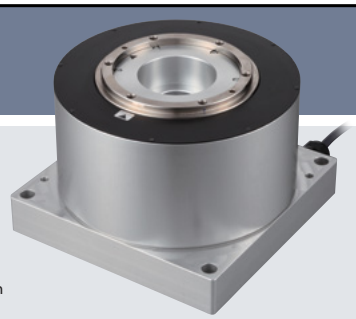
DD-H18

Direct Drive Motor
Standard bore High-torque type



Model Specification Items

DD — **H18**□ — □ — **600** — **360** — **T2** — □

DD	H18□	□	600	360	T2	□
Series	Type	Encoder type	Motor wattage	Range of operation	Applicable controller	Cable length
	S : Standard (17-bit) P : High resolution (20-bit)	AI : Index absolute type AM : Multi-rotation absolute type	600 : 600W	360 : 360 deg	T2 : SCON-CA XSEL-P/Q XSEL-R/S Note : Only SCON-CA applys for H18P	N : None S : 3m M : 5m X□□ : Specified length

Model/ Specifications

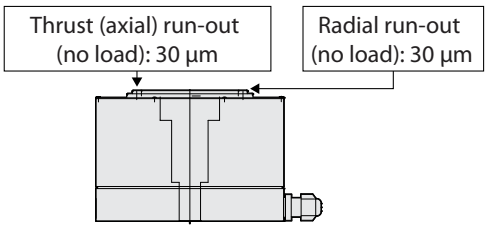
Model number	Encoder type	Motor wattage (W)	Range of operation (deg)	Speed (Note 1) (deg/s)	Rated torque (N·m) (*)	Maximum instantaneous torque (N·m)	Allowable load inertia (kg·m²)	Rotor inertia (kg·m²)
DD-H18①-②-600-360-T2-③	Index absolute type Multi-rotation absolute type	600	360	1 to 1,440	25	75	1.8	0.0106

Legend ① Encoder resolution ② Encoder type ③ Cable length (*) The value when installed on an IAI rated heat dissipating plate. (Please see P9 for further details.)

Common Specifications

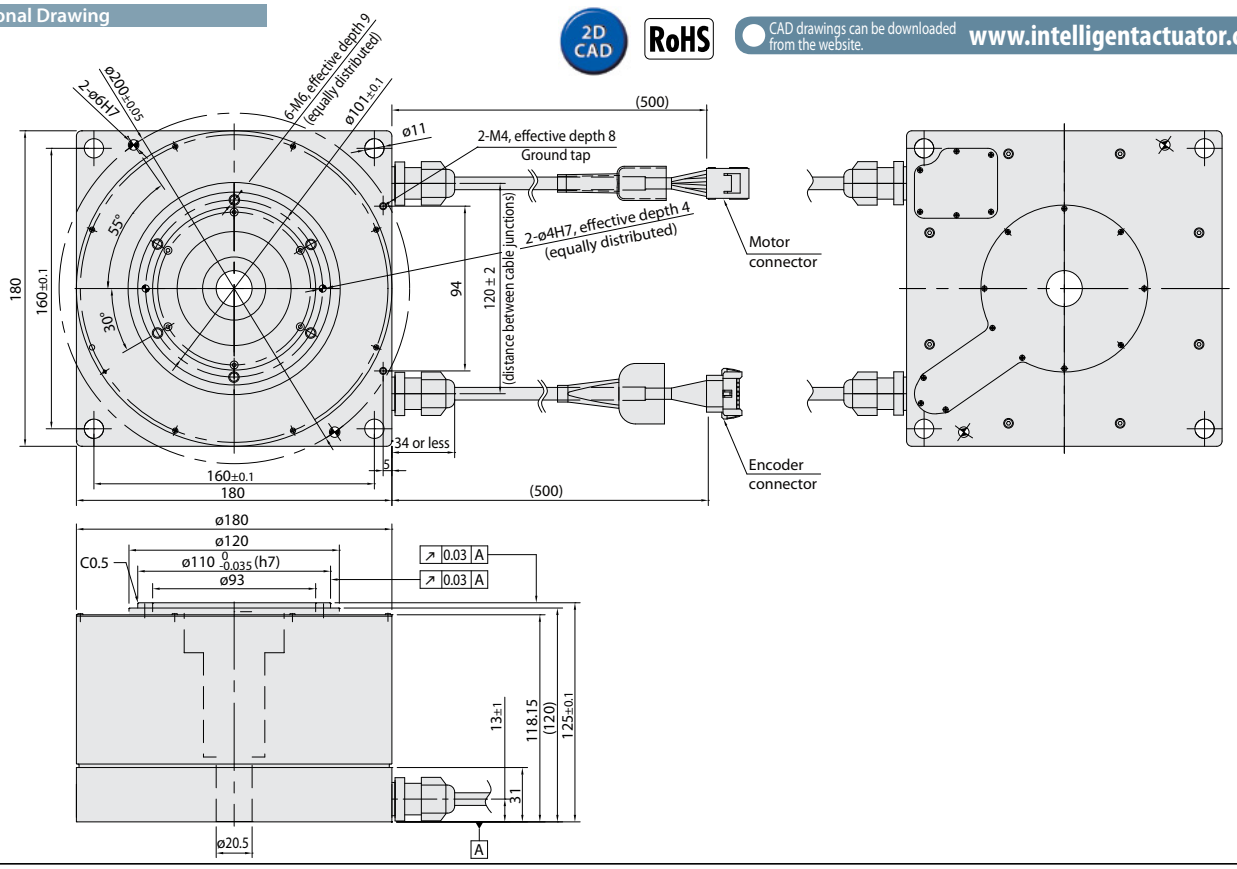
Drive system	Direct Drive Motor
Positioning repeatability	17-bit: ±0.0055 deg 20-bit: ±0.00103 deg
Allowable dynamic load moment (Note 2)	80 N·m
Encoder resolution	17-bit: 131,072 (pulses/rev) 20-bit: 1,048,576 (pulses/rev)
Allowable thrust load (Note 2)	3,400 N [3,100N for the high resolution type]
Base material	Aluminum
Ambient operating temperature/humidity	0 to 40°C, 20 to 85% (Non-condensing)
Weight	13.6 kg

Run-out of Output Shaft



Dimensional Drawing

2D CAD RoHS CAD drawings can be downloaded from the website. www.intelligentactuator.com



Applicable Controller Specifications

Applicable controllers	Max. number of controlled axes	Operating method	Power supply voltage
SCON-CA	1-axis	Positioner	200VAC Single-phase
XSEL-P/Q/R/S	1-axis Single-phase 2-axis Three-phase	Program	200VAC Single-phase 200VAC Three-phase

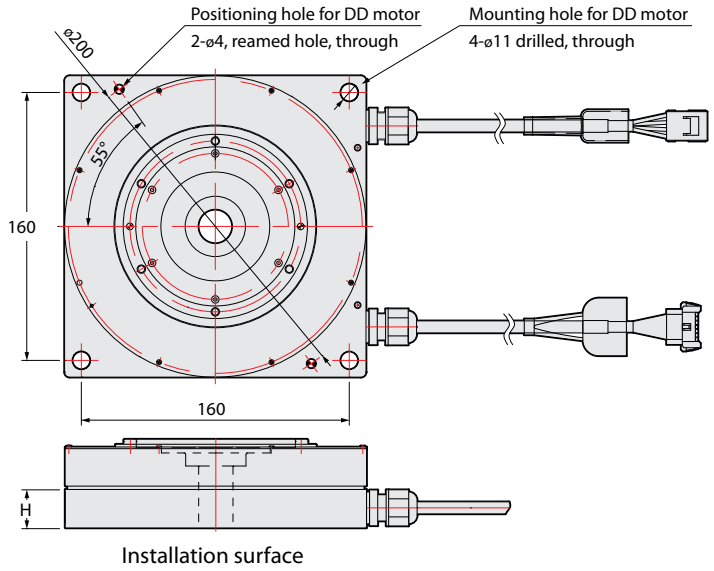
Note: For DD-H18P, only SCON-CA controller applys.

Caution

(Note 1) The maximum speed may not be reached if the moving distance is short.
(Note 2) Assuming that the actuator is operated 8 hours a day at the rated speed and smooth operation without shock, the actuator will reach its life in five years based on this load.
(Note 3) The maximum cable length is 30 m. Specify a desired length in meters. (Example: X08 = 8m)
(Note 4) Please consult IAI if you are considering a 20-bit actuator and using it under conditions where the allowable dynamic moment and allowable thrust load will be exceeded.

Notes

■ Installation



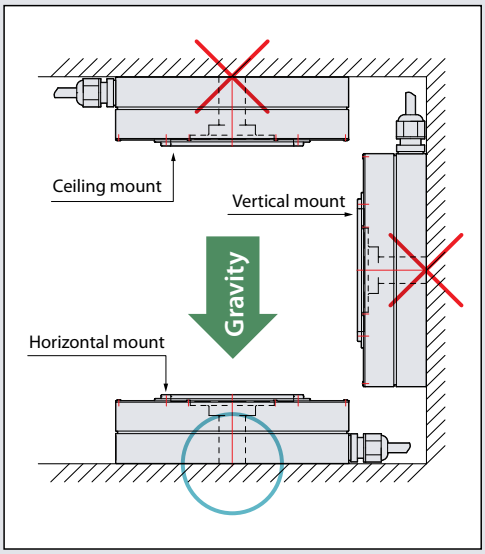
The height "H" measurements

	T18	LT18	H18	LH18
mm	23	33	31	31

(Note) Use this product by installing it on a mounting surface having heat dissipating characteristics equivalent to those of an aluminum plate of 400 x 400 x t10 mm in size. If the installation conditions necessitate lower heat dissipating characteristics, please consult IAI.

Installation Orientation

Do not install it in a vertical position or hung on the ceiling.



■ Operation Types

Two operation types can be selected to suit specific operating conditions.
Check the features of the different types of DD motors and other notes before use.

* ( ) indicates at 20-bit resolution

Operation type	Index absolute type		Multi-rotation absolute type	
Controller type	SCON-CA	XSEL (*1)	SCON-CA	XSEL (*1)
Operation range	0 to 359.999°		Max. ±9,999° (±2,520°)*	
Maximum travel per travel command	360°	180° (*2)	Within the above operation range	
Infinite rotation	Available (*3)		Not available	
Home return	Not required		Not required (*4)	
Absolute battery	Not required		Required	

(*1) The high resolution specification can be connected only to the SCON-CA.

(*2) When the XSEL absolute index type travels more than 180° from the current position, it rotates in a direction that requires a shorter travel to reach the target position. Therefore, please note that the direction of rotation changes according to the current position and travel. If you want to specify the direction of travel, use the SCON-CA.

(*3) The index type can be rotated in a given direction infinitely, but it actually cannot continue to rotate in the same direction without stopping, like a regular motor does, because the maximum travel distance per command from the XSEL controller is 180°. If you want to allow the motor to rotate continuously, use the SCON-CA.

(*4) Home return is required for the multi-rotation absolute encoder during the initial setting and replacement of the absolute battery.

■ Controllers

- The output of the DD motor is 200 watts, but the outside dimensions of the SCON-CA controller are those of the 400-watt type. (For details on the outside dimensions of the SCON-CA, see the ROBO Cylinder General Catalog.)
- One and two regenerative resistor unit(s) are required for T18☐/LT18☐ and H18☐/LH18☐, respectively to operate a DD motor with the SCON-CA.
- When operating DD motor(s) with the XSEL controller, regenerative resistor units are required as shown below:

Number of DD motor(s)		1	2	3	4	5	6	7	8
Number of regenerative resistor units	T18☐/LT18☐	1		2		3		4	
	H18☐/LH18☐	2	4	(Cannot be connected)					

- The number of DD motor(s) connectable to the XSEL controller are a max. of 8 units for the T18/LT18 types, and a max. of 2 units for the H18/LH18 types.
- Please note that, when the DD motor is operated with the SCON-CA, the motor cannot be connected to the ROBO Cylinder gateway function of the XSEL controller.
- Calculation the for power supply value:
  T18/LT18 types: single-phase 600W • three-phase 200W H18/LH18 types: single-phase 1,200W • three-phase 600W

Conditions for Selection

The following should be checked to determine whether the DD motor can be used to suit the specific conditions required by the customer:

1 Check Load Conditions

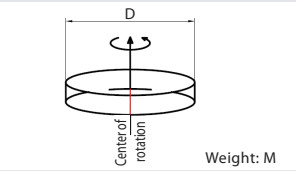
The customer should confirm that the following three points under actual use do not exceed their maximum allowable levels as specified for the DD motor.

[1] Thrust load	The **total load** of device(s) mounted on the actuator
[2] Load moment applied	The **total load moment** of device(s) mounted on the actuator
[3] Load inertia	The **load inertia** of device(s) mounted on the actuator

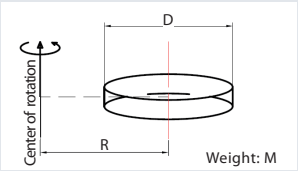
To calculate the load conditions, calculate the load inertia of device(s) mounted on the actuator and check the details with the DD motor selection software. The equations used to calculate the load inertia of typical shapes are shown below for reference purposes.

Download the DD motor selection software from: http://www.intelligentactuator.com/dd-selection-software

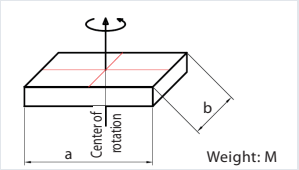
$J = 1/8 \times M \times D^2$



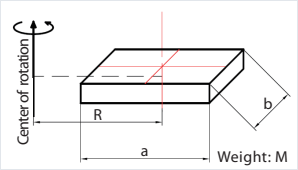
$J = M \times R^2 + 1/8 \times M \times D^2$



$J = 1/12 \times M \times (a^2 + b^2)$



$J = M \times R^2 + 1/12 \times M \times (a^2 + b^2)$



2 Check Operating Conditions

Check the distance, speed, acceleration, deceleration, stop time and other conditions in actual operation against the DD motor specifications to determine whether the DD motor can be used under the applicable operating conditions.

To calculate operating conditions, use the DD motor selection software.

Download the DD motor selection software from: http://www.intelligentactuator.com/dd-selection-software

3 Travel Time Guide

The travel time changes according to the load inertia. See the tables below to check the travel time data.
** The data in the tables is only intended as a guide, so the travel time is not guaranteed.*

DD-T18/LT18

Load inertia lower limit [kg·m²]	0	0.005	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1	0.2	0.3	0.4	0.5
Load inertia upper limit [kg·m²]	0.005	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1	0.2	0.3	0.4	0.5	0.6
45° travel time [sec.]	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.17	0.19	0.21	0.23	0.39	0.62	0.70	0.87	1.11
90° travel time [sec.]	0.12	0.12	0.14	0.16	0.17	0.18	0.20	0.22	0.24	0.26	0.29	0.48	0.73	0.83	1.02	1.23
180° travel time [sec.]	0.17	0.17	0.19	0.21	0.23	0.24	0.27	0.29	0.32	0.35	0.37	0.60	0.89	1.01	1.22	1.42
270° travel time [sec.]	0.22	0.22	0.24	0.26	0.27	0.29	0.32	0.35	0.38	0.41	0.44	0.69	1.00	1.14	1.36	1.68

(Note) The time listed in the above table is the duration from the reception of a travel command until convergence within the positioning band of 0.028 degrees (approximately 100 arcseconds).

DD-H18/LH18

Load inertia lower limit [kg·m²]	0	0.005	0.01	0.02	0.02	0.03	0.04	0.06	0.08	0.10	0.15	0.2	0.3	0.4	0.6	0.8	1.0	1.2	1.4
Load inertia upper limit [kg·m²]	0.005	0.01	0.015	0.02	0.03	0.04	0.06	0.08	0.1	0.15	0.2	0.3	0.4	0.6	0.8	1	1.2	1.4	1.8
45° travel time [sec.]	0.098	0.096	0.096	0.097	0.099	0.104	0.113	0.12	0.126	0.14	0.157	0.207	0.257	0.352	0.447	0.53	0.629	0.795	0.875
90° travel time [sec.]	0.129	0.128	0.127	0.128	0.131	0.136	0.144	0.153	0.163	0.184	0.208	0.268	0.329	0.44	0.549	0.646	0.758	0.941	1.035
180° travel time [sec.]	0.192	0.19	0.19	0.191	0.193	0.199	0.207	0.215	0.225	0.249	0.279	0.354	0.428	0.562	0.692	0.806	0.933	1.133	1.257
270° travel time [sec.]	0.254	0.252	0.252	0.253	0.256	0.262	0.27	0.278	0.288	0.312	0.341	0.42	0.504	0.655	0.8	0.925	1.064	1.274	1.415

(Note) The time listed in the above table is the duration from the reception of a travel command until convergence within the positioning band of 0.028 degrees (approximately 100 arcseconds).