Innovation+ Advance

NEVER STOP IMPROVING

Shenzhen Inovance Technology Co., Ltd.
Add.: Building E, Hongwei Industry Park, Liuxian Road,
Baocheng No. 70 Zone, Bao'an District, Shenzhen
Tel: +86 755 2979 9595
Fax: +86 755 2961 9897
Technical Support: 400-777-1260
http://www.inovance.cn

Contact Information of Agency

Inovance

AC Drive | Servo Drive | Integrated Controller | PLC | HMI | PMSM | Energy

2012

InoTorque

ISMD Series Torque Motor

TÜV Rheinland Group
ISO9001 Certified

V1. 1
Data code X 6210041

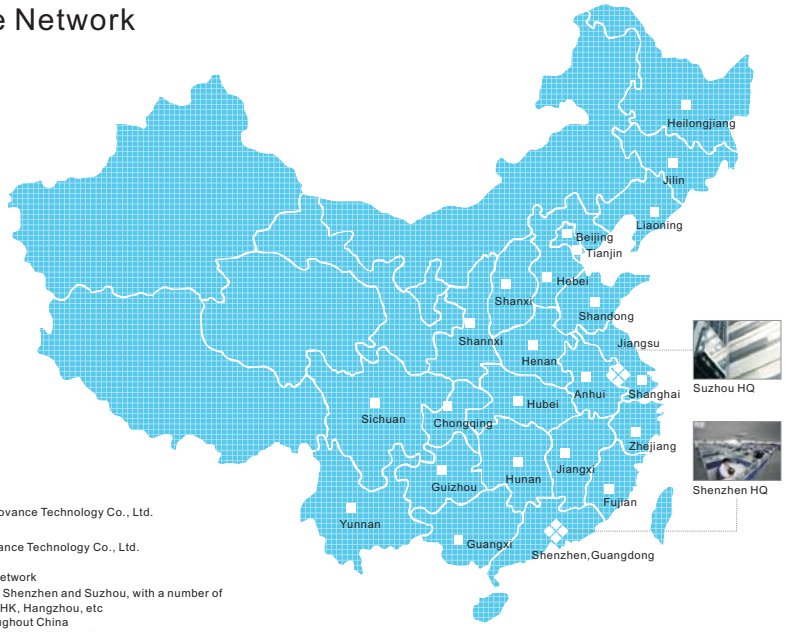
ABOUT INOVANCE

Shenzhen Inovance Technology Co., Ltd. (Stock code: 300124) is a leading industrial automation product and solution provider, dedicated to R&D, manufacturing and sales of automation control products. Targeting at high-end equipment manufacturers, we are committed to achieving a win-win situation with customers based on our solid automation control technologies with IPRs. We have maintained a mature business model through which customized solutions have been constantly and rapidly delivered to customers.

Our offering provides low/mid-voltage AC drives, PLCs, HMIs, servo drives, motors, photoelectric encoders, integrated and special drives, and renewable energy products, etc. We are now taking up the largest market share in domestic low-voltage section and have obtained a leading position in various segmentation markets with our all-round integrated and special drives.

As a national high-tech enterprise, we have obtained 57 authorized patents till the end of year 2011, including 9 invention patents, 31 utility model patents and 17 design patents. Besides, we have mastered various core platform technologies covering the fields of high-performance vector control inverter, PLC, servo, and PMSM. Attracting and cultivating talents is our constant pursuit. Till now, Inovance has already owned a large group of professional R&D experts dedicated to development of core platform technologies, application technologies and new products.

Service Network



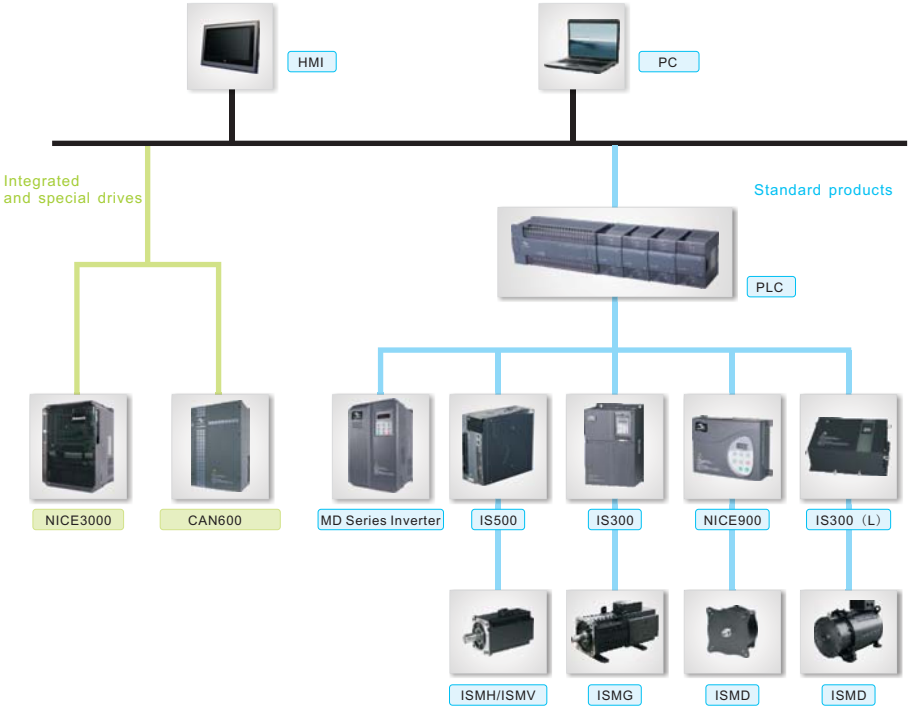
Shenzhen:
Shenzhen Inovance Technology Co., Ltd.

Suzhou:
Suzhou Inovance Technology Co., Ltd.

HQ & Branch Network
Headquarter in Shenzhen and Suzhou, with a number of subsidiaries in HK, Hangzhou, etc
41 offices throughout China
Over 400 sales and service engineers
200 authenticated distributors
50 nationwide warranty centers
8 spare parts centers

Quickly respond to customer needs.

General Products and Solutions



Future Drive, Drive's Future

Customer Requirements

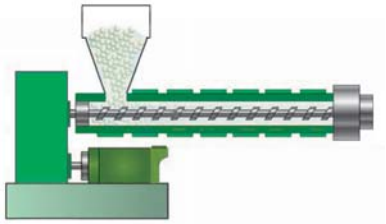
Direct drive technology has emerged as the ideal way to meet the ever-increasing requirements for production efficiency, control accuracy and dynamic response performance of manufacturing equipment, as well as the requirements for improving noise and maintenance issues. Over the past 20 years, torque motors (also referred as DD motor) have demonstrated significant performance improvement in machines in a variety of applications. In addition to providing high dynamic performance, torque motors reduce costs of ownership, simplify machine design, and minimize maintenance.

Early in 2005, Inovance successfully developed the PMSM vector control technology, which has been widely used in the synchronous motor servo drive systems including elevator synchronous traction hoist system, elevator door PM DD drive system, electro-hydraulic servo system for injection molding machines, electric valve BLDC drive system as well as pumping linear motor drive system. Currently, Inovance has successfully developed the low-speed high torque PMSM. By combining the motor drive technology with the motor manufacturing technology, we have been constantly dedicated to promoting the DD technology in OEM sector, aiming to bring upgrades to the industry and to constantly create values for customers.

Torque Motor Advantages (Take the plastic extruder and circular loom for example)

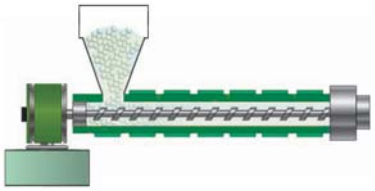
Traditional asynchronous motor or DC motor with gearbox
Disadvantages:

- ☹ Complicated ang high-cost maintenance for DC motor
- ☹ Complicated and high-cost maintenance for gearbox
- ☹ Inefficient and energy-consuming
- ☹ Large size, complex installation
- ☹ Big noise



Gearless torque motor drive system (for extruder)
Advantages:

- ☺ Reducing equipment costs due to lack of gearbox
- ☺ Lower noise
- ☺ High efficiency within wide speed and load ranges
- ☺ High power factor
- ☺ Faster dynamic response
- ☺ Compact structure, saving occupying space
- ☺ High control accuracy, high quality
- ☺ High MTBF
- ☺ Reducing workload for daily maintenance
- ☺ Easy for installing/removing the screw



Torque motor drive system (for circular loom) — worldwide pioneering
Advantages:

- ☺ Simple mechanical design: more compact structure and less installation space
- ☺ Energy-saving due to increase of mechanical transmission and electrical efficiencies
- ☺ Lower noise

What is a Torque Motor?

Torque motors are a special class of PM brushless servo motors, which are also referred to as PMSM or BLDC motors. In applications using torque motors, the load is directly connected to the rotor instead of using a transfer device (such as gearbox, belt pulley, chain)

A torque motor is either a rolled-up linear motor or a servo drive with a large number of poles due to which a torque motor is able to provide high torques at a relatively low speed. Yet, general asynchronous motors are of high speed and small torque. Such motors are designed to transmit speed and position, and thus requires a deceleration unit (such as a gearbox) in order to enlarge the torque. Torque motors, however, are purposely designed to transmit large torques.

A torque motor can produce high torque at general speeds or when the motor is in the status of zero speed or stalling. Different from traditional asynchronous motors, the major parameter of torque motors is "torque" other than "power". Peak torque refers to the maximum torque the motor can generate. Continuous torque defines the torque the motor can continuously supply when all three phases of load are balanced. You can define the referenced torque according to the duty cycle of the motor while it's running.

Torque motors are compact in structure due to a narrow stack of iron chips or the design of hollow shaft.

Applications

ISMD Series Torque Motor

Naming Rules

ISM D1-11E 20B D-R1 4 1 X-LS

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

① Series
ISM: IS series servo motor

② Features
D1: 315×315 base
D2: 266×266 base

③ Rated power
Consist of 2 digits and 1 letter
A: ×1 B: ×10 C: ×100
D: ×1,000 E: ×10,000
For example:
11E indicates 110,000W
40D indicates 40,000W

④ Rated rotational speed
Consist of 2 digits and 1 letter
A: ×1
B: ×10
C: ×100
D: ×1000
E: ×10000
For example:
20B indicates 200 rpm
12B indicates 120 rpm

⑤ Voltage level
D: 400V

⑥ Encoder type
R1: One-pair-pole resolver

⑦ Shaft Connection
2: Solid with key
4: Hollow shaft with key

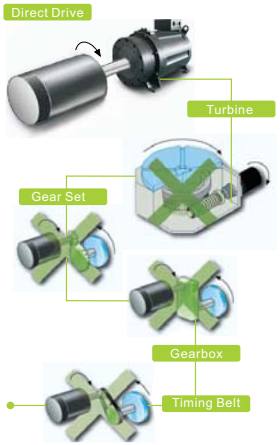
⑧ Brake, decelerator and oil seal
0: None
1: With oil seal

⑨ Customized
X: Standard

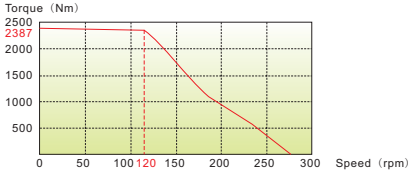
⑩ Non-standard mark

Features

- Use ANSOFT for simulation design, which brings excellent magnetic performance;
- Directly transmit high torque at low speed;
- Direct coupling with loads, eliminating extra mechanical transmission units;
- Use high-performance Nd-Fe-N materials for excitation, with less iron and copper losses than asynchronous motors of the same power;
- Able to maintain highly efficient operation within a wide speed and load range;
- Patented cooling mode: with excellent thermal effect and easily prevent leakage of cooling water;
- Hollow shaft design: suitable for the plastics industry, easy for installing/removing screws;
- Use a resolver for speed feedback, which is suitable for applications with significant vibration;
- Resolver is transmitted via the timing belt wheel with the ratio of 5:1, improving the detection accuracy at low speed;
- Different thrust bearings for options;
- Customization in design is available;
- Motor surface is smooth and easy to clean.
- Able to work as an actuator in tension control applications.



Torque-speed Curve for ISMD1-30D12BD-R141X



Performance Specifications

■ ISMD1 series, frame 315

Model	Rated Speed (rpm)	Rated Power (kw)	Rated Torque (Nm)	Rated Current (A)	Rated Voltage (V)	Back EMF (V)	Maximum Torque (Nm)	Maximum Current (A)	Rated Frequency (Hz)	Power Factor (COS ∮)	Efficiency η (%)
ISMD1-30D12BD-R141X	120	30	2387	64	368	296	6206	165	40.0	0.84	81
ISMD1-45D12BD-R141X		45	3580	95	368	298	9308	248	40.0	0.85	83
ISMD1-65D12BD-R141X		65	5170	140	368	302	13442	363	40.0	0.85	84
ISMD1-80D12BD-R141X		80	6360	172	368	304	16536	446	40.0	0.86	85
ISMD1-11E12BD-R141X		107	8500	230	370	310	23800	730	40.0	0.86	87
ISMD1-37D15BD-R141X	150	37	2387	78	368	317	5968	196	50.0	0.84	85
ISMD1-56D15BD-R141X		56	3580	119	368	309	8950	297	50.0	0.86	86
ISMD1-81D15BD-R141X		81	5170	174	368	305	12925	435	50.0	0.86	87
ISMD1-90D15BD-R141X		90	5730	182	368	302	13100	537	50.0	0.85	88
ISMD1-10E15BD-R141X		100	6360	215	370	309	15900	550	50.0	0.85	89
ISMD1-48D20BD-R141X	200	48	2300	105	365	210	5750	263	66.7	0.81	87
ISMD1-74D20BD-R141X		74	3500	161	365	218	8750	402	66.7	0.82	88
ISMD1-96D20BD-R141X		96	4584	202	370	230	10500	563	66.7	0.82	90
ISMD1-10E20BD-R141X		103	4900	205	370	304	11220	620	66.7	0.83	91
ISMD1-11E20BD-R141X		106	5100	225	370	310	12250	630	66.7	0.83	91
ISMD1-13E20BD-R141X		124	5950	271	372	316	14875	640	66.7	0.84	91
ISMD1-16E20BD-R141X		160	7620	330	372	324	18300	1010	66.7	0.84	91

■ ISMD2 series, frame 260

Model	Rated Speed (rpm)	Rated Power (kw)	Rated Torque (Nm)	Rated Current (A)	Rated Voltage (V)	Back EMF (V)	Maximum Torque (Nm)	Maximum Current (A)	Rated Frequency (Hz)	Power Factor (COS ∮)	Efficiency η (%)
ISMD2-22D12BD-R141X	120	22	1780	43	372	302	4450	108	40.0	0.82	80
ISMD2-34D12BD-R141X		34	2680	66	370	295	6700	165	40.0	0.82	80
ISMD2-46D12BD-R141X		46	3670	90	368	299	9175	225	40.0	0.83	81
ISMD2-56D12BD-R141X		56	4460	110	368	298	11150	275	40.0	0.83	82
ISMD2-28D15BD-R141X	150	28	1780	59	365	330	4450	146	50.0	0.88	81
ISMD2-42D15BD-R141X		42	2680	88	365	323	6700	219	50.0	0.88	81
ISMD2-56D15BD-R141X		56	3670	117	368	327	9175	294	50.0	0.87	82
ISMD2-70D15BD-R141X		70	4460	147	368	320	11150	367	50.0	0.87	82
ISMD2-54D30BD-R141X	300	54	1730	118	365	321	4325	296	100.0	0.84	89
ISMD2-81D30BD-R141X		81	2580	175	370	306	6450	437	100.0	0.84	89
ISMD2-11E30BD-R141X		112	3550	245	370	312	8875	612	100.0	0.83	90
ISMD2-14E30BD-R141X		135	4300	299	370	303	10750	747	100.0	0.82	90

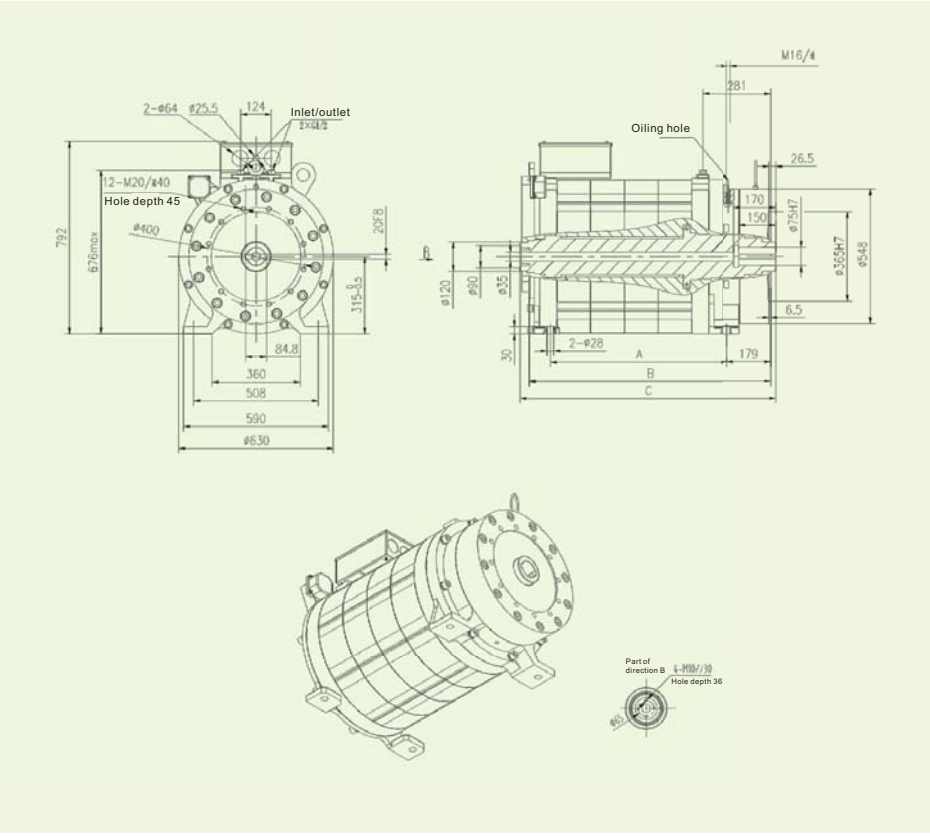
■ ISMD for circular loom

Model	Rated Speed (rpm)	Rated Power (kw)	Rated Torque (Nm)	Rated Current (A)	Rated Voltage (V)	Back EMF (V)	Maximum Torque (Nm)	Maximum Current (A)	Rated Frequency (Hz)	Power Factor (COS ∮)	Efficiency η (%)
ISMD1-16D10BD-N910X	100	16.0	100	32	365	300	3750	100	33.3	0.81	81
ISMD1-11D15BD-N910X	150	11.0	150	22	365	300	1787	60	50.0	0.84	84
ISMD1-42C20BD-N910X	200	4. 2	200	9	360	310	400	19	50.0	0. 88	85

Note:
1) We can provide customized products based on actual requirements.
2) Generally, the delivery period of torque motors is 45 working days.
3) Medels ISMD1-16D10BD-N910X and ISMD1-11D15BD-N910X are currently under development.

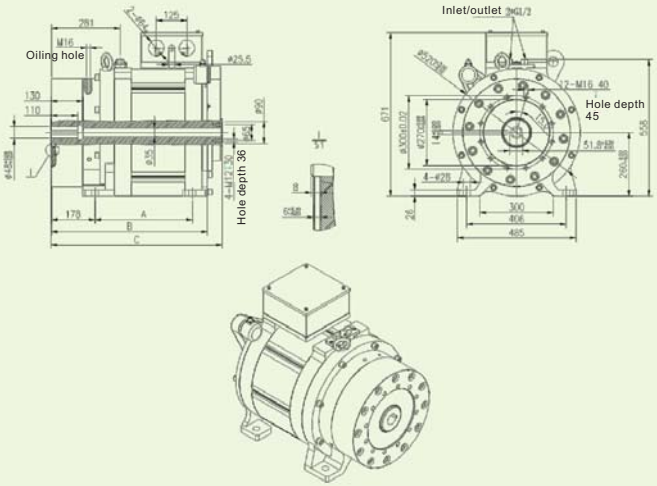
Mounting Dimensions

■ Schematic diagram for physical and mounting dimensions of ISMD1 series torque motor (frame 315)



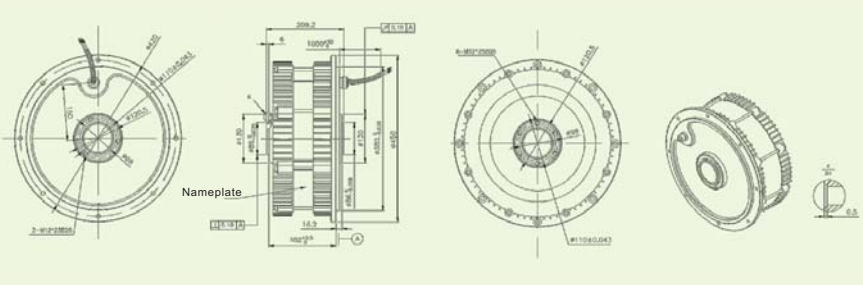
Item \ Model	ISMD1-30D12BD-R141X ISMD1-37D15BD-R141X ISMD1-48D20BD-R141X	ISMD1-45D12BD-R141X ISMD1-56D15BD-R141X ISMD1-74D20BD-R141X	ISMD1-65D12BD-R141X ISMD1-81D15BD-R141X ISMD1-96D20BD-R141X ISMD1-10E20BD-R141X ISMD1-11E20BD-R141X	ISMD1-80D12BD-R141X ISMD1-90D15BD-R141X ISMD1-10E15BD-R141X ISMD1-13E20BD-R141X	ISMD1-11E12BD-R141X ISMD1-16E20BD-R141X
A	393	503	613	723	833
B	658	768	878	988	1098
C	716	826	936	1046	1156

■ Schematic diagram for physical and mounting dimensions of ISMD2 series torque motor (frame 260)



Item \ Model	ISMD2-22D12BD-R141X ISMD2-28D15BD-R141X ISMD2-54D30BD-R141X	ISMD2-34D12BD-R141X ISMD2-42D15BD-R141X ISMD2-81D30BD-R141X	ISMD2-46D12BD-R141X ISMD2-56D15BD-R141X ISMD2-11E30BD-R141X	ISMD2-56D12BD-R141X ISMD2-70D15BD-R141X ISMD2-14E30BD-R141X
A	398	508	618	728
B	638	748	858	968
C	701	811	921	1031

■ Schematic diagram for physical and mounting dimensions of ISMD series torque motor for circular loom
Motor model: ISMD1-42C20BD-N910X



IS300 Series Servo Drive

Naming Rules

IS300 T 030 - C - L

① ② ③ ④ ⑤

① Series
IS300 series servo drive

② Voltage level
T: 3-phase 380V

③ Rated output current

005: 9A	070: 75A
010: 13A	080: 91A
015: 17A	100: 112A
020: 25A	140: 150A
030: 32A	170: 176A
035: 37A	210: 210A
040: 45A	250: 253A
050: 60A	300: 304A

④ Type of interface board
C: With CAN communication and PTC sensor (motor overheat protection)
Note: Standard drive is embedded with a resolver PG card.

⑤ Cooling mode
NULL: Forced air cooling
L: Water cooling

Features

- Current vector control;
- Excellent characteristics at low speed, with a zero-speed torque holding function;
- Rapid dynamic response, quickly responding to load changes and external commands;
- High speed control accuracy, able to maintain a speed adjusting accuracy of 1:10000 while matching with an ISMD motor;
- Powerful functions: embedding multiple various application macros;
- Self-adaptation of motor parameters;
- Lower noise;
- Flat-mounted below the motor, which can greatly reduce the size of the equipment (for water-cooled servo drive).

Specifications

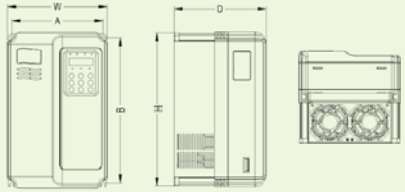
Model	Power Supply Capacity (kVA)	Input Current (A)	Output Current (A)	Adaptable Motor (S1)		Recommended Brake Resistor Power (W)	Recommended Brake Resistance Value (Ω)	Braking Unit	Remarks
				(kW)	(HP)				
Three-phase 380V, 50/60Hz									
IS300T005-C	5.9	10.5	9.0	3.7	5	300W	⩾130Ω	Built-in	/
IS300T010-C	8.9	14.6	13.0	5.5	7.5	400W	⩾90Ω		
IS300T015-C	11.0	20.5	17.0	7.5	10	500W	⩾65Ω		
IS300T020-C	17.0	26.0	25.0	11	15	800W	⩾43Ω		
IS300T030-C	21.0	35.0	32.0	15	20	1000W	⩾32Ω		
IS300T035-C	24.0	38.5	37.0	18.5	25	1300W	⩾25Ω		
IS300T040-C	30.0	46.5	45.0	22	30	1500W	⩾22Ω		
IS300T050-C	40.0	62.0	60.0	30	40	2500W	⩾16Ω		
IS300T070-C	57.0	76.0	75.0	37	50	3.7 kW	⩾8Ω	External	MDBU-70-B
IS300T080-C	69.0	92.0	91.0	45	60	4.5 kW	⩾8Ω	External	MDBU-70-B
IS300T100-C	85.0	113.0	112.0	55	75	5.5 kW	⩾8Ω	External	MDBU-70-B
IS300T140-C	114.0	157.0	150.0	75	100	7.5 kW	⩾8Ω	External	MDBU-70-B
IS300T170-C	134.0	180.0	176.0	90	125	4.5 kW×2	⩾8Ω×2	External	MDBU-70-B × 2
IS300T210-C	160.0	214.0	210.0	110	150	5.5 kW×2	⩾8Ω×2	External	MDBU-70-B × 2
IS300T250-C	192.0	256.0	253.0	132	200	6.5 kW×2	⩾8Ω×2	External	MDBU-70-B × 2
IS300T300-C	231.0	307.0	304.0	160	250	16kW	⩾2.5Ω	External	MDBU-200-B
IS300T140-C-L	114.0	157.0	150.0	75	100	7.5 kW	⩾8Ω	External	MDBU-70-B
IS300T170-C-L	134.0	180.0	176.0	90	125	4.5 kW×2	⩾8Ω×2	External	MDBU-70-B × 2
IS300T210-C-L	160.0	214.0	210.0	110	150	5.5 kW×2	⩾8Ω×2	External	MDBU-70-B × 2
IS300T250-C-L	192.0	256.0	253.0	132	200	6.5 kW×2	⩾8Ω×2	External	MDBU-70-B × 2
IS300T300-C-L	231.0	307.0	304.0	160	250	16kW	⩾2.5Ω	External	MDBU-200-B

1)Models above IS300T070-C (inclusive) and IS300T140-C-L (inclusive) must be configured with an external braking unit.
"×2" indicates that two braking resistors of two braking units are connected and used in parallel.
2) We can provide customized products based on actual requirements.
3) Generally, the delivery period of servo drives is 7 working days.

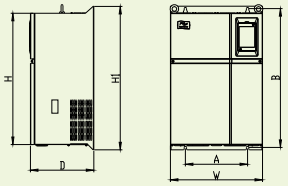
Mounting Dimensions

■ Mounting dimensions of forced air cooling servo drive

Models: IS300T005-C~IS300T030-C



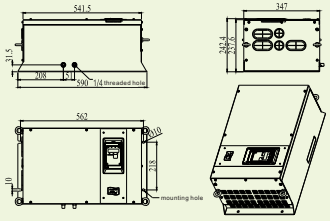
Models: IS300T035-C~IS300T300-C



Model	Mounting Hole (mm)		Physical Dimensions (mm)				Diameter of Mounting Hole (mm)	Weight (kg)
	A	B	H	H1	W	D		
IS300T005-C	148	236	248	/	160	183	ϕ5	2.5
IS300T010-C	148	236	248	/	160	183	ϕ5	2.5
IS300T015-C	190	305	322	/	208	192	ϕ6	6.5
IS300T020-C	190	305	322	/	208	192	ϕ6	6.5
IS300T030-C	190	305	322	/	208	192	ϕ6	6.5
IS300T035-C	235	447	432	463	285	228	ϕ8	20
IS300T040-C	235	447	432	463	285	228	ϕ8	20
IS300T050-C	235	447	432	463	285	228	ϕ8	20
IS300T070-C	260	580	549	600	385	265	ϕ10	32
IS300T080-C	260	580	549	600	385	265	ϕ10	32
IS300T100-C	260	580	549	600	385	265	ϕ10	32
IS300T140-C	343	678	660	700	473	307	ϕ10	47
IS300T170-C	343	678	660	700	473	307	ϕ10	47
IS300T210-C	449	905	880	930	579	375	ϕ10	90
IS300T250-C	449	905	880	930	579	375	ϕ10	90
IS300T300-C	449	905	880	930	579	375	ϕ10	90

■ Mounting dimensions of water cooling servo drive

Models: IS300T140-C-L, IS300T170-C-L



Models: IS300T210-C-L, IS300T250-C-L, IS300T300-C-L