

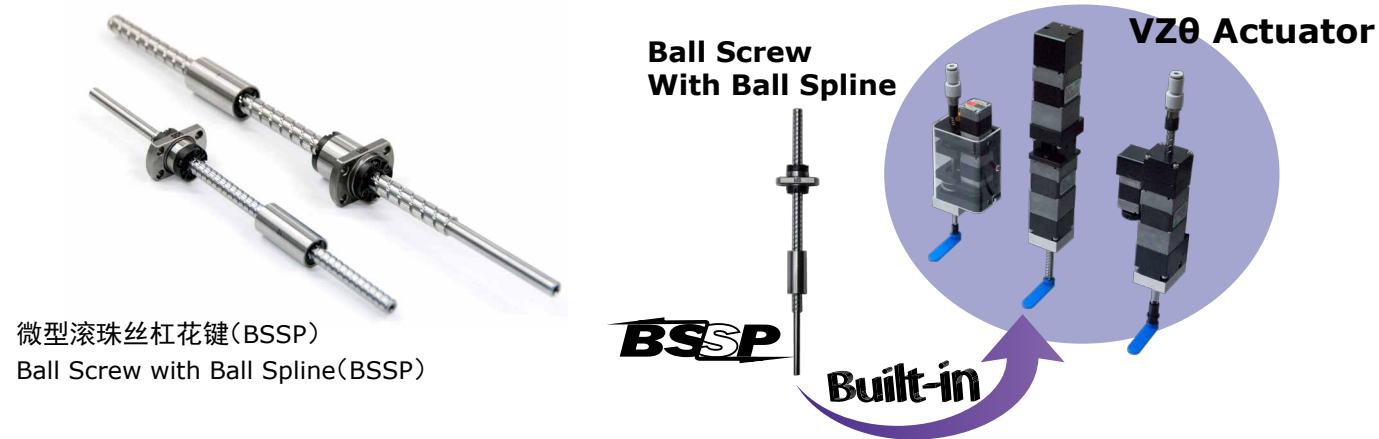
VZ θ 执行器篇

VZ θ Actuator

VZ θ 系列
VZ θ Series

应用KSS微型滚珠丝杠花键(BSSP),在同一产品里实现直线运动(z),旋转(θ),吸附(Vacuum)功能的模块化产品。

The brand new products which applied the KSS miniature Ball Screw with Ball Spline (BSSP), and realized three functions, linear motion (Z), rotary motion (θ), and vacuum (V), with one product.



微型滚珠丝杠花键(BSSP)
Ball Screw with Ball Spline(BSSP)

●种类与特征 / Types and Features

KSS VZ θ 执行器有直接驱动型、混合驱动型、传送带驱动型(包括高速式)3种类型。可根据用途和规格分别使用。

KSS provides 3-types of VZ θ Actuator, which are Direct Drive type, Hybrid Drive type, and Belt-Drive type including high speed type. It is possible to select one of them according to your specifications or application.



直接驱动型
Direct Drive type



混合驱动型
Hybrid Drive type



传送带驱动型
Belt Drive type

●规格 / Specifications

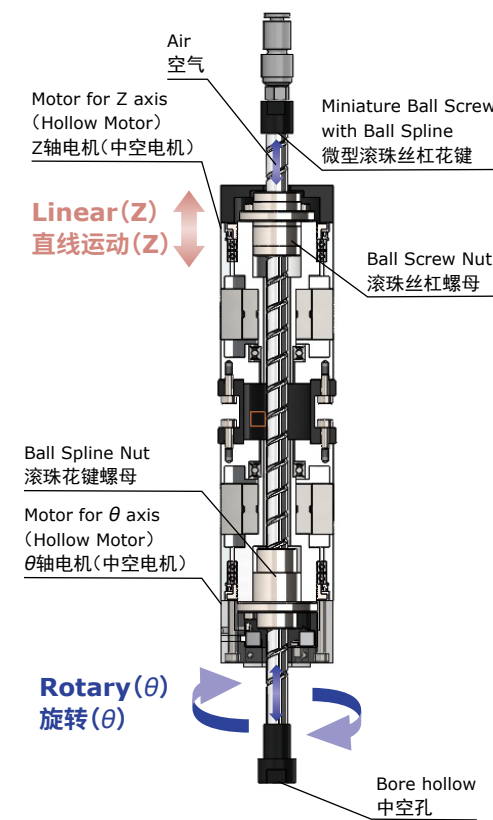
Model / 种类	Shaft dia. 直径 (mm)	Lead 导程 (mm)	Travel 行程 (mm)	Max. Speed(Z) 最高速度(Z) (mm/sec)	Max. speed(θ) 最高速度(θ) (rev/sec)	Thrust Force 推力 (N)	Max. Permissible Moment 最大允许负载力矩 (kg·m ²)
Direct Drive type 直接驱动型	φ6	10	50	120	3	5	0.15×10 ⁻⁴
	φ8	10	50	200	3	25	0.15×10 ⁻³
Hybrid Drive type 混合驱动型	φ6	10	60	200	3	5	0.15×10 ⁻⁴
Belt-Drive type 传送带驱动型	φ4	4	60	80	3	5	0.8×10 ⁻⁵
	φ6	10	60,120	200	3	10	0.4×10 ⁻⁴
Belt-Drive High speed type 传送带驱动型	φ8	10	120	200	3	15	0.1×10 ⁻³
	φ6	10	80	500	25	3	0.15×10 ⁻⁴

●构造 / Structures

【直接驱动型 / Direct Drive type】

中空电机直接驱动滚珠丝杠,滚珠花键螺母,从而实现紧凑型外观形状。

Slim form is realized by driving a Ball Screw and a Ball Spline Nut directly built in a Hollow Motor.



-动作原理-

直线运动(Z)

驱动Z轴电机旋转滚珠丝杠螺母,实现直线运动。此时滚珠花键螺母起到丝杠轴的止转和导向结构的作用。

旋转(θ)

滚珠丝杠螺母和滚珠花键螺母同速同方向旋转,实现驱动轴原地旋转无上下直线运动。

吸附(V)

利用丝杠轴的中空孔提供正压和负压

-Principle of operation-

Linear motion(Z)

Linear motion by driving a Z-axis Motor and rotating the Ball Screw Nut. At this time, the Ball Spline Nut plays a role of anti-rotating device and slide guide of a Screw Shaft.

Rotation(θ)

Turn the Ball Screw Nut and Ball Spline Nut at the same time, same speed and direction, the Shaft rotates without moving up & down.

Vacuum(V)

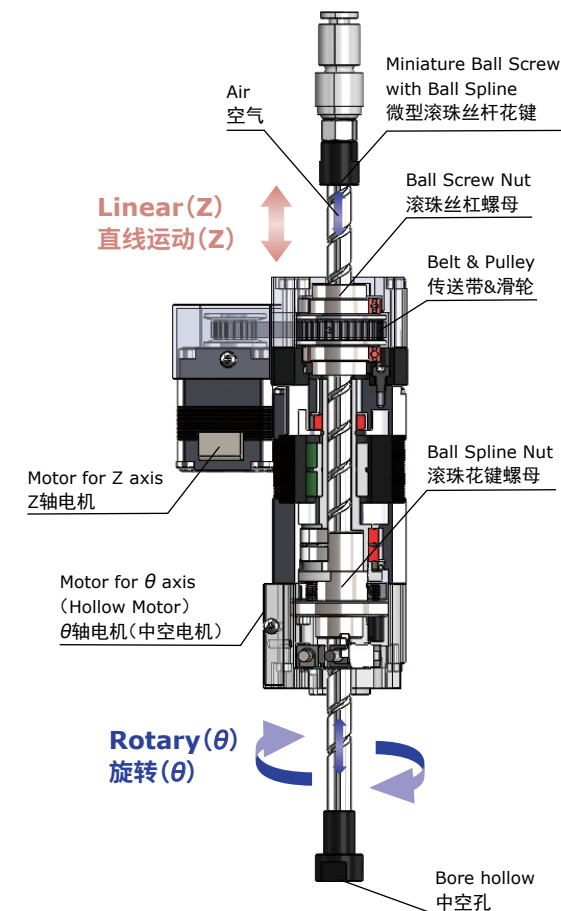
Bore Hollow can be multi uses.

For example vacuum and blow function.

【混合驱动型/ Hybrid Drive type】

除了利用中空电机的直接驱动型以外,利用一般电机和传送带驱动相结合实现了轴向紧凑型设计。

Combination of the Hollow Motor and Normal Motor gives dramatically short length of Actuator Body.



-动作原理-

直线运动(Z)

除了利用中空电机的直接驱动型以外,利用一般电机和传送带驱动相结合实现了轴向紧凑型设计。此时滚珠花键螺母起到丝杠轴的止转和导向结构作用。

旋转(θ)

滚珠丝杠螺母和滚珠花键螺母同速同方向旋转,实现驱动轴原地旋转无上下直线运动。

吸附(V)

利用丝杠轴的中空孔提供正压和负压

-Principle of operation-

Linear motion(Z)

For linear motion, drive the Ball Screw Nut by Z-axis Motor through the Belt & Pulley. In this case, Ball Spline Nut plays a role of slide guide & anti-rotating device.

Rotary Motion(θ)

Turn the Ball Screw Nut and Ball Spline Nut at the same time, same speed and direction, the Shaft rotates without moving up & down.

Vacuum(V)

Bore Hollow can be multi uses.

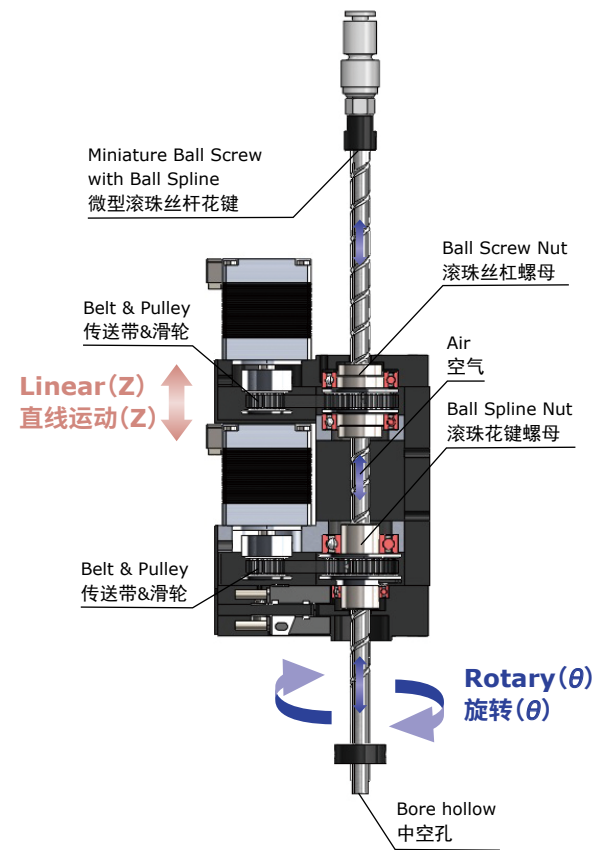
For example vacuum and blow function.

【传送带驱动型 / Belt Drive type】

传送带驱动实现电机泛用性,对应各种选项。

Wide variety of Motor can be set on this Actuator.

This means various options are available based on Motor Specifications.



-动作原理-

直线运动(Z)

驱动Z轴电机旋转滚珠丝杠螺母,实现直线运动。此时滚珠花键螺母起到丝杠轴的止转和导向结构的作用。

旋转(θ)

滚珠丝杠螺母和滚珠花键螺母同速同方向旋转,实现驱动轴原地旋转无上下直线运动。

吸附(V)

利用丝杠轴的中空孔提供正压和负压

-Principle of operation-

Linear motion(Z)

For linear motion, drive the Ball Screw Nut by Z-axis Motor through the Belt & Pulley. In this case, Ball Spline Nut plays a role of slide guide & anti-rotating device.

Rotation(θ)

Turn the Ball Screw Nut and Ball Spline Nut at the same time, same speed and direction, the Shaft rotates without moving up & down.

Vacuum(V)

Bore Hollow can be multi uses.

For example vacuum and blow function.

●公称型号 / Model number notation

【直接驱动型 / Direct Drive type 混合驱动型 / Hybrid Drive type】

DD VZ 42 - G 05 - 050 N XXX

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

- ①系列号
DD : 直接驱动型
HD : 混合驱动型
- ②执行器种类记号
VZ : VZ θ 执行器
- ③电机尺寸
42 : □42角步进电机
28 : □28角步进电机
- ④驱动丝杠种类
G : 精密级滚珠丝杠+滚珠花键
- ⑤导程 / 节距(mm) : 05表示5mm
- ⑥行程(mm) : 050表示50mm
- ⑦连接器种类
N : 散线
E : EI连接器(TE Connectivity制)
- ⑧特记

- ①Series No.
DD : Direct Drive type
HD : Hybrid Drive type
- ②Actuator type
VZ : VZ θ (VZ-theta) Actuator
- ③Motor size
42 : NEMA 17 Stepping Motor
28 : NEMA 11 Stepping Motor
- ④Lead Screw / Ball Screw type
G : Precision Ball Screw+Ball Spline
- ⑤Lead / Pitch(mm) : 05 means 5mm
- ⑥Travel(mm) : 050 means 50mm
- ⑦Connector type
N : No connector(Bare)
E : EI connector(TE Connectivity)
- ⑧Extra notation

【传送带驱动型 / Belt Drive type】

BD VZ 06 - G 10 050 N 01 XXX

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

- ①系列号
BD : 传送带驱动执行器系列
- ②执行器种类记号
VZ : VZ θ 执行器
- ③驱动丝杠直径: 06表示6mm
- ④驱动丝杠种类
G : 精密级滚珠丝杠+滚珠花键
- ⑤导程 / 节距(mm) 10表示10mm
- ⑥行程(mm) 050表示50mm
- ⑦连接器种类
N : 散线
E : EI连接器(TE Connectivity制)
- ⑧电机识别
01 : 20角步进电机
02 : 28角步进电机
03 : 35角步进电机
- ⑨特记

- ①Series No.
BD : Belt Drive Actuator Series
- ②Actuator type
VZ : VZ θ (VZ-theta) Actuator
- ③Shaft Nominal diameter : 06 means 6mm
- ④Lead Screw / Ball Screw type
G : Precision Ball Screw+Ball Spline
- ⑤Lead / Pitch(mm) : 10 means 10mm
- ⑥Travel(mm) : 050 means 50mm
- ⑦Connector type
N : No connector(Bare)
E : EI connector(TE Connectivity)
- ⑧Motor type
01 : NEMA 10 Stepping Motor
02 : NEMA 11 Stepping Motor
03 : NEMA 14 Stepping Motor
- ⑨Extra notation

【高速式传送带驱动型 / High Speed Belt Drive type】

对于高速式传送带驱动,以及在产品目录规格、形状的基础上进行了大幅变更的接单生产,公称型号的构成如下。
The model number nomination is as follows for High Speed Belt Drive type or custom design products which specifications and dimension significantly change from Catalogue.

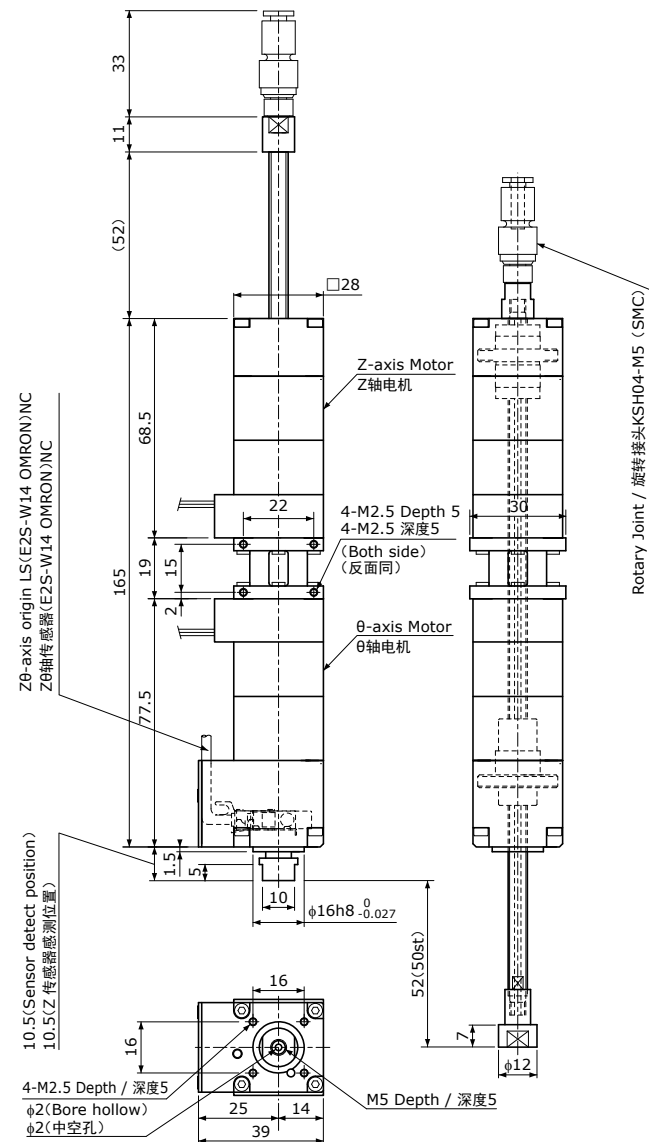
DD 28 - G 100 100 N2 K 2 E - B

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

- ①执行器种类记号
DD : 直接驱动型
HD : 混合驱动型
BD : 传送带驱动型
- ②电机规格
25 : □25 28 : □28
35 : □35 42 : □42
- ③驱动丝杠种类
G : 精密级滚珠丝杠
- ④导程 / 节距(mm) : 100表示10mm
- ⑤行程(mm) : 100表示100mm
- ⑥电机识别
N2 : 2相步进电机
N5 : 5相步进电机
NE : 带编码器步进电机
NS : 伺服电机
- ⑦传感器种类
F : 光电微型 L : 限位开关
K : 近距离 Z : 磁
- ⑧传感器数
1 : 1个 2 : 2个
- ⑨连接器种类
H : 广濑
E : EI (TE Connectivity制)
N : 散线
- ⑩其他
B : 电磁刹车 C : 无尘规格 V : 吸附
() : 电机相位角度

- ①Actuator type
DD : Direct Drive Actuator Series
HD : Hybrid Drive Actuator Series
BD : Belt Drive Actuator Series
- ②Motor Frame size
25 : NEMA 10 28 : NEMA 11
35 : NEMA 14 42 : NEMA 17
- ③Lead Screw / Ball Screw type
G : Precision Ball Screw
- ④Lead / Pitch(mm) : 100 means 10mm
- ⑤Travel(mm) : 100 means 100mm
- ⑥Motor type
N2 : 2-phase stepping motor
N5 : 5-phase stepping motor
NE : Stepping motor with Encoder
NS : Servo motor
- ⑦Sensor type
F : Photo-Micro L : Limit Switch
K : Proximity Z : Magnetic
- ⑧Number of Sensor
1 : 1 sensor 2 : 2 sensors
- ⑨Connector type
H : HIROSE
E : EI (TE Connectivity)
N : No connector (Bare)
- ⑩Option
B : Electro Magnetic Brake
C : for Clean room V : Vacuum
() : Motor position represented by degree

DDVZ28 - G10 - 050 N

□28 / NEMA 11 2-phase Stepping Motor(2相步进电机)
Lead(导程) 10mm Travel(行程) 50mm

Parts List 主要部件	
Motor 电机	NEMA 11 Hollow Stepping Motor 0.67A/phase □28 中空步进电机 0.67A/相
Drive Screw 驱动丝杠	Ball Screw f6 (Lead 10mm) 滚珠丝杠 f6 (导程 10mm)
Sliding Guide 导向结构	Ball Spline f6mm 滚珠花键 f6mm
Sensor (Linear, Rotary) 传感器 (直动, 旋转)	Proximity Sensor E2S-W14-1M(OMRON) 近距离传感器 E2S-W14-1M(欧姆龙)

Motor(Z,θ-axis) / 电机(Z,θ轴)

A	Black(黑)
A	Green(绿)
B	Red(红)
B	Blue(蓝)

UL1061,AWG24(300mm)

Sensor(Z,θ-axis) / 传感器(Z,θ轴)

+12~24V	Brown(褐)
LS	Black(黑)
GND	Blue(蓝)

1000mm

※The numbers in table below are reference. Detail dimensions will be provided by drawing.
※以下仅供参考。详情记载于规格图中。

●规格 / Specifications

Items 项目	Z Axis Z轴	θ Axis θ轴
Movable Range 动作范围	50mm	± 360°
Repeatability 重复定位精度	±0.010mm	±0.03°
Resolution 分辨率	50μm (Full Step / 整步)	1.8° (Full Step / 整步)
Maximum Speed 最高速度	120mm / sec	3 rev / sec
Maximum acceleration 最大加速度	0.6 m/sec ²	150 π rad/sec ²
Reference Thrust Force 参考推力	5N	—
Maximun Permissible Moment 最大允许惯性力矩	—	0.15 × 10 ⁻⁴ kg · m ² (※1)
Mass 重量	540g	
Operating Temperature 使用温度范围	0~40°C(No Condensation) 0~40°C(无结露)	

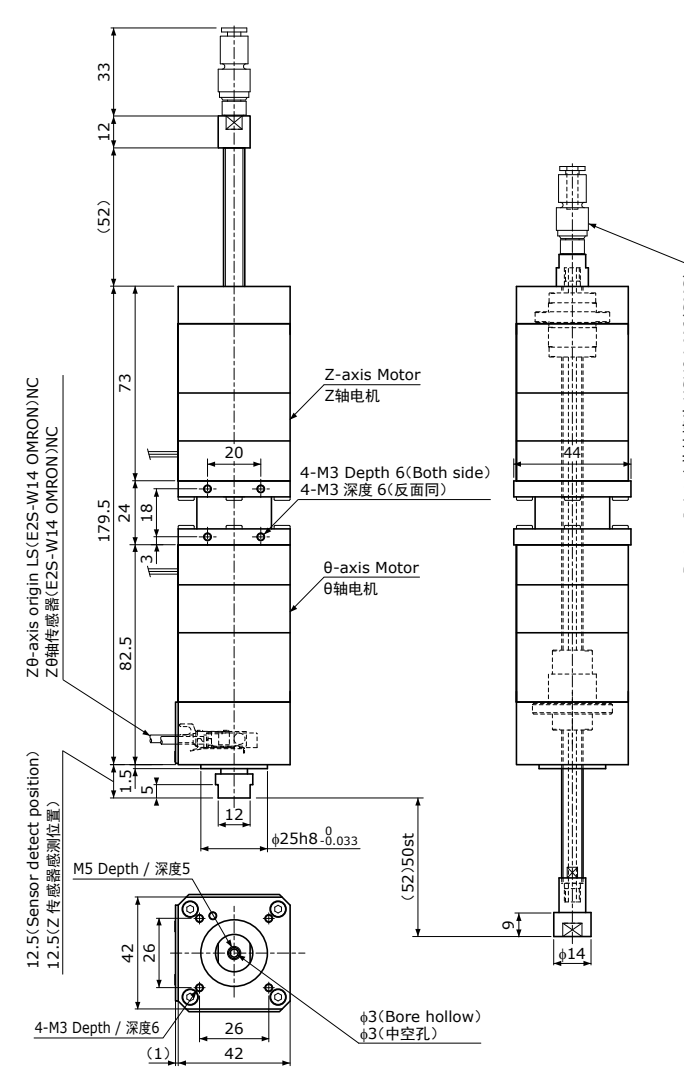
※1 For the Maximum Permissible Moment, see "Reference of Moment of Inertia" table above.

※2 For the technical information, see "Actuator Technical Description".

※1 θ轴最大允许负载力矩请参照“负载力矩标准”。

※2 技术数据请参照执行器技术解说。

DDVZ42 - G10 - 050 N

□42 / NEMA 17 2-phase Stepping Motor(2相步进电机)
Lead(导程) 10mm Travel(行程) 50mm

Parts List 主要部件	
Motor 电机	NEMA 17 Hollow Stepping Motor 1.2A/phase □42 中空步进电机 1.2A/相
Drive Screw 驱动丝杠	Ball Screw f8 (Lead 10mm) 滚珠丝杠 f8 (导程 10mm)
Sliding Guide 导向结构	Ball Spline f8mm 滚珠花键 f8mm
Sensor (Linear, Rotary) 传感器 (直动, 旋转)	Proximity Sensor E2S-W14-1M(OMRON) 近距离传感器 E2S-W14-1M(欧姆龙)

Motor(Z,θ-axis) / 电机(Z,θ轴)

A	Black(黑)
A	Green(绿)
B	Red(红)
B	Blue(蓝)

UL1061,AWG24(300mm)

Sensor(Z,θ-axis) / 传感器(Z,θ轴)

+12~24V	Brown(褐)
LS	Black(黑)
GND	Blue(蓝)

1000mm

※The numbers in table below are reference. Detail dimensions will be provided by drawing.
※以下仅供参考。详情记载于规格图中。

●规格 / Specifications

Items 项目	Z Axis Z轴	θ Axis θ轴
Movable Range 动作范围	50mm	± 360°
Repeatability 重复定位精度	±0.010mm	±0.03°
Resolution 分辨率	50μm (Full Step / 整步)	1.8° (Full Step / 整步)
Maximum Speed 最高速度	200mm / sec	3 rev / sec
Maximum acceleration 最大加速度	1 m/sec ²	150 π rad/sec ²
Reference Thrust Force 参考推力	25N	—
Maximun Permissible Moment 最大允许惯性力矩	—	0.15 × 10 ⁻³ kg · m ² (※1)
Mass 重量	1150g	
Operating Temperature 使用温度范围	0~40°C(No Condensation) 0~40°C(无结露)	

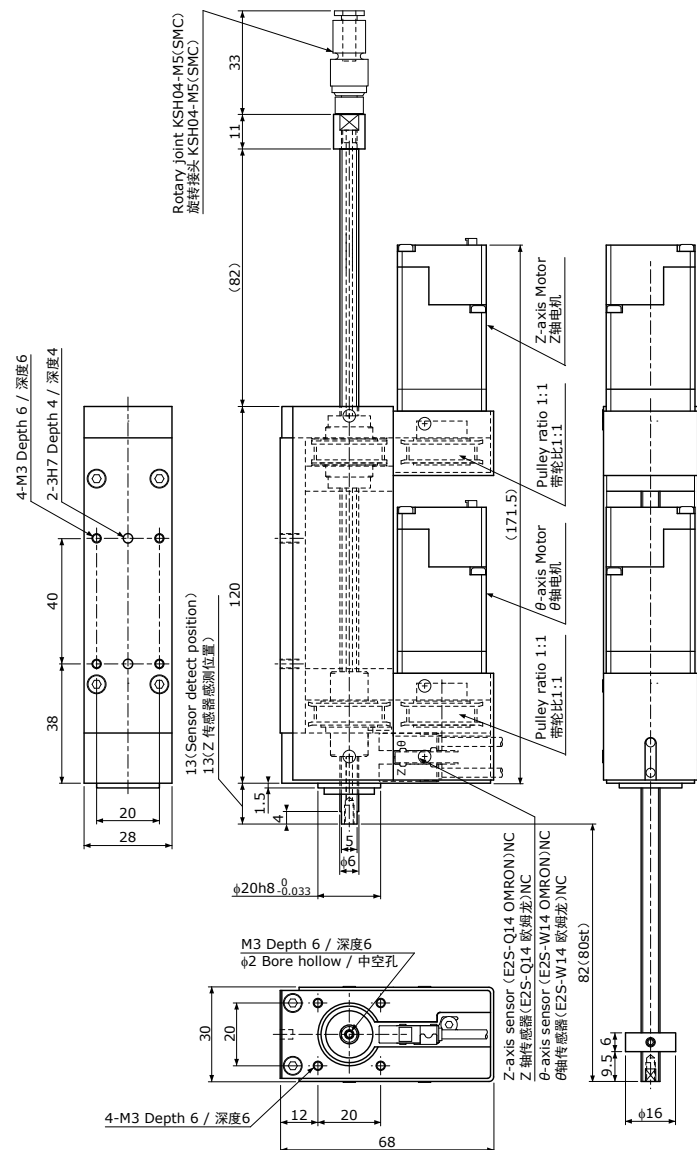
※1 For the Maximum Permissible Moment, see "Reference of Moment of Inertia" table above.

※2 For the technical information, see "Actuator Technical Description".

※1 θ轴最大允许负载力矩请参照“负载力矩标准”。

※2 技术数据请参照执行器技术解说。

BD28-G100 080 NEK2N-V

□28 / NEMA 11 2-phase Stepping-Servo Motor type(2相步进伺服电机型)
Lead(导程) 10mm Travel(行程) 80mm

Parts List 主要部件	
Motor 电机	NEMA 11 Stepping-Servo Motor TSM11Q-2RM □28步进伺服电机 TSM11Q-2RM
Drive Screw 驱动丝杠	Ball Screw f6(Lead 10mm) 滚珠丝杠 f6(导程 10mm)
Sliding Guide 导向结构	Ball Spline f6mm 滚珠花键 f6mm
Sensor 传感器	Z axis: Proximity Sensor E2S-Q14-1M (OMRON) NC Z轴: 近距离传感器E2S-Q14-1M (欧姆龙) NC θ axis: Proximity Sensor E2S-W14-1M (OMRON) NC θ轴: 近距离传感器E2S-W14-1M (欧姆龙) NC

Sensor(Z,θ-axis) / 传感器(Z,θ轴)	
+12~24V	Brown(棕)
LS	Black(黑)
GND	Blue(蓝)

1000mm

●电机侧引脚配线 / Connector Pin diagram



Pin No.	Name	Color / 颜色	Description / 说明
1	Y2	Purple / 紫	Open drain outputs with freewheeling diode (30 VDC, 100 mA in max.) 带飞轮二极管漏极开路输出 (DC30V 最大100 mA)
2	Y1	Orange / 橙	
3	X4	White / 白	Digital inputs (input high voltage 5~24 VDC, input low voltage below 1 VDC, signal frequency 1 MHz in max.) 数字输入(High: 5~24V, Low: 1V以下) 信号输入频率: 最大1MHz
4	X3	Brown / 褐	
5	X2	Yellow / 黄	Digital inputs (input high voltage 5~24 VDC, input low voltage below 2 VDC, signal frequency 1 MHz in max.) 数字输入(High: 5~24V, Low: 2V以下) 信号输入频率: 最大1MHz
6	X1	Gray / 灰	
7	RX-	Green and White / 绿白	RS-422/485 interface differential signals RS-422/485接口差分信号
8	RX+	Green / 绿	
9	TX-	Blue and White / 蓝白	
10	TX+	Blue / 蓝	V+ power supply (typ. 24 VDC) V+ 电源(公称值 DC24V)
11	+	Red / 红	
12	-	Black / 黑	V- power ground (GND) V- 电源(GND)

Note 1) All digital inputs & outputs are referenced to the power ground (-V-).
Note 2) Please use Mating Cable.

注1) 所有数字输入输出均以电源GND(-V)为基准。
注2) 请使用附带电缆。

●规格 / Specifications

※The numbers in table below are reference. Detail dimensions will be provided by drawing.
※以下作为参考值。详情记载于规格图中。

Items 项目	Z Axis Z轴	θ Axis θ轴
Movable Range 动作范围	80mm(※1)	± 360°
Repeatability 重复定位精度	±0.020mm	±0.03°
Resolution 分辨率	0.5μm(※2)	0.018° (※2)
Maximum Speed 最高速度	500mm / sec	25 rev/sec
Maximum acceleration 最大加速度	10 m/sec ²	1000 π rad/sec ²
Reference Thrust Force 参考推力	3N	—
Maximun Permissible Moment / 最大允许惯性力矩	—	0.15 × 10 ⁻⁴ kg · m ² (※3)
Reduction ratio / 减速比	1/1	
Mass 重量	740g	
Operating Temperature / 使用温度范围	0~40°C (No Condensation) / 0~40°C (无结露)	

※1) Travel length (Movable Range) can be changed according to your request.
※2) Default setting : 20,000 steps / rev
※3) For the Maximum Permissible Moment, see "Reference of Moment of Inertia" table above.
※4) For the technical information, see " Actuator Technical Description".

※1) 行程可根据需要变更。
※2) 出厂设定: 20,000 steps / rev
※3) θ轴最大允许力矩请参照“负载力矩标准”。
※4) 技术数据请参照执行器技术解说。

Reference of Moment of Inertia 负载偏心力矩标准		
Dia. / 直径	Height / 高度	
	Aluminum 铝材	Steel 钢材
f30mm	65mm(128g)	23mm(128g)
f40mm	21mm(74g)	7.5mm(74g)
f50mm	8.5mm(46g)	3mm(46g)

Precautions

- The Z-axis does not have brake device. Please be careful when the power supply is switched off in case Z-axis may free-fall.
- Reference of Moment of Inertia table shows the theoretical values. KSS recommends that you should apply actual moment to the machine and confirm the safety operation before use.

注意事项

- Z轴不附带制动结构。关闭电源时Z轴可能会下落, 敬请注意。
- “负载力矩标准”为理论值。建议在使用前以实际负载的力矩进行动作确认。

●选项 / Attachment

为使用户更方便地使用VZθ执行器,本公司准备了标准驱动、连接线等可供选配。

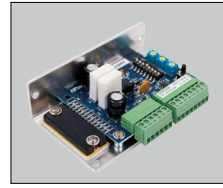
KSS provides Standard Stepping Motor Driver and Extension Cable as an option for VZθ Actuators in order to make it easy to use.

[标准驱动器/ Stepping Motor Driver]

SD4030B3

2相步进电机用推荐驱动器
可设定8种步进角(V108页)

This is recommended Driver for 2-phase stepping Motor.
It has Micro-Step function with 8-step angle.(page V108)



※注意事项

- SD4030B3的出货时电流设定为2A
- 使用前请确认电机额定电流之后,再设定驱动器电流。
- 请按驱动器附属使用说明书内容设定电流。

※Caution

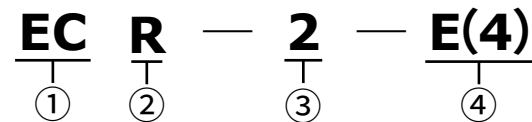
- The factory setting of SD4030B3 is 2A.
- Please be sure to perform a current setup of Driver based on Motor Rated current before use.
- Please confirm the operation manual attached to a Driver about current setup.

[连接线]

KSS VZθ执行器和KSS推荐驱动器专用连接线。
以下实例以外,可指定长度,连接器形状。一端为散线,敬请注意。

[Extension Cable]

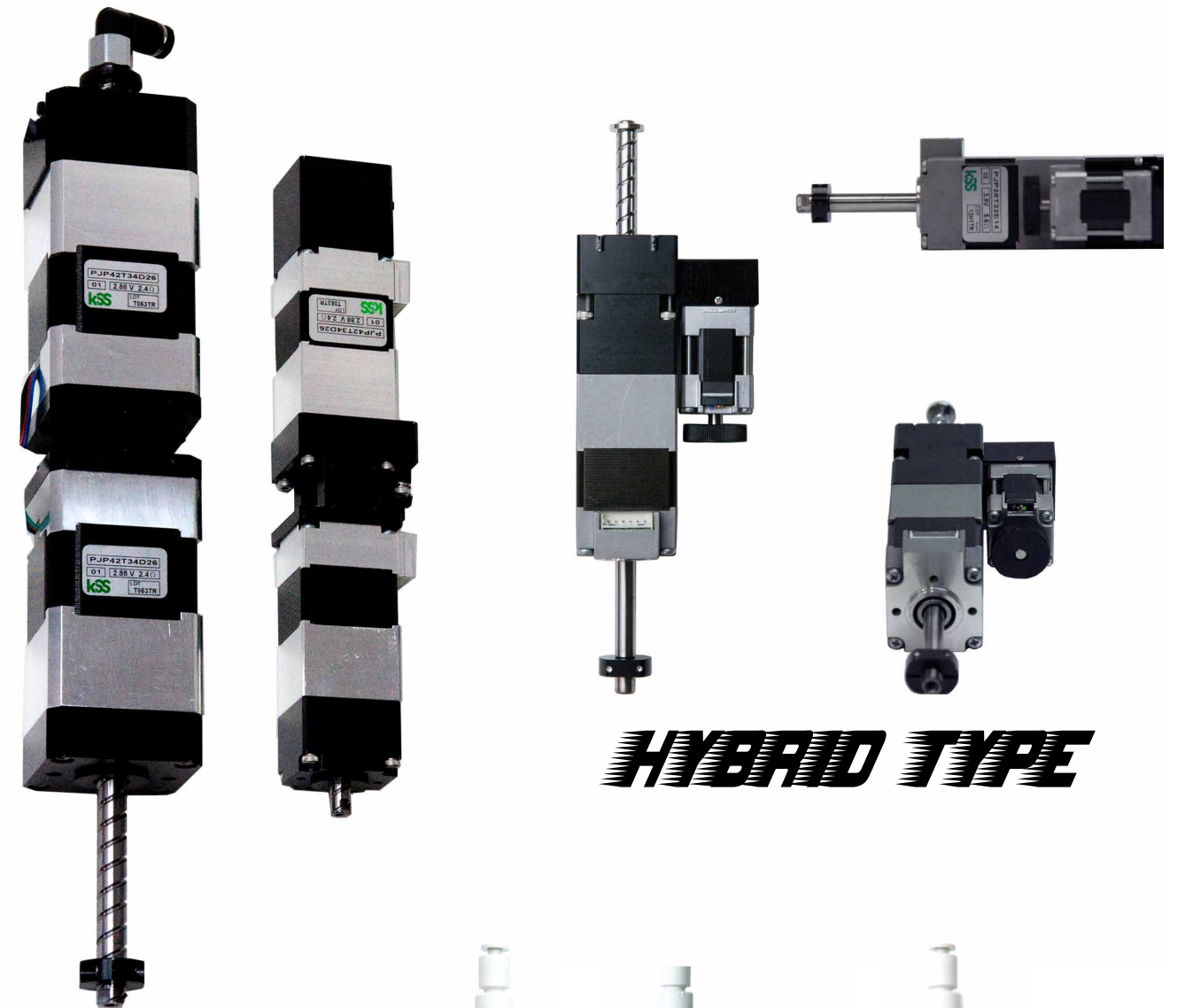
Extension Cable between VZθ Actuators and KSS recommended Stepping Motor Driver.
Please designate Cable length and Connector type in accordance with the example below.
Please note that one side of Extension Cable is cut endge only(Bare).



- ①连接线记号
②种类
R : 耐屈曲线
③长度(m)
④连接器形状
N : 散线
E(4) : EI连接器4芯(TE Connectivity制)

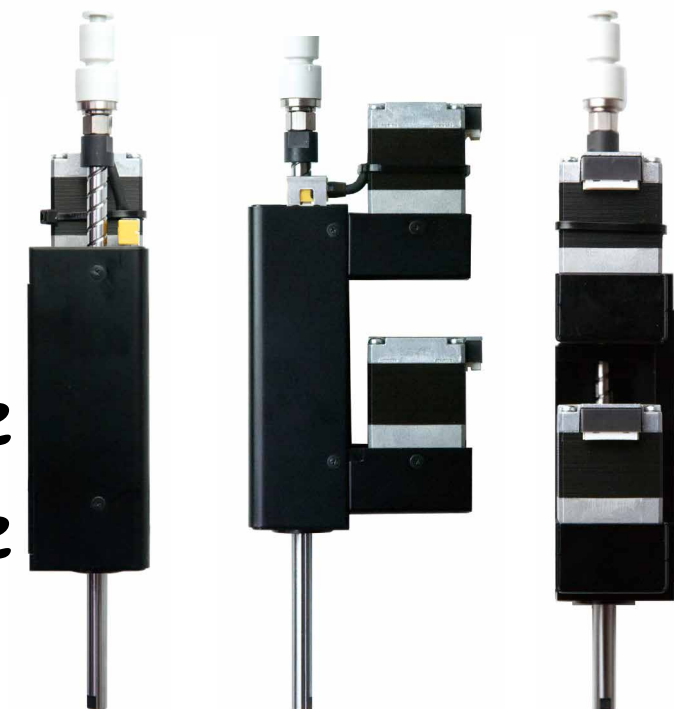
- ①Extension Cable
②Cable type
R : Robot Cable
③Cable length (m)
④Connector type
N : No connector
E(4) : EI connector 4-pins(TE Connectivity)

DIRECT DRIVE TYPE



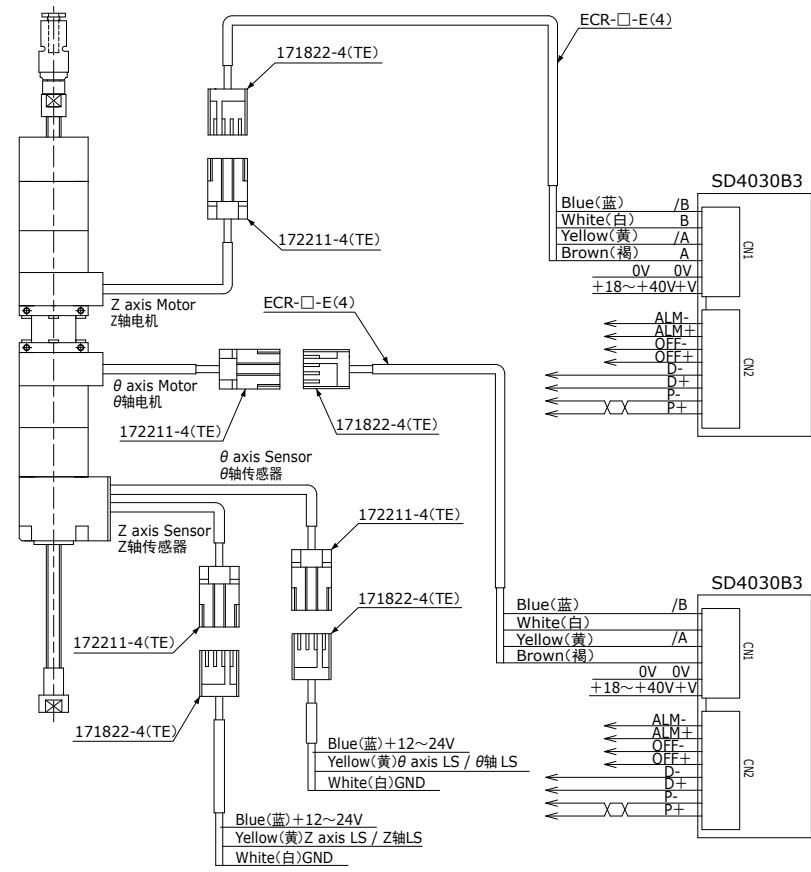
HYBRID TYPE

Belt Drive type

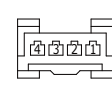


驱动器接线图 / Connection Diagram

【28直接驱动型 / 28 / NEMA11 Direct Drive type】

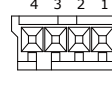


Motor cable 172211-4 (male)
电机线172211-4 (公头)



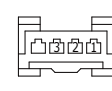
1	Stepping Motor /B (Blue/蓝)
2	Stepping Motor B (Red/红)
3	Stepping Motor /A (Green/绿)
4	Stepping Motor A (Black/黑)

Motor Extension cable171822-4 (female)
电机连接线171822-4 (母头)



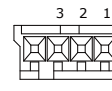
1	Stepping Motor /B (Blue/蓝)
2	Stepping Motor B (White/白)
3	Stepping Motor /A (Yellow/黄)
4	Stepping Motor A (Brown/茶)

Sensor cable 172211-4 (male)
传感器线172211-4 (公头)



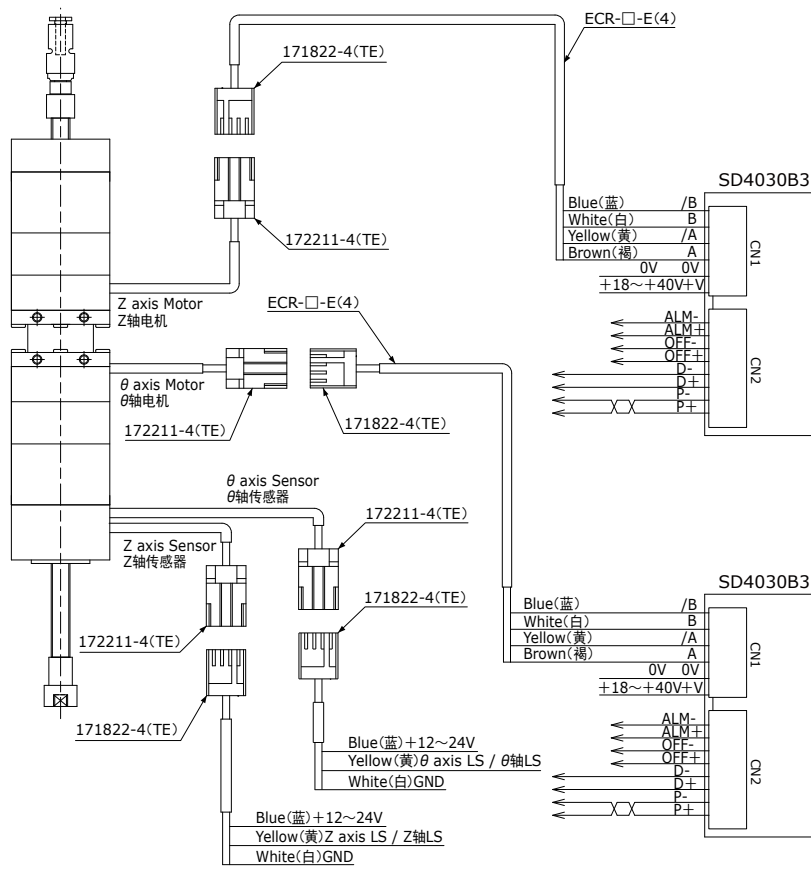
1	+12V~24 (Brown/茶)
2	GND (Blue/蓝)
3	LS (Black/黑)
4	None 备用

Sensor Extension cable171822-4 (female)
传感器连接线171822-4 (母头)

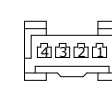


1	+12V~24 (Blue/蓝)
2	GND (White/白)
3	LS (Yellow/黄)
4	None 备用

【42直接驱动型 / 42 / NEMA17 Direct Drive type】

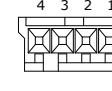


Motor cable 172211-4 (male)
电机线172211-4 (公头)



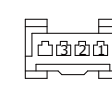
1	Stepping Motor/B (Blue/蓝)
2	Stepping Motor B (Red/红)
3	Stepping Motor/A (Green/绿)
4	Stepping Motor A (Black/黑)

Motor Extension cable171822-4 (female)
电机连接线171822-4 (母头)



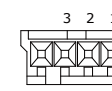
1	Stepping Motor/B (Blue/蓝)
2	Stepping Motor B (White/白)
3	Stepping Motor/A (Yellow/黄)
4	Stepping Motor A (Brown/褐)

Sensor cable 172211-4 (male)
传感器线172211-4 (公头)



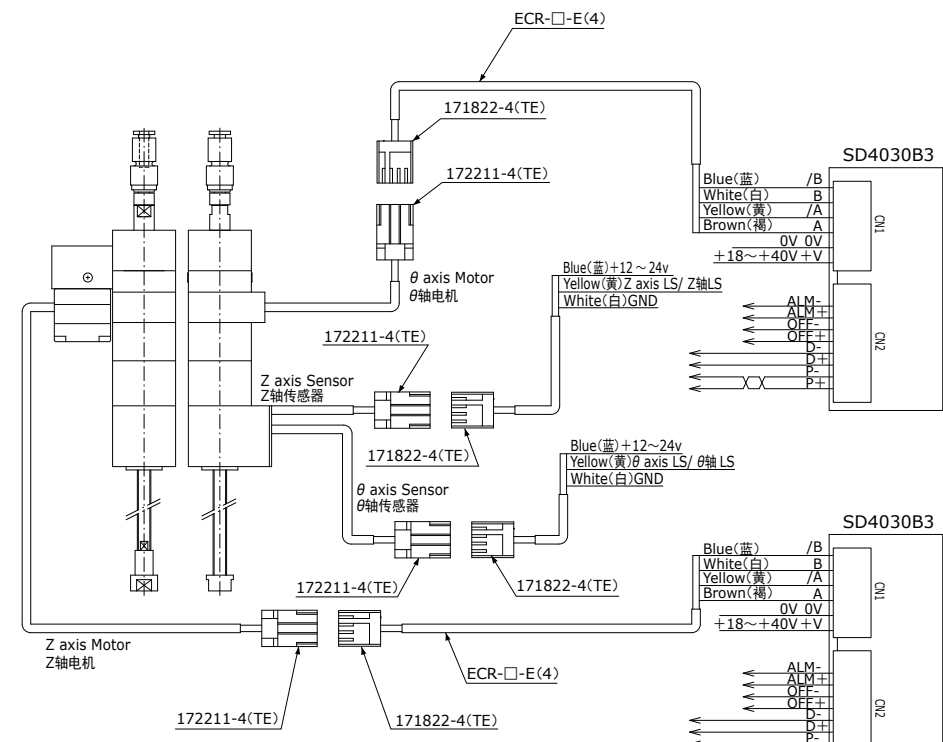
1	+12V~24 (Brown/褐)
2	GND (Blue/蓝)
3	LS (Black/黑)
4	None 备用

Sensor Extension cable171822-4 (female)
传感器连接线171822-4 (母头)



1	+12V~24 (Blue/蓝)
2	GND (White/白)
3	LS (Yellow/黄)
4	None 备用

【混合驱动型 / Hybrid Drive type】

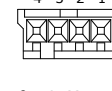


Z axis Motor cable 172211-4 (male)
Z轴电机线172211-4 (公头)



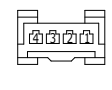
1	Stepping Motor/B (Orange/橙)
2	Stepping Motor B (Blue/蓝)
3	Stepping Motor/A (Yellow/黄)
4	Stepping Motor A (Red/红)

Z axis Motor Extension cable171822-4 (female)
Z轴电机连接线171822-4 (母头)



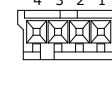
1	Stepping Motor/B (Blue/蓝)
2	Stepping Motor B (White/白)
3	Stepping Motor/A (Yellow/黄)
4	Stepping Motor A (Brown/褐)

θ axis Motor cable 172211-4 (male)
θ轴电机线172211-4 (公头)



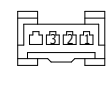
1	Stepping Motor/B (Blue/蓝)
2	Stepping Motor B (White/白)
3	Stepping Motor/A (Green/绿)
4	Stepping Motor A (Black/黑)

θ axis Motor Extension cable 171822-4 (female)
θ轴电机连接线171822-4 (母头)



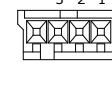
1	Stepping Motor/B (Blue/蓝)
2	Stepping Motor B (White/白)
3	Stepping Motor/A (Yellow/黄)
4	Stepping Motor A (Brown/褐)

Sensor cable 172211-4 (male)
传感器线172211-4 (公头)



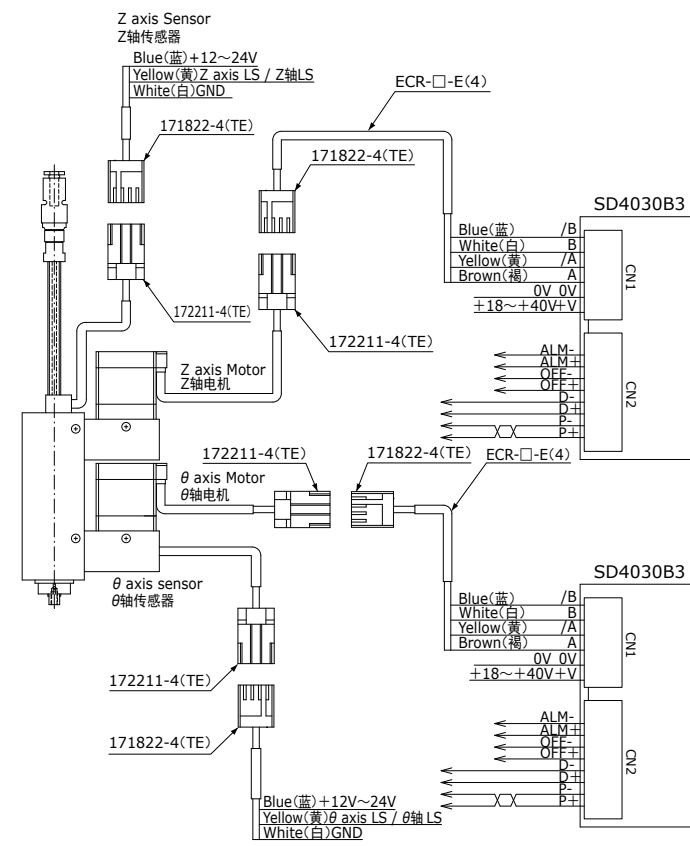
1	+12V~24 (Brown/褐)
2	GND (Blue/蓝)
3	LS (Black/黑)
4	None 备用

Sensor Extension cable 171822-4 (female)
传感器连接线171822-4 (母头)

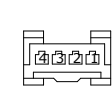


1	+12V~24 (Blue/蓝)
2	GND (White/白)
3	LS (Yellow/黄)
4	None 备用

【传送带驱动型 / Belt Drive type】

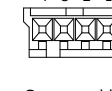


Motor cable 172211-4 (male)
电机线172211-4 (公头)



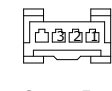
		BDVZ04	BDVZ06/BDVZ08
1	Stepping Motor /B Orange/橙	Blue/蓝	Blue/蓝
2	Stepping Motor B Blue/蓝	Red/红	Red/红
3	Stepping Motor /A Yellow/黄	Green/绿	Green/绿
4	Stepping Motor A Red/红	Black/黑	Black/黑

Motor Extension cable171822-4 (female)
电机连接线171822-4 (母头)



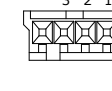
1	Stepping Motor /B (Blue/蓝)
2	Stepping Motor B (White/白)
3	Stepping Motor /A (Yellow/黄)
4	Stepping Motor A (Brown/褐)

Sensor cable 172211-4 (male)
传感器线172211-4 (公头)



1	+12V~24 (Brown/褐)
2	GND (Blue/蓝)
3	LS (Black/黑)
4	None 备用

Sensor Extension cable 171822-4 (female)
传感器连接线171822-4 (母头)



1	+12V~24 (Blue/蓝)
2	GND (White/白)
3	LS (Yellow/黄)
4	None 备用