

C O N T E N T S

Who is Nabtesco?

The key word of Nabtesco is 'motion control.' We use our strengths in the fields of component and systems technologies to develop highly creative products. Through the Nabtesco Group as a whole, we can also utilize our advantage of expertise to maximum effect in order to further enhance these strengths.

In the air, on land and at sea, we have a leading share in various fields of both international and domestic markets. Nabtesco will continue to evolve by utilizing its strengths in many fields and by exploring the possibilities of the future.



Nabtesco

April 2002 Initiation of hydraulic equipment business alliance
October 2003 Business merger

The business alliance between Teijin Seiki and NABCO on hydraulic equipment projects was the beginning of a mutual confirmation by the companies of the other's product configuration, core technologies, corporate strategies and corporate culture. This led to a common recognition that a business merger would be an extremely effective means of increasing corporate value and achieving long-term development. Based on this mutual judgment, in 2003 an equity transfer was conducted to establish Nabtesco as a pure holding company, with both firms as wholly owned subsidiaries. After a year of preparation, both companies were absorbed and amalgamated by means of a short form merger, and Nabtesco was transitioned to an operating holding company.

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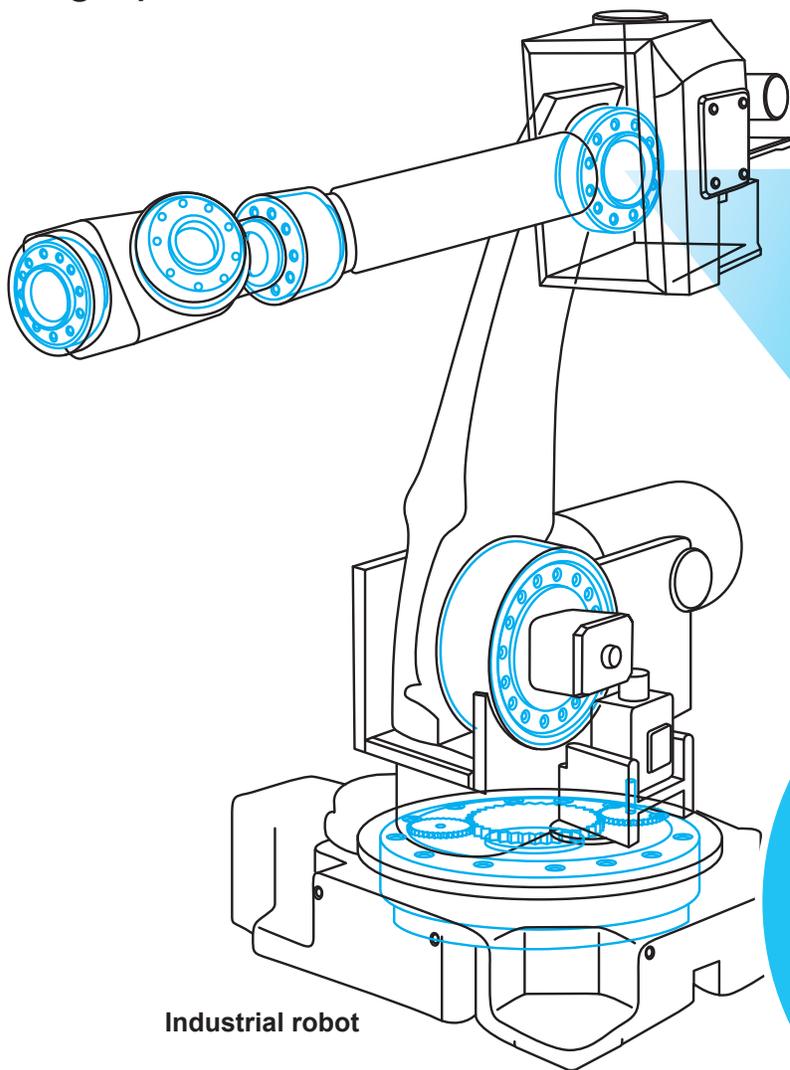
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What is the RD2 SERIES?

RD2: The gear that will change everything

A highly developed precision gear that offers high quality, high performance and ease of use.



Industrial robot

The RV reduction gear

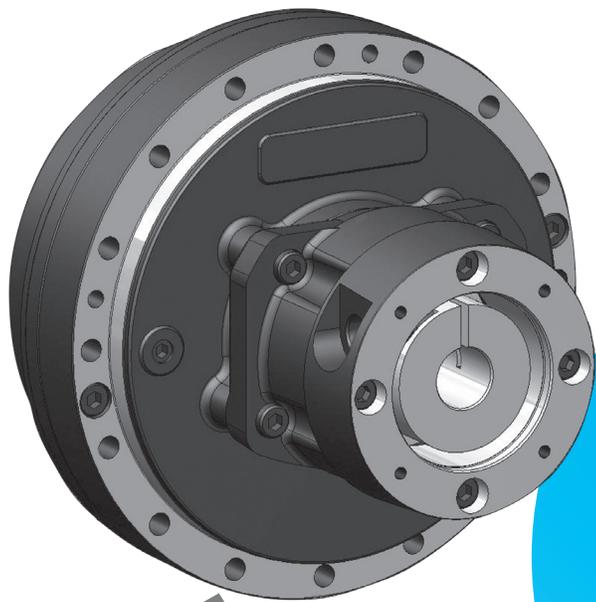
The RV reduction gear enables the precision movements of industrial robots and also ensures their strength. The RV reduction gear has been praised for being compact and lightweight while offering high precision and rigidity. Since its debut in 1985, the RV reduction gear has been selected for use by most major industrial robot manufacturers around the world.

Market share

Industrial robot (vertical articulated robot) joints — **60% share of global market***

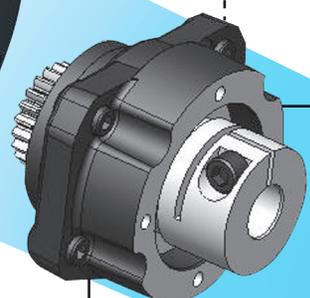
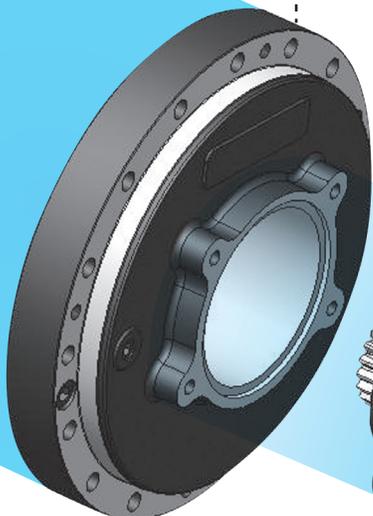
Machine tool ATC drive units — **80% share of Japanese market***

* Based on Nabtesco studies

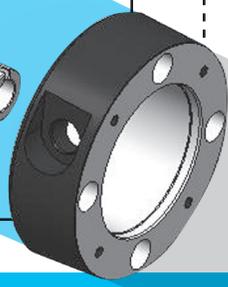
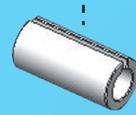


RD2 High Precision Gearheads SERIES

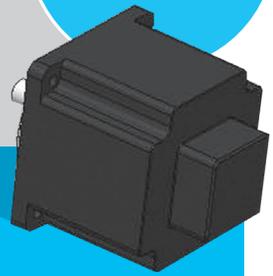
Nabtesco took the RV reduction gear, the most advanced in the industry, and created the RD SERIES. The RD SERIES is a pre-lubricated model with a sealed structure that can be easily mounted on all major motors. The RD2 SERIES, a new version with three input configurations, offers customers dramatically expanded freedom of design.



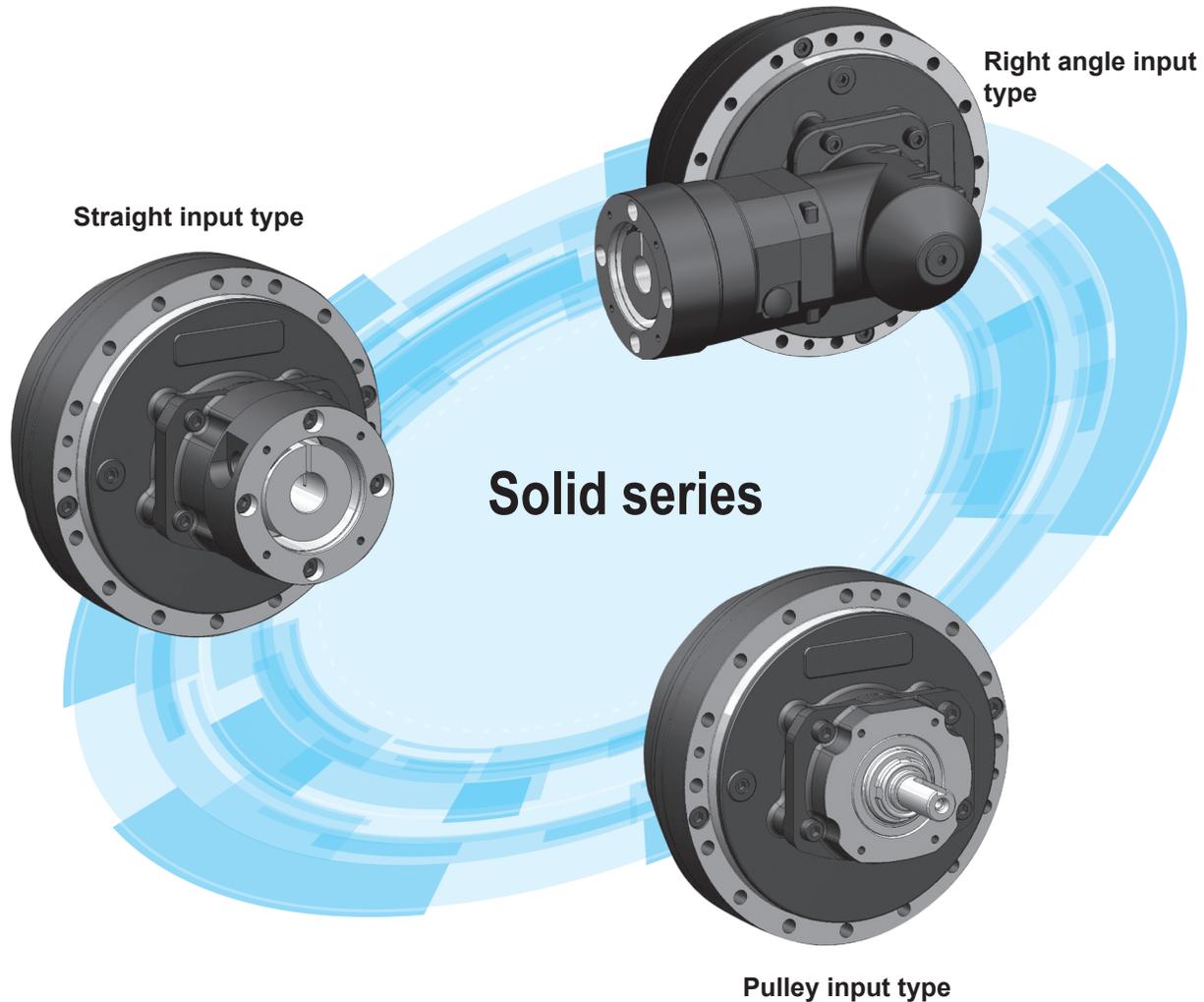
Motor fastener components



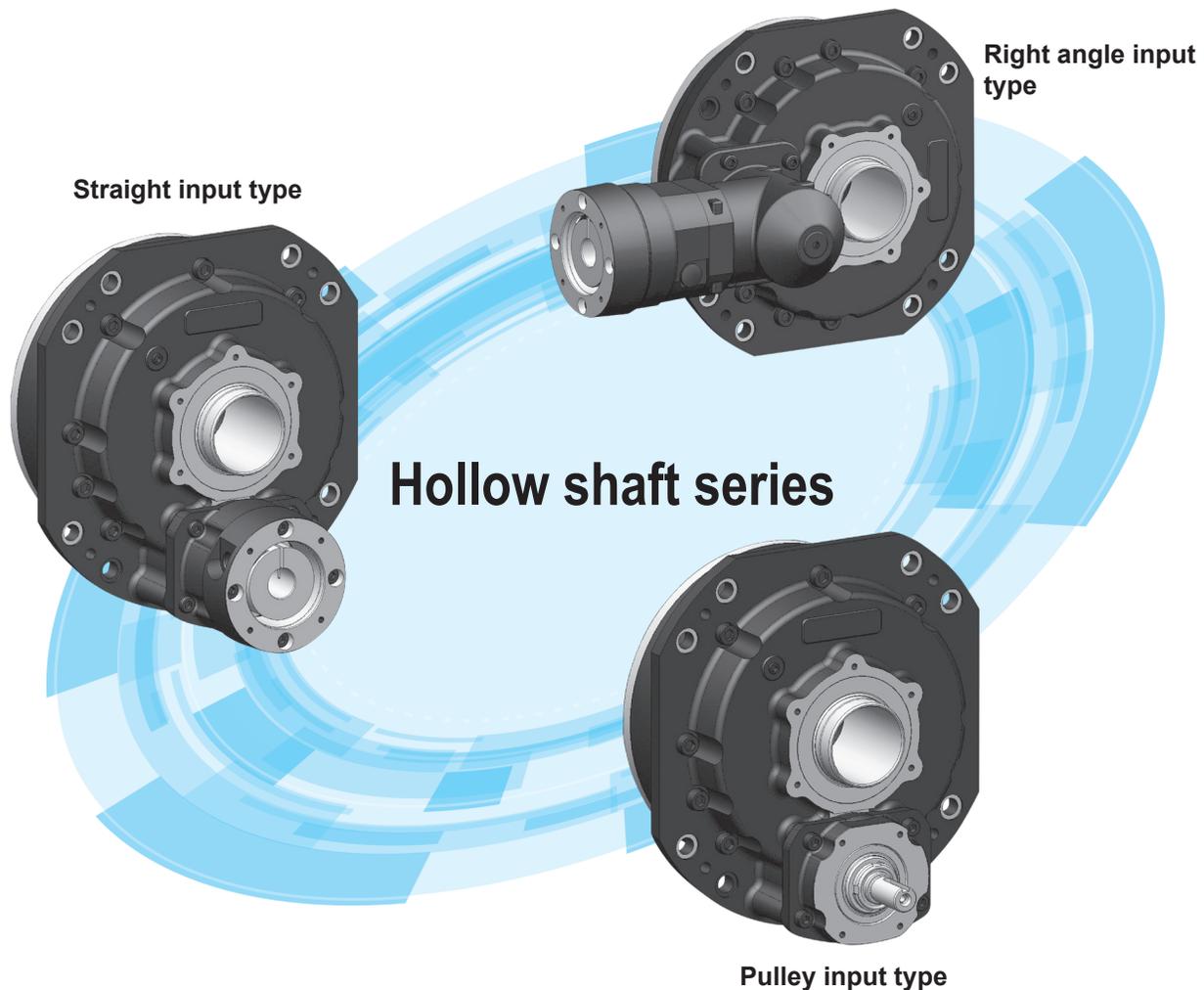
Simple mounting



RD2 SERIES: Designed to meet a variety of customer needs



- ...Benefits** 1 Allows compact equipment design
- 3... Advantages** 1 Flexibility
- ...User-friendly** 1 Many ratios available



2 Reduces the number of components needed

2 Pre-lubricated

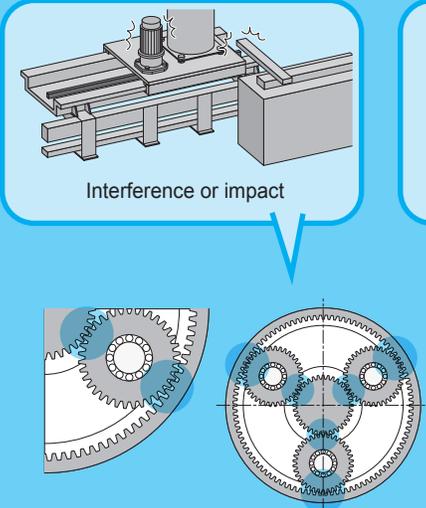
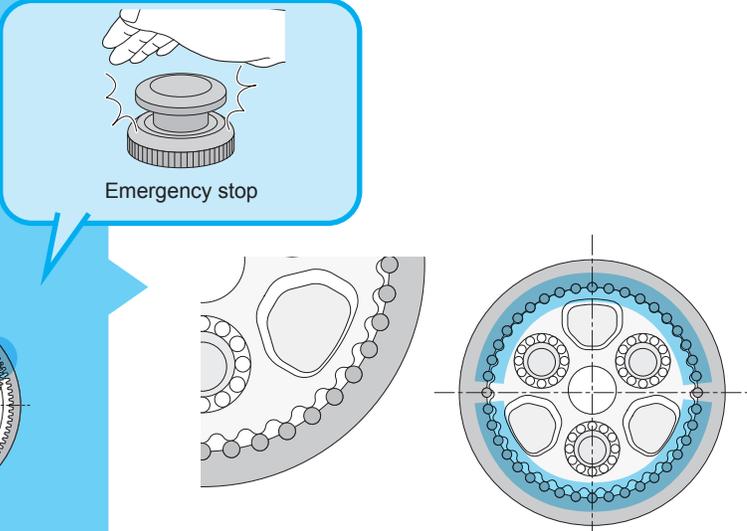
2 Easy installation

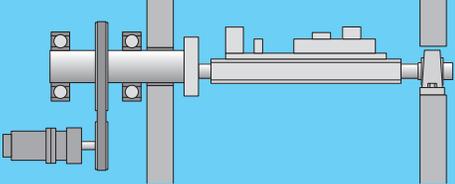
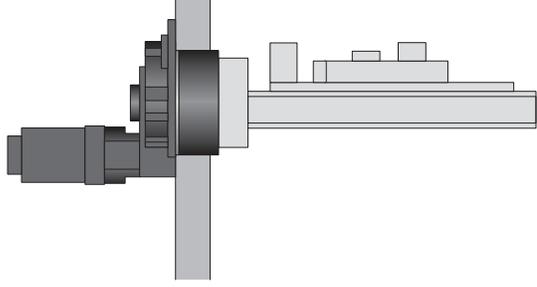
3 High reliability

3 Easy mount

3 Fluorine is used for all oil seals

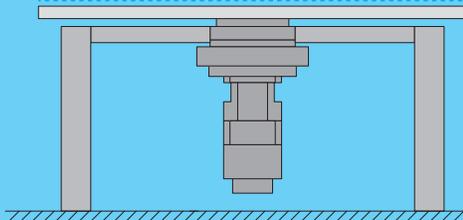
Nabtesco reduction gears offer a variety of solutions

<p>■ Standard Epicyclic Gear</p> <p>Low contact ratio and low resistance to impacts</p>  <p>Interference or impact</p> <p>Emergency stop</p> <p>Typical gear is damaged by shock load</p>	<p>■ RD2 SERIES</p> <p>Use of pin/gear mechanism results in high contact ratio and considerable impact resistance</p>  <p>High reliability for your machine</p>
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<p>■ Typical equipment</p> <p>Bearings and external support table are needed</p>  <p>More components Higher assembly cost Higher design cost</p>	<p>■ RD2 SERIES</p> <p>Integrated large-capacity ⇒ External bearings and support table are not needed</p>  <p>Reduced number of components Reduced cost of assembly Reduced cost of design</p>
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■ Typical equipment

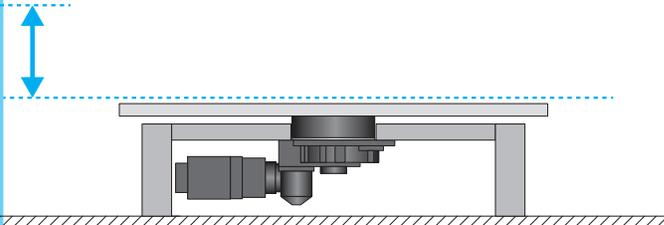
Reduction gear thickness + motor length + space for motor removal



Equipment needs increased space

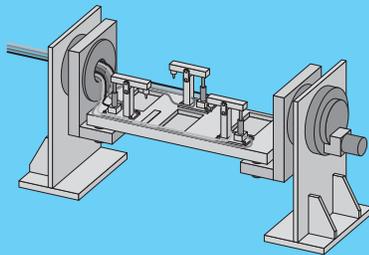
■ RD2 SERIES

Only the thickness of the reduction gear itself



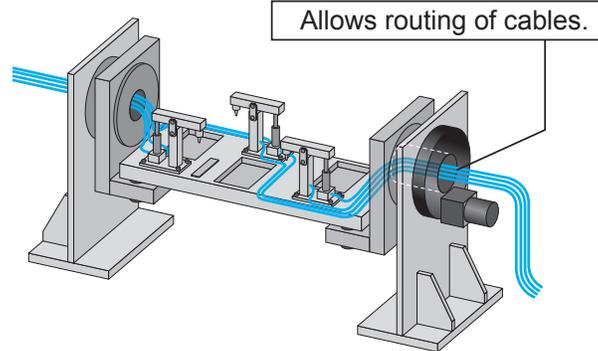
Right angle and pulley models can be used for a lower profile

■ Typical equipment



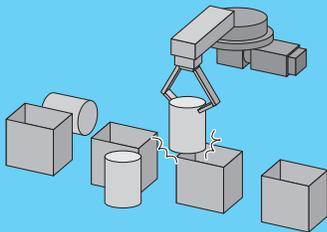
Cable routing is difficult

■ RD2 SERIES



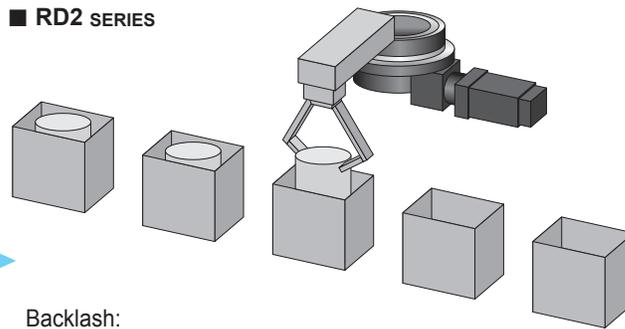
Hollow shaft series also available
Improved layout

■ Typical equipment



High backlash leads to poor repeatability

■ RD2 SERIES



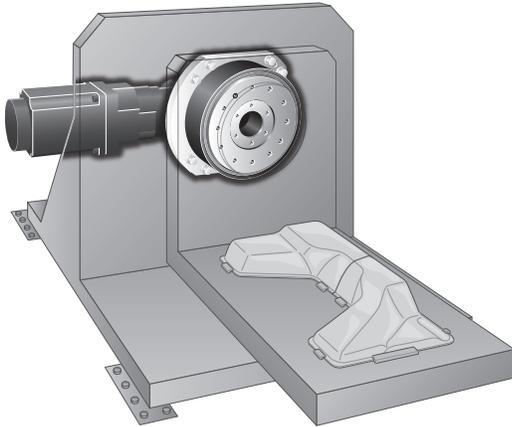
Backlash:
1 arc.min for straight input and pulley input type
1.5 arc.min for right angle input type (except some models)



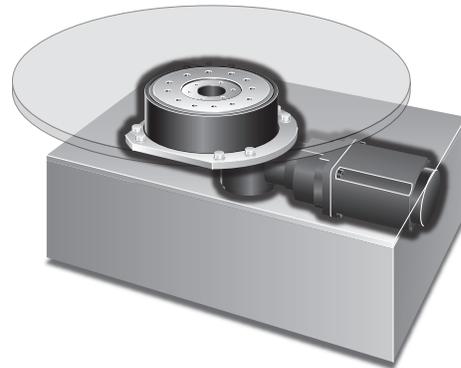
Highly precise positioning is possible

Examples of Uses for the RD2 SERIES (for reference)

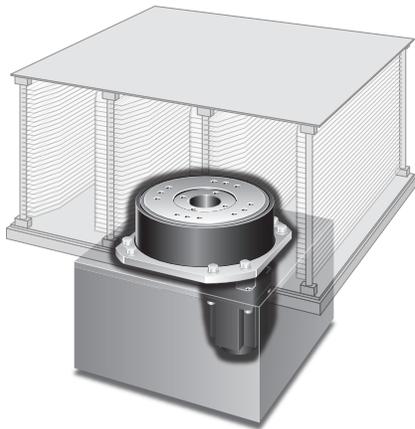
■ Positioner (tilting axis)



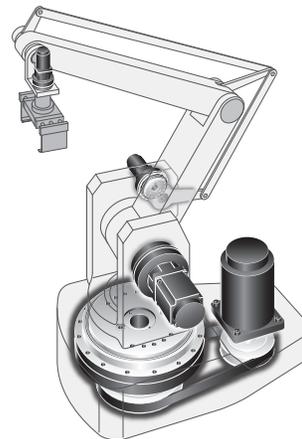
■ Positioner (rotary axis)



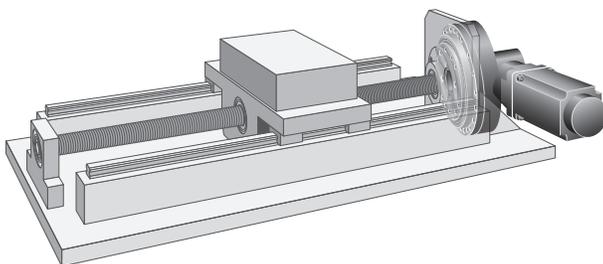
■ Glass Substrate/ Wafer Rotation and Positioning



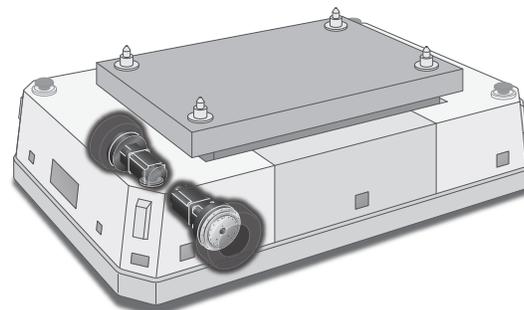
■ Palletizing Robots



■ Ball Screw Drive



■ AGV Drive

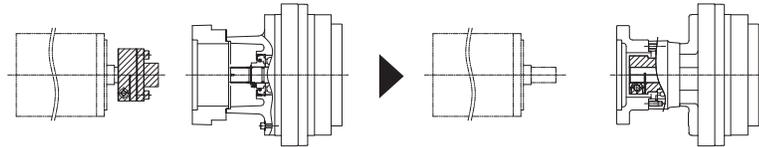


Difference Between RD SERIES and RD2 SERIES

1. Simplified motor mounting

Integrated coupling makes mounting easy

With the previous series, the coupling was an accessory, but on the RD2 SERIES the coupling is built into the input unit. This simplifies the process of mounting the servo motor to the reduction gear.

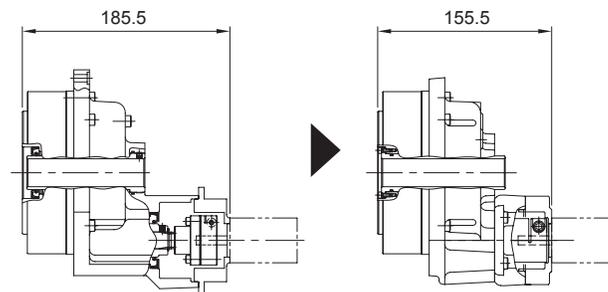


2. Compact design

Reduced total length

Compared to the previous series, the total length in the axial direction has been reduced by up to 15%.

Note: • Use of the same motor model is being studied.
• This diagram shows a comparison between the RD-010C and the RDS-010C.



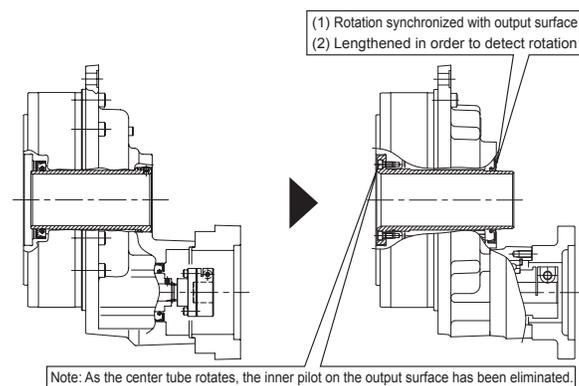
3. Center pipe rotates

For encoder

The center tube has been lengthened.

To protect the cable

On the RD2 SERIES, the center tube is designed to rotate (synchronized with the output face.)



4. Environmentally conscious lubricant

Product name: VIGO GREASE RE0

The barium sulfonate used up to now as a rust prevention agent has been replaced with calcium sulfonate to reduce the environmental impact.

Product Code Selection



<http://www.nabtesco-precision.de>

<http://www.nabtescomotioncontrol.com>

1. Verify reduction gear capacity (model code selection).

Step 1: Establish items needed for selection.

Step 2: Verify reduction gear load.

Step 3: Select reduction gear.

Step 4: Verify input unit specifications.

Note: For flow charts and calculation methods, see pages 101 – 109 of the Technical Documents.

2. Select input unit and motor flange / bushing.

Motor

Manufacturer

Series

Model

To product model number search



(1) Click on the manufacturer, series and model for the servo motor that you are using.

Product model number search

Solid series
 Straight input type: RDS
 Right angle input type: RDR
 Pulley input type: RDP

Hollow shaft series
 Straight input type: RDS
 Right angle input type: RDR
 Pulley input type: RDP

Search results
 Product code Details

Select an item.
 The search results will appear.

(2) In the reduction gear list, click on the desired type of reduction gear.

(3) The product codes corresponding to that motor will be displayed.

Product code	Details
RDS-006E-031-B1-CH-ZZ	<input type="button" value="Product code"/>
RDS-006E-043-B1-CH-ZZ	<input type="button" value="Product code"/>
RDS-006E-054-B1-CH-ZZ	<input type="button" value="Product code"/>
RDS-020E-081-B1-CH-ZZ	<input type="button" value="Product code"/>
RDS-020E-105-B1-CH-ZZ	<input type="button" value="Product code"/>

3. Download CAD data.

Product data

Download CAD data

Model Code	Ratio code (actual gear ratio)	Rated Output Speed (N/min)	Life (Hours)	Reverse Input No. Teeth (N-min)	Reverse Input Pitch Dia. (N-mm)	Allowable Input Speed (rpm)	Allowable Output Speed (rpm)	Backlash (arc.min)	Load motion (sec.min)	Spring Constant (N-mm/arc.min)	Allowable moment (N-m)	
RDS-160E	066 (66)	1568	15	6000	3920	7840	2000	30.3	1	1	392	3920
	081 (81)							24.6				
	101 (101)							19.8				
	121 (121)							16.5				
	145 (145)							13.7				
	171 (171)							11.6				

You may also download CAD data, either 3D CAD (STEP file) or 2D CAD (DXF file).

Note: Free membership registration is required to download the CAD data.

Note: Due to ongoing improvements, the website is subject to change without notice.

Overview of Features (listed by input type)

Input type	Reduction gear configuration	Product	Product features	Corresponding speed ratio	Allowable acceleration and deceleration torque (N-m)	Items not included	Pages for external dimension drawings
Straight input type	Solid series		<ul style="list-style-type: none"> The total length in the axial direction has been reduced by up to 15% as compared to the previous series. 	31 to 258	117 to 7,840	Servo motor	P.16 ▼ P.27
	Hollow shaft series						P.28 ▼ P.39
Right angle input type	Solid series		<ul style="list-style-type: none"> Equipment can be more compact Can be installed in confined space Table can be made shorter 	31 to 258	117 to 7,840	Servo motor	P.44 ▼ P.55
	Hollow shaft series						P.56 ▼ P.67
Pulley input type	Solid series		<ul style="list-style-type: none"> Belt input is possible Motor can be installed anywhere Speed ratio can be changed using pulley 	57 to 157	412 to 7,840	Servo motor pulley	P.71 ▼ P.75
	Hollow shaft series						P.76 ▼ P.81

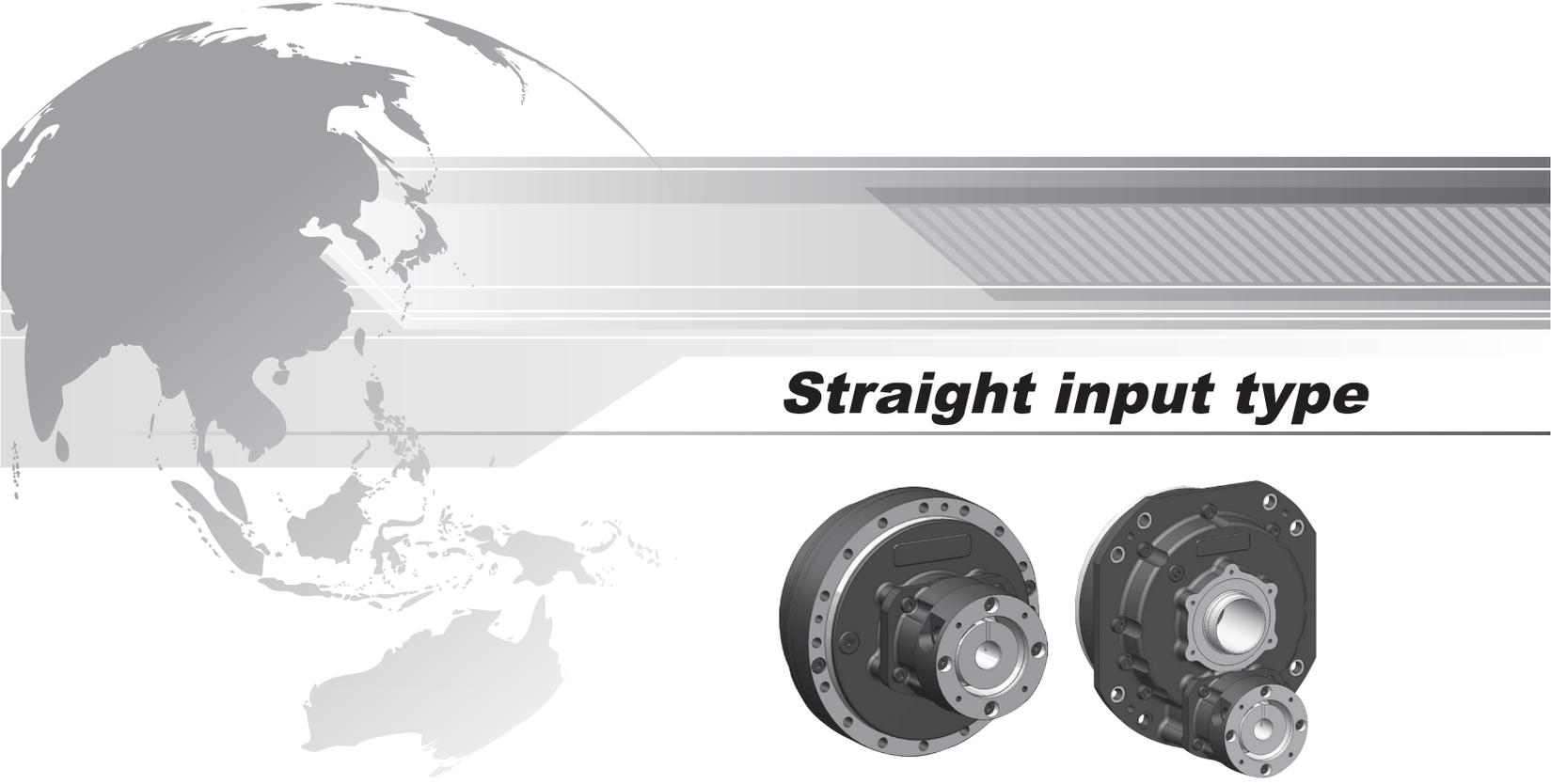
Straight input type

Right angle input type

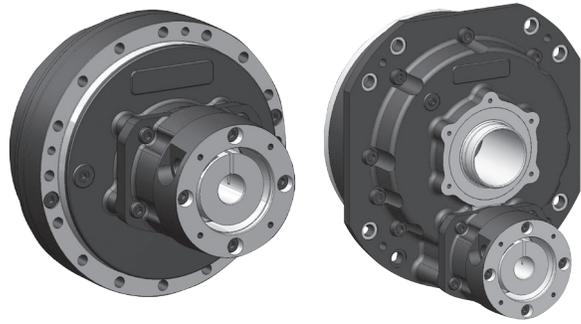
Pulley input type

Motor flange / bushing

Technical Documents



Straight input type



Straight Input Type Product Codes / Configuration Diagram

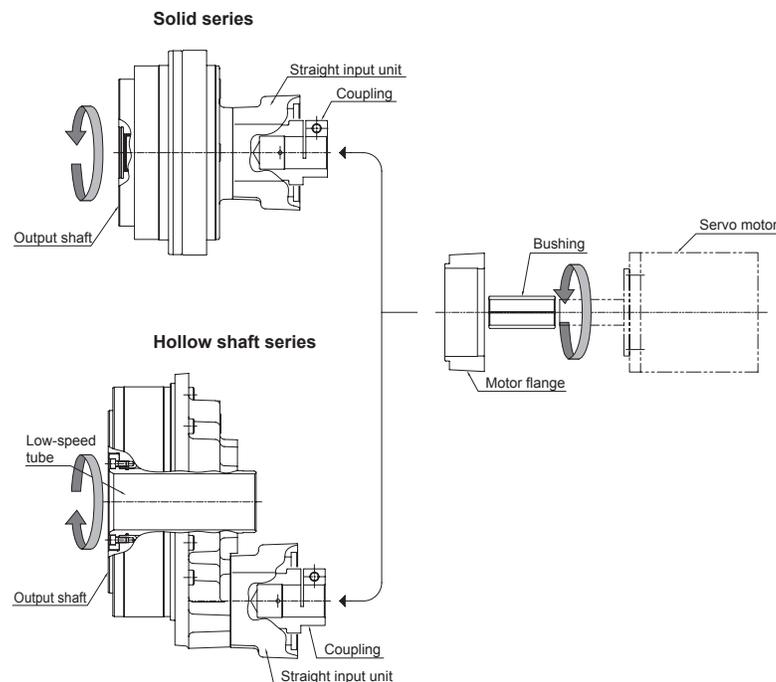
Product code

RD S - 040 E - 153 - B2 - CF - 2E

Model Code			Ratio Code	Input unit code	Motor flange code	Bushing code
Straight Input code	Torque code	Series code				
S	006	E: Solid series	031, 043, 054, 079, 103	B0 : Corresponding motor shaft diameter $\phi 8$ to 14 B1 : Corresponding motor shaft diameter $\phi 15$ to 24	2-letter code (code will differ depending on motor to be attached)	2-letter code (code will differ depending on motor to be attached)
	020		041, 057, 081, 105, 121, 161	B0 : Corresponding motor shaft diameter $\phi 8$ to 14 B1 : Corresponding motor shaft diameter $\phi 15$ to 24		
	040		041, 057, 081, 105, 121, 153	B2 : Corresponding motor shaft diameter $\phi 14$ to 24 B3 : Corresponding motor shaft diameter $\phi 25$ to 35		
	080		041, 057, 081, 101, 121, 153	B2 : Corresponding motor shaft diameter $\phi 14$ to 24 B3 : Corresponding motor shaft diameter $\phi 25$ to 35		
	160		066, 081, 101, 121, 145, 171	B4 : Corresponding motor shaft diameter $\phi 19$ to 28 B5 : Corresponding motor shaft diameter $\phi 32$ to 42		
	320		066, 081, 101, 121, 141, 185	B4 : Corresponding motor shaft diameter $\phi 19$ to 28 B5 : Corresponding motor shaft diameter $\phi 32$ to 42		
	010	C: Hollow shaft series	081, 108, 153, 189, 243	B0 : Corresponding motor shaft diameter $\phi 8$ to 14 B1 : Corresponding motor shaft diameter $\phi 15$ to 24		
	027		100, 142, 184, 233	B0 : Corresponding motor shaft diameter $\phi 8$ to 14 B1 : Corresponding motor shaft diameter $\phi 15$ to 24		
	050		109, 153, 196, 240	B2 : Corresponding motor shaft diameter $\phi 14$ to 24 B3 : Corresponding motor shaft diameter $\phi 25$ to 35		
	100		101, 150, 210, 258	B2 : Corresponding motor shaft diameter $\phi 14$ to 24 B3 : Corresponding motor shaft diameter $\phi 25$ to 35		
	200		106, 156, 206, 245	B4 : Corresponding motor shaft diameter $\phi 19$ to 28 B5 : Corresponding motor shaft diameter $\phi 32$ to 42		
	320		115, 157, 207, 253	B4 : Corresponding motor shaft diameter $\phi 19$ to 28 B5 : Corresponding motor shaft diameter $\phi 32$ to 42		

Note: For selection of motor flange and bushing, see the selection tables on pages 83 – 85 or visit the Nabtesco website (URL : <http://www.nabtesco-precision.de>, <http://www.nabtescomotioncontrol.com>).

Configuration Diagram



Straight input type

Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

Rating Table Straight Input Type

Solid series

Model Code	Ratio code (actual gear ratio)	Reduction Gear														Outer Dimensions
		T ₀	N ₀	K	T _{S1}	T _{S2}	N _{in}	N _s	N _{To}	Backlash	Lost motion	Torsional rigidity	Start-up Efficiency	M ₀	α	
		Rated Torque (N-m)	Rated Output Speed (r.p.m.)	Life Rating (Hr)	Allowable Startup/Stop Torque (N-m)	Momentary maximum allowable torque (N-m)	Allowable Input Speed (Note 2) (r.p.m.)	Allowable Output Speed (Note 2) (r.p.m.)	Reference value to output speed during continuous operation at rated torque (r.p.m.)							
RDS-006E	031 (31)	58	30	6,000	117	294	3,500	100	100	1.5	1.5	20	70	196	77.8	Input Unit Code : B0 ———P.16
	043 (43)							81	76							
	054 (53.5)							65	63							
	079 (79)							44	44							
	103 (103)							34	34							
RDS-020E	041 (41)	167	15	6,000	412	833	3,500	75	75	1.0	1.0	49	75	882	93.2	Input Unit Code : B0 ———P.18
	057 (57)							61	56							
	081 (81)							43	42							
	105 (105)							33	33							
	121 (121)							29	29							
	161 (161)							22	22							
RDS-040E	041 (41)	412	15	6,000	1,029	2,058	3,000	70	37	1.0	1.0	108	70	1,666	114.6	Input Unit Code : B2 ———P.20
	057 (57)							53	35							
	081 (81)							37	34							
	105 (105)							29	29							
	121 (121)							25	25							
	153 (153)							20	20							
RDS-080E	041 (41)	784	15	6,000	1,960	3,920	3,000	70	34	1.0	1.0	196	75	2,156	136.1	Input Unit Code : B2 ———P.22
	057 (57)							53	31							
	081 (81)							37	29							
	101 (101)							30	28							
	121 (121)							25	25							
	153 (153)							20	20							
RDS-160E	066 (66)	1,568	15	6,000	3,920	7,840	2,000	30	20	1.0	1.0	392	75	3,920	167.3	Input Unit Code : B4 ———P.24
	081 (81)							25	18							
	101 (101)							20	16							
	121 (121)							17	15							
	145 (145)							14	14							
	171 (171)							12	12							
RDS-320E	066 (66)	3,136	15	6,000	7,840	15,680	2,000	30	15	1.0	1.0	980	80	7,056	203	Input Unit Code : B4 ———P.26
	081 (81)							25	12							
	101 (101)							20	9							
	121 (121)							17	7							
	141 (141)							14	6							
	185 (185)							11	4							

Hollow shaft series

Model Code	Ratio code (actual gear ratio)	Reduction Gear														Outer Dimensions
		T ₀	N ₀	K	T _{S1}	T _{S2}	N _{in}	N _S	N _{T0}	Backlash	Lost motion	Torsional rigidity	Start-up Efficiency	M ₀	α	
		Rated Torque (N-m)	Rated Output Speed (r.p.m.)	Life Rating (Hr)	Allowable Startup/Stop Torque (N-m)	Momentary maximum allowable torque (N-m)	Allowable Input Speed (Note 2) (r.p.m.)	Allowable Output Speed (Note 2) (r.p.m.)	Reference value to output speed during continuous operation at rated torque (r.p.m.)							
RDS-010C	081 (81)	98	15	6,000	245	490	3,500	43	43	1.0	1.0	47	65	686	91.2	Input Unit Code : B0 ———P.28
	108 (108)							32	32							
	153 (153)							23	23							
	189 (189)							19	19							
	243 (243)							14	14							
RDS-027C	100 (99.82)	265	15	6,000	662	1,323	3,500	35	35	1.0	1.0	147	70	980	112	Input Unit Code : B0 ———P.30
	142 (141.68)							25	25							
	184 (184)							19	19							
	233 (233.45)							15	15							
RDS-050C	109 (109)	490	15	6,000	1,225	2,450	3,000	28	28	1.0	1.0	255	70	1,764	136.8	Input Unit Code : B2 ———P.32
	153 (152.6)							20	20							
	196 (196.2)							15	15							
	240 (239.8)							13	13							
RDS-100C	101 (100.5)	980	15	6,000	2,450	4,900	3,000	30	20	1.0	1.0	510	80	2,450	148.9	Input Unit Code : B2 ———P.34
	150 (150)							20	17							
	210 (210)							14	14							
	258 (258)							12	12							
RDS-200C	106 (105.83)	1,960	15	6,000	4,900	9,800	2,000	19	16	1.0	1.0	980	80	8,820	204.4	Input Unit Code : B4 ———P.36
	156 (155.96)							13	12							
	206 (206.09)							10	10							
	245 (245.08)							8	8							
RDS-320C	115 (115)	3,136	15	6,000	7,840	15,680	2,000	17	17	1.0	1.0	1,960	80	20,580	245.9	Input Unit Code : B4 ———P.38
	157 (157)							13	13							
	207 (207)							10	10							
	253 (253)							8	8							

Notes:

1. The rating table shows the specification values including the entry fields for reduction gear values.
2. The allowable speed may be limited by heat depending on the operating rate. Make sure the surface temperature of the reduction gear does not exceed 60°C during use.
3. The allowable moment will differ depending on the thrust load. Check the allowable moment diagram.
4. For the moment of inertia of the reduction gears, refer to the external dimension drawings for the reduction gear.

Straight input type

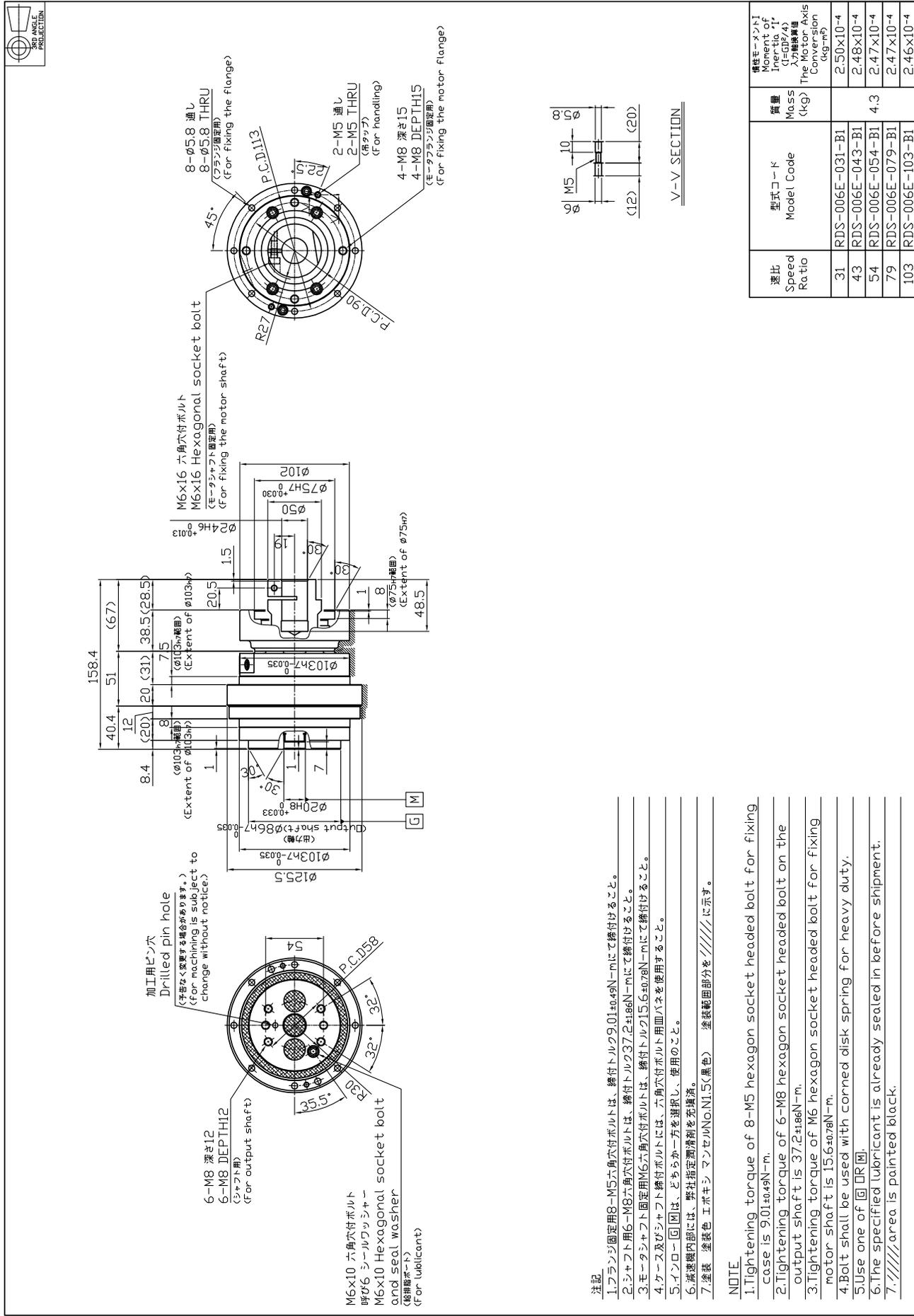
Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

Model Code: RDS-006E-XXX-B1 (Corresponding motor shaft diameter: $\phi 15$ to $\phi 24$)



Technical Documents

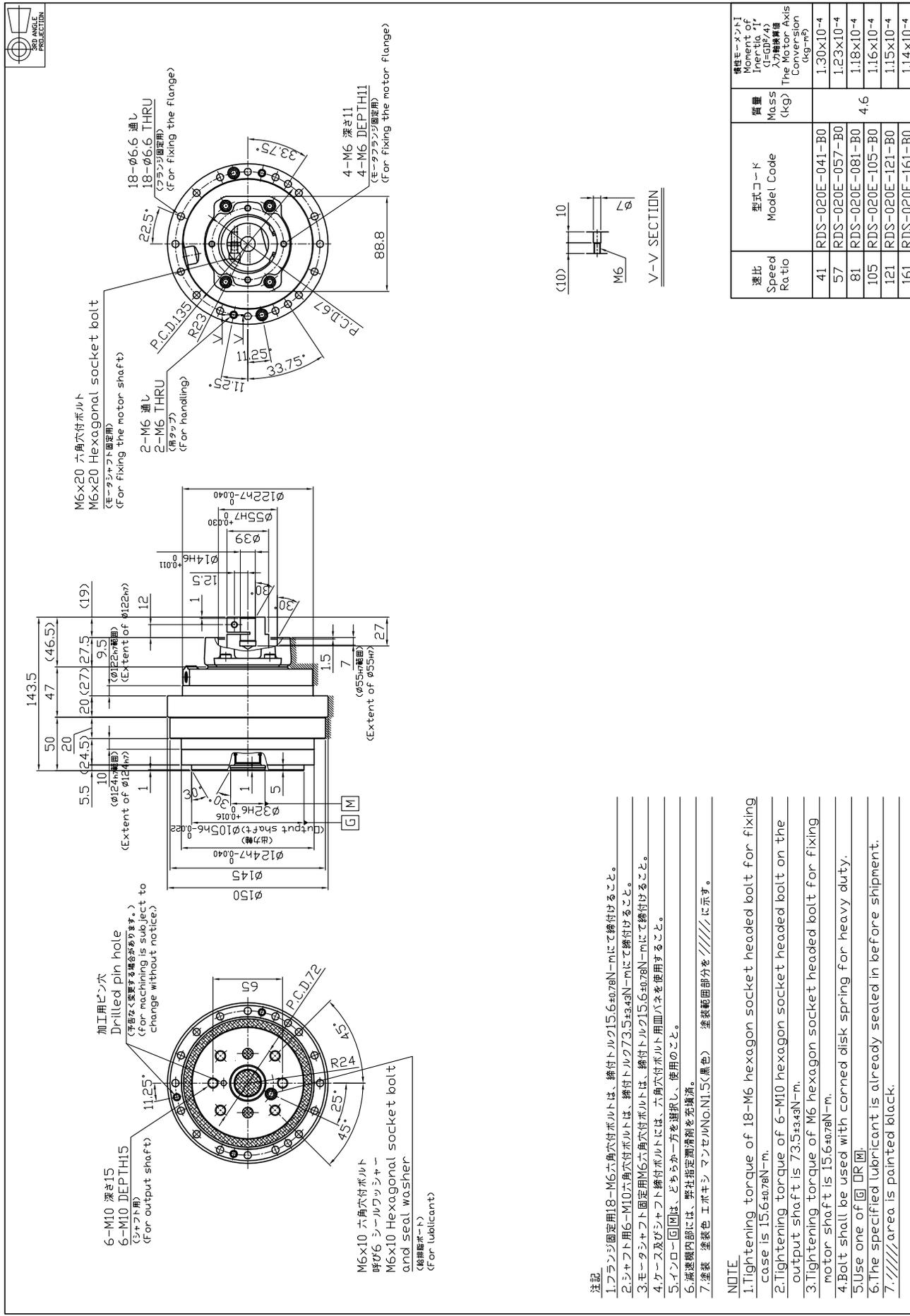
Motor flange / bushing

Pulley input type

Right angle input type

Straight input type

Model Code: RDS-020E-XXX-B0 (Corresponding motor shaft diameter: φ8 to φ14)

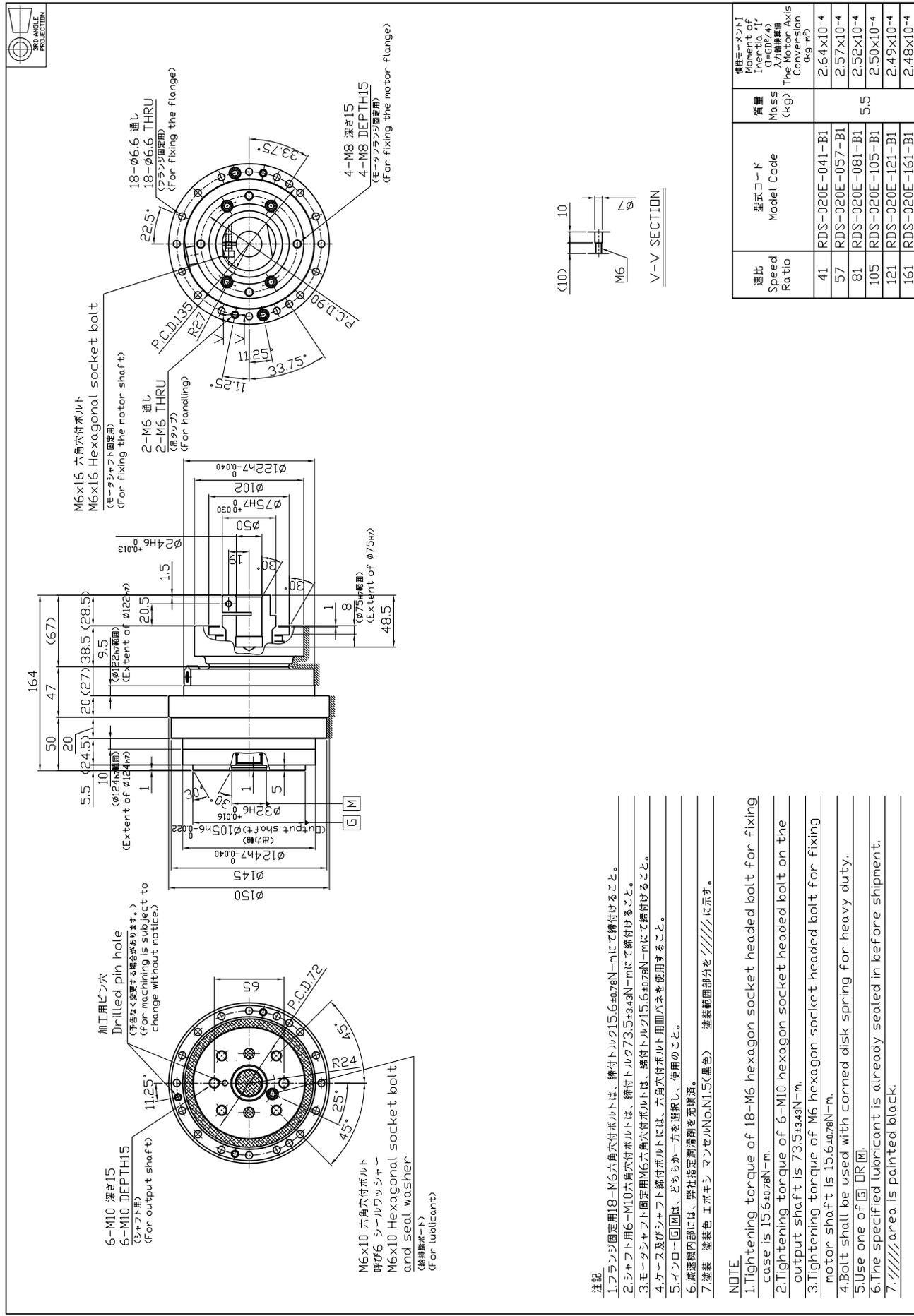


- 注記
- 1.フランジ固定用18-M6六角穴付ボルトは、締付トルク15.6±0.78N・mにて締付けること。
 - 2.シャフト用6-M10六角穴付ボルトは、締付トルク73.5±3.43N・mにて締付けること。
 - 3.モータシャフト固定用M6六角穴付ボルトは、締付トルク15.6±0.78N・mにて締付けること。
 - 4.ケース及びシャフト締付ボルトには、六角穴付ボルト用皿ハネを使用すること。
 - 5.インロー(凹)は、どちらか一方を選択し、使用のこと。
 - 6.潤滑剤内部には、弊社指定潤滑剤を充填す。
 - 7.塗装 塗装色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を//////に示す。

- NOTE
- 1.Tightening torque of 18-M6 hexagon socket headed bolt for fixing case is 15.6±0.78N・m.
 - 2.Tightening torque of 6-M10 hexagon socket headed bolt on the output shaft is 73.5±3.43N・m.
 - 3.Tightening torque of M6 hexagon socket headed bolt for fixing motor shaft is 15.6±0.78N・m.
 - 4.Bolt shall be used with corned disk spring for heavy duty.
 - 5.Use one of (凹) DR (凹).
 - 6.The specified lubricant is already sealed in before shipment.
 - 7.//////area is painted black.

速比 Speed Ratio	型式コード Model Code	質量 Mass (kg)	慣性モーメント Moment of Inertia (I=GD ² /4) 入力軸換算値 The Moment of Inertia Conversion (kg-m ²)
41	RDS-020E-041-B0		1.30x10 ⁻⁴
57	RDS-020E-057-B0		1.23x10 ⁻⁴
81	RDS-020E-081-B0	4.6	1.18x10 ⁻⁴
105	RDS-020E-105-B0		1.16x10 ⁻⁴
121	RDS-020E-121-B0		1.15x10 ⁻⁴
161	RDS-020E-161-B0		1.14x10 ⁻⁴

Model Code: RDS-020E-XXX-B1 (Corresponding motor shaft diameter: $\phi 15$ to $\phi 24$)



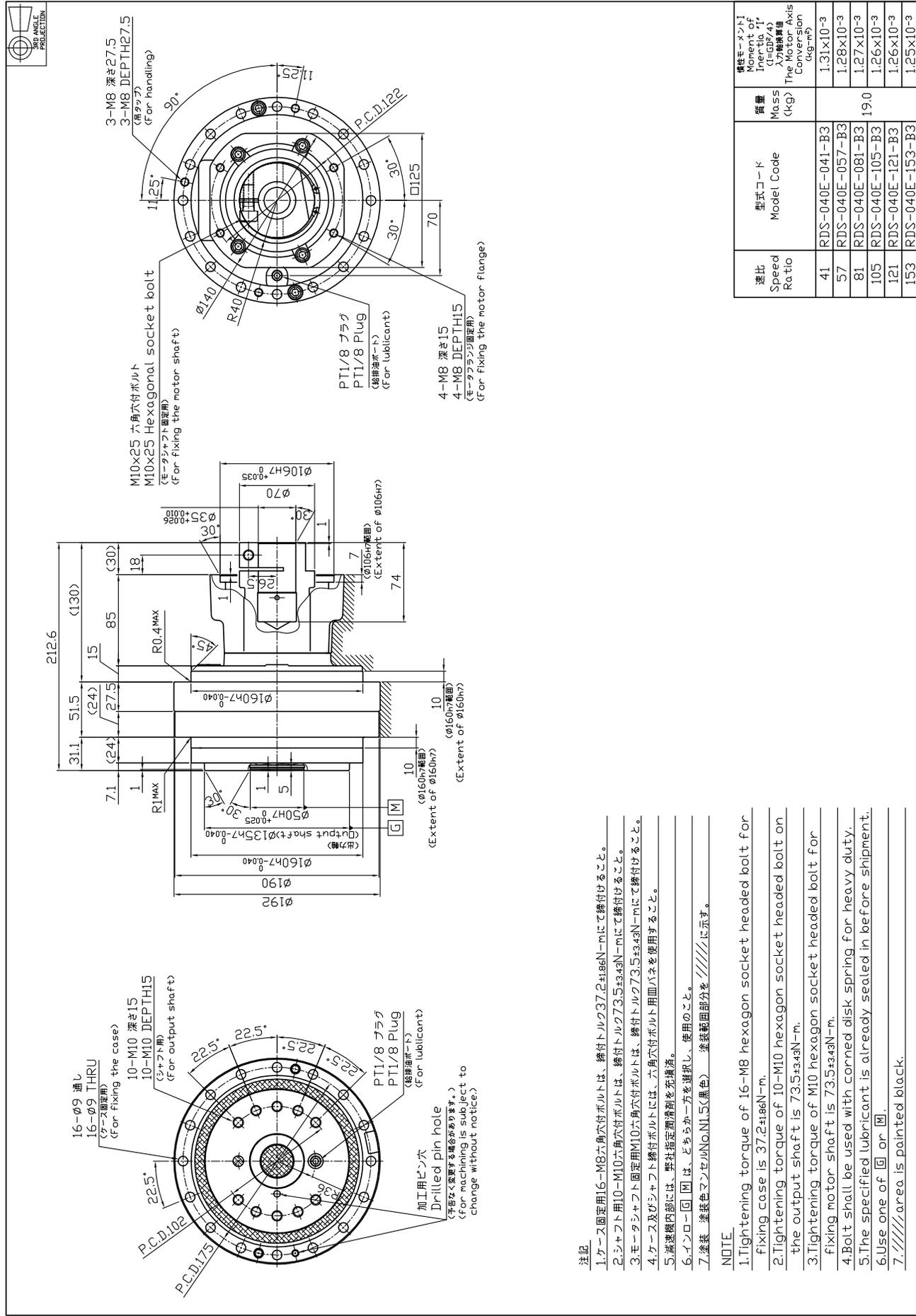
注記

1. フランジ固定用18-M6六角穴付ボルトは、締付トルク15.6±0.78N-mにて締付けること。
2. シャフト用6-M10六角穴付ボルトは、締付トルク73.5±3.43N-mにて締付けること。
3. モータシャフト固定用M6六角穴付ボルトは、締付トルク15.6±0.78N-mにて締付けること。
4. ケース及びシャフト締付ボルトには、六角穴付ボルト用皿ハネを使用すること。
5. インロー回りは、どちらか一方を選択し、使用のこと。
6. 減速機内部には、弊社指定潤滑剤を充填す。
7. 塗装 塗装色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を//////に示す。

NOTE

1. Tightening torque of 18-M6 hexagon socket headed bolt for fixing case is 15.6±0.78N-m.
2. Tightening torque of 6-M10 hexagon socket headed bolt on the output shaft is 73.5±3.43N-m.
3. Tightening torque of M6 hexagon socket headed bolt for fixing motor shaft is 15.6±0.78N-m.
4. Bolt shall be used with coned disk spring for heavy duty.
5. Use one of or .
6. The specified lubricant is already seated in before shipment.
7. //// area is painted black.

Model Code: RDS-040E-XXX-B3 (Corresponding motor shaft diameter: $\phi 25$ to $\phi 35$)



- 注記
- 1.ケース固定用16-M8六角穴付ボルトは、締付トルク37.2±1.66N-mにて締付けること。
 - 2.シャフト用10-M10六角穴付ボルトは、締付トルク73.5±3.43N-mにて締付けること。
 - 3.モータシャフト固定用M10六角穴付ボルトは、締付トルク73.5±3.43N-mにて締付けること。
 - 4.ケース及びシャフト締付ボルトには、六角穴付ボルト用皿バネを使用すること。
 - 5.減速機内部には、弊社指定潤滑剤を充填。
 - 6.インロー \square は、どちらか一方を選択し、使用のこと。
 - 7.塗装: 塗装色マゼンタNo.N1.5(黒色) 塗装範囲部分を//////に示す。
- NOTE
- 1.Tightening torque of 16-M8 hexagon socket headed bolt for fixing case is 37.2±1.66N-m.
 - 2.Tightening torque of 10-M10 hexagon socket headed bolt on the output shaft is 73.5±3.43N-m.
 - 3.Tightening torque of M10 hexagon socket headed bolt for fixing motor shaft is 73.5±3.43N-m.
 - 4.Bolt shall be used with coned disk spring for heavy duty.
 - 5.The specified lubricant is already sealed in before shipment.
 - 6.Use one of \square or \square .
 - 7.//////area is painted black.

速比 Speed Ratio	型式コード Model Code	質量 Mass (kg)	慣性モーメント Moment of Inertia, J (kg-cm ²) 質量 The Motor Axis Conversion (kg-m ²)
41	RDS-040E-041-B3		1.31x10 ⁻³
57	RDS-040E-057-B3		1.28x10 ⁻³
81	RDS-040E-081-B3	19.0	1.27x10 ⁻³
105	RDS-040E-105-B3		1.26x10 ⁻³
121	RDS-040E-121-B3		1.26x10 ⁻³
153	RDS-040E-153-B3		1.25x10 ⁻³

Straight input type

Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

Model Code: RDS-160E-XXX-B4 (Corresponding motor shaft diameter: φ19 to φ28)

加工用ピン穴
Drilled pin hole
(平否なく変更する場合があります。)
(For machining is subject to
change without notice.)

16-φ13 通し
16-φ13 THRU
(モーター固定用)
(For fixing the case)

2-M10 通し
2-M10 THRU
(取り扱い用、取替カフ)
(For handling)

20-M10 深き15
20-M10 DEPTH15
(シャフト用)
(For output shaft)

PT 1/8 プラグ
PT 1/8 Plug
(給油ポート)
(For lubricant)

18° 30° 15° 9°

P.C.D. 260 P.C.D. 183

M12×35 六角穴付ボルト
M12×35 Hexagonal socket bolt
(モータシャフト固定用)

4-M8 深き15
4-M8 DEPTH15
(モータフランジ固定用)
(For fixing the motor flange)

PT1/8 プラグ
PT1/8 Plug
(給油ポート)
(For lubricant)

94.5 30° 30° 24°

φ150 P.C.D. 170 φ125

注記

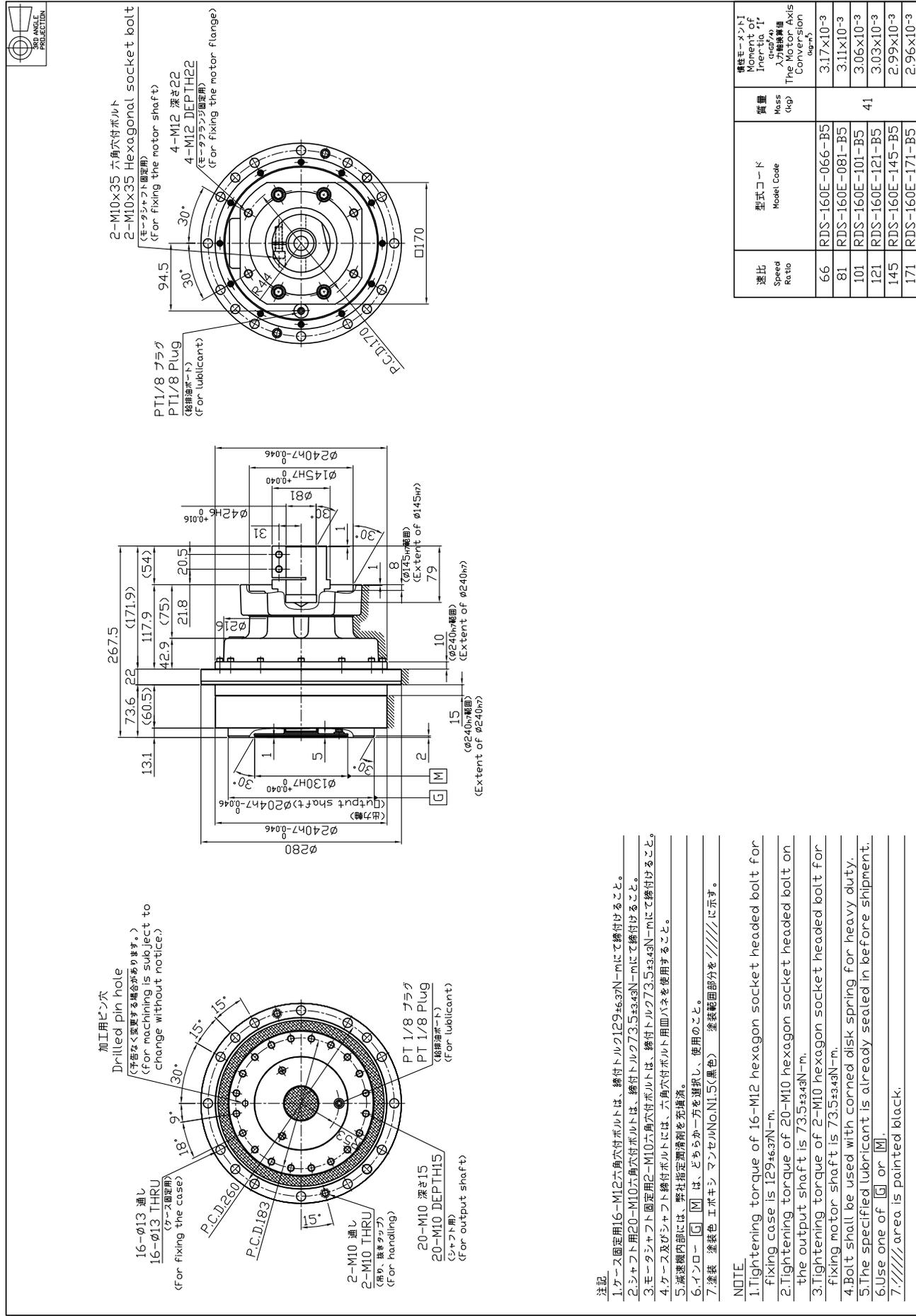
- ケース固定用16-M12六角穴付ボルトは、締付トルク129±6.37N・mにて締付けること。
- シャフト用20-M10六角穴付ボルトは、締付トルク73.5±3.43N・mにて締付けること。
- モータシャフト固定用M12六角穴付ボルトは、締付トルク129±6.37N・mにて締付けること。
- ケース及びシャフト締付ボルトには、六角穴付ボルト用皿バネを使用すること。
- 減速機内部には、弊社指定潤滑剤を充填済。
- インロー [G] [M] は、どちらか一方を選択し、使用のこと。
- 塗装 塗装色 エポキシ マンゼルNo.11.5(黒色) 塗装範囲部分を/////に示す。

NOTE

- Tightening torque of 16-M12 hexagon socket headed bolt for fixing case is 129±6.37N・m.
- Tightening torque of 20-M10 hexagon socket headed bolt on the output shaft is 73.5±3.43N・m.
- Tightening torque of M12 hexagon socket headed bolt for fixing motor shaft is 129±6.37N・m.
- Bolt shall be used with coned disk spring for heavy duty.
- The specified lubricant is already sealed in before shipment.
- Use one of [G] or [M].
- ///// area is painted black.

速比 Speed Ratio	型式コード Model Code	質量 Mass (kg)	慣性モーメント Moment of Inertia "I" (cm ² /s ²) 入力軸換算値 The MOI CONVERSION Value
66	RDS-160E-066-B4		2.08×10 ⁻³
81	RDS-160E-081-B4		2.03×10 ⁻³
101	RDS-160E-101-B4	41	1.98×10 ⁻³
121	RDS-160E-121-B4		1.94×10 ⁻³
145	RDS-160E-145-B4		1.91×10 ⁻³
171	RDS-160E-171-B4		1.88×10 ⁻³

Model Code: RDS-160E-XXX-B5 (Corresponding motor shaft diameter: $\phi 32$ to $\phi 42$)



- NOTE
1. Tightening torque of 16-M12 hexagon socket headed bolt for fixing case is $12.9 \pm 6.37 \text{ N}\cdot\text{m}$.
 2. Tightening torque of 20-M10 hexagon socket headed bolt on the output shaft is $73.5 \pm 3.43 \text{ N}\cdot\text{m}$.
 3. Tightening torque of 20-M10 hexagon socket headed bolt for fixing motor shaft is $73.5 \pm 3.43 \text{ N}\cdot\text{m}$.
 4. Bolt shall be used with coned disk spring for heavy duty.
 5. The specified lubricant is already sealed in before shipment.
 6. Use one of \square or M .
 7. //// area is painted black.

Straight input type

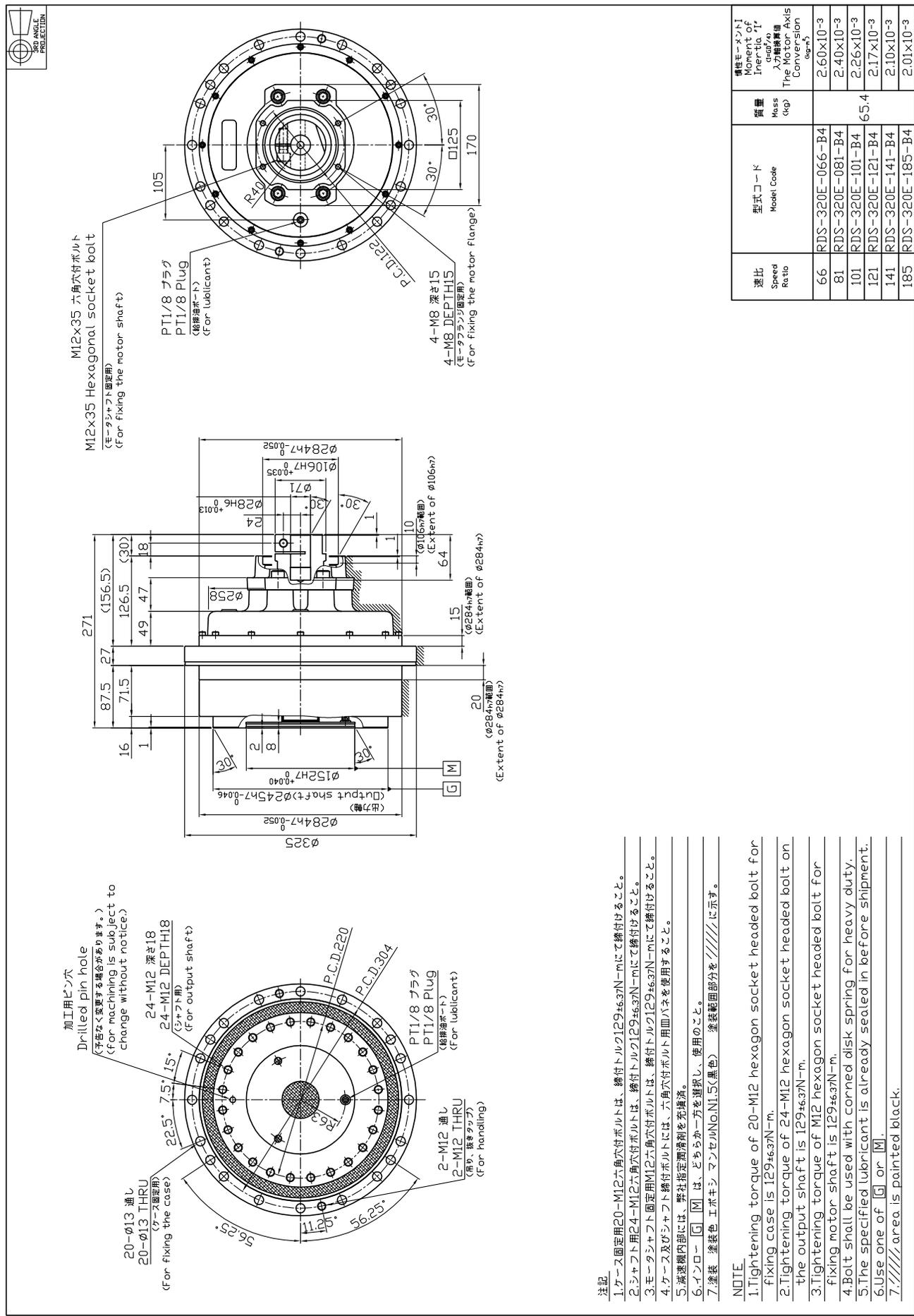
Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

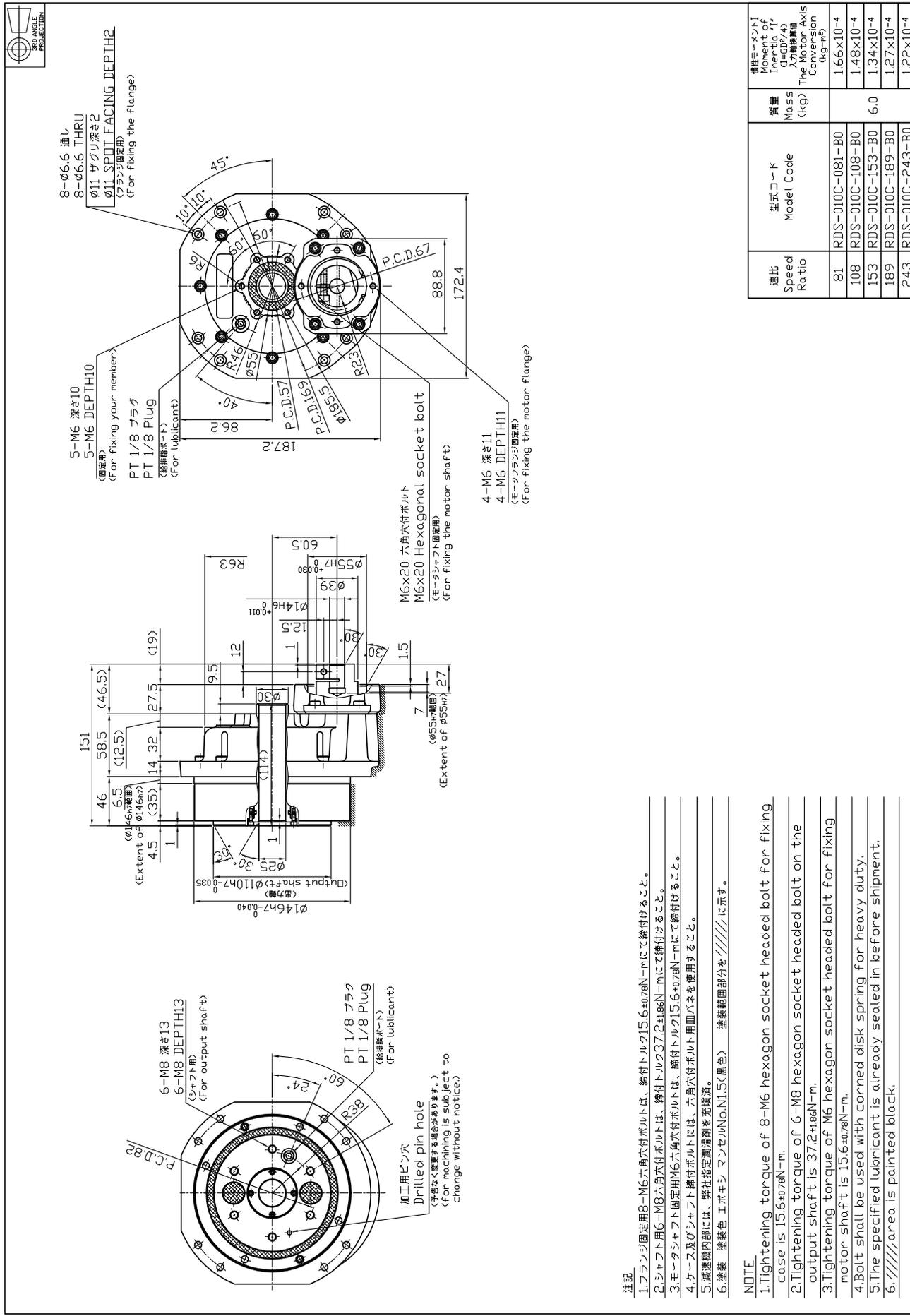
Model Code: RDS-320E-XXX-B4 (Corresponding motor shaft diameter: $\phi 19$ to $\phi 28$)



速比 Speed Ratio	型式コード Model Code	質量 Mass (kg)	慣性モーメント Moment of Inertia (cm^2) 入力軸側 The Inertia on Input Axis Side	慣性モーメント Moment of Inertia (cm^2) 出力軸側 The Inertia on Output Axis Side
66	RDS-320E-066-B4		2.60x10 ⁻³	2.60x10 ⁻³
81	RDS-320E-081-B4		2.40x10 ⁻³	2.40x10 ⁻³
101	RDS-320E-101-B4	65.4	2.26x10 ⁻³	2.26x10 ⁻³
121	RDS-320E-121-B4		2.17x10 ⁻³	2.17x10 ⁻³
141	RDS-320E-141-B4		2.10x10 ⁻³	2.10x10 ⁻³
185	RDS-320E-185-B4		2.01x10 ⁻³	2.01x10 ⁻³

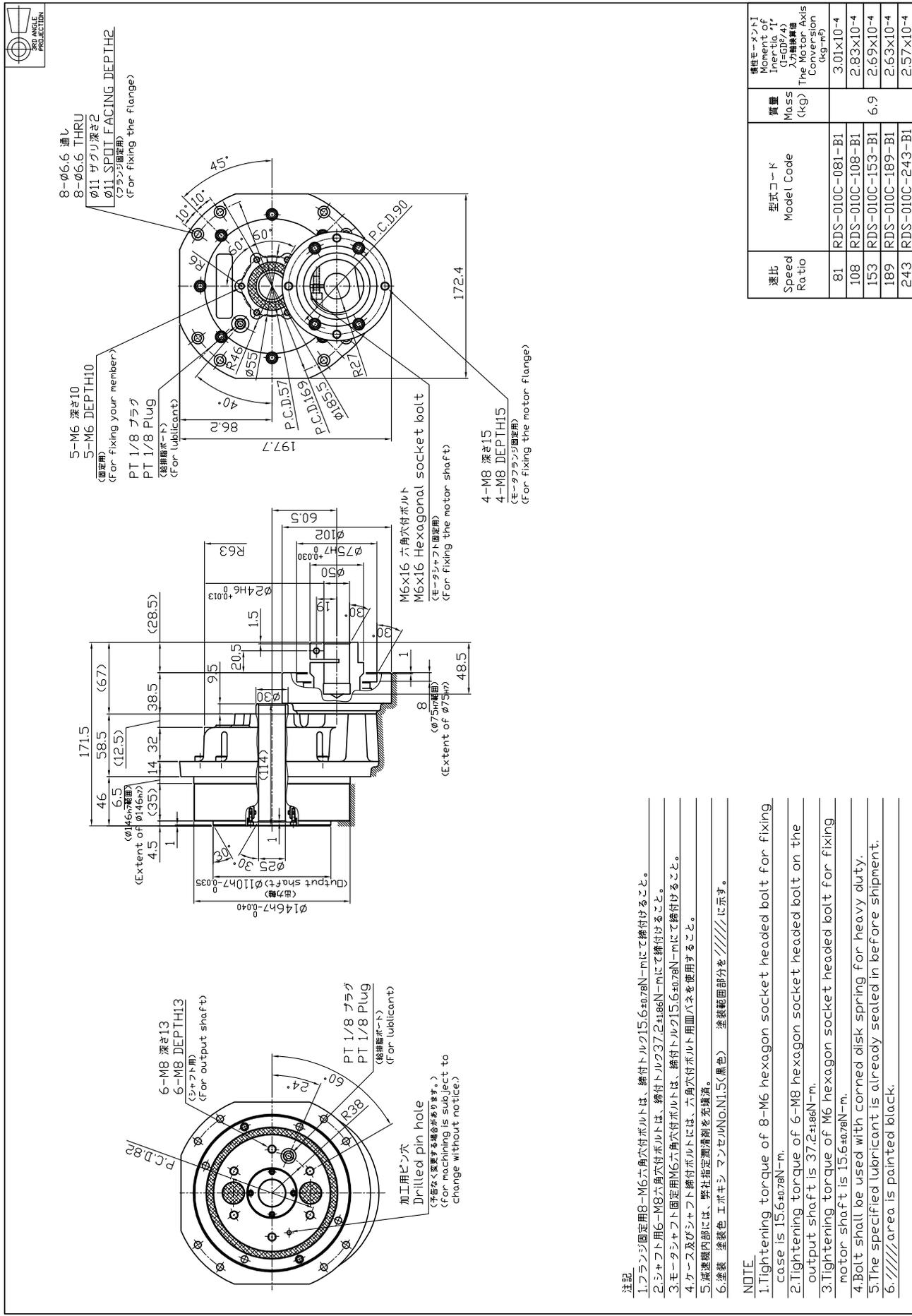
- 注記
- ケース固定用20-M12六角穴付ボルトは、締付トルク129±6.37N-mにて締付けること。
 - シャフト用24-M12六角穴付ボルトは、締付トルク129±6.37N-mにて締付けること。
 - モータシャフト固定用M12六角穴付ボルトは、締付トルク129±6.37N-mにて締付けること。
 - ケース及びシャフト締付ボルトには、六角穴付ボルト用皿ハネを使用すること。
 - 減速機内部には、弊社指定潤滑剤を充填。
 - インロー [G] [M] は、どちらか一方を選択し、使用のこと。
 - 塗装 塗装色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を//////に示す。
- NOTE
- Tightening torque of 20-M12 hexagon socket headed bolt for fixing case is 129±6.37N-m.
 - Tightening torque of 24-M12 hexagon socket headed bolt on the output shaft is 129±6.37N-m.
 - Tightening torque of M12 hexagon socket headed bolt for fixing motor shaft is 129±6.37N-m.
 - Bolt shall be used with coned disk spring for heavy duty.
 - The specified lubricant is already sealed in before shipment.
 - Use one of [G] or [M].
 - ////// area is painted black.

Model Code: RDS-010C-XXX-B0 (Corresponding motor shaft diameter: $\phi 8$ to $\phi 14$)



速比 Speed Ratio	型式コード Model Code	質量 Mass (kg)	慣性モーメント Moment of Inertia (I=GD ² /4) 入力軸換算値 The Motor Axis Conversion (kg \cdot m ²)
81	RDS-010C-081-B0		1.66x10 ⁻⁴
108	RDS-010C-108-B0		1.48x10 ⁻⁴
153	RDS-010C-153-B0	6.0	1.34x10 ⁻⁴
189	RDS-010C-189-B0		1.27x10 ⁻⁴
243	RDS-010C-243-B0		1.22x10 ⁻⁴

Model Code: RDS-010C-XXX-B1 (Corresponding motor shaft diameter: $\phi 15$ to $\phi 24$)



注記

- 1.フランジ固定用8-M6六角穴付ボルトは、締付トルク15.6 ± 0.78 N-mにて締付けること。
- 2.シャフト用6-M8六角穴付ボルトは、締付トルク37.2 ± 1.86 N-mにて締付けること。
- 3.モータシャフト固定用M6六角穴付ボルトは、締付トルク15.6 ± 0.78 N-mにて締付けること。
- 4.ケース及びシャフト締付ボルトには、六角穴付ボルト用皿ハネを使用すること。
- 5.潤滑油内部には、弊社指定潤滑剤を添付。
- 6.塗装 塗装色 エポキシ マンセルNO.NI.5(黒色) 塗装範囲部分を//////に示す。

NOTE

- 1.Tightening torque of 8-M6 hexagon socket headed bolt for fixing case is 15.6 ± 0.78 N-m.
- 2.Tightening torque of 6-M8 hexagon socket headed bolt on the output shaft is 37.2 ± 1.86 N-m.
- 3.Tightening torque of M6 hexagon socket headed bolt for fixing motor shaft is 15.6 ± 0.78 N-m.
- 4.Bolt shall be used with corned disk spring for heavy duty.
- 5.The specified lubricant is already sealed in before shipment.
- 6.//////area is painted black.

選出 Speed Ratio	新式コード Model Code	質量 Mass (kg)	慣性モーメント Inertia (I=GD ² /4) 入力軸換算値 The Motor Axis Conversion (kg-m ²)
81	RDS-010C-081-B1		3.01x10 ⁻⁴
108	RDS-010C-108-B1		2.83x10 ⁻⁴
153	RDS-010C-153-B1	6.9	2.69x10 ⁻⁴
189	RDS-010C-189-B1		2.63x10 ⁻⁴
243	RDS-010C-243-B1		2.57x10 ⁻⁴

Model Code: RDS-027C-XXX-B0 (Corresponding motor shaft diameter: $\phi 8$ to $\phi 14$)

加工用ピンホ
 (予番なく変更する場合があります。)
 (For machining is subject to
 change without notice.)

PT 1/8 プラグ
 PT 1/8 Plug
 (給油ポート)
 (For lubricant)

8-M8 深き15
 8-M8 DEPTH15
 (シャフト用)
 (For output shaft)

8- $\phi 9$ 通し
 8- $\phi 9$ THRU
 $\phi 14$ SPOT FACING DEPTH2
 (フランジ固定用)
 (For fixing the flange)

4-M6 通し
 4-M6 THRU
 (吊り上げ)
 (For handling)

5-M6 深き10
 5-M6 DEPTH10
 (固定用)
 (For fixing your member)

M6x20 六角穴付ボルト
 M6x20 Hexagonal socket bolt
 (モータシャフト固定用)
 (For fixing the motor shaft)

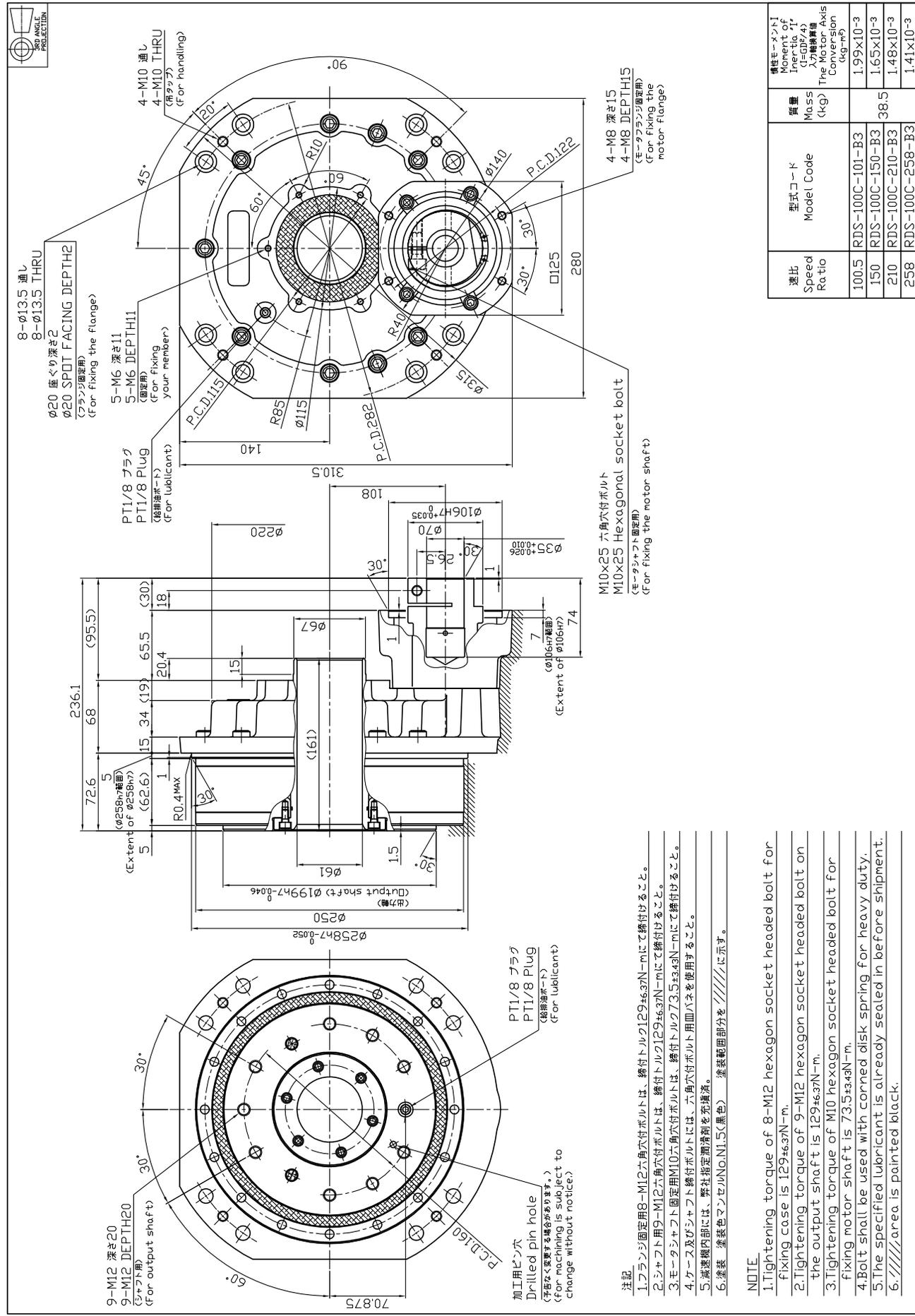
4-M6 深き11
 4-M6 DEPTH11
 (モータフランジ固定用)
 (For fixing the motor flange)

注記
 1.フランジ固定用8-M8六角穴付ボルトは、締付トルク37.2±1.86N-mにて締付けすること。
 2.シャフト用8-M8六角穴付ボルトは、締付トルク37.2±1.86N-mにて締付けすること。
 3.モータシャフト固定用M6六角穴付ボルトは、締付トルク15.6±0.78N-mにて締付けすること。
 4.ケース及びシャフト締付ボルトには、六角穴付ボルト用皿ハネを使用すること。
 5.減速機内部には、弊社指定潤滑剤を充填済。
 6.塗装 塗色 エポキシ マンセルNo.NI.5(黒色) 塗装範囲部分を//////に示す。

NOTE
 1.Tightening torque of 8-M8 hexagon socket headed bolt for fixing case is 37.2±1.86N-m.
 2.Tightening torque of 8-M8 hexagon socket headed bolt on the output shaft is 37.2±1.86N-m.
 3.Tightening torque of M6 hexagon socket headed bolt for fixing motor shaft is 15.6±0.78N-m.
 4.Bolt shall be used with coned disk spring for heavy duty.
 5.The specified lubricant is already sealed in before shipment.
 6.//////area is painted black.

速比 Speed Ratio	型式コード Model Code	質量 Mass (kg)	慣性モーメント Moment of Inertia I_r ($=Gd^4/4$) 入力軸換算値 The Motor Axis Conversion Coefficient ($\text{kg}\cdot\text{m}^2$)
99.82	RDS-027C-100-B0		3.05x10 ⁻⁴
141.68	RDS-027C-142-B0	8.5	2.26x10 ⁻⁴
184	RDS-027C-184-B0		1.93x10 ⁻⁴
233.45	RDS-027C-233-B0		1.69x10 ⁻⁴

Model Code: RDS-100C-XXX-B3 (Corresponding motor shaft diameter: $\phi 25$ to $\phi 35$)



- 注記**
1. フランジ固定用8-M12六角穴付ボルトは、締付トルク129±6.37N-mにて締付けること。
 2. シャフト用9-M12六角穴付ボルトは、締付トルク129±6.37N-mにて締付けること。
 3. モーターシャフト固定用M10六角穴付ボルトは、締付トルク73.5±3.43N-mにて締付けること。
 4. ケース及びシャフト締付ボルトには、六角穴付ボルト用皿ハネを使用すること。
 5. 歯速機内部には、弊社指定潤滑剤を充填す。
 6. 塗装 塗装色マンセルNo.1.5(黒色) 塗装範囲部分を//////に示す。
- NOTE**
1. Tightening torque of 8-M12 hexagon socket headed bolt for fixing case is 129±6.37N-m.
 2. Tightening torque of 9-M12 hexagon socket headed bolt on the output shaft is 129±6.37N-m.
 3. Tightening torque of M10 hexagon socket headed bolt for fixing motor shaft is 73.5±3.43N-m.
 4. Bolt shall be used with corned disk spring for heavy duty.
 5. The specified lubricant is already sealed in before shipment.
 6. ////area is painted black.

Technical Documents

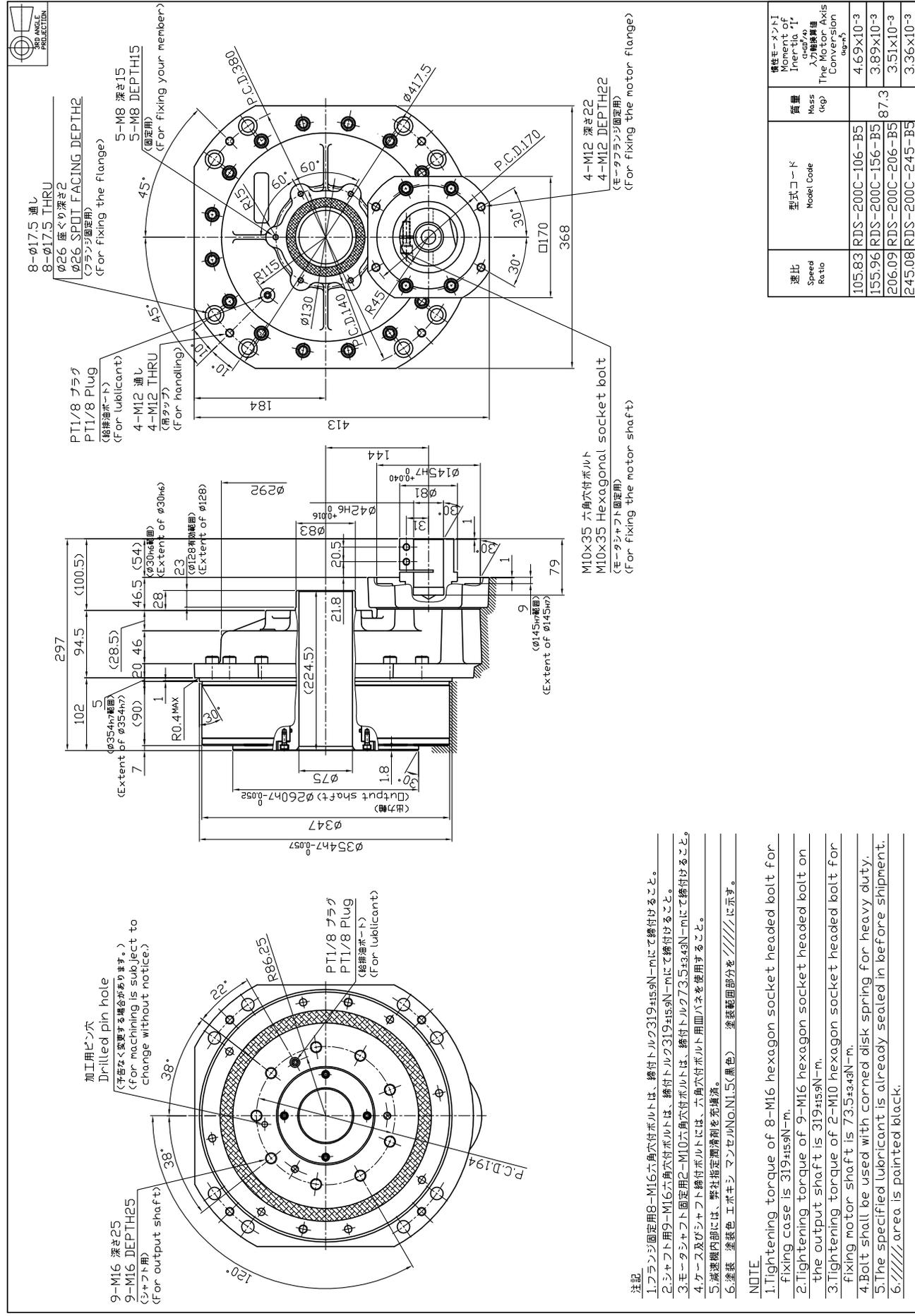
Motor flange / bushing

Pulley input type

Right angle input type

Straight input type

Model Code: RDS-200C-XXX-B5 (Corresponding motor shaft diameter: $\phi 32$ to $\phi 42$)



- 注記
- 1.フランジ固定用8-M16六角穴付ボルトは、締付トルク319±159N・mにて締付すること。
 - 2.シャフト用9-M16六角穴付ボルトは、締付トルク319±159N・mにて締付すること。
 - 3.モータシャフト固定用2-M10六角穴付ボルトは、締付トルク73.5±3.42N・mにて締付すること。
 - 4.ケース及びシャフト締付ボルトには、六角穴付ボルト用皿ガネを使用すること。
 - 5.減速機内部には、弊社指定潤滑剤を充填す。
 - 6.塗装 塗色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を//////に示す。
- NOTE
- 1.Tightening torque of 8-M16 hexagon socket headed bolt for fixing case is 319±159N·m.
 - 2.Tightening torque of 9-M16 hexagon socket headed bolt on the output shaft is 319±159N·m.
 - 3.Tightening torque of 2-M10 hexagon socket headed bolt for fixing motor shaft is 73.5±3.42N·m.
 - 4.Bolt shall be used with coned disk spring for heavy duty.
 - 5.The specified lubricant is already sealed in before shipment.
 - 6.////// area is painted black.

速比 Speed Ratio	型式コード Model Code	質量 Mass (kg)	慣性モーメント Moment of Inertia J (cm^2/s^2) 慣性モーメント The Moment Axis Conversion ($\text{kg}\cdot\text{m}^2$)
105.83	RDS-200C-106-B5		4.69x10 ⁻³
155.96	RDS-200C-156-B5		3.89x10 ⁻³
206.09	RDS-200C-206-B5	87.3	3.51x10 ⁻³
245.08	RDS-200C-245-B5		3.36x10 ⁻³

Technical Documents

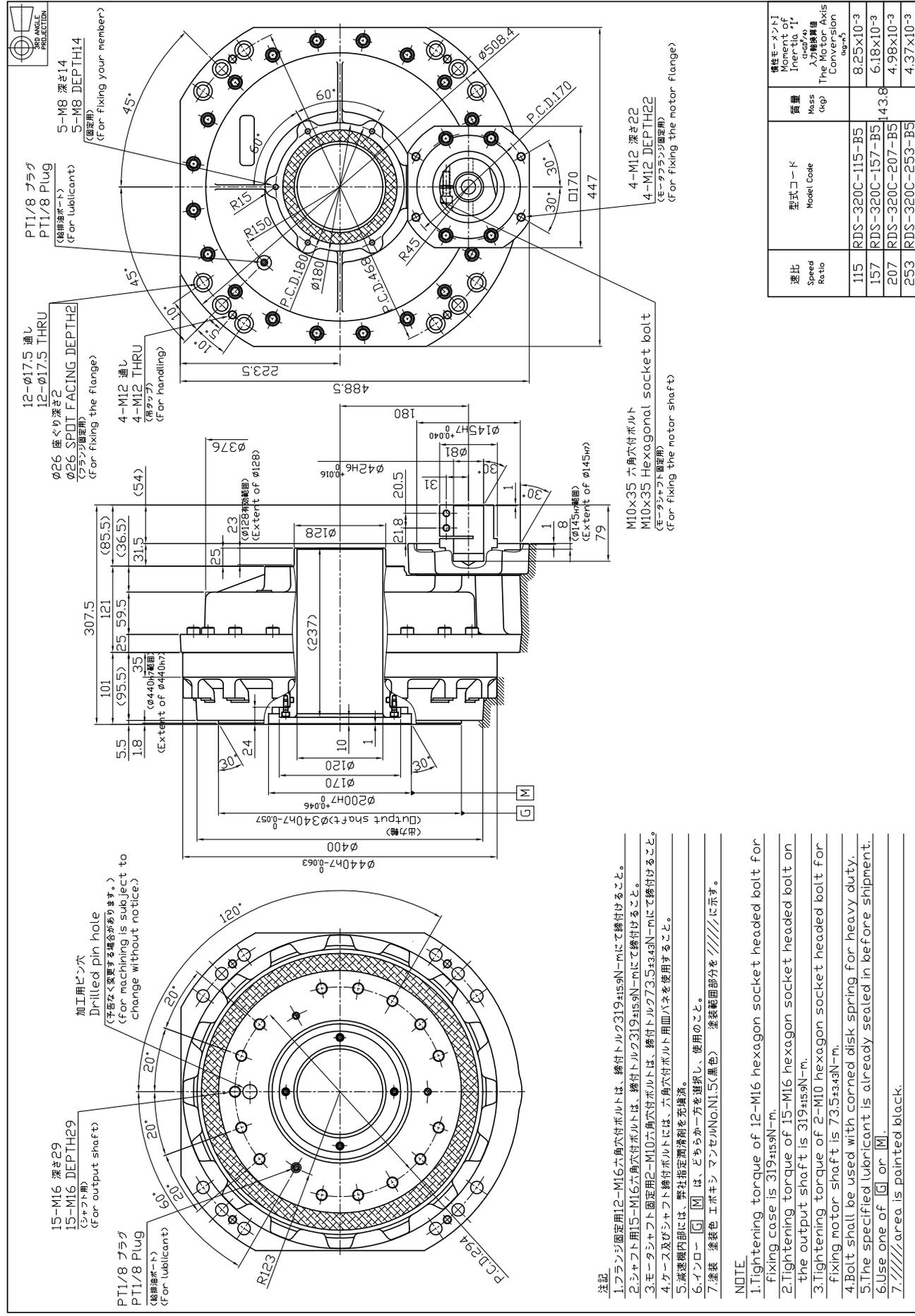
Motor flange / bushing

Pulley input type

Right angle input type

Straight input type

Model Code: RDS-320C-XXX-B5 (Corresponding motor shaft diameter: $\phi 32$ to $\phi 42$)



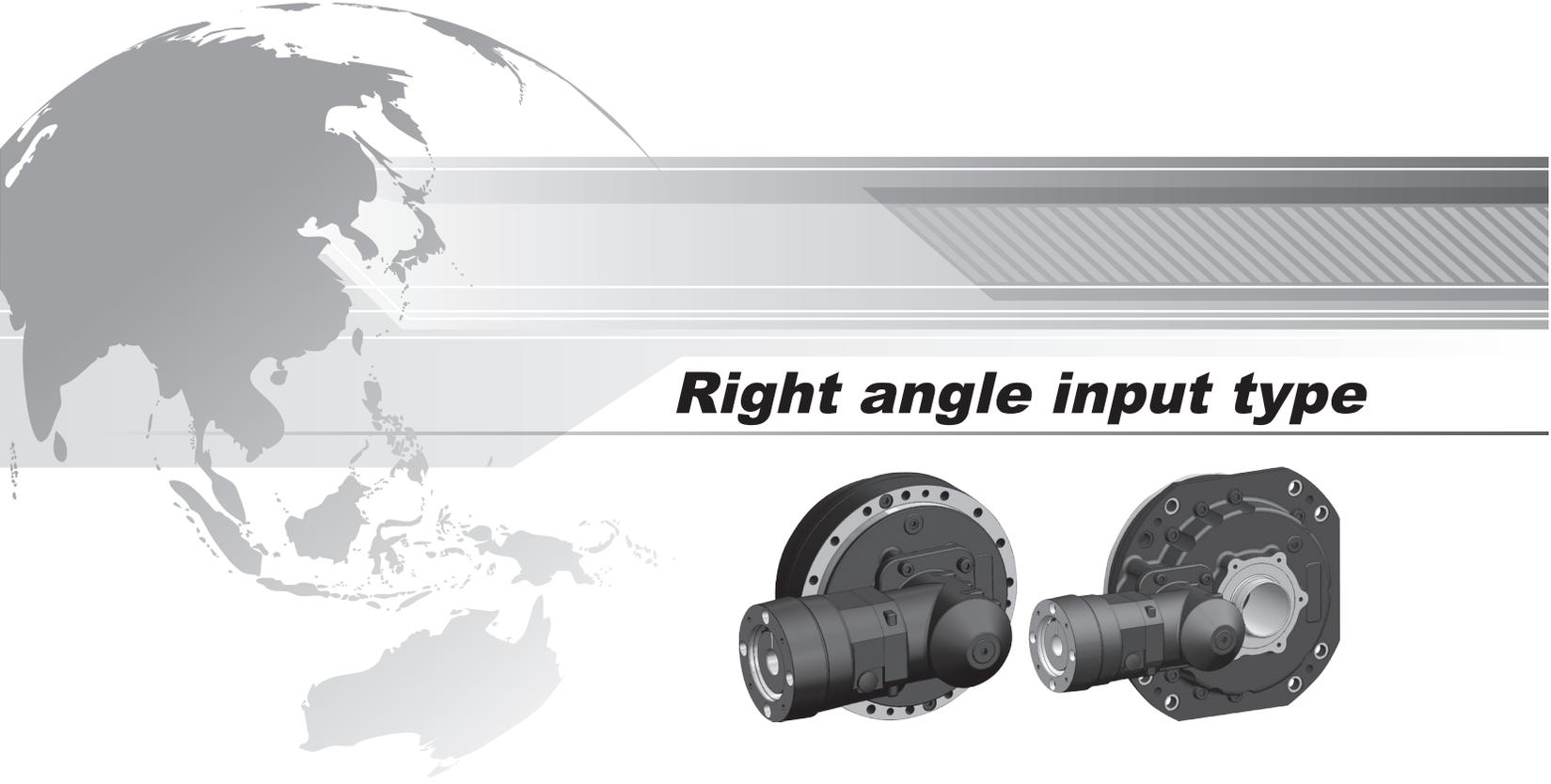
Technical Documents

Motor flange / bushing

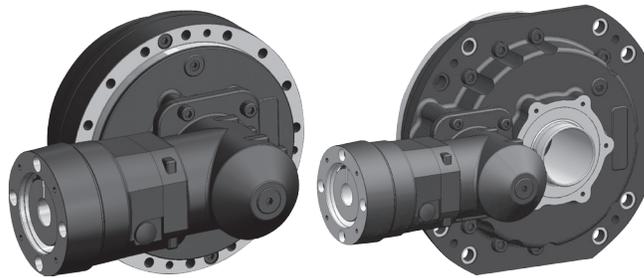
Pulley input type

Right angle input type

Straight input type



Right angle input type



Right Angle Input Type Code Description and Configuration Diagram

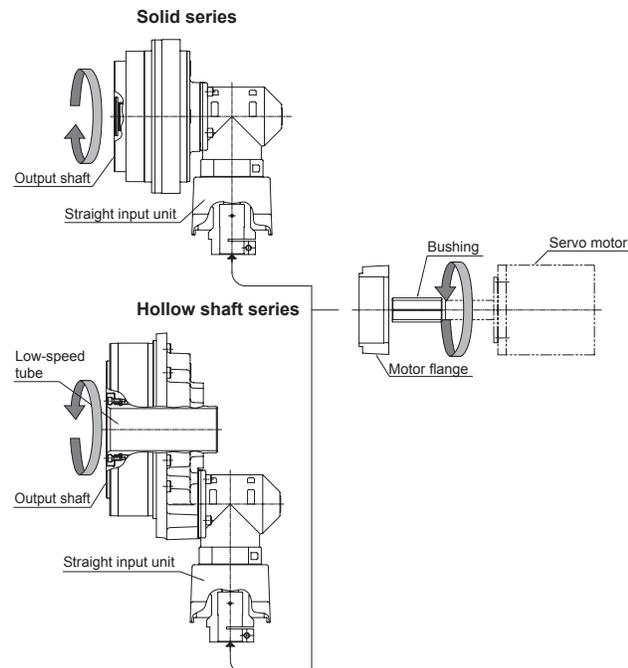
Product code

RD R - 080 E - 041 - C3 - GD - ZZ

Model Code			Ratio Code	Input unit code	Motor flange code	Bushing code
Right angle input code	Torque code	Series code				
R	006	E: Solid series	031, 043, 054, 079, 103	C0: Corresponding motor shaft diameter $\phi 8$ to 14 C1: Corresponding motor shaft diameter $\phi 15$ to 24	2-letter code (code will differ depending on motor to be attached)	2-letter code (code will differ depending on motor to be attached)
	020		041, 057, 081, 105, 121, 161	C0: Corresponding motor shaft diameter $\phi 8$ to 14 C1: Corresponding motor shaft diameter $\phi 15$ to 24		
	040		041, 057, 081, 105, 121, 153	C2: Corresponding motor shaft diameter $\phi 14$ to 24 C3: Corresponding motor shaft diameter $\phi 25$ to 35		
	080		041, 057, 081, 101, 121, 153	C2: Corresponding motor shaft diameter $\phi 14$ to 24 C3: Corresponding motor shaft diameter $\phi 25$ to 35		
	160		066, 081, 101, 121, 145, 171	C4: Corresponding motor shaft diameter $\phi 19$ to 28 C5: Corresponding motor shaft diameter $\phi 32$ to 42		
	320		066, 081, 101, 121, 141, 185	C4: Corresponding motor shaft diameter $\phi 19$ to 28 C5: Corresponding motor shaft diameter $\phi 32$ to 42		
	010	C: Hollow shaft series	081, 108, 153, 189, 243	C0: Corresponding motor shaft diameter $\phi 8$ to 14 C1: Corresponding motor shaft diameter $\phi 15$ to 24		
	027		100, 142, 184, 233	C0: Corresponding motor shaft diameter $\phi 8$ to 14 C1: Corresponding motor shaft diameter $\phi 15$ to 24		
	050		109, 153, 196, 240	C2: Corresponding motor shaft diameter $\phi 14$ to 24 C3: Corresponding motor shaft diameter $\phi 25$ to 35		
	100		101, 150, 210, 258	C2: Corresponding motor shaft diameter $\phi 14$ to 24 C3: Corresponding motor shaft diameter $\phi 25$ to 35		
	200		106, 156, 206, 245	C4: Corresponding motor shaft diameter $\phi 19$ to 28 C5: Corresponding motor shaft diameter $\phi 32$ to 42		
	320		115, 157, 207, 253	C4: Corresponding motor shaft diameter $\phi 19$ to 28 C5: Corresponding motor shaft diameter $\phi 32$ to 42		

Note: For selection of motor flange and bushing, see the selection tables on pages 83 – 85 or visit the Nabtesco website (URL : <http://www.nabtesco-precision.de>, <http://www.nabtescomotioncontrol.com>).

Configuration Diagram



Straight input type

Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

Rating Table Right angle input type

Solid series

Model Code	Ratio code (actual gear ratio)	Reduction Gear														Outer Dimensions
		T ₀	N ₀	K	T _{S1}	T _{S2}	N _{in}	N _s	N _{To}	Backlash	Lost motion	Torsional rigidity	Start-up Efficiency	M ₀	α	
		Rated Torque (N-m)	Rated Output Speed (r.p.m.)	Life Rating (Hr)	Allowable Startup/Stop Torque (N-m)	Momentary maximum allowable torque (N-m)	Allowable Input Speed (Note 2) (r.p.m.)	Allowable Output Speed (Note 2) (r.p.m.)	Reference value to output speed during continuous operation at rated torque (r.p.m.)							
RDR-006E	031 (31)	58	30	6,000	117	294	3,500	100	100	2.0	2.0	20	70	196	77.8	Input Unit Code : C0 ———P.44 Input Unit Code : C1 ———P.45
	043 (43)							81	76							
	054 (53.5)							65	63							
	079 (79)							44	44							
	103 (103)							34	34							
RDR-020E	041 (41)	108	15	6,000	271	543	3,500	75	55	1.5	1.5	49	75	882	93.2	Input Unit Code : C0 ———P.46 Input Unit Code : C1 ———P.47
	057 (57)	151			378	755		61	44							
	081 (81)	167			412	833		43	35							
	105 (105)							33	30							
	121 (121)							29	28							
	161 (161)							22	22							
RDR-040E	041 (41)	400	15	6,000	1,000	2,000	3,000	70	32	1.5	1.5	108	70	1,666	114.6	Input Unit Code : C2 ———P.48 Input Unit Code : C3 ———P.49
	057 (57)	412			1,029	2,058		53	30							
	081 (81)							37	28							
	105 (105)							29	27							
	121 (121)							25	25							
	153 (153)							20	20							
RDR-080E	041 (41)	400	15	6,000	1,000	2,000	3,000	70	35	1.5	1.5	196	75	2,156	136.1	Input Unit Code : C2 ———P.50 Input Unit Code : C3 ———P.51
	057 (57)	556			1,390	2,781		53	31							
	081 (81)	784			1,960	3,920		37	29							
	101 (101)							30	27							
	121 (121)							25	25							
	153 (153)							20	20							
RDR-160E	066 (66)	1,568	15	6,000	3,920	7,840	2,000	30	20	1.5	1.5	392	75	3,920	167.3	Input Unit Code : C4 ———P.52 Input Unit Code : C5 ———P.53
	081 (81)							25	18							
	101 (101)							20	16							
	121 (121)							17	14							
	145 (145)							14	13							
	171 (171)							12	12							
RDR-320E	066 (66)	1,800	15	6,000	4,503	9,002	2,000	30	14	1.5	1.5	980	80	7,056	203	Input Unit Code : C4 ———P.54 Input Unit Code : C5 ———P.55
	081 (81)	2,209			5,527	11,048		25	9							
	101 (101)	2,755			6,892	13,776		20	7							
	121 (121)	3,136			7,840	15,680		17	6							
	141 (141)							14	5							
	185 (185)							11	4							

Hollow shaft series

Model Code	Ratio code (actual gear ratio)	Reduction Gear													Outer Dimensions	
		T ₀	N ₀	K	T _{S1}	T _{S2}	N _{In}	N _S	N _{FD}	Backlash	Lost motion	Torsional rigidity	Start-up Efficiency	M ₀		α
		Rated Torque (N-m)	Rated Output Speed (r.p.m.)	Life Rating (Hr)	Allowable Startup/Stop Torque (N-m)	Momentary maximum allowable torque (N-m)	Allowable Input Speed (Note 2) (r.p.m.)	Allowable Output Speed (Note 2) (r.p.m.)	Reference value to output speed during continuous operation at rated torque (r.p.m.)	(arc.min.)	(arc.min.)	(N-m/arc.min.)	(%)	Allowable moment (Note 3) (N-m)		Dimension α (mm)
RDR-010C	081 (81)	98	15	6,000	245	490	3,500	43	39	1.5	1.5	47	65	686	91.2	Input Unit Code : C0 ———P.56
	108 (108)							32	31							
	153 (153)							23	23							
	189 (189)							19	20							
	243 (243)							14	14							
RDR-027C	100 (99.82)	265	15	6,000	662	1,323	3,500	35	23	1.5	1.5	147	70	980	112	Input Unit Code : C0 ———P.58
	142 (141.68)							25	18							
	184 (184)							19	15							
	233 (233.45)							15	14							
RDR-050C	109 (109)	490	15	6,000	1,225	2,450	3,000	28	28	1.5	1.5	255	70	1,764	136.8	Input Unit Code : C2 ———P.60
	153 (152.6)							20	20							
	196 (196.2)							15	15							
	240 (239.8)							13	13							
RDR-100C	101 (100.5)	980	15	6,000	2,450	4,900	3,000	30	19	1.5	1.5	510	80	2,450	148.9	Input Unit Code : C2 ———P.62
	150 (150)							20	17							
	210 (210)							14	14							
	258 (258)							12	12							
RDR-200C	106 (105.83)	1,960	15	6,000	4,900	9,800	2,000	19	11	1.5	1.5	980	80	8,820	204.4	Input Unit Code : C4 ———P.64
	156 (155.96)							13	8							
	206 (206.09)							10	6							
	245 (245.08)							8	5							
RDR-320C	115 (115)	3,136	15	6,000	7,840	15,680	2,000	17	14	1.5	1.5	1,960	80	20,580	245.9	Input Unit Code : C4 ———P.66
	157 (157)							13	11							
	207 (207)							10	7							
	253 (253)							8	8							

Notes:

1. The rating table shows the specification values including the entry fields for reduction gear values.
2. The allowable speed may be limited by heat depending on the operating rate. Make sure the surface temperature of the reduction gear does not exceed 60°C during use.
3. The allowable moment will differ depending on the thrust load. Check the allowable moment diagram.
4. For the moment of inertia of the reduction gears, refer to the external dimension drawings for the reduction gear.

Straight input type

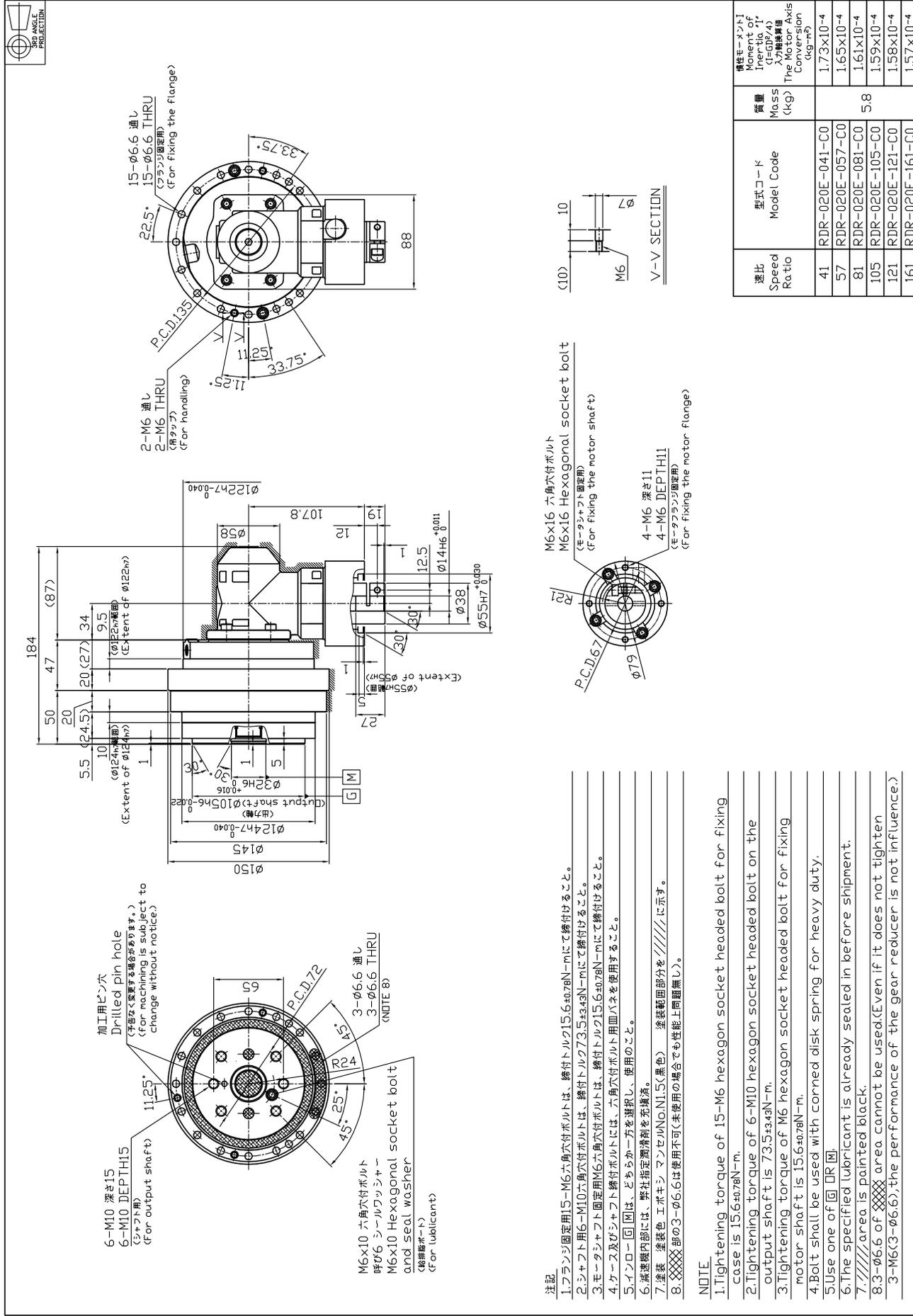
Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

Model Code: RDR-020E-XXX-C0 (Corresponding motor shaft diameter: φ8 to φ14)

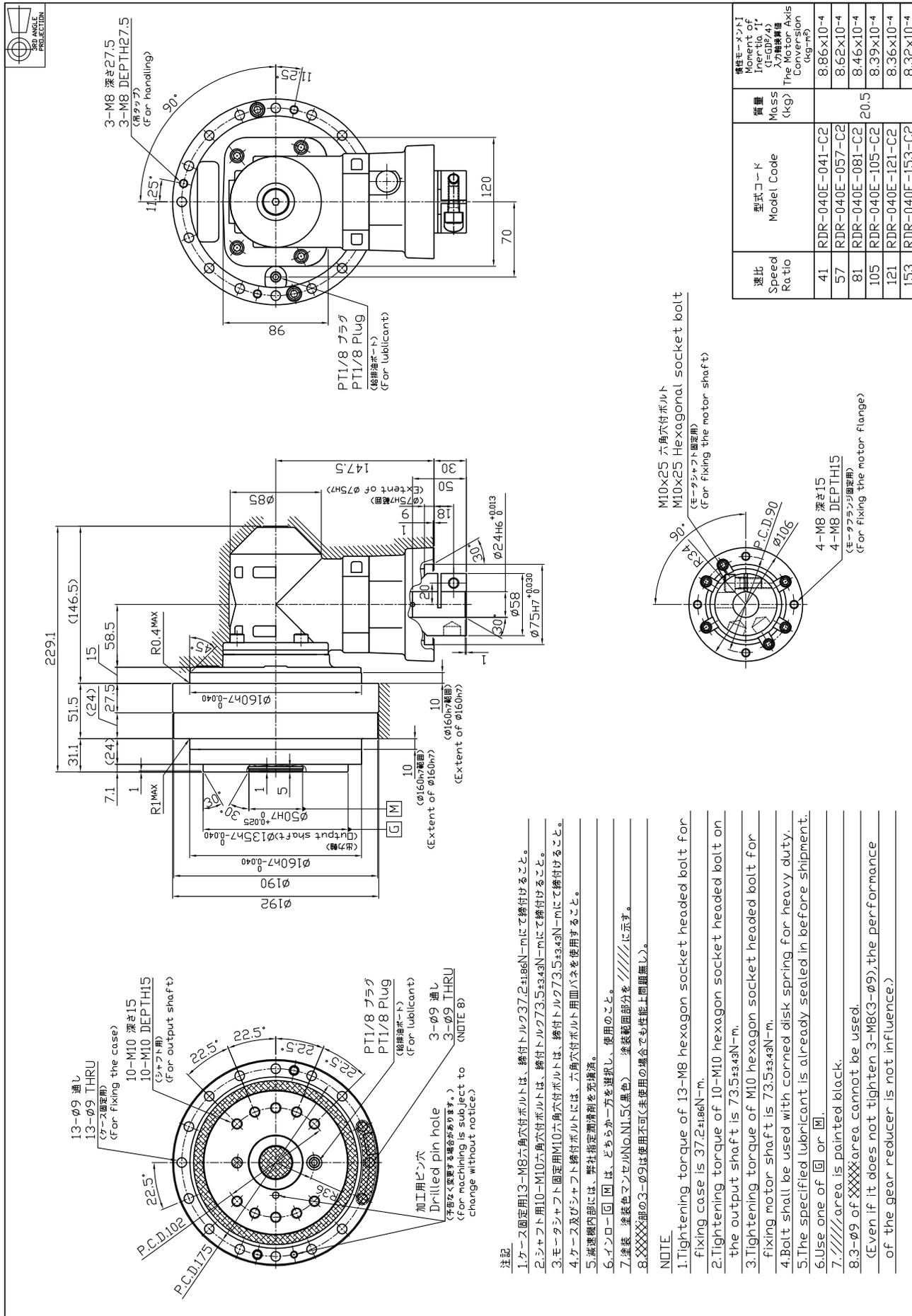


- 注記**
- 1.フランジ固定用15-φ6.6六角穴付ボルトは、締付トルク15.6±0.78N-mにて締付けること。
 - 2.シャフト用6-M10六角穴付ボルトは、締付トルク73.5±3.43N-mにて締付けること。
 - 3.モータシャフト固定用M6六角穴付ボルトは、締付トルク15.6±0.78N-mにて締付けること。
 - 4.ケース及びシャフト締付ボルトには、六角穴付ボルト用皿パネを使用すること。
 - 5.インロー回 図は、どちらか一方を選択し、使用のこと。
 - 6.減速機内部には、弊社指定潤滑剤を充填済。
 - 7.塗装 塗装色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を//////に示す。
 - 8.//////部の3-φ6.6は使用不可(未使用の場合でも性能上問題無し)。

NOTE

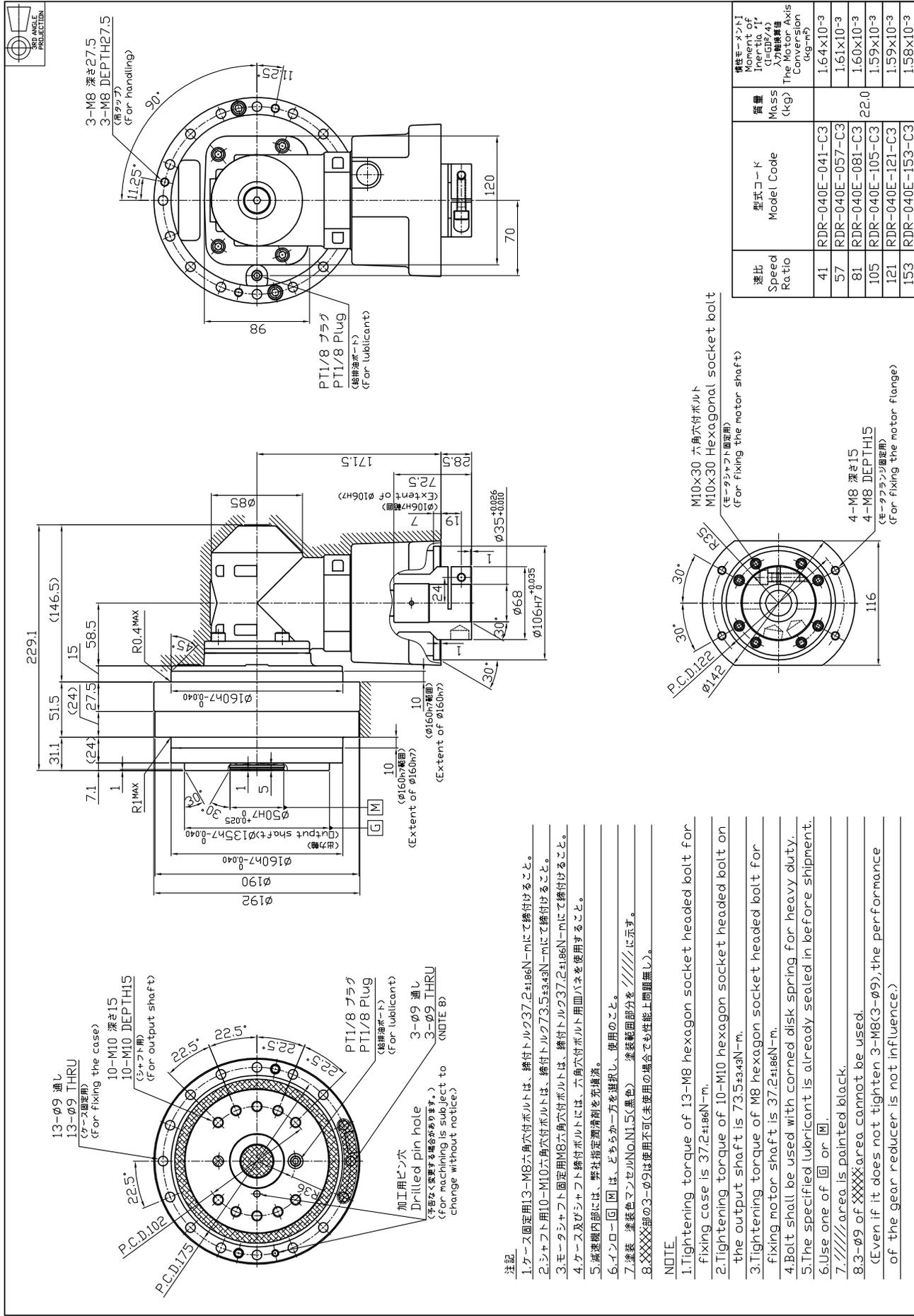
- 1.Tightening torque of 15-φ6.6 hexagon socket headed bolt for fixing case is 15.6±0.78N-m.
- 2.Tightening torque of 6-M10 hexagon socket headed bolt on the output shaft is 73.5±3.43N-m.
- 3.Tightening torque of M6 hexagon socket headed bolt for fixing motor shaft is 15.6±0.78N-m.
- 4.Bolt shall be used with corned disk spring for heavy duty.
- 5.Use one of 図 DR 図.
- 6.The specified lubricant is already sealed in before shipment.
- 7.//////area is painted black.
- 8.3-φ6.6 of ////// area cannot be used.(Even if it does not tighten 3-M6(3-φ6.6), the performance of the gear reducer is not influence.)

Model Code: RDR-040E-XXX-C2 (Corresponding motor shaft diameter: $\phi 14$ to $\phi 24$)



- 注記
- 1.ケース固定用13-M8六角穴付ボルトは、締付トルク37.2±1.86N-mにて締付けること。
 - 2.シャフト用10-M10六角穴付ボルトは、締付トルク73.5±3.43N-mにて締付けること。
 - 3.モータシャフト固定用M10六角穴付ボルトは、締付トルク73.5±3.43N-mにて締付けること。
 - 4.ケース及びシャフト締付ボルトには、六角穴付ボルト用皿ハネを使用すること。
 - 5.減速機内部には、弊社指定潤滑剤を充填済。
 - 6.インロー「**凹**」は、どちらか一方を選択し、使用のこと。
 - 7.塗装 塗装番号No.N1.5(黒色) 塗装範囲部分を//////に示す。
 - 8.//////部の3- $\phi 9$ は使用不可(未使用の場合を軸性能上問題無し)。
- NOTE
- 1.Tightening torque of 13-M8 hexagon socket headed bolt for fixing case is 37.2±1.86N-m.
 - 2.Tightening torque of 10-M10 hexagon socket headed bolt on the output shaft is 73.5±3.43N-m.
 - 3.Tightening torque of M10 hexagon socket headed bolt for fixing motor shaft is 73.5±3.43N-m.
 - 4.Bolt shall be used with corned disk spring for heavy duty.
 - 5.The specified lubricant is already sealed in before shipment.
 - 6.Use one of **凹** or **凸**.
 - 7.//////area is painted black.
 - 8.3- $\phi 9$ of //////area cannot be used.
(Even if does not tighten 3-M8(3- $\phi 9$),the performance of the gear reducer is not influence.)

Model Code: RDR-040E-XXX-C3 (Corresponding motor shaft diameter: $\phi 25$ to $\phi 35$)



- 注記
- 1.ケース固定用13-M8六角穴付ボルトは、締付トルク37.2±1.86N-mにて締付けすること。
 - 2.シャフト用10-M10六角穴付ボルトは、締付トルク73.5±3.43N-mにて締付けすること。
 - 3.モータシャフト固定用M8六角穴付ボルトは、締付トルク37.2±1.86N-mにて締付けすること。
 - 4.ケース及びシャフト締付ボルトには、六角穴付ボルト用皿ハネを使用すること。
 - 5.減速機内部には、弊社指定潤滑剤を充填。
 - 6.インロー図 図 は、どちらか一方を選択し、使用のこと。
 - 7.塗装 塗装色マンセルNo.N1.5(黒色) 塗装範囲部分を//////に示す。
 8. XXXX部の3-φ9は使用不可(未使用の場合でも性能上問題無し)。
- NOTE
- 1.Tightening torque of 13-M8 hexagon socket headed bolt for fixing case is 37.2±1.86N-m.
 - 2.Tightening torque of 10-M10 hexagon socket headed bolt on the output shaft is 73.5±3.43N-m.
 - 3.Tightening torque of M8 hexagon socket headed bolt for fixing motor shaft is 37.2±1.86N-m.
 - 4.Bolt shall be used with coned disk spring for heavy duty.
 - 5.The specified lubricant is already sealed in before shipment.
 - 6.Use one of 図 or 図.
 - 7.//////area is painted black.
 - 8.3-φ9 of XXXX area cannot be used.
(Even if it does not tighten 3-M8(3-φ9), the performance of the gear reducer is not influence.)

Straight input type

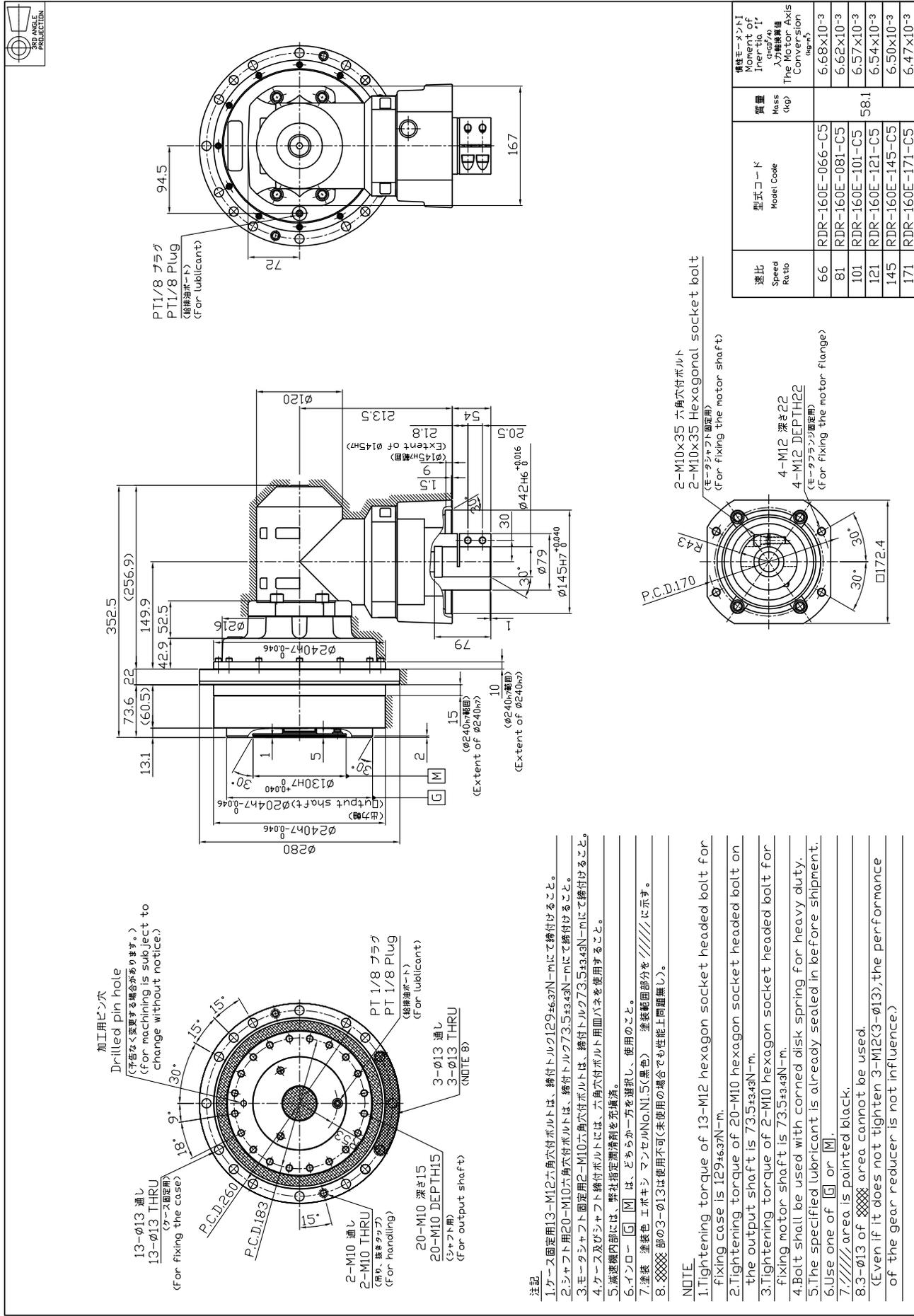
Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

Model Code: RDR-160E-XXX-C5 (Corresponding motor shaft diameter: $\phi 32$ to $\phi 42$)



- 注記
- 1.ケース固定用13-M12六角穴付ボルトは、締付トルク129±6.37N-mにて締付けること。
 - 2.シャフト用20-M10六角穴付ボルトは、締付トルク73.5±3.43N-mにて締付けること。
 - 3.モータシャフト固定用2-M10六角穴付ボルトは、締付トルク73.5±3.43N-mにて締付けること。
 - 4.ケース及びギヤット締付ボルトには、六角穴付ボルト用皿バネを使用すること。
 - 5.減速機内部には、弊社指定潤滑剤を充填済。
 - 6.インロー [G] [M] は、どちらか一方を選択し、使用のこと。
 - 7.塗装 塗装色 エポキシ マンゼルNo.11.5(黒色) 塗装範囲部分を//////に示す。
 - 8.//////部の3- $\phi 13$ は使用不可(未使用の場合でも性能上問題無し)。
- NOTE
- 1.Tightening torque of 13-M12 hexagon socket headed bolt for fixing case is 129±6.37N-m.
 - 2.Tightening torque of 20-M10 hexagon socket headed bolt on the output shaft is 73.5±3.43N-m.
 - 3.Tightening torque of 2-M10 hexagon socket headed bolt for fixing motor shaft is 73.5±3.43N-m.
 - 4.Bolt shall be used with coned disk spring for heavy duty.
 - 5.The specified lubricant is already sealed in before shipment.
 - 6.Use one of [G] or [M].
 - 7.//////area is painted black.
 - 8.3- $\phi 13$ of //////area cannot be used.
(Even if it does not tighten 3-M12(3- $\phi 13$), the performance of the gear reducer is not influence.)

Straight input type

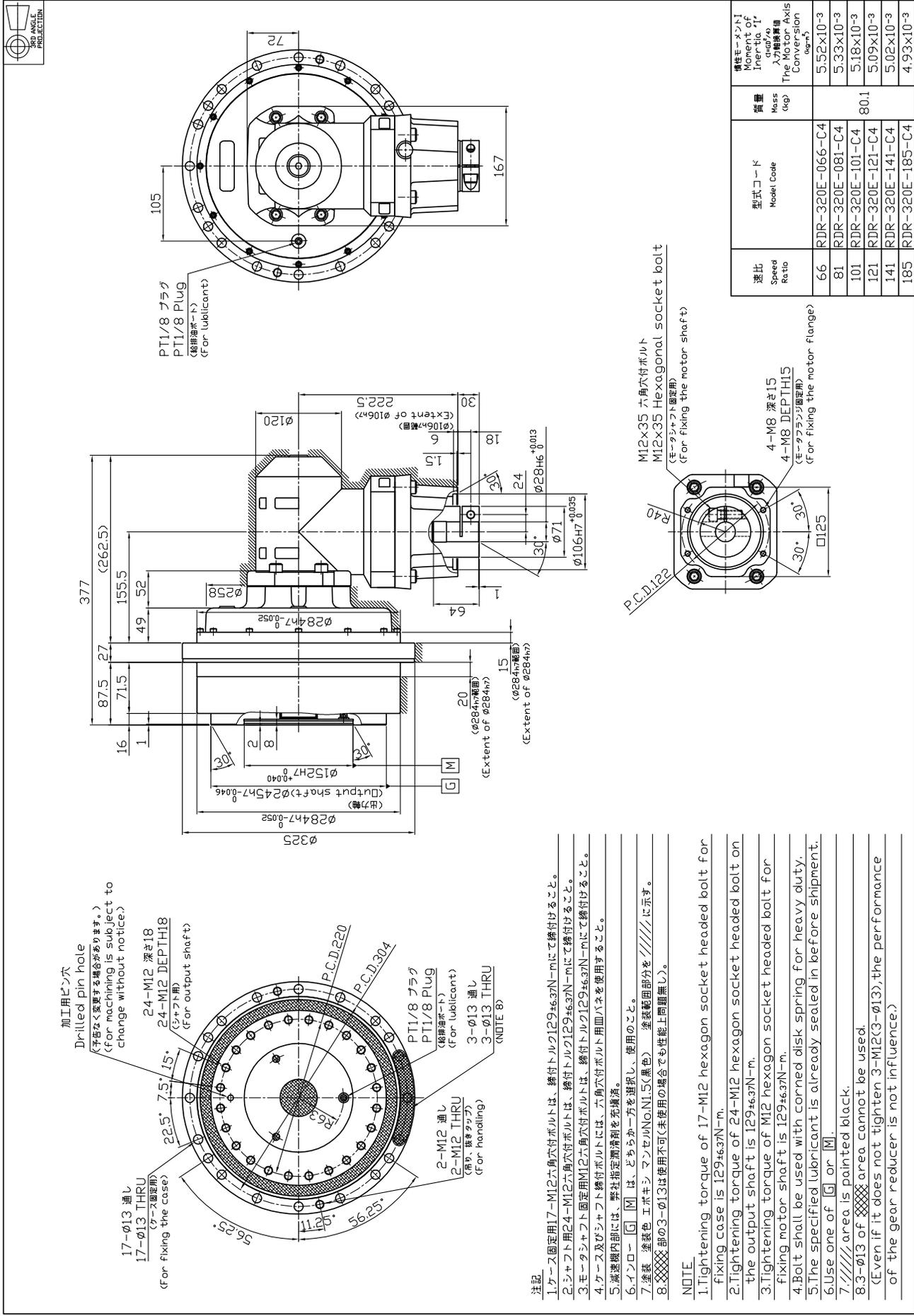
Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

Model Code: RDR-320E-XXX-C4 (Corresponding motor shaft diameter: $\phi 19$ to $\phi 28$)



- 注記
- ケース固定用17-M12六角穴付ボルトは、締付トルク[29±6.37N・m]にて締付けること。
 - シャフト用24-M12六角穴付ボルトは、締付トルク[29±6.37N・m]にて締付けること。
 - モータシャフト固定用M12六角穴付ボルトは、締付トルク[29±6.37N・m]にて締付けること。
 - ケース及びシャフト締付ボルトには、六角穴付ボルト用皿パネを使用すること。
 - 減速機内には、弊社指定潤滑剤を充填済。
 - インロー [G] [M] は、どちらか一方を選択し、使用のこと。
 - 塗装 塗装色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を//////に示す。
 - //////部の3- $\phi 13$ は使用不可(未使用の場合でも性能上問題無し)。
- NOTE
- Tightening torque of 17-M12 hexagon socket headed bolt for fixing case is 129±6.37N·m.
 - Tightening torque of 24-M12 hexagon socket headed bolt on the output shaft is 129±6.37N·m.
 - Tightening torque of M12 hexagon socket headed bolt for fixing motor shaft is 129±6.37N·m.
 - Bolt shall be used with coned disk spring for heavy duty.
 - The specified lubricant is already sealed in before shipment.
 - Use one of [G] or [M].
 - ////// area is painted black.
 - 3- $\phi 13$ of ////// area cannot be used.
(Even if it does not tighten 3-M12(3- $\phi 13$), the performance of the gear reducer is not influence.)

Model Code: RDR-320E-XXX-C5 (Corresponding motor shaft diameter: $\phi 32$ to $\phi 42$)

加工用ピン穴
(予取なく変更する場合があります。)
(for machining is subject to
change without notice.)

17- $\phi 13$ 通し
17- $\phi 13$ THRU
(クレーン用固定用)
(For fixing the case)

22.5° 7.5° 15°

24-M12 深さ18
24-M12 DEPTH18
(シャフト用)
(For output shaft)

PT1/8 プラグ
PT1/8 Plug
(給油ホース用)
(For lubricant)

2-M12 通し
2-M12 THRU
(吊り、持ち上げ用)
(For handling)

3- $\phi 13$ 通し
3- $\phi 13$ THRU
(NOTE 8)

$\phi 284h7-0.052$
 $\phi 152H7-0.040$
 $\phi 284h7-0.052$
 $\phi 252H7-0.052$
 $\phi 145H7-0.052$
 $\phi 42h6-0.016$
 $\phi 79$
 $\phi 145H7-0.040$

377 (262.5)
155.5
71.5
27
87.5
16
1
49
52
20
15
79
54
21.8
213.5
9
1.5
30°
30°
30°
30°

PT1/8 プラグ
PT1/8 Plug
(給油ホース用)
(For lubricant)

105
167
72

2-M10x35 六角穴付ボルト
(モータシャフト固定用)
(For fixing the motor shaft)

4-M12 深さ22
4-M12 DEPTH22
(モータシャフト固定用)
(For fixing the motor flange)

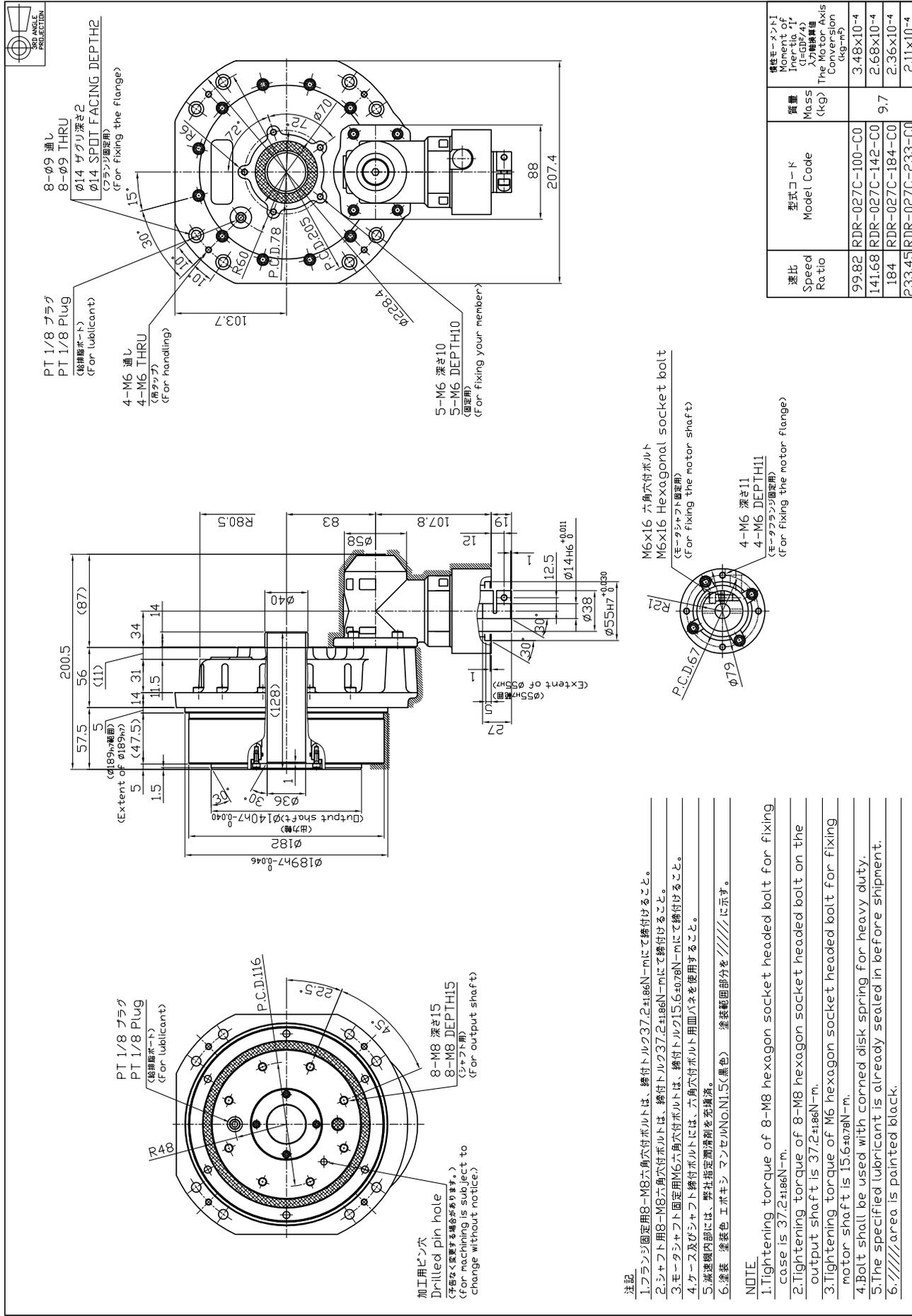
P.C.D.170
R43
 $\phi 172.4$
30°
30°

速比 Speed Ratio	型式コード Model Code	質量 Mass (kg)	慣性モーメント Moment of Inertia (kg・mm ²) The Motor Axis Conversion (kg・m ²)
66	RDR-320E-066-C5		7.19x10 ⁻³
81	RDR-320E-081-C5		7.00x10 ⁻³
101	RDR-320E-101-C5	82.6	6.85x10 ⁻³
121	RDR-320E-121-C5		6.76x10 ⁻³
141	RDR-320E-141-C5		6.69x10 ⁻³
185	RDR-320E-185-C5		6.60x10 ⁻³

注記
1. ケース固定用17-M12六角穴付ボルトは、締付トルク129±6.37N・mにて締付けること。
2. シャフト用24-M12六角穴付ボルトは、締付トルク129±6.37N・mにて締付けること。
3. モータシャフト固定用2-M10六角穴付ボルトは、締付トルク73.5±3.43N・mにて締付けること。
4. ケース及びシャフト締付ボルトには、六角穴付ボルト用皿ワッシャーを使用すること。
5. 減速機内部には、弊社指定潤滑剤を充填す。
6. インロー [G] [M] は、どちらか一方を選択し、使用のこと。
7. 塗装 塗装色 エポキシ マンゼルフノ.11.5(黒色) 塗装範囲部分を//////に示す。
8. 表面の3- $\phi 13$ は使用不可(未使用の場合でも性能上問題無し)。

NOTE
1. Tightening torque of 17-M12 hexagon socket headed bolt for fixing case is 129±6.37N・m.
2. Tightening torque of 24-M12 hexagon socket headed bolt on the output shaft is 129±6.37N・m.
3. Tightening torque of 2-M10 hexagon socket headed bolt for fixing motor shaft is 73.5±3.43N・m.
4. Bolt shall be used with corned disk spring for heavy duty.
5. The specified lubricant is already sealed in before shipment.
6. Use one of [G] or [M].
7. //// area is painted black.
8. 3- $\phi 13$ of surface cannot be used.
(Even if it does not tighten 3-M12(3- $\phi 13$), the performance of the gear reducer is not influence.)

Model Code: RDR-027C-XXX-C0 (Corresponding motor shaft diameter: $\phi 8$ to $\phi 14$)



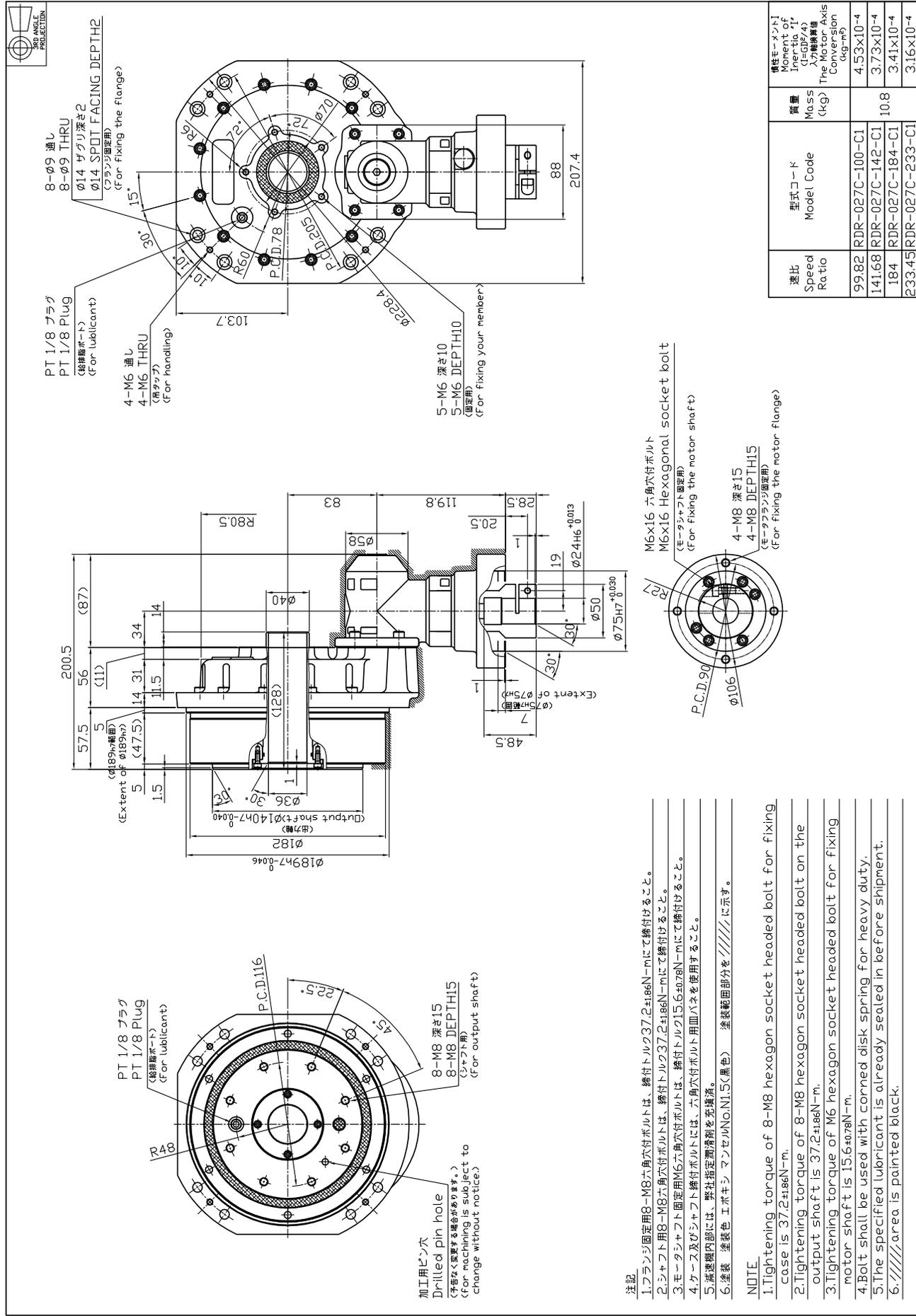
注記

1. フランジ固定用8-M8六角穴付ボルトは、締付トルク37.2±1.66N-mにて締付けすること。
2. シャフト用8-M8六角穴付ボルトは、締付トルク37.2±1.66N-mにて締付けすること。
3. モータシャフト固定用M6六角穴付ボルトは、締付トルク15.6±0.78N-mにて締付けすること。
4. G-スクリュー及びシャフト締付ボルトには、六角穴付ボルト用皿パネを使用すること。
5. 減速機内部には、弊社指定潤滑剤を充填済み。
6. 塗装 塗色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を//////に示す。

NOTE

1. Tightening torque of 8-M8 hexagon socket headed bolt for fixing case is 37.2±1.66N-m.
2. Tightening torque of 8-M8 hexagon socket headed bolt on the output shaft is 37.2±1.66N-m.
3. Tightening torque of M6 hexagon socket headed bolt for fixing motor shaft is 15.6±0.78N-m.
4. Bolt shall be used with coned disk spring for heavy duty.
5. The specified lubricant is already sealed in before shipment.
6. //// area is painted black.

Model Code: RDR-027C-XXX-C1 (Corresponding motor shaft diameter: $\phi 15$ to $\phi 24$)



Straight input type

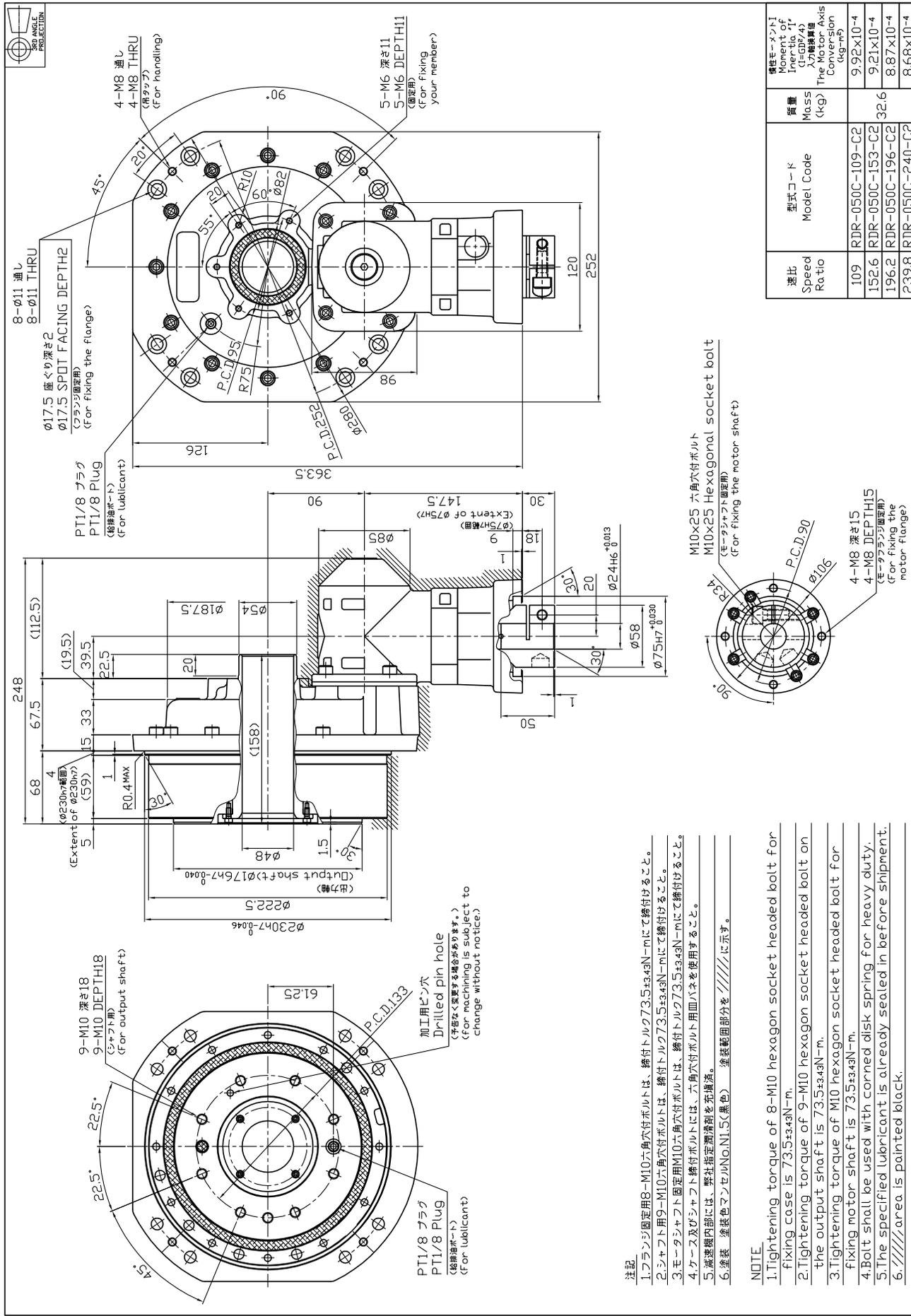
Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

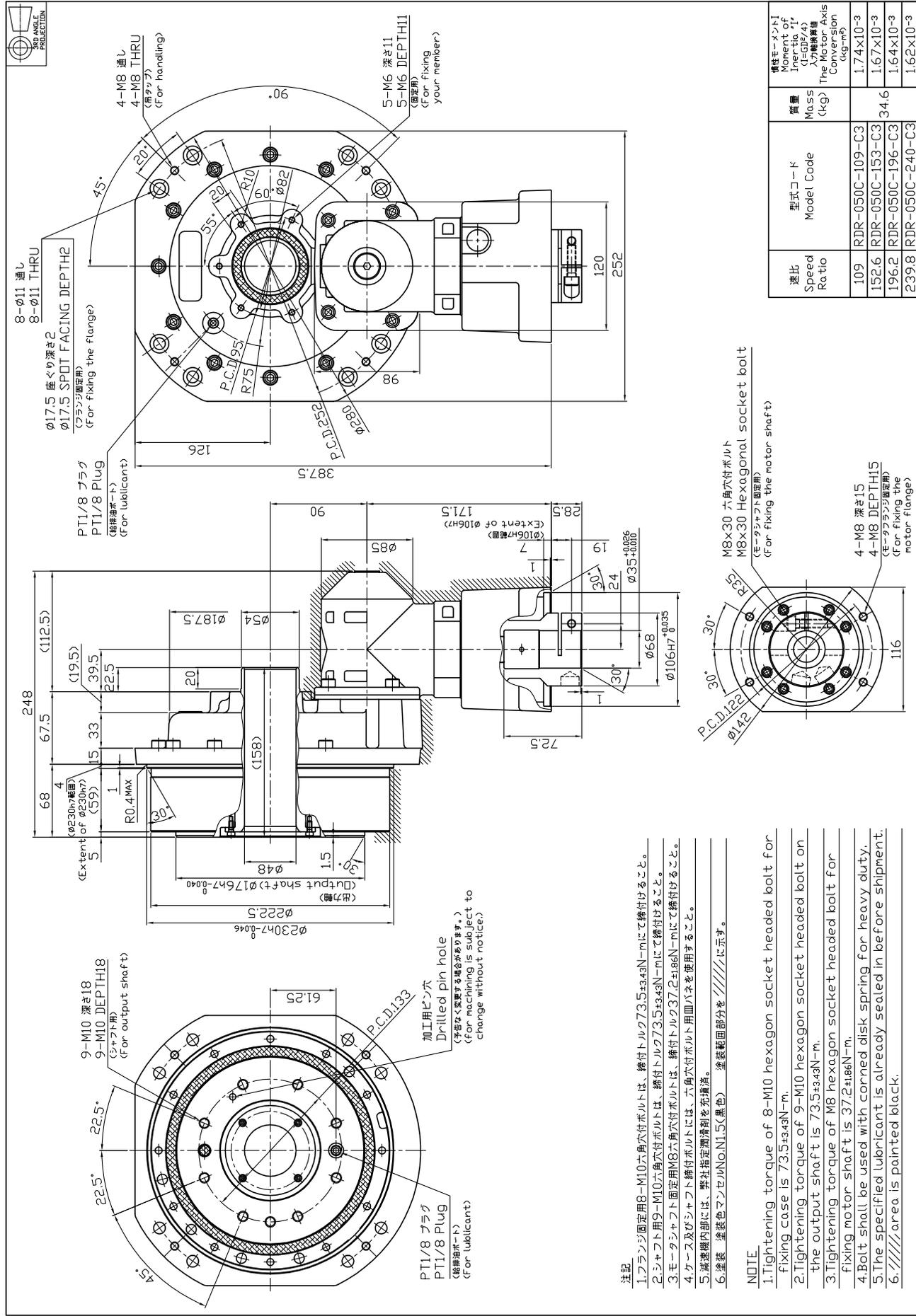
Model Code: RDR-050C-XXX-C2 (Corresponding motor shaft diameter: $\phi 14$ to $\phi 24$)



- 注記
1. フランジ固定用8-M10六角穴付ボルトは、締付トルク73.5±3.43N-mにて締付けること。
 2. シャフト用9-M10六角穴付ボルトは、締付トルク73.5±3.43N-mにて締付けること。
 3. モータシャフト固定用M10六角穴付ボルトは、締付トルク73.5±3.43N-mにて締付けること。
 4. ケース及びシャフト締付ボルトには、六角穴付ボルト用皿入ネを使用すること。
 5. 減速機内部には、弊社指定潤滑油を充填済。
 6. 塗装 塗装色メンセルNo.15(藍色) 塗装範囲部分を//////に示す。
- NOTE
1. Tightening torque of 8-M10 hexagon socket headed bolt for fixing case is 73.5±3.43N-m.
 2. Tightening torque of 9-M10 hexagon socket headed bolt on the output shaft is 73.5±3.43N-m.
 3. Tightening torque of M10 hexagon socket headed bolt for fixing motor shaft is 73.5±3.43N-m.
 4. Bolt shall be used with corned disk spring for heavy duty.
 5. The specified lubricant is already sealed in before shipment.
 6. ////area is painted black.

速比 Speed Ratio	型式コード Model Code	質量 Mass (kg)	慣性モーメント Moment of Inertia (I=GD ² /4) 入力軸側慣性 The Inertia Coefficient (kg·m ²)
109	RDR-050C-109-C2		9.92x10 ⁻⁴
152.6	RDR-050C-153-C2		9.21x10 ⁻⁴
196.2	RDR-050C-196-C2	32.6	8.87x10 ⁻⁴
239.8	RDR-050C-240-C2		8.68x10 ⁻⁴

Model Code: RDR-050C-XXX-C3 (Corresponding motor shaft diameter: $\phi 25$ to $\phi 35$)



- 注記
- 1.フランジ固定用8-M10六角穴付ボルトは、締付トルク73.5±3.43N-mにて締付けること。
 - 2.シャフト用9-M10六角穴付ボルトは、締付トルク73.5±3.43N-mにて締付けること。
 - 3.モータシャフト固定用M8六角穴付ボルトは、締付トルク37.2±1.86N-mにて締付けること。
 - 4.ケース及びシャフト締付ボルトには、六角穴付ボルト用皿パネを使用すること。
 - 5.減速機内部には、弊社指定潤滑剤を充填済。
 - 6.塗装 塗装色マゼンタNo.1.5(黒色) 塗装範囲部分を//////に示す。
- NOTE
- 1.Tightening torque of 8-M10 hexagon socket headed bolt for fixing case is 73.5±3.43N-m.
 - 2.Tightening torque of 9-M10 hexagon socket headed bolt on the output shaft is 73.5±3.43N-m.
 - 3.Tightening torque of M8 hexagon socket headed bolt for fixing motor shaft is 37.2±1.86N-m.
 - 4.Bolt shall be used with corned disk spring for heavy duty.
 - 5.The specified lubricant is already sealed in before shipment.
 - 6.//////area is painted black.

Technical Documents

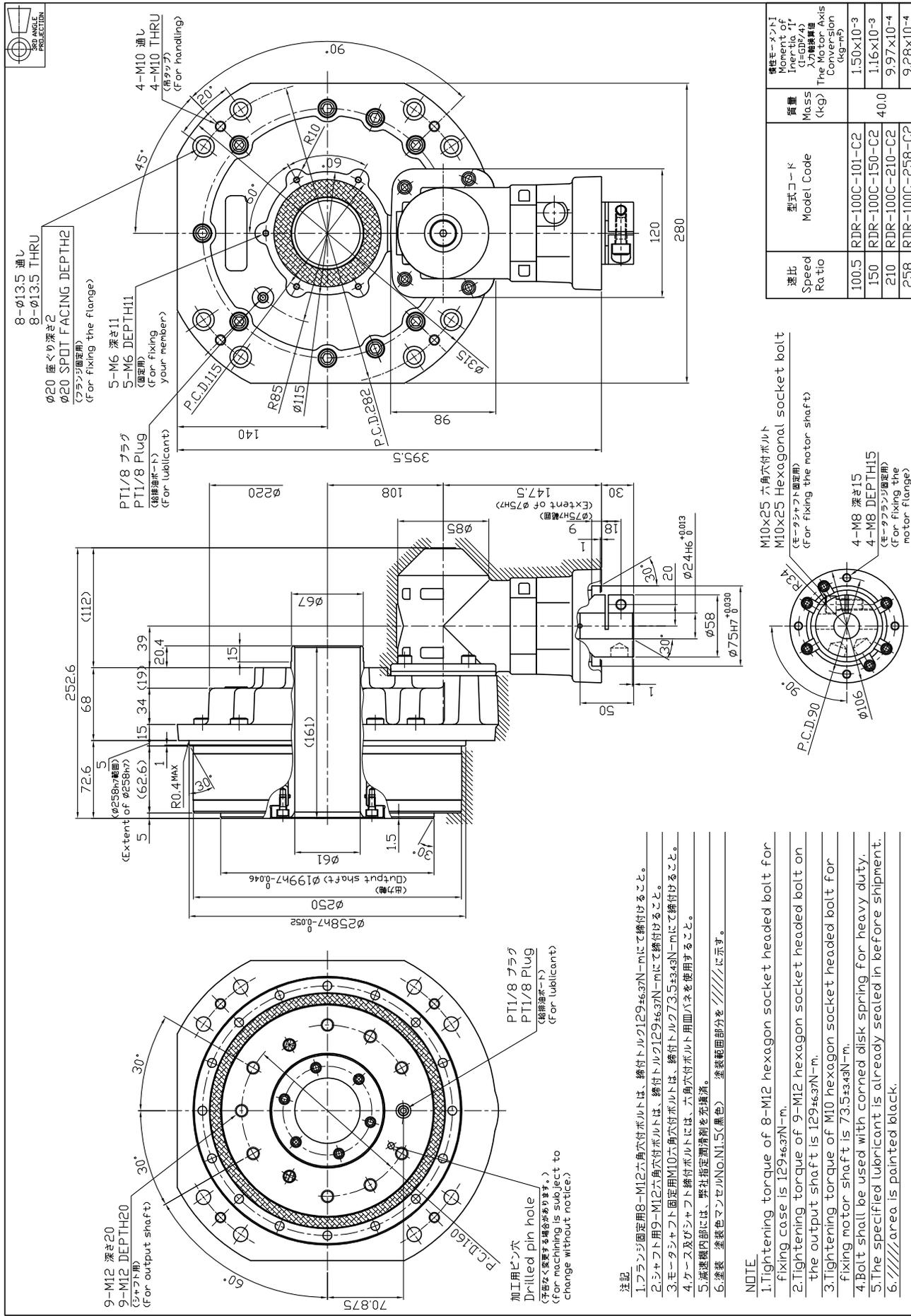
Motor flange / bushing

Pulley input type

Right angle input type

Straight input type

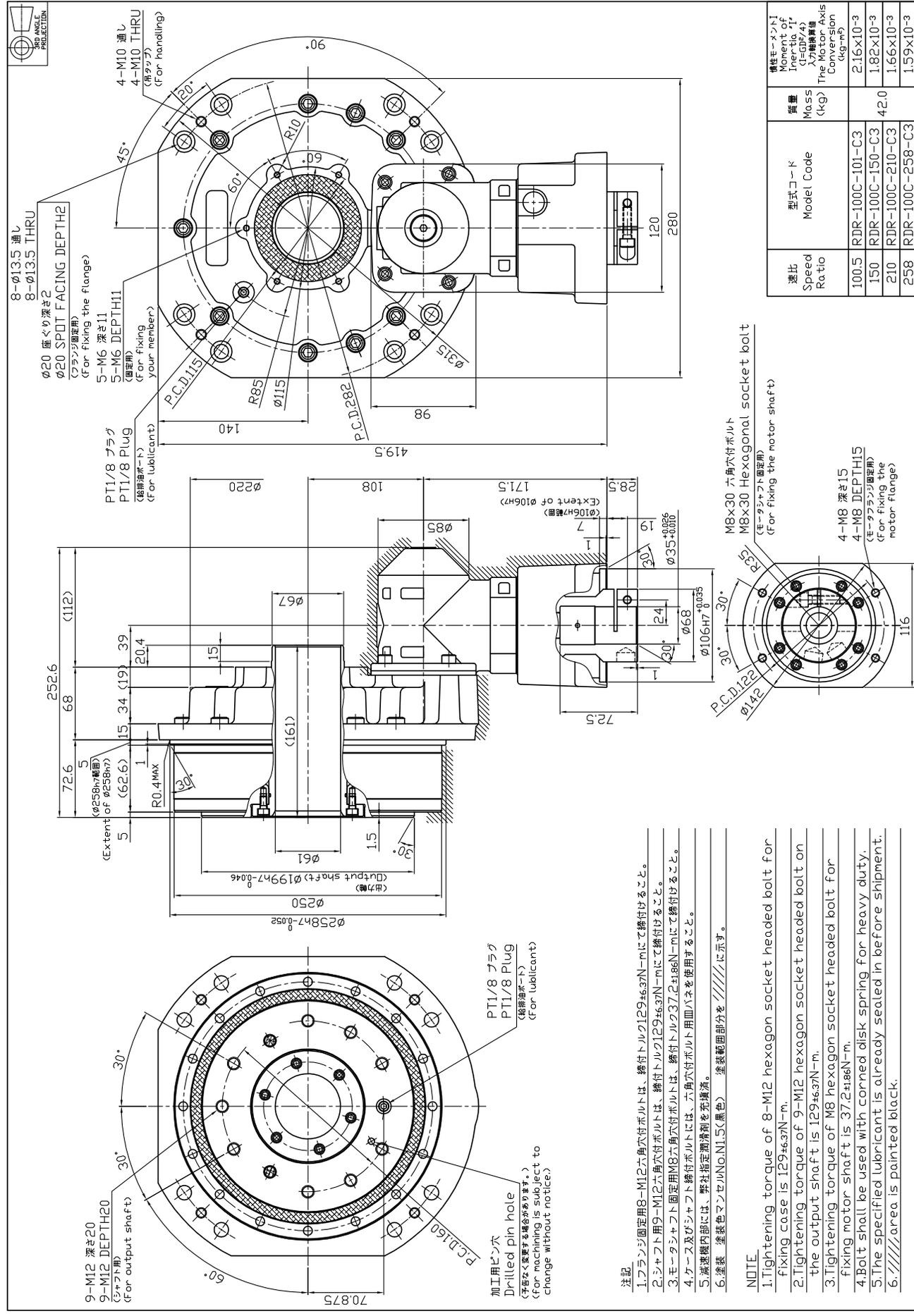
Model Code: RDR-100C-XXX-C2 (Corresponding motor shaft diameter: $\phi 14$ to $\phi 24$)



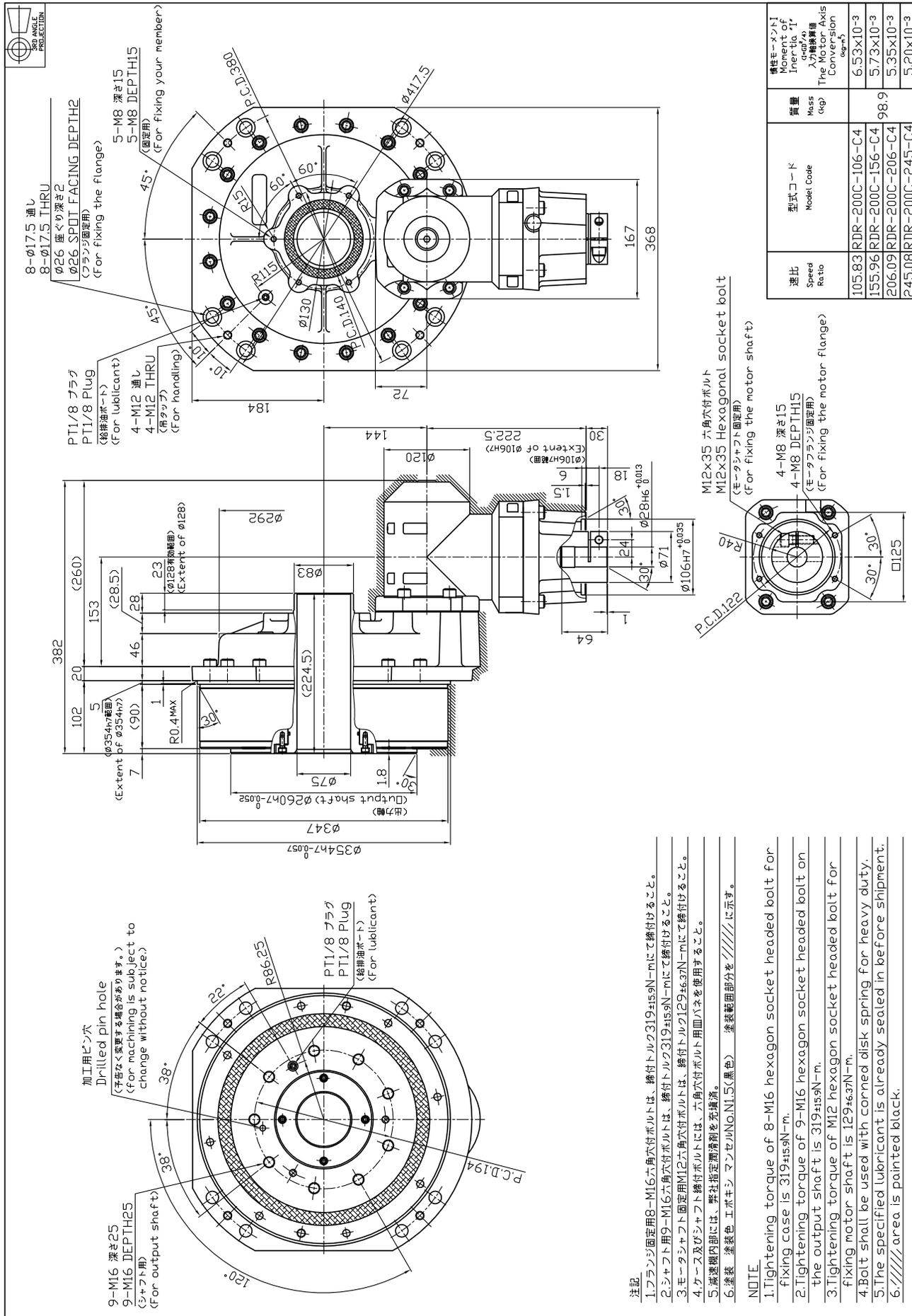
速比 Speed Ratio	型式コード Model Code	質量 Mass (kg)	慣性モーメント Moment of Inertia I_x ($=Gp^2/4$) 入力の単位値 力の単位値 The Moment of Inertia ($\text{kg}\cdot\text{m}^2$)
100.5	RDR-100C-101-C2		1.50x10 ⁻³
150	RDR-100C-150-C2	40.0	1.16x10 ⁻³
210	RDR-100C-210-C2		9.97x10 ⁻⁴
258	RDR-100C-258-C2		9.28x10 ⁻⁴

- 注記
1. フランジ固定用8-M12六角穴付ボルトは、締付トルク129±6.37N-mにて締付けること。
 2. シャフト用9-M12六角穴付ボルトは、締付トルク129±6.37N-mにて締付けること。
 3. モータシャフト固定用M10六角穴付ボルトは、締付トルク73.5±3.43N-mにて締付けること。
 4. カース及びシャフト締付ボルトには、六角穴付ボルト用皿皿入を使用すること。
 5. 減速機内部には、弊社指定潤滑油を充填済。
 6. 塗装 塗装色マンセルNo.N1.5(黒色) 塗装範囲部分を//////に示す。
- NOTE
1. Tightening torque of 8-M12 hexagon socket headed bolt for fixing case is 129±6.37N-m.
 2. Tightening torque of 9-M12 hexagon socket headed bolt on the output shaft is 129±6.37N-m.
 3. Tightening torque of M10 hexagon socket headed bolt for fixing motor shaft is 73.5±3.43N-m.
 4. Bolt shall be used with corned disk spring for heavy duty.
 5. The specified lubricant is already sealed in before shipment.
 6. //// area is painted black.

Model Code: RDR-100C-XXX-C3 (Corresponding motor shaft diameter: $\phi 25$ to $\phi 35$)

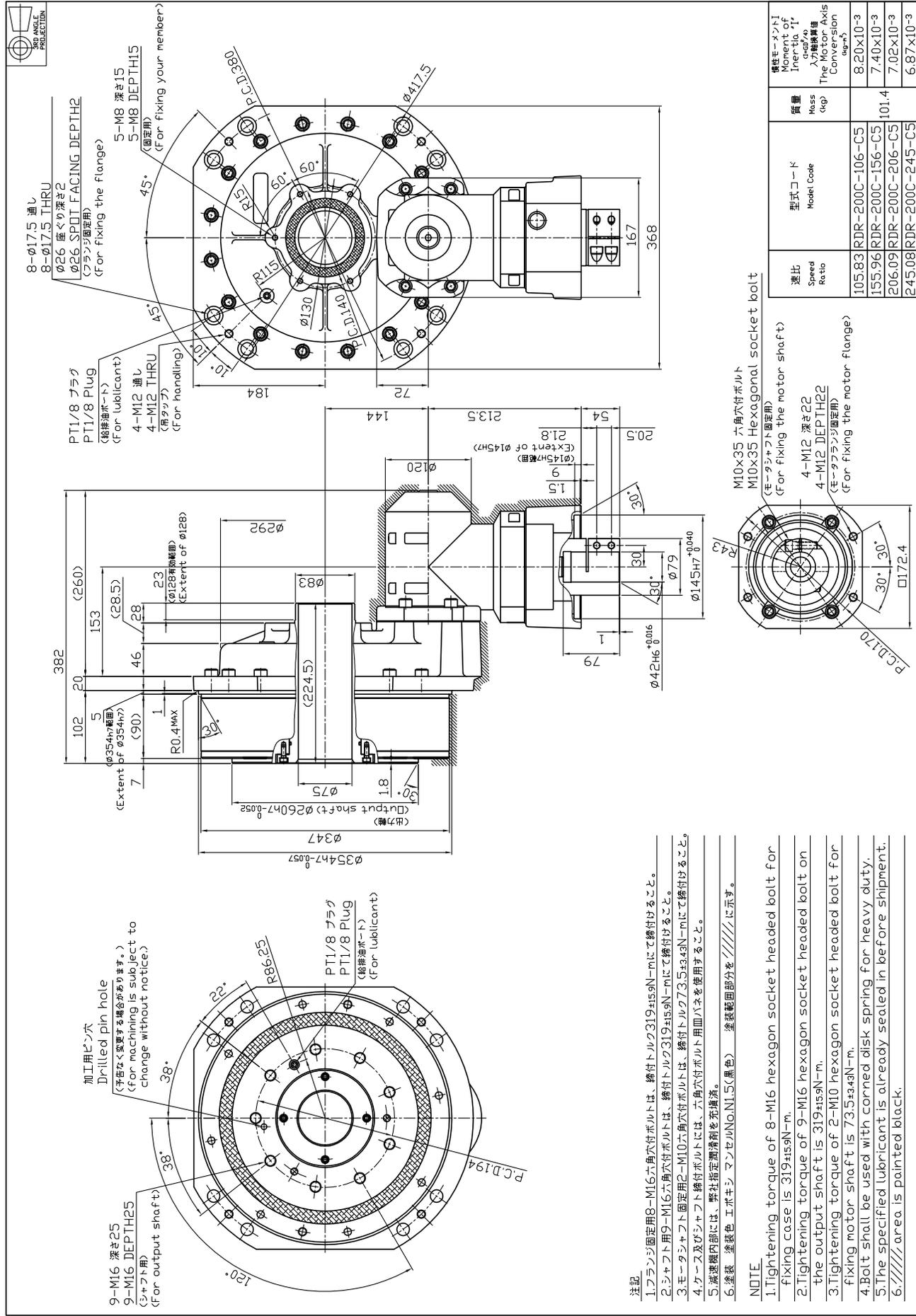


Model Code: RDR-200C-XXX-C4 (Corresponding motor shaft diameter: $\phi 19$ to $\phi 28$)



- 注記
- 1.フランジ固定用8-M16六角穴付ボルトは、締付トルク319±59N-mにて締付けること。
 - 2.シャフト用9-M16六角穴付ボルトは、締付トルク319±59N-mにて締付けること。
 - 3.モータシャフト固定用M12六角穴付ボルトは、締付トルク129±6.37N-mにて締付けること。
 - 4.ケース及びシャフト締付ボルトには、六角穴付ボルト用皿パネを使用すること。
 - 5.減速機内部には、弊社指定潤滑剤を充填済。
 - 6.塗装 塗装色 エポキシ マンセルNo.115(黒色) 塗装範囲部分を/////に示す。
- NOTE
- 1.Tightening torque of 8-M16 hexagon socket headed bolt for fixing case is 319±59N-m.
 - 2.Tightening torque of 9-M16 hexagon socket headed bolt on the output shaft is 319±59N-m.
 - 3.Tightening torque of M12 hexagon socket headed bolt for fixing motor shaft is 129±6.37N-m.
 - 4.Bolt shall be used with coned disk spring for heavy duty.
 - 5.The specified lubricant is already sealed in before shipment.
 - 6.////// area is painted black.

Model Code: RDR-200C-XXX-C5 (Corresponding motor shaft diameter: $\phi 32$ to $\phi 42$)



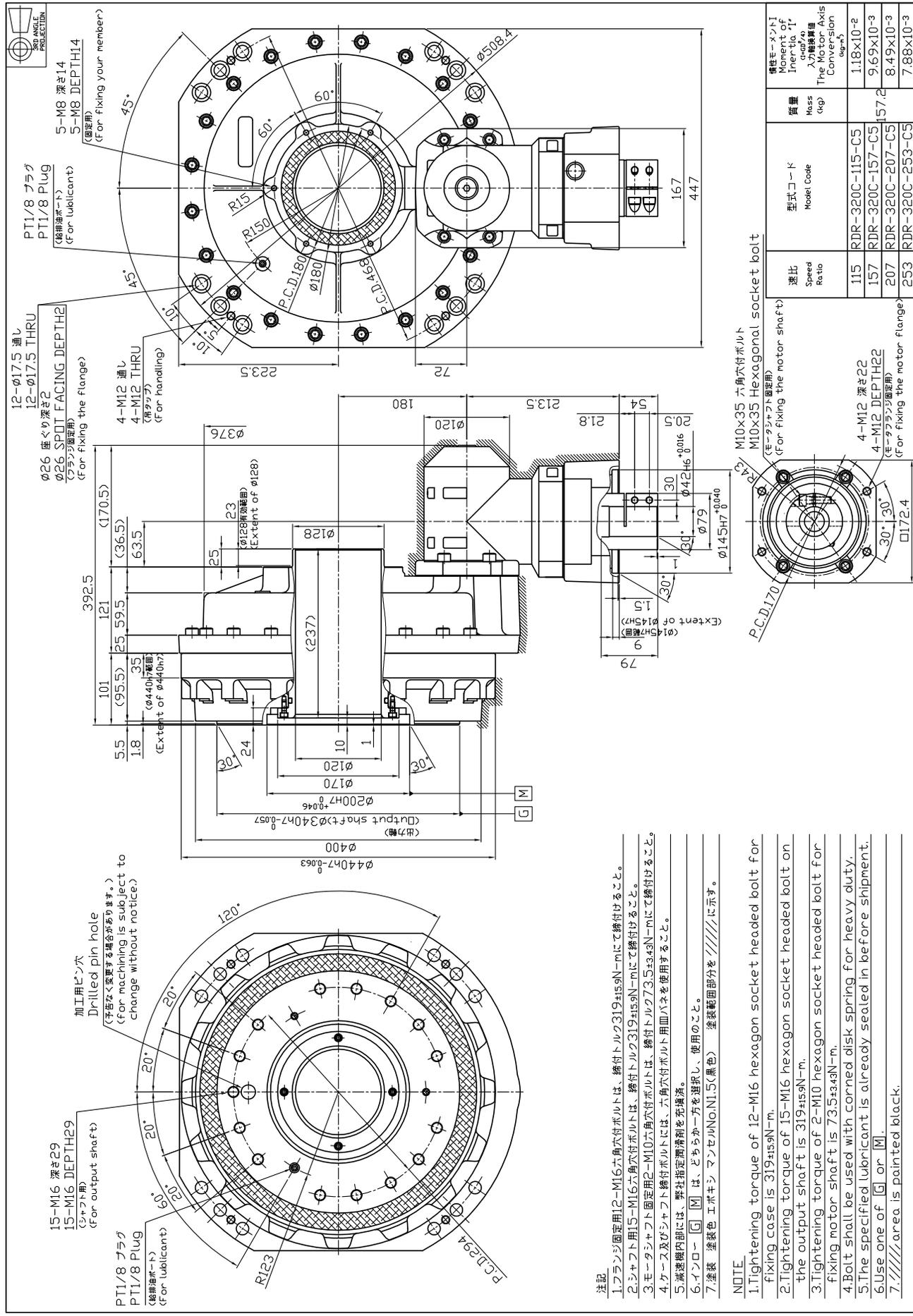
Technical Documents

Motor flange / bushing

Pulley input type

Straight input type

Model Code: RDR-320C-XXX-C5 (Corresponding motor shaft diameter: $\phi 32$ to $\phi 42$)



- 注記
- 1.フランジ固定用12-M16六角穴付ボルトは、締付トルク319±59N-mにて締付けること。
 - 2.シャフト用15-M16六角穴付ボルトは、締付トルク319±59N-mにて締付けること。
 - 3.モータシャフト固定用2-M10六角穴付ボルトは、締付トルク73.5±3.43N-mにて締付けること。
 - 4.ケース及びシャフト締付ボルトには、六角穴付ボルト用皿パネを使用すること。
 - 5.減速機内部には、弊社指定潤滑剤を充填す。
 - 6.インロー [G] [M] は、どちらか一方を選択し、使用のこと。
 - 7.塗装 塗装色 エポキシ マンゼルNo.11.5(黒色) 塗装範囲部分を//////に示す。

- NOTE
- 1.Tightening torque of 12-M16 hexagon socket headed bolt for fixing case is 319±59N-m.
 - 2.Tightening torque of 15-M16 hexagon socket headed bolt on the output shaft is 319±59N-m.
 - 3.Tightening torque of 2-M10 hexagon socket headed bolt for fixing motor shaft is 73.5±3.43N-m.
 - 4.Bolt shall be used with coned disk spring for heavy duty.
 - 5.The specified lubricant is already sealed in before shipment.
 - 6.Use one of [G] or [M].
 - 7.//////area is painted black.

速比 Speed Ratio	型式コード Model Code	質量 Mass (kg)	慣性モーメント Inertia J 入軸側 Input Axis Type Number Conversion ($\text{kg}\cdot\text{m}^2$)
115	RDR-320C-115-C5		1.18x10 ⁻²
157	RDR-320C-157-C5		9.69x10 ⁻³
207	RDR-320C-207-C5	157.2	8.49x10 ⁻³
253	RDR-320C-253-C5		7.88x10 ⁻³

Technical Documents

Motor flange / bushing

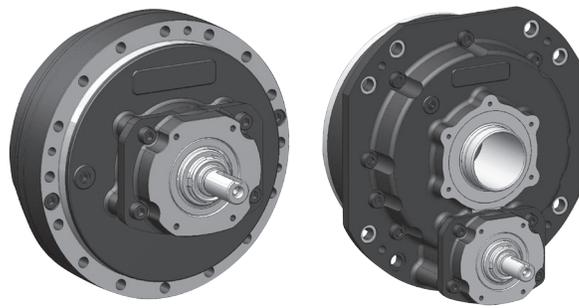
Pulley input type

Right angle input type

Straight input type



Pulley input type



Pulley Input Type Code Description and Configuration Diagram

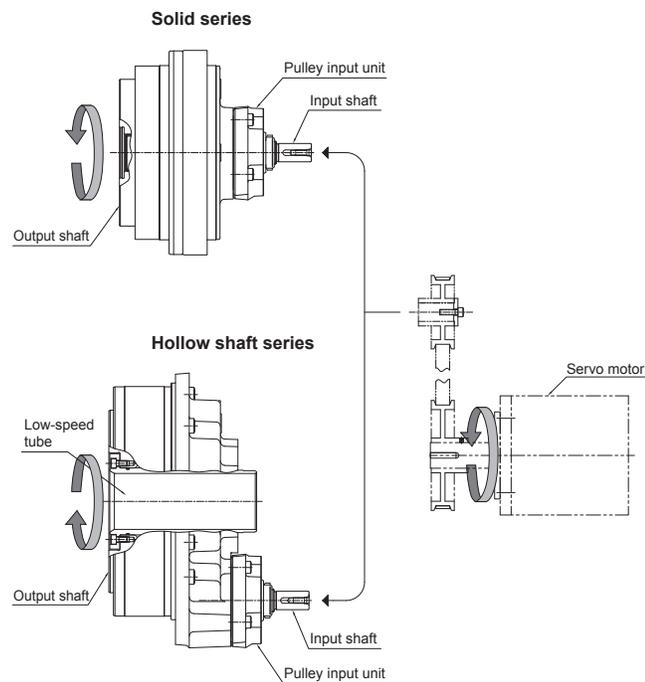
Product code

RD P - 050 C - 109 - A3 - ZZ - ZZ

Model Code			Ratio Code	Input unit code	Motor flange code	Bushing code
Pulley input code	Torque code	Series code				
P	020	E: Solid series	081	A0	ZZ: No motor flange (The pulley input type does not come with a motor flange.)	ZZ: No bushing (The pulley input type does not come with a bushing.)
	040		057	A3		
	080		081	A4		
	160		066	A6		
	320		081	A7		
	010	C: Hollow shaft series	108	A1		
	027		100	A2		
	050		109	A3		
	100		101	A5		
	200		106	A8		
	320		157	A9		

The input unit code for the pulley input type is one code for each model number.

Configuration Diagram



Straight input type

Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

Rating Table Pulley input type

Solid series

Model Code	Ratio code (actual gear ratio)	Reduction Gear												Input shaft			Outer Dimensions				
		T ₀	N ₀	K	T _{S1}	T _{S2}	N _{in}	N _s	N _{To}	Back-lash	Lost motion	Torsional rigidity	Start-up Efficiency	M _O	α	M _{Oin}		M _{Sin}	β dimensions		
		(N-m)	(r.p.m.)	(Hr)	(N-m)	(N-m)	(r.p.m.)	(r.p.m.)	(r.p.m.)	(arc.min.)	(arc.min.)	(N-m/arc.min.)	(%)	(N-m)	(mm)	(N-m)		(N-m)	(mm)		
RDP-020E	081 (81)	167			412	833	3,500	43	43					49	75	882	93.2	38	38	58	Input Unit Code : A0 —P.71
RDP-040E	057 (57)	412			1,029	2,058		53	25					108	80	1,666	114.6	78	122	73.8	Input Unit Code : A3 —P.72
RDP-080E	081 (81)	784	15	6,000	1,960	3,920		37	24	1.0	1.0			196	80	2,156	136.1		133		Input Unit Code : A4 —P.73
RDP-160E	066 (66)	1,568			3,920	7,840		30	15					392	80	3,920	167.3	158	295	86.6	Input Unit Code : A6 —P.74
RDP-320E	081 (81)	3,136			7,840	15,680	2,000	25	12					980	85	7,056	203		417		Input Unit Code : A7 —P.75

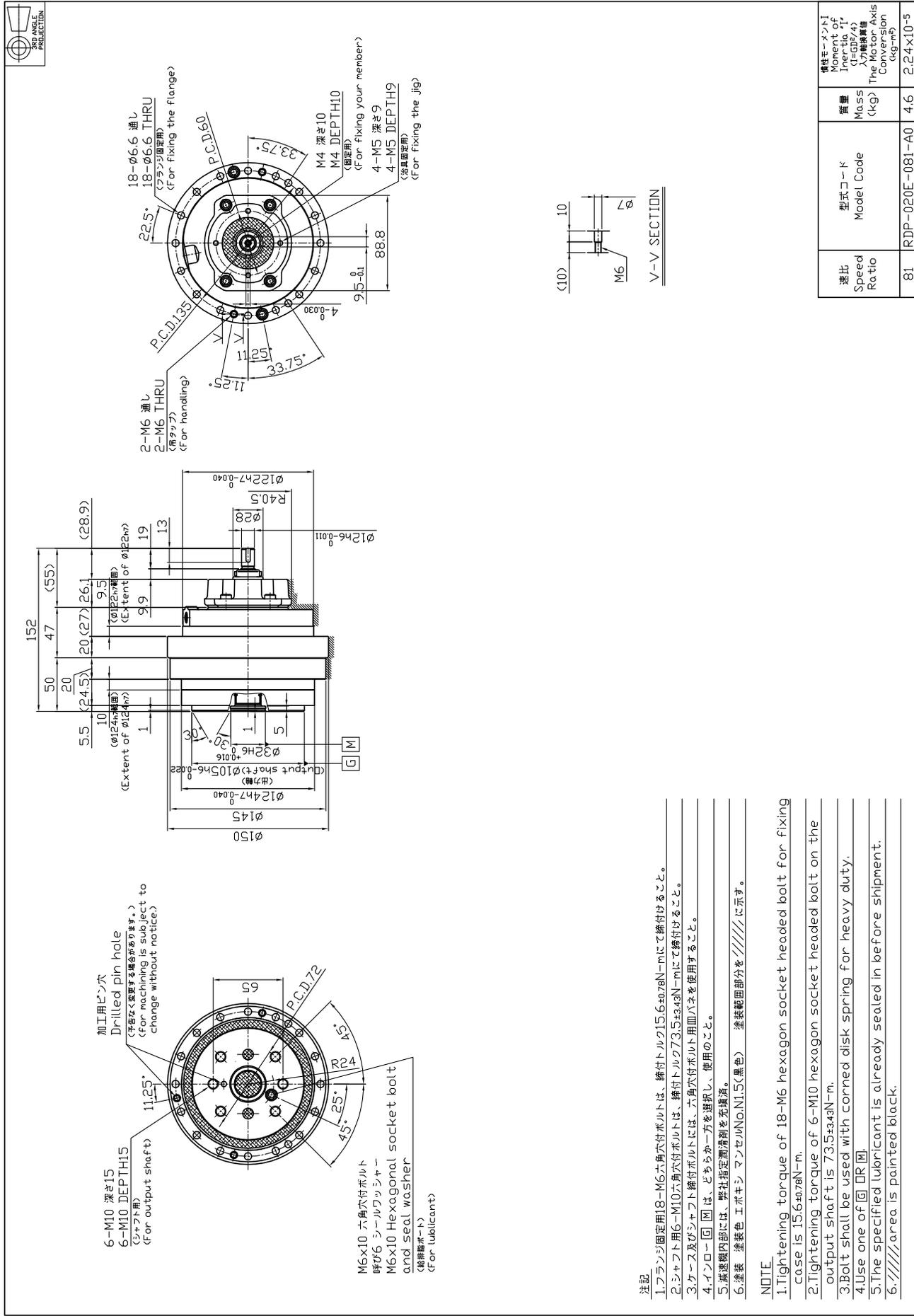
Hollow shaft series

Model Code	Ratio code (actual gear ratio)	Reduction Gear												Input shaft			Outer Dimensions				
		T ₀	N ₀	K	T _{S1}	T _{S2}	N _{in}	N _s	N _{To}	Back-lash	Lost motion	Torsional rigidity	Start-up Efficiency	M _O	α	M _{Oin}		M _{Sin}	β dimensions		
		(N-m)	(r.p.m.)	(Hr)	(N-m)	(N-m)	(r.p.m.)	(r.p.m.)	(r.p.m.)	(arc.min.)	(arc.min.)	(N-m/arc.min.)	(%)	(N-m)	(mm)	(N-m)		(N-m)	(mm)		
RDP-010C	108 (108)	98			245	490		32	32					47	75	686	91.2	38	38	58	Input Unit Code : A1 —P.76
RDP-027C	100 (99.82)	265			662	1,323	3,500	35	28					147	75	980	112		40		Input Unit Code : A2 —P.77
RDP-050C	109 (109)	490	15	6,000	1,225	2,450		28	23	1.0	1.0			255	80	1,764	136.8	78	90	73.8	Input Unit Code : A3 —P.78
RDP-100C	101 (100.5)	980			2,450	4,900	3,000	30	18					510	80	2,450	148.9		134		Input Unit Code : A5 —P.79
RDP-200C	106 (105.83)	1,960			4,900	9,800		19	14					980	80	8,820	204.4	158	230	86.6	Input Unit Code : A8 —P.80
RDP-320C	157 (157)	3,136			7,840	15,680	2,000	13	13					1,960	85	20,580	245.9		215		Input Unit Code : A9 —P.81

Notes:

1. The rating table shows the specification values including the entry fields for reduction gear values.
2. The allowable speed may be limited by heat depending on the operating rate. Make sure the surface temperature of the reduction gear does not exceed 60°C during use.
3. The allowable moment will differ depending on the thrust load. Check the allowable moment diagram.
4. For the moment of inertia of the reduction gears, refer to the external dimension drawings for the reduction gear.

Model Code: RDP-020E-081-A0



加工用ピン穴
Drilled pin hole
(予定なく変更する場合があります)
(for machining is subject to
change without notice)

6-M10 深さ15
6-M10 DEPTH15
(シャフト用)
(for output shaft)

M6x10 六角穴付ボルト
呼びM6 シールワッシャー
M6x10 Hexagonal socket bolt
and seal washer
(給油脂ボルト)
(for lubricant)

- 注記
- 1.フランジ固定用18-M6六角穴付ボルトは、締付トルク15.6±0.78N-mにて締付けること。
 - 2.シャフト用6-M10六角穴付ボルトは、締付トルク73.5±3.43N-mにて締付けること。
 - 3.ゲース及びシャフト締付ボルトには、六角穴付ボルト用皿ハネを使用すること。
 - 4.インロー [図] は、どちらか一方を消滅し、使用のこと。
 - 5.減速機内部には、弊社指定潤滑剤を充填。
 - 6.塗装 塗装色 エポキシ マンセルNo.NI.5(黒色) 塗装範囲部分を//////に示す。
- NOTE
- 1.Tightening torque of 18-M6 hexagon socket headed bolt for fixing case is 15.6±0.78N-m.
 - 2.Tightening torque of 6-M10 hexagon socket headed bolt on the output shaft is 73.5±3.43N-m.
 - 3.Bolt shall be used with corned disk spring for heavy duty.
 - 4.Use one of [図] DR [図].
 - 5.The specified lubricant is already sealed in before shipment.
 - 6.//////area is painted black.

速比 Speed Ratio	型式コード Model Code	慣性モーメント Inertia of Input (I=GD ² /4) 入力軸慣性 The Motor Axis Conversion (kg-m ²)
81	RDP-020E-081-A0	2.24x10 ⁻⁵
		質量 Mass (kg)
		4.6

Straight input type

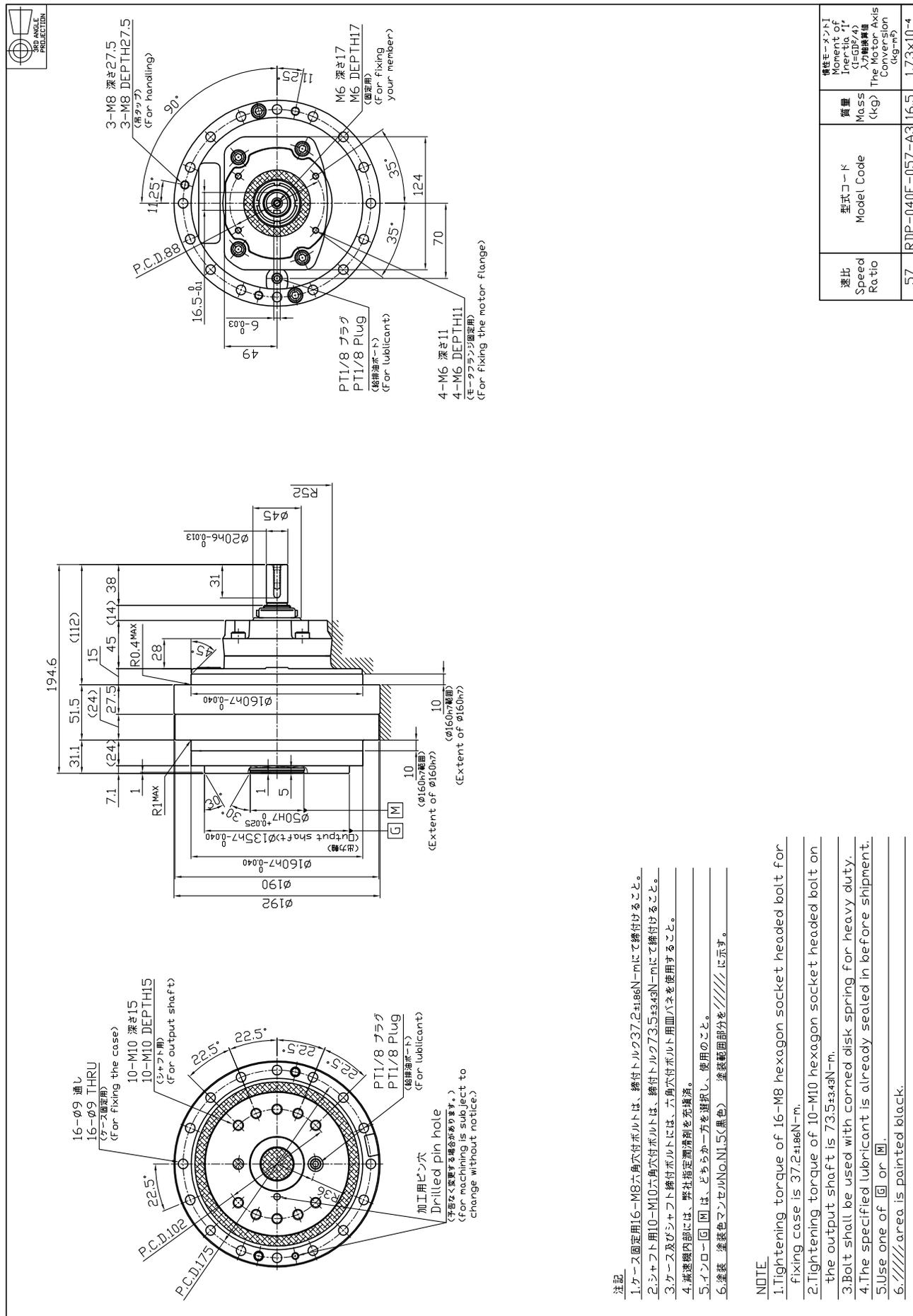
Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

Model Code: RDP-040E-057-A3

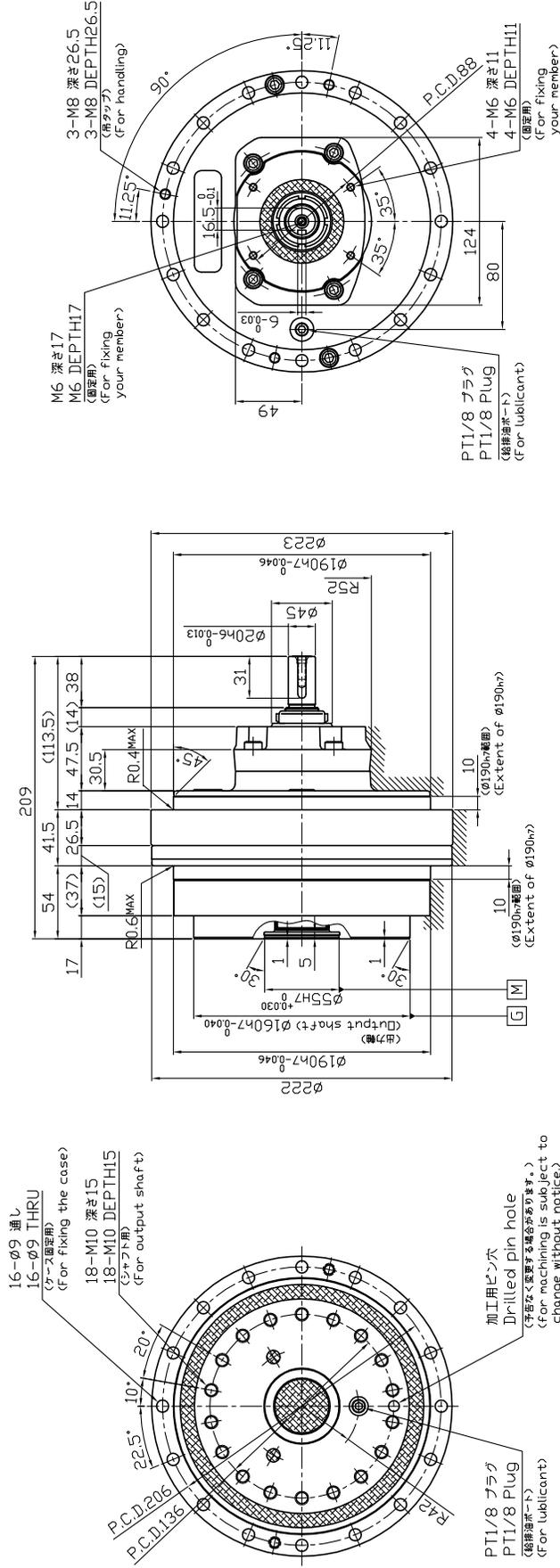


速比 Speed Ratio	型式コード Model Code	質量 Mass (kg)	慣性モーメント Moment of Inertia (kg·m ²)
57	RDP-040E-057-A3	16.5	1.73x10 ⁻⁴

NOTE

1. Tightening torque of 16-M8 hexagon socket headed bolt for fixing case is 37.2±1.86N-m.
2. Tightening torque of 10-M10 hexagon socket headed bolt on the output shaft is 73.5±3.43N-m.
3. Bolt shall be used with coned disk spring for heavy duty.
4. The specified lubricant is already sealed in before shipment.
5. Use one of M or N.
6. //// area is painted black.

Model Code: RDP-080E-081-A4



- 注記
- 1.ケース固定用16-φ9六角穴付ボルトは、締付トルク37.2±1.86N-mにて締付けること。
 - 2.シャフト用18-M10六角穴付ボルトは、締付トルク73.5±3.43N-mにて締付けること。
 - 3.ケース及びシャフト締付ボルトには、六角穴付ボルト用皿パネを使用すること。
 - 4.減速機内部には、弊社指定潤滑剤を充填。
 - 5.インロー 図 には、どちらか一方を選択し、使用のこと。
 - 6.塗装 塗料はマニセックNo.N1.5(黒色) 塗装範囲部分を////に示す。

- NOTE
- 1.Tightening torque of 16-φ9 hexagon socket headed bolt for fixing case is 37.2±1.86N-m.
 - 2.Tightening torque of 18-M10 hexagon socket headed bolt on the output shaft is 73.5±3.43N-m.
 - 3.Bolt shall be used with coned disk spring for heavy duty.
 - 4.The specified lubricant is already sealed in before shipment.
 - 5.Use one of 図 or 図.
 - 6.////area is painted black.

速比 Speed Ratio	型式コード Model Code	質量 Mass (kg)	慣性モーメント Moment of Inertia (I=GJ/4) 入力軸換算値 The Motor Axis Conversion (kg-m ²)
81	RDP-080E-081-A4	21.0	1.92x10-4

Technical Documents

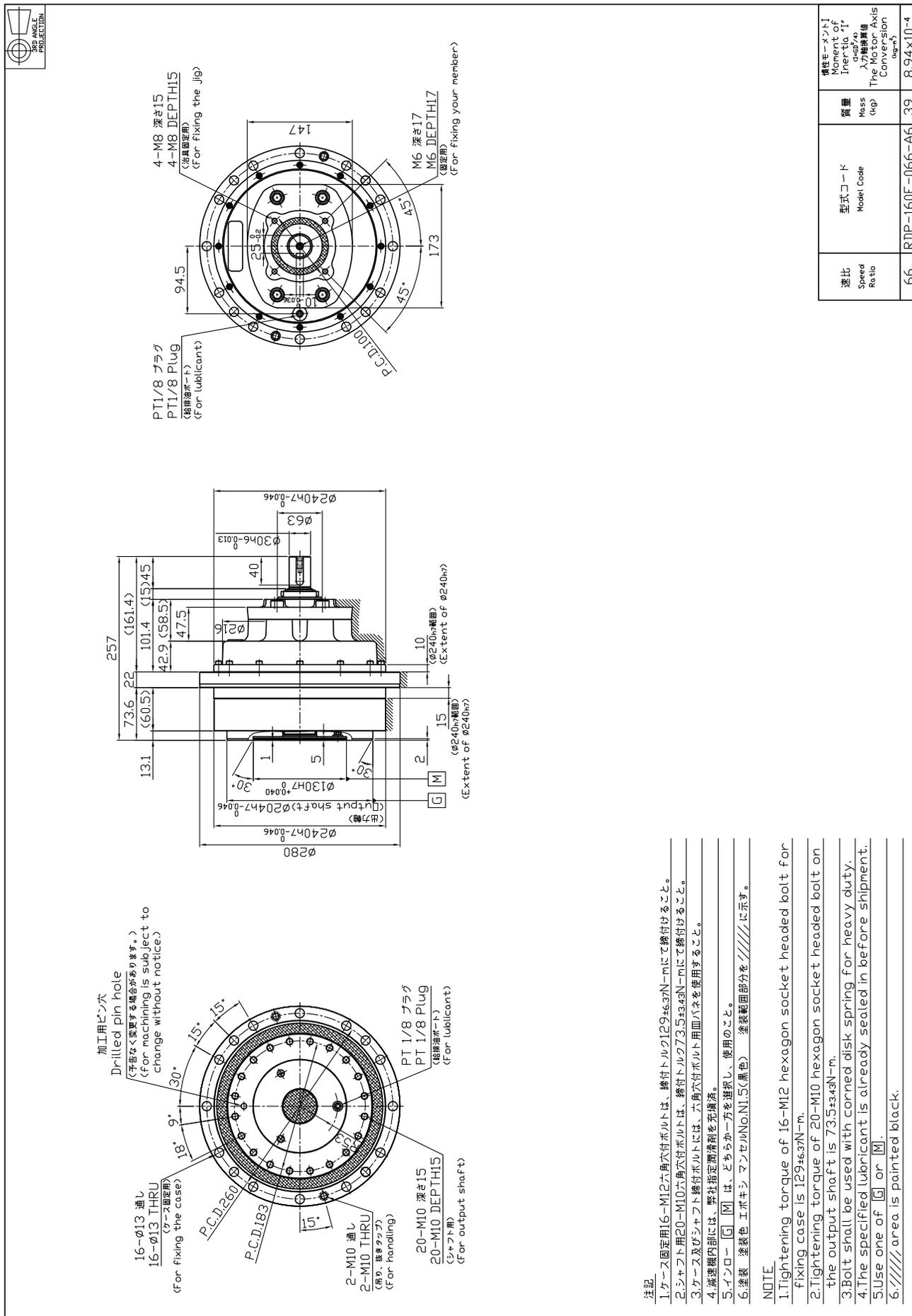
Motor flange / bushing

Pulley input type

Right angle input type

Straight input type

Model Code: RDP-160E-066-A6



注記

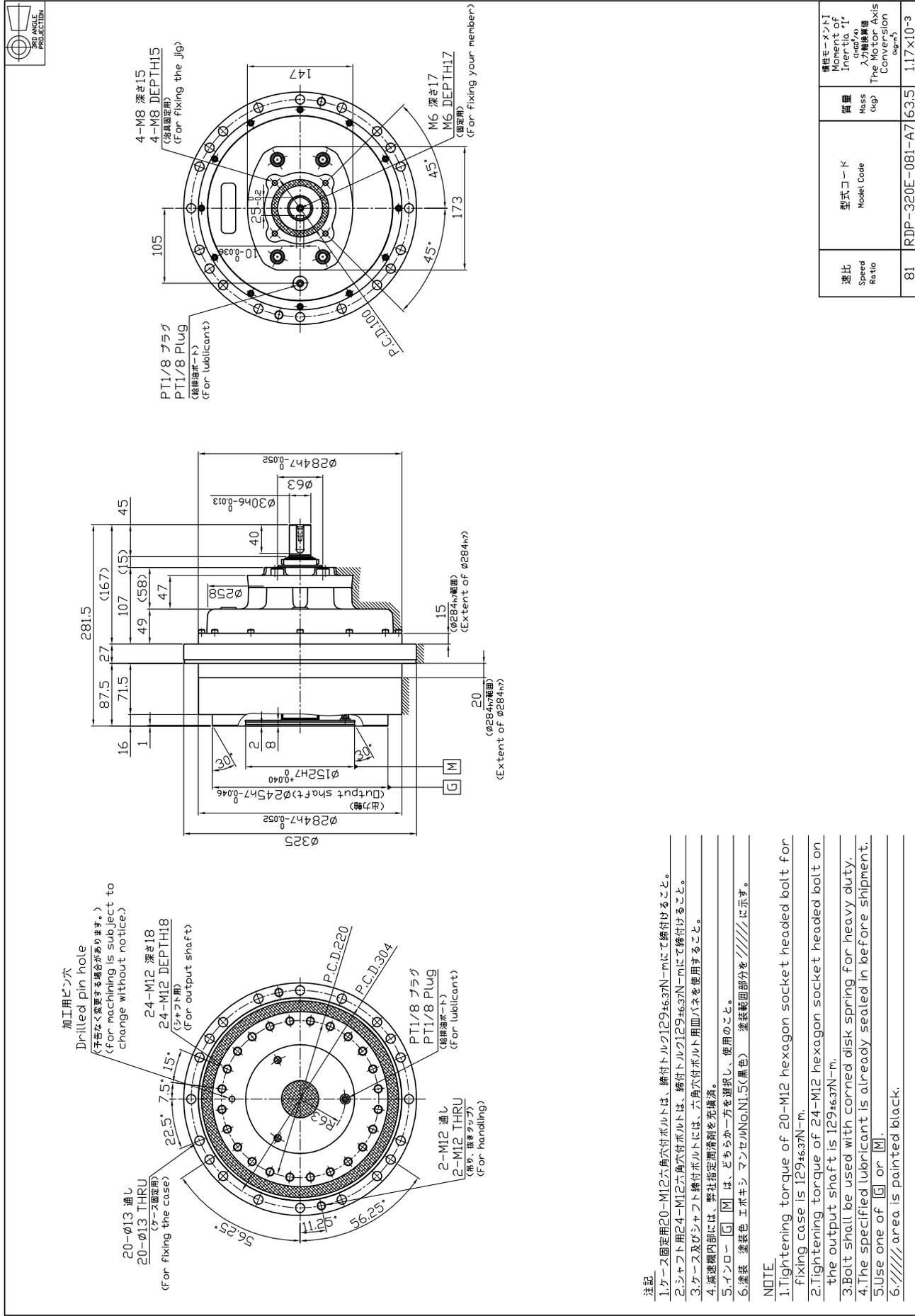
- 1.ケース固定用16-M12六角穴付ボルトは、締付トルク129±6.37N・mにて締付けること。
- 2.シャフト用20-M10六角穴付ボルトは、締付トルク73.5±3.43N・mにて締付けること。
- 3.ケース及びシフト締付ボルトには、六角穴付ボルト用皿バネを使用すること。
- 4.高速機内部には、弊社指定潤滑剤を添付済。
- 5.インロー **G** **M** は、どちらか一方を推奨し、使用のこと。
- 6.塗装 塗装色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を//////に示す。

NOTE

- 1.Tightening torque of 16-M12 hexagon socket headed bolt for fixing case is 129±6.37N·m.
- 2.Tightening torque of 20-M10 hexagon socket headed bolt on the output shaft is 73.5±3.43N·m.
- 3.Bolt shall be used with coned disk spring for heavy duty.
- 4.The specified lubricant is already sealed in before shipment.
- 5.Use one of **G** or **M**.
- 6.////// area is painted black.

速比 Speed Ratio	66	型式コード Model Code	RDP-160E-066-A6	慣性モーメント Moment of Inertia, I _r kg·m ²	8.94×10 ⁻⁴
質量 Mass (kg)	39	質量 Mass (kg)	39	入力軸換算 The Motor Axis Conversion (kg·m ²)	

Model Code: RDP-320E-081-A7



- 注記
- 1.ケース固定用20-M12六角穴付ボルトは、締付トルク129±6.37N・mにて締付けすること。
 - 2.シャフト用24-M12六角穴付ボルトは、締付トルク129±6.37N・mにて締付けすること。
 - 3.ケース及びシャフト締付ボルトには、六角穴付ボルト用皿バネを使用すること。
 - 4.減速機内部には、弊社指定潤滑剤を充填済。
 - 5.インロー [G] [M] は、どちらか一方を選択し、使用のこと。
 - 6.塗装 塗装色 エポキシ マンセルNo.1.5(黒色) 塗装部分を示す。
- NOTE
- 1.Tightening torque of 20-M12 hexagon socket headed bolt for fixing case is 129±6.37N·m.
 - 2.Tightening torque of 24-M12 hexagon socket headed bolt on the output shaft is 129±6.37N·m.
 - 3.Bolt shall be used with coned disk spring for heavy duty.
 - 4.The specified lubricant is already sealed in before shipment.
 - 5.Use one of [G] or [M].
 - 6.////// area is painted black.

速度 Speed Ratio	型式コード Model Code	慣性モーメント Moment of Inertia, J _r [kg·cm ²]
81	RDP-320E-081-A7	質量 Mass (kg)
		入力軸換算 The Motor Axis Conversion (kg·m ²)
		1.17×10 ⁻³

Technical Documents

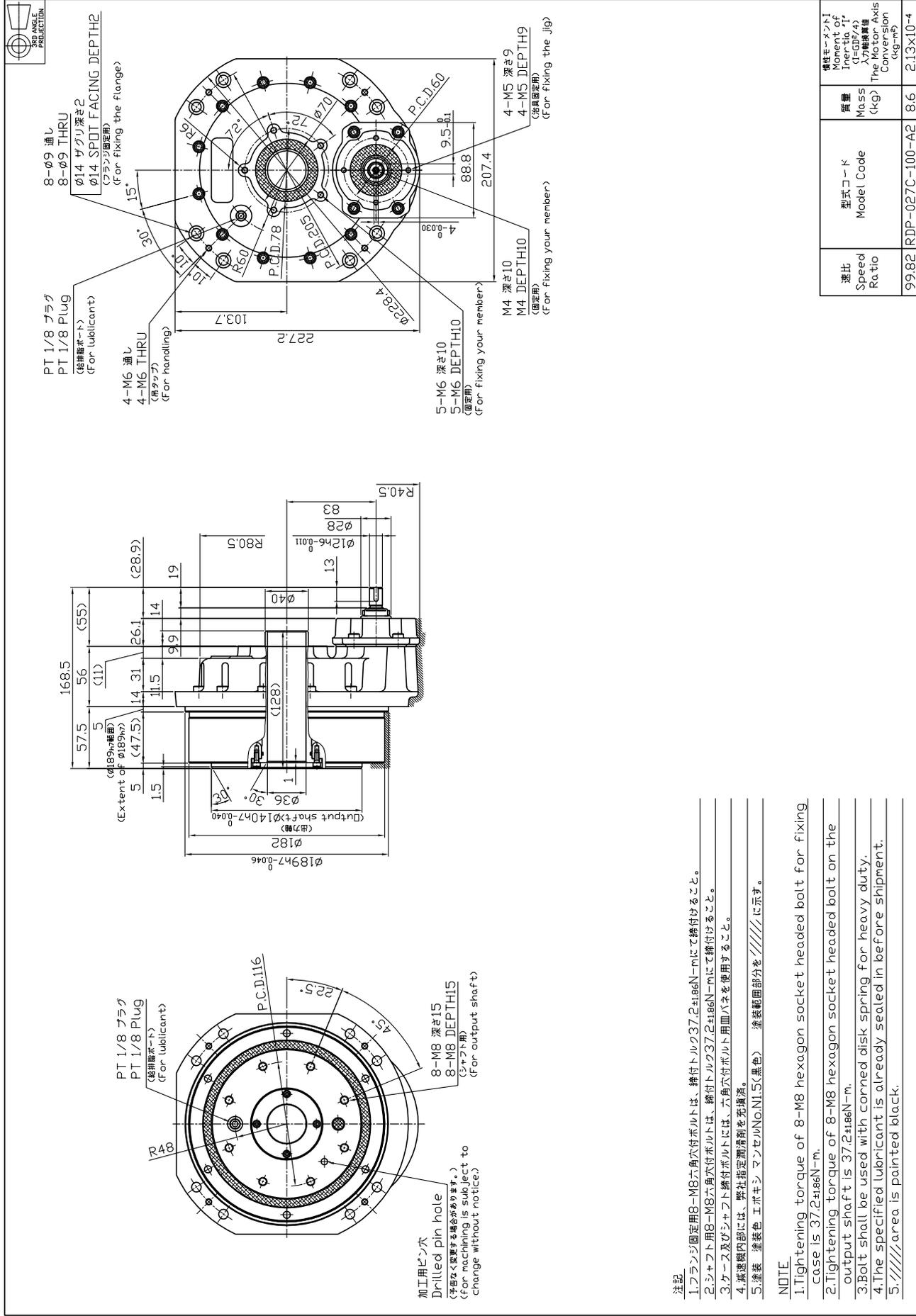
Motor flange / bushing

Pulley input type

Right angle input type

Straight input type

Model Code: RDP-027C-100-A2



Technical Documents

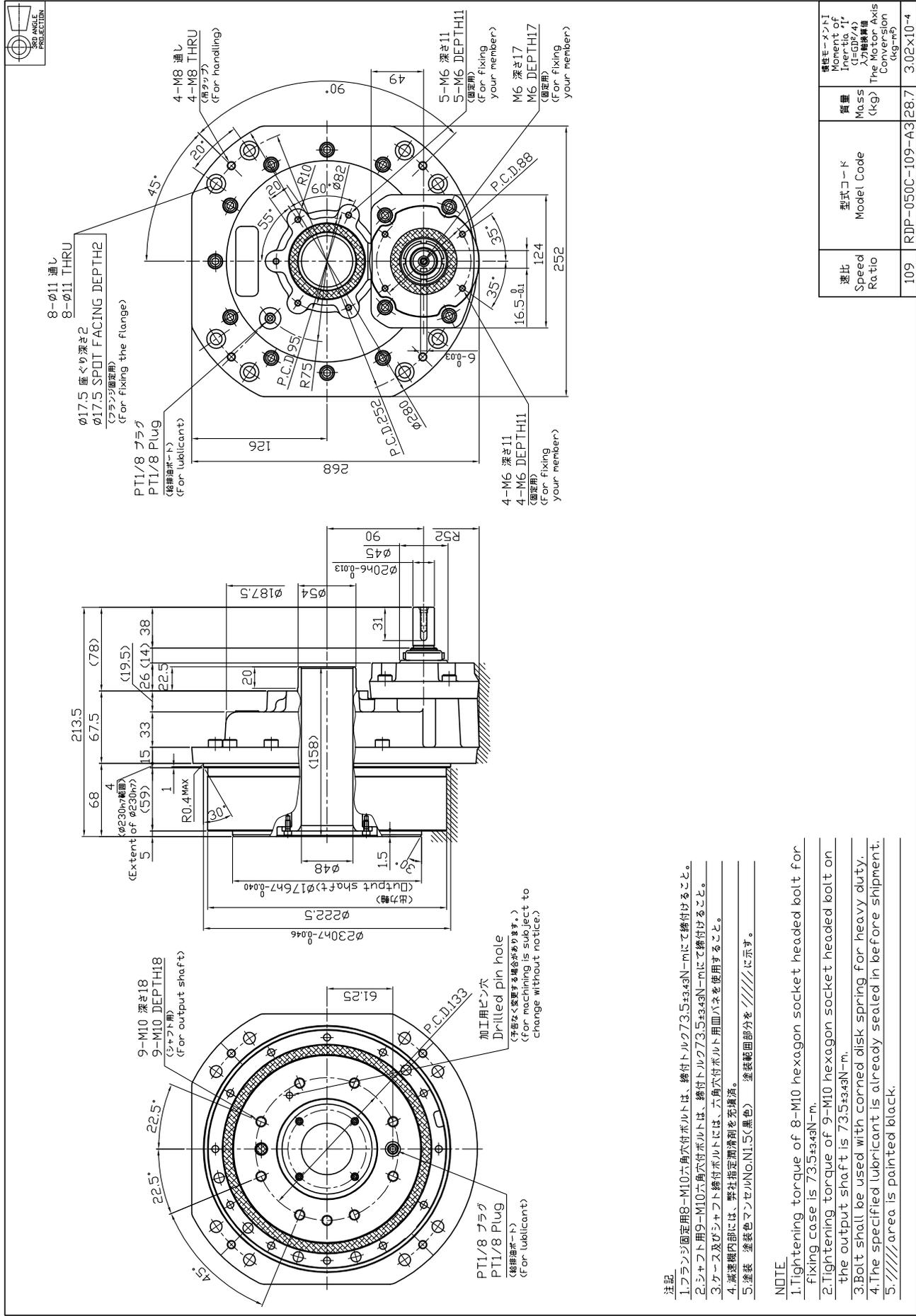
Motor flange / bushing

Pulley input type

Right angle input type

Straight input type

Model Code: RDP-050C-109-A3

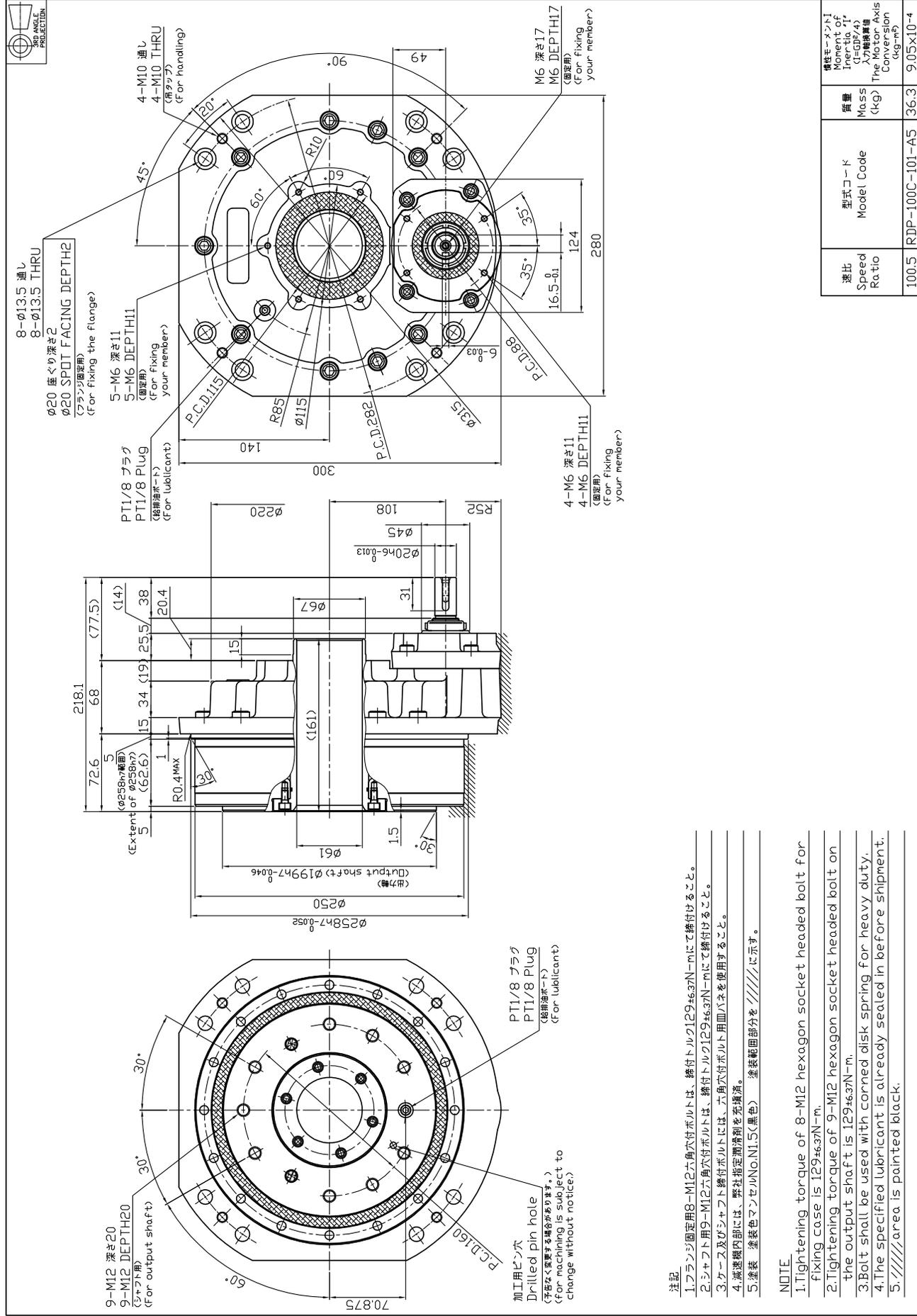


- 注記
1. フランジ面使用8-M10六角穴付ボルトは、締付トルク73.5±3.43N・mにて締付けること。
 2. シャフト用9-M10六角穴付ボルトは、締付トルク73.5±3.43N・mにて締付けること。
 3. ケース及びシャフト締付ボルトには、六角穴付ボルト用皿パネを使用すること。
 4. 減速機内部には、弊社指定潤滑剤を充填済。
 5. 塗装 塗装色マシセルNo.N1.5(黒色) 塗装範囲部分を//////に示す。

NOTE

1. Tightening torque of 8-M10 hexagon socket headed bolt for fixing case is 73.5±3.43N·m.
2. Tightening torque of 9-M10 hexagon socket headed bolt on the output shaft is 73.5±3.43N·m.
3. Bolt shall be used with coned disk spring for heavy duty.
4. The specified lubricant is already sealed in before shipment.
5. //// area is painted black.

Model Code: RDP-100C-101-A5



Technical Documents

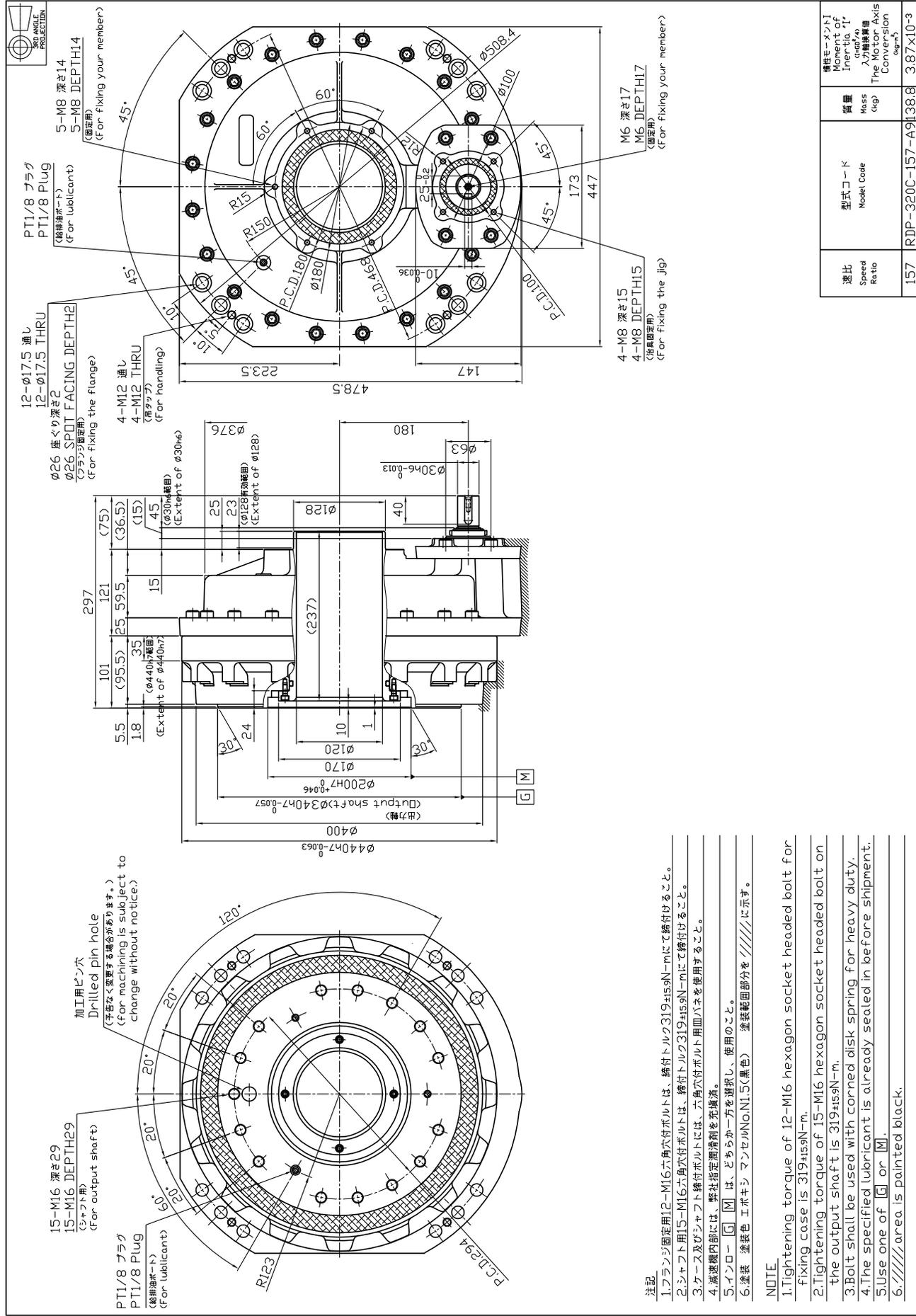
Motor flange / bushing

Pulley input type

Right angle input type

Straight input type

Model Code: RDP-320C-157-A9



Technical Documents

Motor flange / bushing

Pulley input type

Right angle input type

Straight input type



Motor flange / bushing

Selection Table of Motor Flange Code and Bushing Code-1

Select the motor flange code and bushing code based on the dimension of the motor to be used.
Applicable model code: RD□-006E, 020E, 010C, 027C

Supported motor shaft diameter: Φ8 to Φ14

Model Code	Input unit code
Reduction gear (straight input type)	
RDS-006E	
RDS-020E	B0
RDS-010C	
RDS-027C	
Reduction gear (right angle input type)	
RDR-006E	
RDR-020E	C0
RDR-010C	
RDR-027C	

Motor flange code	Motor shaft length (mm)		Motor mounting pilot diameter (mm)		Motor mounting pilot tolerance	Motor mounting pilot length (mm)	Bolt P.C.D.	Bolt size
	Max.	Min.	a	b				
AA	23	30	30	30	h7	3	46	M4
AB	23	31	50	50	h7	5	60	M4
AC	23	31	50	50	h7	5	70	M4
AD	23	31	50	50	h7	5	70	M5
AE	23	31	70	70	h7	6	90	M5
AF	23	31	70	70	h7	6	90	M6
AG	30	38	80	80	h7	6	100	M6
AH	23	31	80	80	h7	6	100	M6
AJ	30	38	95	95	h7	6	115	M8
AK	35	43	115	115	h7	6	165	M8

* The motor mounting pilot length indicates the maximum value of the capable range.

Bushing code	Bushing	
	Motor shaft diameter(mm)	Motor shaft tolerance
0A	8	h6
0B	9	h6
0C	10	h6
0D	11	h6
ZZ	None	

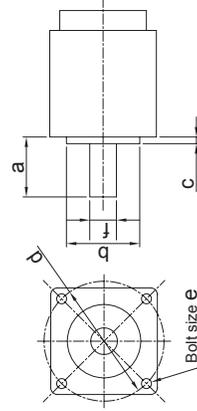
Supported motor shaft diameter: Φ15 to Φ24

Model Code	Input unit code
Reduction gear (straight input type)	
RDS-006E	
RDS-020E	B1
RDS-010C	
RDS-027C	
Reduction gear (right angle input type)	
RDR-006E	
RDR-020E	C1
RDR-010C	
RDR-027C	

Motor flange code	Motor shaft length (mm)		Motor mounting pilot diameter (mm)		Motor mounting pilot tolerance	Motor mounting pilot length (mm)	Bolt P.C.D.	Bolt size
	Max.	Min.	a	b				
CA	28	55	50	50	h7	6	70	M5
CB	28	55	70	70	h7	5.5	90	M5
CC	28	55	70	70	h7	5.5	90	M6
CD	30	57	80	80	h7	6	100	M6
CE	30	57	95	95	h7	6	115	M6
CF	30	57	95	95	h7	6	115	M8
CG	32	59	110	110	h7	7	135	M8
CH	32	59	110	110	h7	7	145	M8
CJ	47	74	110	110	h7	7	145	M8
CK	32	59	114.3	114.3	h7	5	200	M12
CL	32	59	115	115	h7	6	165	M8
CM	32	59	130	130	h7	6	165	M10
CN	32	59	200	200	h7	5	235	M12

* The motor mounting pilot length indicates the maximum value of the capable range.

Bushing code	Bushing	
	Motor shaft diameter(mm)	Motor shaft tolerance
1B	15	h6
1C	16	h6
1D	17	h6
1E	19	h6
1F	22	h6
1G	23	h6
ZZ	None	



Selection Table of Motor Flange Code and Bushing Code-2

Select the motor flange code and bushing code based on the dimension of the motor to be used.
Applicable model code: RD□-040E,080E,050C,100C

Supported motor shaft diameter: Φ14 to Φ24

Model Code	Input unit code
Reduction gear (straight input type)	
RDS-040E	B2
RDS-080E	
RDS-050C	
RDS-100C	
Reduction gear (right angle input type)	
RDR-040E	C2
RDR-080E	
RDR-050C	
RDR-100C	

Motor flange code	Motor flange						Bolt size e
	Motor shaft length (mm) a		Motor mounting pilot diameter (mm) b	Motor mounting pilot tolerance	Motor mounting pilot length (mm) c (*)	Bolt P.C.D. d	
	Max.	Min.					
CA	34	55	50	h7	6	70	M5
CB	34	55	70	h7	5.5	90	M5
CC	34	55	70	h7	5.5	90	M6
CD	36	57	80	h7	6	100	M6
CE	36	57	95	h7	6	115	M6
CF	36	57	95	h7	6	115	M8
CG	38	59	110	h7	7	135	M8
CH	38	59	110	h7	7	145	M8
CJ	53	74	110	h7	7	145	M8
CK	38	59	114.3	h7	5	200	M12
CL	38	59	115	h7	6	165	M8
CM	38	59	130	h7	6	165	M10
CN	38	59	200	h7	5	235	M12

* The motor mounting pilot length indicates the maximum value of the capable range.

Supported motor shaft diameter: Φ25 to Φ35

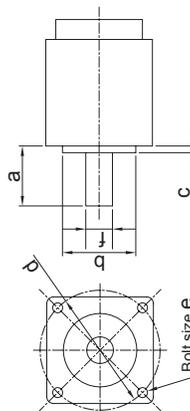
Model Code	Input unit code
Reduction gear (straight input type)	
RDS-040E	B3
RDS-080E	
RDS-050C	
RDS-100C	
Reduction gear (right angle input type)	
RDR-040E	C3
RDR-080E	
RDR-050C	
RDR-100C	

Motor flange code	Motor flange						Bolt size e
	Motor shaft length (mm) a		Motor mounting pilot diameter (mm) b	Motor mounting pilot tolerance	Motor mounting pilot length (mm) c (*)	Bolt P.C.D. d	
	Max.	Min.					
GA	36	81	95	h7	8	115	M8
GB	38	83	110	h7	7	135	M8
GC	38	83	110	h7	7	145	M8
GD	38	83	114.3	h7	5	200	M12
GE	38	83	130	h7	6	165	M10
GF	38	83	200	h7	6	235	M12

* The motor mounting pilot length indicates the maximum value of the capable range.

Bushing code	Bushing	
	Motor shaft diameter (mm) f	Motor shaft tolerance
1A	14	h6
1B	15	h6
1C	16	h6
1D	17	h6
1E	19	h6
1F	22	h6
1G	23	h6
ZZ	None	

Bushing code	Bushing	
	Motor shaft diameter (mm) f	Motor shaft tolerance
3A	25	h6
3B	28	h6
ZZ	None	



Selection Table of Motor Flange Code and Bushing Code-3

Select the motor flange code and bushing code based on the dimension of the motor to be used.
Applicable model code: RD□-160E, 320E, 200C, 320C

Supported motor shaft diameter: Φ19 to Φ28

Model Code	Input unit code
Reduction gear (straight input type)	
RDS-160E	
RDS-320E	B4
RDS-200C	
RDS-320C	
Reduction gear (right angle input type)	
RDR-160E	
RDR-320E	C4
RDR-200C	
RDR-320C	

Motor flange code	Motor shaft length (mm)		Motor mounting pilot diameter (mm)		Motor mounting pilot tolerance	Motor mounting pilot length (mm)	Bolt P.C.D.	Bolt size
	Max.	Min.	b	c (*)				
GA	36	81	95	h7	8	115	M8	
GB	38	83	110	h7	7	135	M8	
GC	38	83	110	h7	7	145	M8	
GD	38	83	114.3	h7	5	200	M12	
GE	38	83	130	h7	6	165	M10	
GF	38	83	200	h7	6	235	M12	

* The motor mounting pilot length indicates the maximum value of the capable range.

Bushing code	Bushing	
	Motor shaft diameter (mm)	Motor shaft tolerance
2A	19	h6
2B	22	h6
2C	24	h6
ZZ		None

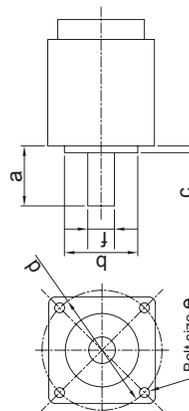
Supported motor shaft diameter: Φ32 to Φ42

Model Code	Input unit code
Reduction gear (straight input type)	
RDS-160E	
RDS-320E	B5
RDS-200C	
RDS-320C	
Reduction gear (right angle input type)	
RDR-160E	
RDR-320E	C5
RDR-200C	
RDR-320C	

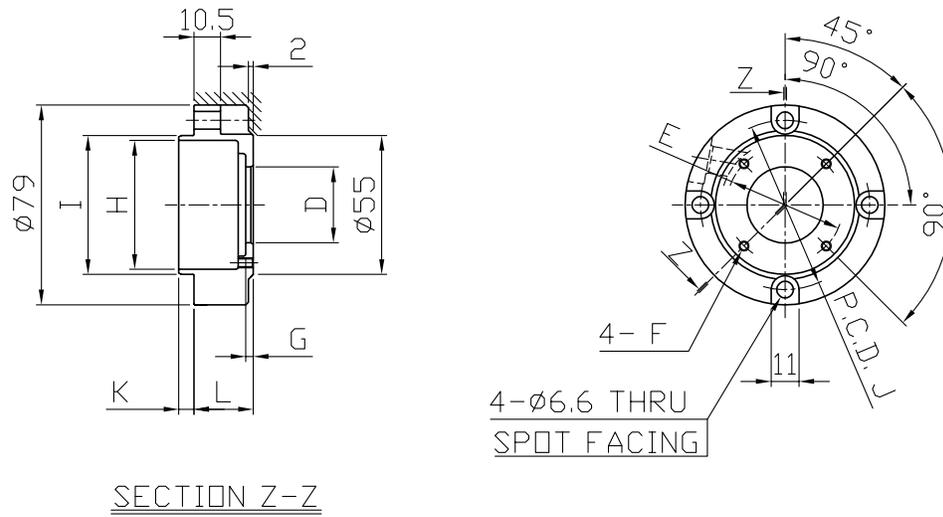
Motor flange code	Motor shaft length (mm)		Motor mounting pilot diameter (mm)		Motor mounting pilot tolerance	Motor mounting pilot length (mm)	Bolt P.C.D.	Bolt size
	Max.	Min.	b	c (*)				
JA	56	86	110	h7	7	145	M8	
JB	54	84	114.3	h7	5	200	M12	
JC	85	115	114.3	h7	5	200	M12	
JD	57	87	180	h7	5	215	M12	
JE	54	84	200	h7	5	235	M12	
JF	87	117	200	h7	5	235	M12	

* The motor mounting pilot length indicates the maximum value of the capable range.

Bushing code	Bushing	
	Motor shaft diameter (mm)	Motor shaft tolerance
4A	32	h6
4B	35	k6
4C	38	k6
4D	32	k6
ZZ		None



Motor Flange Dimension Drawing



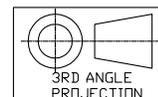
コード Code	モータ取付部寸法 Dimensions (mm)									質量 Mass (kg)
	D	E	F	G	H	I	J	K	L	
AA	$\phi 30^{+0.030}_{+0.009}$	$\phi 46$	M4 THRU	3	$\phi 51$	$\phi 55_{h7-0.030}$	67	6	23.5	0.45

注記

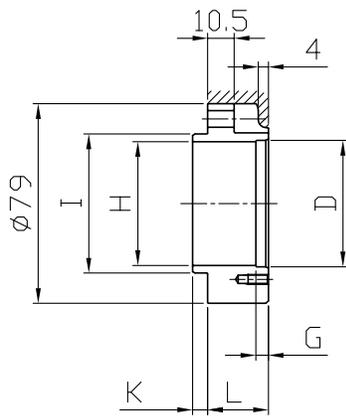
1. 塗装 塗装色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を//////に示す。

NOTE

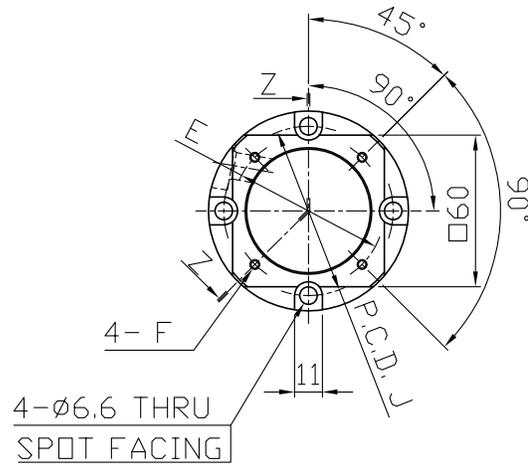
1. //// area is painted black.



Motor Flange Dimension Drawing



SECTION Z-Z



4- $\phi 6.6$ THRU
SPOT FACING

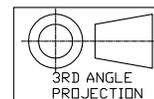
コード Code	モーター取付部寸法 Dimensions (mm)									質量 Mass (kg)
	D	E	F	G	H	I	J	K	L	
AB	$\phi 50^{+0.036}_{+0.011}$	$\phi 60$	M4 DEPTH 8	5	$\phi 49$	$\phi 55_{h7-0.030}$	67	6	24	0.44
AC		$\phi 70$	M5 DEPTH 9							
AD										

注記

1. 塗装 塗装色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を//////に示す。

NOTE

1. //// area is painted black.



Straight input type

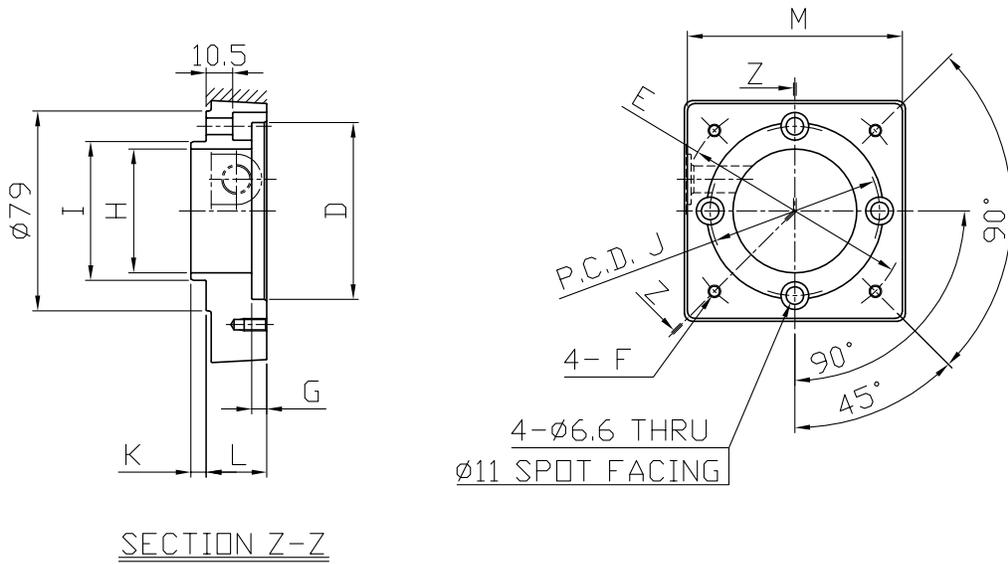
Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

Motor Flange Dimension Drawing



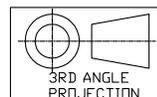
コード Code	モータ取付部寸法 Dimensions (mm)										質量 Mass (kg)
	D	E	F	G	H	I	J	K	L	M	
AE	$\phi 70^{+0.037}_{+0.012}$	$\phi 90$	M5 DEPTH 9	6	$\phi 49$	$\phi 55_{h7-0.030}$	67	6	24	$\square 85$	0.8
AF			M6 DEPTH 11						31		
AG	$\phi 80^{+0.037}_{+0.012}$	$\phi 100$	M8 DEPTH 15	6	$\phi 49$	$\phi 55_{h7-0.030}$	67	6	24	$\square 105$	1.0
AH									31		
AJ	$\phi 95^{+0.038}_{+0.013}$	$\phi 115$	M8 DEPTH 15	6	$\phi 49$	$\phi 55_{h7-0.030}$	67	6	31	$\square 150$	1.7
AK	$\phi 115^{+0.038}_{+0.013}$	$\phi 165$							36		

注記

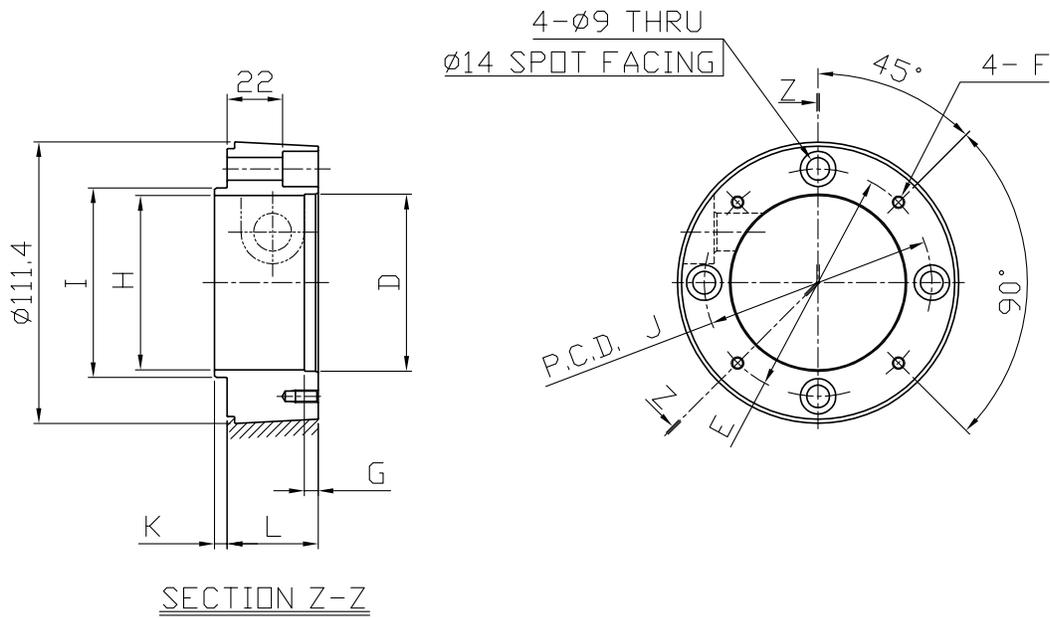
1. 塗装 塗装色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を//////に示す。

NOTE

1. ////// area is painted black.



Motor Flange Dimension Drawing



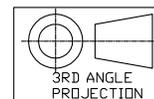
コード Code	モータ取付部寸法 Dimensions (mm)									質量 Mass (kg)
	D	E	F	G	H	I	J	K	L	
CA	$\phi 50^{+0.036}_{-0.011}$	$\phi 70$	M5 DEPTH 9	3.5	$\phi 69$	$\phi 75_{h7-0.030}$	90	5	36	1.3
CB	$\phi 70^{+0.037}_{-0.012}$	$\phi 90$		5.5						
CC			M6 DEPTH 11							

注記

1. 塗装 塗装色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を // // // // に示す。

NOTE

1. // // // // area is painted black.



Straight input type

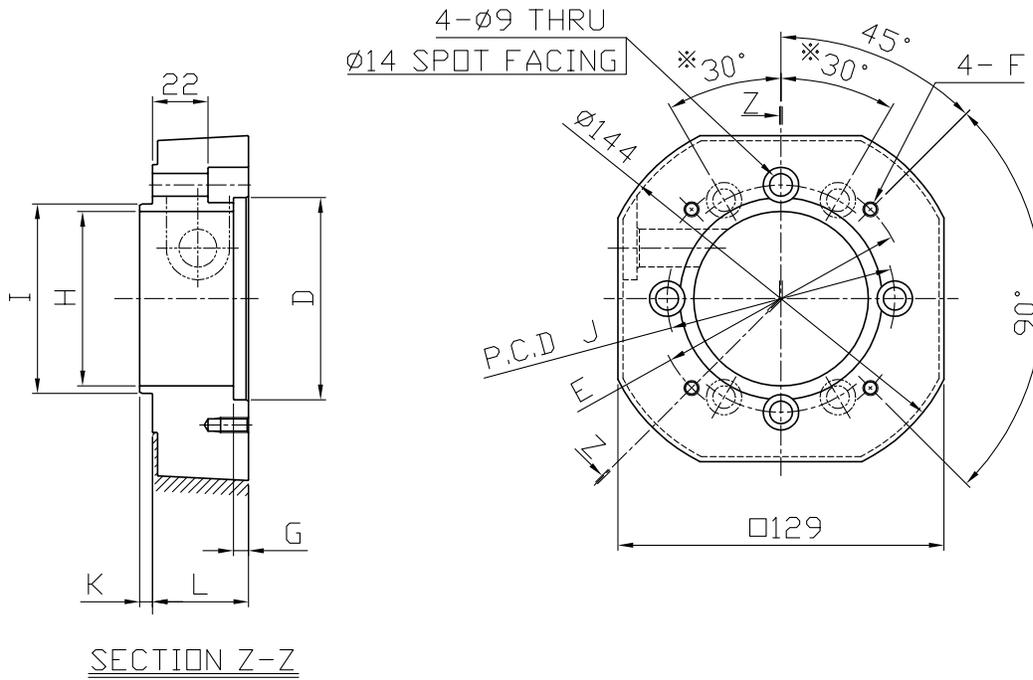
Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

Motor Flange Dimension Drawing



※ 印の角度寸法は、コード"GA"に適用とする。
 ※ Applied to Code "GA"

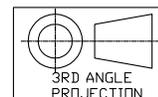
コード Code	モータ取付部寸法 Dimensions (mm)									質量 Mass (kg)
	D	E	F	G	H	I	J	K	L	
CD	$\phi 80^{+0.037}_{-0.012}$	$\phi 100$	M6 DEPTH 11							2.5
CE				6	$\phi 69$	$\phi 75_{h7-0.030}$	90			
CF	$\phi 95^{+0.038}_{-0.013}$	$\phi 115$	M8 DEPTH 15					5	38	2.4
GA				7	$\phi 96$	$\phi 106_{h7-0.035}$	122			

注記

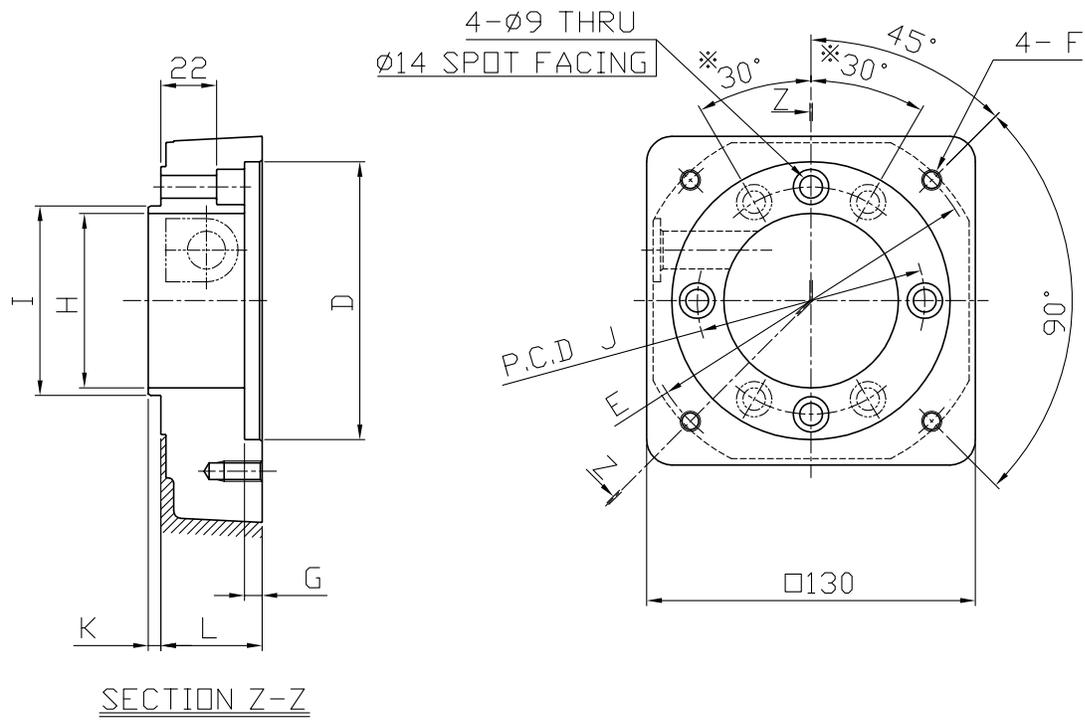
1. 塗装 塗装色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を//////に示す。

NOTE

1. //// area is painted black.



Motor Flange Dimension Drawing



※ 印の角度寸法は、コード“GB”、“GC”に適用とする。
 ※ Applied to Code “GB” or “GC”

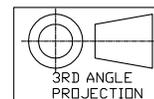
コード Code	モータ取付部寸法 Dimensions (mm)									質量 Mass (kg)
	D	E	F	G	H	I	J	K	L	
CG	$\phi 110^{+0.038}_{+0.013}$	$\phi 135$	M8 DEPTH 15	7	$\phi 69$	$\phi 75_{h7-0.030}$	90	5	40	3.2
CH		$\phi 145$			$\phi 96$	$\phi 106_{h7-0.035}$	122			2.5
GB		$\phi 135$								
GC		$\phi 145$								

注記

1. 塗装 塗装色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を // // // // に示す。

NOTE

1. // // // // area is painted black.



Straight input type

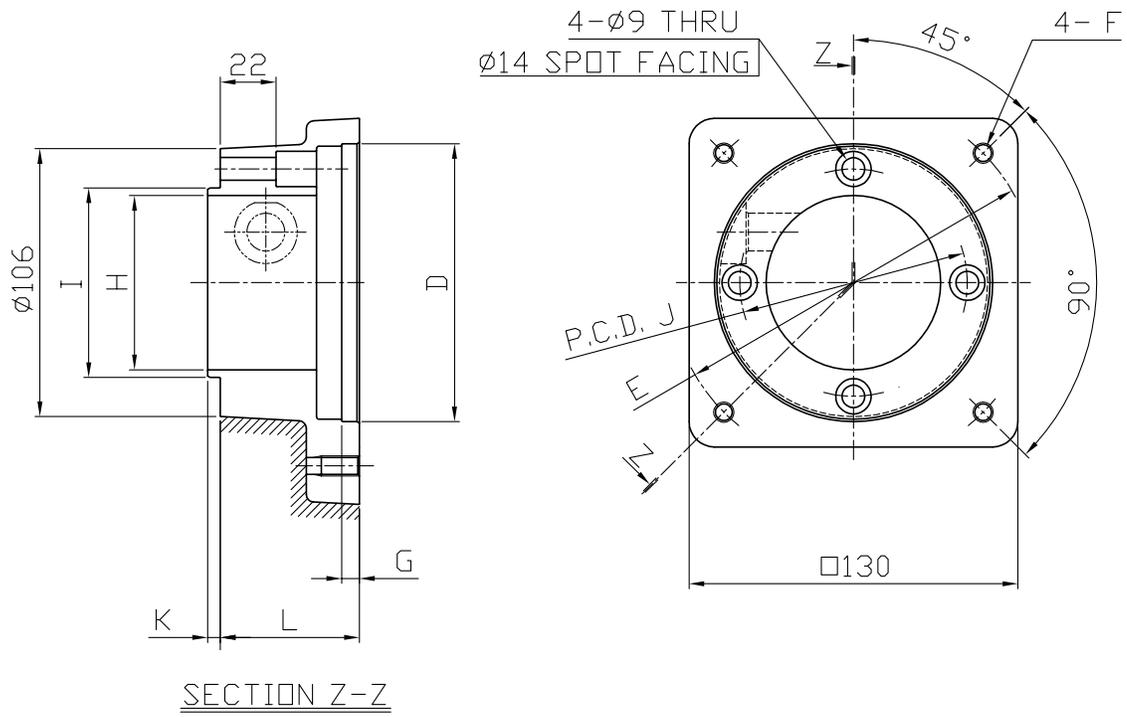
Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

Motor Flange Dimension Drawing



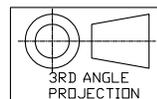
コード Code	モータ取付部寸法 Dimensions (mm)									質量 Mass (kg)
	D	E	F	G	H	I	J	K	L	
CJ	$\phi 110^{+0.038}_{-0.013}$	$\phi 145$	M8 DEPTH 15	7	$\phi 69$	$\phi 75_{h7-0.030}$	90	5	55	2.5

注記

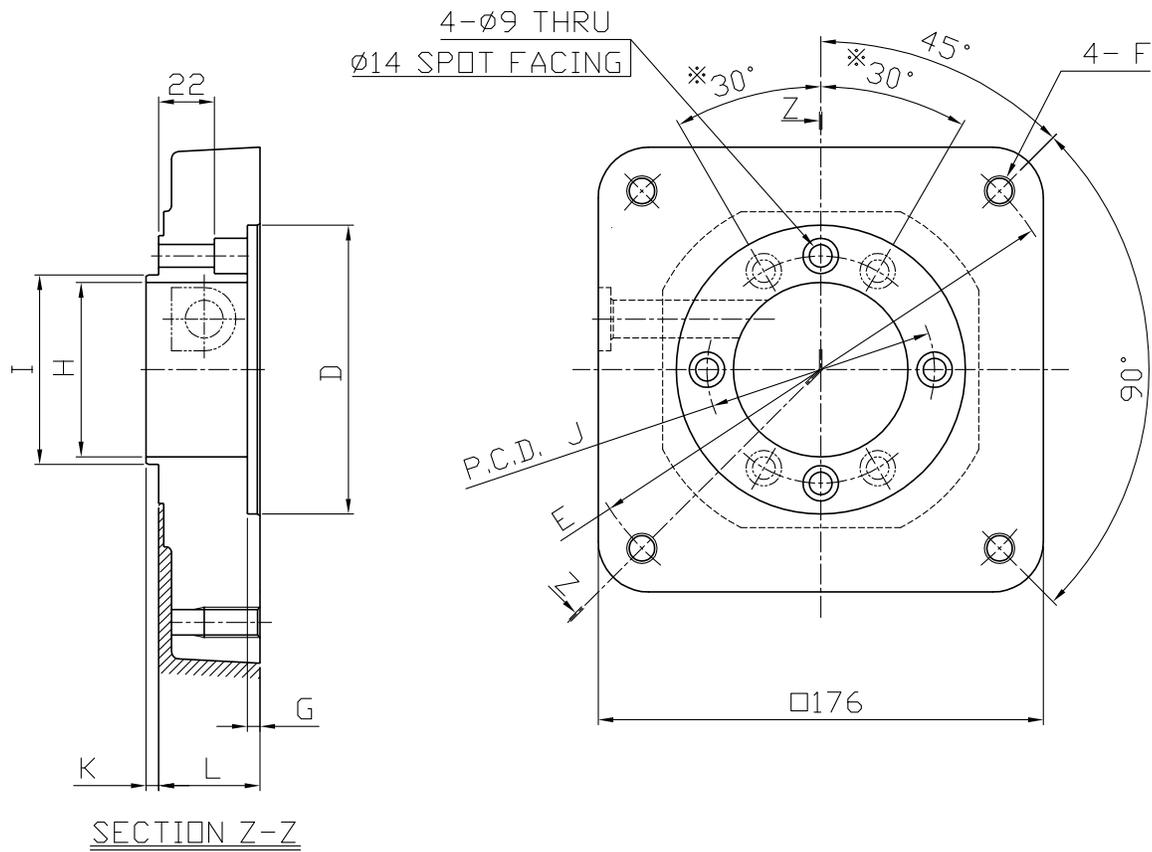
1. 塗装 塗装色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を//////に示す。

NOTE

1. //// area is painted black.



Motor Flange Dimension Drawing



※ 印の角度寸法は、コード“GD”、“GE”に適用とする。
 ※ Applied to Code “GD” or “GE”

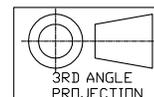
コード Code	モータ取付部寸法 Dimensions (mm)								質量 Mass (kg)	
	D	E	F	G	H	I	J	K		L
CK	$\phi 114.3^{+0.038}_{+0.013}$	$\phi 200$	M12 DEPTH 22	5						6.7
CL	$\phi 115^{+0.038}_{+0.013}$	$\phi 165$	M8 DEPTH 15	6	$\phi 69$	$\phi 75_{h7-0.030}$	90		40	6.8
CM	$\phi 130^{+0.039}_{+0.014}$		M10 DEPTH 18							6.6
GD	$\phi 114.3^{+0.038}_{+0.013}$	$\phi 200$	M12 DEPTH 22	5	$\phi 96$	$\phi 106_{h7-0.035}$	122			6.1
GE	$\phi 130^{+0.039}_{+0.014}$	$\phi 165$	M10 DEPTH 18	6						6.0

注記

1. 塗装 塗装色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を // // // // に示す。

NOTE

1. // // // // area is painted black.



Straight input type

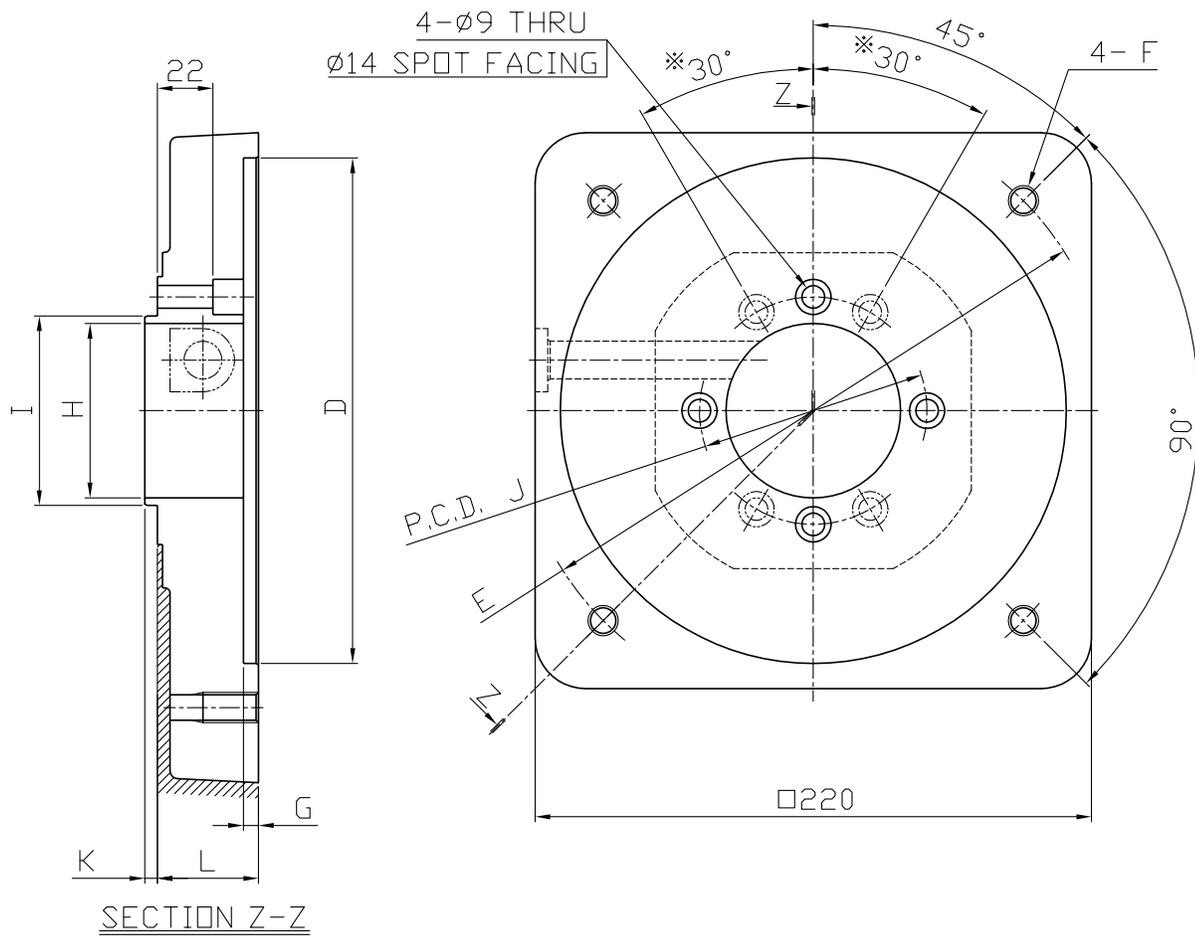
Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

Motor Flange Dimension Drawing



※ 印の角度寸法は、コード"GF"に適用とする。
 ※ Applied to Code "GF"

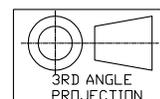
コード Code	モータ取付部寸法 Dimensions (mm)									質量 Mass (kg)
	D	E	F	G	H	I	J	K	L	
CN	$\phi 200^{+0.040}_{+0.015}$	$\phi 235$	M12 DEPTH 22	6	$\phi 69$	$\phi 75_{h7-0.030}$	90	5	40	10.3
GF					$\phi 96$	$\phi 106_{h7-0.035}$	122			9.8

注記

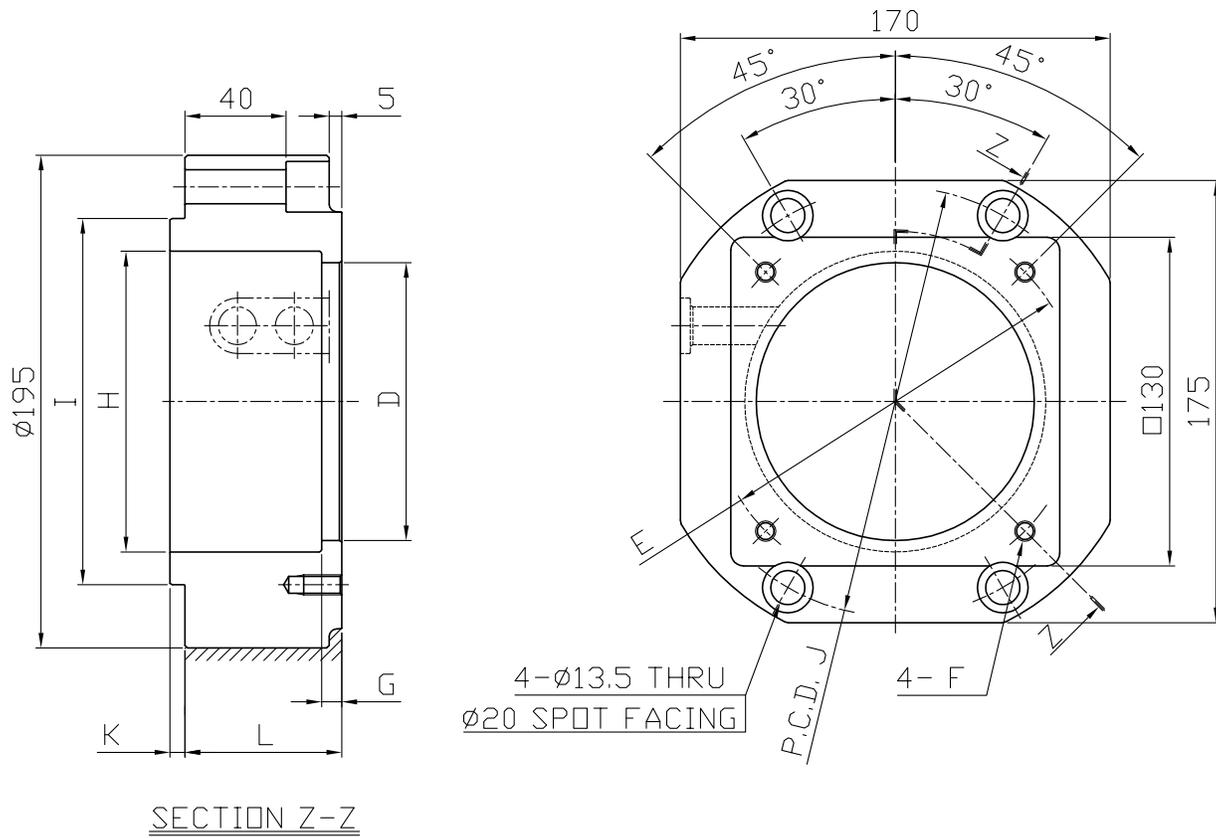
1. 塗装 塗装色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を // // // // に示す。

NOTE

1. // // // // area is painted black.



Motor Flange Dimension Drawing



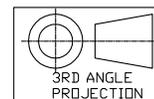
コード Code	モータ取付部寸法 Dimensions (mm)									質量 Mass (kg)
	D	E	F	G	H	I	J	K	L	
JA	$\phi 110^{+0.038}_{-0.013}$	$\phi 145$	M8 DEPTH 15	8	$\phi 119$	$\phi 145_{h7-0.040}$	170	6	62	6.9

注記

1. 塗装 塗装色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を // // // // に示す。

NOTE

1. // // // // area is painted black.



Straight input type

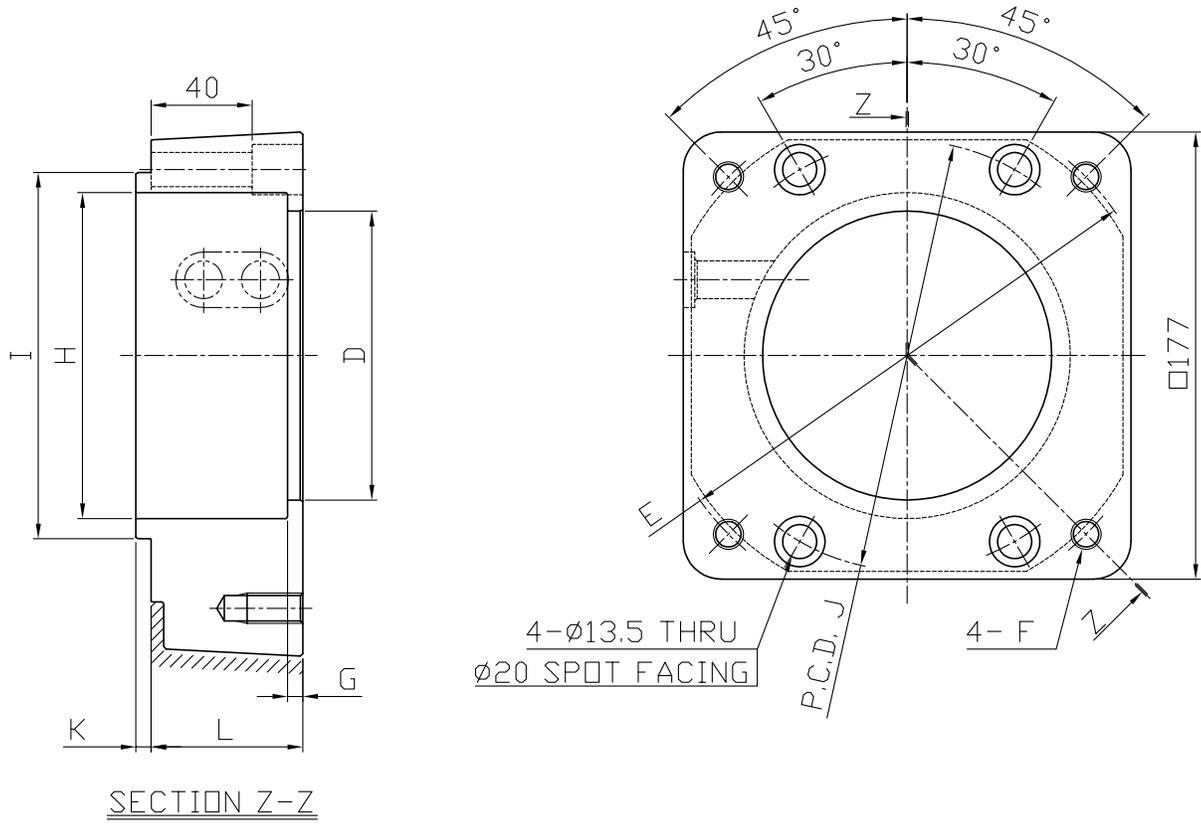
Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

Motor Flange Dimension Drawing



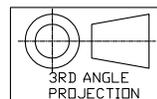
コード Code	モータ取付部寸法 Dimensions (mm)									質量 Mass (kg)
	D	E	F	G	H	I	J	K	L	
JB	Ø114.3 ^{+0.038} / _{-0.013}	Ø200	M12 DEPTH 22	6	Ø129	Ø145 _{h7-0.040}	170	6	60	8

注記

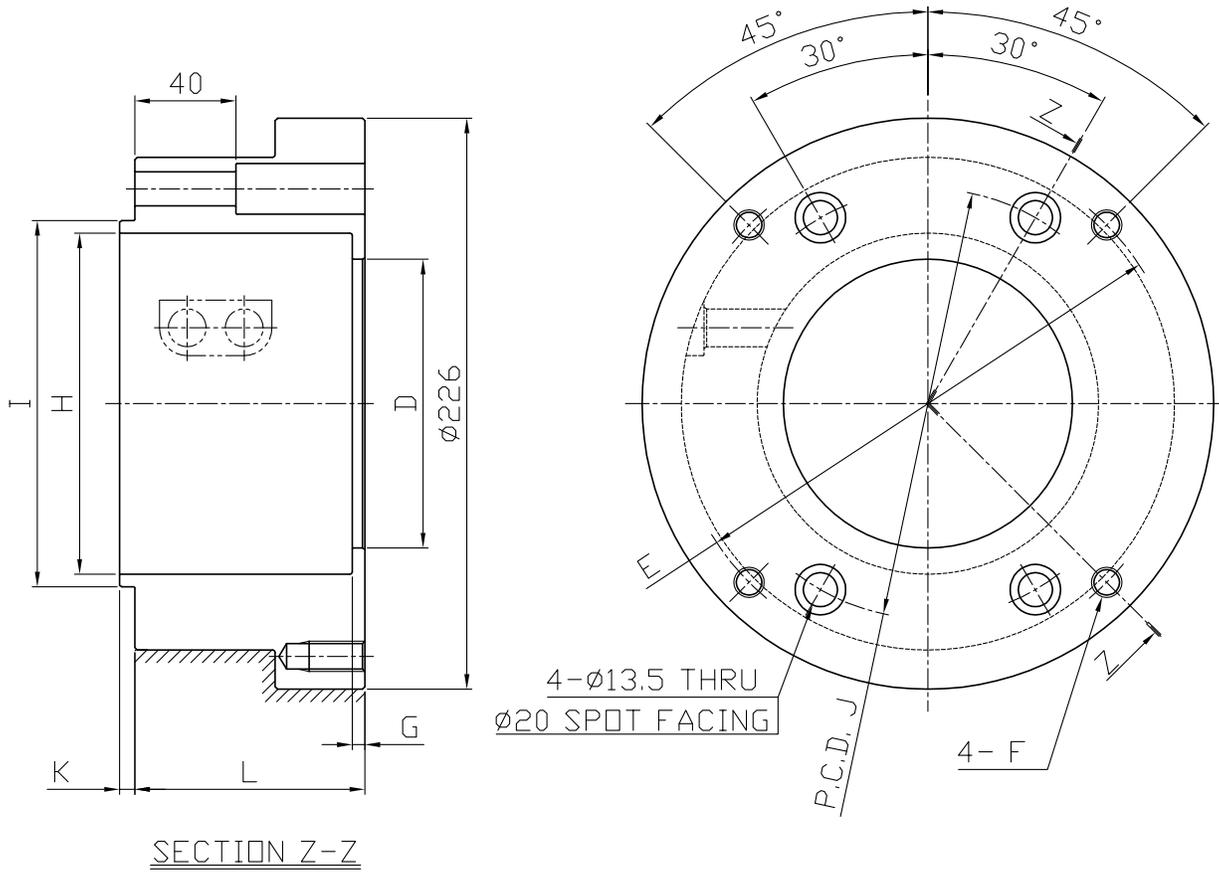
1. 塗装 塗装色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を//////に示す。

NOTE

1. //// area is painted black.



Motor Flange Dimension Drawing



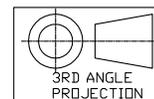
コード Code	モータ取付部寸法 Dimensions (mm)									質量 Mass (kg)
	D	E	F	G	H	I	J	K	L	
JC	Ø114.3 ^{+0.038} / _{-0.013}	Ø200	M12 DEPTH 22	5	Ø135	Ø145 _{h7-0.040}	170	6	91	12.2

注記

1. 塗装 塗装色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を // // // // に示す。

NOTE

1. // // // // area is painted black.



Straight input type

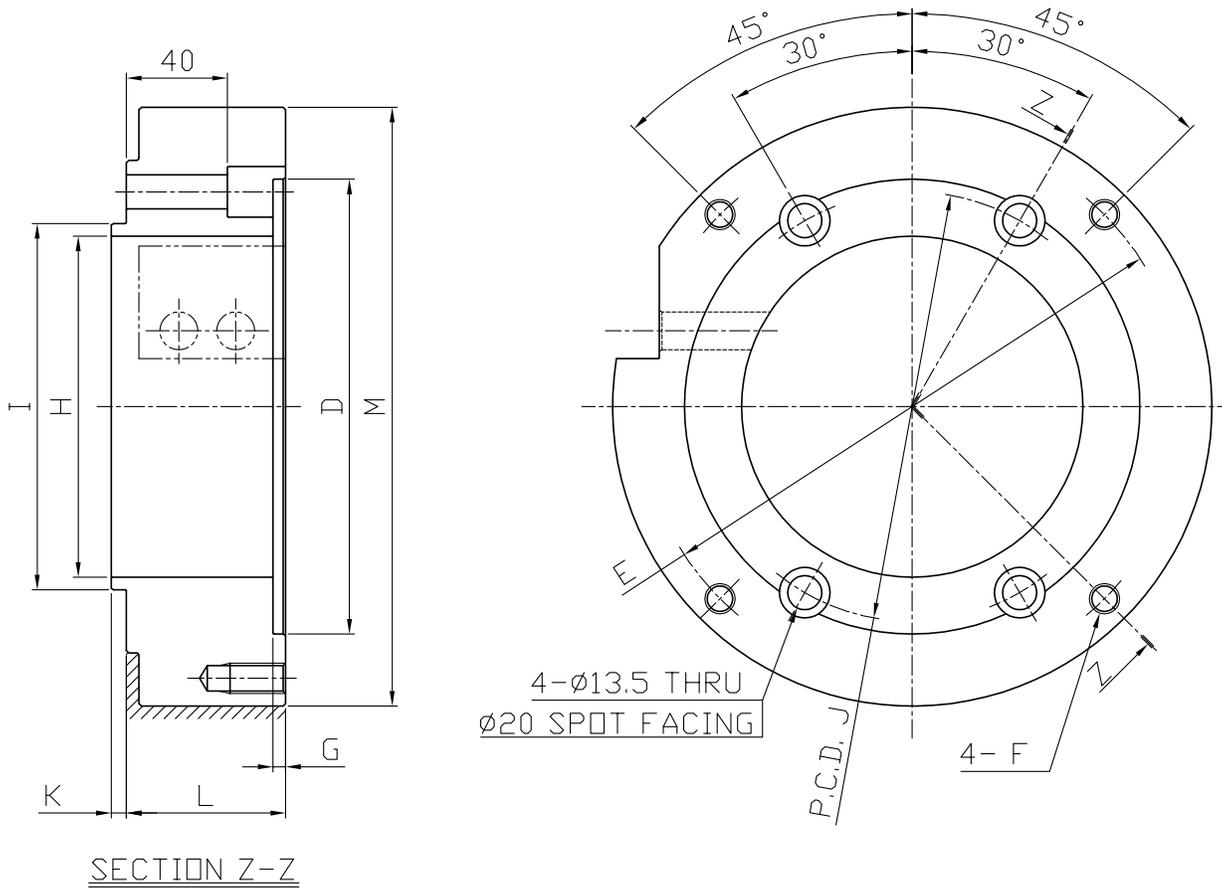
Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

Motor Flange Dimension Drawing



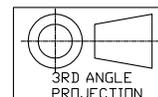
コード Code	モータ取付部寸法 Dimensions (mm)										質量 Mass (kg)
	D	E	F	G	H	I	J	K	L	M	
JD	$\phi 180^{+0.039}_{-0.014}$	$\phi 215$							63	$\phi 237$	12
JE	$\phi 200^{+0.040}_{-0.015}$	$\phi 235$	M12 DEPTH 22	5	$\phi 135$	$\phi 145_{h7-0.040}$	170	6	60	$\phi 255$	13.7
JF									93		18.7

注記

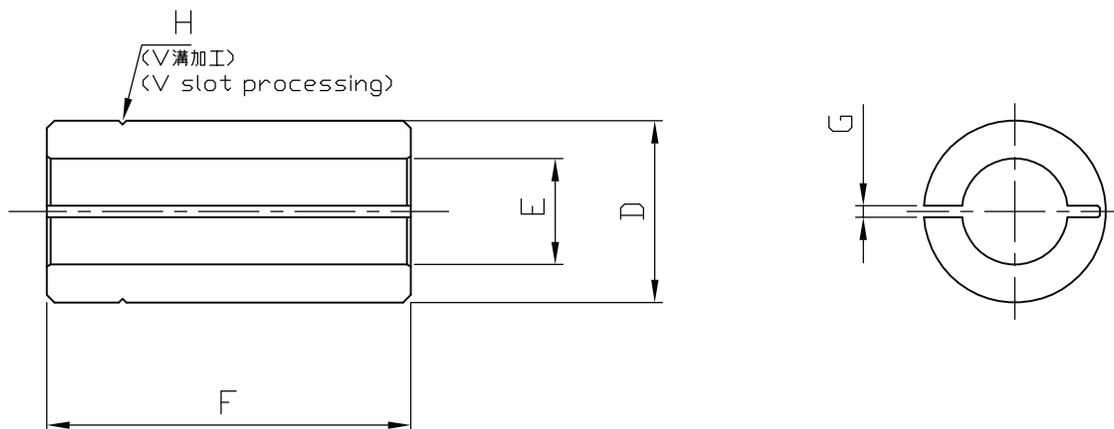
1. 塗装 塗装色 エポキシ マンセルNo.N1.5(黒色) 塗装範囲部分を//////に示す。

NOTE

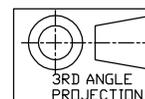
1. //// area is painted black.



Bushing Dimension Drawing



コード Code	ブッシュ寸法 Dimensions (mm)				
	D	E	F	G	H
0A	∅14 _{h7-0.018} ⁰	∅8 _{+0.005} ^{+0.025}	26	1.5	無し Nothing
0B		∅9 _{+0.005} ^{+0.025}			
0C		∅10 _{+0.005} ^{+0.025}			
0D		∅11 _{+0.005} ^{+0.025}			
1A	∅24 _{h7-0.021} ⁰	∅14 _{+0.005} ^{+0.030}	48		
1B		∅15 _{+0.005} ^{+0.030}			
1C		∅16 _{+0.005} ^{+0.030}			
1D		∅17 _{+0.005} ^{+0.030}			
1E		∅19 _{+0.005} ^{+0.030}			
1F		∅22 _{+0.005} ^{+0.030}			
2A	∅28 _{h7-0.021} ⁰	∅19 _{+0.005} ^{+0.030}	62		
2B		∅22 _{+0.005} ^{+0.030}			
2C		∅24 _{+0.005} ^{+0.030}			
3A	∅35 _{-0.015} ^{+0.01}	∅25 _{+0.005} ^{+0.030}	72		
3B		∅28 _{+0.005} ^{+0.030}			
4A	∅42 _{h7-0.025} ⁰	∅32 _{+0.005} ^{+0.030}	77		
4B		∅35 _{+0.015} ^{+0.040}			
4C		∅38 _{+0.023} ^{+0.048}			
4D		∅32 _{+0.023} ^{+0.048}			



Straight input type

Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents



Technical Information

Cautions for use of RD2 SERIES

- If the end user of the product is a military interest or if the product is to be used in the manufacture of weapons, the product may be subject to export regulations prescribed in the Foreign Trade Control Act. Confirm these conditions before exporting the product and take the necessary steps.
- If failure or malfunction of the product may directly endanger human life or if it is used in units which may injure the human body (atomic facilities, space equipment, medical equipment, safety units, etc.), examination of individual situations is required. Contact our agent or nearest business office in such a case.
- Although this product has been manufactured under strict quality control, if it is to be used in equipment that could cause serious injury or damage to facilities as a result of failure of the product, all appropriate safety measures must be taken.

Installation environment

Use the reduction gear under the following environment:

- Location where the ambient temperature is between -10°C to 40°C.
- Location where the humidity is less than 85% and no condensation occurs.
- Location where the altitude is less than 1000 m.
- Well-ventilated location

Do not install the reduction gear at the following locations.

- Location where a lot of dust is collected.
- Outdoors that can be directly affected by wind and rain
- Location near the environment that contains combustible, explosive, or corrosive gases and flammable materials.
- Location where the performance of the servo motor can be affected by magnetic fields or vibration.

Note 1: If the required installation environment cannot be established, contact our service department in advance.

When using the reduction gear under special conditions (clean room, equipment for food, concentrated alkali, high-pressure steam, etc.), contact our agent or nearest business office in advance.

Maintenance

- The reduction gear is filled with grease and the standard replacement time is 20,000 hours.
- When using the reduction gear with deteriorated grease or under an inappropriate ambient temperature condition (40°C or higher), check the deterioration condition of the grease and determine the appropriate replacement cycle.

Reduction gear temperature

- Be careful so that the surface temperature of the reduction gear does not exceed 60°C.

Manuals

- Safety information and detail product instructions are indicated in the operation manual. The operation manual can be downloaded from the following web address.

<http://www.nabtesco-precision.de>

<http://www.nabtescomotioncontrol.com>

Straight input type

Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

Glossary

Life Rating

The lifetime resulting from the operation with the rated torque and the rated output speed is referred to as the "life rating".

Allowable Acceleration/Deceleration Torque

When the machine starts or stops, the load torque to be applied to the reduction gear is larger than the constant-speed load torque due to the effect of the inertia torque of the rotating part.

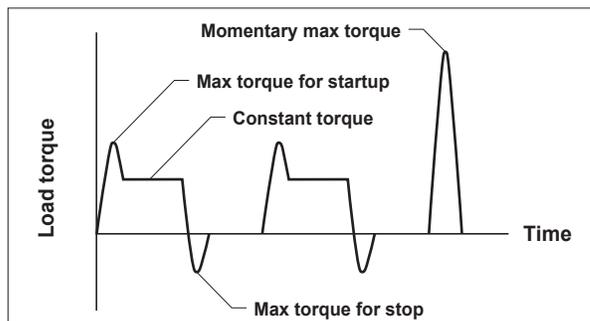
In such a situation, the allowable torque during acceleration/deceleration is referred to as "allowable acceleration/deceleration torque".

Note: Be careful that the load torque, which is applied at startup and stop, does not exceed the allowable acceleration/deceleration torque.

Momentary Maximum Allowable Torque

A large torque may be applied to the reduction gear due to execution of emergency stop or by an external shock. In such a situation, the allowable value of the momentary applied torque is referred to as "momentary maximum allowable torque".

Note: Be careful that the momentary excessive torque does not exceed the momentary maximum allowable torque.



Allowable Input Speed

The allowable value of the input speed is referred to as "allowable input speed".

Note: The reduction gear temperature may increase significantly even when the speed is under the allowable speed depending on the speed ratio. In such a case, use the reduction gear at the speed so that the gear temperature is 60°C or lower.

Allowable Output Speed

The allowable value of the output speed is referred to as "allowable output speed".

Note: The reduction gear temperature may exceed 60°C even when the speed is under the allowable output speed depending on the specification conditions (duty, ambient temperature). In such a case, use the reduction gear at the speed so that the gear temperature is 60°C or lower.

Allowable Output Speed Reference Value

This is a reference value of the output speed at which the temperature increase of the reduction gear is 40°C or lower when the rated torque is applied to the reduction gear and the gear is operated continuously in one direction.

Note: Maintain the environment and operation conditions so that the temperature of the reduction gear is 60°C or lower.

Torsional Rigidity, Lost Motion, Backlash

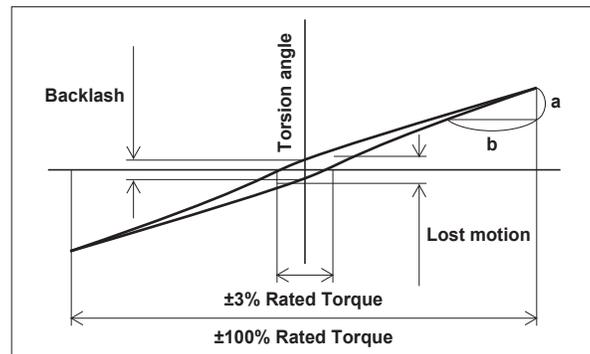
When a torque is applied to the output shaft while the input shaft is fixed, torsion is generated according to the torque value. The torsion can be shown in the hysteresis curves.

The value of b/a is referred to as "torsional rigidity."

The torsion angle at the mid point of the hysteresis curve width within $\pm 3\%$ of the rated torque is referred to as "lost motion."

The torsion angle when the torque indicated by the hysteresis curve is equal to zero is referred to as "backlash."

■ Hysteresis curve



Startup Efficiency

The efficiency of the moment when the reduction gear starts up is referred to as "startup efficiency."

No-load running torque (input shaft)

The torque for the input shaft that is required to run the reduction gear without load is referred to as "no-load running torque."

Allowable Moment and Maximum Thrust Load

The external load moment may be applied to the reduction gear during normal operation. The allowable values of the external moment and the external axial load at this time are each referred to as "allowable moment" and "maximum thrust load."

For pulley input type only

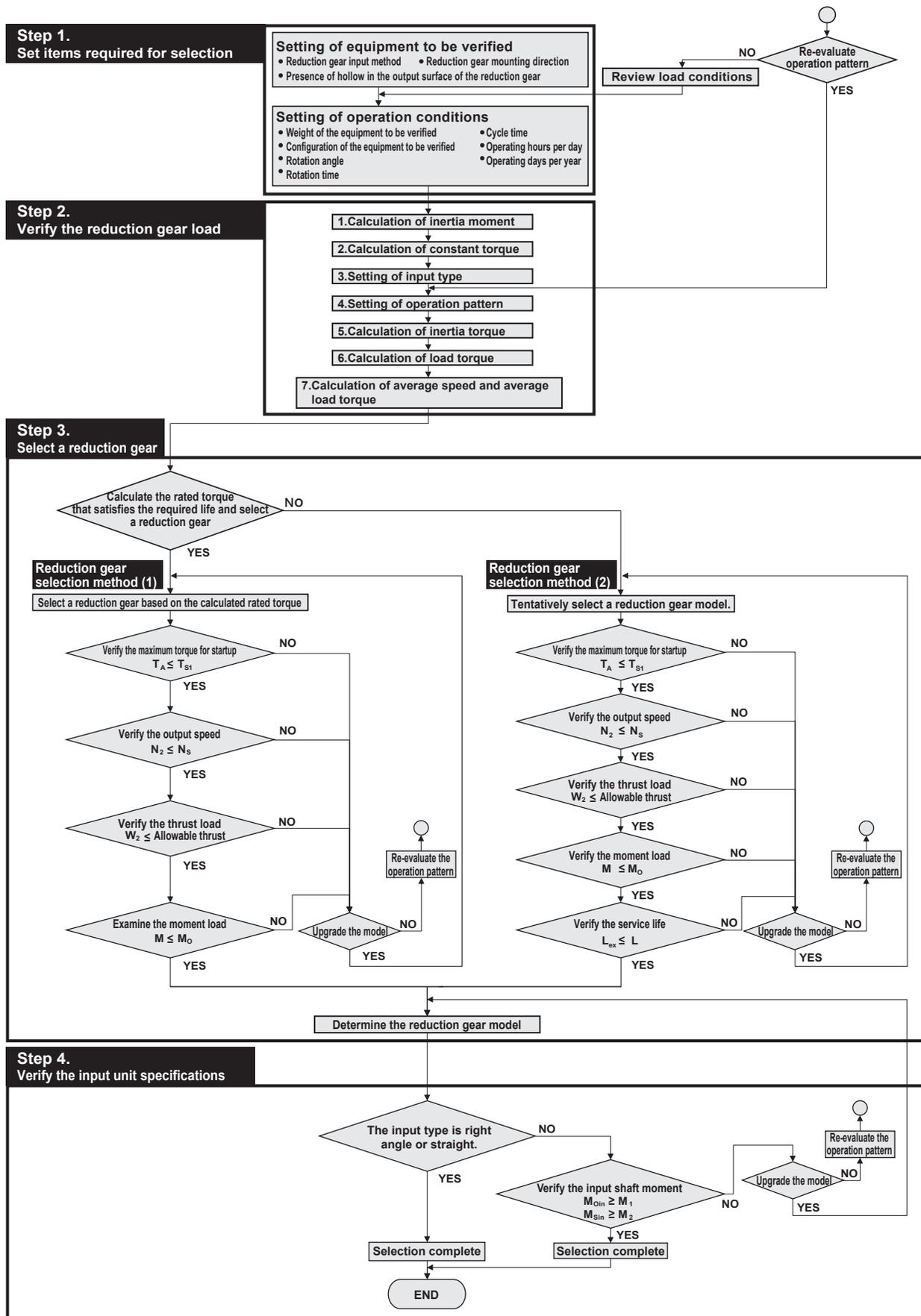
Input Shaft Rated Moment

This is the moment load that satisfies the life rating. The moment to be applied normally must be less than the rated moment.

Input Shaft Allowable Moment

This is the allowable value of the load that can be applied for startup and stop.

Product Selection Flowchart



Straight input type

Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

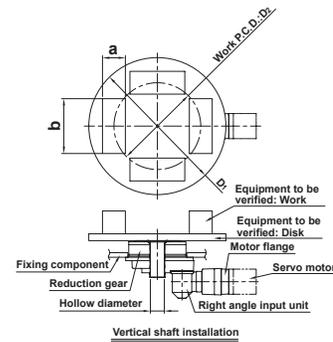
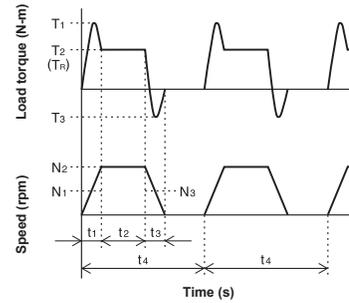
Product Selection

Selection of Product Code-1-(1) (With vertical shaft installed)

Step 1. Set items required for selection

Specification example for the equipment to be verified (1) (with vertical shaft installed)

Specification example for the equipment to be verified (1)	Setting item and value
Reduction gear input method	Right angle input type
Presence of hollow in the output surface of the reduction gear	Hollow (C type)
Reduction gear mounting direction	Vertical shaft installation
Installed equipment weight	
W _A ————— Disk weight (kg)	450
W _B ————— Work weight (kg)	100 x 4 pieces
Installed equipment configuration	
D ₁ ————— Disk: D dimension (mm)	1,200
a ————— Work piece: a dimension (mm)	200
b ————— Work piece: b dimension (mm)	400
D ₂ ————— Work piece: P.C.D. (mm)	800
Operation conditions	
θ ————— Rotation angle (°)	180
[t ₁ +t ₂ +t ₃] ————— Rotation time (sec)	2.5
[t ₄] ————— Cycle time (sec)	20
Q ₁ ————— Equipment operation hours per day (hours/day)	12
Q ₂ ————— Equipment operation days per year (days/year)	365



Step 2-1. Examine the reduction gear load

Setting item	Calculation formula	Selection examples
--------------	---------------------	--------------------

1. Calculate the inertia moment based the calculation formula on page 120.

I_R	Load inertia moment (kg-m ²)	Calculation formula	Selection examples
		$I_{R1} = \frac{W_A \times \left(\frac{D_1}{2 \times 1,000}\right)^2}{2}$ $I_{R2} = \left[\frac{W_B}{12} \left\{ \left(\frac{a}{1,000}\right)^2 + \left(\frac{b}{1,000}\right)^2 \right\} + W_B \times \left(\frac{D_2}{2 \times 1,000}\right)^2 \right] \times 4$ <p> I_{R1} = Disk inertia moment I_{R2} = Work inertia $I_R = I_{R1} + I_{R2}$ </p>	$I_{R1} = \frac{450 \times \left(\frac{1,200}{2 \times 1,000}\right)^2}{2}$ $= 81 \text{ (kg - m}^2\text{)}$ $I_{R2} = \left[\frac{100}{12} \left\{ \left(\frac{200}{1,000}\right)^2 + \left(\frac{400}{1,000}\right)^2 \right\} + 100 \times \left(\frac{800}{2 \times 1,000}\right)^2 \right] \times 4$ $= 70.7 \text{ (kg - m}^2\text{)}$ $I_R = 81 + 70.7$ $= 151.7 \text{ (kg - m}^2\text{)}$

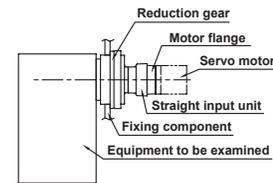
2. Examine the constant torque.

T_R	Constant torque with vertical shaft installed (N-m)	Calculation formula	Selection examples
		$T_R = (W_A + W_B) \times 9.8 \times \frac{D_{in}}{2 \times 1,000} \times \mu$ <p> μ = Friction factor Note: Use 0.015 for this example as the load is applied to the bearing of the RD2 reduction gear. D_{in} = Rolling diameter: Use the pilot diameter which is almost equivalent to the rolling diameter in this selection calculation. * If the reduction gear model is not determined, select the following pilot diameter: Solid series = 284 (mm) – Maximum pilot diameter Hollow shaft series = 440 (mm) – Maximum pilot diameter </p>	$T_R = (450 + 100 \times 4) \times 9.8 \times \frac{440}{2 \times 1,000} \times 0.015$ $= 27.5 \text{ (N - m)}$

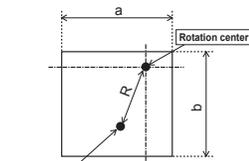
Step 1. Set items required for selection

Equipment specification example (2) (with horizontal shaft installed)

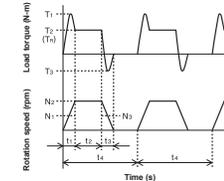
Equipment specification example (2)	Setting item and value
Reduction gear input method	Straight input type
Presence of hollow in the output surface of the reduction gear	Without hollow (Solid series)
Reduction gear mounting direction	Horizontal shaft installation
Installed equipment weight	
W_C ————— Mounted work weight (kg)	490
Installed equipment configuration	
a ————— a dimension (mm)	500
b ————— b dimension (mm)	500
c ————— R dimension (mm)	320
Operation conditions	
θ ————— Rotation angle (°)	90
$[t_1+t_2+t_3]$ ————— Rotation time (sec)	1.5
$[t_4]$ ————— Cycle time (sec)	20
Q_1 ————— Equipment operation hours per day (hours/day)	24
Q_2 ————— Equipment operation days per year (days/year)	365



Horizontal shaft installation



Position of the center of gravity



Step 2-1. Examine the reduction gear load

Setting item	Calculation formula	Selection examples
1. Calculate the inertia moment based the calculation formula on page 120.		
I_R Load inertia moment (kg-m ²)	$I_R = \frac{W_C}{12} \times \left\{ \left(\frac{a}{1,000} \right)^2 + \left(\frac{b}{1,000} \right)^2 \right\} + W_C \times \left(\frac{R}{1,000} \right)^2$	$I_R = \frac{490}{12} \times \left\{ \left(\frac{500}{1,000} \right)^2 + \left(\frac{500}{1,000} \right)^2 \right\} + 490 \times \left(\frac{320}{1,000} \right)^2$ = 70.6 (kg - m ²)
2. Examine the constant torque.		
T_R Constant torque with horizontal shaft installed (N-m)	$T_R = W_C \times 9.8 \times \frac{R}{2 \times 1,000}$	$T_R = 490 \times 9.8 \times \frac{320}{2 \times 1,000}$ = 768 (N - m)

Straight input type

Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

Product Selection

Selection of Product Code-2 (With vertical shaft installed)

* For Selection examples, the calculation for specification example for the equipment to be verified (1) (with vertical shaft installed) is listed.

Step 2-2. Set items required for selection

Setting item	Calculation formula	Selection examples (Specification example for the equipment to be verified (1))
(3)-1 Examine the input type.		
RDS ——— Straight input type		Select RDR (right angle input type) based on the equipment to be verified.
RDR ——— Right angle input type		
RDP ——— Pulley input type		
(3)-2 Examine the in-line type and hollow type of the reduction gear output shaft.		
Solid series or hallow shaft series		Select the hollow shaft type (C type) based on the equipment to be verified.
(4) Set the acceleration/deceleration time, constant-speed operation time, and output speed.		
t ₁ ——— Acceleration time (sec)	<ul style="list-style-type: none"> The operation pattern does not need to be verified if it is already set. If the operation pattern has not been determined, use the following formula to calculate the reference operation pattern. $t_1 = t_3 = \text{Rotation time} \left[t_1 + t_2 + t_3 \right] - \frac{\theta}{\left(\frac{N_2}{60} \times 360 \right)}$ $t_2 = \text{Rotation time} \left[t_1 + t_2 + t_3 \right] - (t_1 + t_3)$	Examine the operation pattern using N ₂ = 15 rpm as the reduction gear output speed is unknown. $t_1 = t_3 = 2.5 - \frac{180}{\left(\frac{15}{60} \times 360 \right)} = 0.5(\text{sec})$ $t_2 = 2.5 - (0.5 + 0.5) = 1.5(\text{sec})$ $\therefore t_1 = t_3 = 0.5(\text{sec})$ $t_2 = 1.5(\text{sec})$ $N_2 = 15(\text{rpm})$
t ₂ ——— Constant-speed operation time (sec)		
t ₃ ——— Deceleration time (sec)		
N ₂ ——— Constant speed (rpm)	Note: 1. Assume that t ₁ and t ₃ are the same. Note: 2. N ₂ = 15 rpm if the reduction gear output speed (N ₂) is not known. Note: 3. If t ₁ and t ₃ is less than 0, increase the output speed or extend the rotation time.	
N ₁ ——— Average speed for startup (rpm)	$N_1 = \frac{N_2}{2}$	$N_1 = \frac{15}{2} = 7.5(\text{rpm})$
N ₃ ——— Average speed for stop (rpm)	$N_3 = \frac{N_2}{2}$	$N_3 = \frac{15}{2} = 7.5(\text{rpm})$
(5) Calculate the inertia torque for acceleration/deceleration.		
T _A ——— Inertia torque for acceleration (N-m)	$T_A = \left\{ \frac{I_R \times (N_2 - 0)}{t_1} \right\} \times \frac{2\pi}{60}$	$T_A = \left\{ \frac{151.7 \times (15 - 0)}{0.5} \right\} \times \frac{2\pi}{60}$ = 476.6 (N-m)
T _D ——— Inertia torque for deceleration (N-m)	$T_D = \left\{ \frac{I_R \times (0 - N_2)}{t_3} \right\} \times \frac{2\pi}{60}$	$T_D = \left\{ \frac{151.7 \times (0 - 15)}{0.5} \right\} \times \frac{2\pi}{60}$ = -476.6 (N-m)
(6) Calculate the load torque for acceleration/deceleration.		
T ₁ ——— Maximum torque for startup (N-m)	$T_1 = T_A + T_R $ T _R : Constant torque See page 104.	$T_1 = 476.6 + 27.5 $ = 504.1(N-m)
T ₂ ——— Constant maximum torque (N-m)	$T_2 = T_R $	$T_2 = 27.5(\text{N-m})$
T ₃ ——— Maximum torque for stop (N-m)	$T_3 = T_D + T_R $ T _R : Constant torque See page 104.	$T_3 = -476.6 + 27.5 $ = 449.1(N-m)
(7)-1 Calculate the average speed.		
N _m ——— Average speed (rpm)	$N_m = \frac{t_1 \times N_1 + t_2 \times N_2 + t_3 \times N_3}{t_1 + t_2 + t_3}$	$N_m = \frac{0.5 \times 7.5 + 1.5 \times 15 + 0.5 \times 7.5}{0.5 + 1.5 + 0.5}$ = 12 (rpm)
(7)-2 Calculate the average load torque.		
T _m ——— Average load torque (N-m)	$T_m = \sqrt[10]{\frac{t_1 \times N_1 \times t_1^3 + t_2 \times N_2 \times t_2^3 + t_3 \times N_3 \times t_3^3}{t_1 \times N_1 + t_2 \times N_2 + t_3 \times N_3}}$	$T_m = \sqrt[10]{\frac{0.5 \times 7.5 \times 504.1^3 + 1.5 \times 15 \times 27.5^3 + 0.5 \times 7.5 \times 449.1^3}{0.5 \times 7.5 + 1.5 \times 15 + 0.5 \times 7.5}}$ = 315.7(N-m)

Go to Page 107 if the reduction gear model is verified based on the required life.

Go to Page 108 if the service life is verified based on the reduction gear model.

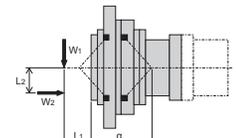
Selection of Product Code-3-(1)

Step 3. Select a reduction gear

Reduction gear selection method (1) Calculate the required torque based on the load conditions and required life and select a reduction gear.

Setting item	Calculation formula	Selection examples
(1) Calculate the rated torque for the reduction gear that satisfies the required life.		
L_{ex} Required life (year)	Based on the operation conditions	5 years
Q_{1cy} Number of cycles per day (times)	$Q_{1cy} = \frac{Q_1 \times 60 \times 60}{t_4}$	$Q_{1cy} = \frac{12 \times 60 \times 60}{20} = 2,160$ (times)
Q_3 Operating hours of reduction gear per day (Hr)	$Q_3 = \frac{Q_{1cy} \times (t_1 + t_2 + t_3)}{60 \times 60}$	$Q_3 = \frac{2,160 \times (0.5 + 1.5 + 0.5)}{60 \times 60} = 1.5$ (Hr)
Q_4 Operating hours of reduction gear per year (Hr)	$Q_4 = Q_3 \times Q_2$	$Q_4 = 1.5 \times 365 = 548$ (Hr)
L_{hour} Reduction gear service life (Hr)	$L_{hour} = Q_4 \times L_{ex}$	$L_{hour} = 548 \times 5 = 2,740$ (Hr)
$T_{O'}$ Reduction gear rated torque that satisfies the required life (N-m)	$T_{O'} = T_m \times \left(\frac{10}{3}\right) \sqrt{\frac{L_{hour} \times N_m}{K \times N_0}}$ K : Reduction gear rated life (Hr) N_0 : Reduction gear rated torque (N-m)	$T_{O'} = 315.7 \times \left(\frac{10}{3}\right) \sqrt{\frac{2,740 \times 12}{6,000 \times 15}} = 233.5$ (N-m)

(2) Select a reduction gear model based on the calculated rated torque.

Tentative selection of the reduction gear model and actual reduction ratio	Tentatively select a reduction gear model that T_0 is equal to or greater than $T_{O'}$. Then check that T_{S1} of the tentatively selected model is equal to or greater than the maximum torque for startup T_1 and N_S of the tentatively selected model is equal to or greater than the output speed N_2 . If the tentatively selected reduction gear is outside of the specifications, increase the reduction gear model. T_{S1} : Check the rating table. N_S : The allowable output speed varies depending on the actual reduction ratio. Tentatively select the actual reduction ratio alongside the allowable output speed.	Tentatively select RDR-027C ($T_0 = 265$ N-m) based on the calculated rated torque. Rated torque: 265 (N-m) ≥ 233.5 (N-m) Allowable acceleration/deceleration torque: 662 (N-m) ≥ 504.4 (N-m) Allowable output speed: 15 (rpm) (when the actual reduction ratio is 233.45) is equal to or greater than 15 (rpm), tentatively selecting RDR-027C-233 should be no problem.
W_1 Radial load (N)	 $M = \frac{W_1 \times (L_1 + \alpha) + W_2 \times L_2}{1,000}$ Refer to the rating table of $\alpha =$ each input type.	0(N)
L_1 Distance to the point of radial load application (mm)		0(mm)
W_2 Thrust load (N)		$W_2 = (450 + 100 \times 4) \times 9.8 = 8,330$ (N)
L_2 Distance to the point of thrust load application (mm)		0(mm)
M Calculation of the moment load (N-m)		As α dimension of RDR-027C is 112 (mm) based on the rating table $M = \frac{0 \times (0 + 112) + 8,330 \times 0}{1,000} = 0$ (N-m)
Determination of the reduction gear model	From the allowable moment diagram on Page 110 • Thrust load • Moment load Select a reduction gear for which the above fall within the allowable moment diagram. Specify the actual reduction ratio so it is lower than the actual reduction ratio that was selected when the allowable output speed was examined. The actual reduction ratio is determined based on the motor speed, input torque, and inertia moment. Check with the motor manufacturer.	For this equipment, Thrust load $W_2 = 8,330$ (N) Moment load $M = 0$ (N) As the above values are within the RCR-027C allowable moment diagram, RDR-027C is selected. The actual reduction ratio lower than 233.45 which was selected when the allowable output speed was verified is selected.

Select a motor flange and bushing.

Refer to the selection table on page 83 to 85 or our Web site for the motor flange and bushing selection.

URL : <http://www.nabtesco-precision.de>, <http://www.nabtescomotioncontrol.com>

Selection of the motor flange and bushing.

T_{M1} Motor momentary maximum torque (N-m)	Determine based on the motor specifications.	For example, $T_{M1} = 25$ (N-m)
T_{M1OUT} Maximum torque generated at the output shaft for the reduction gear (N-m)	$T_{M1out} = T_{M1} \times R \times \eta$ R: Actual reduction ratio η : Startup efficiency(%) Note: If the maximum torque generated at the output shaft for the reduction gear exceeds the momentary maximum allowable torque, impose a limitation on the motor torque value. Also, ensure that the shock torque, due to an emergency stop, is the same as or lower than the momentary maximum allowable torque.	For example, calculate the maximum torque generated at the output shaft for the reduction gear based on the specifications when RDR-027C-233.45 was selected. $T_{M1out} = T_{M1} \times R \times \eta = 25 \times 233.45 \times \frac{70}{100} = 4,085$ (N-m) As T_{M1out} is equal to or greater than T_{S2} ($1,323$ N-m), a limitation is required for the motor torque.

Straight input type

Right angle input type

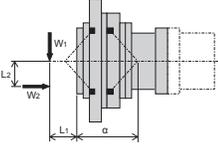
Pulley input type

Motor flange / bushing

Technical Documents

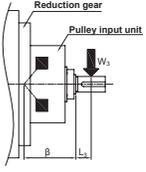
Selection of Product Code-3-(2)

Reduction gear selection method (2) Calculate the required torque based on the load conditions and required life and select a reduction gear.

Setting item	Calculation formula	Selection examples
(1) Select a reduction gear model based on the maximum torque for startup T₁, output speed N₂, thrust load, and moment load.		
Tentative selection of the reduction gear model and actual reduction ratio	<p>If T_{S1} of the tentatively selected model is equal to or greater than the maximum torque for startup T₁ and the tentatively selected model is outside of the reduction gear specifications, upgrade the reduction gear model.</p> <p>T_{S1}: Check the rating table.</p> <p>N_s: The allowable output speed varies depending on the actual reduction ratio.</p> <p>Tentatively select the actual reduction ratio alongside the allowable output speed.</p>	<p>Allowable acceleration/deceleration torque: 662 (N-m) ≥ 504.4 (N-m)</p> <p>Allowable output speed: 15 (rpm) (when the actual reduction ratio is 233.45) is equal to or greater than 15 (rpm), tentatively select RDR-027C-233.</p>
W ₁ — Radial load (N)	 $M = \frac{W_1 \times (L_1 + \alpha) + W_2 \times L_2}{1,000}$ <p>Refer to the rating table of α = each input type.</p>	0(N)
L ₁ — Distance to the point of radial load application (mm)		0(mm)
W ₂ — Thrust load (N)		$W_2 = (450 + 100 \times 4) \times 9.8$ $= 8,330 \text{ (N)}$
L ₂ — Distance to the point of thrust load application (mm)		0(mm)
M — Calculation of the moment load (N-m)		<p>As α dimension of RDR-027C is 112 (mm) based on the rating table</p> $M = \frac{0 \times (0 + 112) + 8,330 \times 0}{1,000}$ $= 0 \text{ (N-m)}$
Determination of the reduction gear model	<p>From the allowable moment diagram on Page 110</p> <ul style="list-style-type: none"> • Thrust load • Moment load <p>Select a reduction gear for which the above fall within the allowable moment diagram.</p> <p>Specify the actual reduction ratio so it is lower than the actual reduction ratio that was selected when the allowable output speed was examined.</p> <p>The actual reduction ratio is determined based on the motor rotation speed, input torque, and inertia moment. Check with the motor manufacturer.</p>	<p>For this equipment,</p> <p>Thrust load W₂ = 8,330 (N)</p> <p>Moment load M = 0 (N)</p> <p>As the above fall within the RCR-027C allowable moment diagram, RDR-027C is selected.</p> <p>The actual reduction ratio lower than 233.45 which was selected when the allowable output speed was examined is selected.</p>
(2) Calculate the reduction gear service life and compare to the required life.		
L _h — Life (Hr)	$L_h = 6,000 \times \frac{N_0}{N_m} \times \left(\frac{T_0}{T_m} \right)^{\frac{10}{3}}$	$L_h = 6,000 \times \frac{15}{12} \times \left(\frac{265}{315.7} \right)^{\frac{10}{3}}$ $= 4,184 \text{ (Hr)}$
Q _{1cy} — Number of cycles per day (times)	$Q_{1cy} = \frac{Q_1 \times 60 \times 60}{t_4}$	$Q_{1cy} = \frac{12 \times 60 \times 60}{20} = 2,160 \text{ (times)}$
Q ₃ — Operating hours per day (Hr)	$Q_3 = \frac{Q_1 \times (t_1 + t_2 + t_3)}{60 \times 60}$	$Q_3 = \frac{2,160 \times (0.5 + 1.5 + 0.5)}{60 \times 60} = 1.5 \text{ (Hr)}$
Q ₄ — Operating hours per year (Hr)	$Q_4 = Q_3 \times Q_2$	$Q_4 = 1.5 \times 365 = 548 \text{ (Hr)}$
L _{year} — Reduction gear service life (year)	$L_{year} = \frac{L_h}{Q_4}$	$L_{year} = \frac{4,180}{548} = 7.6 \text{ (year)}$
L _{ex} — Required life (year)	<p>Based on the required specifications.</p> <p>If the required life is longer than the service life, upgrade the reduction gear model and re-calculate the service life.</p>	<p>As L_{ex} 5 (year) is equal to or smaller than 7.6 (year), a reduction gear model is RDR-027C.</p>
Select a motor flange and bushing		
Refer to the selection table on page 83 to 85 or our Web site for the motor flange and bushing selection. URL : http://www.nabtesco-precision.de , http://www.nabtescomotioncontrol.com		
Cautions for selecting a motor		
T _{M1} — Motor momentary maximum torque (N-m)	Determine based on the motor specifications.	For example, T _{M1} = 25 (N-m)
T _{M1OUT} — Maximum torque generated at the output shaft for the reduction gear (N-m)	$T_{M1out} = T_{M1} \times R \times \eta$ <p>R: Actual reduction ratio η: Startup efficiency(%)</p> <p>Note: If the maximum torque generated at the output shaft for the reduction gear exceeds the momentary allowable torque, impose a limitation on the motor torque value. Also, ensure that the shock torque, due to an emergency stop, is the same as or lower than the momentary maximum allowable torque.</p>	<p>For example, calculate the maximum torque generated at the output shaft for the reduction gear based on the specifications when RDR-027C-233.45 was selected.</p> $T_{M1out} = T_{M1} \times R \times \eta$ $= 25 \times 233.45 \times \frac{70}{100}$ $= 4,085 \text{ (N-m)}$ <p>As T_{M1 out} is equal to or greater than T_{S2} (1,323 N-m), a limitation is required for the motor torque.</p>

Step 4. Verify the input unit specifications (calculation method of pulley input unit specifications)

* Examine only when selecting a pulley input unit.

Setting item	Calculation formula	Selection examples
Calculate the moment load for the input shaft.		
<p>M_1 — Input shaft load moment to be applied during normal operation (N-m)</p>	 $M_1 = W_3 \times \left(\frac{\beta + L_3}{1,000} \right)$ <p>β = Refer to the rating table on Page 70.</p>	<p>When RDP-027C-100 is selected</p> <p>$W_3 = 150$ (N) $\beta = 58$ (mm) $L_3 = 10$ (mm)</p> $M_1 = 150 \times \left(\frac{58 + 10}{1,000} \right) = 10.2 \text{ (N-m)}$
<p>M_2 — Input shaft load moment to be applied at startup and stop (N-m)</p>	$M_2 = \frac{\left(\frac{\text{Maximum output torque for startup (N-m)}}{\text{Actual reduction ratio} \times \frac{\text{Efficiency (\%)}}{100}} \right)}{\text{Pulley pitch diameter (mm)} \times 10^{-3}} \times \left(\frac{\beta + L_3}{1,000} \right)$ <p>β = Refer to the rating table on Page 70.</p>	<p>When the maximum torque for startup is 600 N-m at the output stage and the pulley pitch diameter is 50 mm</p> $M_2 = \frac{\left(\frac{600}{99.82 \times 0.75} \right)}{\left(\frac{50}{1,000} \right)} \times \left(\frac{58 + 10}{1,000} \right) = 10.9 \text{ (N-m)}$
Select a pulley input unit based on the moment load of the input shaft.		
<p>Determination of the input shaft</p>	<p>$M_{Oin} \geq M_1$ $M_{Sin} \geq M_2$ * M_{Oin}, M_{Sin} = Refer to the rating table on Page 70.</p> <p>Select an input unit that meets the above conditions.</p>	<p>If RDP-027C-100 is selected, $M_{Oin} = 38$ (N-m) and $M_{Sin} = 40$ (N-m) and there is no problem with the pulley input shaft.</p>

Straight input type

Right angle input type

Pulley input type

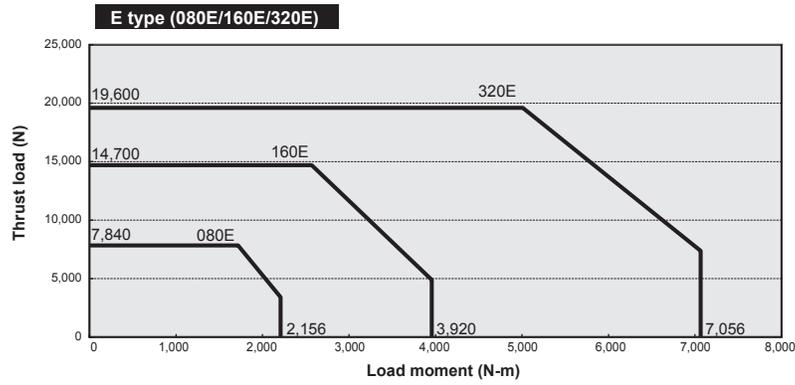
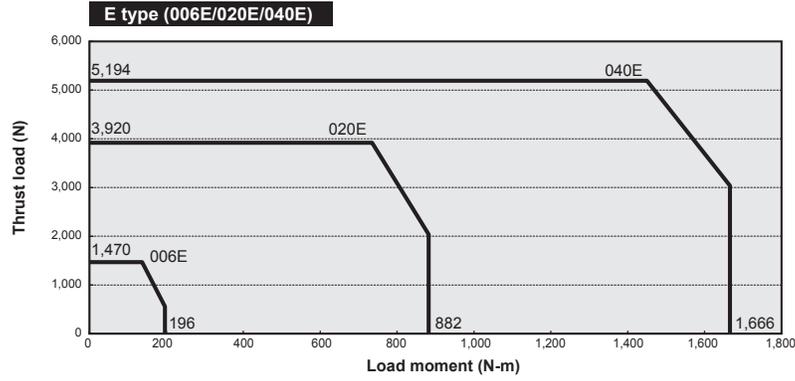
Motor flange / bushing

Technical Documents

Allowable Moment Diagram

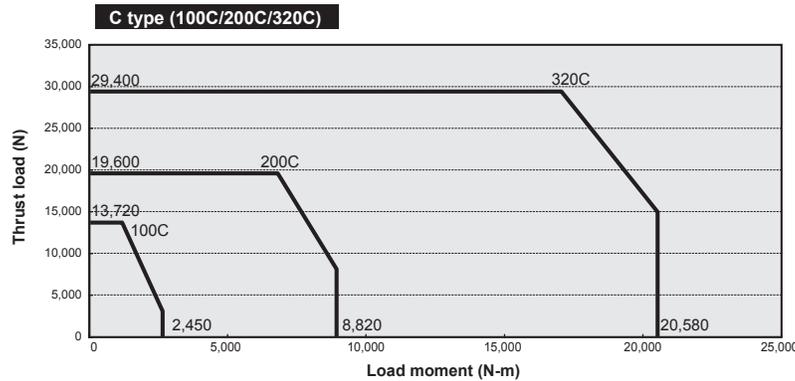
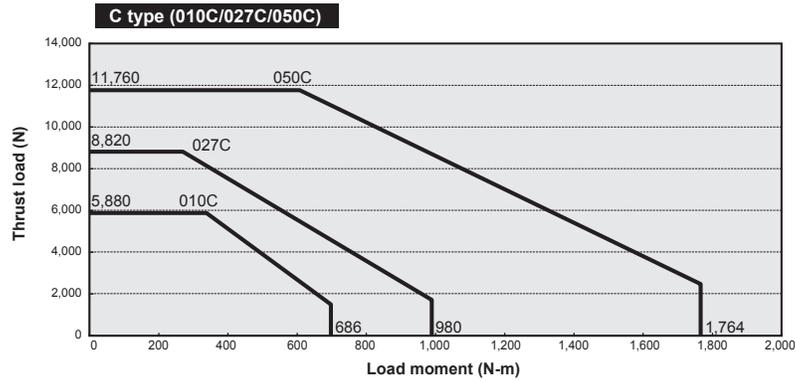
Solid series

RD□-E



Hollow shaft series

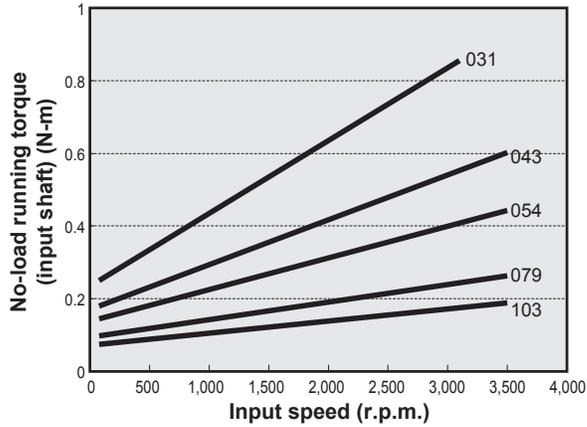
RD□-C



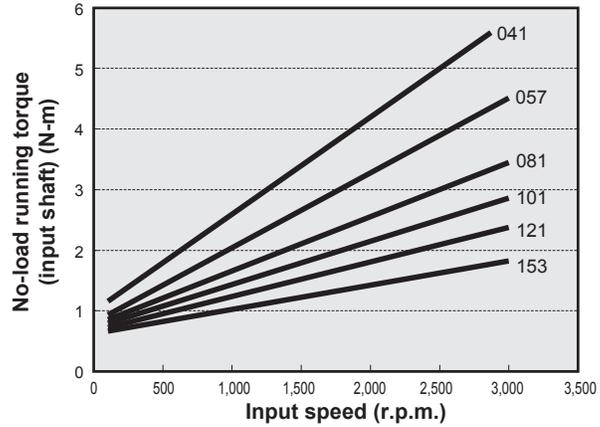
No-load running torque (straight input type)

Solid series

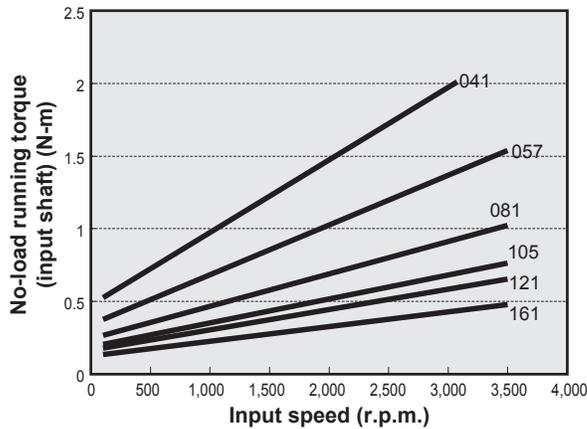
RDS-006E



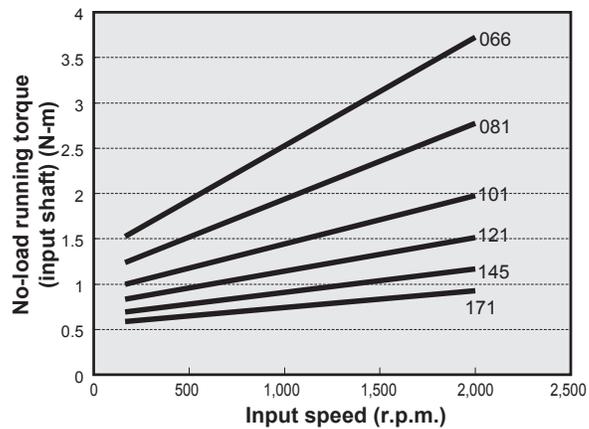
RDS-080E



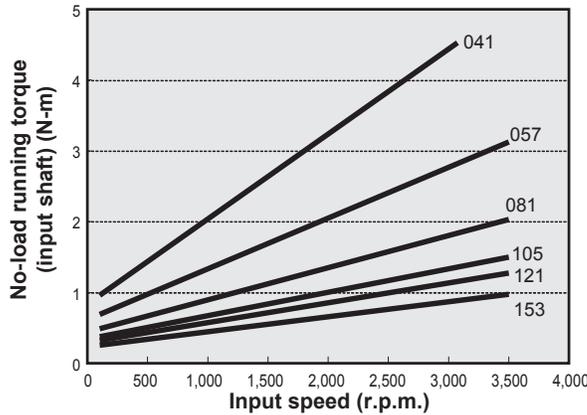
RDS-020E



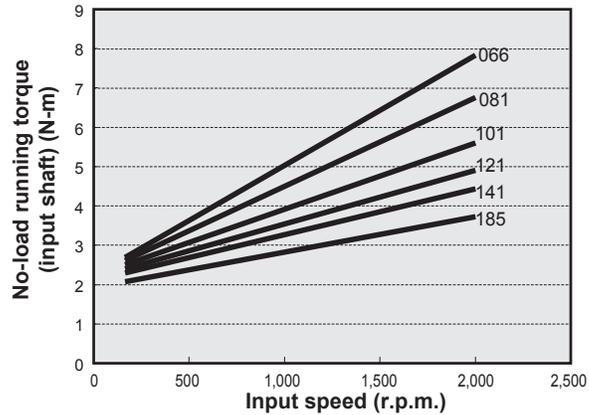
RDS-160E



RDS-040E



RDS-320E



Straight input type

Right angle input type

Pulley input type

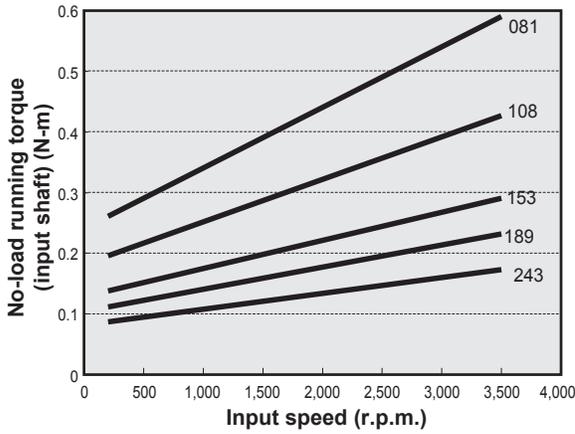
Motor flange / bushing

Technical Documents

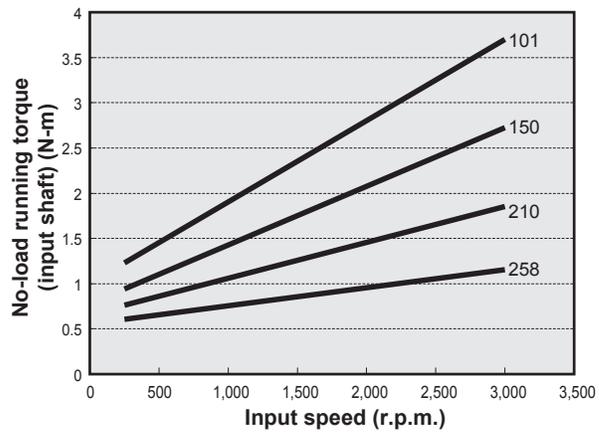
No-load running torque (straight input type)

Hollow shaft series

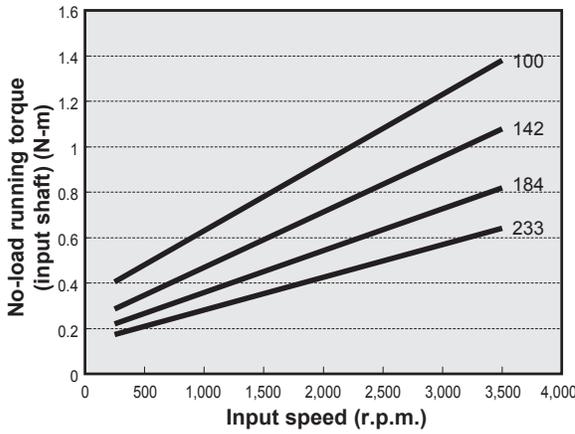
RDS-010C



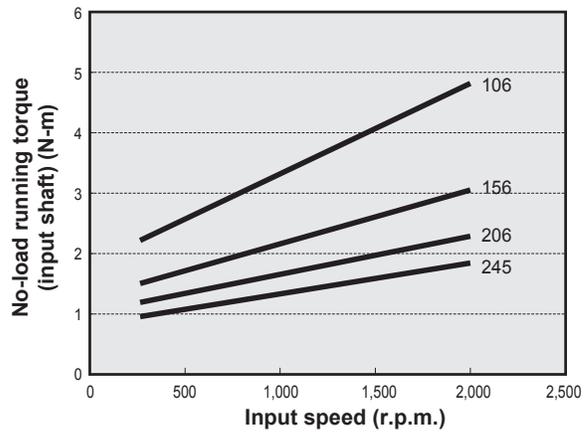
RDS-100C



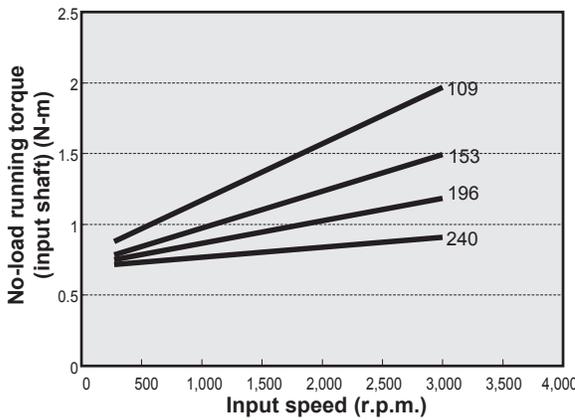
RDS-027C



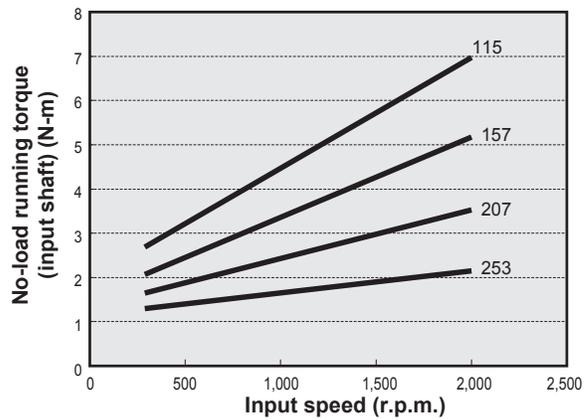
RDS-200C



RDS-050C



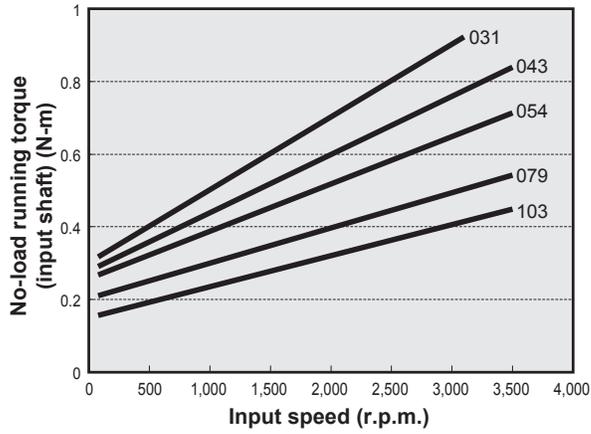
RDS-320C



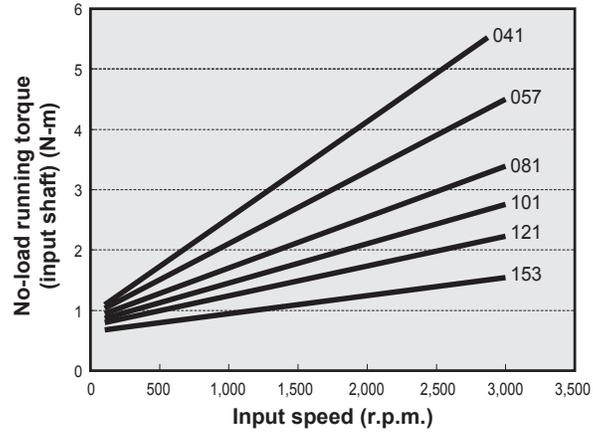
No-load running torque (Right angle input type)

Solid series

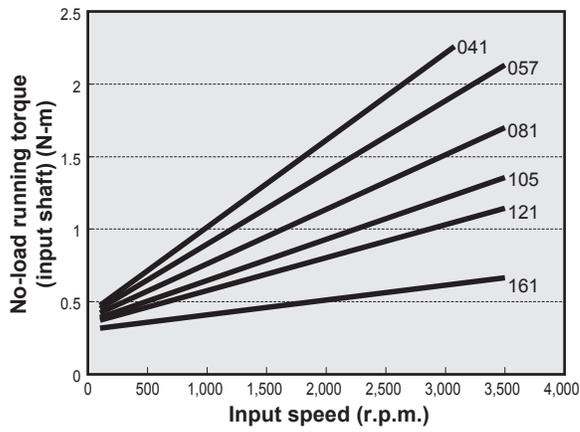
RDR-006E



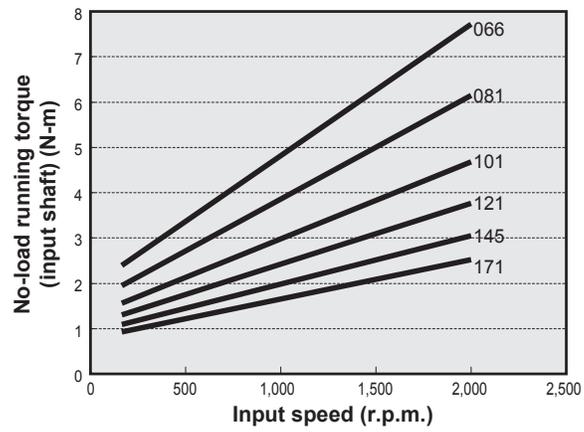
RDR-080E



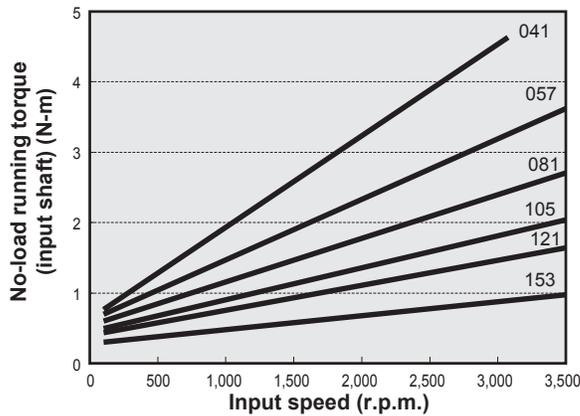
RDR-020E



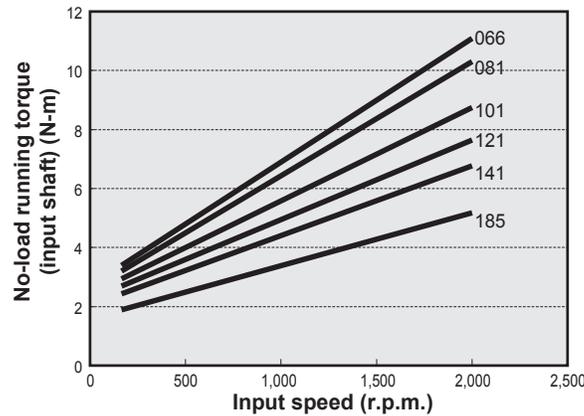
RDR-160E



RDR-040E



RDR-320E



Straight input type

Right angle input type

Pulley input type

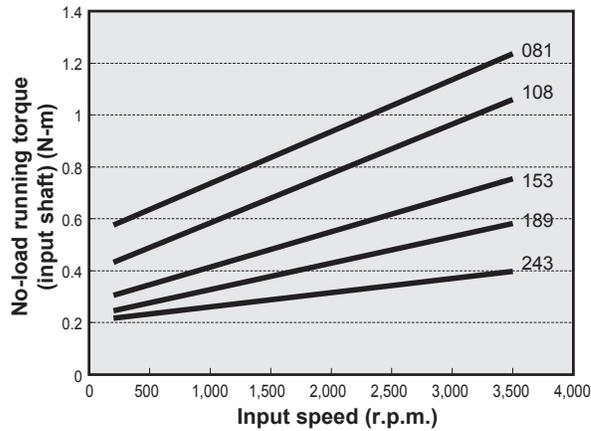
Motor flange / bushing

Technical Documents

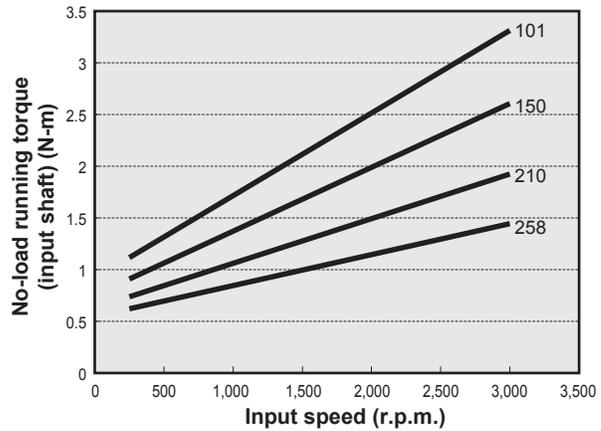
No-load running torque (Right angle input type)

Hollow shaft series

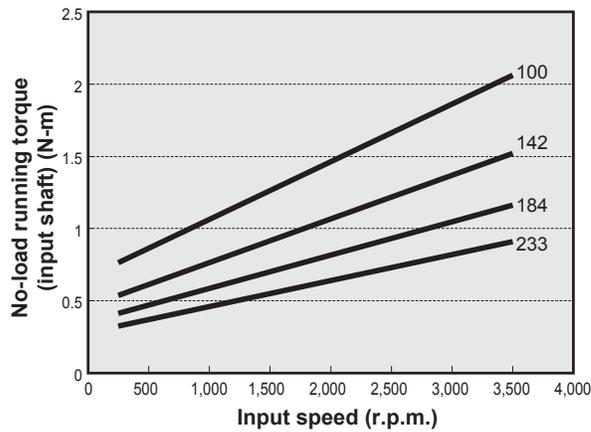
RDR-010C



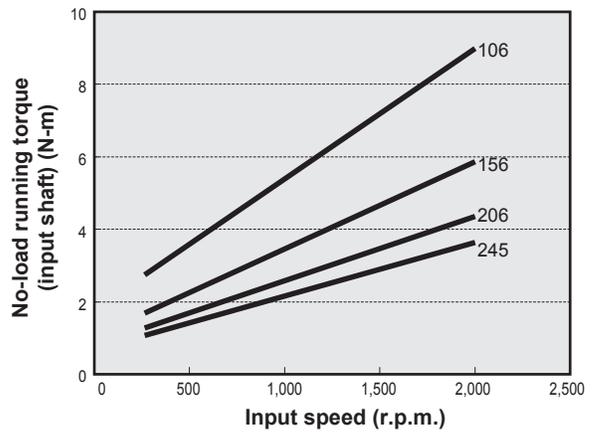
RDR-100C



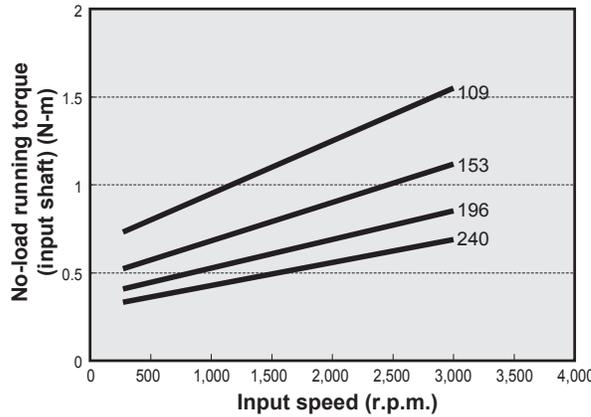
RDR-027C



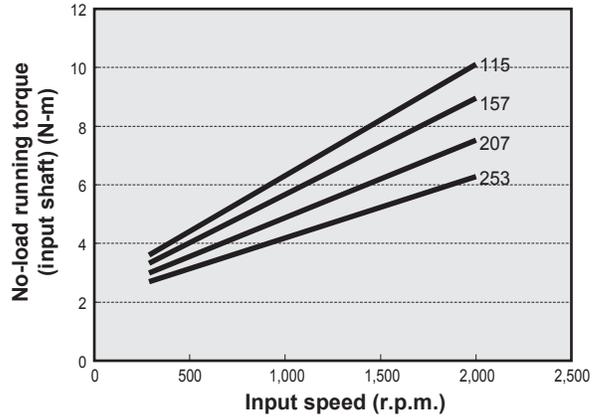
RDR-200C



RDR-050C

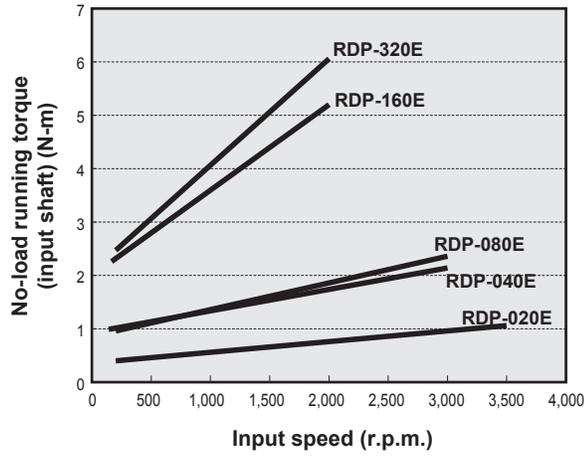


RDR-320C

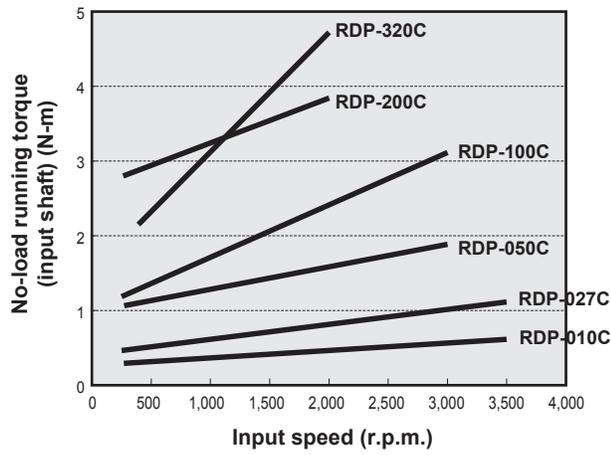


No-load running torque (Pulley input type)

Solid series



Hollow shaft series



Straight input type

Right angle input type

Pulley input type

Motor flange / bushing

Technical Documents

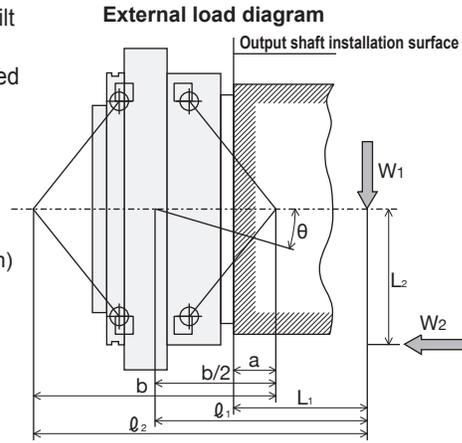
Calculation of tilt angle and torsion angle

Calculation of tilt angle

When a load moment occurs with an external load applied, the output shaft will tilt in proportion to the load moment (if \varnothing_2 is larger than b).
The moment rigidity indicates the rigidity of the main bearing, and it is represented by the load moment value required for tilting the main bearing by 1 arc.min.

$$\theta = \frac{W_1 \varnothing_1 + W_2 L_2}{M_1 \times 10^3}$$

θ : Tilt angle of the output shaft (arc.min)
 M_1 : Moment rigidity (N-m/arc.min.)
 W_1, W_2 : Load (N)
 \varnothing_1, L_2 : Distance to the point of load application (mm)
 \varnothing_1 : $L_1 + \frac{b}{2} - a$
 L_1 : Distance from the output shaft installation surface to the point of load application (mm)



Model code	Moment rigidity N-m/arc.min.	Dimensions (mm)	
		a	b
RD□-006E	117	12.5	90.3
RD□-020E	372	20.1	113.3
RD□-040E	931	29.9	144.5
RD□-080E	1,176	27.9	164.0
RD□-160E	2,940	42.7	210.0
RD□-320E	4,900	48.4	251.4

Model code	Moment rigidity N-m/arc.min.	Dimensions (mm)	
		a	b
RD□-010C	421	28.0	119.2
RD□-027C	1,068	38.0	150.0
RD□-050C	1,960	50.5	187.3
RD□-100C	2,813	58.7	207.6
RD□-200C	9,800	76.0	280.4
RD□-320C	12,740	114.5	360.4

Calculation of torsion angle

Calculate the torsion angle when the torque is applied in a single direction, using an example of RD□-160E.

- 1) When the load torque is 30 N-m.....Torsion angle (ST_1)

● When the load torque is within the lost motion range:

$$ST_1 = \frac{30}{47} \times \frac{1 \text{ (arc.min.)}}{2} = 0.32 \text{ arc.min. or less}$$

- 2) When the load torque is 1,300 N-m Torsion angle (ST_2)

● When the load torque is within the rated range:

$$ST_2 = \frac{1}{2} + \frac{1,300 - 47.0}{392} = 3.70 \text{ arc.min.}$$

Note: 1. The torsion angles that are calculated above are for a single reduction gear.

Model code	Torsion rigidity N-m/arc.min.	Lost motion		Backlash arc.min.
		Lost motion arc.min.	Measured torque N-m	
RD□-006E	20	For RDS or RDP 1.5 For RDR 2.0	± 1.76	For RDS or RDP 1.5 For RDR 2.0
RD□-020E	49		± 5.00	
RD□-040E	108	For RDS or RDP	± 12.3	For RDS or RDP
RD□-080E	196	1.0	± 23.5	1.0
RD□-160E	392	For RDR 1.5	± 47.0	For RDR 1.5
RD□-320E	980		± 94.0	

Model code	Torsion rigidity N-m/arc.min.	Lost motion		Backlash arc.min.
		Lost motion arc.min.	Measured torque N-m	
RD□-010C	47	For RDS or RDP 1.5 For RDR 2.0	± 2.94	For RDS or RDP 1.5 For RDR 2.0
RD□-027C	147		± 7.94	
RD□-050C	255	For RDS or RDP	± 14.7	For RDS or RDP
RD□-100C	510	1.0	± 29.4	1.0
RD□-200C	980	For RDR 1.5	± 58.8	For RDR 1.5
RD□-320C	1,960		± 94.1	

Engineering Notes-1

Installation of the reduction gear and mounting it to the output shaft

When installing the reduction gear and mounting it to the output shaft, use hexagonal socket head cap screw and tighten to the torque, as specified below, in order to satisfy the momentary maximum allowable torque, which is noted in the rating table.

Employment of the Belleville spring washer is recommended to prevent the bolt from loosening and protect the bolt seat surface from flaws.

<Bolt tightening torque and tightening force>

Hexagon socket head cap screw nominal size x pitch (mm)	Tightening torque (N-m)	Tightening force F (N)	Bolt specification
M5 × 0.8	9.01 ± 0.49	9,310	Hexagon socket head cap screw JIS B 1176 or Equivalent Strength class JIS B 1051 12.9 or Equivalent Thread JIS B 0205 6 g or class 2 or Equivalent
M6 × 1.0	15.6 ± 0.78	13,180	
M8 × 1.25	37.2 ± 1.86	23,960	
M10 × 1.5	73.5 ± 3.43	38,080	
M12 × 1.75	129 ± 6.37	55,360	
M16 × 2.0	319 ± 15.9	103,410	

Note: 1. The tightening torque values listed are for steel or cast iron material.

2. If softer material, such as aluminum or stainless, is used, limit the tightening torque. Also pay attention to the system requirements of the transmission torque.

<Calculation of allowable transmission torque of bolts>

$T = F \times \frac{D}{2} \times \mu \times n \times 10^{-3}$	T	Allowable transmission torque by tightening bolt (N-m)
	F	Bolt tightening force (N)
	D	Bolt mounting P.C.D (mm)
	μ	Friction factor μ=0.15: When grease remains on the mating face. μ=0.20: When grease is removed from the mating face.
	n	Number of bolts (pcs.)

<Serrated lock washer External teeth for hexagonal socket head cap screw>

Name: Belleville spring washer (made by Heiwa Hatsujyo Industry Co., Ltd.)

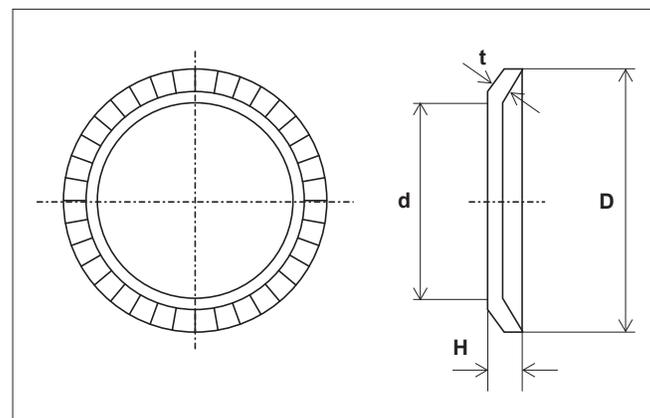
Corporation symbol: Bell SW-2H (nominal size)

Material: S50CM to S65CM

Hardness: HRC 40 to 48

(Unit: mm)

Nominal size	ID and OD of Belleville spring washer		t	H
	d Basic size	D		
5	5.25	8.5	0.6	0.85
6	6.4	10	1.0	1.25
8	8.4	13	1.2	1.55
10	10.6	16	1.5	1.9
12	12.6	18	1.8	2.2
16	16.9	24	2.3	2.8



Note: When using any equivalent washer, select it with special care given to its outside diameter.

Straight input type

Right angle input type

Pulley input type

Motor flange / bushing

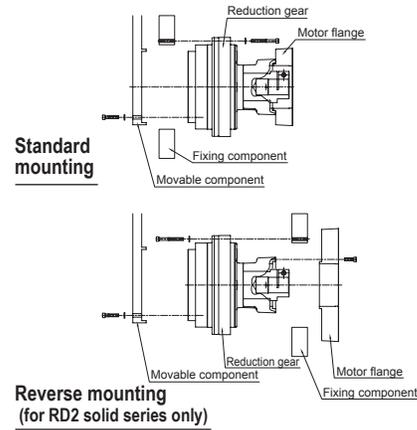
Technical Documents

Engineering Notes-2

Gearhead Installation

- ➔ Mount the gearhead onto the specified position. Please take care to use the specified number of bolts.
- ➔ Tighten all the hexagonal socket head cap screw (with a conical spring lock washer) uniformly, by using the specified tightening torque.

Bolt size	Tightening torque (N-m)	Bolt specification
M5	9.01 ± 0.49	Hexagon socket head cap screw
M6	15.6 ± 0.78	JIS B 1176
M8	37.2 ± 1.86	Strength class
M10	73.5 ± 3.43	JIS B 1051 12.9
M12	129 ± 6.37	Thread
M16	319 ± 15.9	JIS B 0205 6 g or class 2 or equivalent

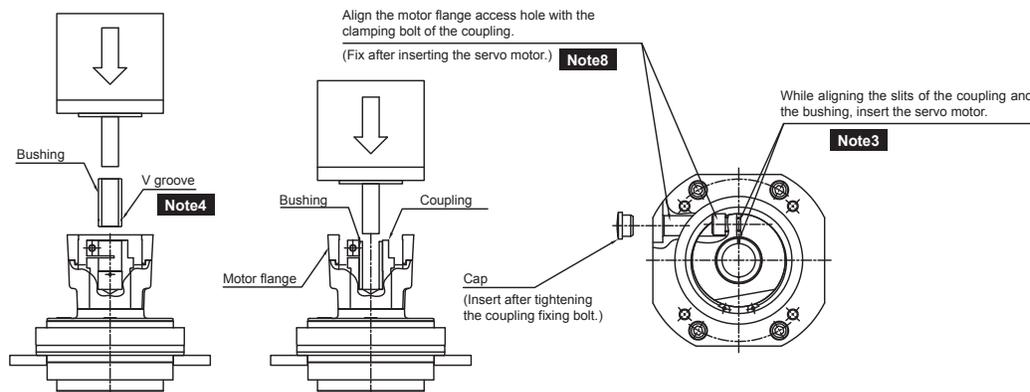


Note: When the gearhead is delivered, a motor flange may already be mounted. Depending on the situation, the gearhead might not be normally assembled unless the motor flange is removed. In the following cases, remove the motor flange before assembling the gearhead into the equipment.

- In the standard mounting, the torque wrench cannot be used because it makes contact with the motor flange
- In the reverse mounting, the motor flange is larger than the mating hole

Do not apply external load to the hollow section of the RD2 hollow shaft series. It could warp the oil seal.

Installation of the servo motor (for straight and right angle input units)



Step 1. Wipe the outside of the servo motor shaft and the clamping surface inside the coupling with a clean cloth. (Make sure that the clamping bolt of the coupling is not tightened.)

When using a bushing, wipe the inside and outside of the bushing using a clean cloth.

Note: 1. Make sure that there is no damage inside of the coupling, bushing, and the motor shaft which before performing the assembly.

2. Make sure that there is no foreign material or oil on the outside of the servo motor shaft, the clamping surface of the coupling, or the inside and outside of the bushing.

Step 2. When using a bushing, insert the bushing into the coupling, and then align the position of the clamping bolt of the coupling and the motor flange hole.

Note: 3. When inserting the bushing, align the slit of the bushing and the slit of the coupling.

If the slits of the bushing and coupling are not aligned, proper tightening force cannot be achieved.

4. When using the bushing with a V groove on the circumference, turn the V groove toward the back (reduction gear side).

If the direction is not correct, proper tightening force cannot be achieved.

Step 3. Wipe off the oil on the installation face of the motor flange and servo motor, and apply the liquid sealing agent on the face.

Note: 5. If the servo motor is forcibly inserted into the reduction gear, the servo motor and reduction gear may be damaged.

Step 4. Align the mating part of the motor flange and insert the servo motor straight.

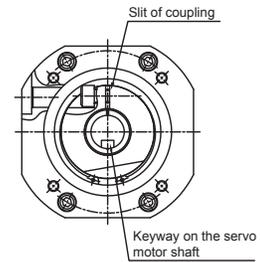
If there is a keyway on the servo motor shaft, set the keyway in a reverse direction against the slit of the coupling and then insert the motor.

Note 6: Make sure that the flange of the servo motor and the edge of the motor flange are in close contact.

If either of the surfaces is tilting or there is a gap, remove the servo motor and repeat Step 4.

7: Adjust the positional relationship between the slit of the coupling and the keyway of the servo motor shaft, as specified in this manual.

If the relational position is not correct, proper tightening force cannot be achieved.



Step 5. Fix the servo motor to the motor flange with bolts.

Check the bolt tightening torque specified by the servo motor manufacturer.

Step 6. Tighten the clamping bolt of the coupling at the specified tightening torque.

Note 8: After step 5 is completed, perform step 6. If the sequence is wrong, the servo motor or the reduction gear could be damaged.

Code	Input type	Input unit code	Nominal size x pitch (mm)	Tightening torque
RD□-006E, RD□-020E RD□-010C, RD□-027C	Straight	B0	M6 x 1.0	15.6 ± 0.78 N-m
		B1		
	Right angle	C0		
		C1		
RD□-040E, RD□-080E RD□-050C, RD□-100C	Straight	B2	M10 x 1.5	73.5 ± 3.43 N-m
		B3		
	Right angle	C2	M8 x 1.25	37.2 ± 1.86 N-m
		C3		
RD□-160E, RD□-320E RD□-200C, RD□-320C	Straight	B4	M12 x 1.75	129 ± 6.37 N-m
		B5	M10 x 1.5	73.5 ± 3.43 N-m
	Right angle	C4	M12 x 1.75	129 ± 6.37 N-m
		C5	M10 x 1.5	73.5 ± 3.43 N-m

Step 7. Insert the cap into the access hole of the motor flange.

Installation of the pulley (for pulley input unit)

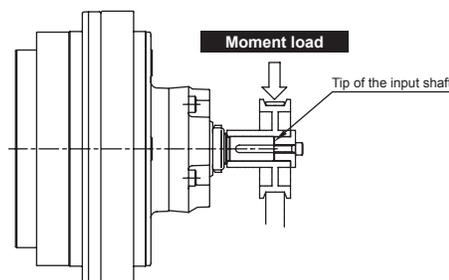
Step 1. Install the pulley using the keyway on the input shaft of the reduction gear and the tap on the tip or set screws.

When using the keyway, prepare a key yourself.

Note 1: Design so that the moment load applied to the tip of the input shaft is less than the rated moment and allowable moment.

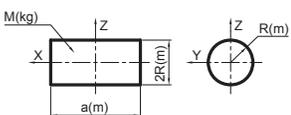
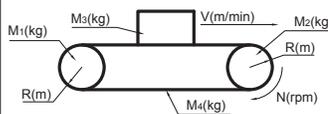
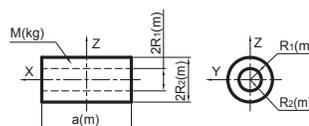
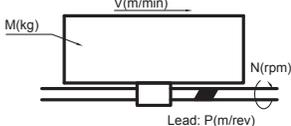
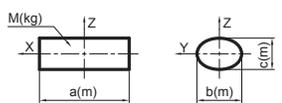
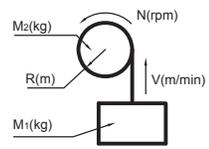
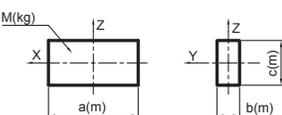
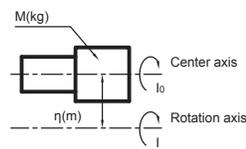
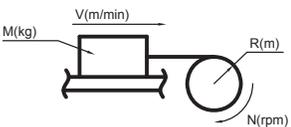
2: Unreasonable force that is applied to the input shaft of the reduction gear can cause damage to the reduction gear or customer's equipment.

3: When inserting the pulley, do not use a hammer to avoid impact on the input shaft.



Appendix

Inertia moment calculation formula

Shape	I(kg, m ²)	Shape	I(kg, m ²)
<p>1. Cylinder solid</p> 	$I_x = \frac{1}{2} MR^2$ $I_y = \frac{1}{4} M \left(R^2 + \frac{R^2}{3} \right)$ $I_z = I_y$	<p>6. Horizontal movement by conveyor</p> 	$I = \left(\frac{M_1 + M_2}{2} + M_3 + M_4 \right) \times R^2$
<p>2. Cylinder hollow</p> 	$I_x = \frac{1}{2} M (R_1^2 + R_2^2)$ $I_y = \frac{1}{4} M \left\{ (R_1^2 + R_2^2) + \frac{a^2}{3} \right\}$ $I_z = I_y$	<p>7. Horizontal movement by lead screw</p> 	$I = \frac{M}{4} \left(\frac{V}{\pi \times N} \right)^2 = \frac{M}{4} \left(\frac{P}{\pi} \right)^2$
<p>3. Oval cross section</p> 	$I_x = \frac{1}{16} M (b^2 + c^2)$ $I_y = \frac{1}{4} M \left(\frac{c^2}{4} + \frac{a^2}{3} \right)$ $I_z = \frac{1}{4} M \left(\frac{b^2}{4} + \frac{a^2}{3} \right)$	<p>8. Up/down movement by hoist</p> 	$I = M_1 R^2 + \frac{1}{2} M_2 R^2$
<p>4. Rectangle</p> 	$I_x = \frac{1}{12} M (b^2 + c^2)$ $I_y = \frac{1}{12} M (a^2 + c^2)$ $I_z = \frac{1}{12} M (a^2 + b^2)$	<p>9. Parallel axis theorem</p> 	$I = I_0 + M \eta^2$ <p>I_0 : Moment of inertia of any object about an axis through its center of mass</p> <p>I : Moment of inertia about any axis parallel to the axis through its center of mass</p> <p>η : Perpendicular distance between the above two axes</p>
<p>5. General application</p> 	$I = \frac{M}{4} \left(\frac{V}{\pi \times N} \right)^2 = MR^2$		