英力智直线电机
ITG Linear Motor

IRONCORE LINEAR MOTOR MANUAL

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Version **2025 Edition**

User Manual Introduction

Company

At ITG Linear Motors, we design and manufacture high-performance linear motors for a wide range of industrial applications. Our iron core linear motors are known for their power, precision, and efficiency, enabling machines to achieve optimal performance and reliability in fields such as automation, robotics, and high-speed machining.

This manual is intended for technicians, engineers, and system integrators working with linear motor systems. It provides a comprehensive overview of the essential components of an ITG iron core linear motor, along with the key supporting elements needed for a fully functional motion system, including drive electronics, feedback sensors, and cooling mechanisms.

By following the guidelines in this manual, users will gain the knowledge needed to optimize performance, ensure reliability, and seamlessly integrate ITG linear motors into their applications.

What You'll Find in This Manual

- **Design & Installation** — The design principles and installation guidelines for linear motors.
- **Pre-Startup Settings** — The necessary settings before startup.
- **Structural Dimensions** — Key dimensions for designing a suitable motor support structure.

Table of Contents

01 Pre-Installation

1 PRE-INSTALLATION INSTRUCTIONS

Essential Guidelines for Safe Use
Before installing and operating the Linear Motor, please read the following carefully to ensure proper setup and avoid potential hazards.

1.1 Key Information

Before You Begin

- Carefully review this manual before proceeding with installation or operation.
- The manufacturer is not responsible for any damage resulting from improper use, neglect, or failure to follow these instructions.

Handling & Inspection

- Handle all components with care, whether packed or unpacked.
- Magnet plates are fragile — avoid dropping or releasing them abruptly.
- Do not expose magnets to temperatures above 70°C to prevent demagnetization.
- Inspect the motor immediately after unboxing; contact the supplier if any irregularities are found.
- Record the serial number for future reference.

1.2 Critical Safety Guidelines

General Safety Considerations
Confirm that the entire setup complies with CE requirements.
Magnet plates generate intense magnetic attraction toward ferromagnetic materials (e.g., iron). Maintain a 25 cm clearance from such objects.
Always secure magnet plates before removing protective covers, and reattach covers prior to disassembly.
Keep sensitive items (e.g., credit cards, medical devices) at least 1 meter away from magnet plates.

Precautionary Measures

- Grounding: Verify proper grounding of the power supply during installation.
- Power Disconnection: Turn off power during maintenance to prevent accidental activation.
- Cleaning: Use Isopropanol only; other chemicals may damage components.
- UV Protection: Wear protective eyewear and clothing when exposed to UV Blacklight.
- Mechanical Safeguards: Install safety mechanisms to prevent motor damage during power loss.
- Earthing: For non-conductive surfaces (e.g., granite), use grounding wires.

⚠️ If safety concerns arise, discontinue use and contact ITG immediately.

1.3 Certification

ITG is committed to delivering high-quality, safe, and environmentally responsible products. This section outlines the certifications and compliance standards applicable to ITG iron-core linear motors. For the official Declaration of Conformity, refer to APPENDIX C.

Compliance Overview

1. CE Certification:

- ITG linear motors comply with European Directive 2006/95/EC.
- They meet the following standards:

- EN 60034-1:2010: Rotating Electrical Machines – Part 1: Rating and Performance.
- EN 60204-1:2010: Safety of Machinery – Electrical Equipment of Machines: General Requirements.

2. UL/CSA Certification:

- All ITG iron-core linear motors are certified to meet UL and CSA standards, ensuring compliance with North American safety regulations.

RoHS Compliance:

- ITG products are fully compliant with the Restriction of Hazardous Substances (RoHS) Directive.
- This ensures the absence of hazardous materials such as lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE).

Key Notes:

- These certifications reflect ITG's dedication to quality, safety, and environmental sustainability.
- For detailed certification documents or additional information, please contact your local ITG representative.

Recap of Certifications:

CE Mark	Compliance with EU safety and environmental standards.
UL/CSA	Certification for North American safety standards.
RoHS	Free from hazardous substances, ensuring environmental and user safety.

Next Steps:

For installation, operation, or maintenance guidelines, refer to the relevant chapters in this manual.
For technical support or certification inquiries, contact ITG's customer service team.

02 MOTOR COMPONENTS

2. MOTOR COMPONENTS

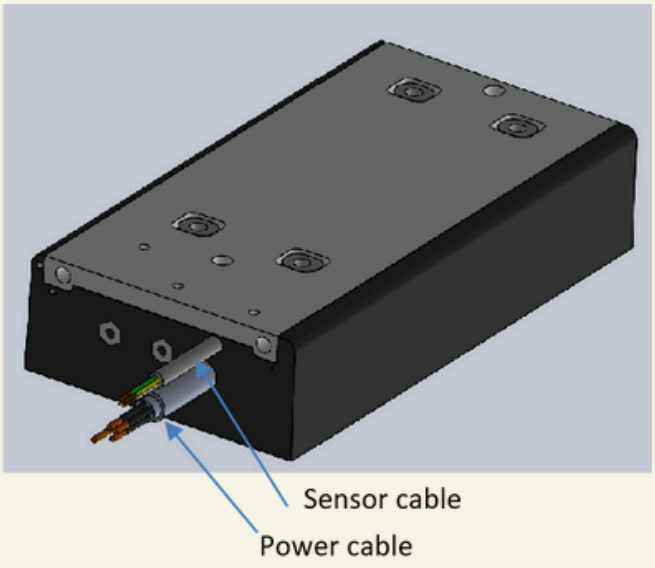
This section provides an overview of the key components of ITG iron-core linear motors, including their features, handling guidelines, and application-specific considerations.

2.1 Components

2.1.1 Coil unit

IITG offers a versatile range of coil units, available in N-winding and S-winding configurations, each tailored to meet specific application requirements:
N-Winding:
Optimized for current efficiency, enabling the use of smaller, more cost-effective amplifiers.
Ideal for applications where power consumption and amplifier size are critical factors.
S-Winding:
Designed for higher speeds or lower voltage applications.
May require a larger amplifier compared to the N-winding configuration.
Select the appropriate coil unit based on your application's speed, voltage, and amplifier requirements.

We believe diversity strengthens our team and fosters innovation, creativity, and better problem-solving. By embracing inclusivity, we ensure that everyone has an equal opportunity to contribute and thrive within our company.



Winding	IC50				IC76						IC124			IC124WC		
	3	6	12	18	6	9	12	15	18	24	12	15	30	18	30	45
N				x	x	x	x	x	x	x	x	x	x	x	x	x
S	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Table 2.3: available N- and S-winding type coilunits

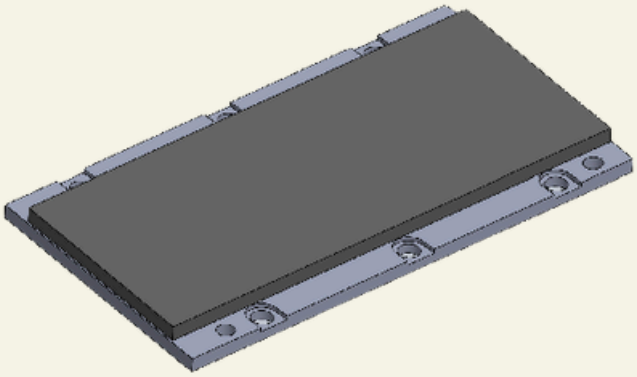
2.1.2 Magnet Plates

- Magnet plates are a core component of ITG iron-core linear motors and are available in varying lengths to support optimized and efficient magnet track designs.
- Safety Note:

- Magnet plates generate extremely strong magnetic forces that can cause serious jamming if not handled properly.

- Always ensure that magnetic field protection covers are in place during handling, installation, and maintenance.

For detailed information on magnet track design, refer to Chapter 3.1.1 – Magnet Track Length (Page 15).



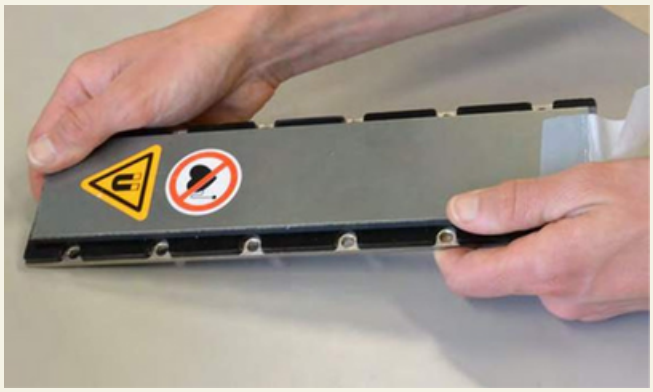
Picture 2.4: A IC76192mm magnet plate

2.1.3 Magnetic Field Protection Plates

- Magnet plates produce unpredictable and uncontrollable magnetic forces, which can pose safety risks if not managed correctly.
- Protective Measures:

1. ITG ships all magnet plates with protective covers to reduce magnetic force exposure and ensure safe handling.
2. These covers act as shields, allowing for secure manipulation during installation and maintenance.
3. Always use protective covers during assembly and disassembly to prevent accidents or damage.

For step-by-step instructions on handling magnet plates, refer to Chapter 4.3.2 – Mounting the Magnet Plates (Page 34).



Picture 2.5: A magnet plate with a protection plate.

Key Takeaways:
Coil Units: Choose between N-winding (current efficiency) and S-winding (high speed/low voltage) based on application needs.
Magnet Plates: Handle with protective covers in place to avoid jamming or safety hazards.
Protection Plates: Use provided covers to safely manage strong magnetic forces during assembly, disassembly, and maintenance.

2.1.4 Bolts and Dowelpins

Bolt Length Precautions:

- Using bolts that are too long for the coil unit can cause damage or create dangerous situations.
- Always check the bolt length before mounting and verify the bolt height after mounting to ensure proper installation.

Bolt and Dowelpin Requirements:

- ITG does not supply bolts and dowelpins for mounting the coil unit or magnet plates.
- The required bolt length depends on the mechanical dimensions of the mounting slide.
- For detailed instructions on bolt and dowelpin selection and installation, refer to:

Chapter 4.3.1 – Mounting the Coil Unit (Page 33).
Chapter 4.3.2 – Mounting the Magnet Plates (Page 34).

2.2 Additional Features

ITG offers optional components to enhance the functionality of your linear motor system. These components can serve as cost-effective alternatives to traditional encoder systems, depending on your application requirements.

2.2.1 Analog Hall Module

- **The Analog Hall Module functions as an incremental encoder, using the magnet track as a linear scale.**

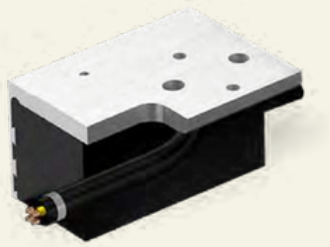
- **Key Specifications:**

1. **Repeatable Accuracy: ~30 µm.**
2. **Absolute Accuracy: ~100 µm (depending on interpolation)**

- **This module is ideal for applications where extreme positioning accuracy is not required**

2.2.2 Digital Hall Module

- The Digital Hall Module is used when the controller does not support commutation within the servo drive.
- Like the analog module, it uses the magnet track as a linear scale.
- This module is a practical solution for systems requiring basic commutation functionality.



Picture 2.6: The analog hall module

Picture 2.7: The digital hall module

2.2.3 Additional Motion System Components

A complete motion system requires several components that are not supplied by ITG.
These include:

- Power supply.
- Cables and connectors.
- Amplifier and servo controller system.
- Bearing system.
- Ruler and encoder system (if ITG's analog or digital hall modules are not used).
- Bolts and dowelpins (as mentioned in Section 2.1.4).

ITG also offers an optional stainless steel cover plate for the magnet track, providing additional protection and durability.

Key Takeaways:
Bolts and Dowelpins: Ensure proper bolt length and height to avoid damage or safety risks.
Analog Hall Module: A cost-effective alternative for incremental encoding with moderate accuracy.
Digital Hall Module: Enables commutation in systems without integrated servo drive support.
Additional Components: A complete motion system requires external components not supplied by ITG.

2.3 Transportation

For transport, additional transport packacking is neccesary.

2.4 Storage

The Storage area for linear motor components needs to be clearly delimited with a warning sign: "Caution! Powerful magnets" to ensure the product quality ITG advises the folowing storage conditions: Only store motors in their original packaging.

Stacking height	4 cartons
Storage temperature	-25° C to +55° C and a maximum rate of change of 20° C/hour
Storage humidity	5 to 95%, relative humidity with no condensation
Storage duration	No limitation.

03 MOTOR CONFIGURATION

3.1 Configuration options

Individual iron core coils can be paired together. This can be achieved on two separate magnet tracks for gantry-style applications or on a single magnet track to generate greater force. The latter option is particularly advantageous for reducing costs in long-stroke applications. By coupling two coils, a smaller series coil and magnet track can be utilized, which helps lower the overall cost of the magnet track.

3.1.1 Magnet Track Length

This section explains how to calculate the required number of magnet plates for a specific application. There are two primary methods to determine this:

- Simple Calculation Method:

The most straightforward approach is to add the necessary stroke length for the application to the length of the coil unit. This sum provides the minimum magnet track length required, which can then be constructed using the available magnet plate sizes. Refer to APPENDIX A for a detailed list of available lengths per series.

- Cost-Effective Calculation Method:

Alternatively, the required magnet track length can be determined based on the effective area of the coil unit rather than its total length. This method is particularly useful when an additional magnet plate is needed to meet the minimum hub length, especially if the coil length falls short by approximately 25mm. By using this approach, you can potentially save the cost of one magnet plate. The effective area of a coil unit refers to the section where the actual windings are located, as illustrated in Figure 3.1. This is the area where the force is generated to propel the linear motor. The remaining space accommodates components such as wiring, PCBs, or filler material. The non-effective area of the coil can extend beyond the end of the magnet track without affecting the motor's force output.

Example

Magnet length calculation with coil unit length

Hr = Required stroke 440mm

Lc = IC76-6 Coil unit length 146mm

Mpl = Magnet plate length 288mm

Required number of magnet plates

=(Hr + Lc)/Mpl > two 288mm magnetplates

Magnet length calculation by means of effective area

Hr = Required stroke 440mm

Leff = Lc – (a + b) = IC76-6 Coil unit effective area 114mm

Mpl = Magnet plate length 288mm

Required number of magnet plates

=(Hr + Leff)/Mpl < two 288mm magnetplates

Picture 3.1: Location of effective area

Table 3.2 states the location where the effective area of a coil starts and ends.

			IC50			
Parameter	Unit	Dimension	3	6	12	18
Cableside	mm	A	19	23	23	26.7
End	mm	B	8	6	2	3.7
Effective area	mm	C	66	114	216	305.6

			IC76					
Parameter	Unit	Dimension	6	9	12	15	18	24
Cableside	mm	A	26	25	26	26.2	26,7	26
End	mm	B	6	5	2	6.2	3.7	2
Effective area	mm	C	114	164	216	257.6	305.6	440

			IC124			IC124WC		
Parameter	Unit	Dimension	12	15	30	18	30	45
Cableside	mm	A	26	26.2	26.2	34.7	39.2	39.2
End	mm	B	2	6.2	6.2	3.7	11.2	11.2
Effective area	mm	C	216	257.6	529.6	305.6	529.6	801.6

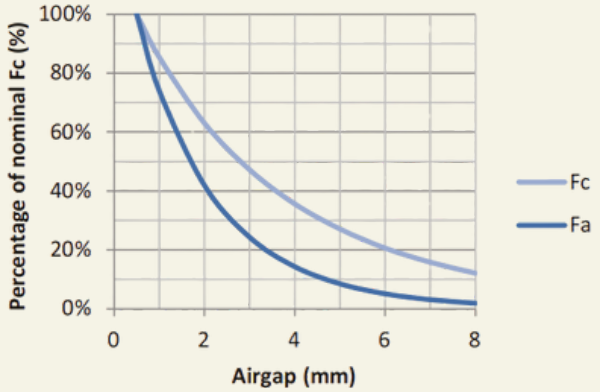
Table 3.2: Dimensions of the effective area per motor type

3.1.2 Air Gap

The air gap between the magnet plates and the coil unit can be adjusted to address tolerance issues related to clearance, parallelism, or flatness. Increasing the air gap is often beneficial, especially for large-axis configurations, as it helps mitigate alignment challenges. However, reducing the air gap is not recommended due to the tight mechanical tolerances required, which can increase design complexity and costs.
ITG does not specify a nominal air gap because the casted finish of the coil unit and magnet plate makes it difficult to measure accurately with traditional tools like a feeler gauge. Instead, ITG recommends deriving the air gap from the total mounting height for precise measurements.
It's important to note that increasing the air gap results in a non-linear reduction in force, as demonstrated in Graph 3.3.

Mounting height (nominal)	
IC50 ; IC76 series	40mm ±0.1mm
IC124 series	45mm ±0.1mm
IC124WC series	47mm ±0.1mm

Table 3.3: Mounting height of T-Series



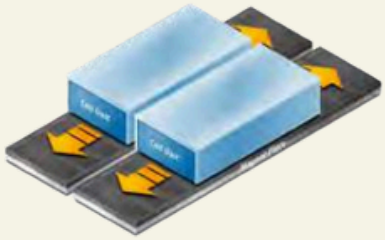
Graph 3.3 Continuous force and attraction force airgap dependency.

3.1.3 Motor Coupling

Motors within the same series can be coupled, provided they share the same motor constant (note: N and S types cannot be coupled). When coupled, the forces generated by both coils are combined.

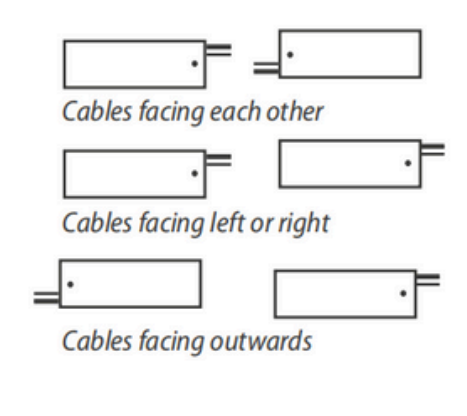
- **Parallel Connection:**

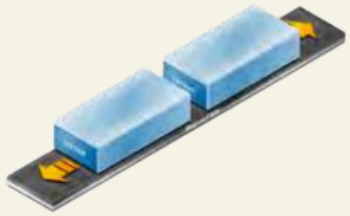
Motors must always be connected to the drive in parallel. Series coupling is not feasible due to voltage limitations in the cables. For phase connection details, refer to APPENDIX E. If the cables of both motors face the same direction, the motors can be positioned at the same location on their respective magnet plates, aligned parallel to each other.



- **Mounting Distances:**

For information on the minimum mounting distances between coils, consult APPENDIX E. For other coupling configurations, contact your local ITG representative.
Important Notes:





Key Takeaways:
Use only one temperature sensor for the coupled motors.
Ensure that the cables of both motors are of identical length.
Always adhere to the coil positioning guidelines over the magnet track, as outlined in Section 3.2.3.

3.2 Mechanical interface

3.2 .1 Bolt and Dowelpin Guidelines

Using incorrect bolts or dowelpins can damage the coil unit or magnet plate. Follow these guidelines:

1. Bolt Length:

- Check bolt length before mounting and verify height after mounting.
- Use only specified flat head fasteners with the correct length. Non-flat head bolts can damage the coil and magnet plate.

2. Dowelpins:

- Ensure dowelpins do not exceed the specified height. Overly long dowelpins can damage the magnet plate.

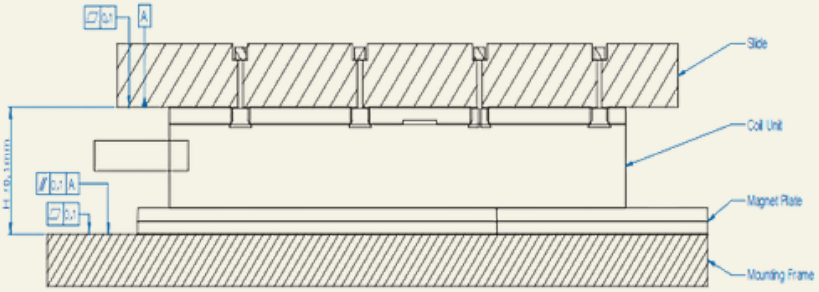
3. Water Cooling Connections:

- Using non-standard water cooling connections may cause higher pressure drops due to reduced throughput.

Note: Refer to the advice, tips, and warnings in this chapter to ensure optimal performance of your ITG linear motor. Pay special

3.2.2 Flatness

- Use the prescribed flatness (see Figure 3.4) to maintain the specified mounting height.
- If a lower flatness ratio is used, increase the mounting height. Refer to Section 3.2.3 for details.



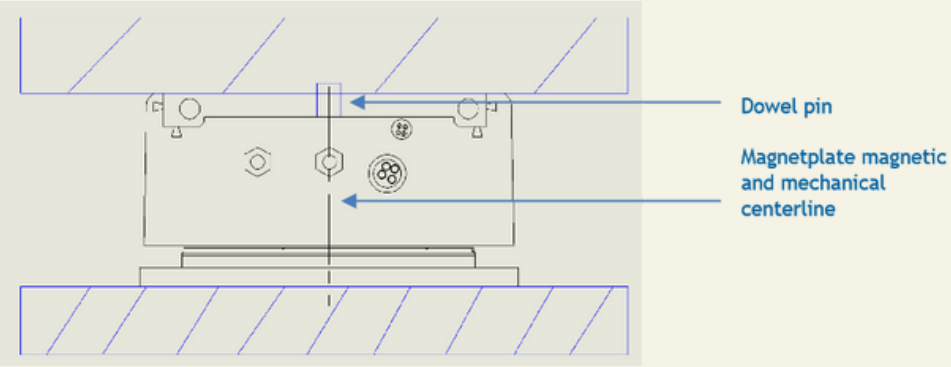
Picture 3.4: Flatness and parallelism requirements for coil and magnet plate

3.2.3 Mounting Height

The specified mounting height ensures the correct air gap between the magnet plate and coil unit. No additional air gap verification is required.
Increasing the mounting height will cause the motor's rated specifications to deteriorate exponentially.
For more information on air gap effects, refer to Section 3.1.3 – Motor Coupling.

3.2.4 Coil Positioning Over the Magnet Track

- Do not position the coils symmetrically over the magnet track. The windings are not centered, and improper positioning will reduce available force.
- Follow the specified dimensions in Drawing 0 (APPENDIX A) for correct construction.



Picture 3.5: Non symmetrical positioning of the coil unit over the magnet track

3.2.5 Bolts for coil unit

Applying too long bolts for the coil unit may inconspicuously cause damage and dangerous situations. Please, check

- bolt length before mounting
- bolt height after mounting

All mounting holes must be used. The bolt length depends on the mechanical dimensions of the mounting slide, see table 3.6.

Bolts for coil unit	IC50	IC76	IC124 & IC124WC
Bolts (steel)	M4 DIN912	M5 DIN912	M5 DIN912
Depth bolt in thread hole	Min: 4 mm Max: 5 mm	Min 4 mm Max: 5 mm	Min: 4.5 mm Max: 6 mm
Tightening torque	2.0 - 3.0 Nm	3.0 - 5.0 Nm	
Dowelpins (stainless)	5h8 M3		

Table 3.6: Bolts for coil unit

3.2.6 Dowelpins for coil unit

Dowelpins must not extend beyond the specified height to avoid damaging the magnet plate.

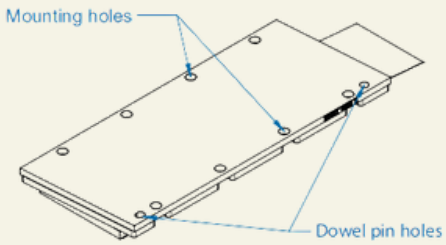
Dowelpins for coil unit	IC50	IC76	IC124 & IC124WC
Dowelpins (Stainless)	5h8 M3		

Table 3.7: Dowelpins for coil unit

3.2.7 Magnet Track Assembly

- For short magnet tracks, plates can be butted directly together.
- For tracks over 2000mm or when using the analog Hall module, use positioning holes with dowelpins.
- Ensure correct magnetic pole alignment:

1. Dowel pin holes should be on the same side.
2. Reference markers between mounting holes should align.
3. Adjacent magnet plates should attract, not repel.



Picture 3.8: Location of the mounting holes, dowel pin and reference marker

3.2.8 Bolts for magnet plates

Bolts for magnet plates	IC50	IC76	IC124 & IC124WC
Bolts (steel)	M5x10, DIN7984	M5x10, DIN7984	M5x10, DIN7984
Depth bolt in thread hole	Min: 6.5mm		
Tightening torque	2.0 -3.5Nm		

Table 3.9: Flathead bolts for magnet plates

Use only the specified type of flat head fasteners with the correct length. The coil and magnet plate can be damaged by non flat head bolts.

Make sure the dowelpins do not extend further than the spec- ified height. The magnet plate can be damaged by too long dowelpins.

3.2.9 Dowelpins for magnet plates

Dowelpins for magnet plates	IC50	IC76	IC124 & IC124WC
Dowelpins (stainless)	5h8 M3 (max 3 deep)		

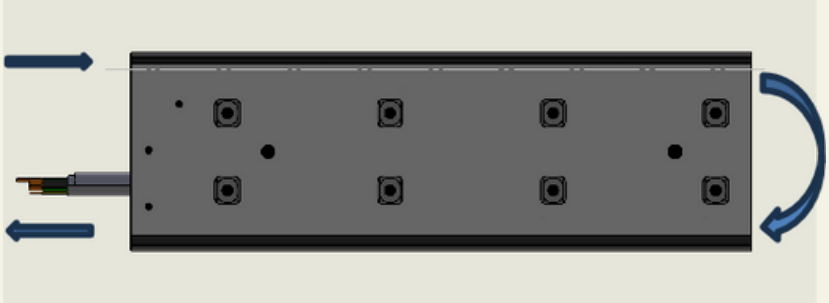
Table 3.10: Dowelpins for magnet plates

3.2.10 Water cooling connections

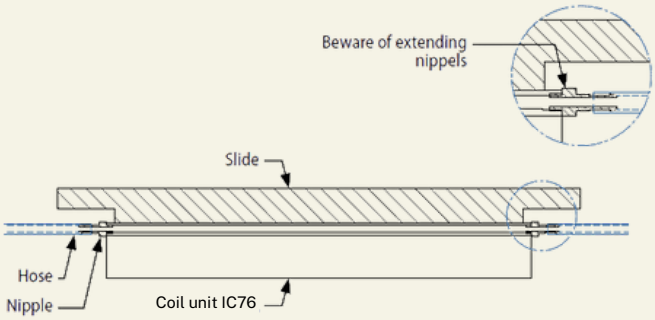
IITG linear motors (IC76 and IC124WC series) feature integrated water cooling channels to enhance continuous force performance.

IC76 Series:

- Equipped with two water cooling channels running through the coil unit (see Figure 3.13).
- Close the cooling circuit externally using a tube. Refer to Table 3.14 for nipple dimensions.
- Note: The nipples extend above the coil's top surface (see Figure 3.12). Ensure the slide is designed to accommodate this.



Picture 3.11: IC76 water cooling channels run completely through the coil. The cooling circuit needs to be closed externally by means of a tube.

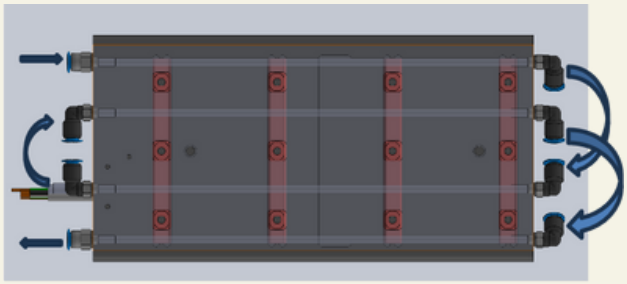


Picture 3.12: IC76 nipples extend above mounting surface

! This section provides essential information for setting up water cooling systems for ITG IC76 and IC124WC series motors. For further details, consult Table 3.14 and the corresponding figures.

IC124WC Series:

- Features a closed-loop water cooling system within the coil unit (see Figure 3.13).
- The entrance and exit for the cooling system are located on one side of the coil. Refer to Table 3.14 for nipple dimensions.



Picture 3.13: IC124WC water cooling channels form a closed loop within the coil unit. The entrance and exit holes of the cooling channels are located on the same side of the coil unit.

Nipples	IC76-series	IC124WC series
Thread holes	4 times M5 (on both sides of coilunit)	2 times 1/8" NPT (both on one side)
Recommended Nipple/ Fitting	M5 nipple	Push-Pull Fitting, -Festo QS-1/8-8*
Sealings	M5 plastic sealings and Loctite 638/648 glue	Teflon tape
Tightening torque	0,2 - 0,3 Nm	4.0 Nm

** Other 1/8" Push and Pull Fitting can also be applied. The use of smaller hose diameter and /or nipple diameter can reduce the flow.*

Table 3.14: recommendations for IC76 and IC124WC water cooling connections.

3.3 Watercooling

ITG's IC76 and IC124WC series iron core motors are equipped with integrated water cooling capabilities. The continuous force specifications for these motors are based on pure water cooling. This section provides guidelines for designing your water cooling system using water or other common coolants.
For details on the location and dimensions of water cooling connections, refer to Chapter 4: Installation (Page 21).

3.3.1 Hose Connections

- Ensure hose connections are free of grease and oil before fitting.
- IC76 Series:

The two cooling channels can be connected in series or parallel.
Parallel configuration reduces pressure drop, but cavitation must be minimized. Use Y-joints with a diameter of ø6mm-ø8mm for optimal performance.

	IC76-series	IC124WC-series
Hose diameter	ø4mm (inner diameter)	Ø8mm (outer diameter)
Minimum flow diameter fitting	ø2.5mm	Ø5mm
Hose examples:	Festo PU-4* Rauclair PVC E 4x1* flexible	Festo PUN-H-8x1,25*

Other hoses can also be applied, but the outer diameter should Ø8mm to fit properly ona 1/8" push and pull fitting.
Table 3.15: Recommended watercooling connections

	IC76-06	IC76-12	IC76-15	IC76-18	IC76-24	IC124WC-18	IC124WC-30	IC124WC-45
Minimum Flow (l/min)*	0.7	1.4	1.8	2.2	2.9	3.1	5.2	7.8
Pressure drop (bar)*	1	2	2	2	3	1	1.5	2.5

Values are based on pure water coolant and depend on used connections and hose-system.
Table 3.16: Presure drop value per coil type

3.4 Electrical interface

Ensure your machine complies with all applicable electrical standards, such as EN 60204.

3.4.1 Cables

ITG linear motors are equipped with two external cables:

- Power Cable: Supplies power to the motor.
- Temperature Sensor Cable: Monitors coil temperature.

Both cables are shielded with a braided metal shield for protection.

Cable Lengths:

- The IC76 series comes with a 3m long power and temperature sensor cable, suitable for use in power chains.
- All other motors have a 1m long non-flexible cable.

Cable Type Length Remark Series
Power Cable 1m Non-flexible IC76, IC124WC, IC124
Temperature Sensor 1m Flexible IC76, IC124WC, IC124

3.4.2 Wiring Scheme

Refer to Figure 3.18 for the wiring scheme of both cables. If necessary, cables can be shortened and fitted with appropriate connectors.

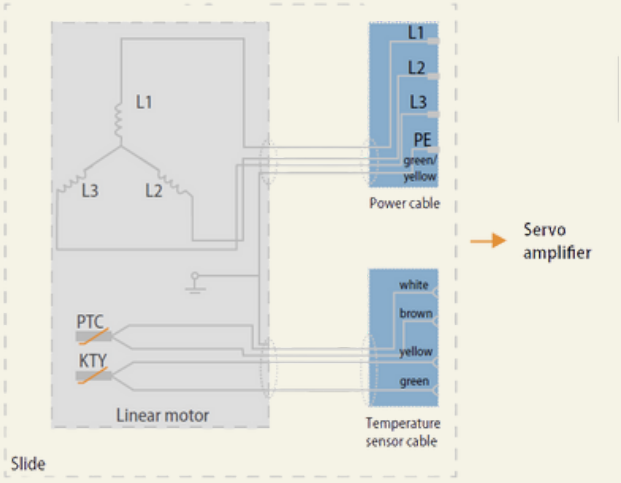


Figure 3.18: Wiring scheme for iron core

User-Defined Cables:
Standard cables are not always suitable for cable chains. Use user-defined cables that meet specifications for bending radius, length, replaceability, velocity, and acceleration.

3.4.3 Power Cable Configuration

The power cable can be customized to fit the servo drive. All motors (except the IC76 series) require an additional flexible cable between the coil and the servo drive.

Powercable		Color code IC50/IC76/IC124/IC124WC	Connection to servo controller
3-phases	L1	black '1'	3-phases
	L2	black '2'	
	L3	black '3'	
Protective Earth		green/yellow	Protective Earth
Shield		Metal shield	Protective Earth

Table 3.19: Power cables wire identification

3.4.4 Protective Earth

- The motor's protective earth wire is internally connected to the motor housing.
- Ensure the protective earth wire is connected to the servo amplifier's protective earth terminal.
- Provide short protective earth lines to the amplifier and ensure the magnet track has an effective protective earth connection.

3.4.5 Temperature Sensor Cable

The coil unit is equipped with two temperature sensors:

- PTC-1k Type: For overheating protection.
- KTY83-122 Type: For temperature monitoring.

All motors require an extra flexible temperature sensor cable between the coil and the servo drive except for the IC124-series.

Sensor cable (color)	Connection to servo controller
PTC (white)	PTC
PTC (brown)	PTC
KTY83-122 (green)	KTY83-122
KTY83-122 (yellow)	KTY83-122
Shield	Protective Earth

Table 3.20: Sensor cable wire identification

3.5 Temperature sensors

3.5.1 Overview

The coil unit is equipped with two temperature sensors:
PTC-1k Type: For overheating protection.
KTY83-122 Type: For temperature monitoring.

3.5.2 PTC Sensor Characteristics

The PTC-1k sensor exhibits a sharp resistance increase near the coil's critical temperature of 110°C, acting as a digital indicator for overheating.

1. Resistance Behavior:

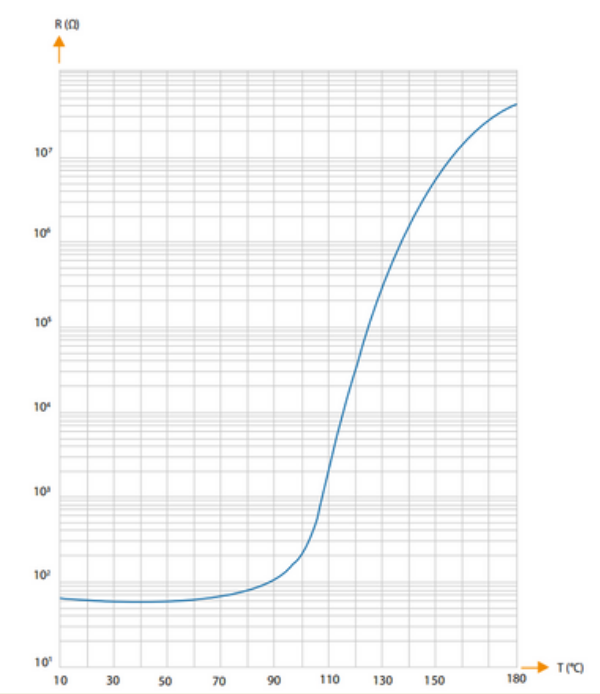
- At room temperature: Resistance <100Ω.
- As temperature approaches 110°C: Resistance increases uniformly to 1000Ω.
- Above 110°C: Resistance rises exponentially.

2. Switching Point:

- At 1000Ω, the amplifier should immediately cut off power to prevent overheating and motor damage.

Temperature	Resistance
Up to 20° C below critical temperature (110° C)	< 250 Ω
Up to 5° C below critical temperature (110° C)	< 550 Ω
Nominal switching resistance (110° C)	1000 Ω
Above critical temperature (110° C)	> 1330 Ω

Table 3.22: PTC-1k characteristic values



Graph 3.21: Temperature dependence of the PTC-1k sensor.

3.5.3 KTY Sensor Characteristics

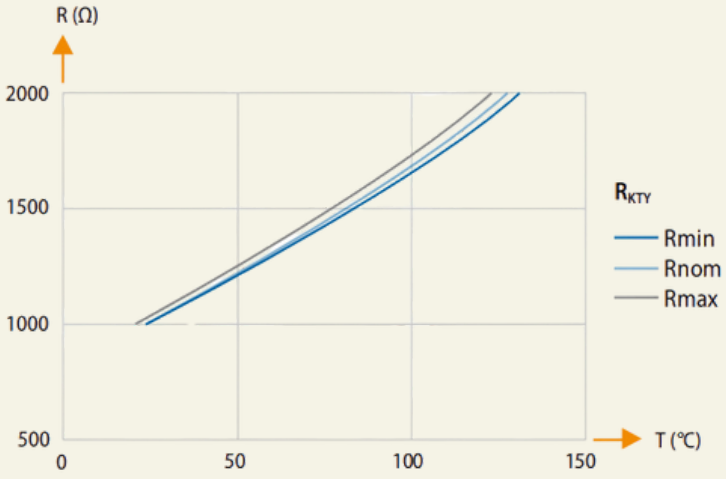
temperature response, enabling continuous temperature monitoring across the entire range.
Advantages:
Useful for testing and ensuring thermal margins are sufficient for error-free operation.
Disadvantages:
Requires precise and sensitive electronics for accurate readings.
Configuration:
Follow the wiring scheme in Figure 3.25 for correct setup

3.5.2 PTC Sensor Characteristics

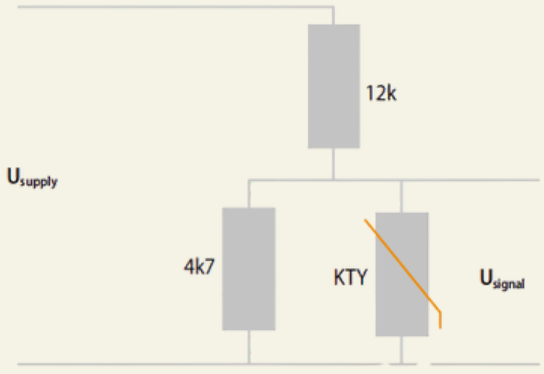
The two temperature sensors are positioned between the coils. For exact locations, refer to APPENDIX B (Page 51).

T (° C)	20	25	30	40	50	60	70	80	90	100	110	120	130
RNOM Ω	972	1010	1049	1130	1214	1301	1392	1487	1585	1687	1792	1900	2012

Table 3.23: KTY83-122 characteristic values



Graph 3.24: Temperature dependence of the KTY 83-122 sensor



Picture 3.25: wiring scheme for KTY 83-122 sensor

3.6 Accessories

3.6.1 Digital Hall module

The Digital Hall Module utilizes the magnet track as a linear scale for commutation, offering a resolution of 4mm. This module is compatible with all ITG iron core motors, providing precise and reliable commutation for optimal motor performance.

Analog Hall module electrical interface

The analog hall module is delivered without a connector.

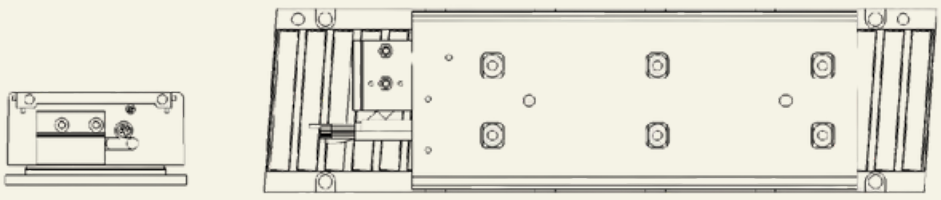
Color	Connection
Green	A+ (Cos)
Yellow	A- (Cos)
Blue	B+ (Sin)
Red	B- (Sin)
Brown	+5V
White	Gnd
Pink	+5V_sense(optional)
Grey	Gnd_sense(optional)
Shield	Gnd (Only connected to cable shield)

Table 3.29: Analog Hall module electrical interface

Digital Hall module specifications

Specifications	
Signal	TTL, 2mA, 5Vdc, (3 signals)
Signal Period	24mm
Power supply	+4…28Vdc, 25mA
Cable	Ø = 5.0mm, length = 1,2m, 6x AWG26 Static bending: 7.5D, 30g/m
Mass	25g

Table 3.30: Digital Hall module specifications



Picture 3.31: Installation dimensions for the Iron core digital hall module

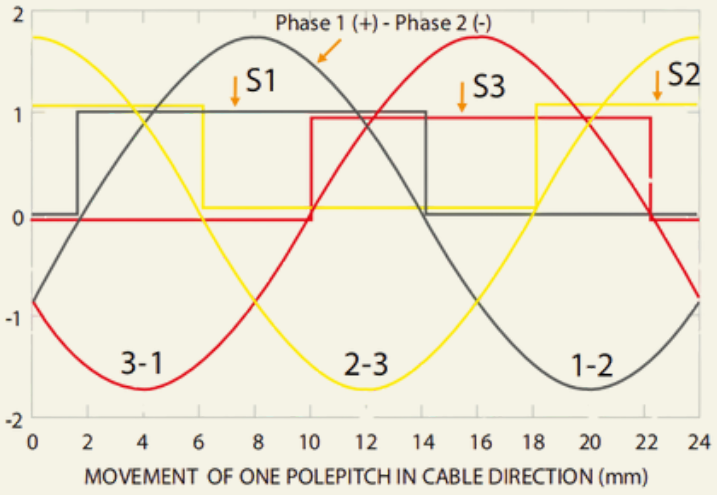
Coilunit type	SIGNAL ACCORDING FIGURE		
	Hall A	Hall B	Hall C
IC50-03	S2 Inverted	S3 Inverted	S1 Inverted
IC50-06	S1	S2	S3
IC50-12	S1	S2	S3
IC50-18	S1	S2	S3
IC76-06	S1	S2	S3
IC76-09 & IC76-15	S1	S2	S3
IC76-12 & IC76-24	S3 Inverted	S1 Inverted	S2 Inverted
IC76-18	S1	S2	S3
IC124-12	S2	S3	S1
IC124-15 & IC124-30	S1	S2	S3
IC124WC-18	S2	S3	S1
IC124WC-30 & IC124WC-45	S3	S1	S2

Table 3.32: Digital Hall module mechanical and electrical installation requirements. (see picture 3.34)

Digital Hall electrical interface

Color	Connection
Black	Gnd
Brown	+4..28V
Orange	HALL A
Green	HALL B
Yellow	HALL C

Table 3.33: Digital Hall module cables indentification



Picture 3.34: Digital Hall signal reference corresponding to the pole pitch

The signal characteristics of the Digital Hall Module vary depending on the coil unit type. For accurate installation, carefully review Table 3.32 to ensure proper setup for your specific motor configuration.
Note: The digital hall module is supplied without a connector. Ensure the appropriate connector is selected and installed based on your system requirements.

3.7 Storage

The storage area for linear motor components must be clearly marked with a warning sign: “Caution! Powerful Magnets.”
To maintain product quality, ITG recommends adhering to the following storage conditions:

- Store motors and magnet plates only in their original packaging.
- Ensure the storage shelf does not exceed its maximum load capacity. For product weight details, refer to APPENDIX D.

These guidelines help ensure the safety and integrity of ITG linear motor components during storage.

Stacking height	8 cartons
Storage temperature	-25°C to +55°C and a maximum rate of change of 20°C/hour
Storage humidity	5 to 95%, relative humidity with no condensation
Storage duration	No limitation.

04 INSTALLATION

4 INSTALLATION

Important Safety Instructions for Installation
To prevent dangerous situations and potential damage caused by uncontrolled magnetic forces, strictly follow the installation order outlined in this manual. Deviating from the specified sequence may result in hazardous conditions.

Handling Magnet Plates

- Magnet plates generate strong magnetic attraction forces on soft magnetic materials, such as iron. These forces cannot be controlled manually and pose a serious risk of jamming or injury.
- Keep all magnetic objects (e.g., iron) at least 25cm away from the magnetic side of the magnet plates.

Safety Precautions

- Securing Magnet Plates:

Ensure magnet plates are securely fixed in your machine before removing the magnetic field neutralizing protection plates.

- Reapplying Protection Plates:

Reattach the magnetic field neutralizing protection plates to the magnet plates before dismounting them.

- Magnetic Sensitive Objects:

Keep magnetic-sensitive items (e.g., banking cards, pacemakers, or other magnetic information carriers) at least 1 meter away from the magnet plates to avoid damage.

Cleaning Guidelines
Use only Isopropanol for cleaning the magnet plates and coil unit. Other cleaning agents may damage the components.

By adhering to these guidelines, you can ensure safe handling and installation of ITG linear motor components, minimizing risks and maintaining product integrity.

4.1 Installation Materials

For the installation of the coil unit and magnet plates, the following tools are required:
Allen Key Set: For mounting the coils and magnet plates.
Use non-ferromagnetic tools to avoid damaging the magnet plates.
Connector Tooling: Specific tools are needed to mount connectors to the power and sensor cables. Consult your connector supplier for the required tooling.

4.2 Cleaning

- For general (non-cleanroom) applications, intensive cleaning of the magnet plates and coil units is not required before installation and commissioning.
- Cleaning Agent: Use only Isopropanol for cleaning the magnet plates and coil units.

4.3 Installation order

Before installing the linear motor components, complete the following preparatory steps:

1. Mounting Frame Installation:

- Ensure the mounting frame is properly installed.
- Position and mount the rails and ruler on the frame.
- Equip the slide with bearings, dampers, linear probes, and necessary cabling to ensure smooth, safe, and precise movement over the stroke.
- Test the operation of bearings and dampers.

2. Optional Water Cooling Installation

Installation Steps

Follow this sequence for proper installation:

1. Mount the Coil Unit to the Slide.
2. Move the Slide to the End of the Stroke: Secure the slide to prevent unintended movements.
3. Mount Magnet Plates:

- Install magnet plates on the exposed part of the track.
- Ensure magnet plates are covered with protection plates.
- Keep magnet plates at least 10 cm away from the coil unit.

4. Remove Protection Plates: After mounting, remove the protection plates from the magnet plates.
5. Position the Slide: Move the slide over the newly mounted magnet plates and secure it to prevent unwanted movements.
6. Mount Remaining Magnet Plates: Complete the installation of all magnet plates.
7. Optional Steps:

- Install and ground the stainless steel cover plate. Verify the earth connection.
- Connect the water cooling system (if applicable).

8. Connect Wiring: Complete the electrical connections.

4.3.1 Mounting the Coil Unit

Key Considerations

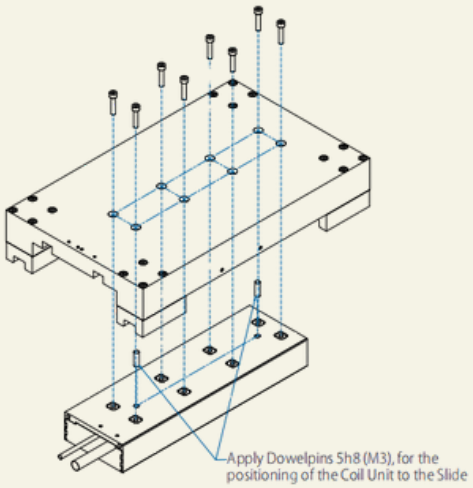
Bolt Length:

- Using bolts that are too long can cause damage or create dangerous situations. Always:

1. Check the bolt length before mounting.
2. Verify the bolt height after mounting.

Water Cooling Connections:

- If water cooling is applied, note that the connections may protrude up to 1 mm above the mounting surface.
- Ensure sufficient space or use an intermediate plate of at least 1 mm thickness.
- Refer to Section 3.2.10: Water Cooling Connections (Page 21) for additional details.



Picture 4.1: Mount coil unit to slide

Pre-Mounting Checks

- Verify the mounting height and flatness before installation. For more information, refer to Chapter 3.2: Mechanical Interface (Page 18).
- For bolt specifications, review Table 3.2.5: Bolts for Coil Unit (Page 19).

Installation Steps

1. Dowelpins:

Use dowelpins with an M3 internal thread to facilitate easy dismantling later.

2. Tightening Bolts:

Tighten the bolts crosswise to ensure an even distribution of fixing force.

4.3.2 Mounting the magnet plates

Handling Guidelines

1. Mechanical Sensitivity:

- Magnet plates are highly sensitive to mechanical shocks. Never drop or release them in an uncontrolled manner.

2. Magnetic Forces:

- The structured side of the magnet plates is the magnetic side.
- Magnet plates generate strong attraction forces on ferromagnetic objects (e.g., iron). These forces cannot be controlled manually and pose a serious risk of jamming or injury.

Safety Precautions

1. Magnetic Field Protection Plates:

- Always handle magnet plates with the magnetic field protection plates in place.
- Ensure the magnet plates are securely fixed in your machine before removing the protection plates.
- Reattach the protection plates before dismounting the magnet plates.

2. Ferromagnetic Objects:

- Keep all ferromagnetic objects (e.g., iron) at least 25 cm away from the magnetic side of the magnet plates.

3. Magnetic-Sensitive Items:

- Keep magnetic-sensitive objects (e.g., pacemakers, banking cards, or other magnetic information carriers) at least 1 meter away from the magnet plates to avoid damage.

Step 1 Mounting the First Magnet Plate

- Position the Slide:

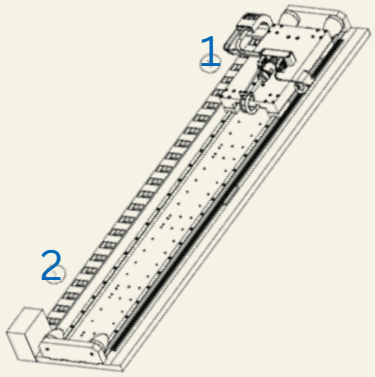
Move the slide to one end of the stroke (1).

- Prepare for Mounting:

1. The first magnet plate will be mounted against the opposite end (2) of the stroke.
2. Secure the slide to prevent any unintended movements.

- Clean the Mounting Surface:

Ensure the mounting surface is free of dust and small particles to guarantee proper adhesion and alignment.



Picture 4.2: Move slide to the end of the stroke

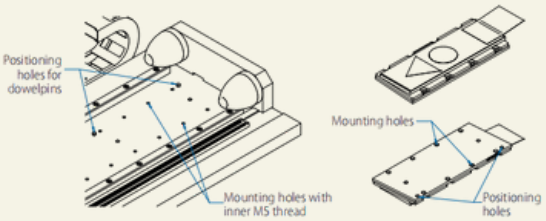
Step 2: Positioning and Mounting the Magnet Plate

1. Install Dowelpins:

- Insert dowelpins into the positioning holes in the mounting frame.
- Refer to Figure 4.3 for the correct placement of the dowelpins.

2. Additional Guidance:

- For more details on positioning and the mounting interface, consult Chapter 3.2: Mechanical Interface (Page 18).



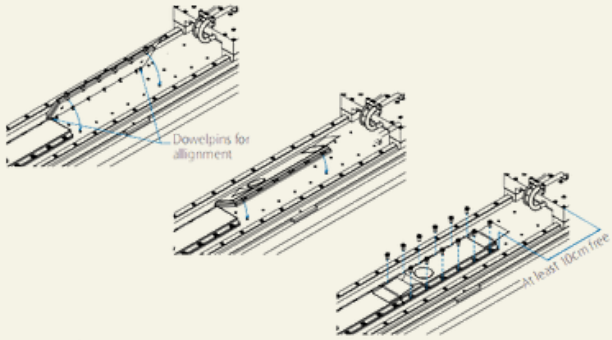
Picture 4.3: Positioning and mounting holes in magnet plates and axis

Step 3: Orientation and Finalizing the Magnet Plate Installation

1. Dowel Pin Height:
- Ensure the total height of the dowel pin above the mounting surface does not exceed 3 mm.
2. Dowel Pin Type:
- Use dowel pins with an M3 internal thread to facilitate easy dismantling later.
3. Magnet Plate Orientation:
- Ensure te magnet plate is properly oriented.
- All magnet plates must be aligned in the same direction. For example, position them so that the dowel pin holes are consistently directed toward the right upper corner.

Step 4: Securing the Magnet Plate

- Fix the magnet plate to the mounting frame using all available holes.
- To verify the correct orientation of the magnet plates, refer to Chapter 3.2.7: Magnet Track (Page 20).



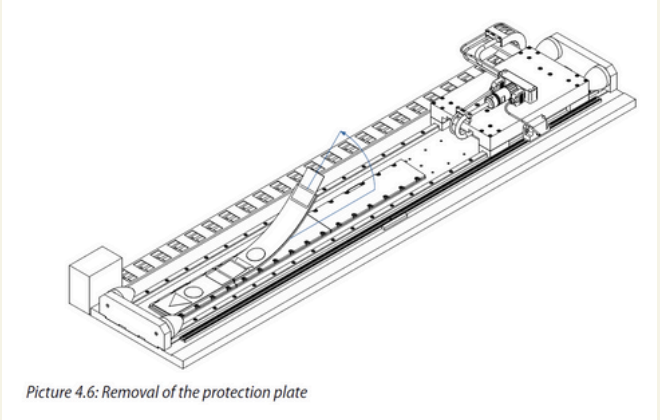
Picture 4.4: Fixing the magnet plate

Step 5: Removing Protection Plates and Moving the Slide

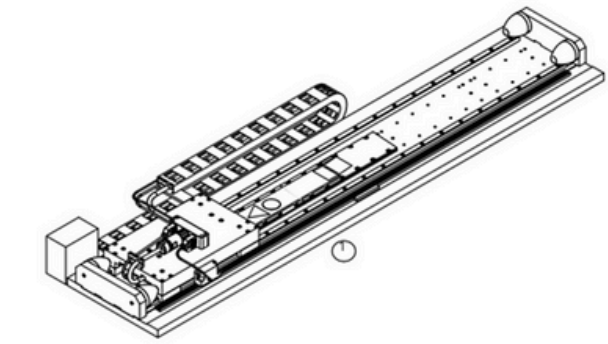
1. Remove the protection plate from the mounted magnet plate.
2. Move the slide to the other end of the stroke and secure it to prevent unwanted movements.
- Tip: Reposition a protection plate in front of the slide (1) to secure it.

Bolts for magnet plates	IC50	IC76	IC124 and IC124WC
Bolts (steel)	M5x10, DIN7984	M5x10, DIN7984	M5x16, DIN912
Depth bolt in thread hole	Min: 6.5mm		
Tightening torque	2,0 –3.5Nm		
Dowelpins (stainless)	5h8 M3		

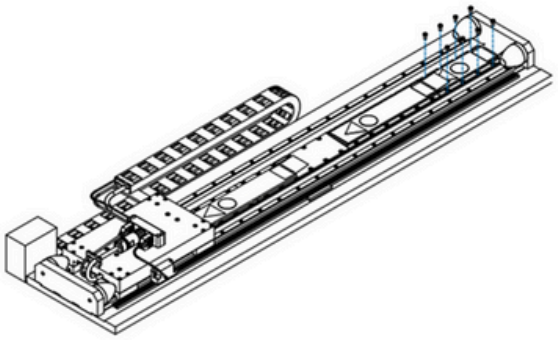
Table 4.5: Bolts for magnet plates



Picture 4.6: Removal of the protection plate



Picture 4.7: Securing slide



Picture 4.8: Mounting the remaining plates

Step 6: Mounting Remaining Magnet Plates

- Repeat Steps 2 through 5 to mount the remaining magnet plates.

Step 7: Final Checks

1. Remove all protection plates.
2. Check that the slide moves freely and smoothly over the magnet plates.
3. If a strong force ripple is detected at the edges of the magnet plates, verify the orientation of the plates and correct if necessary.

05 ADDITIONAL INSTALLATIONS

5 ADDITIONAL INSTALLATIONS

5.1 Installing the digital hall module

The Digital Hall Module is compatible with all ITG iron core series motors and provides precise commutation feedback.

Picture 5.5: Iron core digital hall module

5.1.1 Additional installation material

For the installation of the digital hall module, the following tools are required:

- Allen Key Set: For mounting the module.
- Connector Tooling: Specific tools are needed to mount connectors to the power and sensor cables. Consult your connector supplier for the required tooling.
- Bolts and Dowelpins: Refer to the Digital Hall Mechanical Interface (Page 24) for detailed specifications.

5.1.2 Mounting the digital hall module

- Alignment: Proper vertical and horizontal mounting is critical for the module to function correctly.
- Dimensions: Review the Digital Hall Mechanical Interface (Page 27) for the correct mounting dimensions.

5.1.3 Wiring

- Refer to the Digital Hall Electrical Interface (Page 28) for the correct wiring configuration.

06 OPERATION

6. OPERATION

6.1 Pre-commissioning

For configuring several types of servo amplifiers ITG can offer parameter files. With these files motor specific settings can be configured. Nevertheless, application specific settings should be configured by yourself. Please contact ITG for information.

1. Testing

- Before handing over the control of the linear motor to the closed loop feedback controllers, perform the commissioning tests prescribed for all control components.
- Before testing, make sure that the electrical and mechanical protection of the linear motor system is well configured!

2. End switches

- Check proper functioning of the end switches.

3. Starting up

- Start the tuning with very low speeds.
- Increase maximum speed if everything operates properly.

6.2 Configuring

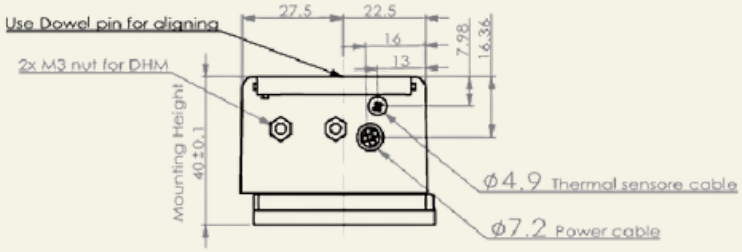
After powering up the amplifier, configure the following settings:

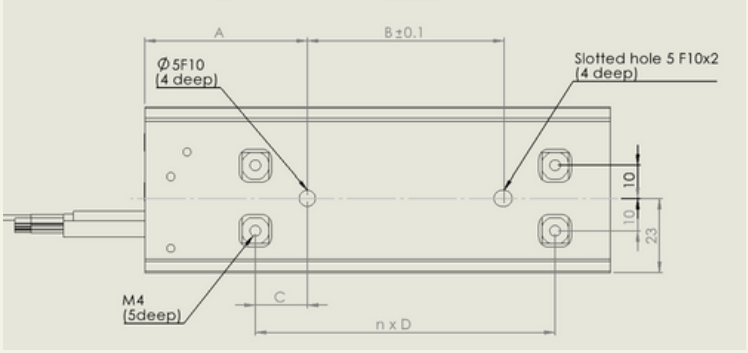
1. **Input/Output Signals:**
   - Test end switches by manually moving the slide to the switch position and verifying the signal is detected by the amplifier.
   - Check the presence of the PTC signal.
2. **Motor Parameters:**
   - Maximum continuous current.
   - Maximum peak current.
   - Number of coils.
   - Maximum speed.
   - Presence/absence of an electromechanical brake.
   - Magnet interval (North-South distance) and/or pole pitch (North-North distance).
   - Switching resistance of the PTC sensor.
3. **Ruler System Parameters:**
   - Type of ruler system interface.
   - Resolution or period of the linear encoder.
4. **I/O Parameters:**
   - Configure digital inputs/outputs (e.g., end switches).
   - Configure analog inputs/outputs.
5. **Control Parameters:**
   - Current control settings (dependent on motor and amplifier).
   - Speed control settings.
   - Position control settings.

7 APPENDIX

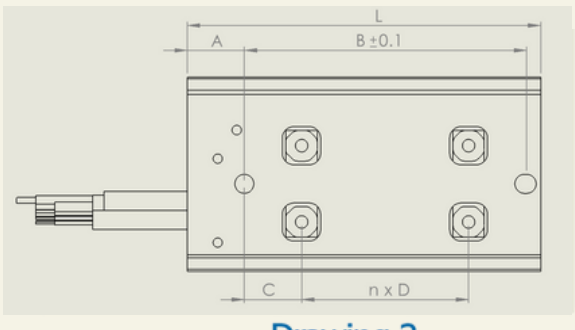
APPENDIX A - Dimensions - IC50 Coil

Parameter	Dimension	Unit	IC50			
			3	6	12	18
Drawing Number			2	1		
Coil Unit Length	L	mm	93	143	241	336
Coil Unit Width		mm	50			
Coil Unit Mounting Height		mm	40 ± 0.1			
Coil unit weight		kg	0.55	0.9	1.2	2.25
Motor Edge to Centerline		mm	27.5/22.5			
Motor Edge to Dowel Pin	A	mm	15	50	51	68
Dowelpin to Slotted Dowelpin	B	mm	74 ± 0.1	60 ± 0.1	160 ± 0.1	223 ± 0.1
Dowel Pin to Mounting Hole	C	mm	15	16	16	16
Mounting Hole to Mounting Hole	D	mm	44	92	64	85
Number	n		1	1	3	3
Mounting Hole to Centerline		mm	10			
Dowelpin Hole size and depth For Dowelpin DIN7 Ø5h8		mm	Ø5 F10(4 deep)			
Slotted Dowelpin Hole size and depth for Dowelpin DIN7 Ø5h8		mm	5F10 x 0.2(4 deep)			
Mounting Hole size. depth and number		mm	M4 (5 deep) (4x)	M4(5 deep) (8x)	M4(5 deep) (8x)	
Power Cable		mm	Ø7.2			
Thermal Sensor Cable		mm	Ø4.9			





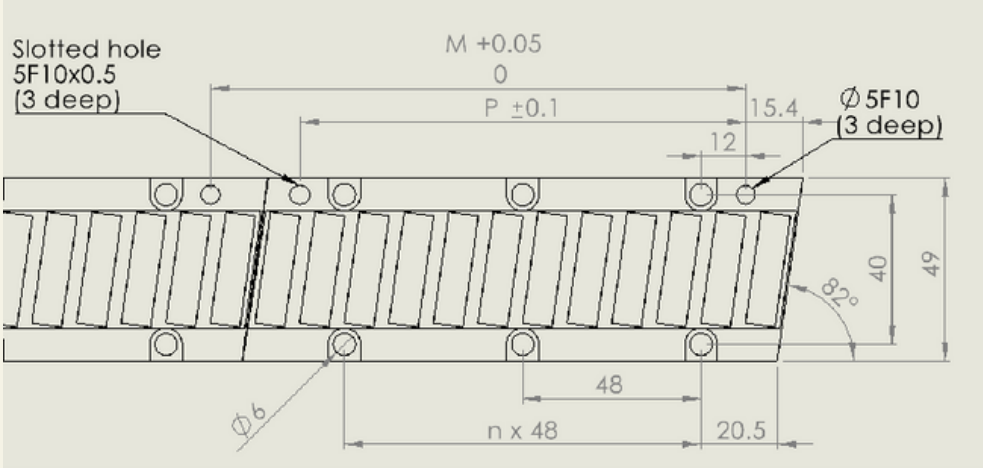
Drawing 1



Drawing 2

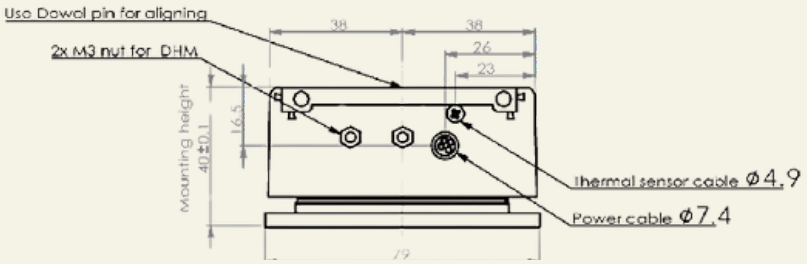
APPENDIX A - Dimensions - IC50 Magnet plates

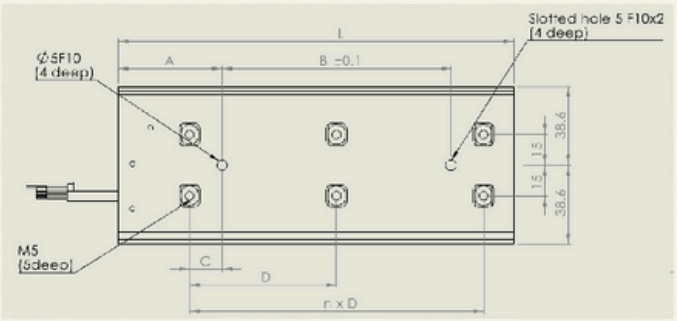
Parameter	Dimension	Unit	IC50		
Magnet Plate Type			96	144	384
Magnet Plate Length		mm	96	144	384
Magnet Plate Width		mm	49		
Magnet Plate Height		mm	8,2		
Magnet Plate weight		kg/m	2.1		
Magnet Plate Edge to Centerline		mm	24.5		
Dowelpin to Slotted Dowelpin	P	mm	72	120	360
Dowelpin to dowelpin	M	mm	96	144	384
Dowel Pin to Mounting Hole		mm	12		
Mounting Hole to Mounting Hole		mm	48		
Number	n		1	2	7
Mounting Hole to Centerline		mm	20		
Dowelpin Hole size and depth For Dowelpin DIN7 Ø5h8		mm	Ø5 F10(3 deep)		
Slotted Dowelpin Hole size and depth For Dowelpin DIN7 Ø5h8		mm	5F10 x 0,5(3 deep)		
Mounting Hole size and number For M5 DIN7984 (Lowhead)		mm	Ø6 (4x)	Ø6 (6x)	Ø6 (16x)



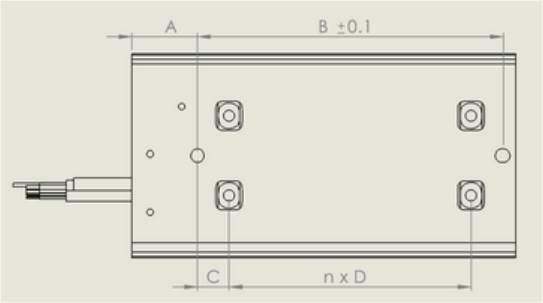
APPENDIX A - Dimensions - IC76 Coil

Parameter	Dimension	Unit	IC76					
			6	9	12	15	18	24
Drawing number			2	1				3
Coil Unit Length	L	mm	146	194	244	290	336	468
Coil Unit Width		mm	76					
Coil Unit Mounting Height		mm	40					
Coil unit weight		kg	1.45	1.9	2.5	3	3.65	5
Motor Edge to Centerline		mm	38					
Motor Edge to Dowel Pin	A	mm	25	51	54	51	68	54
Dowelpin to Slotted Dowelpin	B	mm	116	112	160	208	223	384
Dowel Pin to Mounting Hole	C	mm	12	16	16	16	16	16
Mounting Hole to Mounting Hole	D	mm	92	72	64	80	85	64
Distance	D2	mm						32
Number	n		1	2	3	3	3	3 (2x)
Mounting Hole to Centerline		mm	15					
Dowelpin Hole size and depth For Dowel pin DIN7 Ø5h8		mm	Ø5 F10(4 deep)					
Slotted Dowelpin Hole size and depth fo r Dowelpin DIN7 Ø5h8		mm	5F10 x 0.6(4 deep)					
Mounting Hole size, depth and number		mm	M5 (5deep) (4x)	M5 (5deep) (6x)	M5 (5deep) (8x)	M5 (5deep) (8x)	M5 (5deep) (8x)	M5 (5deep) (16x)
Power Cable		mm	Ø7.4					Ø11.9
Thermal Sensor Cable		mm	Ø4.9					

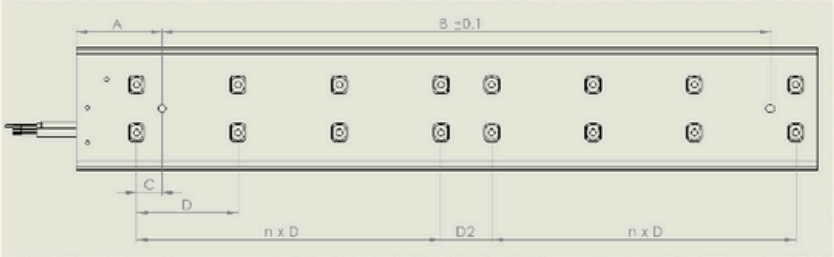




Drawing 1



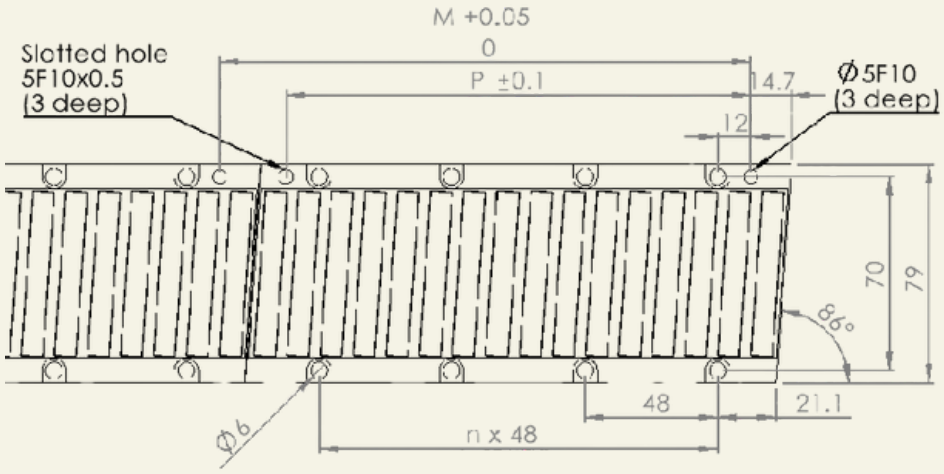
Drawing 2



Drawing 3

APPENDIX A - Dimensions - IC76 Magnet plates

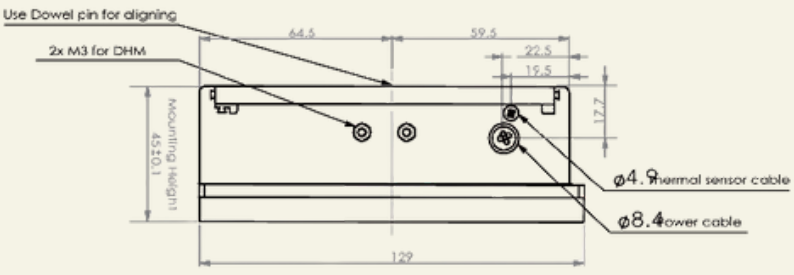
Parameter	Dimension	Unit	IC76	
Magnet Plate Type			192	288
Magnet Plate Length	M	mm	192	288
Magnet Plate Width		mm	79	
Magnet Plate Height		mm	8.2	
Magnet Plate weight		kg/m	3.8	
Magnet Plate Edge to Centerline		mm	39.5	
Dowelpin to Slotted Dowelpin	P	mm	168	264
Dowelpin to dowelpin	M	mm	192	288
Dowel Pin to Mounting Hole		mm	12	
Mounting Hole to Mounting Hole		mm	48	
Number	n		3	5
Mounting Hole to CenterlineDowelpin Hole size and depth For Dowelpin DIN7 Ø5h8		mm	35	
		mm	Ø5 F10(3 deep)	
Slotted Dowelpin Hole size and depthFor Dowelpin DIN7 Ø5h8		mm	5F10 x 0,5(3 deep)	
Mounting Hole size and number For M5 DIN7984 (Lowhead)		mm	Ø6 (8x)	Ø6 (12x)



Drawing 2

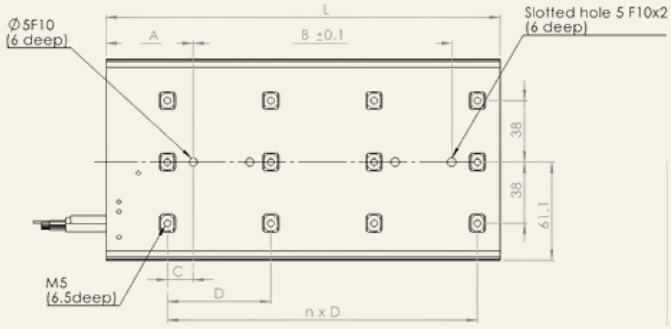
APPENDIX A - Dimensions - IC124 Coil

Parameter	Dimension	Unit	IC124		
			12	15	30
Drawing number			1		2
Coil Unit Length	L	mm	244	290	562
Coil Unit Width		mm	124		
Coil Unit Mounting Height		mm	45		
Coil unit weight		kg	4.6	5.5	11
Motor Edge to Centerline		mm	64.5/59.5		
Motor Edge to Dowel Pin	A	mm	54	51	51
Dowelpin to Slotted Dowelpin	B	mm	160	208	480
Dowel Pin to Mounting Hole	C	mm	16	16	16
Mounting Hole to Mounting Hole	D	mm	64	80	80
Distance	D2	mm			32
Number	n		2	3	3 (2x)
Mounting Hole to Centerline		mm	38		
Dowelpin Hole size and depth For Dowelpin DIN7 Ø5h8		mm	Ø5 F10(6 deep)		
Slotted Dowelpin Hole size and depth for Dowelpin DI N7 Ø5h8		mm	5F10 x 0.5(6 deep)		
Mounting Hole size, depth and number		mm	M5 (6.5 deep) (12 x)	M5 (6.5 deep) (12 x)	M5 (6.5 deep) (24 x)
Power Cable		mm	Ø8.4		
Thermal Sensor Cable		mm	Ø4.9		

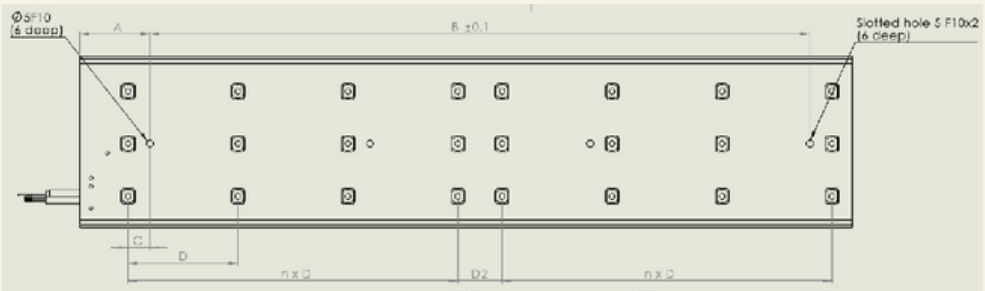


2

Drawing 0



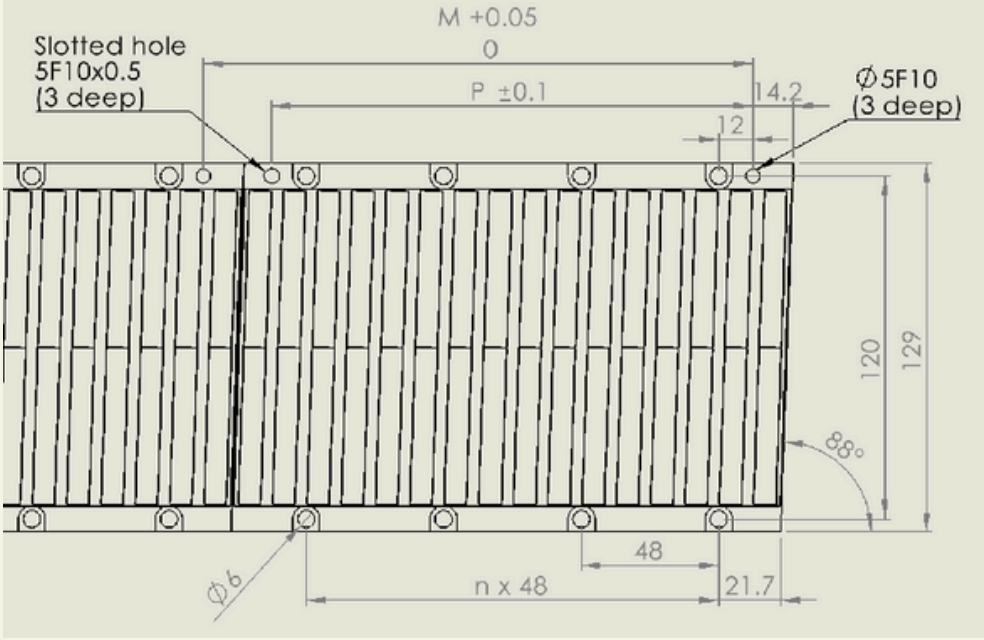
Drawing 1



Drawing 2

APPENDIX A - IC124WC Magnet plates

Parameter	Dimension	Unit	IC124WC	
Magnet Plate Type			192	288
Magnet Plate Length	M	mm	192	288
Magnet Plate Width		mm	129	
Magnet Plate Height		mm	12.2	
Magnet plate weight		kg/m	10.5	
Magnet Plate Edge to Centerline		mm	64.5	
Dowelpin to Slotted DowelpinDowelpin to dowelpin	P	mm	168	264
	M	mm	192	288
Dowel Pin to Mounting Hole		mm	12	
Mounting Hole to Mounting Hole		mm	48	
Number	n		3	5
Mounting Hole to Centerline		mm	60	
Dowelpin Hole size and depth For Dowelpin DIN7 Ø5h8		mm	Ø5 F10(3 deep)	
Slotted Dowelpin Hole size and depthFor Dowelpin DIN7 Ø5h8		mm	5F10 x 0.5(3 deep)	
Mounting Hole size and number For M5 DIN912		mm	Ø6 (8x)	Ø6 (12x)



APPENDIX B - Motor cable configuration

	Power cable				Sensor Cable			
Coil unit	**Power cable outside dia.**	**Power cable configuration**	**Static**	**Dynamic**	**Sensor cable outside dia.**	**Sensor cable configuration**	**Static**	**Dynamic**
IC76-6N&S	7.4 mm	4. x 1 mm² (AWG 18)	4x diam.	*	4.9 mm	4 x 0.14 mm² (AWG 26)	7.5x diam.	*
IC76-9N&S	7.4 mm	4 x 1 mm² (AWG 18)	4x diam.	*	4.9 mm	4 x 0.14 mm² (AWG 26)	7.5x diam.	*
IC76-12N&S	7.4 mm	4 x 1 mm² (AWG 18)	4x diam.	*	4.9 mm	4 x 0.14 mm² (AWG 26)	7.5x diam.	*
IC76-15N&S	7.4 mm	4 x 1 mm² (AWG 18)	4x diam.	*	4.9 mm	4 x 0.14 mm² (AWG 26)	7.5x diam.	*
IC76-18N&S	7.4 mm	4 x 1 mm² (AWG 18)	4x diam.	*	4.9 mm	4 x 0.14 mm² (AWG 26)	7.5x diam.	*
IC76-24N&S	10.1mm	4 x 2.5 mm² (AWG 14)	4x diam.	*	4.9 mm	4 x 0.14 mm² (AWG 26)	7.5x diam.	*
IC50-03 (FLEX cable)	7.2 mm	4 x 0.75 mm² (AWG 19)	4x diam.	10x diam.	4.9mm	4 x 0.14 mm² (AWG 26)	7.5x diam.	*
IC50-6 (FLEX cable)	7.2 mm	4 x 0.75 mm² (AWG 19)	4x diam.	10x diam.	4.9mm	4 x 0.14 mm² (AWG 26)	7.5x diam.	*
IC50-12 (FLEX cable)	7.2 mm	4 x 0.75 mm² (AWG 19)	4x diam.	10x diam.	4.9mm	4 x 0.14 mm² (AWG 26)	7.5x diam.	*
IC50-18 (FLEX cable)	7.2 mm	4 x 0.75 mm² (AWG 19)	4x diam.	10x diam.	4.9mm	4 x 0.14 mm² (AWG 26)	7.5x diam.	*
IC124-12N&S	8.4 mm	4 x 1.5 mm² (AWG 16)	4x diam.	*	4.9 mm	4 x 0.14 mm² (AWG 26)	7.5x diam.	*
IC124-15N&S	8.4 mm	4 x 1.5 mm² (AWG 16)	4x diam.	*	4.9 mm	4 x 0.14 mm² (AWG 26)	7.5x diam.	*
IC124-30N&S	10.1 mm	4 x 2.5 mm² (AWG 14)	4x diam.	*	4.9 mm	4 x 0.14 mm² (AWG 26)	7.5x diam.	*
IC124WC-18N&S	8.4 mm	4 x 1.5 mm² (AWG 16)	4x diam.	*	4.9 mm	4 x 0.14 mm² (AWG 26)	7.5x diam.	*
IC124WC-30N	10.1 mm	4 x 2.5 mm² (AWG 14)	4x diam.	*	4.9 mm	4 x 0.14 mm² (AWG 26)	7.5x diam.	*
IC124WC-30S	10.1 mm	4 x 2.5 mm² (AWG 14)	4x diam.	*	4.9 mm	4 x 0.14 mm² (AWG 26)	7.5x diam.	*
TIC124WC-45N&S	12.1 mm	4 x 4 mm²	4x diam.	*	4.9 mm	4 x 0.14 mm² (AWG 26)	7.5x diam.	*

APPENDIX C - ROHS

ZERTIFIKAT ◆ CERTIFICATE ◆ 認證證書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

Attestation of Conformity

No. ROHS8 109476 0001 Rev. 00

Holder of Certificate: **Suzhou ITG Linear Motor Co., Ltd**
Room 302, building 2#, No. 6 Xujing Road
Xushu guan Town, SND
215151 Suzhou
PEOPLE'S REPUBLIC OF CHINA

Product: **Linear motor**
Linear motor

Tested according to:
EN 62321-1:2013
EN 62321-2:2014
EN 62321-3-1:2014
EN 62321-4:2014/A1:2017
EN 62321-5:2014
EN 62321-6:2015
EN 62321-7-1:2015
EN 62321-7-2:2017
EN 62321-8:2017

The product was tested according to the European Directive 2011/65/EU concerning RoHS and additionally according to Directive (EU) 2015/863 to amend Annex II of the above mentioned Directive with 4 additional substances. Pb, Hg, Cd, Cr(VI), PBBs and PBDEs could not be detected over the limit defined by the European Directive 2011/65/EU. DEHP, BBP, DBP and DIBP could not be detected over the limit defined by the European Directive (EU) 2015/863. This Attestation of Conformity confirms the compliance with the listed requirements on a voluntary basis. It refers only to the sample submitted and does not certify the quality or safety of the serial products.
For details see: www.tuvsud.com/ps-cert

Test report no.: 704002097901-00.01

Date, 2020-09-23

(Nannan Qi)

Page 1 of 3
After preparation of the necessary technical documentation as well as the EU declaration of conformity the required CE marking can be affixed on the product. Other relevant directives have to be observed.

TÜV SÜD Product Service GmbH • Certification Body • Ridlerstraße 65 • 80339 Munich • Germany

ZERTIFIKAT ◆ CERTIFICATE ◆ 認證證書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

Attestation of Conformity

No. ROHS8 109476 0001 Rev. 00

Model(s):

Coil Unit: IL59-6N-T-01 Magnet Yoke: MY59-90
Coil Unit: IL30-3,6,9,12 Magnet Yoke: MY30-60,90,120
Coil Unit: ILD30-3,6,9,12 Magnet Plate: MP30-72,96,144,288
Coil Unit: IL42DHM-3,6,9 Magnet Plate: MP42-66,99,115,264
Coil Unit: IL42-3,6,9,12 Magnet Yoke: MY42-66,99,264
Coil Unit: IL44-3,6,9,12 Magnet Yoke: MY44-72,120,144,168
Coil Unit: ILS44-3,6,9,12 Magnet Plate: MP44-72,120,144,168
Coil Unit: ILC44-3,6,9,12 Magnet Plate: MPC44-72,120,144,168
Coil Unit: IL59-3,6,9,12 Magnet Yoke: MY59-90,120,150,390
Coil Unit: ILS59-3,6,9,12 Magnet Plate: MP59-90,120,150,390
Coil Unit: ILC59-3,6,9,12 Magnet Yoke: MYC59-90,120,150,390
Coil Unit: IL91-3,6,9,12,15 Magnet Yoke: MY91-126,168,210,546
Coil Unit: ILS91-3,6,9 Magnet Plate: MP91-126,168,210,546
Coil Unit: ILC91-3,6,9,12 Magnet Yoke: MYC91-126,168,210,546
Coil Unit: IL109-3,6,9,12,15,18 Magnet Yoke: MY109-114,171,456
Coil Unit: IL109WC-3,6,9,12,15,18
Magnet Yoke: MY109-114,171,456
Coil Unit: IL109X-3,6,9,12,15,18
Magnet Yoke: MY109X-114,171,456
Coil Unit: IL109XWC-3,6,9,12,15,18
Magnet Yoke: MY109XWC-114,171,456

Coil Unit: IC76-6N-T-01 Magnet Plate: MP76-144
Coil Unit: IC30-3,6,9,12,15,18
Magnet Plate: MP30-96,144,288,384
Coil Unit: ICD30-3,6,9,12
Magnet Plate: MPD30-72,96,144,288,384
Coil Unit: IC50-3,6,9,12,15,18
Magnet Plate: MP50-96,144,288,384
Coil Unit: IC76-3,6,9,12,15,18,24,27,30
Magnet Plate: MP76-144,192,288,336
Coil Unit: IC124-6,9,12,15,18,24,30,45
Magnet Plate: MP124-144,192,288,336
Coil Unit: IC230-6,9,12,15,18,24,27,30,45
Magnet Plate: MP230-144,192,288,336
Coil Unit: IC124WC-6,9,12,15,18,24,27,30,45
Magnet Plate: MP124WC-144,192,288,336
Coil Unit: IC230WC-6,9,12,15,18,24,27,30,45
Magnet Plate: MP230WC-144,192,288,336

Page 2 of 3
After preparation of the necessary technical documentation as well as the EU declaration of conformity the required CE marking can be affixed on the product. Other relevant directives have to be observed.

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ZERTIFIKAT ◆ CERTIFICATE ◆ 認證證書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

Attestation of Conformity

No. ROHS8 109476 0001 Rev. 00

Parameters:

Coil Unit: IC30-3,6,9,12,15,18 Magnet Plate: MP30-96,144,288,384
Coil Unit: ICD30-3,6,9,12 Magnet Plate: MPD30-72,96,144,288,384
Coil Unit: IC50-3,6,9,12,15,18 Magnet Plate: MP50-96,144,288,384
Coil Unit: IC76-3,6,9,12,15,18,24,27,30 Magnet Plate: MP76-144,192,288,336
Coil Unit: IC124-6,9,12,15,18,24,30,45 Magnet Plate: MP124-144,192,288,336
Coil Unit: IC230-6,9,12,15,18,24,27,30,45 Magnet Plate: MP230-144,192,288,336
Coil Unit: IC124WC-6,9,12,15,18,24,27,30,45 Magnet Plate:MP124WC-144,192,288,366
Coil Unit: IC230WC-6,9,12,15,18,24,27,30,45 Magnet Plate: MP230WC-144,192,288,336
Coil Unit: IC76-6N-T-01 Magnet Plate: MP76-144
Continuous Current: 2.4A
Resistance Per Phase: 7.21Ω
Power Loss: 171W

Coil Unit: IL30-3,6,9,12 Magnet Yoke: MY30-60,90,120
Coil Unit: ILD30-3,6,9,12 Magnet Plate: MP30-72,96,144,288
Coil Unit: IL42DHM-3,6,9 Magnet Plate: MP42-66,99,115,264
Coil Unit: IL42-3,6,9,12 Magnet Yoke: MY42-66,99,264
Coil Unit: IL44-3,6,9,12 Magnet Yoke: MY44-72,120,144,168
Coil Unit: ILS44-3,6,9,12 Magnet Plate: MP44-72,120,144,168
Coil Unit: ILC44-3,6,9,12 Magnet Plate: MPC44-72,120,144,168
Coil Unit: IL59-3,6,9,12 Magnet Yoke: MY59-90,120,150,390
Coil Unit: ILS59-3,6,9,12 Magnet Plate: MP59-90,120,150,390
Coil Unit: IL59-3,6,9,12 Magnet Yoke: MYC59-90,120,150,390
Coil Unit: IL91-3,6,9,12,15 Magnet Yoke: MY91-126,168,210,546
Coil Unit: ILS91-3,6,9 Magnet Plate: MP91-126,168,210,546
Coil Unit: ILC91-3,6,9,12 Magnet Yoke: MYC91-126,168,210,546
Coil Unit: IL109-3,6,9,12,15,18 Magnet Yoke: MY109-114,171,456
Coil Unit: IL109WC-3,6,9,12,15,18 Magnet Yoke: MY109-114,171,456
Coil Unit: IL109X-3,6,9,12,15,18 Magnet Yoke: MY109X-114,171,456
Coil Unit: IL109XWC-3,6,9,12,15,18 Magnet Yoke: MY109XWC-114,171,456
Coil Unit: IL59-6N-T-01 Magnet Yoke: MY59-90
Continuous Current: 1.7A
Resistance Per Phase: 9.29Ω
Power Loss: 104W

Page 3 of 3
After preparation of the necessary technical documentation as well as the EU declaration of conformity the required CE marking can be affixed on the product. Other relevant directives have to be observed.

TÜV SÜD Product Service GmbH • Certification Body • Ridlerstraße 65 • 80339 Munich • Germany

APPENDIX C - UL

CERTIFICATE OF COMPLIANCE

Certificate Number UL-CA-2246984-0
Report Reference E530366-20221223
Date 4-Jan-2023

Issued to: Suzhou ITG Linear Motor Co.，Ltd
NO.6 Xujing Road，Xuguan Industrial Park，SND Suzhou
China 215151
China

This is to certify that representative samples of NDMM8 - Incomplete Rotating Machines and Rotating Machine Parts Certified for Canada - Component
See Addendum Page for Product Designation(s).

Have been evaluated by UL in accordance with the component requirements in the Standard(s) indicated on this Certificate. UL Recognized components are incomplete in certain constructional features or restricted in performance capabilities and are intended for installation in complete equipment submitted for investigation to UL LLC.

Standard(s) for Safety: CSA C22.2 NO. 100, 7th Ed., Issue Date: 2014-07-01, Revision Date: 2017-04-01

Additional Information: See the UL Online Certifications Directory at https://iq.ulprospector.com for additional information

This Certificate of Compliance indicates that representative samples of the product described in the certification report have met the requirements for UL certification. It does not provide authorization to apply the UL Recognized Component Mark. Only the Authorization Page that references the Follow-Up Services Procedure for ongoing surveillance provides authorization to apply the UL Mark.

Only those products bearing the UL Recognized Component Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Recognized Component Mark on the product.

Deborah Jennings-Conner, VP Regulatory Services
UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at http://ul.com/aboutul/locations/

CERTIFICATE OF COMPLIANCE

Certificate Number UL-US-2249416-0
Report Reference E530366-20221223
Date 4-Jan-2023

Issued to: Suzhou ITG Linear Motor Co.，Ltd
NO.6 Xujing Road，Xuguan Industrial Park，SND Suzhou
China 215151
China

This is to certify that representative samples of NDMM2 - Incomplete Rotating Machines and Rotating Machine Parts - Component
See Addendum Page for Product Designation(s).

Have been evaluated by UL in accordance with the component requirements in the Standard(s) indicated on this Certificate. UL Recognized components are incomplete in certain constructional features or restricted in performance capabilities and are intended for installation in complete equipment submitted for investigation to UL LLC.

Standard(s) for Safety: UL 1004-1, 2nd Ed., Issue Date: 2012-09-19, Revision Date: 2020-11-05

Additional Information: See the UL Online Certifications Directory at https://iq.ulprospector.com for additional information

This Certificate of Compliance indicates that representative samples of the product described in the certification report have met the requirements for UL certification. It does not provide authorization to apply the UL Recognized Component Mark. Only the Authorization Page that references the Follow-Up Services Procedure for ongoing surveillance provides authorization to apply the UL Mark.

Only those products bearing the UL Recognized Component Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Recognized Component Mark on the product.

Deborah Jennings-Conner, VP Regulatory Services
UL LLC

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CERTIFICATE OF COMPLIANCE

Certificate Number UL-CA-2246984-0
Report Reference E530366-20221223
Date 4-Jan-2023

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements

Model	Category Description
IC124-12N-X-YY	Incomplete Motor Parts
IC124-12S-X-YY	Incomplete Motor Parts
IC124-15N-X-YY	Incomplete Motor Parts
IC124-15S-X-YY	Incomplete Motor Parts
IC124-18N-X-YY	Incomplete Motor Parts
IC124-18S-X-YY	Incomplete Motor Parts
IC124-30N-X-YY	Incomplete Motor Parts
IC124-30S-X-YY	Incomplete Motor Parts
IC50-12S-X-YY	Incomplete Motor Parts
IC50-18S-X-YY	Incomplete Motor Parts
IC50-3S-X-YY	Incomplete Motor Parts
IC50-6S-X-YY	Incomplete Motor Parts
IC50-9S-X-YY	Incomplete Motor Parts
IC76-12N-X-YY	Incomplete Motor Parts
IC76-12S-X-YY	Incomplete Motor Parts
IC76-15N-X-YY	Incomplete Motor Parts
IC76-15S-X-YY	Incomplete Motor Parts
IC76-18N-X-YY	Incomplete Motor Parts
IC76-18S-X-YY	Incomplete Motor Parts
IC76-24N-X-YY	Incomplete Motor Parts
IC76-24S-X-YY	Incomplete Motor Parts
IC76-6N-X-YY	Incomplete Motor Parts
IC76-6S-X-YY	Incomplete Motor Parts
IC76-9N-X-YY	Incomplete Motor Parts
IC76-9S-X-YY	Incomplete Motor Parts

Deborah Jennings-Conner, VP Regulatory Services
UL LLC

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CERTIFICATE OF COMPLIANCE

Certificate Number UL-US-2249416-0
Report Reference E530366-20221223
Date 4-Jan-2023

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements

Model	Category Description
IC124-12N-X-YY	Incomplete Motor Parts
IC124-12S-X-YY	Incomplete Motor Parts
IC124-15N-X-YY	Incomplete Motor Parts
IC124-15S-X-YY	Incomplete Motor Parts
IC124-18N-X-YY	Incomplete Motor Parts
IC124-18S-X-YY	Incomplete Motor Parts
IC124-30N-X-YY	Incomplete Motor Parts
IC124-30S-X-YY	Incomplete Motor Parts
IC50-12S-X-YY	Incomplete Motor Parts
IC50-18S-X-YY	Incomplete Motor Parts
IC50-3S-X-YY	Incomplete Motor Parts
IC50-6S-X-YY	Incomplete Motor Parts
IC50-9S-X-YY	Incomplete Motor Parts
IC76-12N-X-YY	Incomplete Motor Parts
IC76-12S-X-YY	Incomplete Motor Parts
IC76-15N-X-YY	Incomplete Motor Parts
IC76-15S-X-YY	Incomplete Motor Parts
IC76-18N-X-YY	Incomplete Motor Parts
IC76-18S-X-YY	Incomplete Motor Parts
IC76-24N-X-YY	Incomplete Motor Parts
IC76-24S-X-YY	Incomplete Motor Parts
IC76-6N-X-YY	Incomplete Motor Parts
IC76-6S-X-YY	Incomplete Motor Parts
IC76-9N-X-YY	Incomplete Motor Parts
IC76-9S-X-YY	Incomplete Motor Parts

Deborah Jennings-Conner, VP Regulatory Services
UL LLC

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APPENDIX C - UL

Certificate of Compliance

Certificate: 80211178 **Master Contract:** 304873

Project: 80211178 **Date Issued:** 2024-08-23

Issued to: **Suzhou ITG Linear Motor Co., Ltd**
Floor 4, Bldg. 7#, No.26
Qinghua Rd., Phase II
Science & Tech Innovation Pk.
Xushuguan Town, SND
Suzhou, Jiangsu 215151
China

Attention: Weijia Liu

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.

Issued by: *Lily Li*
Lily Li

C US

PRODUCTS

Class 4211 31 MOTORS AND GENERATORS - Sub-Assemblies - Component Acceptance
Class 4211 91 MOTORS AND GENERATORS - Sub-Assemblies - Component Acceptance - US Standards

Component of AC linear motors, mover, series IC50,IC 76 and IC124,Voltage 380VAC, Frequency 50/60Hz,Insulation Class A.

Model(s)	Dimensions
Series 50	Width 50mm, Length 93-336mm, thick 31.3-31.4mm
Series 76	Width 76mm, Length 96-916mm, thick 31.3-31.4mm
Series 124	Width 124mm, Length 146-847mm, thick 32.3-32.4mm

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Note:
These sub-assemblies are investigated for use only as components of AC linear motor where the acceptability of the final assembly is to be determined.

APPLICABLE REQUIREMENTS

CSA C22.2 No. 100-14+Upd.1 (Seventh Edition)(R2019) - Motors and generators -Update No. 1: April 2017

ANSI/UL 1004-1 (Second Edition; Reprint with Revisions Through and Including November 5, 2020) - UL Standard for Safety Rotating Electrical Machines – General Requirements

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Notes:

Products certified under Class(es) C421131 have been certified under CSA's ISO/IEC 17065 accreditation with the Standards Council of Canada (SCC). www.scc.ca

SCC Accredited CB-P/S OCPS Accrédité CCN

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Supplement to Certificate of Compliance

Certificate: 80211178 **Master Contract:** 304873

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
80211178	2024-08-23	Original certification of component of AC linear motors, mover, series IC50,IC 76 and IC124,Voltage 380VAC, Frequency 50/60Hz. IFE conducted.

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APPENDIX C - CE

ISET S.r.l. Unipersonale

ISTITUTO SERVIZI EUROPEI TECNOLOGICI

Sede Legale e Uffici: Via Donatori di sangue, 9 - 46024 Moglia (MN) — Tel. e fax +39 (0)376 598963 — www.iset-italia.com commerciale1@iset-italia.com

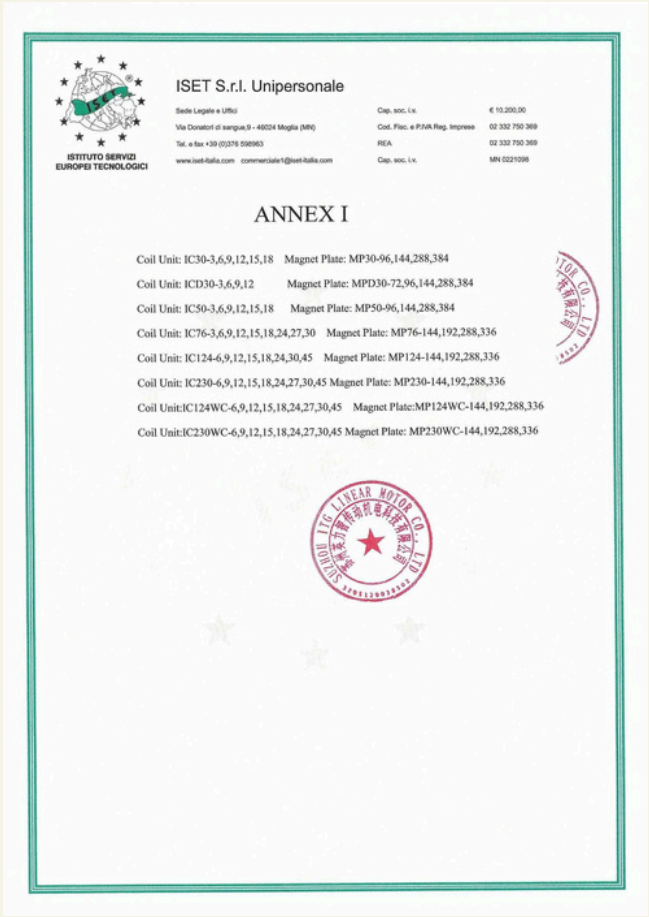
Cap. soc. i.v. € 10.200,00 — Cod. Fisc. e P.IVA Reg. Imprese 02 332 750 369 — REA 02 332 750 369 — Cap. soc. i.v. MN 0221098

CERTIFICATE

Certificat - Certificado- Сертификат - Zertifikat - 證書

1) **APPLICANT:** (who finally puts the product on the market)
Suzhou ITG Linear Motor Co., Ltd
Room 302, building 2#, No. 6 Xujing Road, Xushu guan Town, SND Suzhou, China
2) **CERTIFICATE NO.:** ISETC.001820200721
TECHNICAL REFERENCE: TCF-01-07070803-LVD, TCF-01-07070803-EMC
3) **ISET MARK:**
4) **CAUTION ABOUT CE MARKING** (Instruction for the Applicant who puts the product on the EU market):
The label of the CE Marking on the left side should be not less than 5mm height. CE Marking and EC Declaration of Conformity are duties for the manufacturer or its applicant who puts the product on the market. This one is responsible to start the CE marking and certification procedure as required by the legislation in force. Only for the products which are compulsorily included into specific Directives or Regulations will be necessary to appoint a Notified Body.
5) **TYPE OF PRODUCT:** Iron-core linear motors
MODEL(S): See the following annex I
6) **LIST OF DIRECTIVES / REGULATIONS /STANDARDS** (as declared by the manufacturer itself)
Low Voltage Directive 2014/35/EU, Electromagnetic Compatibility 2014/30/EU
EN 60034-1:2010, EN 60252-1:2011+A1:2013, EN 61000-3-2:2014
EN 61000-3-3:2013, EN 55014-2:2015, EN 55014-1:2017
7) **NOTE:** This document is not referred to any evaluation that could be considered as included in the scope of the activities covered by the standard BS EN ISO/IEC 17065:2012 or European Regulation 765/2008.
8) **REMARK:** Certificate is issued on voluntary application from the Client and it gives to the applicant the right to use and affix the ISET Mark on their products, even if it doesn't imply any assessment on the safety and compliance of the product. ISET declares that the only scope of the assessment is to verify the existence of the declaration issued by the manufacturer or an applicant under its own responsibilities.
9) **DATE OF ISSUE:** 21/07/2020 **EXPIRY DATE:** 20/07/2025
10) **SIGNATURE:** Xiao Ming
(On behalf of the Legal representative)

ISET S.R.L



ISET S.r.l. Unipersonale

ISTITUTO SERVIZI EUROPEI TECNOLOGICI

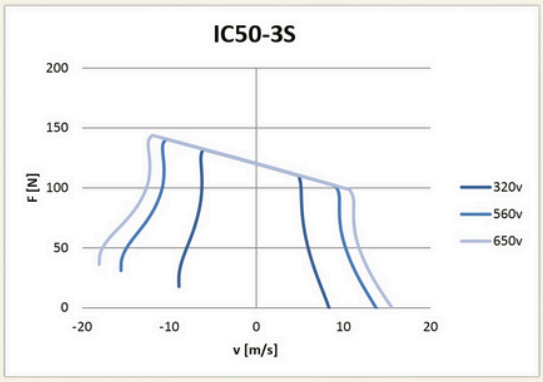
Sede Legale e Uffici: Via Donatori di sangue,9 - 46024 Moglia (MN) — Tel. e fax +39 (0)376 598963 — www.iset-italia.com commerciale1@iset-italia.com

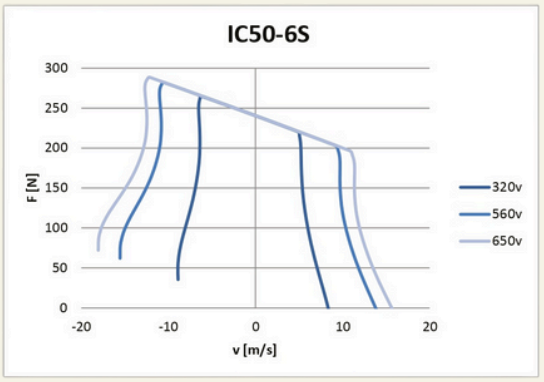
Cap. soc. i.v. € 10.200,00 — Cod. Fisc. e P.IVA Reg. Impresa 02 332 750 369 — REA 02 332 750 369 — Cap. soc. i.v. MN 0221098

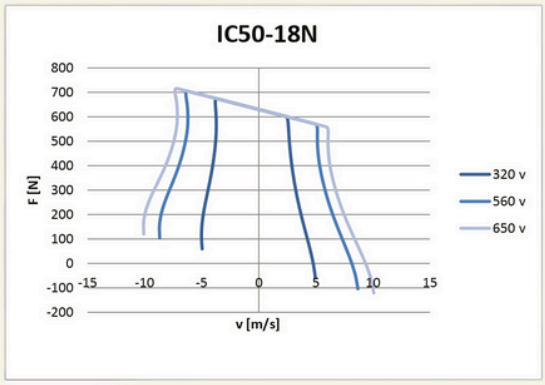
ANNEX I

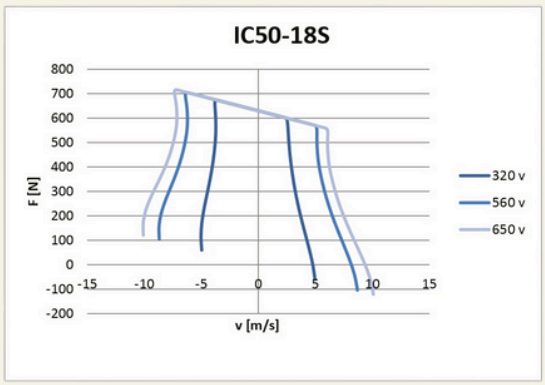
Coil Unit: IC30-3,6,9,12,15,18 Magnet Plate: MP30-96,144,288,384
Coil Unit: ICD30-3,6,9,12 Magnet Plate: MPD30-72,96,144,288,384
Coil Unit: IC50-3,6,9,12,15,18 Magnet Plate: MP50-96,144,288,384
Coil Unit: IC76-3,6,9,12,15,18,24,27,30 Magnet Plate: MP76-144,192,288,336
Coil Unit: IC124-6,9,12,15,18,24,30,45 Magnet Plate: MP124-144,192,288,336
Coil Unit: IC230-6,9,12,15,18,24,27,30,45 Magnet Plate: MP230-144,192,288,336
Coil Unit:IC124WC-6,9,12,15,18,24,27,30,45 Magnet Plate:MP124WC-144,192,288,336
Coil Unit:IC230WC-6,9,12,15,18,24,27,30,45 Magnet Plate: MP230WC-144,192,288,336

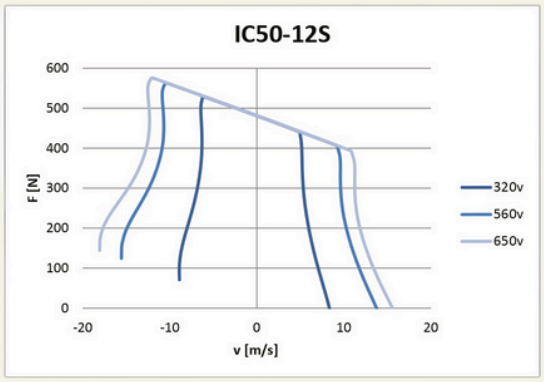
APPENDIX D - F / v Graphs



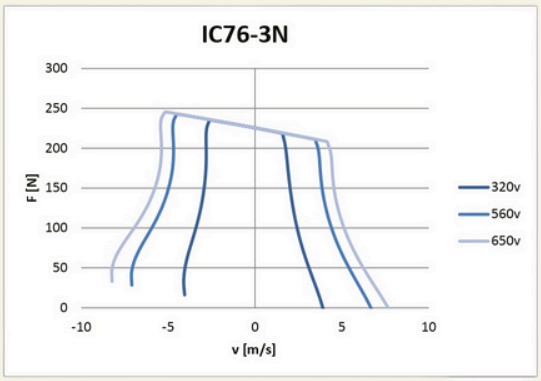


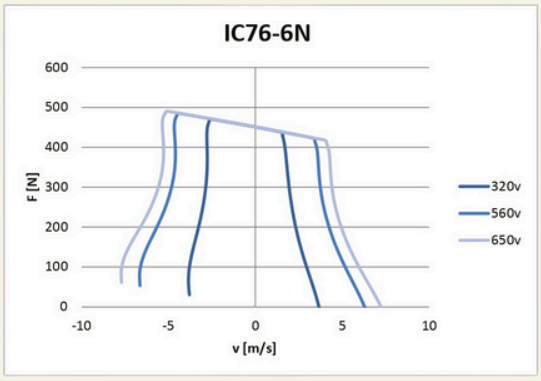


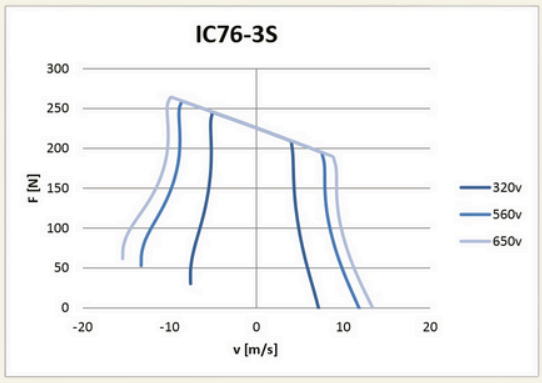


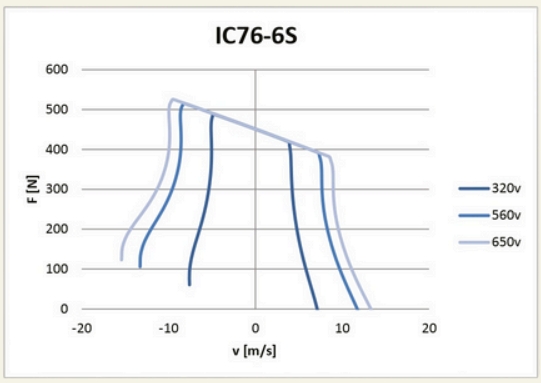


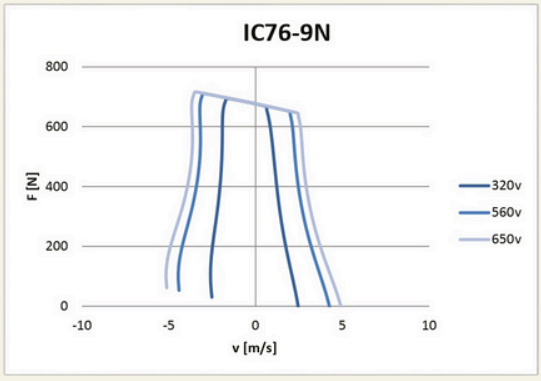
APPENDIX D - F / v Graphs

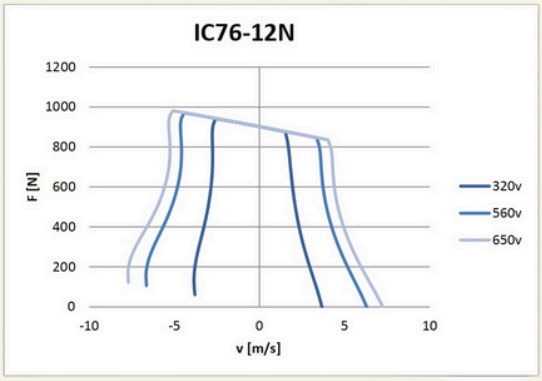


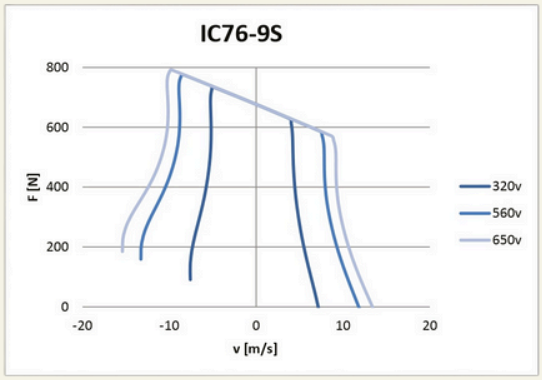


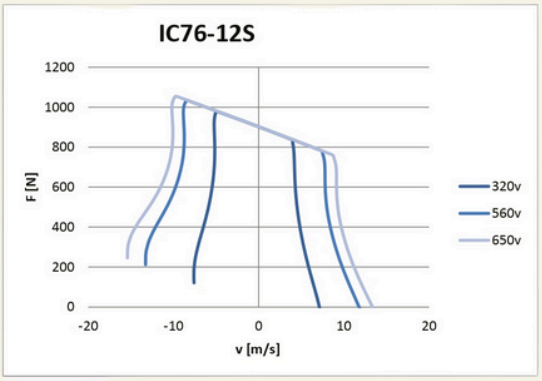




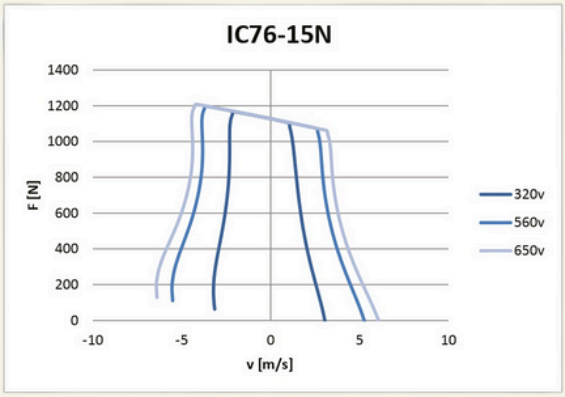


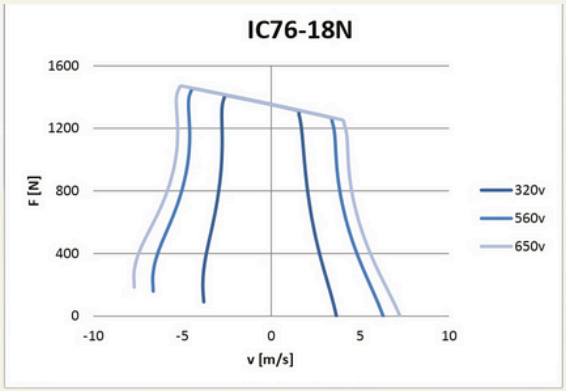


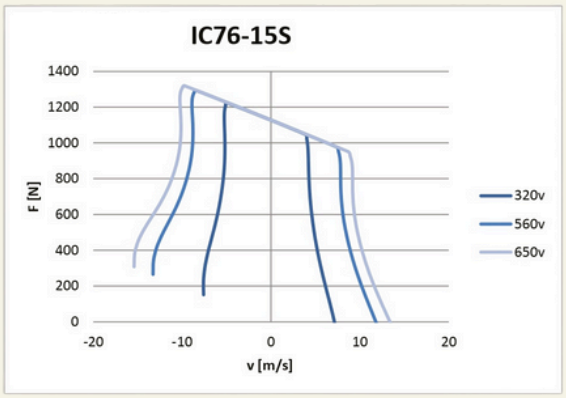


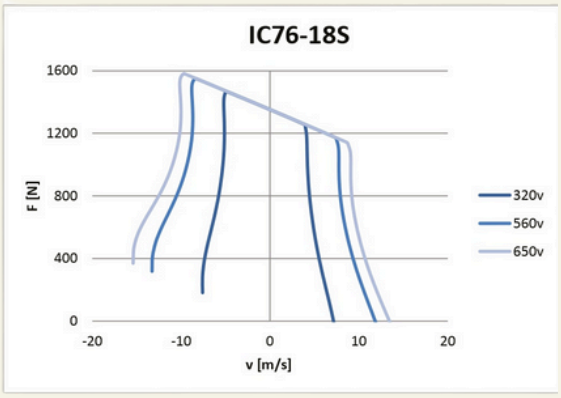


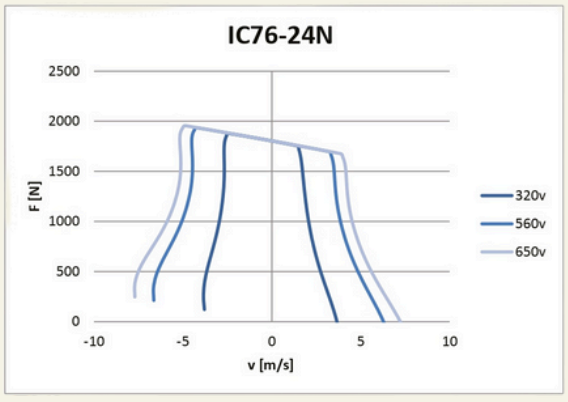
APPENDIX D - F / v Graphs

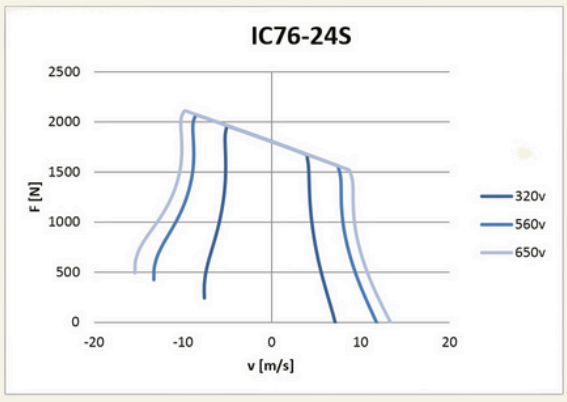












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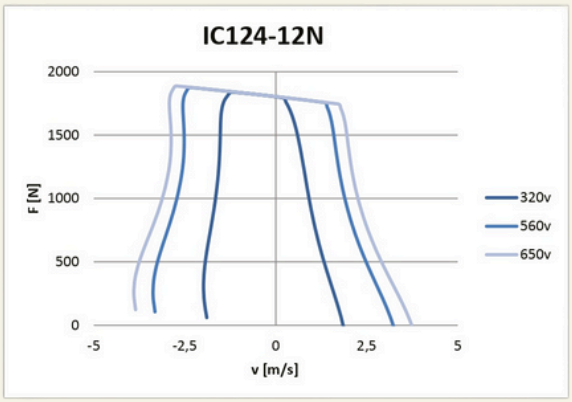
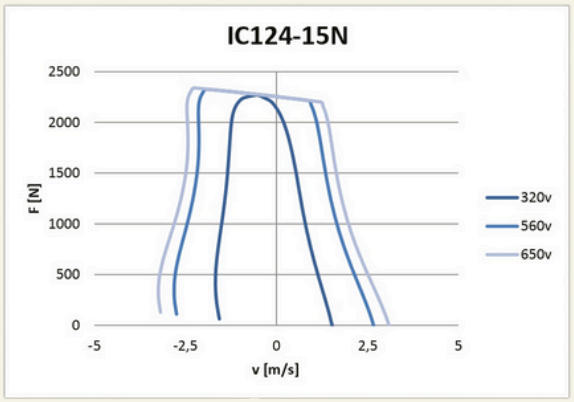
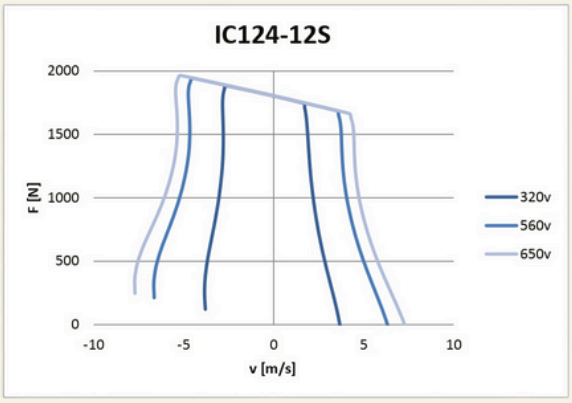
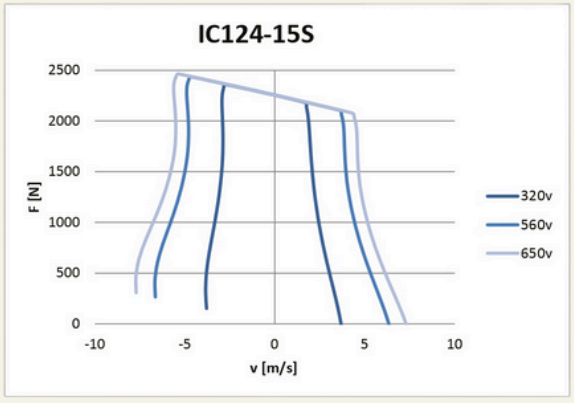
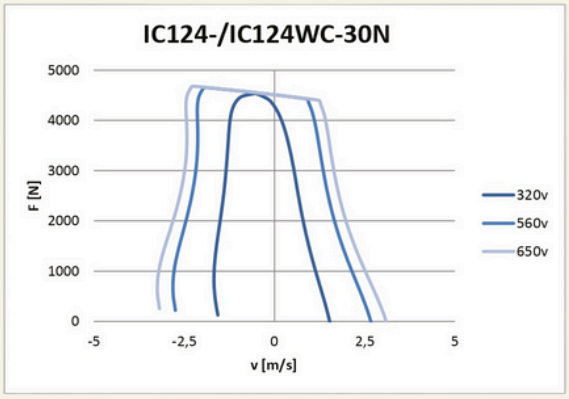


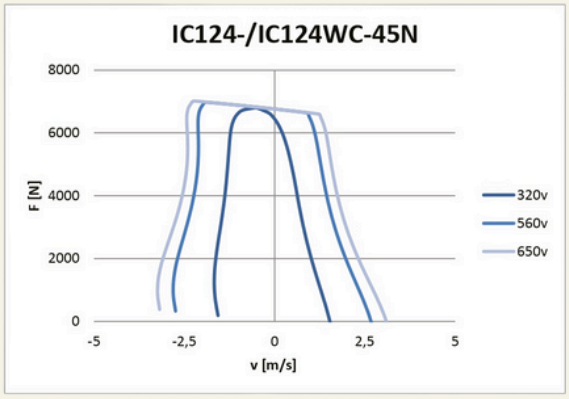


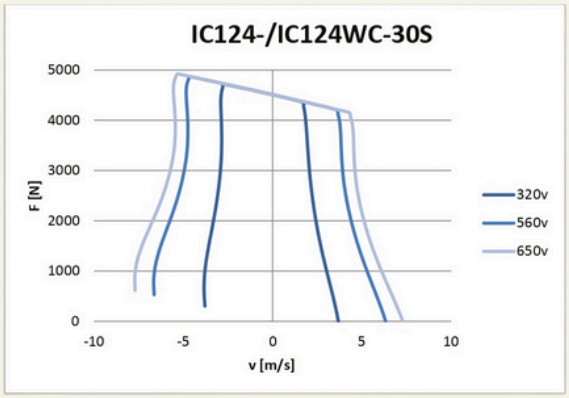


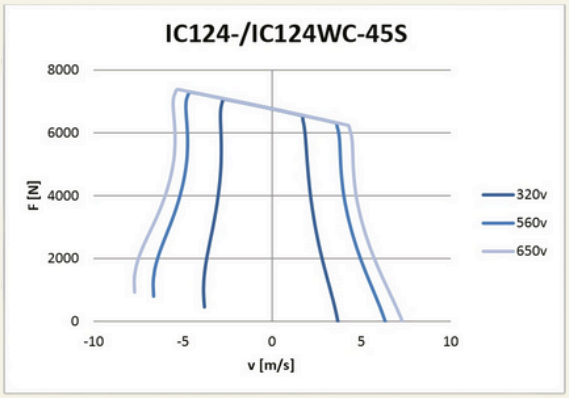


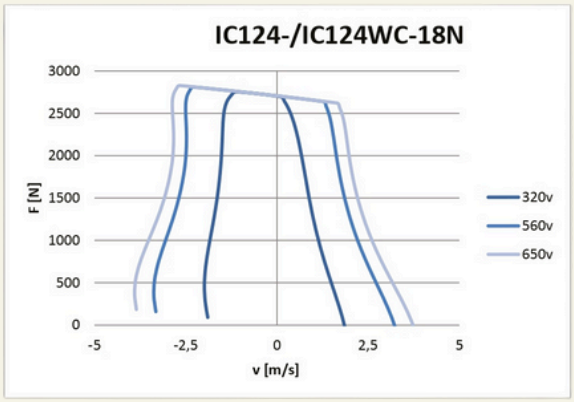
APPENDIX D - F / v Graphs

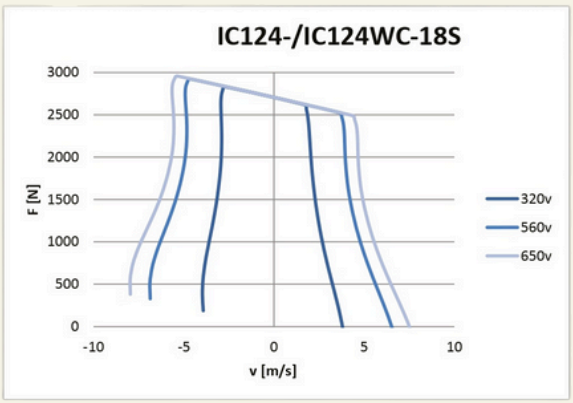




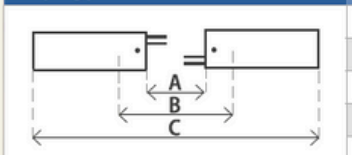
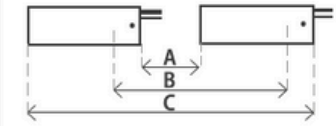
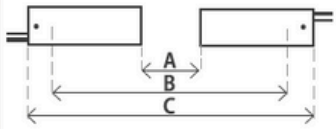






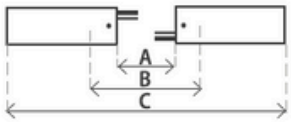
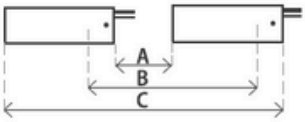
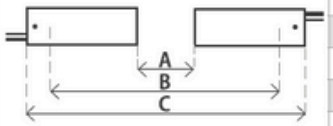


APPENDIX E - Coupling - IC50

Coupling possibilities	Combination	N	S	Distance coilunits (A)	Distance Dowelpins (B)	Total length coilunits (C)	L1	L2	L3
	IC50-3+IC50-6	X	X	36	101	272	L3	L2	L1
	IC50-3+IC50-12	X	X	49	115	383	L2	L1	L3
	IC50-6+IC50-12	X	X	45	146	429	L2	L1	L3
	IC50-12+IC50-12	X	X	42	144	524	L2	L1	L3
	IC50-18+IC50-18	X	X	41	177	713	L2	L1	L3
	IC50-3+IC50-6	X	X	37	145	273	L3	L1	L2
	IC50-3+IC50-12	X	X	38	243	372	L3	L1	L2
	IC50-6+IC50-12	X	X	50	290	434	L1	L2	L3
	IC50-12+IC50-12	X	X	47	288	529	L1	L2	L3
	IC50-18+IC50-18	X	X	48	384	720	L1	L2	L3
	IC50-3+IC50-6	X	X	16	187	252	L3	L2	L1
	IC50-3+IC50-12	X	X	1	269	335	L2	L1	L3
	IC50-6+IC50-12	X	X	3	286	387	L2	L1	L3
	IC50-12+IC50-12	X	X	4	384	486	L2	L1	L3
	IC50-18+IC50-18	X	X	7	543	679	L2	L1	L3

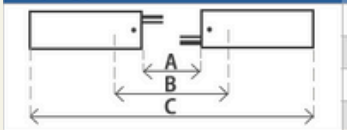
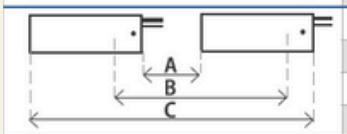
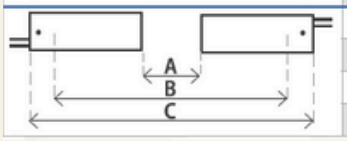
Note: Larger distances are possible. Please ask ITG for exact distances.

APPENDIX E - Coupling - IC76

Coupling possibilities	Combination	N	S	Distance coilunits (A)	Distance Dowelpins (B)	Total length coilunits (C)	L1	L2	L3
	IC76-6 + IC76-15		X	42	118	478	L2	L1	L3
	IC76-9 + IC76-12		X	39	144	477	L2	L1	L3
	IC76-12+IC76-15		X	39	144	573	L2	L1	L3
	IC76-09 + IC76-24		X	71	176	733	L3	L2	L1
	IC76-12 + IC76-24	X	X	68	176	780	L3	L2	L1
	IC76-15 + IC76-24		X	71	176	829	L3	L2	L1
	IC76-18+IC76-18	X	X	41	177	713	L2	L1	L3
	IC76-18 + IC76-24	X		70.5	192.5	874.5	L3	L2	L1
	IC76-24+IC76-24	X	X	68	176	1004	L3	L2	L1
	IC76-06 + IC76-15		X	46	310	482	L1	L2	L3
	IC76-9 + IC76-12		X	47	288	485	L1	L2	L3
	IC76-12+IC76-15		X	43	336	577	L1	L2	L3
	IC76-09 + IC76-24		X	47	512	709	L3	L1	L2
	IC76-12 + IC76-24	X	X	44	512	756	L3	L1	L2
	IC76-15 + IC76-24		X	47	512	805	L3	L1	L2
	IC76-18+IC76-18	X	X	48	384	720	L1	L2	L3
	IC76-18 + IC76-24	X		46.5	528.5	850.5	L3	L1	L2
	IC76-24+IC76-24	X	X	60	528	996	L1	L2	L3
	IC76-06 + IC76-15		X	2	362	438	L2	L1	L3
	IC76-9 + IC76-12		X	3	336	441	L2	L1	L3
	IC76-12+IC76-15		X	3	432	537	L2	L1	L3
	IC76-09 + IC76-24		X	3	560	665	L1	L3	L2
	IC76-12 + IC76-24	X	X	4	608	716	L1	L3	L2
	IC76-15 + IC76-24		X	3	656	761	L1	L3	L2
	IC76-18+IC76-18	X	X	7	543	679	L2	L1	L3
	IC76-18 + IC76-24	X		5.5	687.5	809.5	L1	L3	L2
	IC76-24 + IC76-24	X	X	4	832	940	L3	L2	L1

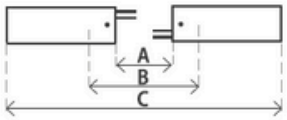
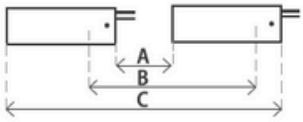
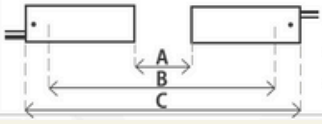
Note: Larger distances are possible. Please ask ITG for exact distances.

APPENDIX E - Coupling - IC124

Coupling possibilities	Combination	N	S	Distance coilunits (A)	Distance Dowelpins (B)	Total length coilunits (C)	L1	L2	L3
	IC124-12+IC124-12	X	X	68	176	556	L3	L2	L1
	IC124-12+IC124-15		X	71	176	605	L3	L2	L1
	IC124-12+IC124-30		X	71	176	877	L3	L2	L1
	IC124-30+IC124-30	X	X	74	176	1198	L3	L2	L1
	IC124-12+IC124-12	X	X	60	304	548	L2	L3	L1
	IC124-2+IC124-15		X	75	368	609	L3	L1	L2
	IC124-12+IC124-30		X	75	640	881	L2	L3	L1
	IC124-30+IC124-30	X	X	62	624	1186	L1	L2	L3
	IC124-12+IC124-12	X	X	4	384	492	L2	L1	L3
	IC124-12+IC124-15		X	3	432	537	L2	L1	L3
	IC124-12+IC124-30		X	3	704	809	L2	L1	L3
	IC124-30+IC124-30	X	X	2	1024	1126	L3	L2	L1

Note: Larger distances are possible. Please ask ITG for exact distances.

APPENDIX E - Coupling - IC124WC

Coupling possibilities	Combination	N	S	Distance coilunits (A)	Distance Dowelpins (B)	Total length coilunits (C)	L1	L2	L3
	IC124WC-18+IC124WC-18	X	X	73	225	761	L2	L1	L3
	IC124WC-30+IC124WC-30	X		64	192	1224	L2	L1	L3
	IC124WC-30+IC124WC-30		X	112	240	1272	L2	L1	L3
	IC124WC-30+IC124WC-45	X		64	192	1496	L2	L1	L3
	IC124WC-30+IC124WC-45		X	112	240	1544	L2	L1	L3
	IC124WC-45+IC124WC-45	X	X	112	240	1816	L2	L1	L3
	IC124WC-18+IC124WC-18	X	X	72	416	760	L3	L1	L2
	IC124WC-30+IC124WC-30	X		60	640	1220	L2	L3	L1
	IC124WC-30+IC124WC-30		X	108	688	1268	L2	L3	L1
	IC124WC-30+IC124WC-45	X		60	912	1492	L1	L2	L3
	IC124WC-30+IC124WC-45		X	108	960	1540	L1	L2	L3
	IC124WC-45+IC124WC-45	X	X	108	960	1812	L1	L2	L3
	IC124WC-18+IC124WC-18	X	X	7	543	695	L2	L1	L3
	IC124WC-30+IC124WC-30	X	X	8	1040	1168	L1	L3	L2
	IC124WC-30+IC124WC-45	X	X	8	1312	1440	L3	L2	L1
	IC124WC-45+IC124WC-45	X	X	8	1584	1712	L2	L1	L3

Note: Larger distances are possible. Please ask ITG for exact distances.

ITG

Suzhou ITG Linear Motor Co., Ltd. is a Hi-tech company which has been specialized in R & D, manufacturing, sales and providing relevant technical consultation and after-sales service for direct drive motors such as DDL, DDR, and also for Curve Motor.

Our main products are iron-core linear motors, ironless linear motors, torque motors, curve motors and all the relevant accessories. We also have the availability of providing customized linear motors and OEM service.

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