rockwell Automation.

See Kinetix Servo Drives Specifications Technical Data, publication [KNX-TD003](#), for complete Kinetix 5700 Servo Drive system ordering information.

Kinetix 5700 iTRAK Power Supply and iTRAK Bus Conditioner Module

Cat. No.	Description
2198T-W25K-ER	Kinetix 5700 iTRAK power supply
2198T-WBCMOD	iTRAK bus conditioner module

Technical Specifications

Kinetix 5700 iTRAK Power Supply

Attribute	2198T-W25K-ER
Input voltage	458...747V DC
Continuous output current (per output)	12.5 A
Peak output current	25 A
Continuous power output DC-bus output (low voltage) DC-bus output (high voltage)	4.1 kW 165V DC 330V DC
DC input current ⁽¹⁾ @ 458V DC in @ 747V DC in	10 A 6.2 A
Internal capacitance	390 µF

(1) Because the iTRAK power supply is a DC-DC converter with a constant output rating, input current varies linearly with input voltage.

iTRAK Bus Conditioner Module

Attribute	2198T-WBCMOD
Input voltages	330V DC and 165V DC
Input current	16 A rms (330V), 10 A rms (165V), max
Temperature, operating	0...40 °C (32...104 °F)
Module ingress protection	IP65
UL listed	61800-5-1: Adjustable Speed Electrical Power Drive Systems

Control Power Current Specifications

iTRAK power supply and other Kinetix 5700 servo drive components have different 24V DC power consumption. Factors to consider when calculating the combined current demand from your 24V DC power supply include the following:

- Catalog number for each drive in the system
- Whether servo motors include the holding brake option
- Whether the system includes 2198-CAPMOD-2240 capacitor modules
- How many 2198T-W25K-ER iTRAK power supplies and the number of iTRAK motor modules supported

Control Power Current Specifications

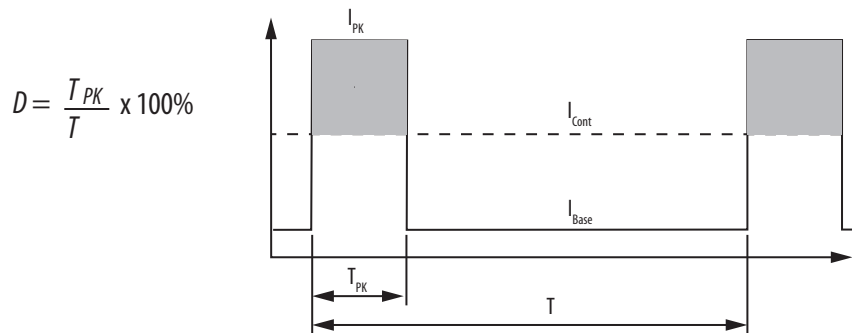
Drive Module	Drive Module Cat. No.	24V Current Per Module (Non-brake Motor) A_{DC}	24V Current, Max (With maximum brake current) A_{DC}	24V Inrush Current ⁽²⁾ A
iTRAK Power Supply ⁽¹⁾	2198T-W25K-ER	1.3	N/A	2.2

(1) These values represent only the iTRAK power supply. They exclude the iTRAK motor modules that are connected to the iTRAK power supply and also draw current from this 24V control power input. For more information regarding 24V control power requirements, see the iTRAK System User Manual, publication [2198T-UM001](#).

(2) Inrush current duration is less than 30 ms.

Peak Current Specifications

Load Duty-cycle Profile Example

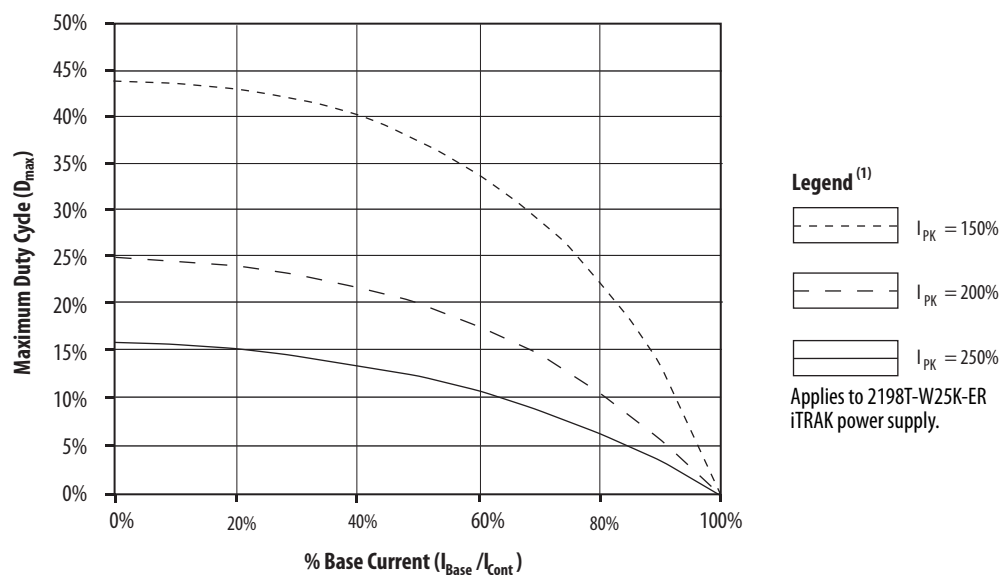


Peak-duty Cycle Definition of Terms

Term	Definition ⁽¹⁾
Continuous Current Rating (I_{Cont})	The maximum value of current that can be outputted continuously.
Peak Current Rating (I_{PKmax})	The maximum value of peak current that the drive can output. This rating is valid only for overload times less than T_{PKmax} .
Duty Cycle (D)	The ratio of time at peak to the Application Period is defined as: $D = \frac{T_{PK}}{T} \times 100\%$
Time at Peak (T_{PK})	The time at peak current (I_{PK}) for a given loading profile. Must be less than or equal to T_{PKmax} .
Peak Current (I_{PK})	The level of peak current for a given loading profile. I_{PK} must be less than or equal to the Peak Current Rating (T_{PKMAX}) of the drive.
Base Current (I_{Base})	The level of current between the pulses of peak current for a given loading profile. I_{Base} must be less than or equal to the continuous current rating (I_{Cont}) of the drive.
Loading Profile	The loading profile is composed of I_{PK} , I_{Base} , T_{PK} , and D (or T) values and completely specifies the operation of the drive in an overload situation. These values are collectively defined as the Loading Profile of the drive.
Application Period (T)	The sum of the times at I_{PK} (T_{PK}) and I_{Base} .

(1) All current values are specified as RMS.

iTRAK Power Supply Overload ($T_{PK} < 1.0$ s)



(1) Base current (I_{Base}) and peak current (I_{PK}) are a percentage of the continuous drive current rating (I_{Cont}).

Power Dissipation Specifications

Use this table to size an enclosure and calculate required ventilation for your Kinetix 5700 drive system.

Cat. No.	Usage as % of Rated Power Output (Watts)				
	20%	40%	60%	80%	100%
2198T-W25K-ER	206	272	338	404	470

Maximum Motor-cable Lengths

For iTRAK systems, cables from iTRAK power supply to motor modules up to 30 m (98 ft) can be used. See [Maximum iTRAK Power Supply to Motor Module Cable Length on page 13](#) for cable specifications.

IMPORTANT System performance was tested at these cable lengths. These limitations also apply when meeting CE requirements.

Environmental Specifications

Kinetix 5700 iTRAK Power Supply

Attribute	Operational Range	Storage Range (Non-operating)
Ambient temperature	0...50 °C (32...122 °F)	-40...+70 °C (-40...+158 °F)
Relative humidity	5...95% noncondensing	5...95% noncondensing
Protection class (EN 60529)	IP20	
Degree of pollution (EN 61800-5-1)	2	
Altitude	<ul style="list-style-type: none"> 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 	3000 m (9843 ft) during transport
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

Kinetix 5700 iTRAK Power Supply

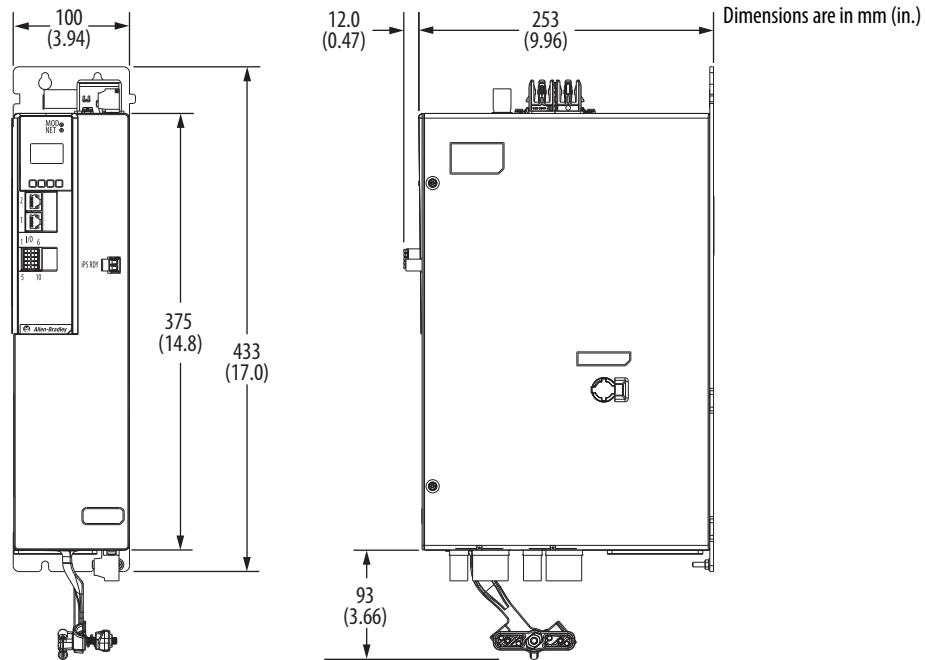
Agency Certification ⁽¹⁾	Standards
c-UL-us	UL Listed to U.S. and Canadian safety standards (UL 61800-5-1, File E59272, and CSA C22.2 No 274-13).
CE	<p>European Union 2004/108/EC EMC Directive compliant with EN 61800-3:2004 + A1:2012: Adjustable Speed Electrical Power Drive Systems - Part 3; EMC Product Standard including specific test methods.</p> <p>European Union 2006/95/EC Low Voltage Directive compliant with EN 61800-5-1:2007 - Adjustable speed electrical power drive systems.</p>
C-Tick	<p>Australian Radiocommunications Act, compliant with:</p> <ul style="list-style-type: none"> Radiocommunications Act: 1992 Radiocommunications (Electromagnetic Compatibility) Standard: 2008 Radio communications Labeling (Electromagnetic Compatibility) Notice: 2008
KC	<p>Korean Registration of Broadcasting and Communications Equipment, compliant with:</p> <ul style="list-style-type: none"> Article 58-2 of Radio Waves Act, Clause 3 Registration number: KCC-REM-RAA-2198
OSHA	Maximum audible noise from the servo drive system complies with OSHA standard 3074, Hearing Conservation (<85 dBA).

(1) When product is marked, see <http://www.rockwellautomation.com/global/certification/overview.page> for Declarations of Conformity Certificates.

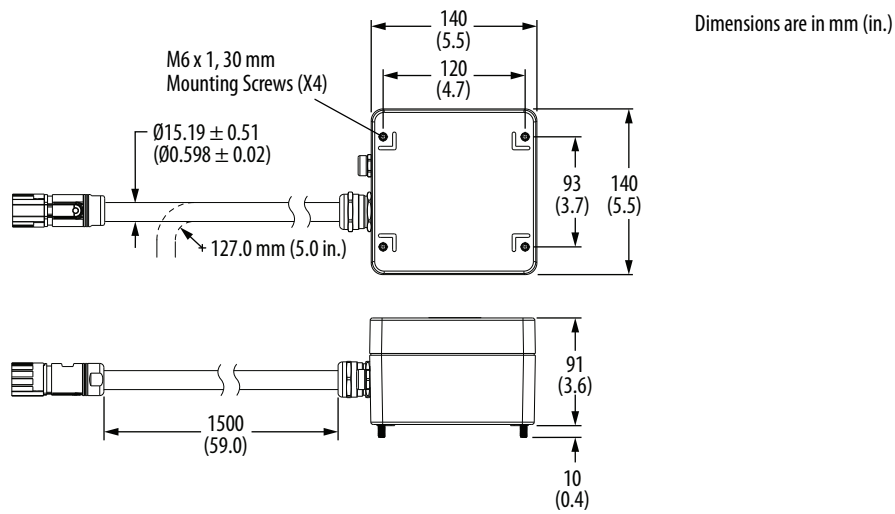
Dimensions

These drawings provide mounting dimensions iTRAK power supply and the iTRAK bus conditioner.

2198T-W25K-ER Kinetix 5700 iTRAK Power Supply



2198T-WBCMOD iTRAK Bus Conditioner Module



Weights

Kinetix 5700 iTRAK Power Supply and iTRAK Bus Conditioner

Cat. No.	Weight, Approx kg (lb)
2198T-W25K-ER	7.60 (16.8)
2198T-WBCMOD	2.7 (5.96)

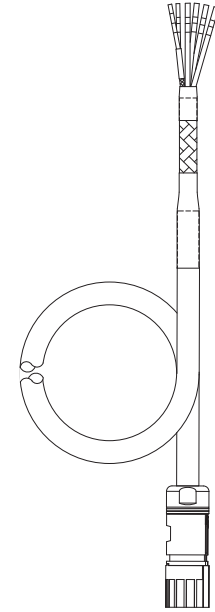
Power Cable - iTRAK Power Supply

Power Cables - iTRAK Power Supply

Cat. No.	Length m (ft)	Control Power Conductor mm ² (AWG)	Buss Power Conductor mm ² (AWG)	Down Stream Connector	Upstream Connector	Cable Type
2198T-CHBFLS8-12AA06	6 (19.7)	2.08 (14)	3.31 (12)	M23 - Female	Flying Lead	Hybrid Main and Control Power
2198T-CHBFLS8-12AA09	9 (29.5)					
2198T-CHBFLS8-12AA12	12 (39.4)					
2198T-CHBFLS8-12AA15	15 (49.2)					
2198T-CHBFLS8-12AA30	30 (98.4)					

Power Cable

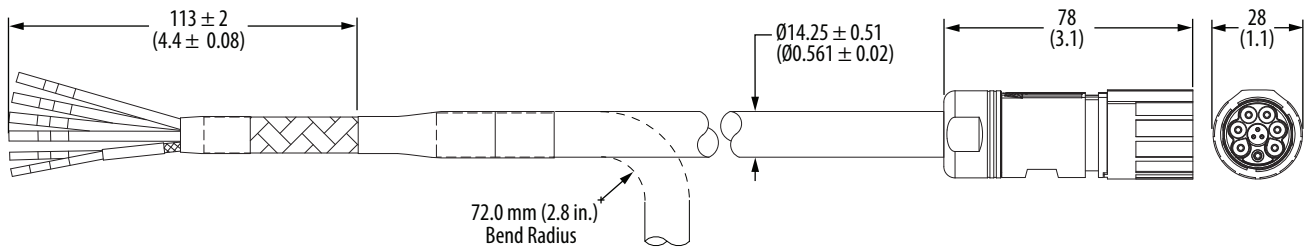
(catalog number 2198T-CHBP8S8-12AAxx show



Dimensions

2198T-CHBP8S8-12xx Power Cable

Dimensions are in mm (in.)



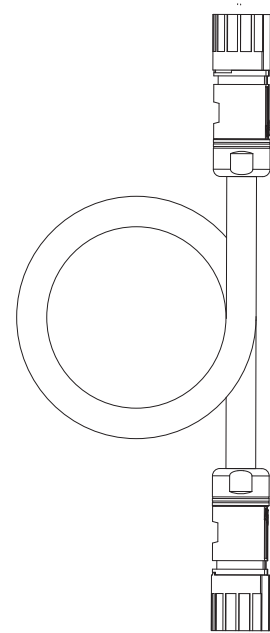
Power Cables - Jumper

Power Cables - Jumper

Cat. No.	Length m (ft)	Control Power Conductor mm ² (AWG)	Buss Power Conductor mm ² (AWG)	Down Stream Connector	Upstream Connector	Cable Type
2198T-CHBP8S8-12P3	0.38 (1.2)	0.82 (18)	3.31 (12)	M23 - Female	M23 - Male	Hybrid Main and Control Power
2198T-CHBP8S8-12P6	0.60 (2.0)					

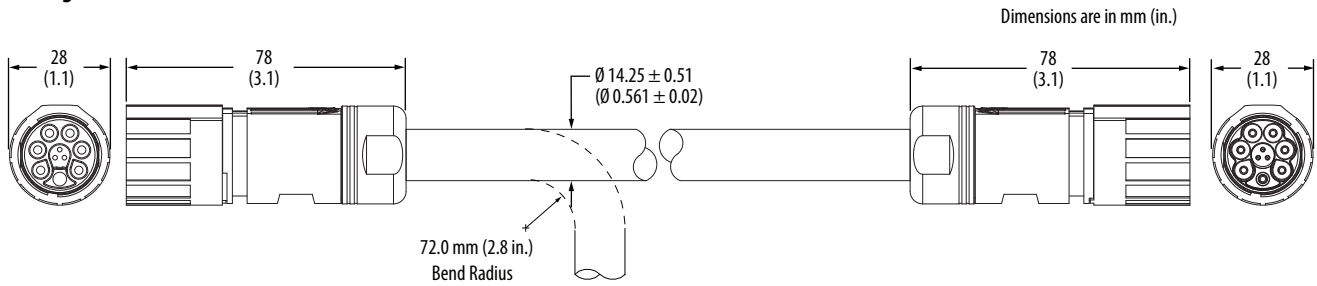
Power Cable

(catalog number 2198T-CHBP8S8-12P6 shown)



Dimensions

Catalog Number 2198T-CHBP8S8-12xx



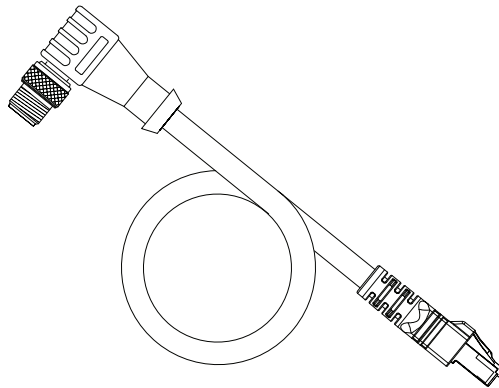
Communication Cables

The following table shows the standard serial-communication cord sets for the iTRAK system. The cord sets are terminated with RJ-45 and right angle 8-wire A-Code M12 connectors.

2198T Communication Cable

Cat. No.	Length m (ft)
2198T-CC-01	1 (3.3)
2198T-CC-02	2 (6.6)
2198T-CC-03	3 (9.9)
2198T-CC-04	4 (13.1)
2198T-CC-05	5 (16.4)
2198T-CC-06	6 (19.7)
2198T-CC-08	8 (26.2)
2198T-CC-09	9 (29.5)
2198T-CC-10	10 (32.8)
2198T-CC-12	12 (39.4)
2198T-CC-15	15 (49.2)

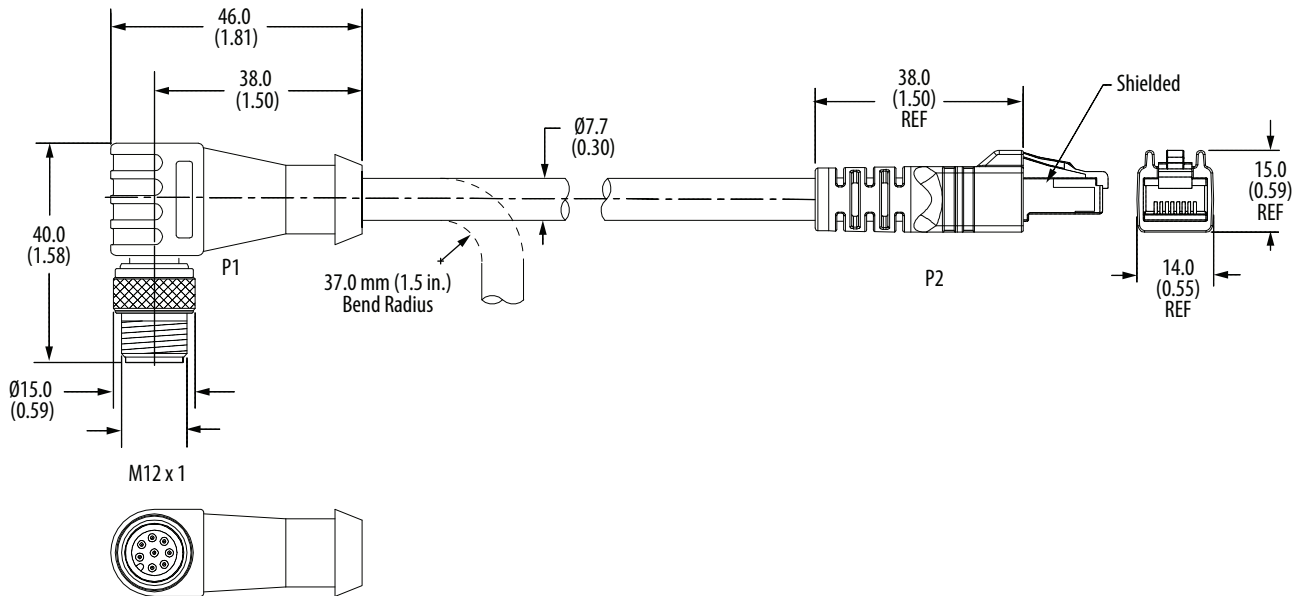
Communication Cable
(catalog number 2198T-CC-01 shown)



Dimensions

2198T-CC-xx Communication Cable

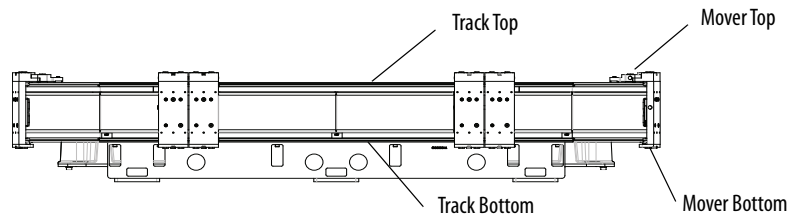
Dimensions are in mm (in.)



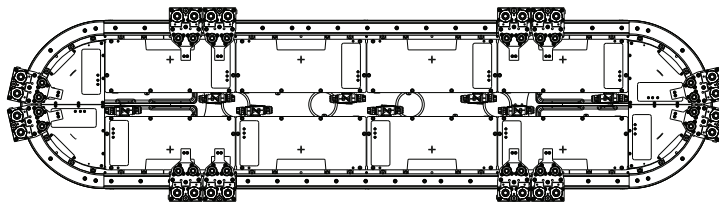
Mounting Options

iTRAK systems can be mounted in few orientations. In any orientation, the top of the system is defined as the top of the mover as shown the [Horizontal Mounting Orientation \(H\)](#) figure.

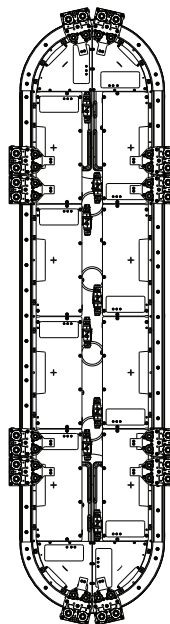
Horizontal Mounting Orientation (H)



Vertical Mounting Orientation (V)



Stand-up Mounting Orientation (S)



Mover and Magnet Plate Specifications

- Force specification $\pm 10\%$ unless otherwise stated.
- The maximum acceleration for a 2198T-VTxxxx-x mover is limited to 39.2 m/s^2 (4.0 g).

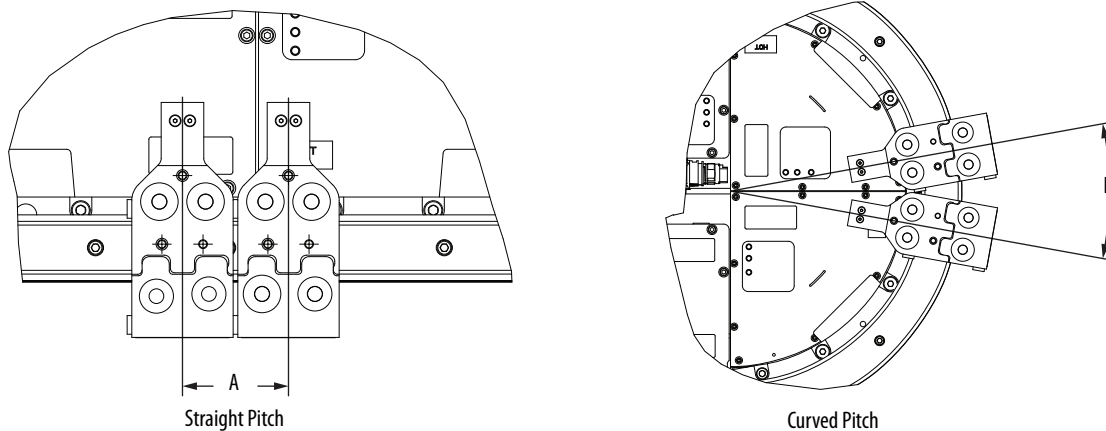
Mover Cat. No.	Magnet Plate Cat. No.	Magnet Width mm (in.)	Magnet Length ⁽¹⁾ mm (in.)	Magnetic Attraction Straights ⁽²⁾ N (lbf)	Magnetic Attraction Curves ⁽²⁾ N (lbf)	Straight Motor-module Minimum Mover to Mover Pitch ⁽³⁾ A mm (in.)	Curved Motor Module Minimum Mover to Mover Pitch ⁽³⁾ B°
2198T-VT0505-x	2198T-M0505-A000	50 (1.97)	50 (1.97)	410 (92)	350 (79)	72.5 (2.85)	20.5°
2198T-VT0510-x	2198T-M0510-A000		100 (3.97)	820 (184)	570 (128)	104.5 (4.11)	25.5°
2198T-VT0515-x	2198T-M0515-A000		150 (5.91)	1250 (281)	610 (137)	166.5 (6.6)	34.0°
2198T-VT1005-x	2198T-M1005-A000	100 (3.97)	50 (1.97)	820 (184)	700 (157)	72.5 (2.85)	20.5°
2198T-VT1010-x	2198T-M1010-A000		100 (3.97)	1640 (369)	1140 (256)	104.5 (4.11)	25.5°
2198T-VT1015-x	2198T-M1015-A000		150 (5.91)	2510 (564)	1220 (274)	166.5 (6.6)	34.0°
2198T-VT1505-x	2198T-M1505-A000	150 (5.91)	50 (1.97)	1220 (274)	1040 (234)	72.5 (2.85)	20.5°
2198T-VT1510-x	2198T-M1510-A000		100 (3.97)	2460 (553)	1710 (384)	104.5 (4.11)	25.5°
2198T-VT1515-x	2198T-M1515-A000		150 (5.91)	3760 (845)	1830 (411)	166.5 (6.6)	34.0°

(1) See mechanical drawing for overall mover length.

(2) At standard mechanical air gap.

(3) Pitch is measured at the center line of the mover.

Straight and Curved Motor Module Mover to Mover Pitch



Environmental Specifications

System Level

Attribute	Value
Ambient temperature	0...40 °C (32...104 °F)
Storage temperature	-30...+70 °C (-22...+158 °F)
Relative humidity	5...95% non-condensing

Motor Module

Attribute	Value
Liquid / dust protection	IP65
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

System Level Certifications

- EN 60204-1:2006/A1:2009, Safety of machinery - Electrical Equipment of Machines - Part 1: General requirements
- EN 61800-3: 2004, Adjustable Speed Electrical Power Drive Systems - Part 3 EMC Requirements
- EN ISO-13849-1 Safety of Machinery - Safety - related parts of control system - Part 1: General principle of design

Module Level Certifications

- UL Listed, XDNZ: Electronically Protected Motors with Integral Controllers for Industrial Use
- EN 60034-1: 2004, Rotating electrical machines. Part 1 Rating and Performance
- EN 60204-1:2006/A1:2009, Safety of machinery - Electrical Equipment of Machines - Part 1: General requirements

Performance Specifications

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

Common Performance Specifications

Attribute	Value
Motor max temperature ⁽¹⁾	80 °C (176 °F)
Nominal air gap between motor and center line of magnet surface	2.0 ± 0.25 mm (0.08 ± 0.01 in.)

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

Performance Specifications Straight Module and Mover Combination

Motor Module Cat. No.	Frame Width	Mover Cat. No.	Magnet Length mm (in.)	Stall Force ^{(1) (2)} N (lb)	Continuous Force ^{(1) (3) (4)} N (lb)	Peak Force ⁽¹⁾ N (lb)
2198T-L16-T0504-A00N-2E1E-NS	50 mm	2198T-VT0505-x	50 (1.97)	37 (8.3)	46 (10.3)	88 (19.8)
		2198T-VT0510-x	100 (3.94)	79 (17.8)	97 (21.8)	185 (41.6)
		2198T-VT0515-x	150 (5.91)	112 (33.7)	139 (31.2)	265 (59.6)
2198T-L16-T1004-A00N-2E1E-NS	100 mm	2198T-VT1005-x	50 (1.97)	75 (25.2)	93 (20.9)	176 (39.6)
		2198T-VT1010-x	100 (3.94)	157 (35.3)	194 (43.6)	370 (83.2)
		2198T-VT1015-x	150 (5.91)	225 (50.6)	278 (62.5)	529 (118.9)
2198T-L16-T1504-A00N-2E1E-NS	150 mm	2198T-VT1505-x	50 (1.97)	112 (27.4)	139 (31.2)	265 (59.6)
		2198T-VT1510-x	100 (3.94)	236 (53.1)	292 (65.6)	555 (124.4)
		2198T-VT1515-x	150 (5.91)	337 (75.8)	417 (93.7)	793 (178.3)

(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 multiple movers on the same section, derate by 20%.

Performance Specifications Curved Module and Mover Combination

Motor Module Cat. No.	Frame Width	Mover Cat. No.	Magnet Length mm (in.)	Stall Force ^{(1) (2)} N (lb)	Continuous Force ^{(1) (3) (4)} N (lb)	Peak Force ⁽¹⁾ N (lb)
2198T-L16-T0504-B09x-2E1E-NS	50 mm	2198T-VT0505-x	50 (1.97)	28 (6.3)	34 (7.6)	65 (14.6)
		2198T-VT0510-x	100 (3.94)	54 (12.1)	67 (15.1)	128 (28.8)
		2198T-VT0515-x	150 (5.91)	66 (14.8)	82 (18.4)	155 (34.8)
2198T-L16-T1004-B09x-2E1E-NS	100 mm	2198T-VT1005-x	50 (1.97)	55 (12.4)	68 (15.3)	130 (29.2)
		2198T-VT1010-x	100 (3.94)	109 (24.5)	134 (30.1)	225 (50.6)
		2198T-VT1015-x	150 (5.91)	132 (29.7)	163 (36.6)	311 (69.9)
2198T-L16-T1504-B09x-2E1E-NS	150 mm	2198T-VT1505-x	50 (1.97)	83 (18.7)	102 (22.9)	194 (43.6)
		2198T-VT1510-x	100 (3.94)	163 (36.6)	201 (45.2)	383 (86.1)
		2198T-VT1515-x	150 (5.91)	198 (44.5)	245 (55.1)	466 (104.8)

(1) The force tolerance is ±10%.

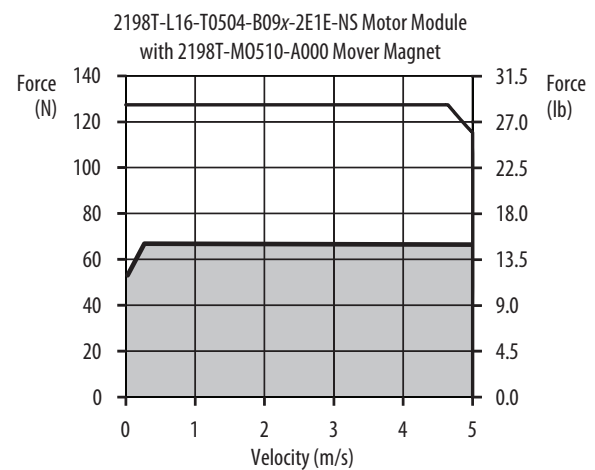
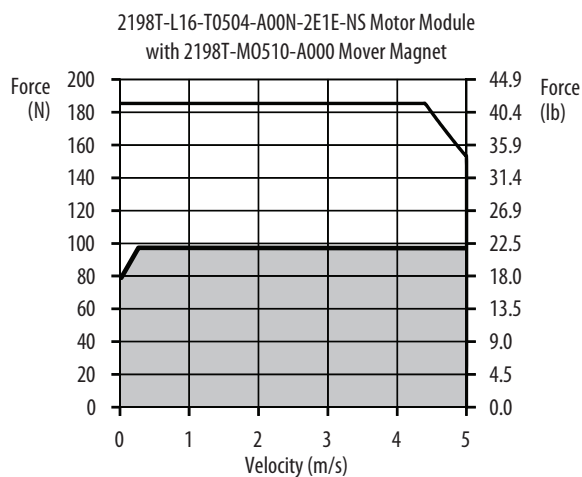
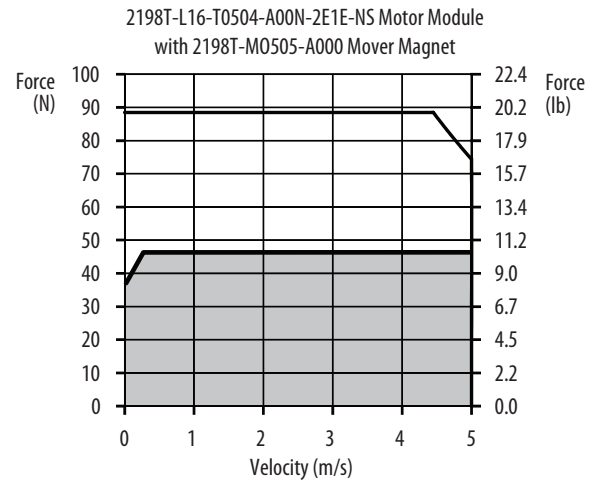
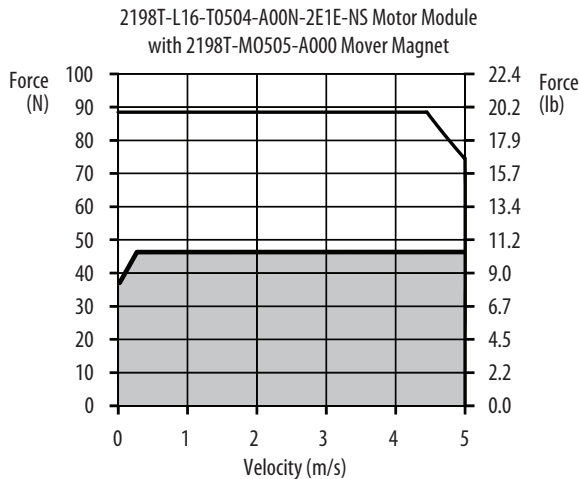
(2) The stall speed is 250 mm/s or less.



(3) Force specifications are for one mover per section moving at 250 mm/s (0.8 ft/s) or greater.

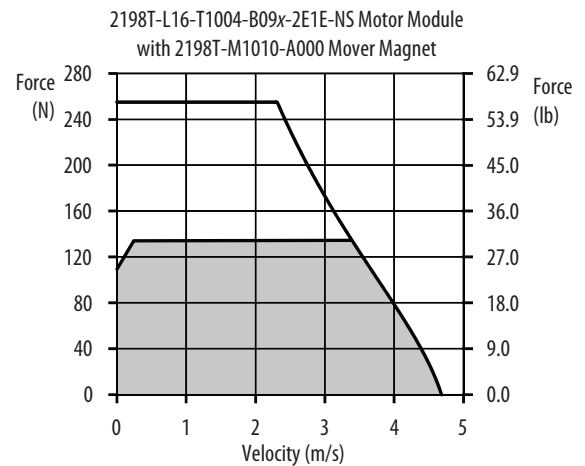
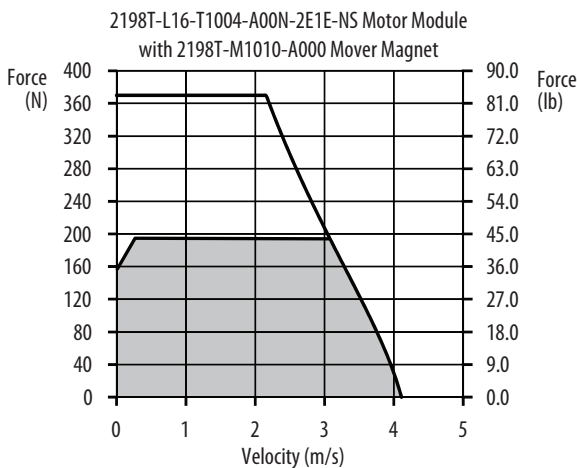
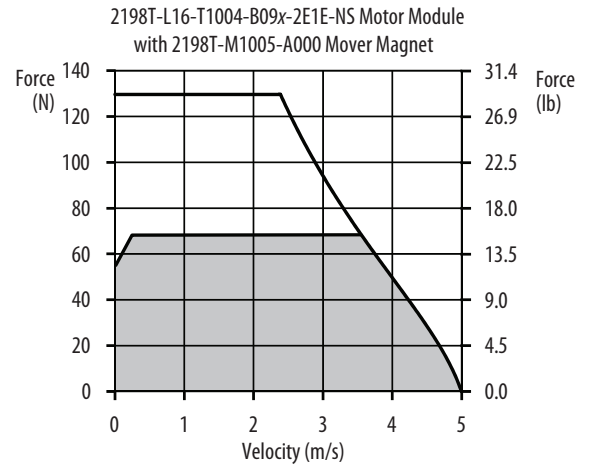
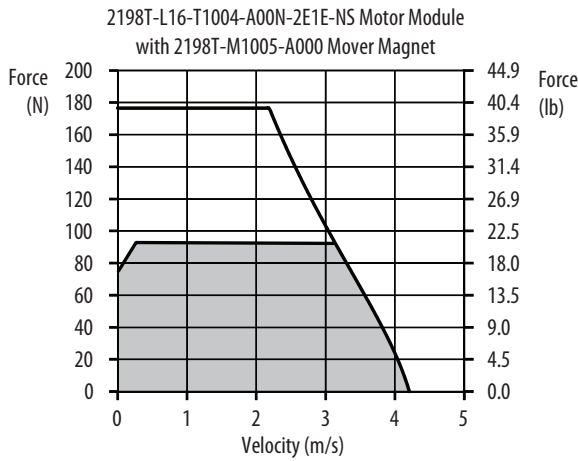
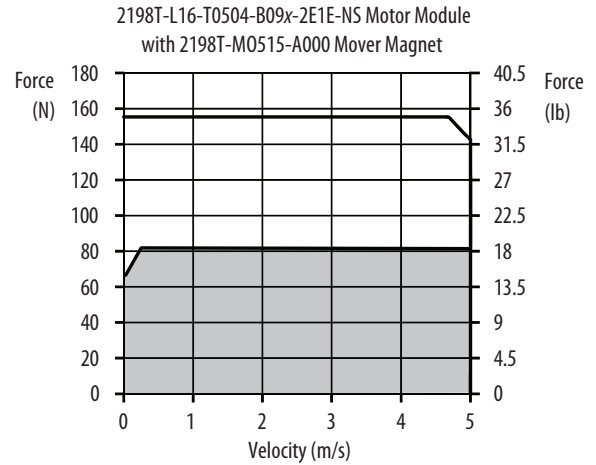
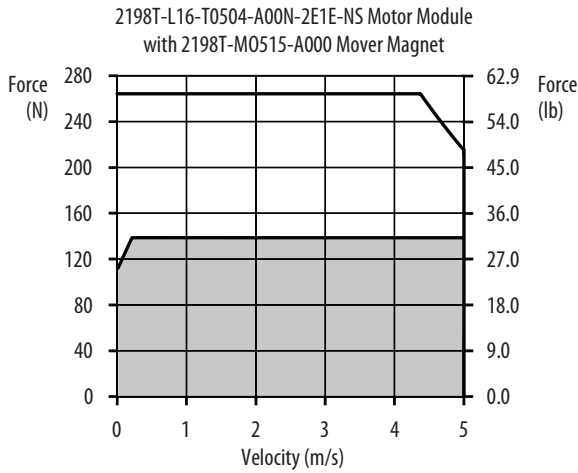
(4) For multiple movers on the same section, derate by 20%.



Force Speed Curves

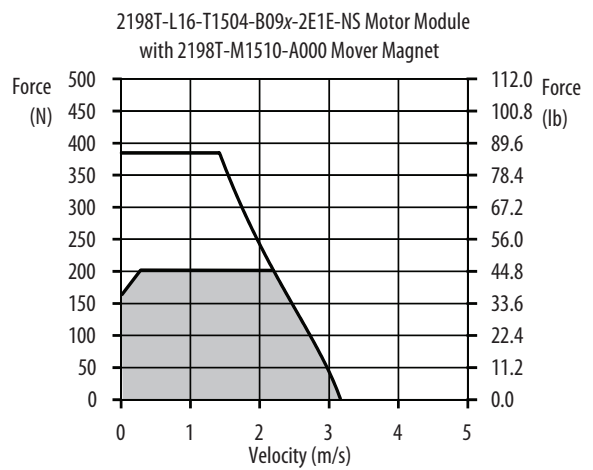
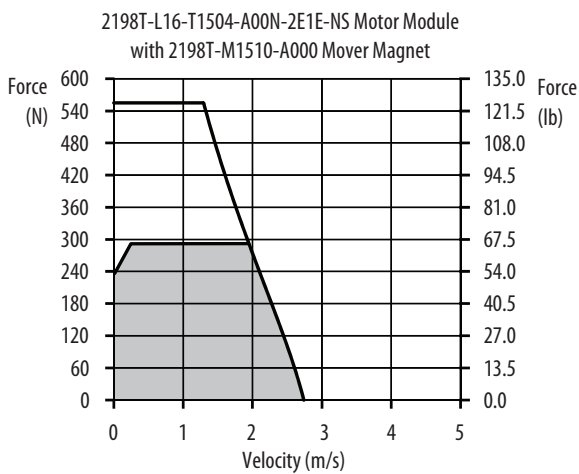
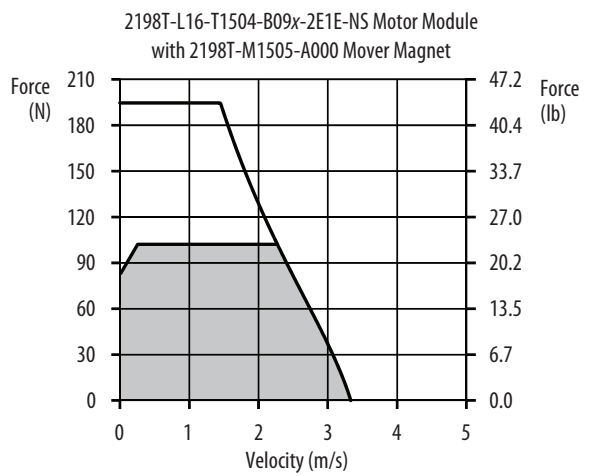
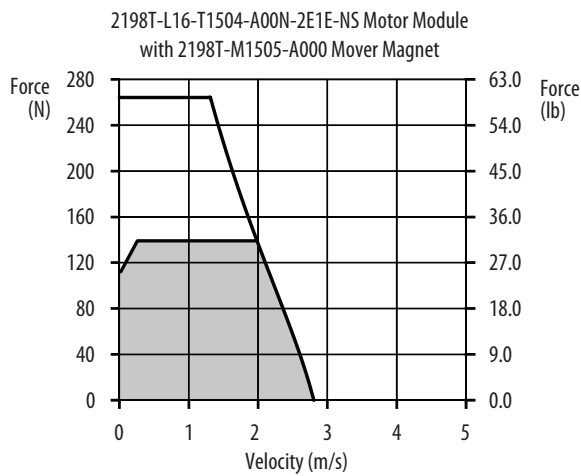
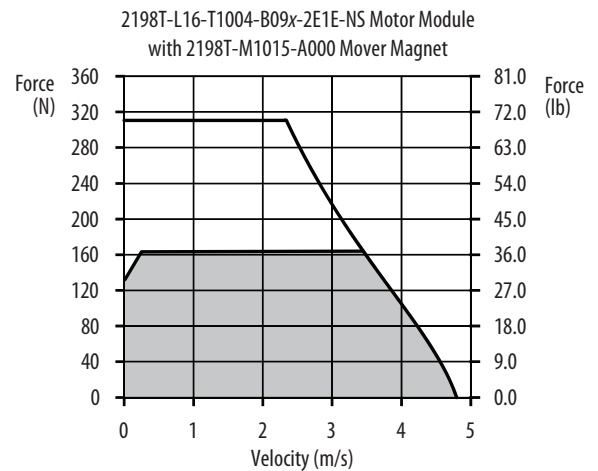
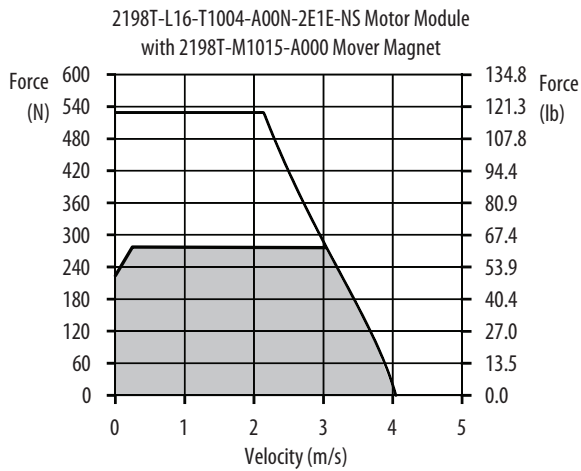
- All specifications are at 40 °C (104 °F) ambient and standard air gap unless otherwise noted.
- Maximum speed is based on mechanical bearing and voltage limitations. Consult Rockwell Automation application engineering for estimated bearing life at your application speed.
- Force specification $\pm 10\%$ unless otherwise noted.
- For each additional mover per section, a derating factor of 20% must be applied to peak, continuous, and stall forces.



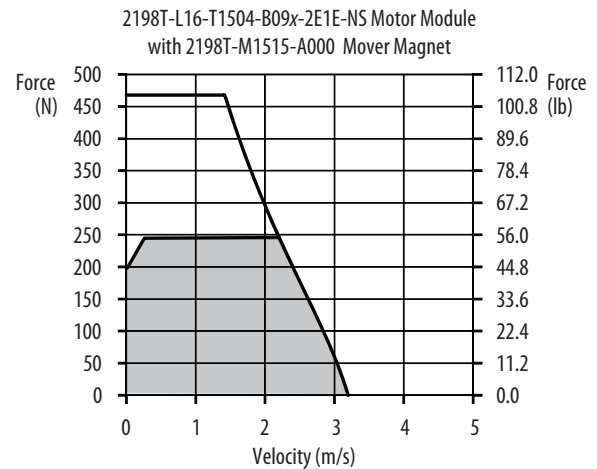
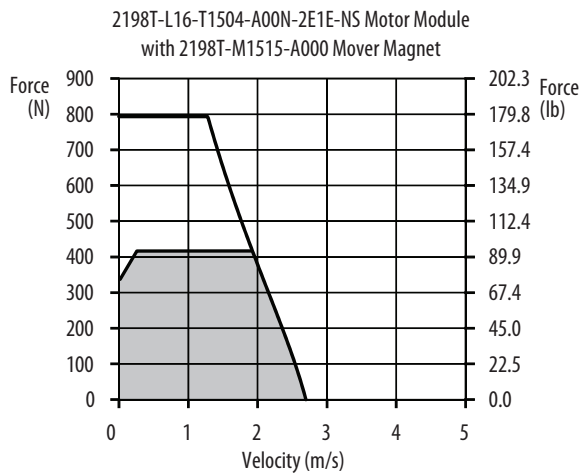
 = Intermittent operation region
 = Continuous operating region



 = Intermittent operation region
 = Continuous operating region



□ = Intermittent operation region
 ■ = Continuous operating region



□ = Intermittent operation region
 ■ = Continuous operating region

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
Kinetix Motion Control Selection Guide, publication KNX-SG001	Overview of Kinetix servo drives, motors, actuators, and motion accessories that are designed to help make initial decisions for the motion control products that are best suited for your system requirements.
iTRAK System User Manual, publication 2198T-UM001	Information to help you install, commission, maintain, and troubleshoot the iTRAK system.
iTRAK System with TriMax Bearings User Manual, publication 2198T-UM002	Information to help you install, commission, maintain, and troubleshoot the iTRAK system with TriMax bearings.
iTRAK System Programming Manual, publication 2198T-PM001	Provides Information on how to commission and program an iTRAK system.
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.

You can view or download publications at <http://www.rockwellautomation.com/global/literature-library/overview.page>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Notes:

Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	www.rockwellautomation.com/knowledgebase
Local Technical Support Phone Numbers	Locate the phone number for your country.	www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	www.rockwellautomation.com/literature
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	www.rockwellautomation.com/global/support/pcdc.page

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete the How Are We Doing? form at http://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002_-en-e.pdf.

Rockwell Automation maintains current product environmental information on its website at <http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page>.

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