CKD

New Products

Mechanical indexer
Roller gear cam unit
ZRS Series

Ensures Stable
Swivel and Stop

Mechanical indexer

Roller gear cam unit
ZRS Series

CKD Corporation

CC-1601A

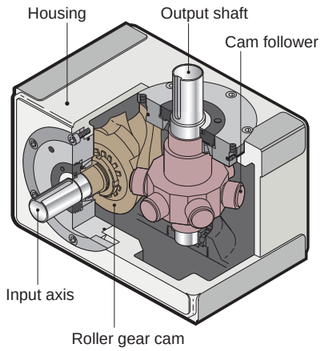
Stable operation
Mechanical indexer

Mechanical indexer is a unit in which the input shaft rotates at a constant speed so that the output shaft moves and stops repeatedly at a constant cycle.

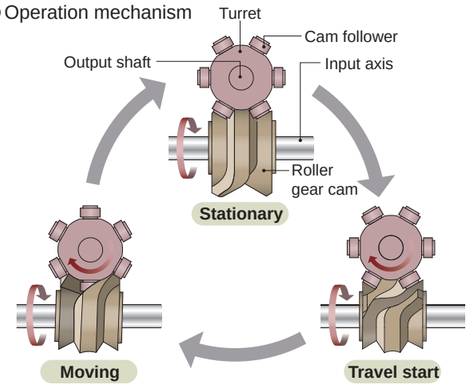
"Roller gear cam unit" that is good at high precision indexing

The Roller Gear Cam is a Mechanical Indexer in which the input and output shafts are orthogonal. The cam followers are radially aligned at the turret of the output shaft and are in contact with the cam mounted on the input shaft, which is always preloaded and driven.

● Internal structure



● Operation mechanism



Line-up			Size						Catalog page
			04	05	06	08	11	14	
Roller gear cam unit	ZRS	Index operation (Straight shaft / Flange shaft)	●	●	●	●	●	●	1
		Oscillating operation (Straight shaft / Flange shaft)	●	●	●	●	●	●	
Max. table O.D. (guideline) mm			400	500	630	800	1100	1400	

Long service life | Safety & Security

Secure positioning and high reliability

Positioning with high precision, and while stopping, firmly holding the stop position with the mechanical lock.

Index operation		
Indexing accuracy	1 stationary	±30 seconds
	2 stationary	±60 seconds
Repeatability		±15 seconds

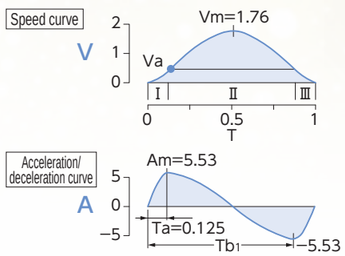
Oscillating operation	
Indexing accuracy	±60 seconds
Repeatability	±15 seconds

* Some values may differ depending on the model No.

Productivity improved

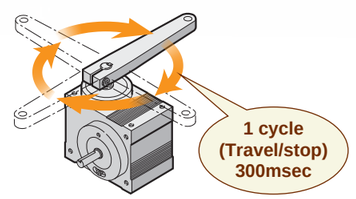
High motion characteristics

Smooth acceleration/deceleration by the cam enables high-speed and high-cycle operation.



● Shockless positioning

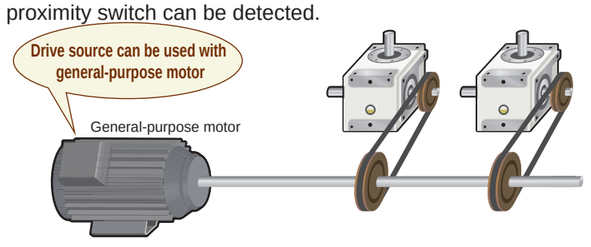
● Min. cycle time 300msec

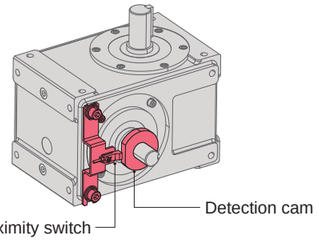


Easy Controls

Synchronous operation enabled with a general-purpose motor

General-purpose motor can be used as the drive source. Synchronized operation with multiple axes and other mechanisms is also possible. By attaching a detection cam to the input shaft, the timing signal from the proximity switch can be detected.





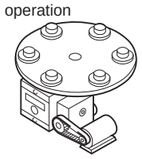
Two motions available

The output shaft is continuously moved and stopped at a defined angle. Select between indexing operation and oscillating operation.

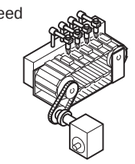
Index operation

Examples of applications

● Table indexing operation



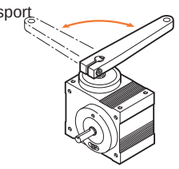
● Conveyor pitch feed



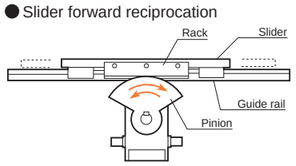
Oscillating operation

Examples of applications

● Arm transport



● Slider forward reciprocation



CKD

Mechanical indexer

ZRS

Roller gear cam unit

CONTENTS

Model No. configuration (body)

Index operation X

ZRS – 08 X – 006 120 S 1 S 1

(1) (2) (3) (4) (5) (6) (7)

(1) Size

	Distance between axes
04	40mm
05	50mm
06	63mm
08	80mm
11	110mm
14	140mm

(2) Indexing No. (n)

002	2
003	3
004	4
005	5
006	6
008	8
009	9
010	10
012	12
015	15
016	16
018	18
020	20
024	24
030	30
032	32

(3) Total allocation angle (θt)

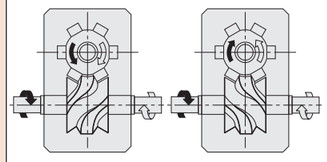
090	90°
120	120°
150	150°
180	180°
210	210°
240	240°
270	270°
300	300°
330	330°

(4) Cam curve

S	MS curve (Standard)

(5) Cam torsion direction/number of stays

1	Left torsion/1 stationary
2	Left torsion/2 stationary
5	Right twist/1 stationary
6	Right twist/2 stationary



Left torsion (Standard) Right twist

Oscillating operation Y

ZRS – 06 Y – 090 300 S T S 1

(1) (2) (3) (4) (5) (6) (7)

(1) Size

	Distance between axes
04	40mm
05	50mm
06	63mm
08	80mm
11	110mm
14	140mm

(2) Oscillation angle (ψ)

120	120°
090	90°
060	60°
045	45°
030	30°

(3) Total allocation angle (θt)

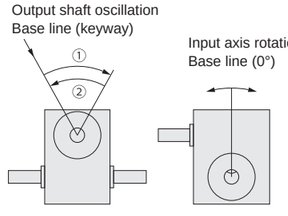
180	180°(90°×2)
240	240°(120°×2)
300	300°(150°×2)
360	360°(180°×2)

(4) Cam curve

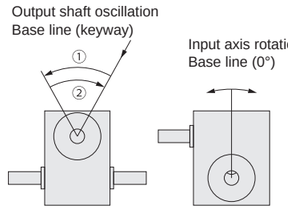
S	MS curve (Standard)

(5) Oscillation pattern

T (Standard) When the input shaft starts rotating from the rotation reference position, the output shaft rotates in the order shown in ①⇨②.



S When the input shaft starts rotating from the rotation reference position, the output shaft rotates in the order shown in ①⇨②.



(6) Output shaft shape

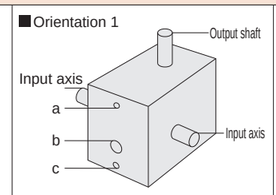
S	Straight
F	Flange

*Torque saver (Option) If included, the code is S.

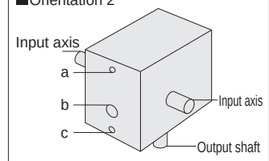
(7) Installation orientation/housing material

1	Orientation 1/Fc Housing
2	Orientation 2/Fc Housing
3	Orientation 3/Fc Housing
4	Orientation 4/Fc Housing
5	Orientation 5/Fc Housing
6	Orientation 6/Fc Housing

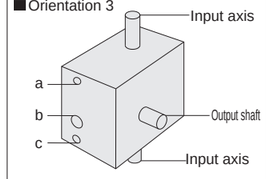
■Orientation 1



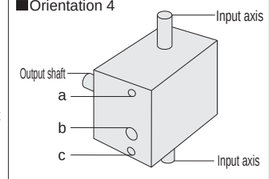
■Orientation 2



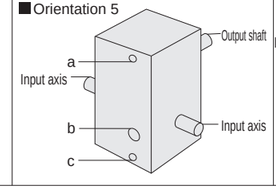
■Orientation 3



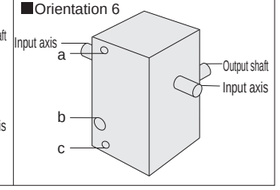
■Orientation 4



■Orientation 5



■Orientation 6



a: Lubrication port b: Oil level indicator c: Oil discharge port

Model No. configuration (with option)

Common for index oscillations

ZRS – 08 (X/Y) – 006 180 S 1 S 1 – N H F N J S D F 08 C

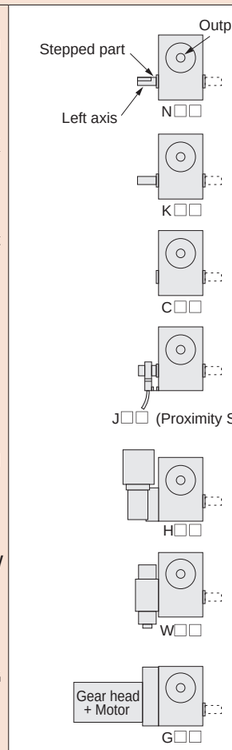
(8) (9) (10) (11) (12) (13) (14) (15) (16) (17)

Body model No.

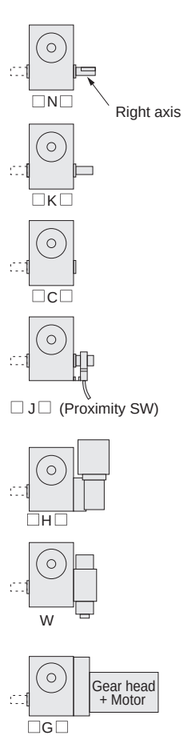
▼When mounting the torque saver/torque guard → (Refer to the following page)

I/O axis specification code

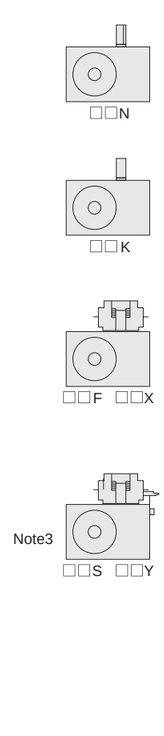
(8) Input axis specification code [Left axis]

N	
K	
C	
J	
H	
W	
G	

(9) Input axis specification code [right axis]

N	
K	
C	
J	
H	
W	
G	

(10) Output axis specification code

N	
K	
F/X	
S/Y	

N	Standard (with keyway)
K	Without keyway
C	Cut * The parts are cut at stepped parts, so they project from the housing. Check the dimensions.
J	Input axis 1 rotation detection cam + proximity switch (1 station) * Two or more stations are custom made. (In some cases, two stations may be required when reversing the input axis.) * Two proximity switch detection locations are custom made for two dwell locations (including oscillations) or three dwell locations or more.
H	Hollow shaft geared motor * Since the motor to be mounted must be specified, determine the "hollow shaft geared motor mounting specification code".
W	With worm reducer (W:HO reducer) * As the specification of the worm reducer to be attached is required, determine the "worm reducer mounting specification code".
G	Gear head + motor * Since the specifications of the gear head and motor to be mounted are required, decide on the "gear head + motor mounting specification code".

N	Standard (with keyway)
K	Without keyway (straight axis)
F	With torque saver (TSF) (Without output shaft keyway)
X	With torque guard (TGX) (Without output shaft keyway)
S	Torque saver (TSF) + release detection proximity switch (without output shaft key groove)
Y	Torque guard (TGX) + release detection proximity switch (without output shaft key groove)

For F/X/S/Y selection, the specifications of the torque saver and torque guard to be mounted are required. Determine the torque saver and torque guard mounting specification code.

▼Hollow shaft geared motor mounting specification code * Refer to pages 114 to 115.

(11) Motor-type		(12) Motor output		Applicable index size	(13) Voltage		(14) Reduction ratio	(15) Driving method	
G	Hypoid gear	G	0.1kW	05	S	Three-phase 200 V	Refer to the table below for codes of the reduction ratio	F	Face mount
		H	0.2kW						
		H	0.2kW	06					
		J	0.4kW						
		J	0.4kW	08					
		K	0.75kW						
		K	0.75kW	11					
		L	1.5kW						
		L	1.5kW	14					
T		M	2.2kW						

(11) G: Nissei T: Tsubaki T&M

▼Motor output and reduction ratio combination table

(12) Motor output		Size	(14) Reduction ratio							
			A	B	C	D	E	F	G	H
G	0.1kW	05	-	-	1/20	1/25	1/30	1/40	1/50	1/60
H	0.2kW		1/10	1/15	1/20	1/25	1/30	1/40	1/50	1/60
H	0.2kW	06	-	-	1/20	1/25	1/30	1/40	1/50	1/60
J	0.4kW		1/10	1/15	1/20	1/25	1/30	1/40	1/50	1/60
J	0.4kW	08	-	-	1/20	1/25	1/30	1/40	1/50	1/60
K	0.75kW		1/10	1/15	1/20	1/25	1/30	1/40	1/50	1/60
K	0.75kW	11	-	-	1/20	1/25	1/30	1/40	1/50	1/60
L	1.5kW		1/10	1/15	1/20	1/25	1/30	1/40	1/50	1/60
L	1.5kW	14	-	-	1/20	1/25	1/30	1/40	1/50	1/60
M	2.2kW		1/10	1/15	1/20	1/25	1/30	1/40	1/49.286	1/60

* The combinations above are standard mounting.
Check the motor capacity (Pe), output shaft allowable torque (Trr), and geared motor load torque (Ter) before use.

▼For worm reducer installation → (Refer to the following page)

▼For gear head + motor mounting → (Refer to the following page)

Model No. configuration (with option)

Common for index oscillations

ZRS – 08 (X/Y) – 006 180 S 1 S 1 – N W F 0 5 6 Y G 08 C

Body model No.

⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰

▼For worm reducer installation

⑪ ⑫ ⑬ ⑭ ⑮ Worm reducer mounting specification code

⑪ ⑫ Reducer size		⑬ Reduction ratio		⑭ Clutch with/ without brake		⑮ Mounting direction				
03	HO32	2	1/20	Y	Clutch With brake	Left axis mounting	A	B	C	D
04	HO40	3	1/30				J AR	K BR	L CR	M DR
05	HO50	4	1/40	N	Clutch Without brake	Right axis mounting	E	F	G	H
06	HO60	5	1/50				N ER	P FR	Q GR	R HR
08	HO80	6	1/60							

* Refer to pages 88 to 99.

* Be sure to confirm the delivery date as 1/30 and 1/50 are in the special speed ratio.

Standard mounted worm reducer list

Body model No.		HO reducer size	Values in reduction ratio ( ) are for special speed ratios.
ZRS-*X ZRS-*Y	04	HO32	1/20, 1/40, 1/60 (1/30, 1/50)
	05	HO32	1/20, 1/40, 1/60 (1/30, 1/50)
	06	HO40	1/20, 1/40, 1/60 (1/30, 1/50)
	08	HO50	1/20, 1/40, 1/60 (1/30, 1/50)
	11	HO60	1/20, 1/40, 1/60 (1/30, 1/50)
	14	HO80	1/20, 1/40, 1/60 (1/30, 1/50)

* The combinations above are standard mounting. Check the reducer load torque (Ter) and reducer rated output torque before use.

▼For gear head + motor mounting

⑪ ⑫ ⑬ ⑭ ⑮ Gear head + motor mounting specification code

⑪ Motor-type		⑫ Motor output		⑬ Voltage		⑭ Gear head reduction ratio				⑮ Driving method	
E	Induction	C	25W	A	Single-phase 100 V	A	1/3	L	1/30	G	Gear drive
R	Reversible	D	40W	C	Single-phase 200 V	B	1/3.6	M	1/36		
B	With brake	E	60W	S	Three-phase 200 V	C	1/5	N	1/50		
C	With C/B	F	90W			D	1/6	P	1/60		
						E	1/7.5	Q	1/75		
						F	1/9	R	1/90		
						G	1/12.5	S	1/100		
						H	1/15	T	1/120		
						J	1/18	U	1/150		
						K	1/25	V	1/180		

* Refer to the gear head + motor mounting list on page 49.

* For reduction ratio 1/3 to 1/9, the input shaft rotation speed may be 200rpm or more. Contact CKD in this case.

▼For torque saver

⑯ ⑰ Torque saver Mounting specification code				Application Body size
⑯ TSF size		⑰ Release Torque range		
04	TSF4			04
05	TSF5	A	A	04/05
06	TSF6	B	B	05/06
08	TSF8	C	C	08
11	TSF11	D	D	11
14	TSF14			14

* If the input shaft is not equipped with a worm reducer, gear head + motor, or hollow shaft geared motor, and the output shaft is equipped with a torque saver/torque guard, add a hyphen "-" in (11) and continue with the torque saver/torque guard installation specification code.
(Example) ZRS-08X-006270S1S1-NNF-08D
ZRS-11X-008180S1S1-NNX-70L

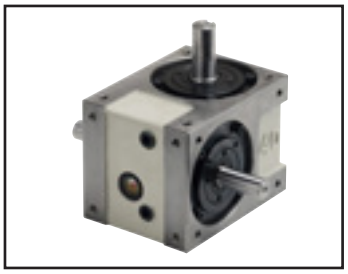
* If a torque saver/torque guard is installed with a specification exceeding the indexing No. n=12, it may not be possible to set an appropriate release torque.
Check this information during model selection.

▼In case of torque guard installation

⑯ ⑰ Torque guard Mounting specification code				Application Body size
⑯ TGX size		⑰ Trip Torque range		
20	TGX20	L	LC	04/05
35	TGX35	M	MC	06
50	TGX50	H	HC	08
70	TGX70			11

* Torque Saver/Torque Guard Release (Trip)
Please let us know if you want to specify the torque setting. If not specified, the product is shipped with the minimum value within the adjusting range.
(Refer to pages 100 to 113)

* The proximity SW for release detection of the torque saver/torque guard is NO. NC is also available. Contact CKD.



Mechanical indexer Roller gear cam unit

ZRS-04

Distance between axes: 40mm

How to order

ZRS - 04 X - 004 270 S 1 S 1 - Option

*Refer to page 87.

❶Size
❷Operation
❸Indexing No. Oscillation angle
❹Total allocated angle
❺Cam curve
❻Cam torsion Oscillation pattern
❼Output shaft shape
❽Installation orientation

❶Size	
04	Distance between axes 40mm

❷Operation	
X	Index
Y	Oscillations

❸Indexing No. (for indexing)			
002	2	012	12
003	3	016	16
004	4	018	18
005	5	020	20
006	6	024	24
008	8		
009	9		
010	10		

❸Oscillation angle (for oscillations)			
030	30°	090	90°
045	45°	120	120°
060	60°		

❹Total indexing angle (for index)			
090	90°	240	240°
120	120°	270	270°
150	150°	300	300°
180	180°	330	330°
210	210°		

❹Total allocated angle (for oscillations)			
180	180°(90°x 2)	300	300°(150°x 2)
240	240°(120°x 2)	360	360°(180°x 2)

❺Cam curve	
S	MS curve

❻Cam torsion (for index)
Refer to page 2
❻Oscillating pattern (for oscillations)
Refer to page 2

❼Output shaft shape	
S	Straight
F	Flange

❽Installation orientation
Refer to page 3.

Specifications

Indexing accuracy (Index)	Seconds	1 stationary	±60
		2 stationary	±120
Indexing accuracy (oscillating)	Seconds		±120
Repeatability	Seconds		30
Allowable thrust force	N	Output shaft	1300
		Input axis	800
Allowable radial force	N	Output shaft	1100 (1000)
		Input axis	540
Allowable bending moment	N·m	Output shaft	30
Moment of inertia	kg·m^2	Output shaft	6.40 x 10^{-5} (3.14 x 10^{-4})
		Input axis	4.61 x 10^{-5}
Internal friction torque	N·m		1.9
Body weight	kg		5
Oil amount	ℓ		0.1

* Values in ( ) are for ❼ output shaft shape F: flange.
* Contact CKD for stopping accuracy.

Allocation angle list

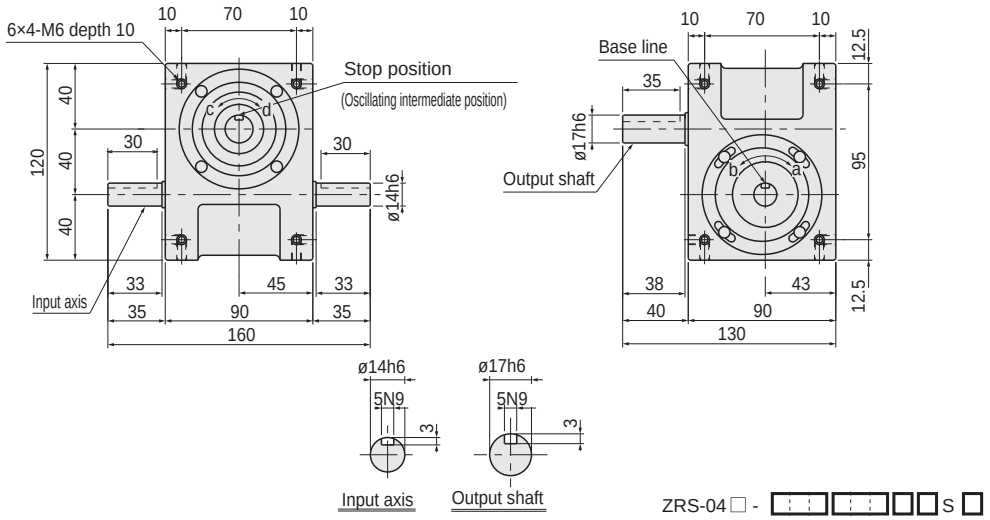
Index operation

Total allocated angle (θt) / Indexing No. (n)		90°	120°	150°	180°	210°	240°	270°	300°	330°
1 stationary	2							○	○	○
	3				○	○	○	○	○	○
	4			○	○	○	○	○	○	○
	5		○	○	○	○	○	○	○	○
	6	○	○	○	○	○	○	○	○	○
	8	○	○	○	○	○	○	○	○	○
	9	○	○	○	○	○	○	○	○	○
	10	○	○	○	○	○	○	○	○	○
	12	○	○	○	○	○	○	○	○	○
2 stationary	16		○	○	○	○	○	○	○	○
	18		○	○	○	○	○	○	○	○
	20	○	○	○	○	○	○	○	○	○
	24	○	○	○	○	○	○	○	○	○

Oscillating operation

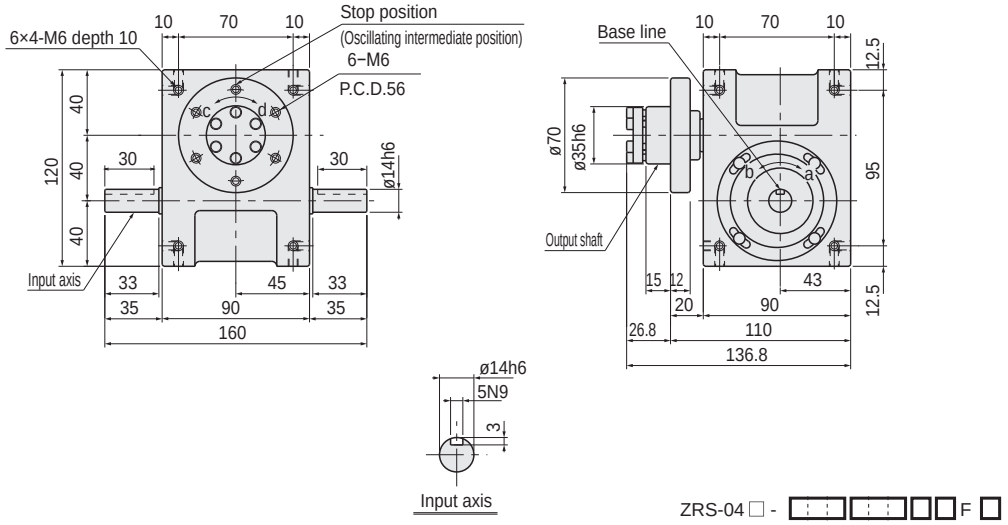
Total allocated angle (θt) / Oscillation angle (ψ)	180°	240°	300°	360°
120°				○
90°			○	○
60°	○	○	○	○
45°	○	○	○	○
30°	○	○	○	○

Dimensions (straight axis)



ZRS-04□ - □□□□□S□

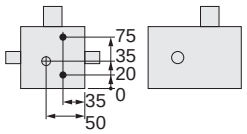
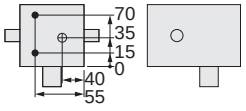
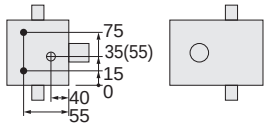
Dimensions (flange shaft)

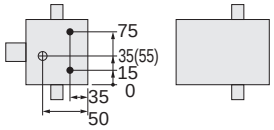
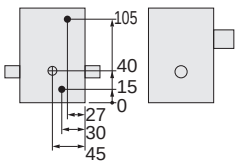
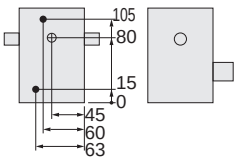


ZRS-04□ - □□□□□F□

Mounting orientation and lubrication port/Oil level indicator position

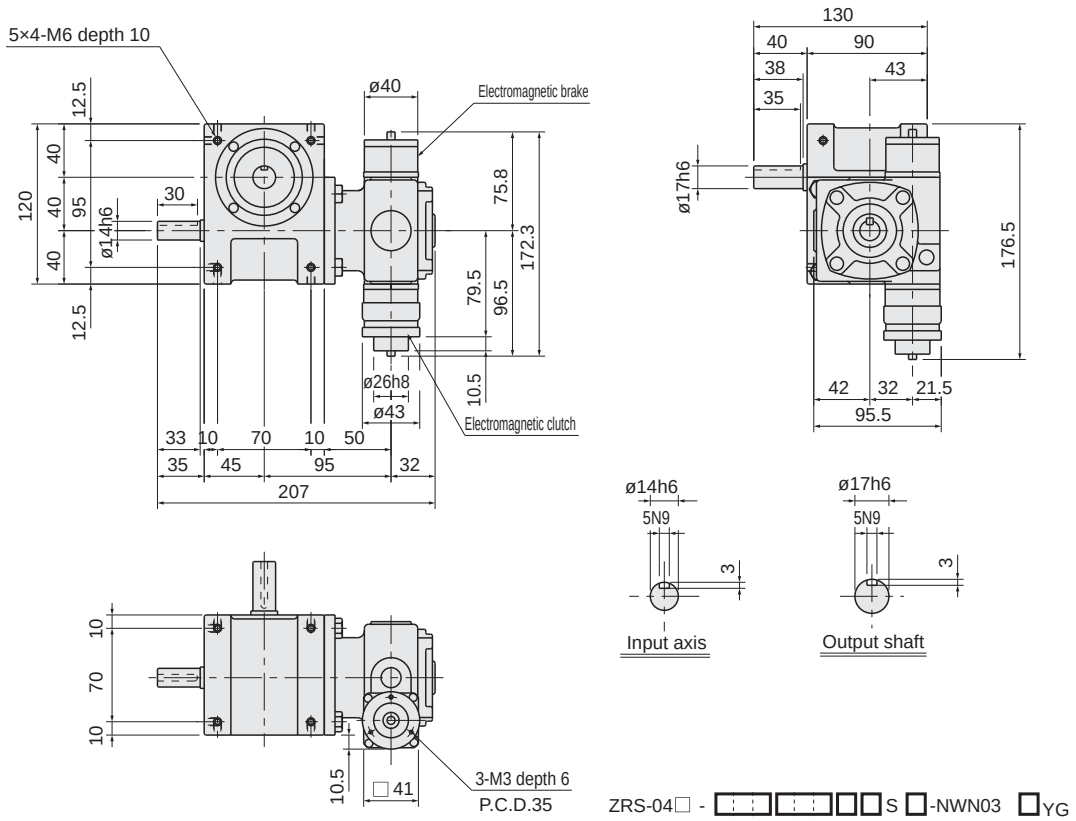
• Oil filler ($Rc^1/_4$) ○ Oil level indicator
Positions 1 to 4 (ø20)
Positions 5 to 6 (ø30)

Installation orientation	1	2	3
Dimensions			
			Dimensions in ( ) are for ZRS-04Y.

Installation orientation	4	5	6
Dimensions			
Dimensions in ( ) are for ZRS-04Y.			

Optional dimensions

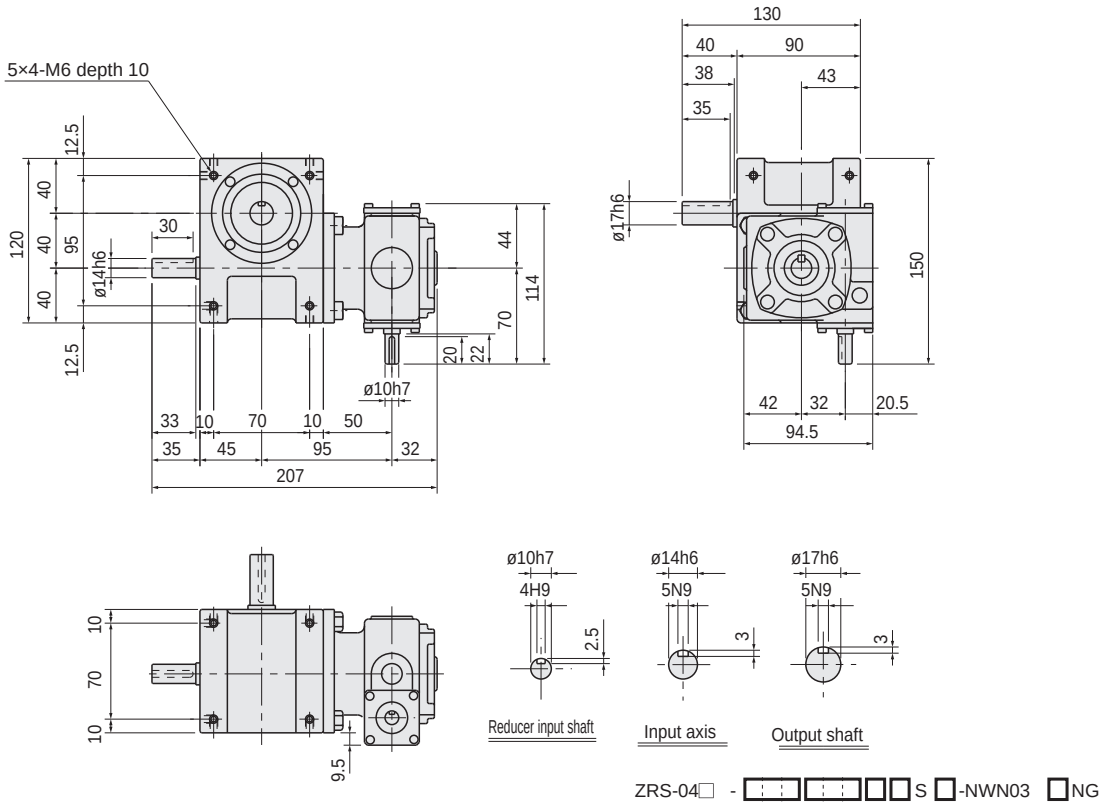
● With worm reducer (HO32-C/B)



ZRS-04□ - □□□S □-NWN03 □YG

The fastening key of the reduction gear and the input shaft shall be of old JIS1 type (JIS B1301-1959).

● With worm reducer (without HO32-C/B)

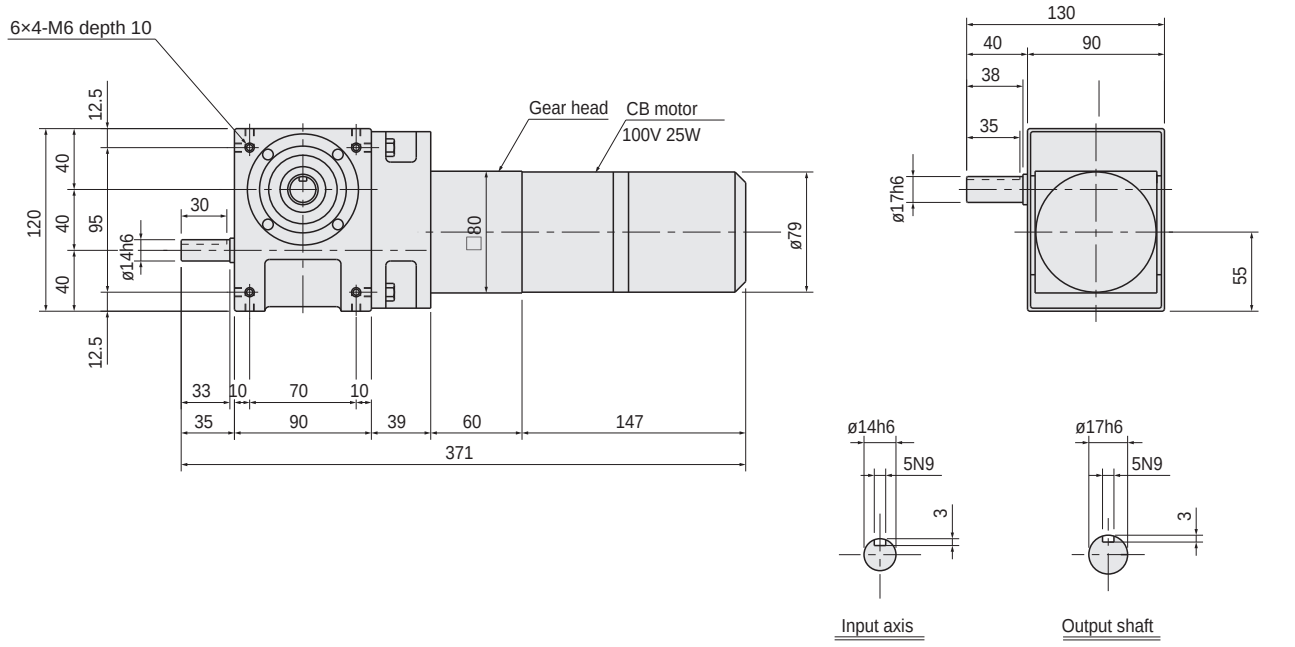


ZRS-04□ - □□□S □-NWN03 □NG

The fastening key of the reduction gear and the input shaft shall be of old JIS1 type (JIS B1301-1959)

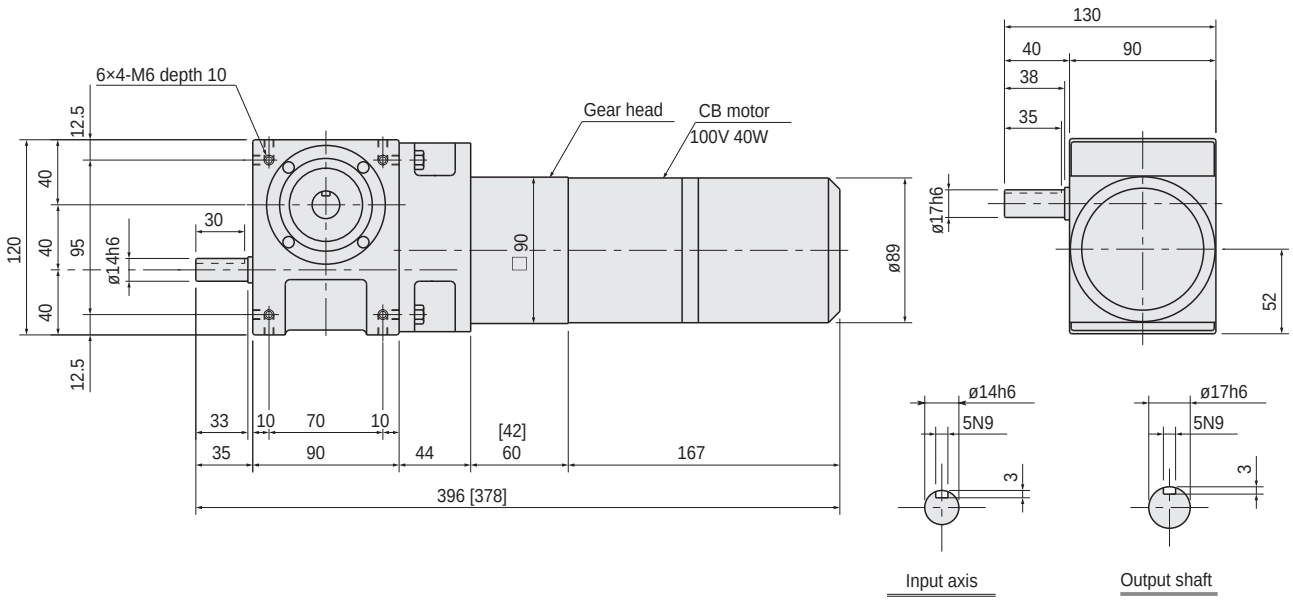
Optional dimensions

● Gear head + motor (with C/B 25 W)



ZRS-04□ - □□□□S □-NGNCCA □G

● Gear head + motor (with C/B 40 W)

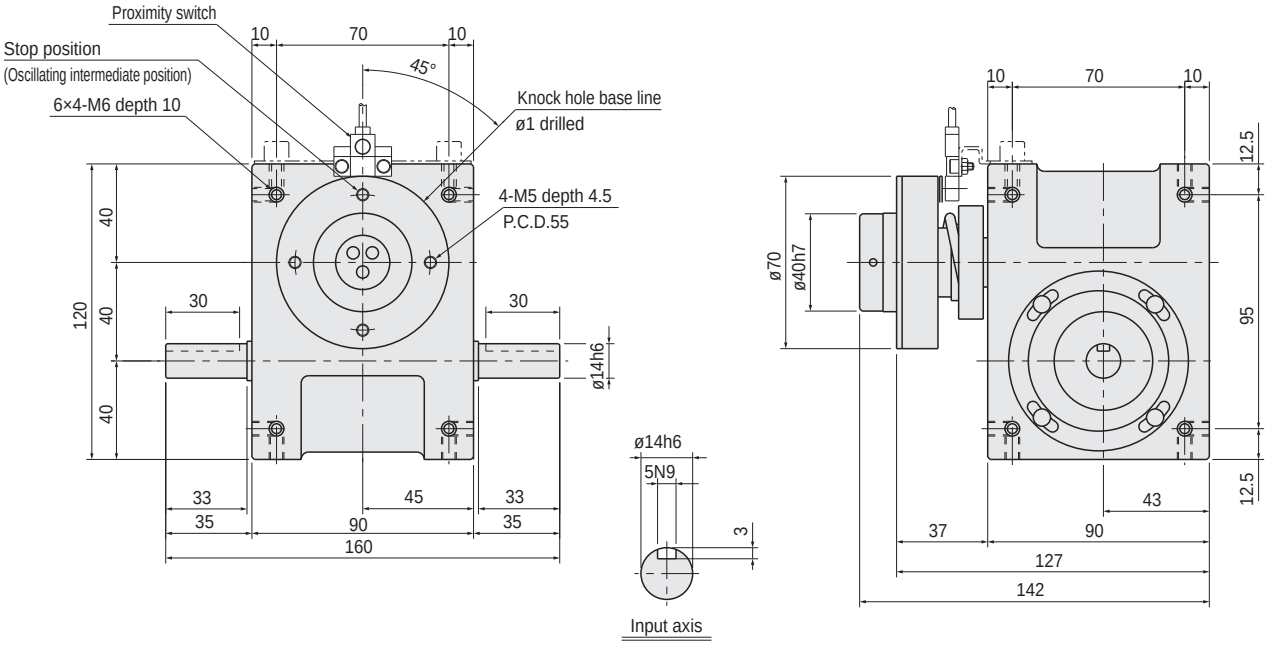


Dimensions in [ ] are for which the reduction ratio of the gear head is 1/3 to 1/18

ZRS-04□ - □□□□S □-NGNCDA □G

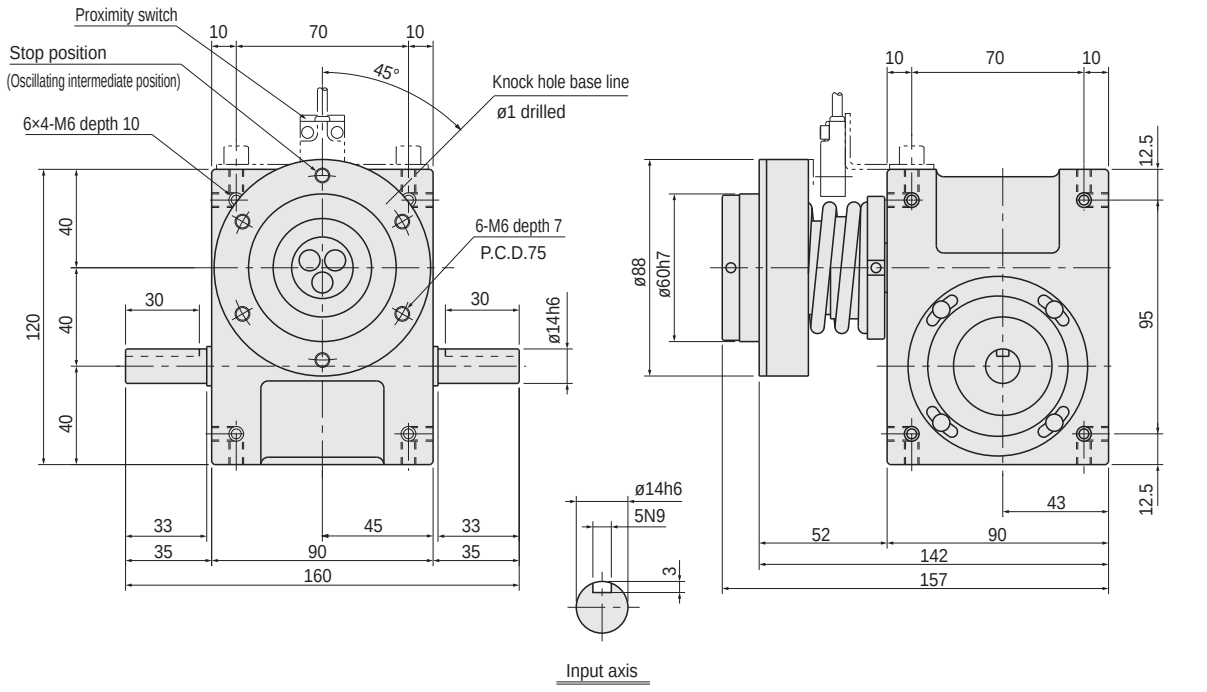
Optional dimensions

● With torque saver (TSF4)



ZRS-04□ - □□□□S □-NNF-04 □

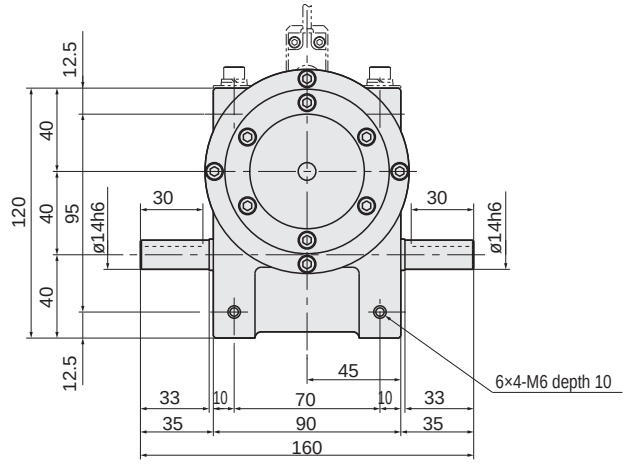
● With torque saver (TSF5)

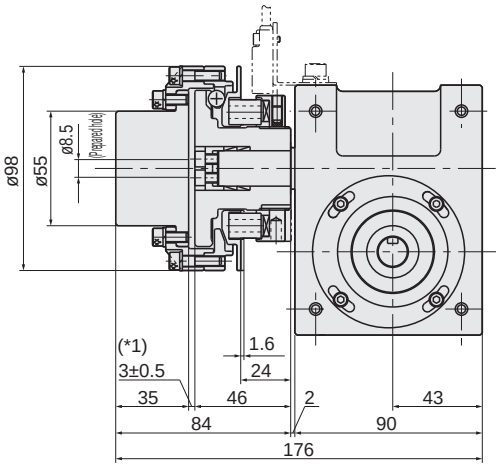


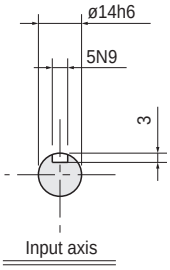
ZRS-04□ - □□□□S □-NNF-05 □

Optional dimensions

● With torque guard (TGX20)







(*1) Assemble on the device within the dimension range.

ZRS-04 □ - □□ □□ □□ S □ -NNX-20 □

Mechanical indexer Roller gear cam unit

ZRS-05

Distance between axes: 50mm

How to order

ZRS - 05 X - 004 270 S 1 S 1 - Option

*Refer to page 87.

❶Size
❷Operation
❸Indexing No. Oscillation angle
❹Total allocated angle
❺Cam curve
❻Cam torsion Oscillation pattern
❼Output shaft shape
❽Installation orientation

❶Size	
05	Distance between axes 50mm

❷Operation	
X	Index
Y	Oscillations

❸Indexing No. (for indexing)			
002	2	012	12
003	3	016	16
004	4	018	18
005	5	020	20
006	6	024	24
008	8		
009	9		
010	10		

❸Oscillation angle (for oscillations)			
030	30°	090	90°
045	45°	120	120°
060	60°		

❹Total indexing angle (for indexes)			
090	90°	240	240°
120	120°	270	270°
150	150°	300	300°
180	180°	330	330°
210	210°		

❹Total allocated angle (in the case of oscillations)			
180	180°(90°x 2)	300	300°(150°x 2)
240	240°(120°x 2)	360	360°(180°x 2)

❺Cam curve	
S	MS curve

❻Cam torsion (for index)
Refer to page 2
❻Oscillating pattern (oscillating)
Refer to page 2

❼Output shaft shape	
S	Straight
F	Flange

❽Installation orientation
Refer to page 3.

Specifications

Indexing accuracy (Index) (Table at right ☆ indexing number)	Seconds	1 stationary	±30
		2 stationary	±90
Indexing accuracy (Index) (Indexing No. ☆ other than the marking on the right table)	Seconds	1 stationary	±60
		2 stationary	±120
Indexing accuracy (oscillating) (★ of table at right)	Seconds		±90
Indexing accuracy (oscillating) (★ angle other than those in the table at right)	Seconds		±120
Repeatability (Table ☆on right, ★ angle)	Seconds		±15
Repeatability (☆ number of indexing other than the mark on the right, ★ angle other than the mark)	Seconds		±30
Allowable thrust force	N	Output shaft	2200
		Input axis	1200
Allowable radial force	N	Output shaft	2000
		Input axis	710
Allowable bending moment	N·m	Output shaft	50
Moment of inertia	kg·m^2	Output shaft	2.20 x 10^{-4} (4.69 x 10^{-4})
		Input axis	2.57 x 10^{-4}
Internal friction torque	N·m		3.0
Body weight	kg		11
Oil amount	ℓ		0.5

* Values in ( ) are for ❼ output shaft shape F: flange.
* Contact CKD for stopping accuracy.

Allocation angle list

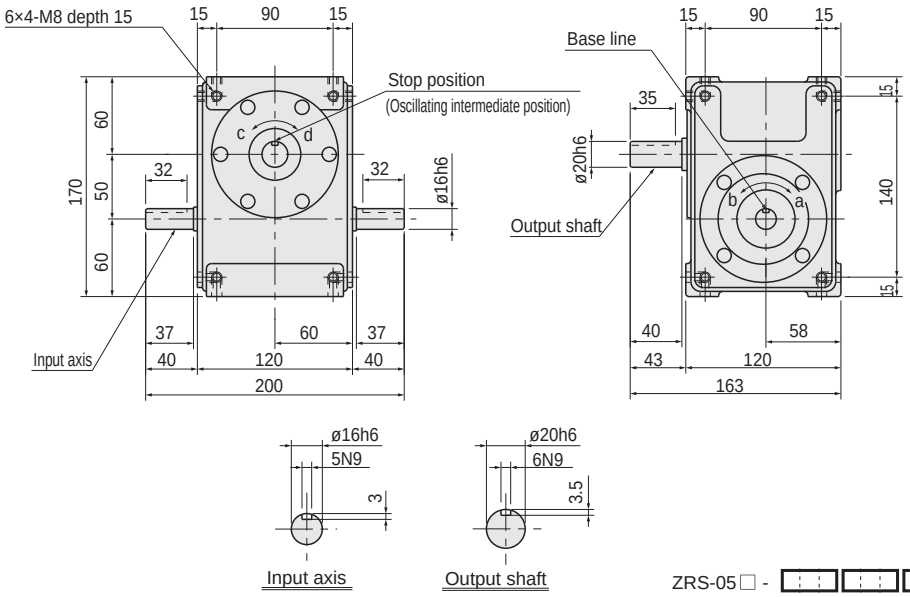
Index operation

	Total allocated angle (θt) / Indexing No. (n)	90°	120°	150°	180°	210°	240°	270°	300°	330°
1 stationary	☆2							○	○	○
	☆3				○	○	○	○	○	○
	☆4			○	○	○	○	○	○	○
	☆5		○	○	○	○	○	○	○	○
	☆6	○	○	○	○	○	○	○	○	○
	☆8	○	○	○	○	○	○	○	○	○
	☆9	○	○	○	○	○	○	○	○	○
	10	○	○	○	○	○	○	○	○	○
	12	○	○	○	○	○	○	○	○	○
2 stationary	☆16		○	○	○	○	○	○	○	○
	☆18		○	○	○	○	○	○	○	○
	20	○	○	○	○	○	○	○	○	○
	24	○	○	○	○	○	○	○	○	○

Oscillating operation

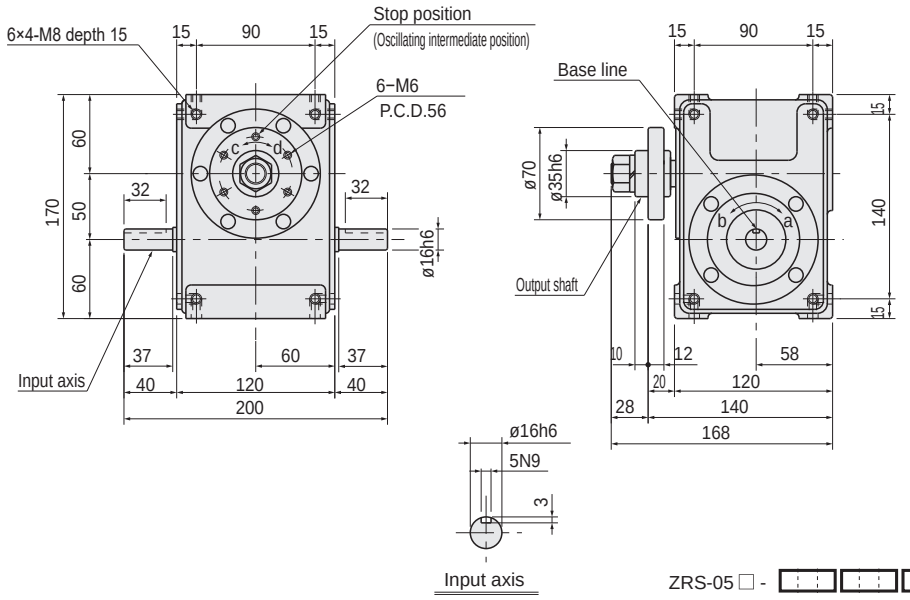
Total allocated angle (θt) / Oscillation angle (ψ)	180°	240°	300°	360°
★120°				○
★90°			○	○
★60°	○	○	○	○
★45°	○	○	○	○
30°	○	○	○	○

Dimensions (straight axis)



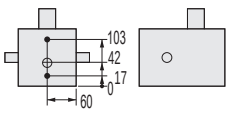
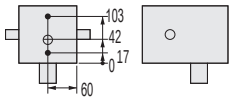
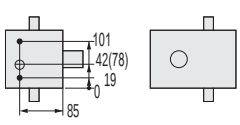
ZRS-05□ - □□□□□S□

Dimensions (flange shaft)

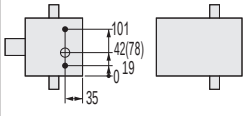
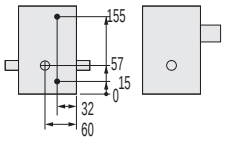
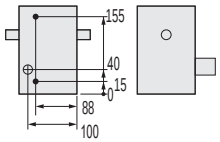
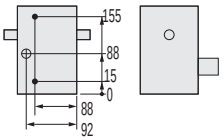


ZRS-05□ - □□□□□F□

Mounting orientation and lubrication port/Oil level indicator position

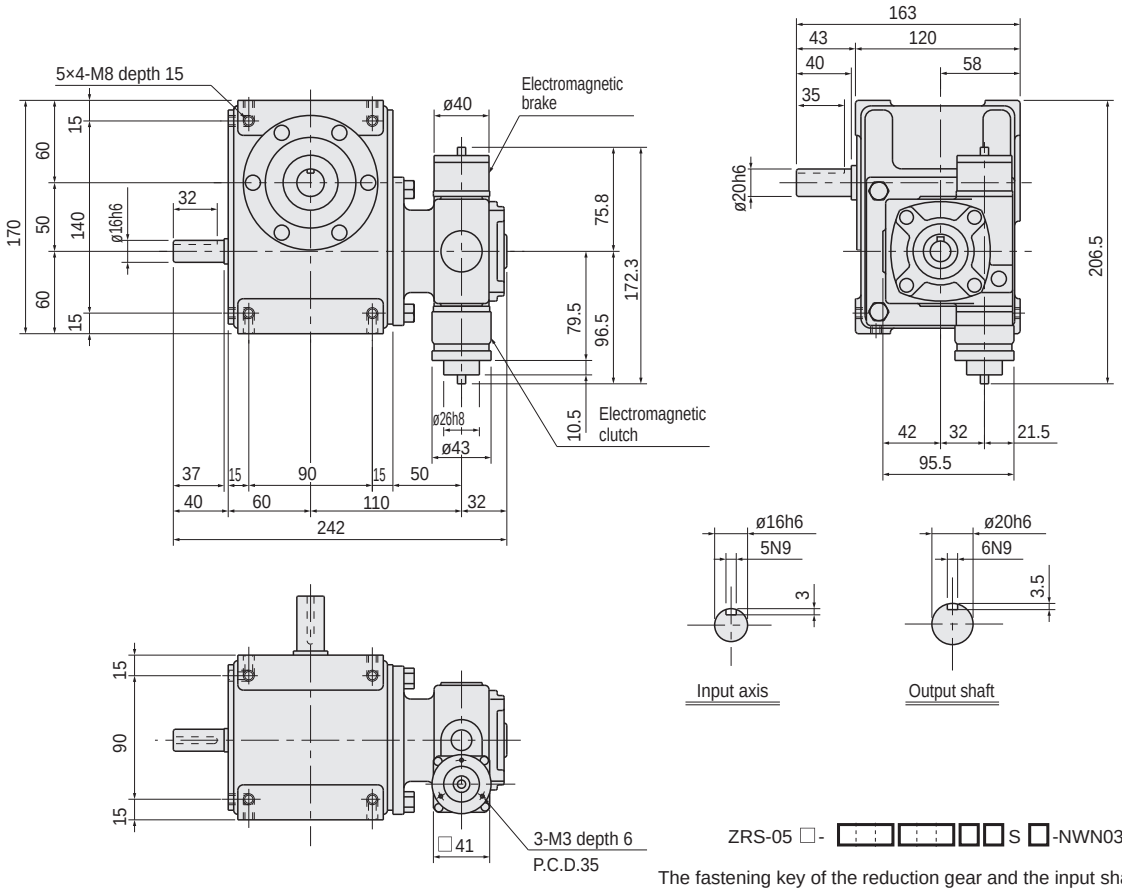
Installation orientation	1	2	3
Dimensions			
			Dimensions in ( ) are for ZRS-05Y.

- Oil filler(Rc¼)
- ○ Oil level indicator (φ20)

Installation orientation	4	5	6	
Dimensions				
	Dimensions in ( ) are for ZRS-05Y.		ZRS-05X	ZRS-05Y

Optional dimensions

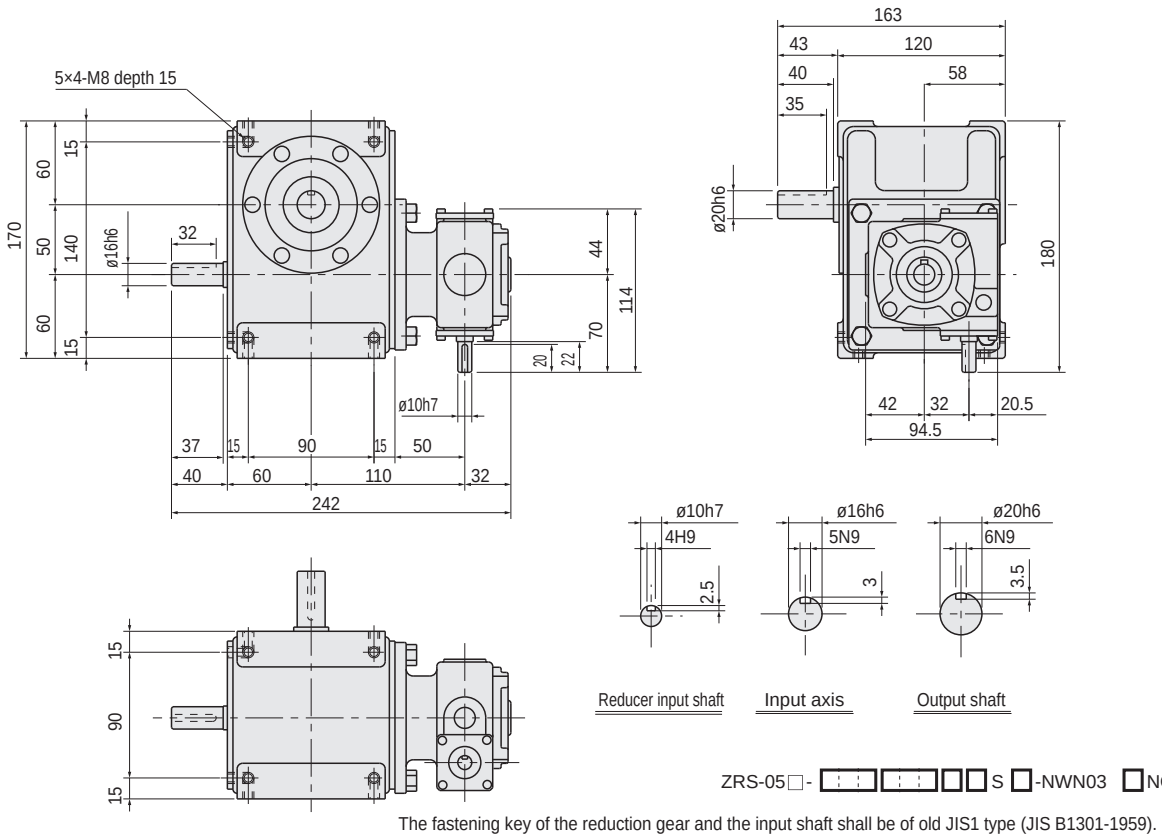
● With worm reducer (HO32-C/B)



ZRS-05 □- □□□□□□S □-NWN03 □YG

The fastening key of the reduction gear and the input shaft shall be of old JIS1 type (JIS B1301-1959).

● With worm reducer (without HO32-C/B)

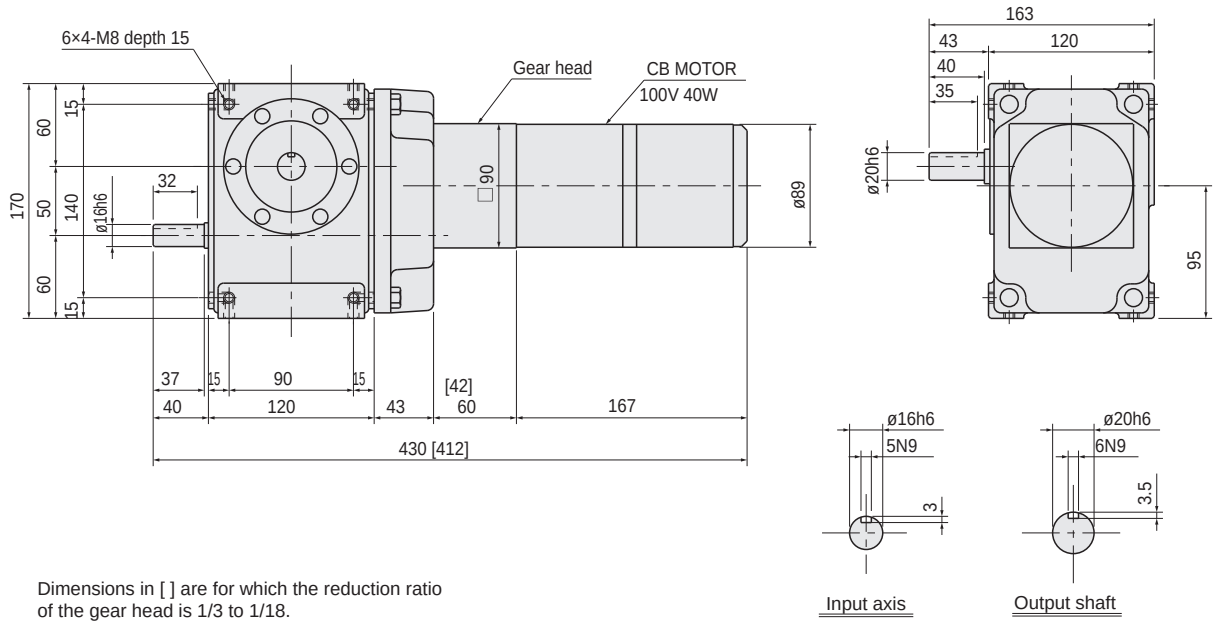


ZRS-05□- □□□□□□S □-NWN03 □NG

The fastening key of the reduction gear and the input shaft shall be of old JIS1 type (JIS B1301-1959).

Optional dimensions

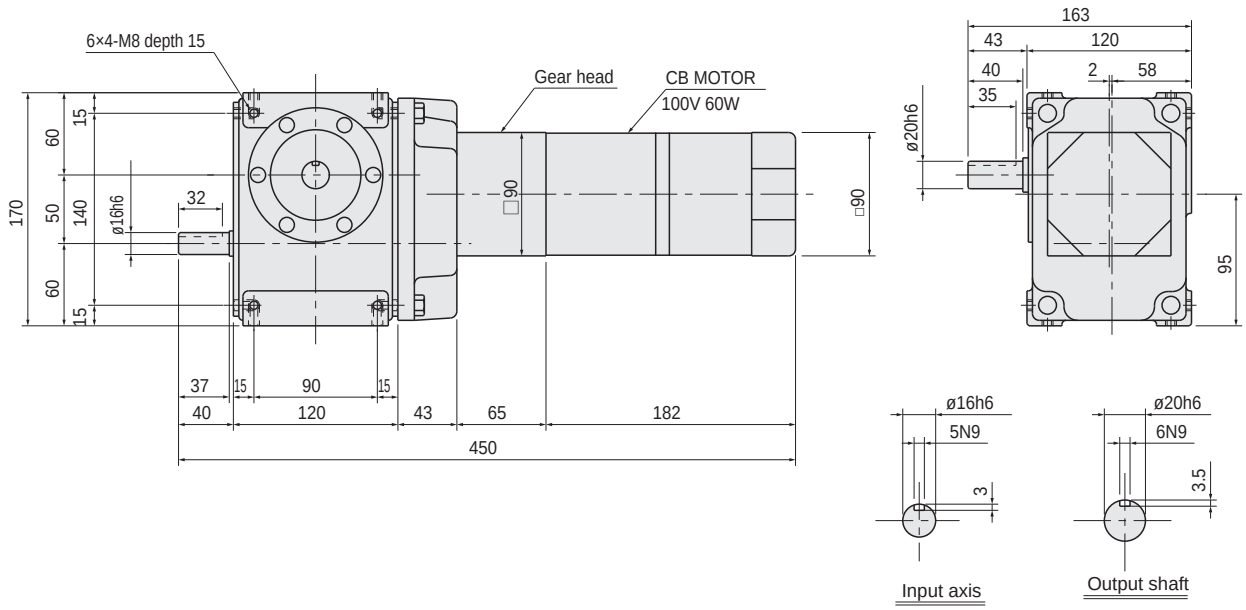
● Gear head + motor (with C/B 40 W)



Dimensions in [ ] are for which the reduction ratio of the gear head is 1/3 to 1/18.

ZRS-05 □ - □□□□S □-NGNCDA □G

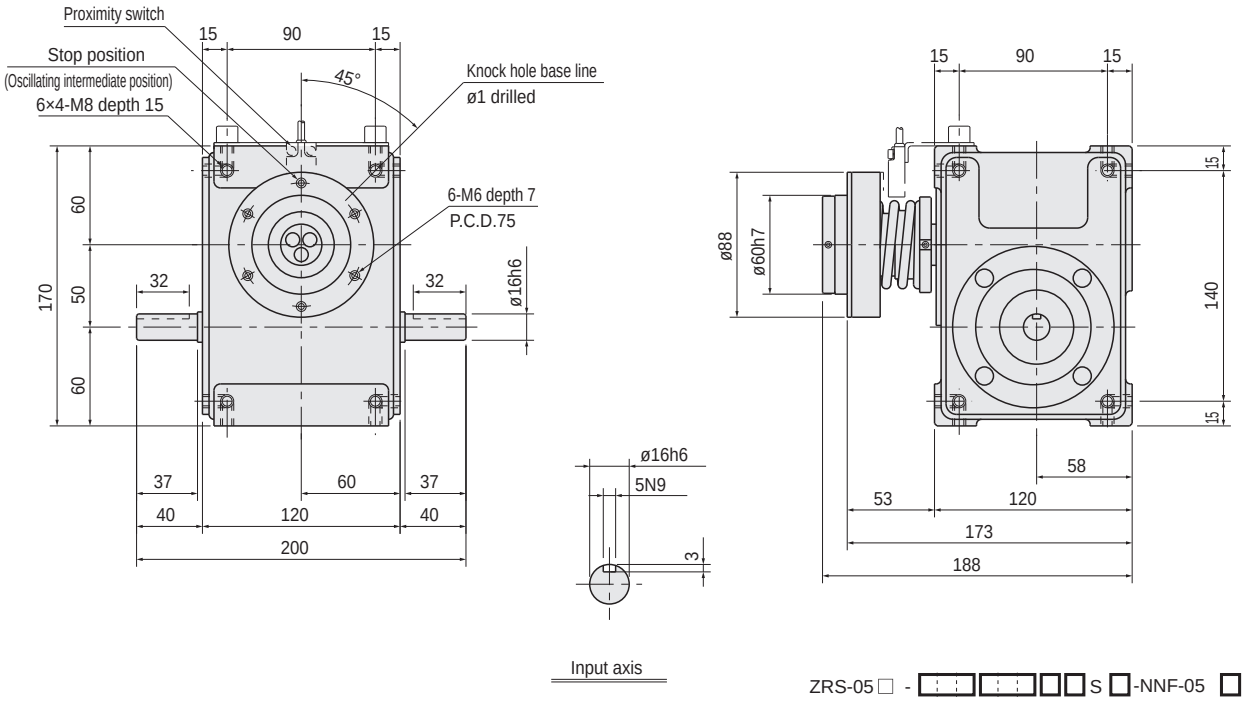
● Gear head + motor (with C/B 60 W)



ZRS-05 □ - □□□□S □-NGNCEA □G

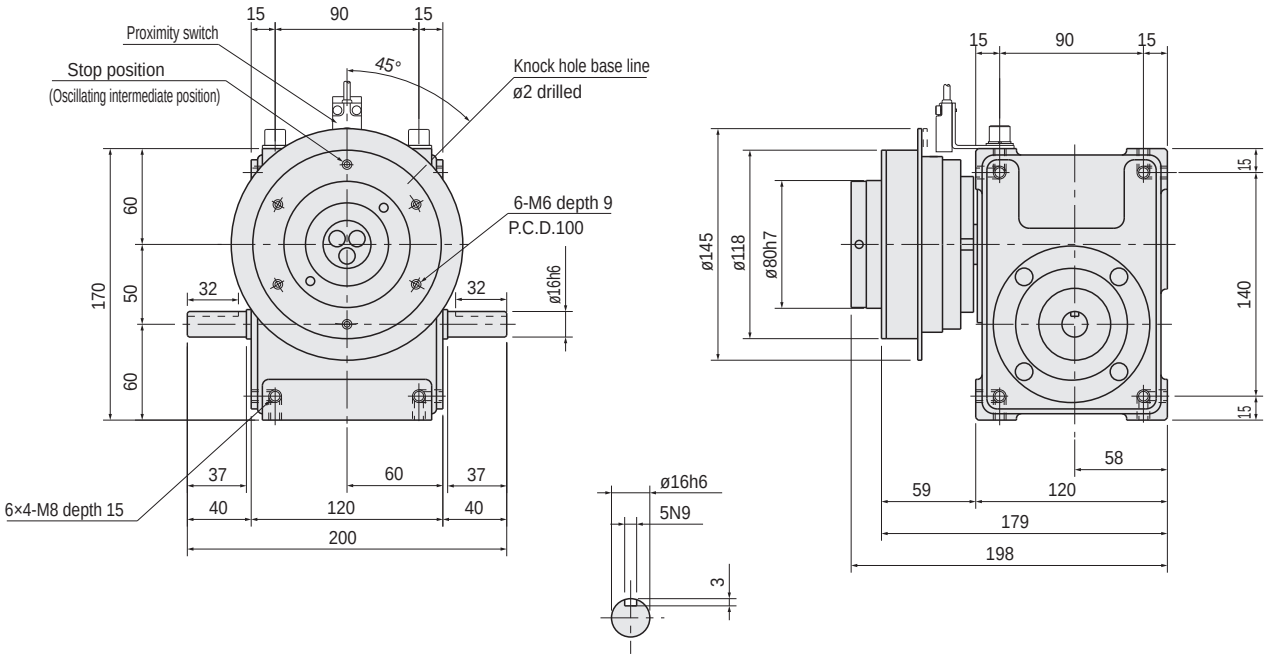
Optional dimensions

● With torque saver (TSF5)



ZRS-05□ - □□□□□□S □-NNF-05 □

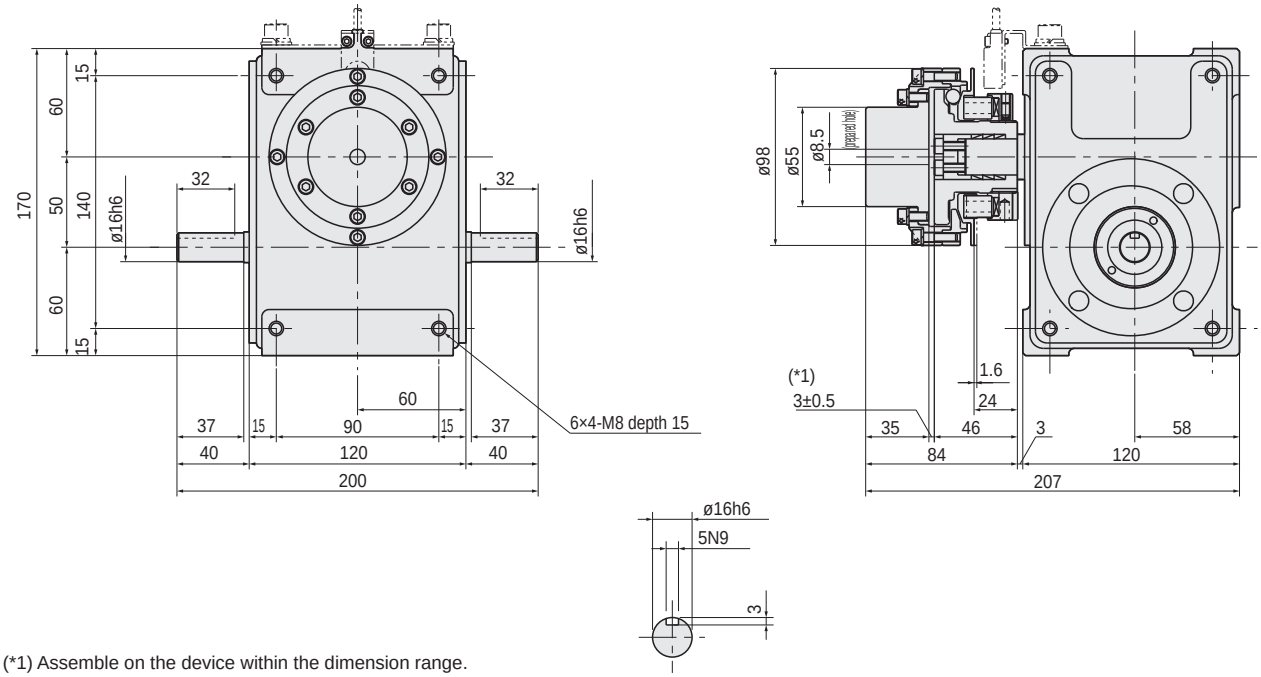
● With torque saver (TSF6)



ZRS-05□- □□□□□□S □-NNF-06 □

Optional dimensions

● With torque guard (TGX20)



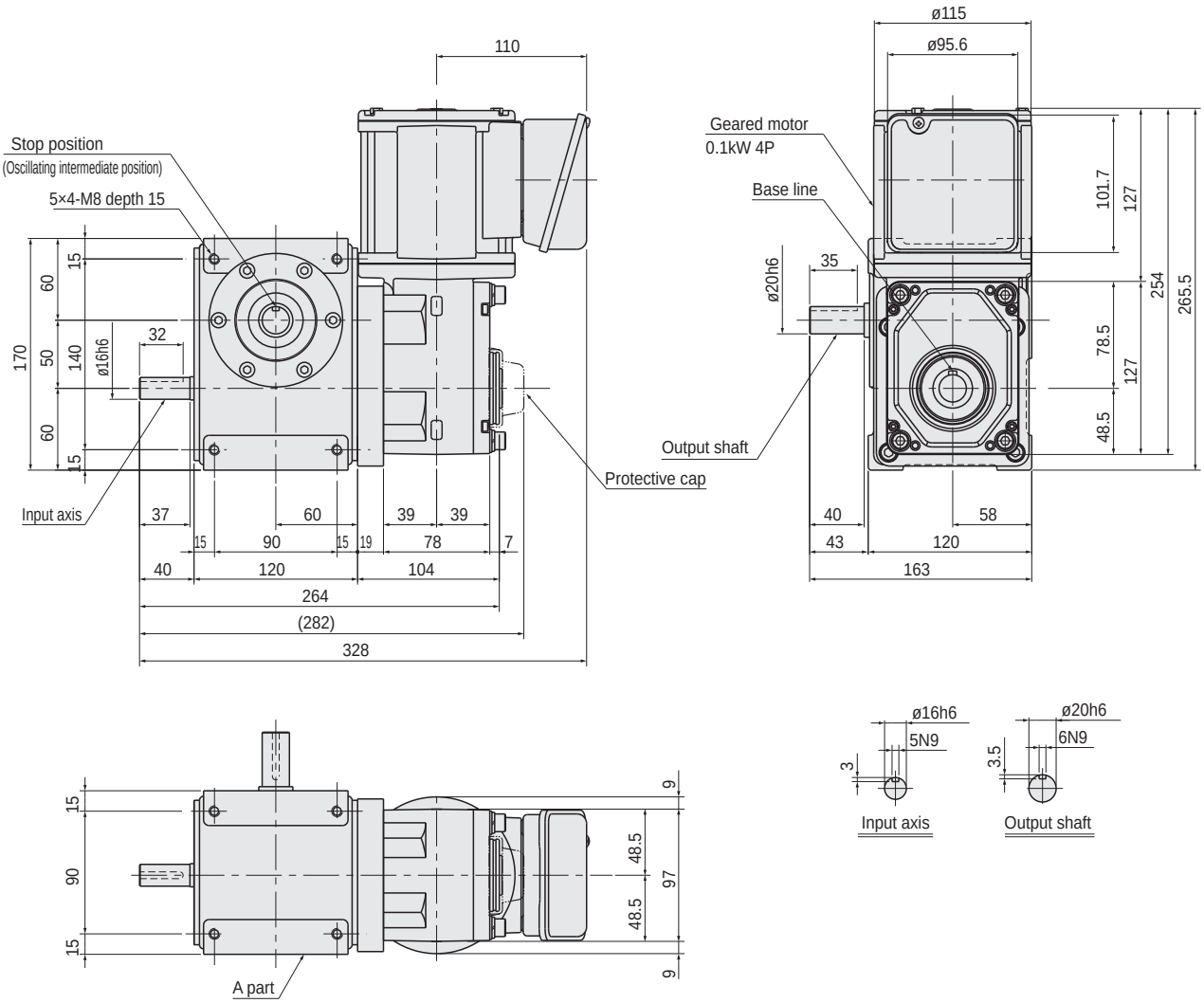
(*1) Assemble on the device within the dimension range.

Input axis

ZRS-05□- □□□□□S □-NNX-20 □

Optional dimensions

● With hollow shaft geared motor (0.1 kW)

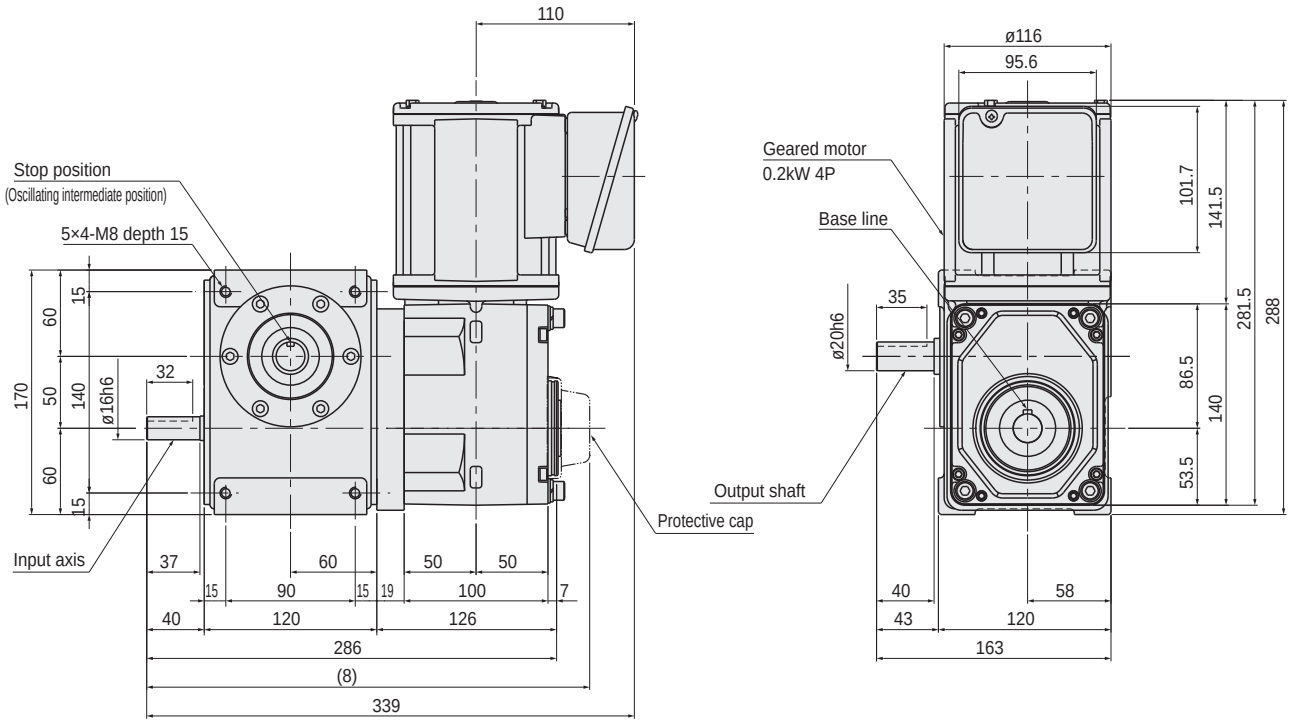


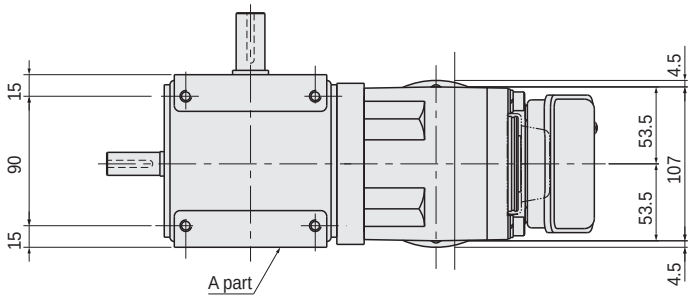
*The motor may protrude from the housing end (A part).

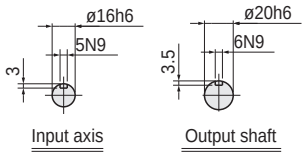
ZRS-05 □ - □□□□□S □-NHNGGS □F

Optional dimensions

● With hollow shaft geared motor (0.2 kW)







*The motor may protrude from the housing end (A part).

ZRS-05 □ - □□□□□S □-NHNGHS □F

Mechanical indexer Roller gear cam unit

ZRS-06

Distance between axes: 63mm

How to order

ZRS - 06 X - 004 270 S 1 S 1 - Option

*Refer to page 87.

❶Size
❷Operation
❸Indexing No. Oscillation angle
❹Total allocated angle
❺Cam curve
❻Cam torsion Oscillation pattern
❼Output shaft shape
❽Installation orientation

❶Size	
06	Distance between axes 63mm

❷Operation	
X	Index
Y	Oscillations

❸Indexing No. (for indexing)			
002	2	012	12
003	3	016	16
004	4	018	18
005	5	020	20
006	6	024	24
008	8		
009	9		
010	10		

❸Oscillation angle (for oscillations)			
030	30°	090	90°
045	45°	120	120°
060	60°		

❹Total indexing angle (for indexes)			
090	90°	240	240°
120	120°	270	270°
150	150°	300	300°
180	180°	330	330°
210	210°		

❹Total allocated angle (in the case of oscillations)			
180	180°(90°x 2)	300	300°(150°x 2)
240	240°(120°x 2)	360	360°(180°x 2)

❺Cam curve	
S	MS curve

❻Cam torsion (for index)
Refer to page 2
❻Oscillating pattern (oscillating)
Refer to page 2

❼Output shaft shape	
S	Straight
F	Flange

❽Installation orientation
Refer to page 3.

Specifications

Indexing accuracy (Index)	Seconds	1 stationary	±30
		2 stationary	±90
Indexing accuracy (oscillating)	Seconds		±90
Repeatability	Seconds		15
Allowable thrust force	N	Output shaft	3000
		Input axis	2000
Allowable radial force	N	Output shaft	3000
		Input axis	1600
Allowable bending moment	N·m	Output shaft	100
Moment of inertia	$kg \cdot m^2$	Output shaft	6.99×10^{-4} (1.12×10^{-3})
		Input axis	8.09×10^{-4}
Internal friction torque	N·m		4.8
Body weight	kg		18
Oil amount	ℓ		0.8

* Values in ( ) are for ❼ output shaft shape F: flange.
* Contact CKD for stopping accuracy.

Allocation angle list

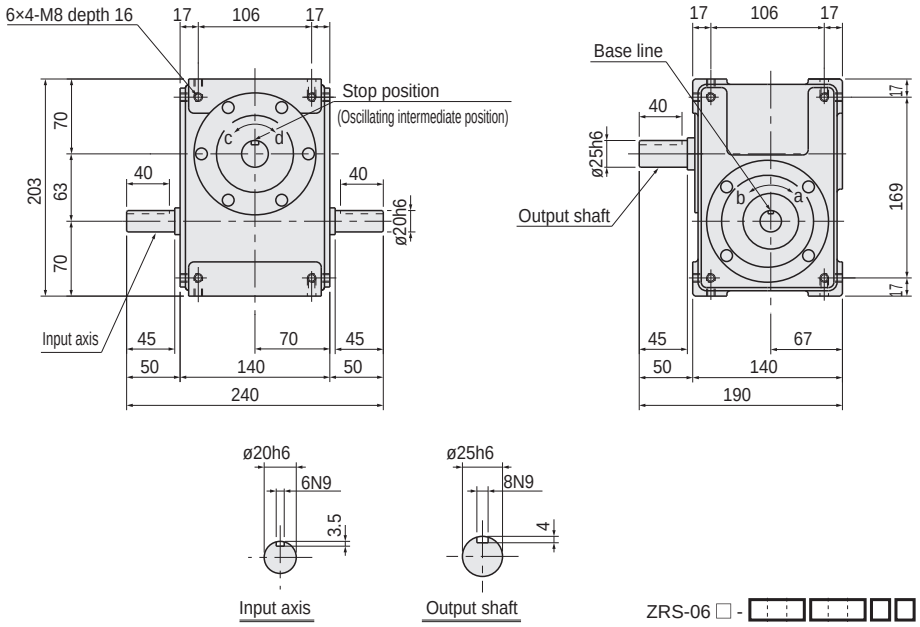
Index operation

Total allocated angle (θt) / Indexing No. (n)		90°	120°	150°	180°	210°	240°	270°	300°	330°
1 stationary	2							○	○	○
	3				○	○	○	○	○	○
	4			○	○	○	○	○	○	○
	5		○	○	○	○	○	○	○	○
	6	○	○	○	○	○	○	○	○	○
	8	○	○	○	○	○	○	○	○	○
	9	○	○	○	○	○	○	○	○	○
	10	○	○	○	○	○	○	○	○	○
	12	○	○	○	○	○	○	○	○	○
2 stationary	16		○	○	○	○	○	○	○	○
	18		○	○	○	○	○	○	○	○
	20	○	○	○	○	○	○	○	○	○
	24	○	○	○	○	○	○	○	○	○

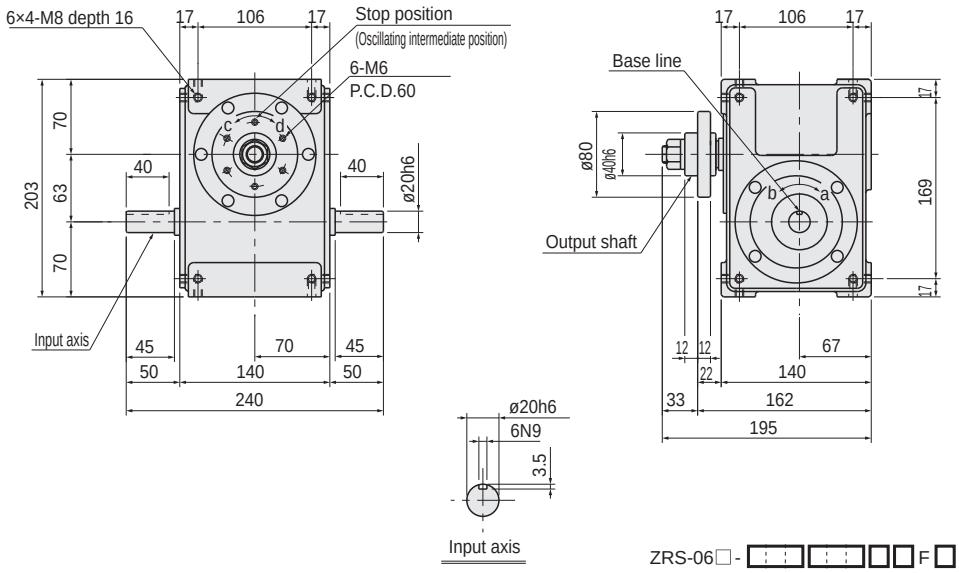
Oscillating operation

Total allocated angle (θt) / Oscillation angle (ψ)	180°	240°	300°	360°
120°				○
90°			○	○
60°	○	○	○	○
45°	○	○	○	○
30°	○	○	○	○

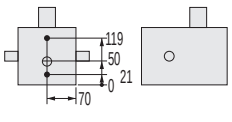
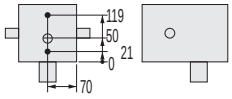
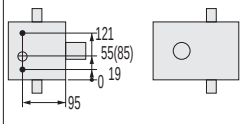
Dimensions (straight axis)



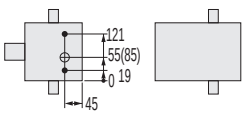
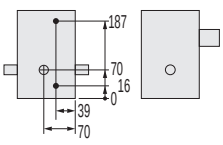
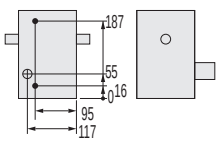
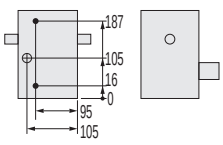
Dimensions (flange shaft)



Mounting orientation and lubrication port/Oil level indicator position

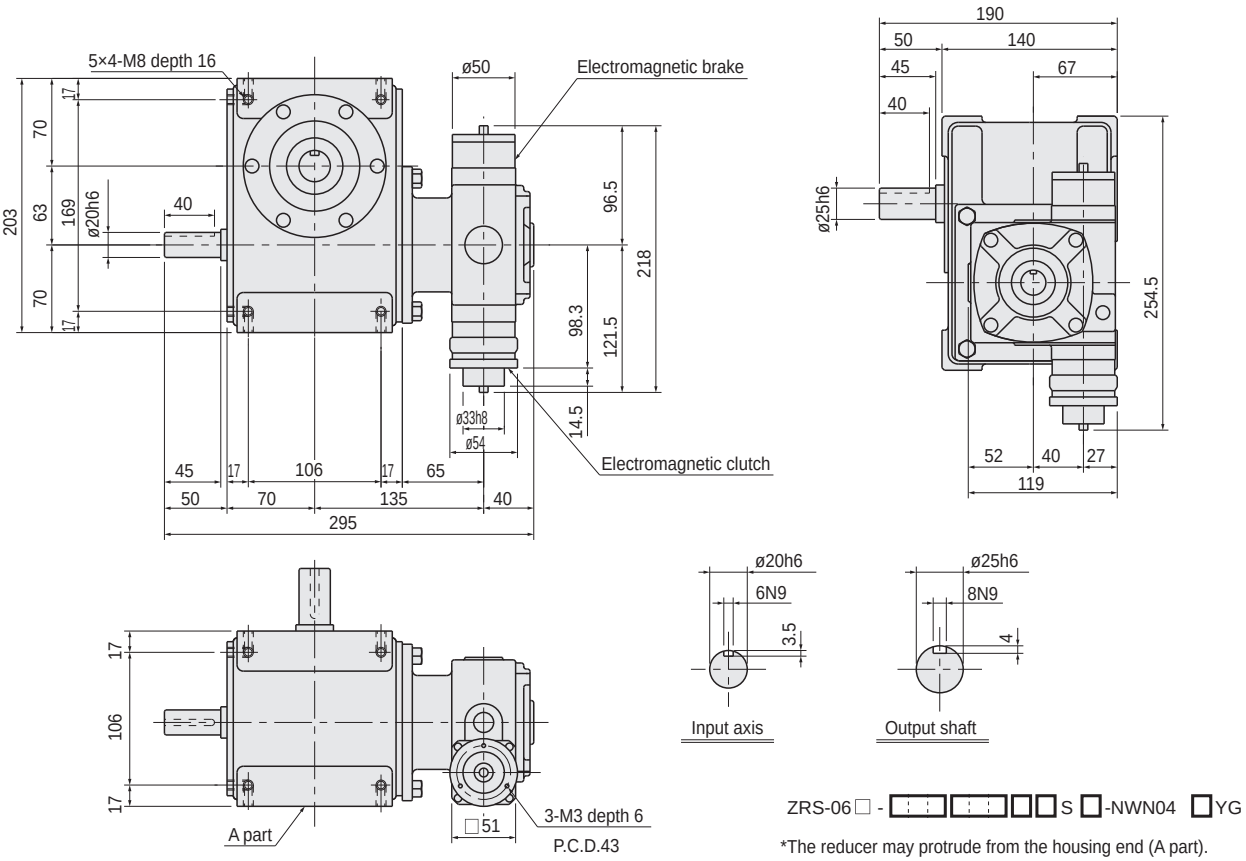
Installation orientation	1	2	3
Dimensions			 Dimensions in ( ) are for ZRS-06Y.

• Lubrication port (Rc¼)
○ Oil level indicator (ø20)

Installation orientation	4	5	6	
Dimensions	 Dimensions in ( ) are for ZRS-06Y.		 ZRS-06X	 ZRS-06Y

Optional dimensions

● With worm reducer (HO40-C/B)

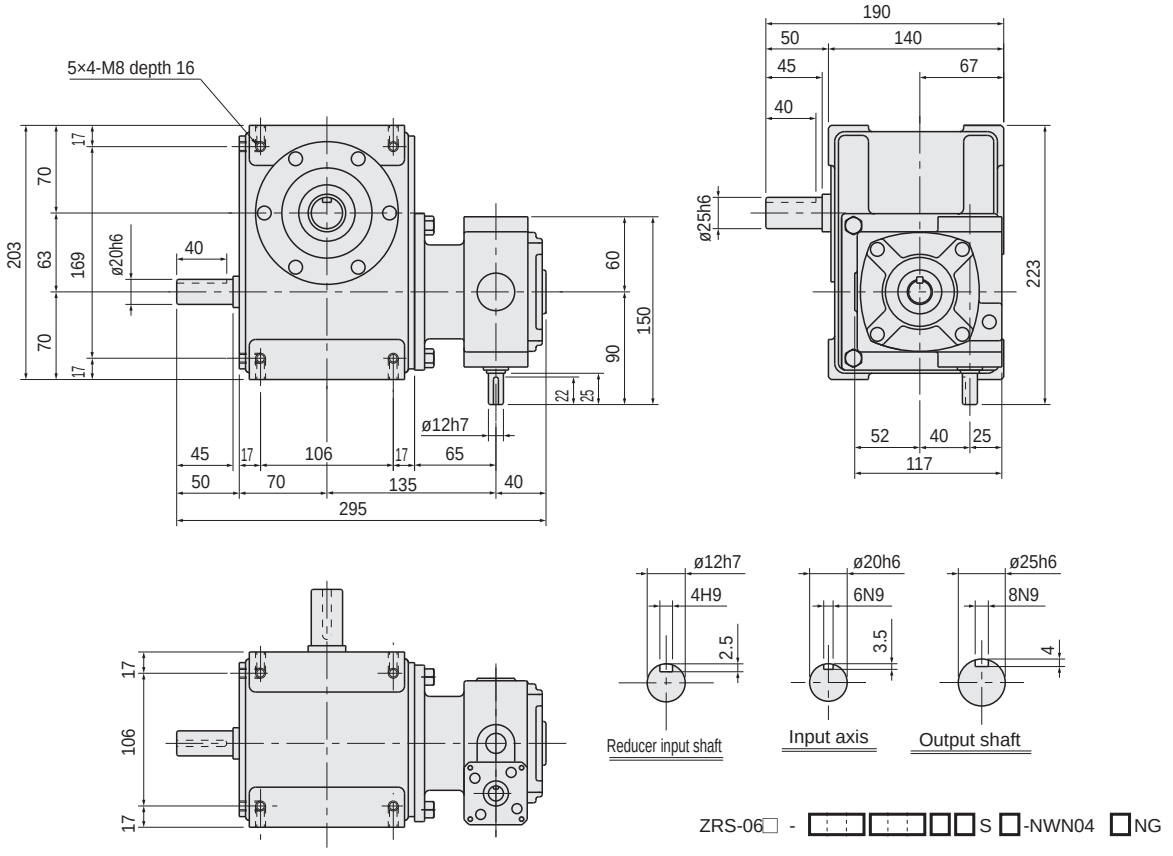


ZRS-06□ - □□□□S □-NWN04 □YG

*The reducer may protrude from the housing end (A part).

The fastening key of the reduction gear and the input shaft shall be of old JIS1 type (JIS B1301-1959).

● With worm reducer (without HO40-C/B)

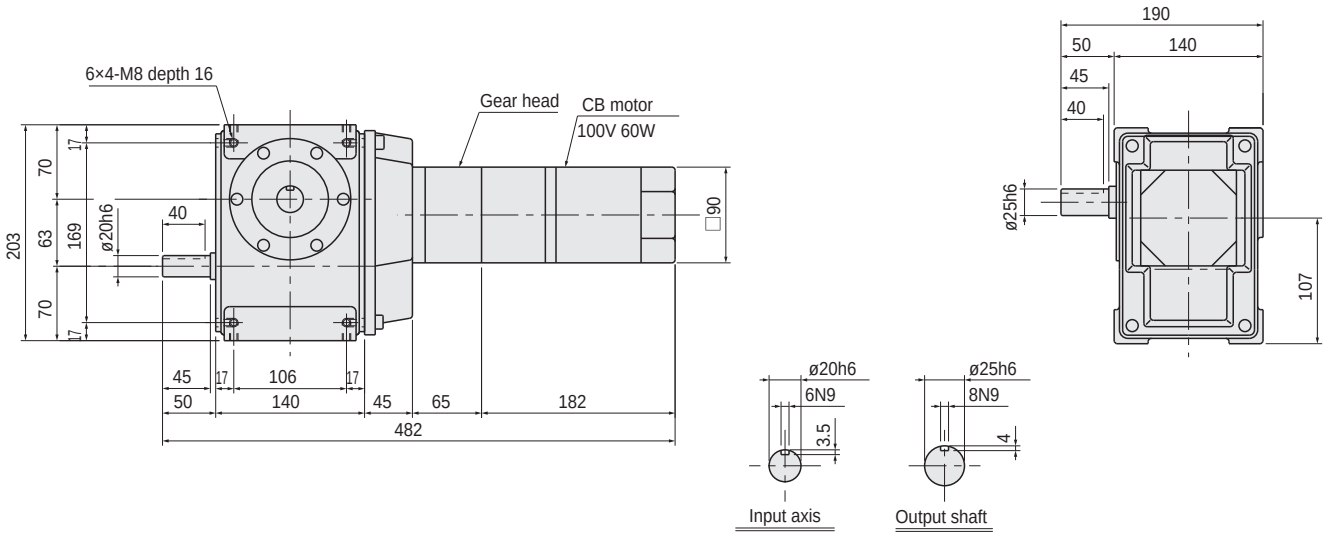


ZRS-06□ - □□□□S □-NWN04 □NG

The fastening key of the reduction gear and the input shaft shall be of old JIS1 type (JIS B1301-1959).

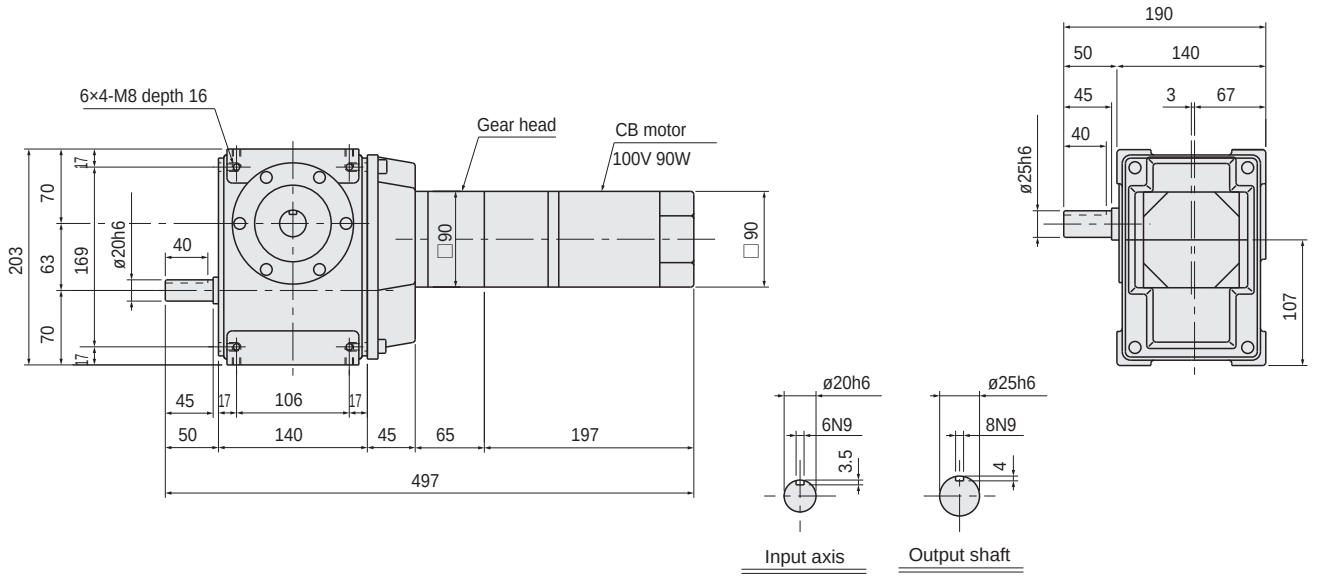
Optional dimensions

● Gear head + motor (with C/B 60 W)



ZRS-06□-□□□□□S□-NGNCEA□G

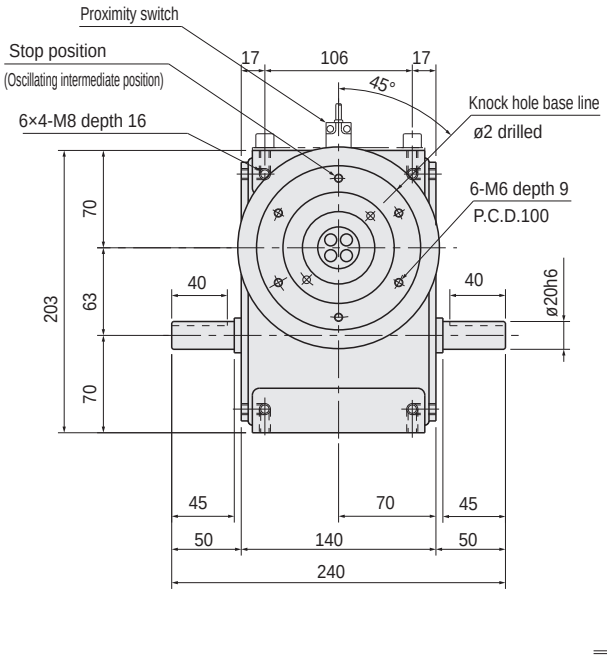
● Gear head + motor (with C/B 90 W)

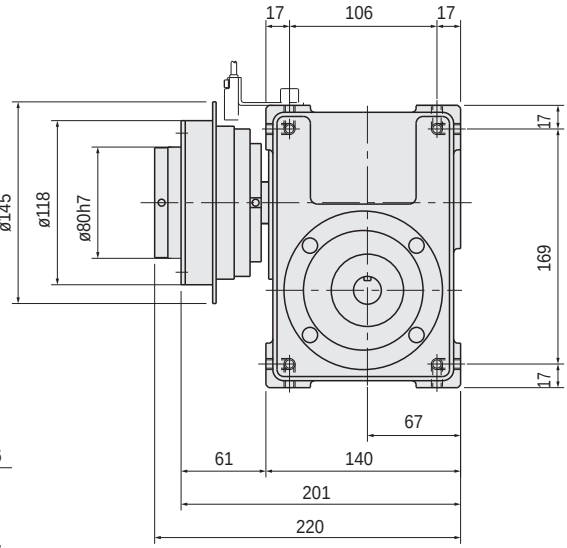


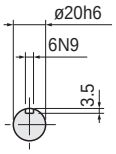
ZRS-06□-□□□□□S□-NGNCFA□G

Optional dimensions

● With torque saver (TSF6)



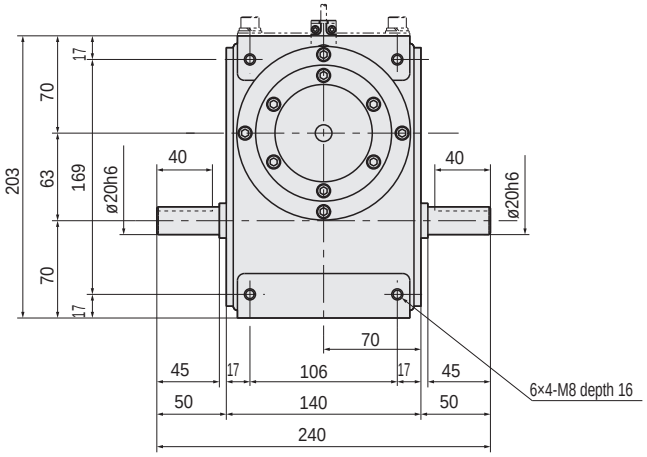


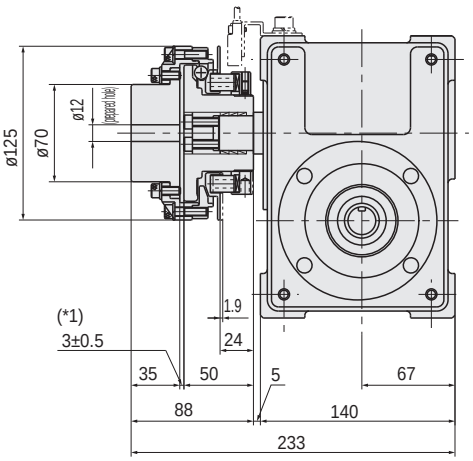


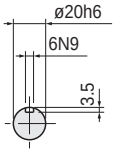
Input axis

ZRS-06□-□□□□□S□-NNF-06□

● With torque guard (TGX35)







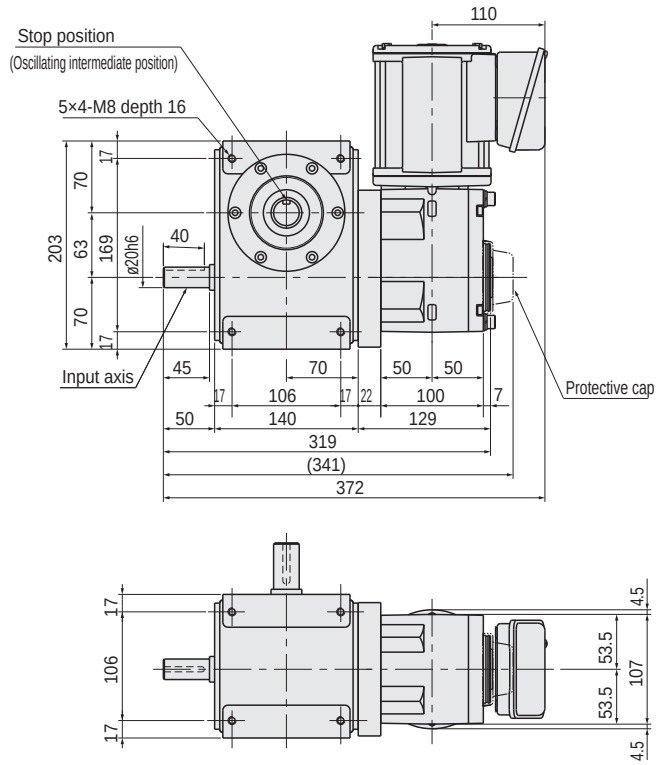
Input axis

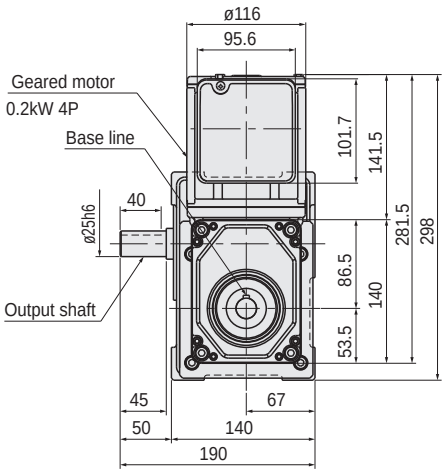
ZRS-06□-□□□□□S□-NNX-35□

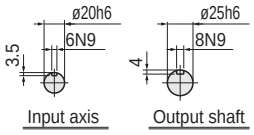
(*1) Assemble on the device within the dimension range.

Optional dimensions

With hollow shaft geared motor (0.2 kW)

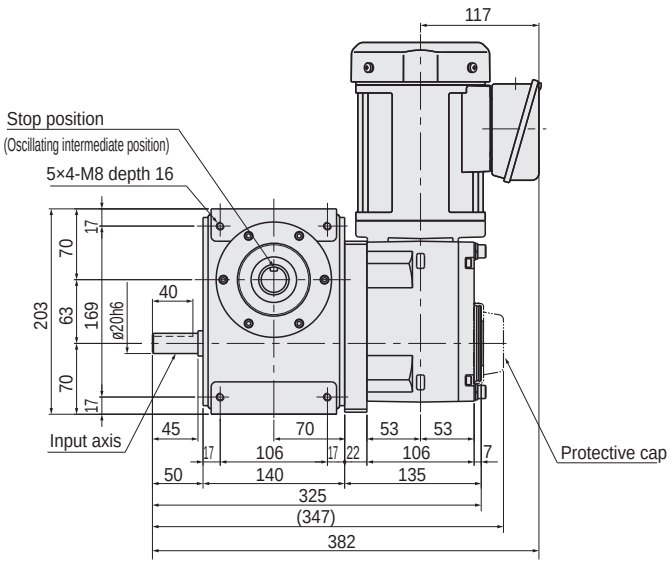


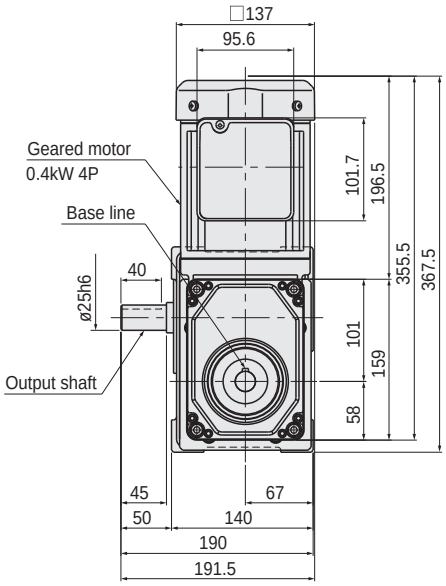


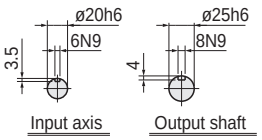


ZRS-06□- □□ □□ S □-NHNGHS □F

With hollow shaft geared motor (0.4 kW)







ZRS-06 □- □□ □□ S □-NHNGJS □F

Mechanical indexer Roller gear cam unit

ZRS-08

Distance between axes: 80mm

How to order

ZRS - 08 X - 004 270 S 1 S 1 - Option

*Refer to page 87.

❶Size
❷Operation
❸Indexing No. Oscillation angle
❹Total allocated angle
❺Cam curve
❻Cam torsion Oscillation pattern
❼Output shaft shape
❽Installation orientation

❶Size	
08	Distance between axes 80mm

❷Operation	
X	Index
Y	Oscillations

❸Indexing No. (for indexing)			
002	2	012	12
003	3	015	15
004	4	016	16
005	5	018	18
006	6	020	20
008	8	024	24
009	9	030	30
010	10	032	32
❸Oscillation angle (for oscillations)			
030	30°	090	90°
045	45°	120	120°
060	60°		

❹Total indexing angle (for indexes)			
090	90°	240	240°
120	120°	270	270°
150	150°	300	300°
180	180°	330	330°
210	210°		
❹Total allocated angle (in the case of oscillations)			
180	180°(90°x 2)	300	300°(150°x 2)
240	240°(120°x 2)	360	360°(180°x 2)

❺Cam curve	
S	MS curve

❻Cam torsion (for index)
Refer to page 2
❻Oscillating pattern (oscillating)
Refer to page 2

❼Output shaft shape	
S	Straight
F	Flange

❽Installation orientation
Refer to page 3.

Specifications

Indexing accuracy (Index)	Seconds	1 stationary	±30
		2 stationary	±60
Indexing accuracy (oscillating)	Seconds		±60
Repeatability	Seconds		15
Allowable thrust force	N	Output shaft	3500
		Input axis	2500
Allowable radial force	N	Output shaft	3800 (4500)
		Input axis	2700
Allowable bending moment	N·m	Output shaft	150 (200)
Moment of inertia	$kg \cdot m^2$	Output shaft	1.95×10^{-3} (3.07×10^{-3})
		Input axis	3.14×10^{-3}
Internal friction torque	N·m		7.8
Body weight	kg		32
Oil amount	ℓ		1.2

* Values in ( ) are for ❼ output shaft shape F: flange.
* Contact CKD for stopping accuracy.

Allocation angle list

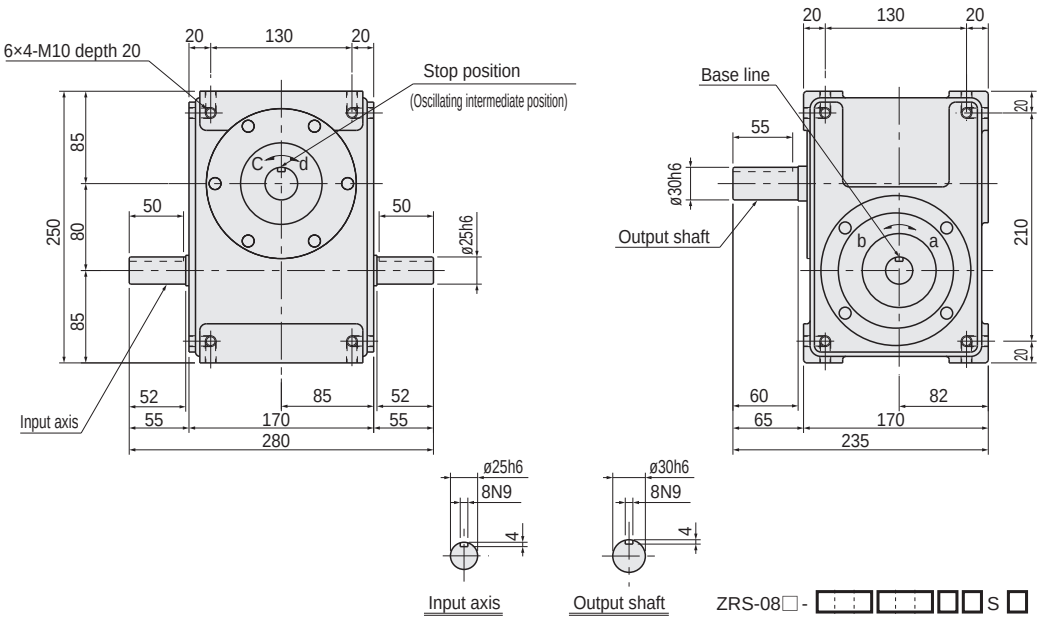
Index operation

Total allocated angle (θt) / Indexing No. (n)		90°	120°	150°	180°	210°	240°	270°	300°	330°
1 stationary	2							○	○	○
	3				○	○	○	○	○	○
	4			○	○	○	○	○	○	○
	5		○	○	○	○	○	○	○	○
	6	○	○	○	○	○	○	○	○	○
	8	○	○	○	○	○	○	○	○	○
	9	○	○	○	○	○	○	○	○	○
	10	○	○	○	○	○	○	○	○	○
	12	○	○	○	○	○	○	○	○	○
	15	○	○	○	○	○	○	○	○	○
	16	○	○	○	○	○	○	○	○	○
2 stationary	16		○	○	○	○	○	○	○	○
	18		○	○	○	○	○	○	○	○
	20	○	○	○	○	○	○	○	○	○
	24	○	○	○	○	○	○	○	○	○
	30	○	○	○	○	○	○	○	○	○
	32	○	○	○	○	○	○	○	○	○

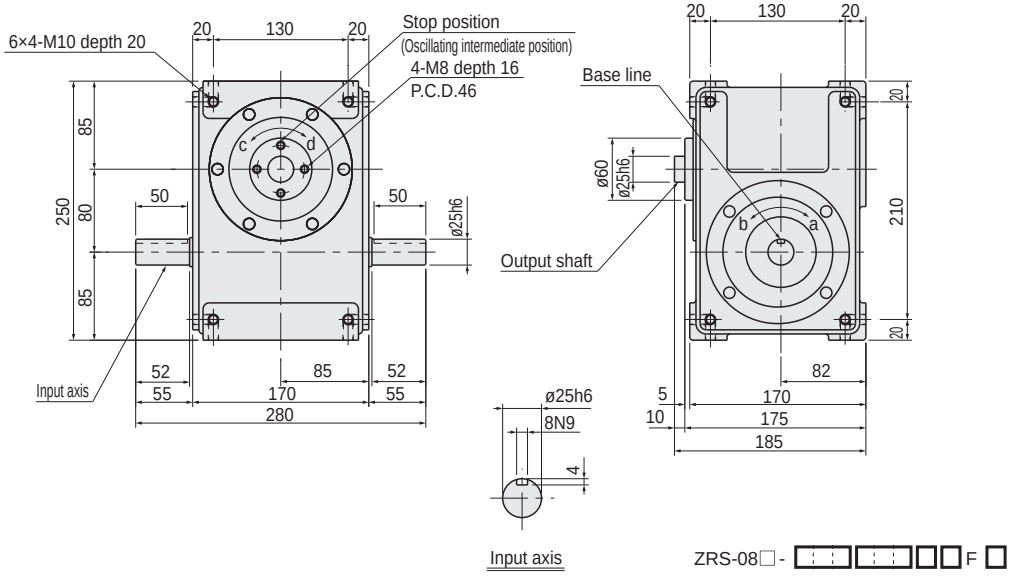
Oscillating operation

Total allocated angle (θt) / Oscillation angle (ψ)	180°	240°	300°	360°
120°				○
90°			○	○
60°	○	○	○	○
45°	○	○	○	○
30°	○	○	○	○

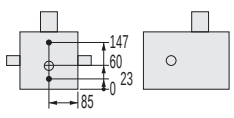
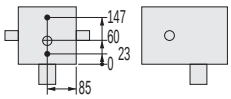
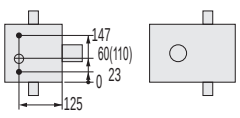
Dimensions (straight axis)



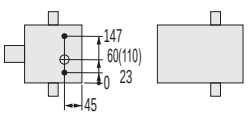
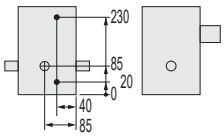
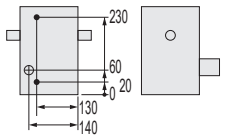
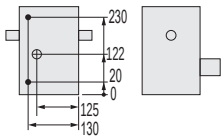
Dimensions (flange shaft)



Mounting orientation and lubrication port/Oil level indicator position

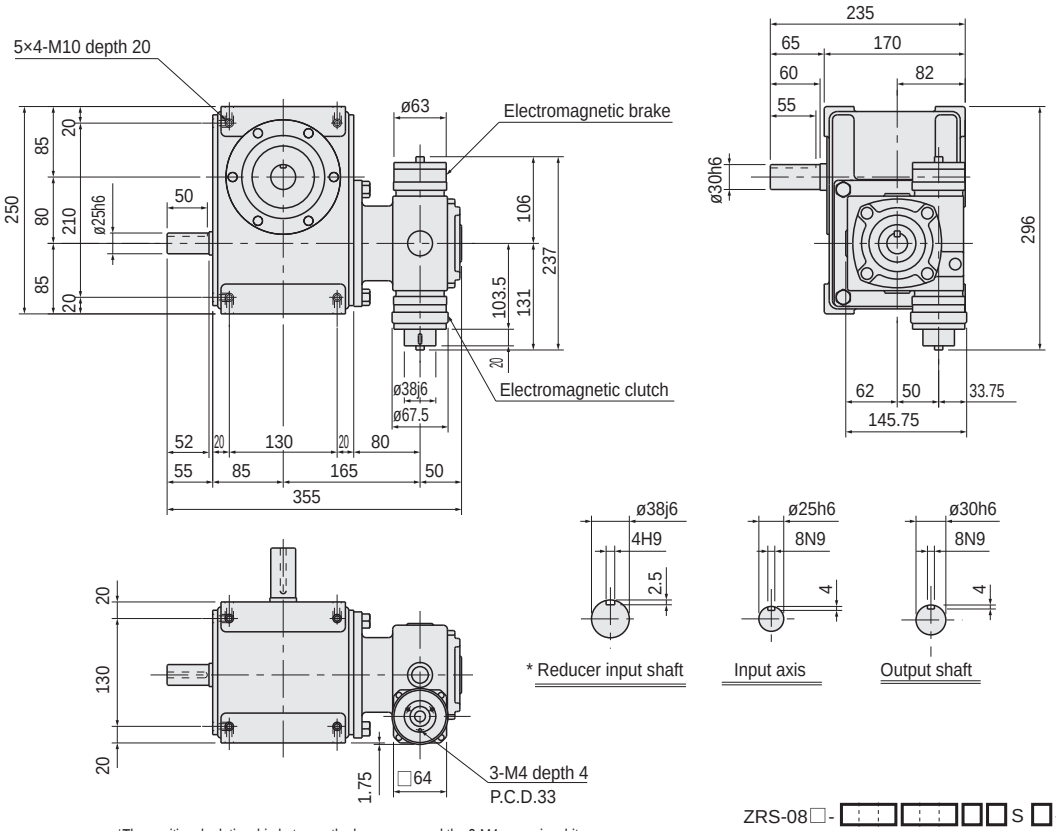
Installation orientation	1	2	3
Dimensions			 Dimensions in ( ) are for ZRS-08Y.

• Oil filler (Rc⅜)
○ Oil level indicator (φ30)

Installation orientation	4	5	6	
Dimensions	 Dimensions in ( ) are for ZRS-08Y.		 ZRS-08X	 ZRS-08Y

Optional dimensions

● With worm reducer (HO50-C/B)

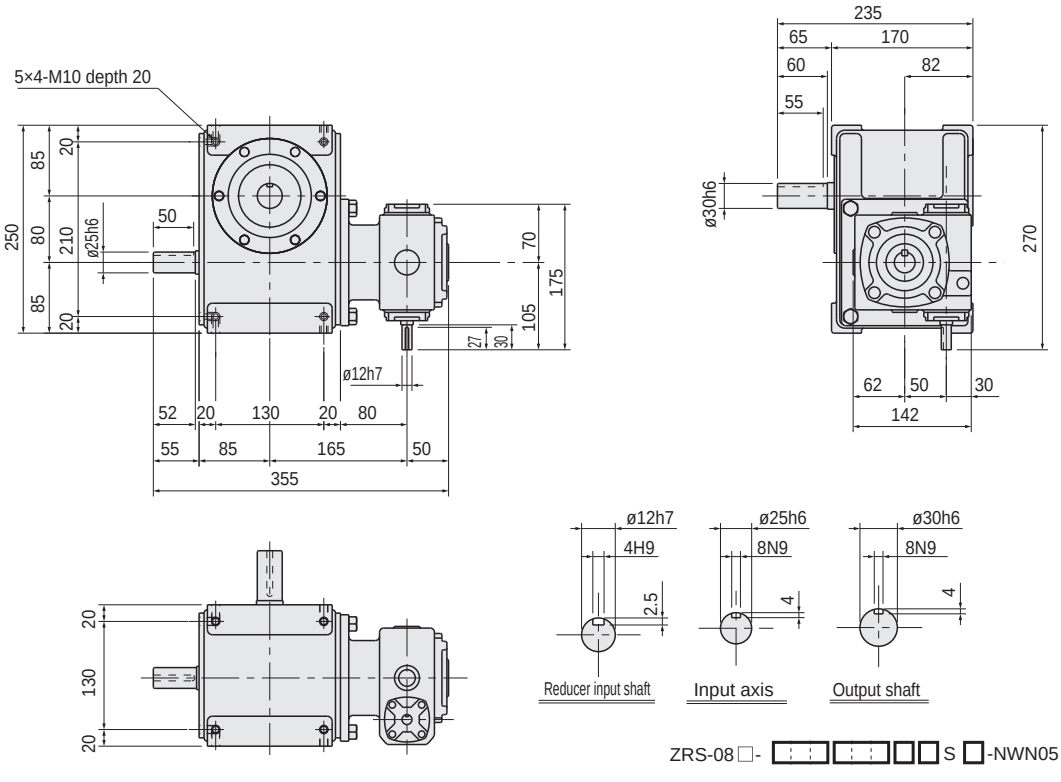


ZRS-08□- □□□□□S □-NWN05 □YG

*The positional relationship between the key groove and the 3-M4 screw is arbitrary.

The fastening key of the reduction gear and the input shaft shall be of old JIS1 type (JIS B1301-1959).

● With worm reducer (without HO50-C/B)

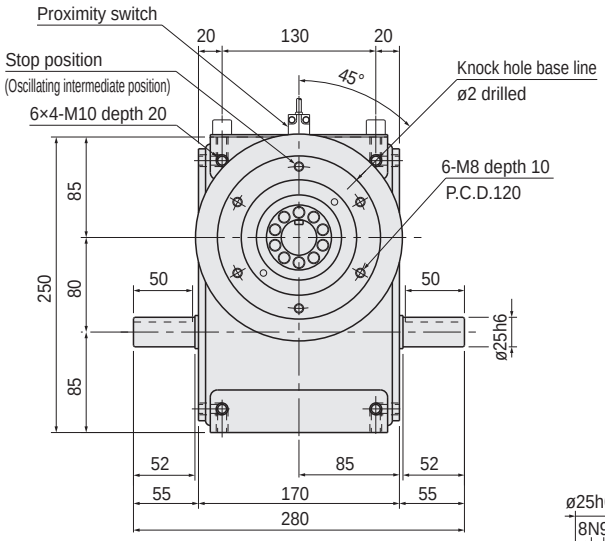


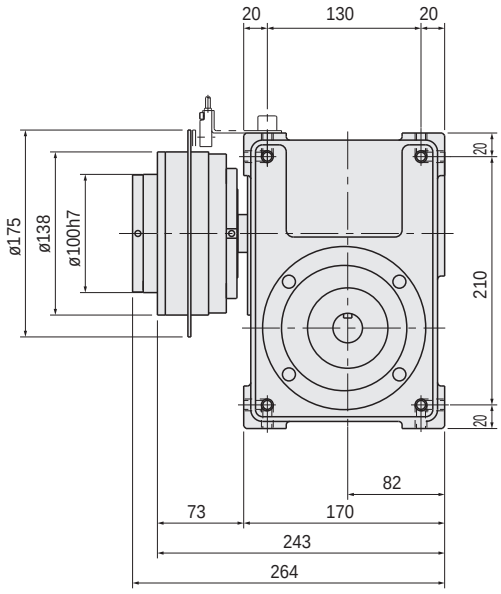
ZRS-08□- □□□□□S □-NWN05 □NG

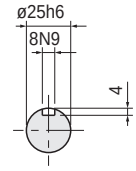
The fastening key of the reduction gear and the input shaft shall be of old JIS1 type (JIS B1301-1959).

Optional dimensions

● With torque saver (TSF8)



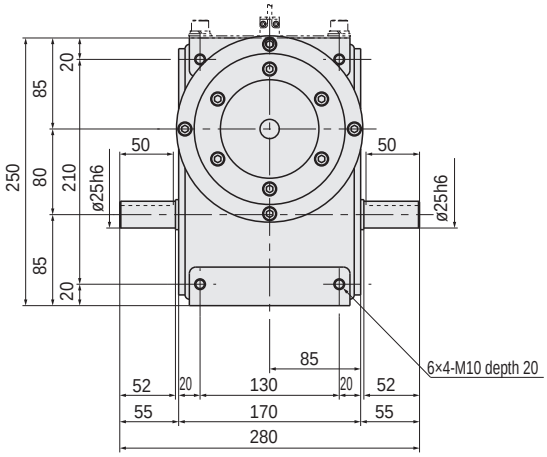


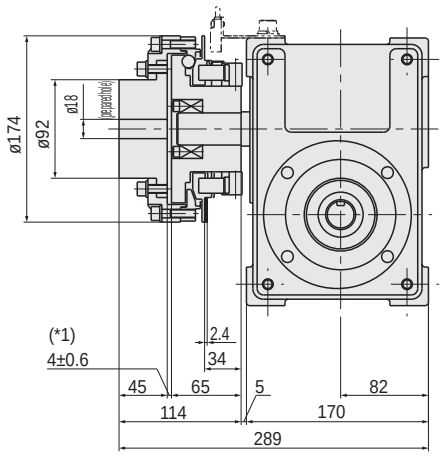


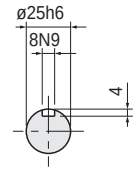
Input axis

ZRS-08□-□□□□□S□-NNF-08□

● With torque guard (TGX50)







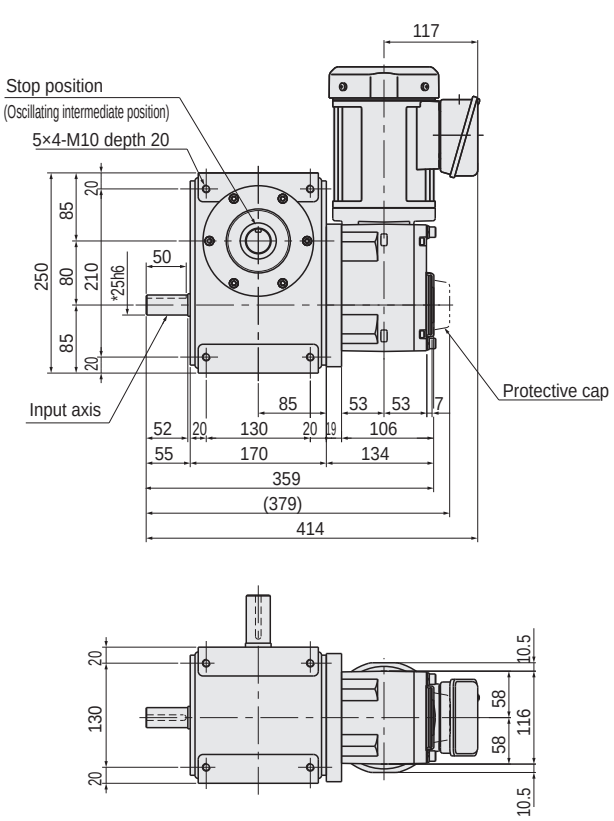
Input axis

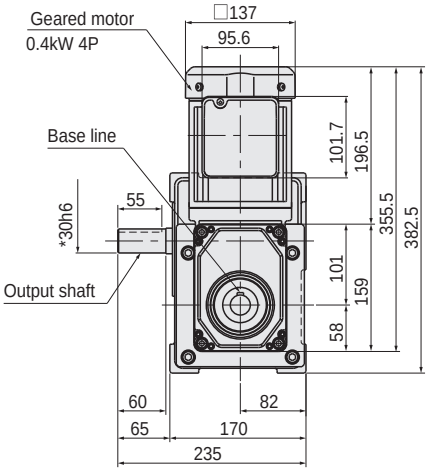
(*1) Assemble on the device within the dimension range.

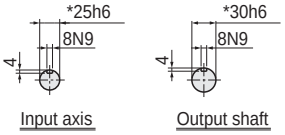
ZRS-08□-□□□□□S□-NNX-50□

Optional dimensions

● With hollow shaft geared motor (0.4 kW)

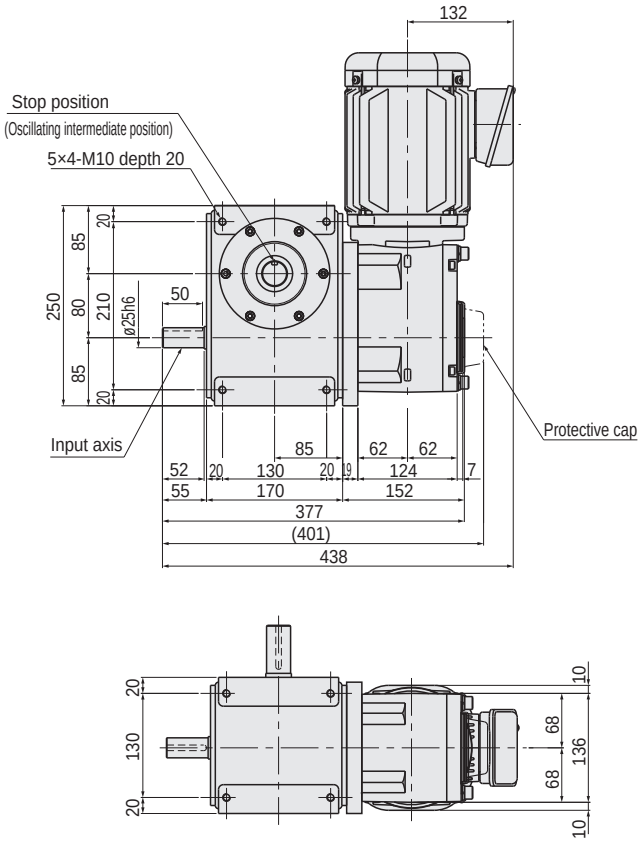


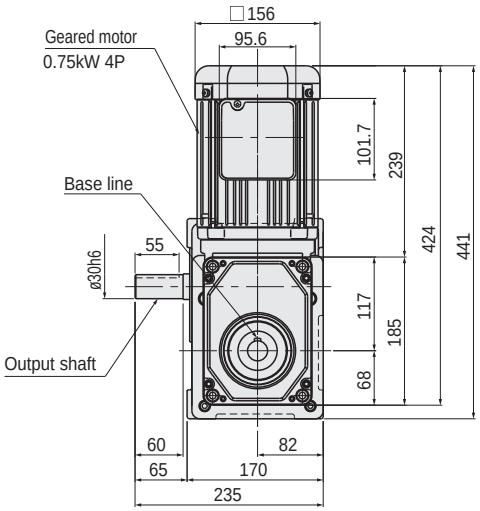


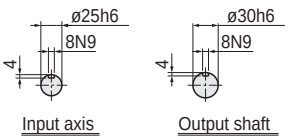


ZRS-08 □ - □□□□ S □ -NHNGJS □ F

● With hollow shaft geared motor (0.75 kW)







ZRS-08 □ - □□□□ S □ -NHNGKS □ F

MEMO

Mechanical indexer Roller gear cam unit

ZRS-11

Distance between axes: 110mm

How to order

ZRS - 11 X - 004 270 S 1 S 1 - Option

*Refer to page 87.

❶Size
❷Operation
❸Indexing No. Oscillation angle
❹Total allocated angle
❺Cam curve
❻Cam torsion Oscillation pattern
❼Output shaft shape
❽Installation orientation

❶Size	
11	Distance between axes 110mm

❷Operation	
X	Index
Y	Oscillations

❸Indexing No. (for indexing)			
002	2	012	12
003	3	015	15
004	4	016	16
005	5	018	18
006	6	020	20
008	8	024	24
009	9	030	30
010	10	032	32
❸Oscillation angle (for oscillations)			
030	30°	090	90°
045	45°	120	120°
060	60°		

❹Total indexing angle (for index)			
090	90°	240	240°
120	120°	270	270°
150	150°	300	300°
180	180°	330	330°
210	210°		
❹Total allocated angle (for oscillations)			
180	180°(90°x 2)	300	300°(150°x 2)
240	240°(120°x 2)	360	360°(180°x 2)

❺Cam curve	
S	MS curve

❻Cam torsion (for index)
Refer to page 2
❻Oscillating pattern (for oscillations)
Refer to page 2

❼Output shaft shape	
S	Straight
F	Flange

❽Installation orientation
Refer to page 3.

Specifications

Indexing accuracy (Index)	Seconds	1 stationary	±30
		2 stationary	±60
Indexing accuracy (oscillating)	Seconds		±60
Repeatability	Seconds		15
Allowable thrust force	N	Output shaft	4900
		Input axis	3500
Allowable radial force	N	Output shaft	6200 (6800)
		Input axis	3600
Allowable bending moment	N·m	Output shaft	180 (350)
Moment of inertia	$kg \cdot m^2$	Output shaft	8.92×10^{-3} (1.38×10^{-2})
		Input axis	1.36×10^{-2}
Internal friction torque	N·m		15
Body weight	kg		60
Oil amount	ℓ		3.8

* Values in ( ) are for ❼ output shaft shape F: flange.
* Contact CKD for stopping accuracy.

Allocation angle list

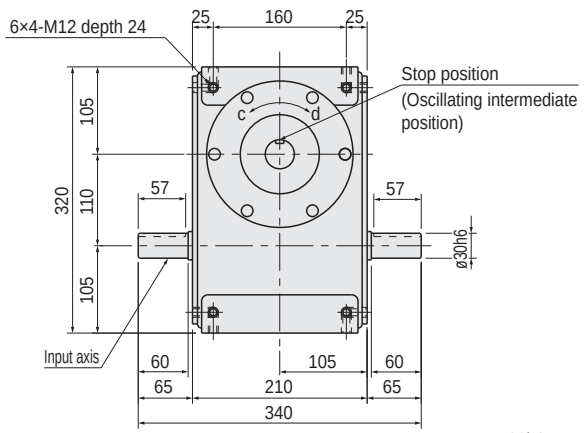
Index operation

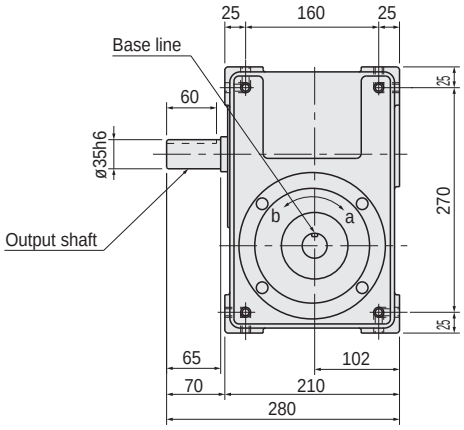
Total allocated angle (θt) / Indexing No. (n)		90°	120°	150°	180°	210°	240°	270°	300°	330°
1 stationary	2							○	○	○
	3				○	○	○	○	○	○
	4			○	○	○	○	○	○	○
	5		○	○	○	○	○	○	○	○
	6	○	○	○	○	○	○	○	○	○
	8	○	○	○	○	○	○	○	○	○
	9	○	○	○	○	○	○	○	○	○
	10	○	○	○	○	○	○	○	○	○
	12	○	○	○	○	○	○	○	○	○
	15	○	○	○	○	○	○	○	○	○
	16	○	○	○	○	○	○	○	○	○
2 stationary	16		○	○	○	○	○	○	○	○
	18		○	○	○	○	○	○	○	○
	20	○	○	○	○	○	○	○	○	○
	24	○	○	○	○	○	○	○	○	○
	30	○	○	○	○	○	○	○	○	○
	32	○	○	○	○	○	○	○	○	○

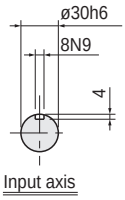
Oscillating operation

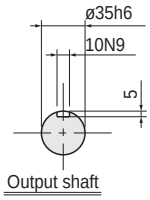
Total allocated angle (θt) / Oscillation angle (ψ)	180°	240°	300°	360°
120°				○
90°			○	○
60°	○	○	○	○
45°	○	○	○	○
30°	○	○	○	○

Dimensions (straight axis)



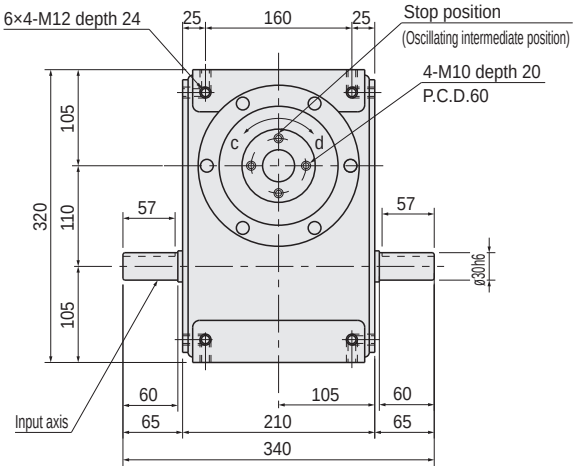


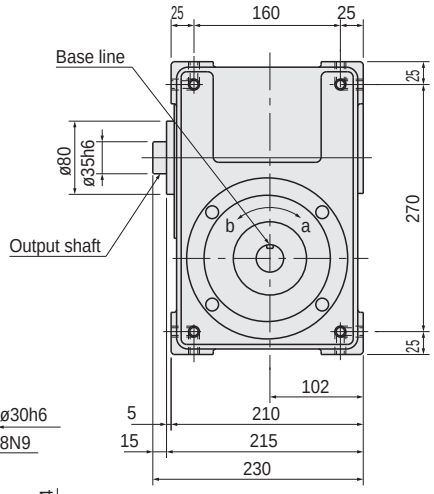


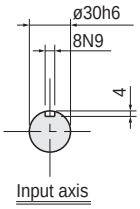


ZRS-11 □- □□□□S□

Dimensions (flange shaft)

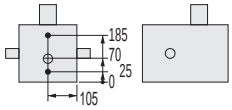
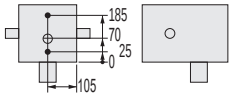
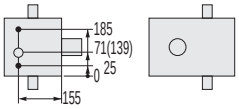




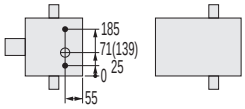
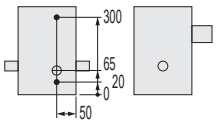
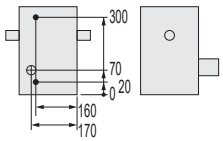
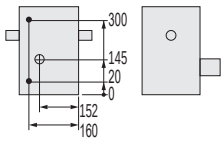


ZRS-11 □- □□□□F□

Mounting orientation and lubrication port/Oil level indicator position

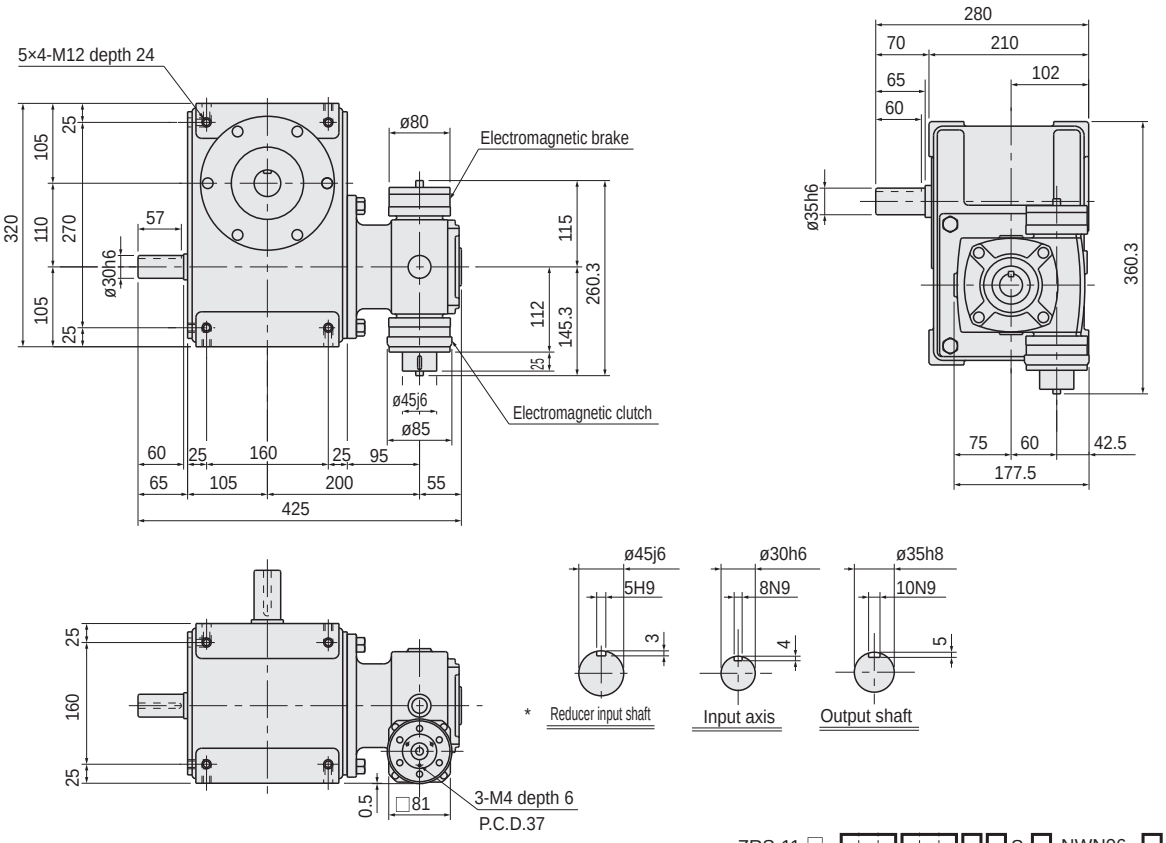
Installation orientation	1	2	3
Dimensions			 Dimensions in ( ) are for ZRS-11Y.

• Oil filler (Rc⅜)
○ Oil level indicator (φ30)

Installation orientation	4	5	6	
Dimensions	 Dimensions in ( ) are for ZRS-11Y.		 ZRS-11X	 ZRS-11Y

Optional dimensions

● With worm reducer (HO60-C/B)

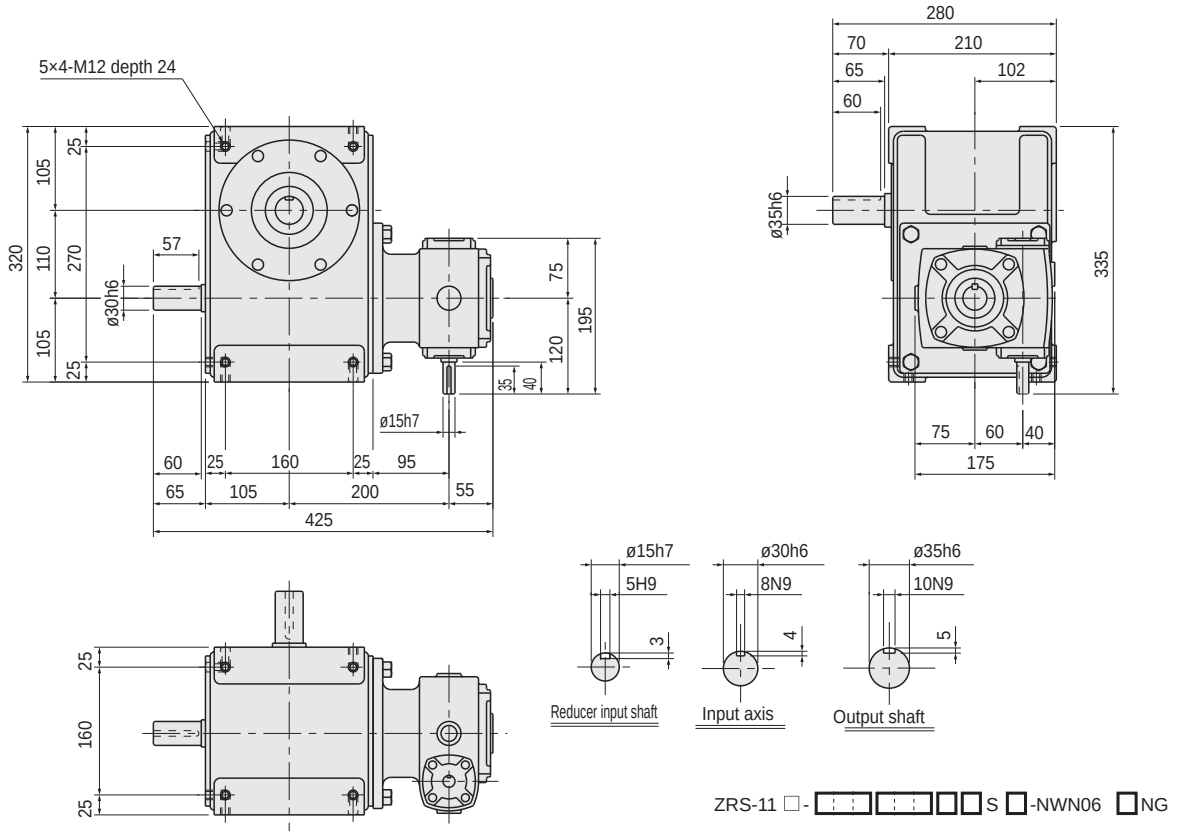


ZRS-11 □- □□ □□ S □-NWN06 □YG

* The positional relationship between the key groove and the 3-M4 screw is arbitrary.

The fastening key of the reduction gear and the input shaft shall be of old JIS1 type (JIS B1301-1959).

● With worm reducer (without HO60-C/B)

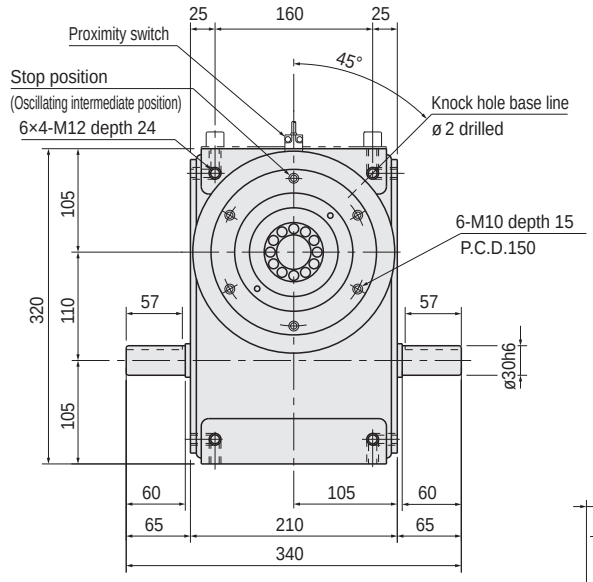


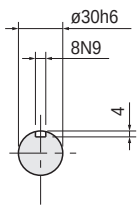
ZRS-11 □- □□ □□ S □-NWN06 □NG

The fastening key of the reduction gear and the input shaft shall be of old JIS1 type (JIS B1301-1959).

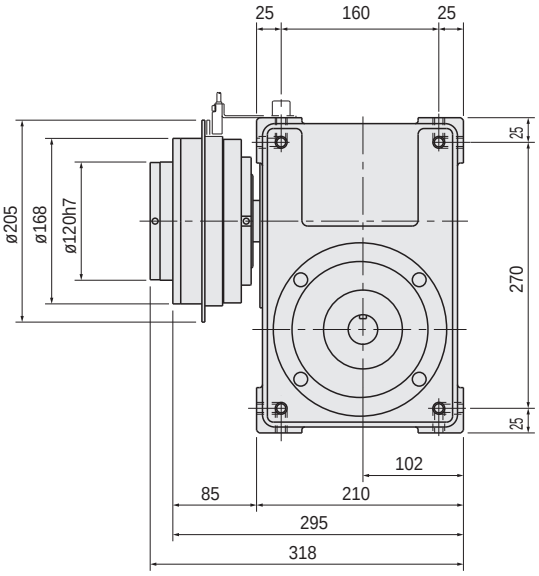
Optional dimensions

● With torque saver (TSF11)



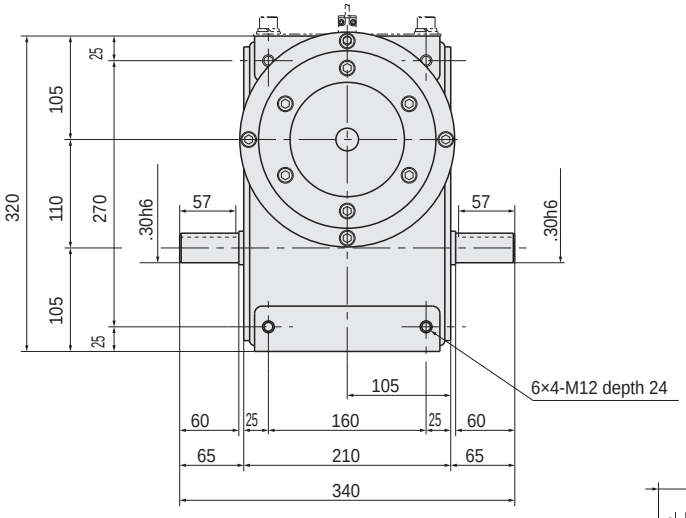


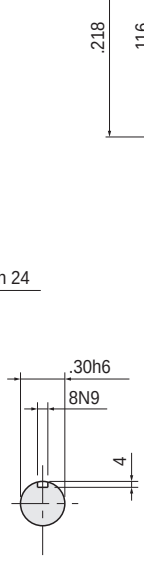
Input axis



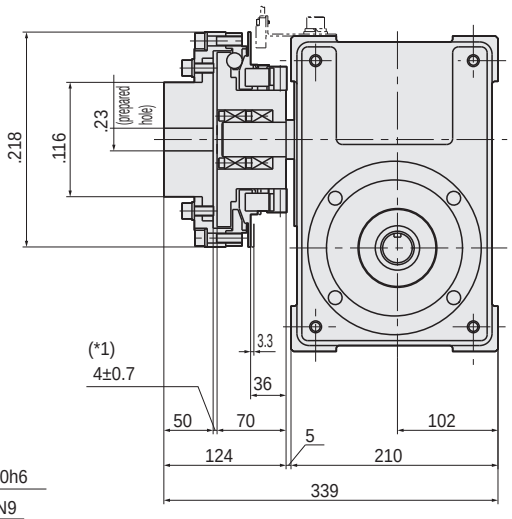
ZRS-11 □-□□□□S□-NNF-11□

● With torque guard (TGX70)





Input axis

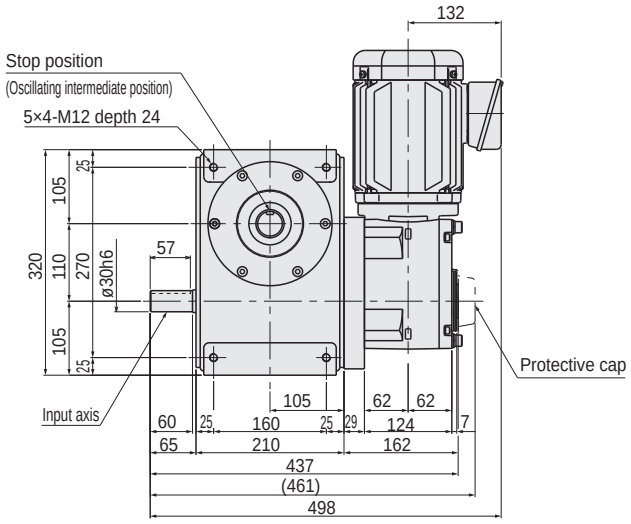


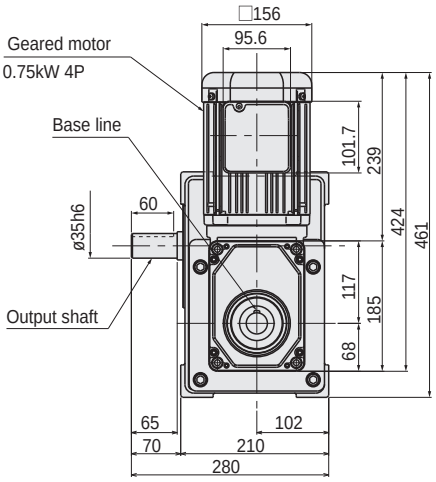
ZRS-11 □-□□□□S□-NNX-70□

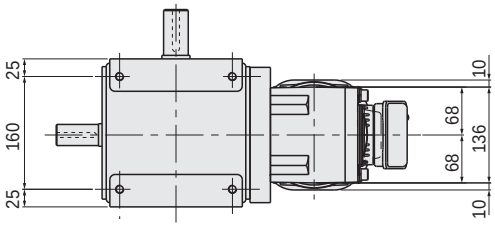
(*1) Assemble on the device within the dimension range.

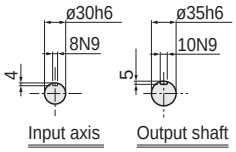
Optional dimensions

● With hollow shaft geared motor (0.75 kW)



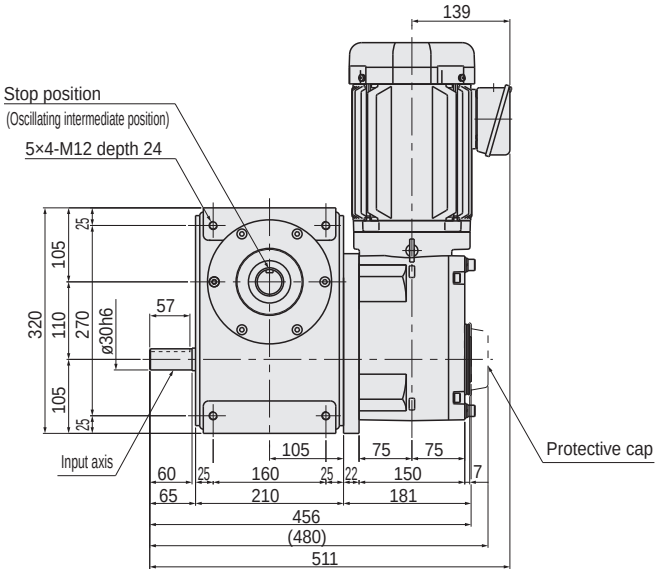


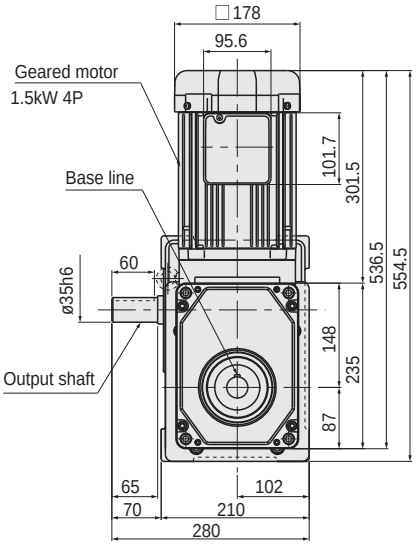


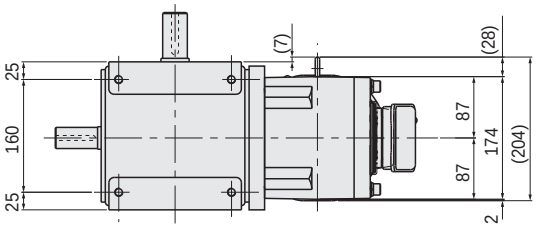


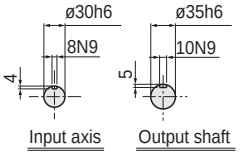
ZRS-11 □ - □□□□ S □ -NHNGKS □ F

● With hollow shaft geared motor (1.5 kW)









ZRS-11 □ - □□□□ S □ -NHNGLS □ F

MEMO

Mechanical indexer Roller gear cam unit

ZRS-14

Distance between axes: 140mm

How to order

ZRS - 14 X - 004 270 S 1 S 1 - Option

*Refer to page 87.

❶Size
❷Operation
❸Indexing No. Oscillation angle
❹Total allocated angle
❺Cam curve
❻Cam torsion Oscillation pattern
❼Output shaft shape
❽Installation orientation

❶Size	
14	Distance between axes 140mm

❷Operation	
X	Index
Y	Oscillations

Indexing No. (for indexing)			
002	2	012	12
003	3	015	15
004	4	016	16
005	5	018	18
006	6	020	20
008	8	024	24
009	9	030	30
010	10	032	32
❸Oscillation angle (for oscillations)			
030	30°	090	90°
045	45°	120	120°
060	60°		

❹Total indexing angle (for index)			
090	90°	240	240°
120	120°	270	270°
150	150°	300	300°
180	180°	330	330°
210	210°		
❹Total allocated angle (for oscillations)			
180	180°(90°x 2)	300	300°(150°x 2)
240	240°(120°x 2)	360	360°(180°x 2)

❺Cam curve	
S	MS curve

❻Cam torsion (for index)
Refer to page 2
❻Oscillating pattern (for oscillations)
Refer to page 2

❼Output shaft shape	
S	Straight
F	Flange

❽Installation orientation
Refer to page 3.

Specifications

Indexing accuracy (Index)	Seconds	1 stationary	±30
		2 stationary	±60
Indexing accuracy (oscillating)	Seconds		±60
Repeatability	Seconds		15
Allowable thrust force	N	Output shaft	7300
		Input axis	4500
Allowable radial force	N	Output shaft	9500
		Input axis	4200
Allowable bending moment	N·m	Output shaft	450 (600)
Moment of inertia	$kg·m^2$	Output shaft	2.53×10^{-2} (3.93×10^{-2})
		Input axis	5.42×10^{-2}
Internal friction torque	N·m		24
Body weight	kg		115
Oil amount	ℓ		6

* Values in ( ) are for ❼ output shaft shape F: flange.
* Contact CKD for stopping accuracy.

Allocation angle list

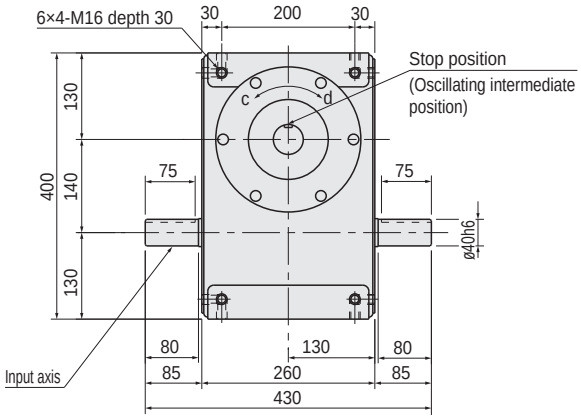
Index operation

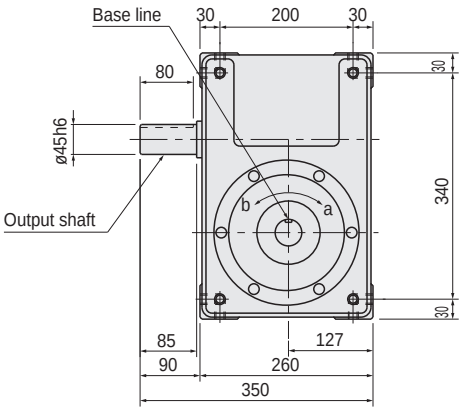
Total allocated angle (θt) / Indexing No. (n)		90°	120°	150°	180°	210°	240°	270°	300°	330°
1 stationary	2							○	○	○
	3				○	○	○	○	○	○
	4			○	○	○	○	○	○	○
	5		○	○	○	○	○	○	○	○
	6	○	○	○	○	○	○	○	○	○
	8	○	○	○	○	○	○	○	○	○
	9	○	○	○	○	○	○	○	○	○
	10	○	○	○	○	○	○	○	○	○
	12	○	○	○	○	○	○	○	○	○
	15	○	○	○	○	○	○	○	○	○
	16	○	○	○	○	○	○	○	○	○
2 stationary	16		○	○	○	○	○	○	○	○
	18		○	○	○	○	○	○	○	○
	20	○	○	○	○	○	○	○	○	○
	24	○	○	○	○	○	○	○	○	○
	30	○	○	○	○	○	○	○	○	○
	32	○	○	○	○	○	○	○	○	○

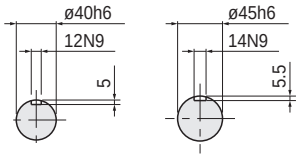
Oscillating operation

Total allocated angle (θt) / Oscillation angle (ψ)	180°	240°	300°	360°
120°				○
90°			○	○
60°	○	○	○	○
45°	○	○	○	○
30°	○	○	○	○

Dimensions (straight axis)

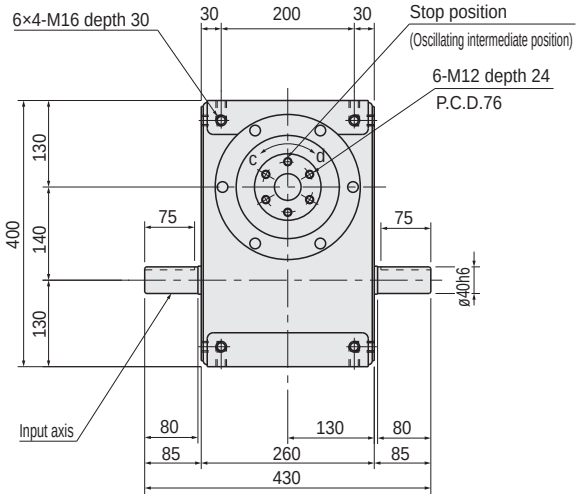


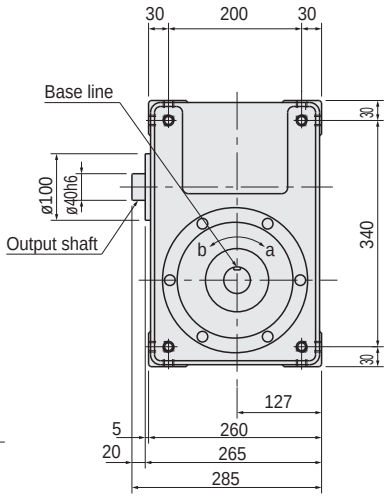


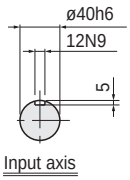


ZRS-14□-□□□□S□

Dimensions (flange shaft)

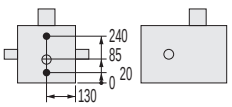
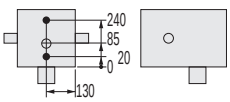
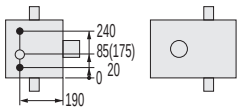




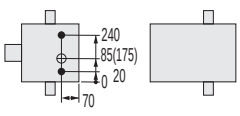
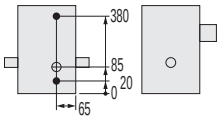
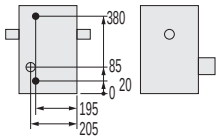
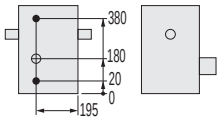


ZRS-14□-□□□□F□

Mounting orientation and lubrication port/Oil level indicator position

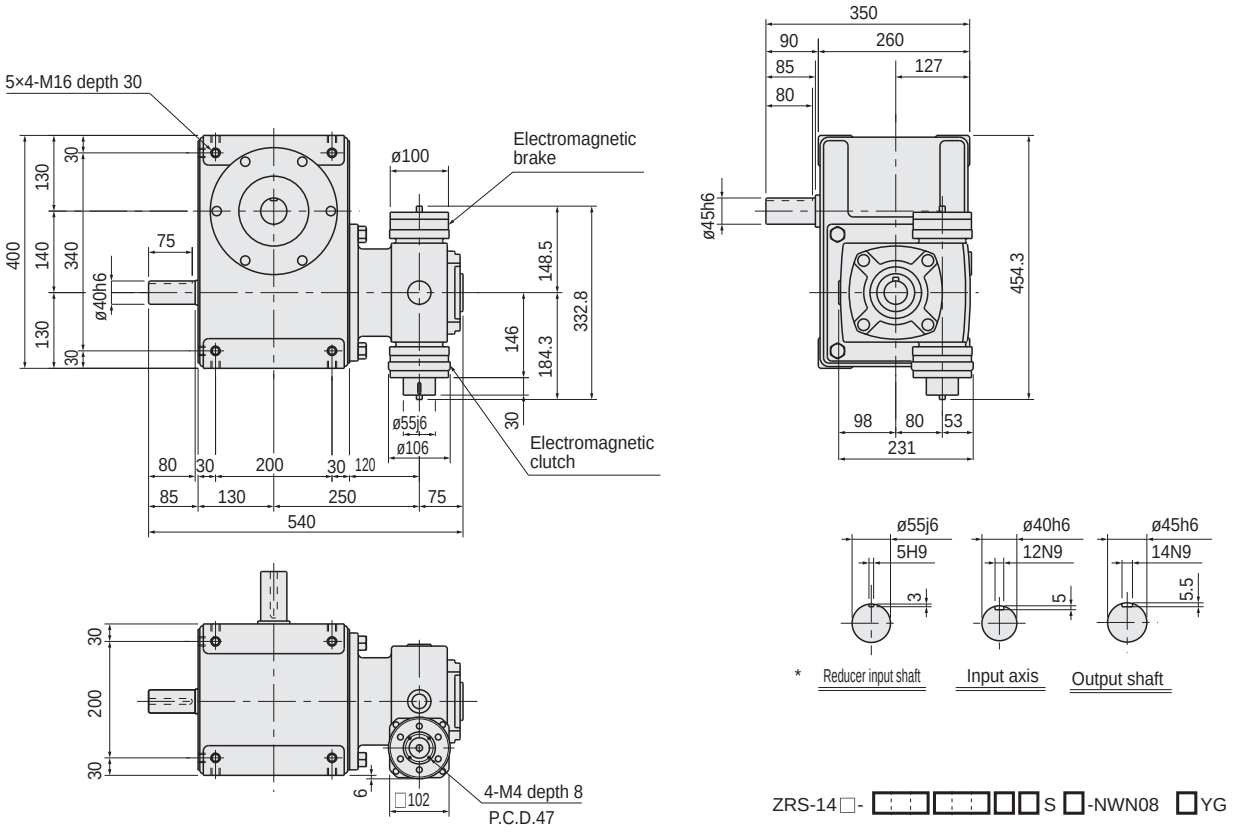
Installation orientation	1	2	3
Dimensions			
			Dimensions in ( ) are for ZRS-14Y.

- Oil filler(Rc⅜)
- ○ Oil level indicator (ø30)

Installation orientation	4	5	6	
Dimensions				
	Dimensions in ( ) are for ZRS-14Y.		ZRS-14X	ZRS-14Y

Optional dimensions

● With worm reducer (HO80-C/B)

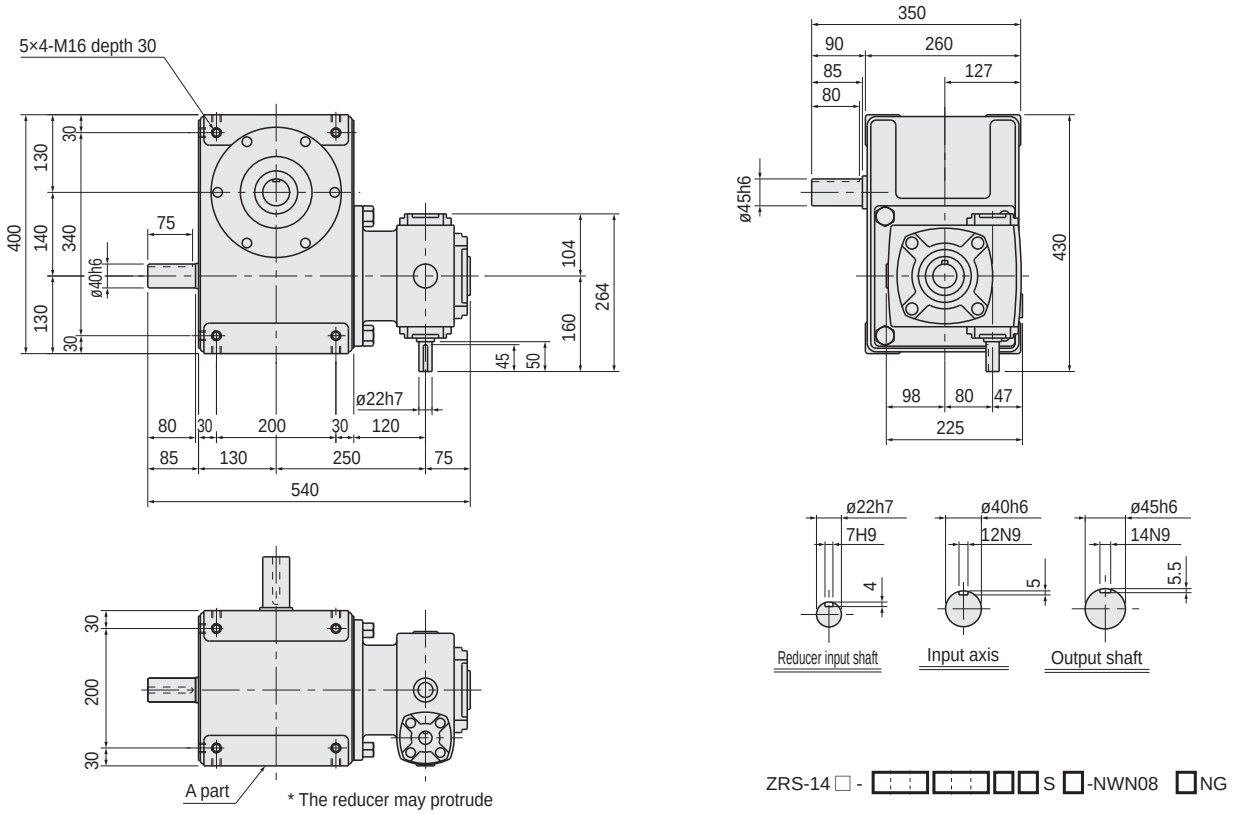


ZRS-14□- □□□□□S □-NWN08 □YG

* The positional relationship between the key groove and the 4-M4 screw is arbitrary.

The fastening key of the reduction gear and the input shaft shall be of old JIS1 type (JIS B1301-1959).

● With worm reducer (without HO80-C/B)



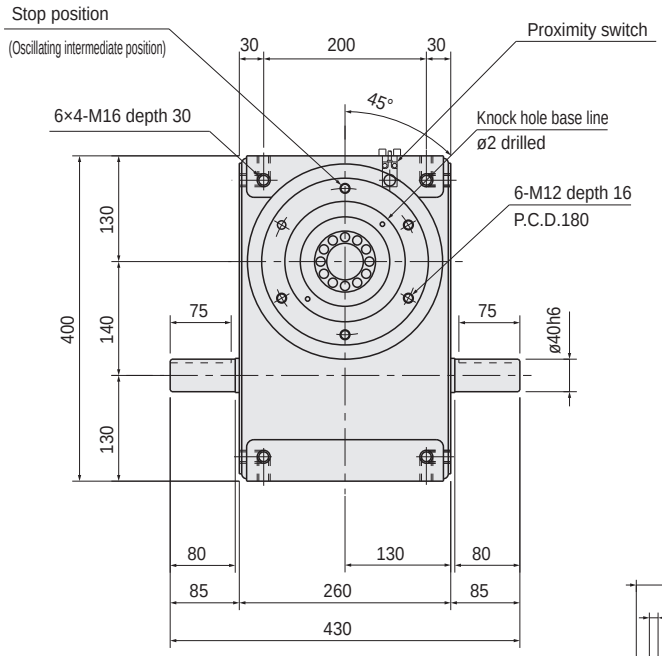
ZRS-14□- □□□□□S □-NWN08 □NG

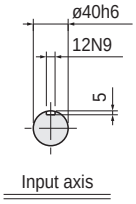
* The reducer may protrude from the housing end (A part).

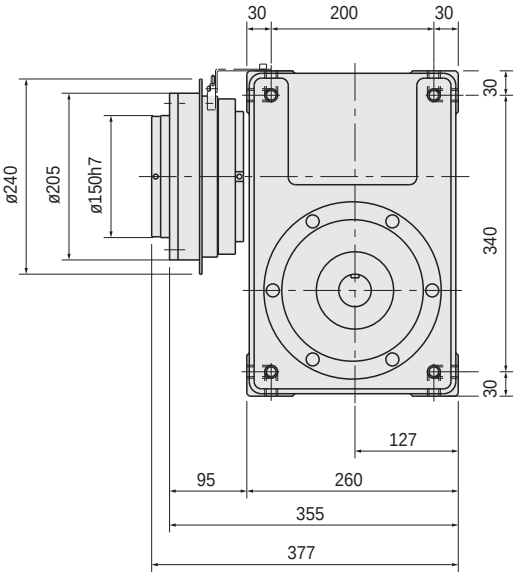
The fastening key of the reduction gear and the input shaft shall be of old JIS1 type (JIS B1301-1959).

Optional dimensions

● With torque saver (TSF14)



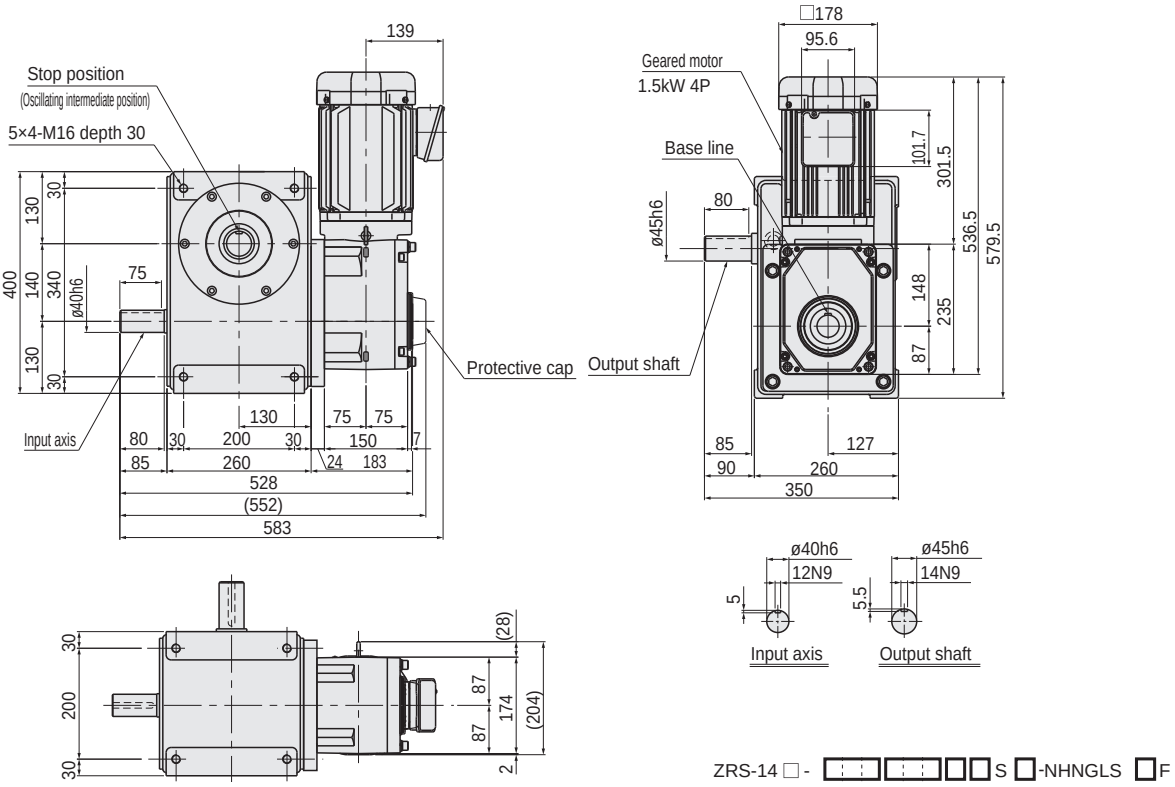




ZRS-14 □- □□ □□ S □-NNF-14 □

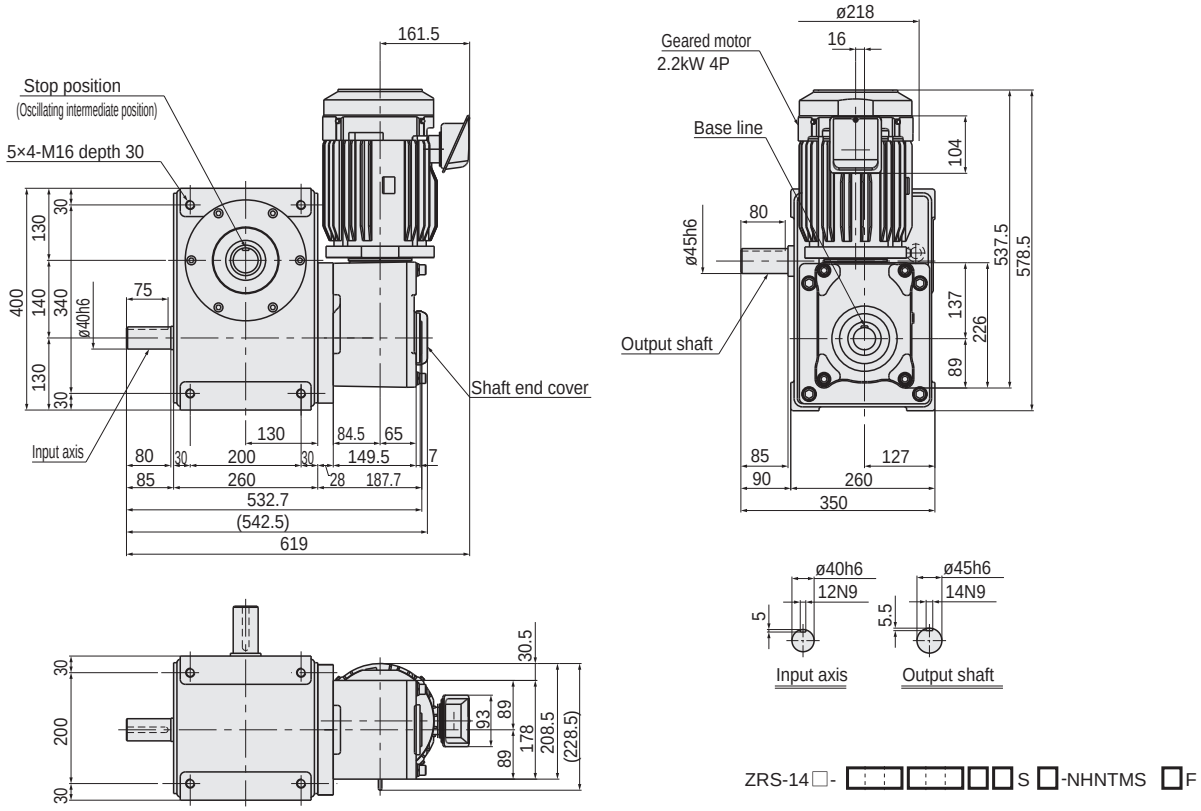
Optional dimensions

● With hollow shaft geared motor (1.5 kW)



ZRS-14□- □□□□S□-NHNGLS□F

● With hollow shaft geared motor (2.2 kW)



ZRS-14□- □□□□S□-NHNTMS□F

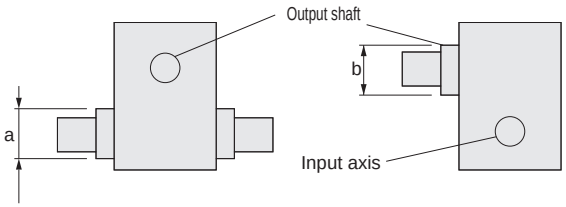
MEMO

Technical data

CONTENTS

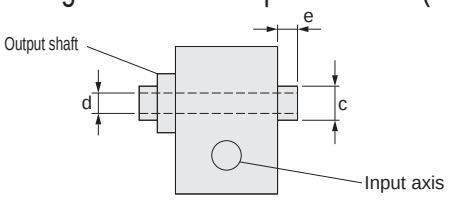
Common specifications

1. Stepped part diameter of input shaft and output shaft



Dimension size	a	b
04	ø15	ø20
05	ø17	ø25
06	ø25	ø30
08	ø28	ø32
11	ø32	ø42
14	ø42	ø55

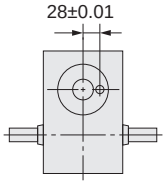
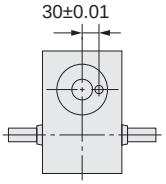
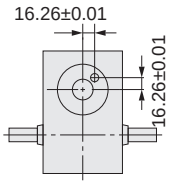
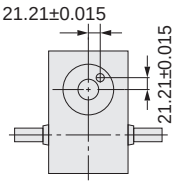
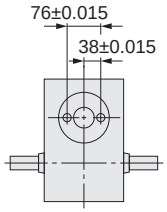
2. Flange shaft hollow specifications (made to order)



Dimension size	c	d	e
08	ø25	ø12	5
11	ø30	ø16	5
14	ø40	ø20	5

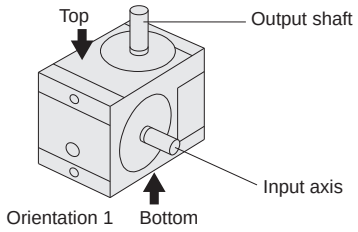
3. Output shaft (flange shaft) positioning pin hole dimensions (made to order)

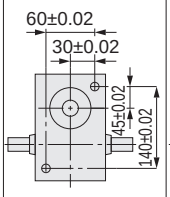
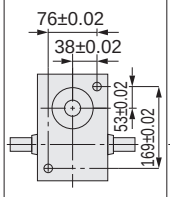
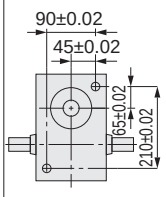
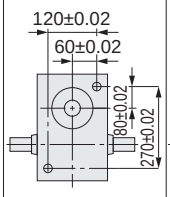
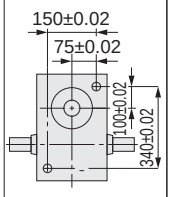
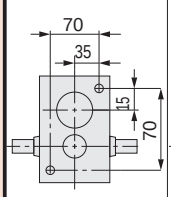
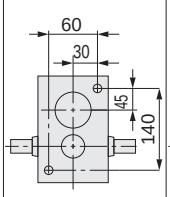
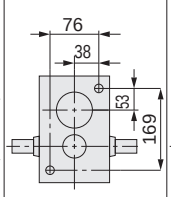
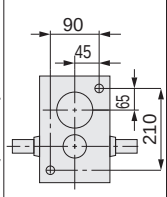
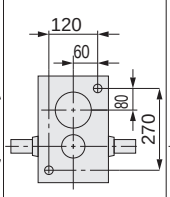
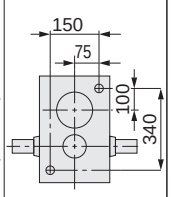
The dimensions below are used as reference when machining the positioning pin hole on the output shaft.

Size	05	06	08	11	14
Pitch					
Reference hole	ø8H7 through Effective length 12	ø8H7 through Effective length 12	ø8H7 depth 15 (P.C.D46)	ø10H7 depth 20 (P.C.D60)	2-ø13H7 Depth 25

4. Housing positioning pin hole dimension (made to order)

When machining positioning pin holes on the housing, the dimensions below are used as reference.



Size	04	05	06	08	11	14
Top						
Bottom						
Reference hole diameter	2-ø6H7 depth 8	2-ø8H7 depth 10	2-ø8H7 depth 10	2-ø8H7 depth 10	2-ø10H7 depth 10	2-ø13H7 depth 8

*Contact CKD for information on the lower surface positioning pin dimension tolerance.

Common specifications

5. Option (motor)

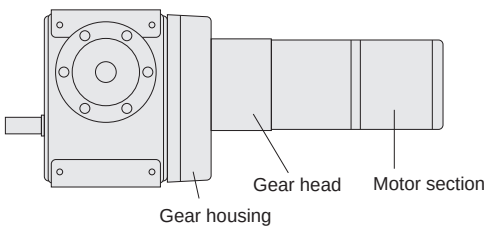
The life of the optionally mountable parts is determined by the manufacturer as below. The service life may be reached in a short time depending on the operating frequency.
Refer to the service life below to set the maintenance period.

Service life guidelines for optional parts manufacturers

Optional parts	Estimated service life	Manufacturer
Motor with brake, motor with C/B	Operation cycles 2 million times	Oriental Motor

6. Option/ Gear head + motor [Oriental Motor Co., Ltd.]
Gear head + motor mounting list

Size	ZRS	04	04 05	05 06	06
Motor specifications	Motor output	25W	40W	60W	90W
Induction	Single phase100V	○	○	○	○
	Single phase200V	○	○	○	○
	Three-phase200V	○	○	○	○
Reliable	Single phase100V	○	○	○	○
	Single phase200V	○	○	○	○
With electromagnetic brake	Single phase100V	○	○	○	○
	Single phase200V	○	○	○	○
	Three-phase200V	○	○	○	○
With C/B	Single phase100V	◎	◎	◎	◎
	Single phase200V	○	○	○	○
	Three-phase200V	○	○	○	○
Gear head reduction ratio		1/3, 1/3.6, 1/5, 1/6, 1/7.5, 1/9, 1/12.5 1/15, 1/18, 1/25, 1/30, 1/36, 1/50, 1/60 1/75, 1/90, 1/100, 1/120, 1/150, 1/180			
Reduction ratio of gear housing		1/1			



*Contact CKD for belt drive.

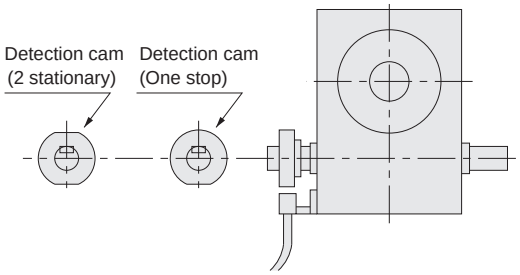
◎ ...Standard (Dimensions description)
○ ...Option
(note) An electronic brake circuit is required for intermittent operation with an induction motor.
Purchase the Oriental Motor brake pack separately.

(note) Calculate the motor size before using the body selection.

7. Option/input shaft 1 rotation Detection cam + proximity SW

Proximity SW model No.

Size	SW model No.	Manufacturer
04 to 11	E2S-Q23	OMRON
14	E2E-X2C112	



8. Option/torque saver (TSF4 to TSF14) Torque guard (TGX20 to TGX70) + release detection proximity switch

Proximity SW model No.

Torque saver Torque guard	SW model No.	Manufacturer
TSF4	TL-W3MC1	OMRON
TSF5 to TSF14	TL-W5MC1	
TGX20 to TGX70		

Output torque table

■ ZRS-X Straight axis 1 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 30	60	90	120	150	200
2	270	04	10.9	6.64	6.45	6.21	6.05	5.93	5.77
		05	19.9	12.3	12.0	11.5	11.2	11.0	10.7
		06	85.1	44.2	40.6	34.6	30.9	28.3	25.2
		08	164	100	97	89	80	73	65
		11	359	220	211	180	161	147	130
		14	950	444	407	347	309	282	248
	300	04	30.6	16.1	14.9	12.7	11.4	10.4	9.3
		05	50.1	28.1	26.1	22.3	19.9	18.2	16.3
		06	85.1	47.0	43.6	37.2	33.3	30.4	27.1
		08	242	140	130	111	99	91	81
		11	591	286	265	226	202	184	164
		14	1160	598	555	473	422	385	342
	330	04	30.6	17.0	15.9	13.5	12.1	11.1	9.9
		05	50.1	29.6	27.7	23.6	21.1	19.4	17.3
		06	119	56.6	52.9	45.2	40.3	36.9	33.0
		08	242	148	138	118	105	96	86
		11	591	301	281	240	214	196	175
		14	1160	631	590	503	449	411	365
3	180	04	10.9	6.64	6.33	6.10	5.94	5.81	5.65
		05	19.9	12.3	11.7	11.3	11.0	10.8	10.4
		06	85.1	44.2	39.8	34.0	30.3	27.7	24.6
		08	164	100	96	87	78	71	63
		11	359	220	207	177	157	144	127
		14	950	444	400	340	302	275	241
	210	04	10.9	7.27	7.03	6.77	6.60	6.46	6.29
		05	50.1	28.9	26.4	22.5	20.1	18.4	16.4
		06	85.1	48.3	44.2	37.7	33.7	30.8	27.4
		08	242	144	132	112	100	92	82
		11	591	293	268	229	204	187	166
		14	1160	615	562	479	427	390	344
	240	04	30.6	17.7	16.4	14.0	12.5	11.5	10.2
		05	50.1	30.9	28.6	24.4	21.8	20.0	17.8
		06	85.1	51.8	48.0	40.9	36.6	33.5	29.8
		08	242	154	143	122	109	100	89
		11	591	314	291	248	222	203	180
		14	1160	660	611	521	465	424	376
	270	04	41.6	26.1	24.4	20.8	18.6	17.1	15.3
		05	50.1	32.6	30.5	26.0	23.3	21.3	19.0
		06	85.1	54.7	51.1	43.7	39.0	35.7	31.9
		08	242	163	152	130	116	106	95
		11	591	332	310	265	236	216	193
		14	1160	697	652	556	496	454	403
	300	04	41.6	27.2	25.7	22.0	19.6	18.0	16.1
		05	67.0	45.2	42.7	36.4	32.6	29.8	26.7
		06	119	65.0	61.4	52.4	46.9	42.9	38.3
		08	262	207	204	174	156	143	127
		11	738	451	426	364	325	298	265
		14	1640	907	857	731	653	597	532
	330	04	41.6	28.2	26.7	22.9	20.5	18.8	16.8
		05	67.0	46.7	44.2	38.0	33.9	31.1	27.8
		06	129	106	106	97	87	80	71
		08	262	214	212	182	162	149	133
		11	738	467	442	379	339	310	277
		14	1640	939	889	763	682	624	556

Output torque table

ZRS-X Straight axis 1 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 30	60	90	120	150	200
4	150	04	10.2	6.66	5.99	5.11	4.57	4.18	3.72
		05	12.8	8.90	8.45	8.14	7.91	7.74	7.50
		06	63.6	35.4	31.8	27.1	24.2	22.1	19.5
		08	108	59.7	53.6	45.7	40.7	37.2	32.9
		11	331	193	173	147	131	119	105
		14	760	362	325	276	245	222	193
	180	04	10.9	7.79	7.53	7.25	7.07	6.92	6.73
		05	19.9	14.4	13.9	13.4	13.1	12.8	12.4
		06	63.6	38.9	35.6	30.4	27.1	24.8	22.0
		08	152	75.0	68.6	58.5	52.2	47.7	42.4
		11	359	258	246	210	187	171	152
		14	950	522	477	406	361	329	290
	210	04	17.9	13.9	13.6	13.1	12.8	12.3	11.0
		05	19.9	15.4	15.1	14.6	14.2	13.9	13.5
		06	63.6	41.7	38.7	33.0	29.4	27.0	24.0
		08	164	126	124	113	101	92	82
		11	359	277	268	228	204	186	166
		14	950	560	519	442	394	360	319
	240	04	17.9	14.6	14.5	14.0	13.6	13.1	11.7
		05	19.9	16.2	16.1	15.5	15.1	14.8	14.4
		06	63.6	43.9	41.1	35.1	31.4	28.7	25.6
		08	164	133	132	120	108	99	88
		11	359	291	285	243	217	199	177
		14	950	589	553	471	420	384	341
	270	04	17.9	15.1	15.1	14.6	14.2	13.8	12.3
		05	19.9	16.8	16.8	16.2	15.8	15.5	15.1
		06	63.6	45.5	43.1	36.8	32.9	30.2	26.9
		08	164	138	138	126	113	103	92
		11	591	367	348	297	265	243	217
		14	1160	775	733	626	559	512	456
	300	04	30.6	21.3	20.2	17.4	15.6	14.3	12.8
		05	50.1	37.1	35.1	30.3	27.1	24.8	22.2
		06	85.1	62.3	59.0	50.9	45.5	41.7	37.2
		08	164	142	142	131	117	108	96
		11	591	378	358	309	276	253	225
		14	1160	798	755	652	582	533	475
	330	04	30.6	21.8	20.7	18.0	16.1	14.7	13.2
		05	50.1	37.9	35.9	31.2	27.9	25.6	22.8
		06	85.1	63.8	60.4	52.5	47.0	43.0	38.4
		08	164	145	145	135	121	111	99
		11	591	386	366	318	284	261	233
		14	1160	817	773	673	601	550	490
5	120	04	7.19	4.92	4.38	3.74	3.33	3.05	2.71
		05	13.1	8.32	7.40	6.30	5.61	5.12	4.52
		06	16.4	11.2	10.5	10.1	9.8	9.5	9.1
		08	80.0	45.0	40.0	34.0	30.3	27.5	24.2
		11	200	94.1	83.6	71.0	62.8	56.8	49.1
		14	420	245	217	184	162	146	124
	150	04	7.19	5.45	4.95	4.23	3.77	3.45	3.08
		05	12.8	9.87	9.46	9.11	8.87	8.68	8.42
		06	25.3	18.5	17.8	17.1	16.6	16.2	15.7
		08	108	67.1	60.9	51.9	46.3	42.3	37.5
		11	225	165	158	145	129	117	104
		14	462	335	317	270	240	218	191

Output torque table

■ ZRS-X Straight axis 1 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 30	60	90	120	150	200
5	180	04	10.2	7.93	7.32	6.25	5.58	5.11	4.56
		05	12.8	10.5	10.3	9.9	9.6	9.4	9.2
		06	25.3	20.0	19.5	18.8	18.3	17.9	17.3
		08	108	72.4	66.8	57.0	50.9	46.6	41.4
		11	225	178	174	159	142	129	115
		14	462	362	349	297	265	241	213
	210	04	14.8	8.30	7.77	6.63	5.93	5.43	4.85
		05	12.8	11.0	10.9	10.5	10.2	10.0	9.7
		06	63.6	45.2	42.3	36.1	32.2	29.5	26.3
		08	152	87.1	81.5	69.6	62.1	56.9	50.7
		11	331	246	230	196	175	160	143
		14	462	382	374	318	284	259	230
	240	04	10.9	9.39	9.39	9.06	8.83	8.65	8.43
		05	37.9	26.6	25.1	21.5	19.2	17.6	15.7
		06	63.6	46.9	44.4	37.9	33.9	31.0	27.7
		08	152	90.4	85.6	73.1	65.3	59.8	53.3
		11	331	255	241	206	184	168	150
		14	760	483	457	391	348	319	283
	270	04	10.9	9.65	9.65	9.41	9.17	8.99	8.75
		05	37.9	27.3	25.8	22.3	19.9	18.3	16.3
		06	63.6	48.2	45.6	39.4	35.2	32.2	28.8
		08	152	92.9	88.0	76.0	67.9	62.2	55.5
		11	359	319	315	272	243	223	199
		14	760	497	471	406	362	332	295
	300	04	10.9	9.85	9.85	9.70	9.45	9.26	9.02
		05	37.9	27.8	26.3	23.0	20.5	18.8	16.8
		06	63.6	49.2	46.5	40.6	36.2	33.2	29.6
		08	152	94.9	89.8	78.3	69.9	64.1	57.2
		11	359	326	322	281	251	230	205
		14	760	508	481	419	374	342	305
	330	04	10.9	10.0	10.0	9.9	9.7	9.5	9.2
		05	37.9	28.3	26.7	23.5	21.0	19.3	17.2
		06	63.6	49.9	47.3	41.6	37.1	34.0	30.4
		08	152	96.4	91.2	80.2	71.7	65.7	58.6
		11	359	331	327	287	257	235	210
		14	760	516	488	429	383	351	313
6	90	04	10.9	6.53	6.13	5.91	5.75	5.62	5.45
		05	19.9	12.1	11.4	10.9	10.6	10.4	10.0
		06	85.1	43.4	38.6	32.9	29.3	26.7	23.5
		08	164	98.7	92.6	84.6	75.4	68.8	60.8
		11	591	264	234	199	177	161	141
		14	950	436	386	327	289	261	223
	120	04	41.6	24.7	22.2	18.9	16.9	15.5	13.8
		05	67.0	41.1	36.9	31.5	28.1	25.8	23.0
		06	119	59.1	53.0	45.2	40.4	36.9	32.8
		08	262	188	176	150	134	123	109
		11	738	410	368	314	280	255	226
		14	1640	822	737	628	559	509	449
	150	04	41.6	27.2	24.9	21.3	19.0	17.4	15.6
		05	67.0	45.2	41.4	35.3	31.5	28.9	25.8
		06	129	102	99	90	81	74	66
		08	262	207	198	169	151	138	123
		11	738	451	413	352	315	288	256
		14	1640	907	830	708	631	577	511

Output torque table

ZRS-X Straight axis 1 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 30	60	90	120	150	200
6	180	04	41.6	28.9	26.9	23.0	20.6	18.8	16.8
		05	67.0	47.9	44.6	38.1	34.0	31.2	27.9
		06	129	109	107	98	87	80	71
		08	431	268	249	213	190	174	155
		11	903	606	564	482	430	394	351
		14	2230	1190	1110	950	850	770	690
	210	04	41.6	30.1	28.5	24.3	21.7	19.9	17.8
		05	67.0	49.9	47.1	40.2	35.9	32.9	29.4
		06	129	113	113	103	92	84	75
		08	431	279	263	225	201	184	164
		11	903	631	596	508	454	416	371
		14	2230	1240	1170	1000	890	820	730
	240	04	41.6	31.0	29.4	25.3	22.6	20.7	18.5
		05	67.0	51.3	48.5	41.8	37.4	34.3	30.6
		06	129	116	116	107	96	88	79
		08	431	287	271	234	209	192	171
		11	903	649	614	529	473	433	387
		14	2230	1280	1210	1040	930	850	760
	270	04	41.6	31.7	30.0	26.1	23.3	21.4	19.1
		05	67.0	52.3	49.5	43.1	38.5	35.3	31.6
		06	129	119	119	111	99	91	81
		08	431	293	277	241	216	198	177
		11	1270	825	781	680	608	557	497
		14	2230	1310	1240	1080	960	880	790
	300	04	41.6	32.1	30.4	26.8	23.9	21.9	19.6
		05	67.0	53.1	50.2	44.2	39.5	36.2	32.3
		06	129	120	120	113	101	93	83
		08	431	297	281	247	221	203	181
		11	1270	838	793	697	623	571	510
		14	2230	1330	1260	1110	990	900	810
	330	04	41.6	32.5	30.8	27.3	24.4	22.4	20.0
		05	67.0	53.7	50.8	45.0	40.3	36.9	33.0
		06	129	122	122	116	103	95	85
		08	431	301	285	252	226	207	185
		11	1270	847	802	710	636	583	520
		14	2230	1340	1270	1130	1010	920	820
8	90	04	10.9	7.77	7.29	7.03	6.84	6.70	6.51
		05	50.1	30.8	27.4	23.4	20.8	19.1	17.0
		06	85.1	51.6	45.9	39.1	34.9	31.8	28.2
		08	164	117	110	101	90	82	73
		11	359	257	239	203	181	165	145
		14	950	520	461	392	347	315	273
	120	04	30.6	20.0	18.2	15.5	13.9	12.7	11.3
		05	50.1	34.7	31.6	27.0	24.1	22.0	19.7
		06	85.1	58.3	53.0	45.2	40.4	37.0	32.9
		08	242	174	158	135	120	110	98
		11	591	354	322	274	245	224	198
		14	1160	745	677	577	514	469	414
	150	04	30.6	21.3	19.8	16.9	15.1	13.8	12.4
		05	50.1	37.1	34.4	29.4	26.2	24.0	21.4
		06	85.1	62.3	57.8	49.4	44.1	40.4	36.0
		08	242	186	172	147	131	120	107
		11	591	378	351	299	267	244	217
		14	1160	798	740	631	563	514	457

Output torque table

■ ZRS-X Straight axis 1 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 30	60	90	120	150	200
8	180	04	30.6	22.2	21.0	17.9	16.0	14.7	13.1
		05	50.1	38.5	36.4	31.0	27.7	25.4	22.7
		06	85.1	64.9	61.2	52.2	46.7	42.8	38.2
		08	242	194	183	156	139	128	114
		11	738	513	484	413	369	338	301
		14	1640	1040	980	830	740	680	610
	210	04	30.6	22.8	21.6	18.6	16.6	15.3	13.6
		05	50.1	39.5	37.4	32.3	28.8	26.4	23.6
		06	85.1	66.6	63.0	54.4	48.6	44.5	39.7
		08	242	199	188	162	145	133	119
		11	738	527	498	430	384	352	314
		14	1640	1060	1010	870	780	710	630
	240	04	30.6	23.2	22.0	19.2	17.2	15.7	14.0
		05	50.1	40.2	38.1	33.2	29.7	27.2	24.3
		06	85.1	67.8	64.2	56.0	50.0	45.9	41.0
		08	242	202	191	167	149	137	122
		11	738	536	507	443	396	362	323
		14	1640	1080	1030	900	800	730	650
	270	04	30.6	23.5	22.3	19.6	17.6	16.1	14.4
		05	50.1	40.7	38.5	34.0	30.4	27.8	24.9
		06	85.1	68.6	65.0	57.3	51.2	46.9	41.9
		08	262	249	246	217	194	178	159
		11	738	542	513	453	405	371	331
		14	1640	1100	1040	920	820	750	670
	300	04	30.6	23.7	22.5	19.9	17.9	16.4	14.6
		05	50.1	41.1	38.9	34.4	30.9	28.4	25.3
		06	85.1	69.2	65.5	58.0	52.2	47.8	42.7
		08	262	252	249	220	198	181	162
		11	738	547	518	459	412	378	337
		14	1640	1110	1050	930	830	760	680
	330	04	30.6	23.9	22.6	20.0	18.2	16.6	14.9
		05	50.1	41.3	39.1	34.6	31.4	28.8	25.7
		06	85.1	69.7	66.0	58.4	53.0	48.6	43.4
		08	262	253	250	222	201	184	165
		11	738	551	522	462	419	384	343
		14	1640	1120	1060	940	850	780	690
9	90	04	10.9	8.23	7.74	7.46	7.26	7.11	6.91
		05	37.9	23.3	20.8	17.7	15.8	14.5	12.9
		06	63.6	41.1	36.6	31.2	27.8	25.4	22.5
		08	152	79.2	70.5	60.0	53.5	48.8	43.2
		11	331	224	199	169	151	137	121
		14	760	422	375	319	282	256	222
	120	04	10.9	9.12	8.81	8.49	8.27	8.10	7.88
		05	37.9	25.8	23.6	20.1	18.0	16.5	14.7
		06	63.6	45.5	41.6	35.5	31.7	29.0	25.8
		08	152	87.8	80.3	68.5	61.1	55.9	49.7
		11	359	302	288	246	219	200	178
		14	760	469	429	365	325	296	261
	150	04	10.9	9.65	9.51	9.17	8.93	8.75	8.52
		05	37.9	27.3	25.4	21.7	19.4	17.8	15.9
		06	85.1	64.1	59.7	51.0	45.5	41.7	37.2
		08	164	146	144	131	117	108	96
		11	359	319	311	265	237	217	193
		14	950	649	605	516	460	420	373

Output torque table

ZRS-X Straight axis 1 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 30	60	90	120	150	200
9	180	04	10.9	9.98	9.98	9.64	9.39	9.20	8.96
		05	51.5	39.3	37.2	31.8	28.4	26.1	23.3
		06	85.1	66.2	62.7	53.6	47.9	43.9	39.2
		08	164	151	151	138	124	113	101
		11	359	330	326	279	249	228	203
		14	950	671	635	543	485	443	395
	210	04	30.6	23.2	21.9	19.0	17.0	15.6	13.9
		05	51.5	40.1	38.0	32.9	29.4	27.0	24.1
		06	85.1	67.6	64.0	55.5	49.6	45.5	40.6
		08	164	154	154	143	128	117	105
		11	359	337	333	289	258	236	211
		14	1160	868	822	712	636	582	519
	240	04	30.6	23.5	22.3	19.5	17.5	16.0	14.3
		05	51.5	40.7	38.5	33.8	30.2	27.7	24.7
		06	85.1	68.6	65.0	57.0	50.9	46.7	41.7
		08	164	156	156	147	131	120	108
		11	359	341	338	296	265	242	216
		14	1160	881	834	731	653	598	534
	270	04	30.6	23.7	22.5	19.9	17.8	16.3	14.6
		05	51.5	41.1	38.9	34.4	30.8	28.3	25.3
		06	85.1	69.3	65.6	58.1	52.0	47.7	42.6
		08	164	158	158	150	134	123	110
		11	359	345	341	302	270	248	221
		14	1160	890	843	746	667	611	546
	300	04	30.6	23.9	22.7	20.1	18.1	16.6	14.8
		05	51.5	41.4	39.2	34.7	31.4	28.7	25.7
		06	85.1	69.8	66.1	58.5	52.9	48.5	43.3
		08	164	159	159	151	136	125	112
		11	591	423	400	354	320	293	262
		14	1160	897	849	752	679	622	555
	330	04	30.6	24.1	22.8	20.2	18.4	16.9	15.1
		05	51.5	41.6	39.4	34.9	31.8	29.1	26.0
		06	85.1	70.2	66.4	58.8	53.6	49.2	43.9
		08	164	160	160	152	138	127	113
		11	591	425	402	356	325	298	266
		14	1160	902	854	756	689	631	564

Output torque table

■ ZRS-X Straight axis 1 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 30	60	90	120	150	200
10	90	04	10.2	7.93	7.09	6.05	5.40	4.95	4.41
		05	12.8	10.5	10.0	9.6	9.3	9.1	8.8
		06	25.3	20.0	18.9	18.2	17.6	17.2	16.6
		08	108	72.4	64.8	55.2	49.2	44.9	39.7
		11	225	178	168	154	137	124	110
		14	462	362	338	287	254	230	200
	120	04	10.9	9.39	9.11	8.78	8.55	8.38	8.16
		05	37.9	26.6	24.4	20.8	18.6	17.0	15.2
		06	63.6	46.9	43.0	36.7	32.8	30.0	26.7
		08	152	90.4	83.0	70.8	63.2	57.8	51.4
		11	331	255	234	200	178	163	144
		14	760	483	444	378	336	307	271
	150	04	10.9	9.85	9.75	9.40	9.16	8.97	8.74
		05	37.9	27.8	26.1	22.3	19.9	18.2	16.3
		06	63.6	49.1	46.1	39.3	35.1	32.1	28.7
		08	152	94.8	88.9	75.8	67.7	62.0	55.3
		11	359	326	319	272	243	222	198
		14	760	508	476	405	362	330	293
	180	04	10.9	10.1	10.1	9.8	9.6	9.4	9.1
		05	37.9	28.6	27.1	23.3	20.8	19.0	17.0
		06	85.1	67.2	63.6	54.7	48.8	44.8	40.0
		08	152	97.6	92.3	79.3	70.9	64.9	57.9
		11	359	335	331	284	254	232	207
		14	950	682	645	554	495	453	403
	210	04	10.9	10.3	10.3	10.1	9.9	9.7	9.4
		05	37.9	29.1	27.5	24.0	21.4	19.6	17.5
		06	85.1	68.4	64.8	56.4	50.4	46.2	41.3
		08	164	156	156	146	130	119	106
		11	359	341	337	293	262	240	214
		14	950	694	657	572	511	468	417
	240	04	10.9	10.4	10.4	10.4	10.1	9.9	9.7
		05	37.9	29.4	27.9	24.6	21.9	20.1	18.0
		06	85.1	69.2	65.5	57.8	51.6	47.3	42.3
		08	164	158	158	149	133	122	109
		11	359	345	341	300	268	246	220
		14	950	703	665	586	524	480	428
	270	04	10.9	10.5	10.5	10.5	10.3	10.1	9.9
		05	37.9	29.7	28.1	24.9	22.4	20.5	18.3
		06	85.1	69.8	66.1	58.5	52.6	48.2	43.1
		08	164	159	159	151	136	124	111
		11	359	347	344	304	273	251	224
		14	950	709	671	594	534	489	437
	300	04	10.9	10.6	10.6	10.6	10.5	10.3	10.0
		05	37.9	29.8	28.2	25.0	22.7	20.8	18.6
		06	85.1	70.2	66.5	58.9	53.5	49.0	43.8
		08	164	160	160	152	138	126	113
		11	359	349	346	306	278	255	227
		14	950	713	675	598	543	497	444
	330	04	10.9	10.6	10.6	10.6	10.6	10.4	10.1
		05	37.9	30.0	28.4	25.1	23.0	21.1	18.8
		06	85.1	70.5	66.8	59.1	54.2	49.6	44.4
		08	164	161	161	153	140	128	114
		11	359	351	347	307	281	258	230
		14	950	717	679	601	550	504	450

Output torque table

ZRS-X Straight axis 1 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 30	60	90	120	150	200
12	90	04	7.19	6.13	5.53	4.72	4.21	3.86	3.44
		05	12.8	11.1	10.6	10.2	9.9	9.7	9.4
		06	25.3	21.2	20.2	19.5	18.9	18.5	17.9
		08	108	77.0	69.4	59.2	52.8	48.2	42.7
		11	225	189	180	165	147	134	118
		14	462	385	363	308	274	249	217
	120	04	7.19	6.49	6.01	5.13	4.58	4.20	3.75
		05	12.8	11.7	11.5	11.1	10.8	10.6	10.3
		06	25.3	22.8	22.3	21.4	20.9	20.4	19.8
		08	108	82.5	76.4	65.2	58.2	53.2	47.4
		11	225	203	198	181	162	148	131
		14	462	414	400	341	304	277	245
	150	04	10.2	9.14	8.64	7.37	6.59	6.04	5.39
		05	12.8	12.1	12.1	11.6	11.3	11.1	10.8
		06	25.3	23.6	23.5	22.7	22.1	21.6	21.0
		08	108	85.5	80.8	68.9	61.6	56.4	50.3
		11	225	210	209	192	171	157	139
		14	462	429	424	361	322	294	261
	180	04	10.2	9.30	8.81	7.63	6.82	6.25	5.58
		05	12.8	12.3	12.3	12.0	11.7	11.5	11.2
		06	25.3	24.1	24.1	23.5	22.9	22.4	21.8
		08	108	87.3	82.6	71.5	63.9	58.6	52.3
		11	331	280	265	230	205	188	168
		14	760	534	505	437	390	357	318
	210	04	10.2	9.40	8.90	7.82	6.99	6.40	5.72
		05	12.8	12.4	12.4	12.3	12.0	11.8	11.4
		06	25.3	24.4	24.4	24.2	23.5	23.1	22.5
		08	108	88.4	83.7	73.5	65.7	60.2	53.7
		11	331	284	269	236	211	193	172
		14	760	541	512	449	401	367	327
	240	04	10.2	9.47	8.96	7.94	7.12	6.53	5.83
		05	12.8	12.5	12.5	12.5	12.2	12.0	11.7
		06	25.3	24.6	24.6	24.6	24.0	23.5	22.9
		08	108	89.2	84.4	74.7	67.0	61.4	54.9
		11	331	286	271	240	215	197	176
		14	760	545	516	457	410	375	335
	270	04	10.9	10.6	10.6	10.6	10.5	10.3	10
		05	19.9	19.5	19.5	19.5	19.3	18.9	18.4
		06	25.3	24.7	24.7	24.7	24.4	23.9	23.3
		08	108	89.7	84.9	75.2	68.2	62.5	55.8
		11	331	288	273	241	219	201	179
		14	760	549	519	460	417	382	341
	300	04	10.9	10.7	10.7	10.7	10.7	10.4	10.2
		05	19.9	19.6	19.6	19.6	19.5	19.1	18.7
		06	63.6	53.2	50.4	44.6	40.8	37.4	33.4
		08	152	103	97	86	79	72	65
		11	331	289	274	242	222	203	182
		14	760	551	522	462	423	387	346
	330	04	10.9	10.7	10.7	10.7	10.7	10.6	10.3
		05	19.9	19.6	19.6	19.6	19.6	19.4	18.9
		06	63.6	53.4	50.5	44.7	41.0	37.9	33.8
		08	152	103	98	86	79	73	65
		11	331	290	275	243	223	206	184
		14	760	553	524	463	425	392	350

Output torque table

■ ZRS-X Straight axis 1 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 30	60	90	120	150	200
15	90	08	31.8	28.4	27.3	26.2	25.5	24.9	24.0
		11	143	109	99	85	75	68	60
		14	285	254	244	222	198	179	157
	120	08	80.0	63.7	59.6	50.8	45.4	41.5	37.0
		11	200	130	122	104	92	84	75
		14	285	266	263	240	214	195	172
	150	08	80.0	65.2	61.7	53.1	47.4	43.4	38.7
		11	200	133	126	108	96	88	78
		14	420	357	338	290	259	237	210
	180	08	80.0	66.1	62.5	54.7	48.9	44.8	39.9
		11	200	134	127	111	99	91	81
		14	420	362	342	299	267	245	218
	210	08	80.0	66.6	63.1	55.8	50.0	45.8	40.9
		11	200	135	128	113	101	93	83
		14	420	365	345	306	273	250	223
	240	08	80.0	67.0	63.4	56.1	50.9	46.6	41.6
		11	200	136	129	114	103	95	84
		14	420	367	347	307	278	255	227
	270	08	80.0	67.2	63.6	56.3	51.6	47.3	42.2
		11	200	136	129	114	105	96	86
		14	420	368	349	308	282	259	231
	300	08	80.0	67.4	63.8	56.5	51.8	47.9	42.8
		11	200	137	129	115	105	97	87
		14	420	369	349	309	284	262	234
	330	08	80.0	67.5	63.9	56.6	51.9	48.4	43.2
		11	200	137	130	115	105	98	88
		14	420	370	350	310	284	265	236
16	90	08	31.8	28.7	27.7	26.7	25.9	25.3	24.4
		11	143	110	101	86	76	70	61
		14	305	267	257	234	208	189	164
	120	08	31.8	30.0	29.7	28.6	27.8	27.2	26.4
		11	143	115	107	92	82	75	66
		14	285	268	266	243	216	197	174
	150	08	31.8	30.6	30.6	29.8	29.0	28.4	27.6
		11	143	117	110	95	85	78	69
		14	285	274	274	253	226	207	183
	180	08	80.0	66.3	62.8	55.1	49.2	45.1	40.2
		11	143	118	112	98	87	80	71
		14	285	277	277	261	233	213	189
	210	08	80.0	66.8	63.2	56.0	50.3	46.0	41.1
		11	200	136	128	114	102	93	83
		14	285	279	279	265	238	218	194
	240	08	80.0	67.1	63.5	56.2	51.1	46.8	41.8
		11	200	136	129	114	104	95	85
		14	285	281	281	266	242	222	198
	270	08	80.0	67.3	63.7	56.4	51.7	47.5	42.4
		11	200	137	129	114	105	96	86
		14	285	282	282	267	245	225	201
	300	08	80.0	67.5	63.9	56.6	51.9	48.1	42.9
		11	200	137	130	115	105	97	87
		14	285	282	282	268	246	228	203
	330	08	80.0	67.6	64.0	56.7	52.0	48.6	43.4
		11	200	137	130	115	105	98	88
		14	285	283	283	268	246	230	205

MEMO

Output torque table

■ ZRS-X Straight axis 2 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 15	30	45	60	75	100	150	200
16	120	04	16.1	13.0	12.9	12.4	12.1	11.9	11.6	10.0	8.8
		05	19.9	16.2	16.1	15.5	15.1	14.8	14.4	13.8	12.8
		06	63.6	43.9	41.1	35.1	31.4	28.7	25.6	21.7	19.1
		08	164	133	132	120	108	98.5	87.9	74.6	66.0
		11	359	291	285	243	217	199	177	149	131
		14	950	589	553	471	420	384	341	285	246
	150	04	30.6	21.3	20.2	17.4	15.6	14.3	12.8	10.9	9.7
		05	50.1	37.1	35.1	30.3	27.1	24.8	22.2	18.9	16.8
		06	85.1	62.3	59.0	50.9	45.5	41.7	37.2	31.7	28.1
		08	164	142	142	131	117	108	96	82	73
		11	591	378	358	309	276	253	225	191	169
		14	1160	798	755	652	582	533	475	401	352
	180	04	30.6	22.2	21.0	18.5	16.5	15.1	13.5	11.5	10.3
		05	50.1	38.5	36.5	32.0	28.6	26.2	23.4	20.0	17.8
		06	119	74.0	70.1	61.5	55.0	50.4	45.0	38.3	34.1
		08	242	194	183	161	144	132	118	100	89
		11	591	393	372	327	292	267	239	203	180
		14	1160	832	787	691	617	565	504	427	378
	210	04	30.6	22.8	21.6	19.1	17.2	15.7	14.1	12.0	10.7
		05	50.1	39.5	37.4	33.1	29.8	27.3	24.4	20.8	18.6
		06	119	76.0	71.9	63.7	57.2	52.4	46.8	39.9	35.6
		08	242	199	188	166	150	137	122	104	93
		11	591	403	382	338	304	278	249	212	188
		14	1640	1060	1010	890	800	730	650	560	490
	240	04	30.6	23.2	22.0	19.5	17.7	16.2	14.5	12.4	11.1
		05	50.1	40.2	38.1	33.7	30.6	28.1	25.1	21.4	19.1
		06	119	77.3	73.2	64.8	58.9	54.0	48.2	41.1	36.7
		08	242	202	191	169	154	141	126	108	96
		11	591	411	389	344	313	287	256	218	194
		14	1640	1080	1030	910	830	760	680	570	510
	270	04	30.6	23.5	22.3	19.7	18.1	16.6	14.8	12.7	11.3
		05	50.1	40.7	38.5	34.1	31.3	28.7	25.7	21.9	19.6
		06	119	78.3	74.1	65.6	60.2	55.3	49.4	42.1	37.6
		08	242	205	194	172	157	144	129	110	98
		11	591	416	394	348	320	293	262	223	199
		14	1640	1100	1040	920	840	770	690	590	520
	300	04	30.6	23.7	22.5	19.9	18.2	16.9	15.1	12.9	11.5
		05	50.1	41.1	38.9	34.4	31.6	29.3	26.2	22.3	19.9
		06	119	79.0	74.8	66.2	60.7	56.3	50.3	42.9	38.3
		08	262	252	249	220	202	187	167	143	127
		11	738	547	518	459	421	390	348	297	265
		14	1640	1110	1050	930	850	790	710	600	540
	330	04	30.6	23.9	22.6	20.0	18.4	17.2	15.4	13.1	11.7
		05	50.1	41.3	39.1	34.6	31.8	29.7	26.6	22.7	20.2
		06	119	79.5	75.3	66.7	61.1	57.2	51.1	43.6	38.9
		08	262	253	250	222	203	190	170	145	130
		11	738	551	522	462	424	396	354	302	269
		14	1640	1120	1060	940	860	800	720	610	540
18	120	04	10.9	9.12	9.09	8.76	8.54	8.36	8.15	6.97	6.21
		05	37.9	25.8	24.4	20.8	18.6	17.0	15.2	12.9	11.5
		06	85.1	60.6	57.1	48.8	43.6	39.9	35.6	30.2	26.8
		08	152	87.8	82.8	70.7	63.1	57.8	51.5	43.6	38.5
		11	359	302	297	254	226	207	185	156	137
		14	950	612	577	492	439	402	357	299	259

Output torque table

ZRS-X Straight axis 2 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 15	30	45	60	75	100	150	200
18	150	04	10.9	9.65	9.65	9.46	9.22	9.03	8.80	7.54	6.72
		05	37.9	27.3	25.8	22.4	20.0	18.4	16.4	14.0	12.4
		06	85.1	64.1	60.6	52.6	47.0	43.1	38.5	32.7	29.1
		08	164	146	146	136	121	111	99	84	75
		11	359	319	315	274	244	224	200	170	150
		14	950	649	614	533	476	435	388	327	287
	180	04	30.6	22.7	21.5	18.9	16.9	15.5	13.9	11.8	10.6
		05	51.5	39.3	37.2	32.8	29.3	26.9	24.0	20.5	18.3
		06	85.1	66.2	62.7	55.3	49.4	45.3	40.5	34.5	30.7
		08	164	151	151	143	127	117	104	89	79
		11	359	330	326	288	257	235	210	179	159
		14	1160	849	804	709	633	580	518	439	388
	210	04	30.6	23.2	21.9	19.4	17.5	16.1	14.4	12.3	11.0
		05	51.5	40.1	38.0	33.6	30.4	27.8	24.9	21.2	18.9
		06	85.1	67.6	64.0	56.7	51.2	46.9	41.9	35.7	31.9
		08	164	154	154	146	132	121	108	92	82
		11	591	410	388	343	310	284	254	216	192
		14	1160	868	822	727	657	602	537	456	405
	240	04	30.6	23.5	22.3	19.7	18.0	16.5	14.8	12.6	11.3
		05	51.5	40.7	38.5	34.1	31.2	28.6	25.5	21.8	19.5
		06	85.1	68.6	65.0	57.5	52.6	48.2	43.0	36.7	32.7
		08	164	156	156	148	136	124	111	95	85
		11	591	416	393	348	318	292	261	222	198
		14	1160	881	834	738	675	618	552	470	417
	270	04	30.6	23.7	22.5	19.9	18.3	16.9	15.1	12.9	11.5
		05	51.5	41.1	38.9	34.4	31.6	29.2	26.1	22.2	19.9
		06	85.1	69.3	65.6	58.1	53.3	49.2	43.9	37.5	33.5
		08	164	158	158	150	137	127	113	97	86
		11	591	420	397	352	323	298	266	227	202
		14	1160	890	843	746	684	631	564	480	427
	300	04	30.6	23.9	22.7	20.1	18.4	17.1	15.3	13.1	11.7
		05	51.5	41.4	39.2	34.7	31.8	29.7	26.5	22.6	20.2
		06	85.1	69.8	66.1	58.5	53.7	50.0	44.7	38.1	34.0
		08	164	159	159	151	139	129	115	98	88
		11	591	423	400	354	325	303	271	231	206
		14	1160	897	849	752	689	642	574	489	435
	330	04	30.6	24.1	22.8	20.2	18.5	17.3	15.5	13.3	11.9
		05	51.5	41.6	39.4	34.9	32.0	29.9	26.9	22.9	20.5
		06	85.1	70.2	66.5	58.8	54.0	50.5	45.3	38.7	34.5
		08	164	160	160	152	139	130	117	100	89
		11	591	425	402	356	327	306	274	234	209
		14	1160	902	854	756	693	648	582	496	442
20	90	04	10.2	7.93	7.32	6.25	5.58	5.11	4.56	3.87	3.43
		05	19.9	15.8	15.5	14.9	14.5	14.2	13.8	11.9	10.5
		06	25.3	20.0	19.5	18.8	18.3	17.9	17.3	16.5	15.1
		08	108	72.4	66.8	57.0	50.9	46.6	41.4	34.8	30.3
		11	225	178	174	159	142	129	115	96	82
		14	462	362	349	297	265	241	213	174	144
	120	04	10.9	9.39	9.39	9.06	8.83	8.65	8.43	7.21	6.43
		05	37.9	26.6	25.1	21.5	19.2	17.6	15.7	13.4	11.9
		06	63.6	46.9	44.4	37.9	33.9	31.0	27.7	23.5	20.8
		08	152	90.4	85.6	73.1	65.3	59.8	53.3	45.2	39.9
		11	331	255	241	206	184	168	150	127	111
		14	760	483	457	391	348	319	283	237	205

Output torque table

■ ZRS-X Straight axis 2 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 15	30	45	60	75	100	150	200
20	150	04	10.9	9.85	9.85	9.70	9.45	9.26	9.02	7.73	6.90
		05	37.9	27.8	26.3	23.0	20.5	18.8	16.8	14.3	12.8
		06	63.6	49.2	46.5	40.6	36.2	33.2	29.6	25.2	22.4
		08	152	94.9	89.8	78.3	69.9	64.1	57.2	48.6	43.1
		11	359	326	322	281	251	230	205	174	154
		14	760	508	481	419	374	342	305	257	225
	180	04	10.9	10.1	10.1	10.1	9.9	9.7	9.4	8.1	7.2
		05	37.9	28.6	27.1	24.0	21.4	19.7	17.6	15.0	13.4
		06	63.6	50.5	47.8	42.4	37.9	34.7	31.0	26.4	23.5
		08	152	97.6	92.4	81.8	73.1	67.0	59.9	50.9	45.3
		11	359	335	331	293	262	240	214	182	162
		14	950	682	646	571	511	468	417	354	313
	210	04	10.9	10.3	10.3	10.3	10.2	10.0	9.7	8.4	7.5
		05	37.9	29.1	27.5	24.4	22.1	20.3	18.1	15.5	13.8
		06	63.6	51.4	48.7	43.1	39.1	35.8	32.0	27.3	24.3
		08	164	156	156	148	134	123	110	94	84
		11	359	341	337	298	270	248	221	188	168
		14	950	695	657	582	528	484	432	367	325
	240	04	10.9	10.4	10.4	10.4	10.4	10.2	10.0	8.6	7.6
		05	37.9	29.4	27.9	24.7	22.6	20.8	18.5	15.8	14.1
		06	63.6	52.0	49.3	43.6	40.0	36.7	32.8	28.0	24.9
		08	164	158	158	150	137	126	113	96	86
		11	359	345	341	302	277	254	227	193	172
		14	950	703	666	589	540	496	443	376	335
	270	04	10.9	10.5	10.5	10.5	10.5	10.4	10.2	8.7	7.8
		05	37.9	29.7	28.1	24.9	22.8	21.1	18.9	16.1	14.4
		06	63.6	52.5	49.7	44.0	40.3	37.4	33.4	28.5	25.4
		08	164	159	159	151	139	128	115	98	87
		11	359	347	344	304	279	259	231	197	176
		14	950	709	671	594	545	505	451	384	342
	300	04	10.9	10.6	10.6	10.6	10.6	10.6	10.3	8.9	7.9
		05	37.9	29.8	28.2	25.0	22.9	21.5	19.2	16.4	14.6
		06	85.1	70.2	66.5	58.9	54.0	50.5	45.2	38.5	34.4
		08	164	160	160	152	139	130	117	99	89
		11	359	349	346	306	281	262	235	200	179
		14	950	713	675	598	548	513	459	391	348
	330	04	10.9	10.6	10.6	10.6	10.6	10.6	10.5	9.0	8.0
		05	37.9	30.0	28.4	25.1	23.0	21.5	19.4	16.6	14.8
		06	85.1	70.5	66.8	59.1	54.2	50.7	45.8	39.1	34.9
		08	164	161	161	153	140	131	118	101	90
		11	359	351	347	307	282	264	238	203	181
		14	950	717	679	601	551	515	465	396	353
24	90	04	7.19	6.13	5.71	4.87	4.35	3.99	3.56	3.02	2.68
		05	12.8	11.1	10.9	10.5	10.2	10.0	9.7	8.3	7.3
		06	25.3	21.3	20.9	20.1	19.6	19.2	18.6	17.7	16.3
		08	80.0	57.6	53.6	45.7	40.8	37.3	33.2	27.9	24.2
		11	200	119	110	94	84	77	68	56	48
		14	462	386	375	319	284	260	230	189	159
	120	04	7.19	6.49	6.15	5.30	4.73	4.34	3.87	3.30	2.93
		05	12.8	11.8	11.7	11.4	11.1	10.9	10.6	9.1	8.1
		06	25.3	22.8	22.8	22.1	21.6	21.1	20.5	19.7	18.2
		08	108	82.5	78.1	67.3	60.1	55.0	49.1	41.6	36.8
		11	225	203	203	187	167	153	136	115	101
		14	462	414	409	352	314	287	256	214	186

Output torque table

ZRS-X Straight axis 2 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 15	30	45	60	75	100	150	200
24	150	04	10.2	9.14	8.66	7.61	6.80	6.23	5.57	4.75	4.23
		05	12.8	12.1	12.1	12.0	11.7	11.5	11.2	9.5	8.5
		06	63.6	50.5	47.8	42.1	37.6	34.4	30.8	26.2	23.3
		08	108	85.5	81.0	71.2	63.6	58.2	52.0	44.2	39.3
		11	225	210	210	198	177	162	144	123	108
		14	462	429	424	373	333	305	272	229	201
	180	04	10.2	9.30	8.81	7.80	7.03	6.45	5.76	4.91	4.39
		05	12.8	12.3	12.3	12.3	12.1	11.8	11.5	9.9	8.8
		06	63.6	51.6	48.8	43.2	39.0	35.7	31.9	27.2	24.2
		08	108	87.3	82.6	73.2	66.0	60.5	54.0	46.0	40.9
		11	225	214	214	203	183	168	150	128	113
		14	462	438	434	384	346	317	283	240	212
	210	04	10.2	9.40	8.90	7.88	7.21	6.61	5.90	5.04	4.50
		05	12.8	12.4	12.4	12.4	12.4	12.1	11.8	10.1	9.0
		06	63.6	52.2	49.5	43.8	40.0	36.7	32.8	28.0	24.9
		08	152	101	95	85	77	71	63	54	48
		11	225	217	217	206	188	173	154	131	117
		14	760	541	512	453	414	380	339	288	255
	240	04	10.2	9.47	8.96	7.94	7.28	6.73	6.02	5.14	4.59
		05	12.8	12.5	12.5	12.5	12.5	12.4	12.0	10.3	9.2
		06	63.6	52.7	49.9	44.2	40.5	37.5	33.5	28.5	25.5
		08	152	102	96	85	78	72	65	55	49
		11	225	219	219	208	190	176	157	134	119
		14	760	545	516	457	419	388	346	294	262
	270	04	10.2	9.51	9.01	7.97	7.31	6.84	6.11	5.22	4.66
		05	37.9	29.9	28.3	25.1	23.0	21.5	19.2	16.4	14.7
		06	63.6	53.0	50.2	44.4	40.7	38.1	34.0	29.0	25.9
		08	152	102	97	86	79	74	66	56	50
		11	225	220	220	209	192	179	160	136	122
		14	760	549	520	460	422	394	352	300	267
	300	04	10.2	9.55	9.04	8.00	7.34	6.86	6.19	5.29	4.72
		05	37.9	30.1	28.5	25.2	23.1	21.6	19.5	16.6	14.9
		06	63.6	53.2	50.4	44.6	40.9	38.3	34.5	29.4	26.3
		08	152	103	97	86	79	74	67	57	51
		11	331	289	274	242	222	208	188	160	143
		14	760	551	522	462	424	396	357	304	271
	330	04	10.2	9.57	9.06	8.02	7.36	6.88	6.26	5.35	4.78
		05	37.9	30.2	28.5	25.3	23.2	21.7	19.7	16.8	15.0
		06	63.6	53.4	50.5	44.7	41.0	38.4	34.9	29.8	26.6
		08	152	103	98	86	79	74	67	58	51
		11	331	290	275	243	223	209	190	162	144
		14	760	553	524	464	425	398	362	308	275
30	90	08	31.8	28.4	28.2	27.1	26.4	25.8	25.0	23.8	21.8
		11	143	109	103	87	78	71	63	53	45
		14	285	254	252	230	205	187	166	136	114
	120	08	80.0	63.7	60.3	52.5	46.9	42.9	38.3	32.5	28.7
		11	200	130	123	107	96	87	78	66	58
		14	285	266	266	248	221	203	180	151	131
	150	08	80.0	65.2	61.7	54.7	49.0	44.9	40.1	34.1	30.2
		11	200	133	126	111	100	91	81	69	61
		14	420	357	338	299	268	245	219	185	162
	180	08	80.0	66.1	62.6	55.4	50.5	46.2	41.3	35.2	31.3
		11	200	134	127	113	103	94	84	71	63
		14	420	362	343	303	276	253	226	191	169

Output torque table

ZRS-X Straight axis 2 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 15	30	45	60	75	100	150	200
30	210	08	80.0	66.6	63.1	55.8	51.2	47.3	42.2	36.0	32.1
		11	200	135	128	113	104	96	86	73	65
		14	420	365	345	306	280	259	231	196	174
	240	08	80.0	67.0	63.4	56.1	51.5	48.1	43.0	36.6	32.7
		11	200	136	129	114	104	98	87	74	66
		14	420	367	347	307	282	263	235	200	178
	270	08	80.0	67.2	63.6	56.3	51.7	48.3	43.6	37.2	33.2
		11	200	136	129	114	105	98	88	75	67
		14	420	368	349	309	283	265	239	203	181
	300	08	80.0	67.4	63.8	56.5	51.8	48.5	44.1	37.6	33.6
		11	200	137	129	115	105	98	89	76	68
		14	420	369	350	309	284	265	242	206	183
	330	08	80.0	67.5	63.9	56.6	51.9	48.5	44.5	38.1	34.0
		11	200	137	130	115	105	98	90	77	69
		14	420	370	350	310	284	266	244	208	185
32	90	08	31.8	28.7	28.6	27.6	26.8	26.2	25.4	24.2	22.2
		11	143	110	104	89	79	72	64	53	46
		14	285	257	256	234	209	190	168	139	117
	120	08	31.8	30.0	30.0	29.5	28.7	28.1	27.4	26.2	24.2
		11	143	115	108	95	84	77	69	58	51
		14	285	269	268	251	224	205	182	153	133
	150	08	31.8	30.6	30.6	30.6	30.0	29.3	28.6	27.4	25.5
		11	143	117	110	98	88	80	72	61	54
		14	285	274	274	260	234	214	190	161	141
	180	08	80.0	66.3	62.8	55.6	50.8	46.5	41.6	35.4	31.5
		11	143	118	112	99	90	83	74	63	56
		14	285	277	277	263	240	220	196	166	147
	210	08	80.0	66.8	63.2	56.0	51.3	47.5	42.5	36.2	32.2
		11	200	136	128	114	104	96	86	73	65
		14	285	279	279	265	243	225	201	171	151
	240	08	80.0	67.1	63.5	56.2	51.6	48.2	43.2	36.8	32.8
		11	200	136	129	114	105	98	88	75	66
		14	285	281	281	266	244	228	204	174	154
	270	08	80.0	67.3	63.7	56.4	51.8	48.4	43.8	37.4	33.3
		11	200	137	129	114	105	98	89	76	67
		14	285	282	282	267	245	229	207	176	157
	300	08	80.0	67.5	63.9	56.6	51.9	48.5	44.3	37.8	33.8
		11	200	137	130	115	105	98	90	77	68
		14	285	282	282	268	246	230	210	179	159
	330	08	80.0	67.6	64.0	56.7	52.0	48.6	44.6	38.2	34.1
		11	200	137	130	115	105	99	90	77	69
		14	285	283	283	268	246	230	211	181	161

MEMO

Output torque table

■ ZRS-X Flange shaft 1 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 30	60	90	120	150	200
2	270	04	10.9	6.64	6.44	6.19	6.02	5.88	5.68
		05	19.9	12.3	12.0	11.5	11.2	10.9	10.6
		06	85.1	44.2	40.6	34.6	30.9	28.2	25.0
		08	164	100	97	89	79	73	64
		11	359	220	211	180	160	146	129
		14	950	443	407	346	307	279	244
	300	04	30.6	16.1	14.9	12.7	11.4	10.4	9.2
		05	50.1	28.1	26.1	22.2	19.9	18.2	16.2
		06	85.1	47.0	43.6	37.2	33.2	30.4	27.0
		08	242	140	130	111	99	90	81
		11	591	286	265	226	201	184	163
		14	1160	598	554	472	420	383	338
	330	04	30.6	17.0	15.9	13.5	12.1	11.1	9.9
		05	50.1	29.6	27.7	23.6	21.1	19.3	17.2
		06	119	56.6	52.9	45.1	40.3	36.9	32.9
		08	242	148	138	118	105	96	86
		11	591	301	281	240	214	196	174
		14	1160	631	590	503	448	409	362
3	180	04	10.9	6.64	6.32	6.07	5.89	5.74	5.53
		05	19.9	12.3	11.7	11.3	11.0	10.7	10.3
		06	85.1	44.1	39.8	33.9	30.2	27.6	24.4
		08	164	100	96	87	78	71	63
		11	359	220	207	176	157	142	125
		14	950	443	399	338	300	271	233
	210	04	10.9	7.27	7.02	6.76	6.56	6.41	6.19
		05	50.1	28.9	26.4	22.5	20.1	18.4	16.4
		06	85.1	48.3	44.2	37.7	33.6	30.7	27.3
		08	242	144	132	112	100	92	81
		11	591	293	268	228	203	186	164
		14	1160	615	562	478	425	387	339
	240	04	30.6	17.7	16.4	14.0	12.5	11.4	10.2
		05	50.1	30.9	28.6	24.4	21.8	20.0	17.8
		06	85.1	51.8	48.0	40.9	36.5	33.4	29.7
		08	242	154	143	122	109	100	89
		11	591	314	291	248	221	202	179
		14	1160	660	611	520	463	422	372
	270	04	41.6	26.1	24.4	20.8	18.6	17.0	15.2
		05	50.1	32.6	30.5	26.0	23.2	21.3	19.0
		06	85.1	54.6	51.1	43.6	39.0	35.7	31.8
		08	242	163	152	130	116	106	95
		11	591	332	310	264	236	216	192
		14	1160	697	652	556	495	452	400
	300	04	41.6	27.2	25.7	22.0	19.6	18.0	16.0
		05	67.0	45.2	42.7	36.4	32.5	29.8	26.6
		06	119	65.0	61.4	52.4	46.8	42.9	38.2
		08	262	207	204	174	156	142	127
		11	738	451	426	364	325	297	264
		14	1640	907	857	731	652	596	529
	330	04	41.6	28.2	26.7	22.9	20.5	18.7	16.7
		05	67.0	46.7	44.2	38.0	33.9	31.1	27.8
		06	129	106	106	97	87	80	71
		08	262	214	211	182	162	149	133
		11	738	467	442	379	339	310	276
		14	1640	939	888	763	681	623	554

Output torque table

ZRS-X Flange shaft 1 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 30	60	90	120	150	200
4	150	04	10.2	6.66	5.98	5.08	4.52	4.10	3.58
		05	12.8	8.90	8.44	8.11	7.87	7.66	7.36
		06	63.6	35.4	31.8	27.0	24.1	21.9	19.3
		08	108	59.7	53.6	45.6	40.5	36.8	32.2
		11	331	193	173	147	130	118	103
		14	760	362	324	275	242	218	185
	180	04	10.9	7.79	7.52	7.23	7.03	6.87	6.64
		05	19.9	14.4	13.9	13.4	13.0	12.7	12.3
		06	63.6	38.9	35.6	30.3	27.0	24.7	21.9
		08	152	75.0	68.5	58.4	52.0	47.5	41.9
		11	359	258	246	210	187	170	150
		14	950	522	476	405	359	326	285
	210	04	17.9	13.9	13.4	13.1	12.8	12.3	10.9
		05	19.9	15.4	15.1	14.5	14.2	13.8	13.4
		06	63.6	41.7	38.6	33.0	29.4	26.9	23.9
		08	164	126	124	113	101	92	82
		11	359	276	268	228	203	186	164
		14	950	560	518	441	393	358	315
	240	04	17.9	14.6	14.5	14.0	13.6	13.1	11.6
		05	19.9	16.2	16.1	15.5	15.1	14.7	14.3
		06	63.6	43.9	41.1	35.1	31.3	28.7	25.5
		08	164	133	132	120	107	98	88
		11	359	291	285	243	217	198	176
		14	950	589	552	471	419	383	338
	270	04	17.9	15.1	15.1	14.6	14.2	13.7	12.2
		05	19.9	16.8	16.8	16.2	15.8	15.5	15.0
		06	63.6	45.5	43.1	36.8	32.9	30.1	26.8
		08	164	138	138	126	113	103	92
		11	591	367	348	297	265	243	216
		14	1160	775	733	626	558	510	453
	300	04	30.6	21.3	20.2	17.4	15.6	14.3	12.7
		05	50.1	37.1	35.1	30.3	27.1	24.8	22.1
		06	85.1	62.3	59.0	50.9	45.5	41.7	37.2
		08	164	142	142	131	117	107	96
		11	591	378	358	309	276	252	225
		14	1160	798	755	651	581	532	473
	330	04	30.6	21.8	20.7	18.0	16.1	14.7	13.1
		05	50.1	37.9	35.9	31.2	27.9	25.6	22.8
		06	85.1	63.8	60.4	52.5	46.9	43.0	38.4
		08	164	145	145	135	121	111	99
		11	591	386	366	318	284	260	232
		14	1160	816	773	672	600	549	489
5	120	04	7.19	4.92	4.36	3.70	3.27	2.95	2.53
		05	13.1	8.31	7.38	6.27	5.55	5.02	4.35
		06	16.4	11.2	10.5	10.0	9.7	9.3	8.8
		08	80.0	45.0	39.9	33.9	30.0	27.1	23.4
		11	200	94.1	83.3	70.3	61.6	54.9	45.7
		14	420	245	217	182	159	140	115
	150	04	7.19	5.45	4.94	4.20	3.73	3.39	2.97
		05	12.8	9.86	9.45	9.09	8.83	8.61	8.31
		06	25.3	18.5	17.7	17.1	16.5	16.1	15.5
		08	108	67.0	60.8	51.8	46.1	42.0	37.0
		11	225	165	158	144	128	116	102
		14	462	335	317	269	237	214	184

Output torque table

■ ZRS-X Flange shaft 1 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 30	60	90	120	150	200
5	180	04	10.2	7.92	7.31	6.23	5.55	5.07	4.48
		05	12.8	10.5	10.3	9.9	9.6	9.4	9.1
		06	25.3	20.0	19.5	18.7	18.2	17.8	17.2
		08	108	72.4	66.8	56.9	50.8	46.4	41.1
		11	225	178	174	158	141	129	113
		14	462	362	349	296	263	239	208
	210	04	14.8	8.30	7.77	6.62	5.91	5.40	4.79
		05	12.8	11.0	10.9	10.5	10.2	9.9	9.6
		06	63.6	45.2	42.3	36.1	32.2	29.4	26.2
		08	152	87.1	81.5	69.5	62.0	56.7	50.4
		11	331	246	230	196	175	160	141
		14	462	382	373	318	283	257	226
	240	04	10.9	9.39	9.39	9.05	8.81	8.63	8.38
		05	37.9	26.6	25.1	21.5	19.2	17.6	15.7
		06	63.6	46.9	44.4	37.9	33.8	31.0	27.6
		08	152	90.4	85.6	73.1	65.2	59.7	53.1
		11	331	255	241	206	184	168	149
		14	760	483	457	390	348	317	281
	270	04	10.9	9.65	9.65	9.41	9.16	8.97	8.72
		05	37.9	27.3	25.8	22.3	19.9	18.2	16.3
		06	63.6	48.2	45.6	39.4	35.2	32.2	28.7
		08	152	92.9	87.9	75.9	67.8	62.1	55.3
		11	359	319	315	272	243	222	198
		14	760	497	470	406	362	331	293
	300	04	10.9	9.85	9.85	9.70	9.44	9.25	9.00
		05	37.9	27.8	26.3	23.0	20.5	18.8	16.8
		06	63.6	49.1	46.5	40.6	36.2	33.2	29.6
		08	152	94.8	89.8	78.3	69.9	64.0	57.1
		11	359	326	322	280	250	229	204
		14	760	508	480	418	373	341	303
	330	04	10.9	10.0	10.0	9.9	9.7	9.5	9.2
		05	37.9	28.3	26.7	23.5	21.0	19.3	17.2
		06	63.6	49.9	47.3	41.6	37.1	34.0	30.4
		08	152	96.4	91.2	80.2	71.6	65.6	58.5
		11	359	331	327	287	257	235	210
		14	760	516	488	429	383	350	312
6	90	04	10.9	6.52	6.11	5.85	5.65	5.48	5.20
		05	19.9	12.1	11.3	10.9	10.5	10.2	9.8
		06	85.1	43.4	38.5	32.8	29.1	26.4	23.1
		08	164	98.7	92.5	84.4	75.0	68.1	59.6
		11	591	263	234	198	175	158	135
		14	950	436	385	325	284	252	209
	120	04	41.6	24.7	22.2	18.9	16.9	15.4	13.7
		05	67.0	41.1	36.9	31.5	28.1	25.7	22.8
		06	119	59.1	53.0	45.2	40.3	36.8	32.6
		08	262	188	176	150	134	122	109
		11	738	410	368	313	279	254	224
		14	1640	822	737	626	556	505	441

Output torque table

ZRS-X Flange shaft 1 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 30	60	90	120	150	200
6	150	04	41.6	27.2	24.9	21.3	19.0	17.4	15.5
		05	67.0	45.2	41.4	35.3	31.5	28.8	25.7
		06	129	102	99	90	81	74	66
		08	262	207	198	169	151	138	123
		11	738	451	413	352	314	287	254
		14	1640	907	830	707	629	574	506
	180	04	41.6	28.9	26.9	23.0	20.5	18.8	16.8
		05	67.0	47.9	44.6	38.1	34.0	31.2	27.8
		06	129	109	107	98	87	80	71
		08	431	268	249	213	190	174	155
		11	903	606	564	481	430	393	350
		14	2230	1190	1110	950	840	770	680
	210	04	41.6	30.1	28.5	24.3	21.7	19.9	17.7
		05	67.0	49.9	47.1	40.2	35.9	32.9	29.4
		06	129	113	113	103	92	84	75
		08	431	279	263	225	201	184	164
		11	903	631	596	508	454	416	370
		14	2230	1240	1170	1000	890	820	730
	240	04	41.6	31.0	29.4	25.3	22.6	20.7	18.5
		05	67.0	51.3	48.5	41.8	37.4	34.2	30.6
		06	129	116	116	107	96	88	78
		08	431	287	271	234	209	191	171
		11	903	649	614	529	473	433	386
		14	2230	1280	1210	1040	930	850	760
	270	04	41.6	31.7	30.0	26.1	23.3	21.4	19.1
		05	67.0	52.3	49.5	43.1	38.5	35.3	31.5
		06	129	119	119	111	99	91	81
		08	431	293	277	241	216	198	176
		11	1270	825	781	680	608	557	497
		14	2230	1310	1240	1080	960	880	790
	300	04	41.6	32.1	30.4	26.7	23.9	21.9	19.6
		05	67.0	53.1	50.2	44.2	39.5	36.2	32.3
		06	129	120	120	113	101	93	83
		08	431	297	281	247	221	203	181
		11	1270	838	793	697	623	571	510
		14	2230	1330	1260	1100	990	900	810
	330	04	41.6	32.5	30.8	27.3	24.4	22.4	20.0
		05	67.0	53.7	50.8	45.0	40.3	36.9	33.0
		06	129	122	122	116	103	95	85
		08	431	301	285	252	226	207	185
		11	1270	847	802	710	636	582	520
		14	2230	1340	1270	1130	1010	920	820
8	90	04	10.9	7.76	7.28	6.99	6.77	6.59	6.31
		05	50.1	30.8	27.4	23.3	20.8	19.0	16.8
		06	85.1	51.6	45.8	39.0	34.7	31.7	27.9
		08	164	117	110	101	90	82	72
		11	359	257	238	202	179	163	141
		14	950	519	460	390	343	309	263

Output torque table

■ ZRS-X Flange shaft 1 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 30	60	90	120	150	200
8	120	04	30.6	20.0	18.1	15.5	13.8	12.6	11.2
		05	50.1	34.7	31.6	26.9	24.0	22.0	19.6
		06	85.1	58.3	53.0	45.2	40.3	36.9	32.7
		08	242	174	158	135	120	110	98
		11	591	354	321	274	244	222	196
		14	1160	745	677	576	512	465	408
	150	04	30.6	21.3	19.8	16.9	15.1	13.8	12.3
		05	50.1	37.1	34.4	29.3	26.2	24.0	21.4
		06	85.1	62.3	57.8	49.3	44.0	40.3	35.9
		08	242	186	172	147	131	120	107
		11	591	378	350	299	266	244	216
		14	1160	798	740	630	561	512	453
	180	04	30.6	22.2	21.0	17.9	16.0	14.6	13.1
		05	50.1	38.5	36.4	31.0	27.7	25.4	22.6
		06	85.1	64.9	61.2	52.2	46.6	42.7	38.1
		08	242	193	182	156	139	127	114
		11	738	513	484	413	369	337	300
		14	1640	1040	980	830	740	680	600
	210	04	30.6	22.8	21.6	18.6	16.6	15.2	13.6
		05	50.1	39.5	37.4	32.3	28.8	26.4	23.6
		06	85.1	66.6	63.0	54.3	48.6	44.5	39.7
		08	242	199	188	162	145	133	118
		11	738	527	498	430	384	351	313
		14	1640	1060	1010	870	770	710	630
	240	04	30.6	23.2	22.0	19.2	17.1	15.7	14.0
		05	50.1	40.2	38.1	33.2	29.7	27.2	24.3
		06	85.1	67.8	64.2	56.0	50.0	45.8	40.9
		08	242	202	191	167	149	137	122
		11	738	536	507	443	395	362	323
		14	1640	1080	1030	890	800	730	650
	270	04	30.6	23.5	22.3	19.6	17.5	16.1	14.4
		05	50.1	40.7	38.5	34.0	30.4	27.8	24.9
		06	85.1	68.6	65.0	57.3	51.2	46.9	41.9
		08	262	249	246	217	194	178	159
		11	738	542	513	453	405	371	331
		14	1640	1100	1040	920	820	750	670
	300	04	30.6	23.7	22.5	19.9	17.9	16.4	14.6
		05	50.1	41.1	38.9	34.4	30.9	28.3	25.3
		06	85.1	69.2	65.5	58.0	52.2	47.8	42.7
		08	262	252	249	220	198	181	162
		11	738	547	518	459	412	378	337
		14	1640	1110	1050	930	830	760	680
	330	04	30.6	23.9	22.6	20.0	18.2	16.6	14.9
		05	50.1	41.3	39.1	34.6	31.4	28.8	25.7
		06	85.1	69.7	66.0	58.4	53.0	48.5	43.4
		08	262	253	250	222	201	184	165
		11	738	551	522	462	419	384	342
		14	1640	1120	1060	940	850	780	690

Output torque table

ZRS-X Flange shaft 1 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 30	60	90	120	150	200
9	90	04	10.9	8.22	7.72	7.42	7.20	7.01	6.74
		05	37.9	23.3	20.8	17.7	15.8	14.4	12.7
		06	63.6	41.1	36.5	31.1	27.7	25.2	22.2
		08	152	79.2	70.4	59.9	53.2	48.4	42.4
		11	331	224	199	169	149	135	117
		14	760	422	374	317	279	250	212
	120	04	10.9	9.12	8.80	8.47	8.24	8.05	7.79
		05	37.9	25.8	23.6	20.1	18.0	16.4	14.6
		06	63.6	45.5	41.6	35.5	31.6	28.9	25.6
		08	152	87.8	80.2	68.4	60.9	55.6	49.2
		11	359	302	288	245	218	199	176
		14	760	469	428	364	323	293	255
	150	04	10.9	9.65	9.50	9.15	8.91	8.72	8.46
		05	37.9	27.3	25.4	21.7	19.4	17.7	15.8
		06	85.1	64.1	59.7	51.0	45.5	41.7	37.1
		08	164	146	144	131	117	107	96
		11	359	319	311	265	236	216	192
		14	950	649	605	515	459	419	370
	180	04	10.9	9.98	9.98	9.63	9.37	9.18	8.92
		05	51.5	39.3	37.2	31.8	28.4	26.0	23.2
		06	85.1	66.2	62.7	53.6	47.9	43.8	39.1
		08	164	151	151	138	123	113	101
		11	359	330	326	278	249	227	202
		14	950	671	635	542	484	442	392
	210	04	30.6	23.2	21.9	19.0	17.0	15.6	13.9
		05	51.5	40.1	38.0	32.9	29.4	27.0	24.1
		06	85.1	67.6	64.0	55.5	49.6	45.4	40.5
		08	164	154	154	143	128	117	105
		11	359	337	333	288	258	236	210
		14	1160	868	821	712	635	581	517
	240	04	30.6	23.5	22.3	19.5	17.5	16.0	14.3
		05	51.5	40.7	38.5	33.8	30.2	27.7	24.7
		06	85.1	68.6	65.0	57.0	50.9	46.7	41.6
		08	164	156	156	147	131	120	107
		11	359	341	338	296	265	242	216
		14	1160	881	834	731	653	598	532
	270	04	30.6	23.7	22.5	19.9	17.8	16.3	14.6
		05	51.5	41.1	38.9	34.4	30.8	28.3	25.2
		06	85.1	69.3	65.6	58.1	52.0	47.6	42.5
		08	164	158	158	150	134	123	110
		11	359	345	341	302	270	247	221
		14	1160	890	842	746	667	611	545
	300	04	30.6	23.9	22.6	20.1	18.1	16.6	14.8
		05	51.5	41.4	39.2	34.7	31.3	28.7	25.7
		06	85.1	69.8	66.1	58.5	52.9	48.4	43.3
		08	164	159	159	151	136	125	112
		11	591	423	400	354	320	293	262
		14	1160	897	849	751	679	622	554
	330	04	30.6	24.1	22.8	20.2	18.4	16.8	15.0
		05	51.5	41.6	39.4	34.9	31.8	29.1	26.0
		06	85.1	70.2	66.4	58.8	53.6	49.1	43.9
		08	164	160	160	152	138	127	113
		11	591	425	402	356	325	297	266
		14	1160	902	854	756	689	631	563

Output torque table

■ ZRS-X Flange shaft 1 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 30	60	90	120	150	200
10	90	04	10.2	7.92	7.08	6.02	5.35	4.86	4.25
		05	12.8	10.5	9.9	9.6	9.3	9.0	8.7
		06	25.3	20.0	18.9	18.1	17.5	17.1	16.3
		08	108	72.4	64.7	55.0	48.9	44.5	39.0
		11	225	178	168	153	136	123	107
		14	462	362	337	285	251	226	192
	120	04	10.9	9.39	9.10	8.76	8.52	8.33	8.07
		05	37.9	26.6	24.4	20.8	18.6	17.0	15.1
		06	63.6	46.9	43.0	36.7	32.7	29.9	26.6
		08	152	90.4	83.0	70.7	63.1	57.6	51.1
		11	331	255	234	199	177	162	143
		14	760	483	443	377	335	304	266
	150	04	10.9	9.85	9.75	9.39	9.14	8.94	8.68
		05	37.9	27.8	26.1	22.2	19.9	18.2	16.2
		06	63.6	49.1	46.0	39.3	35.1	32.1	28.6
		08	152	94.8	88.9	75.8	67.6	61.9	55.0
		11	359	326	318	272	242	222	197
		14	760	508	475	405	360	329	290
	180	04	10.9	10.1	10.1	9.8	9.6	9.4	9.1
		05	37.9	28.6	27.1	23.2	20.8	19.0	17.0
		06	85.1	67.2	63.6	54.7	48.8	44.7	39.9
		08	152	97.5	92.3	79.3	70.8	64.8	57.7
		11	359	335	331	284	254	232	207
		14	950	682	645	554	494	451	401
	210	04	10.9	10.3	10.3	10.1	9.9	9.7	9.4
		05	37.9	29.1	27.5	24.0	21.4	19.6	17.5
		06	85.1	68.4	64.8	56.4	50.4	46.2	41.2
		08	164	156	156	146	130	119	106
		11	359	341	337	293	262	240	214
		14	950	694	657	572	511	467	415
	240	04	10.9	10.4	10.4	10.4	10.1	9.9	9.6
		05	37.9	29.4	27.9	24.6	21.9	20.1	17.9
		06	85.1	69.2	65.5	57.8	51.6	47.3	42.2
		08	164	158	158	149	133	122	109
		11	359	345	341	300	268	246	219
		14	950	703	665	586	523	479	427
	270	04	10.9	10.5	10.5	10.5	10.3	10.1	9.8
		05	37.9	29.7	28.1	24.9	22.4	20.5	18.3
		06	85.1	69.8	66.1	58.5	52.6	48.2	43.1
		08	164	159	159	151	136	124	111
		11	359	347	343	304	273	250	223
		14	950	709	671	594	534	489	436
	300	04	10.9	10.6	10.6	10.6	10.5	10.3	10.0
		05	37.9	29.8	28.2	25.0	22.7	20.8	18.6
		06	85.1	70.2	66.5	58.9	53.4	49.0	43.7
		08	164	160	160	152	138	126	113
		11	359	349	346	306	278	254	227
		14	950	713	675	598	542	497	443
	330	04	10.9	10.6	10.6	10.6	10.6	10.4	10.1
		05	37.9	30.0	28.4	25.1	23.0	21.1	18.8
		06	85.1	70.5	66.8	59.1	54.1	49.6	44.3
		08	164	161	161	153	140	128	114
		11	359	351	347	307	281	258	230
		14	950	717	678	601	550	504	449

Output torque table

ZRS-X Flange shaft 1 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 30	60	90	120	150	200
12	90	04	7.19	6.13	5.52	4.69	4.17	3.79	3.31
		05	12.8	11.1	10.6	10.2	9.9	9.6	9.3
		06	25.3	21.2	20.2	19.4	18.8	18.4	17.7
		08	108	77.0	69.4	59.1	52.6	47.9	42.2
		11	225	189	180	164	146	132	116
		14	462	385	362	307	271	245	210
	120	04	7.19	6.49	6.01	5.12	4.56	4.16	3.67
		05	12.8	11.7	11.5	11.1	10.8	10.5	10.2
		06	25.3	22.8	22.2	21.4	20.8	20.3	19.7
		08	108	82.5	76.4	65.1	58.1	53.1	47.1
		11	225	203	198	181	161	147	130
		14	462	414	400	340	302	275	241
	150	04	10.2	9.14	8.64	7.37	6.57	6.01	5.35
		05	12.8	12.1	12.1	11.6	11.3	11.1	10.8
		06	25.3	23.6	23.5	22.7	22.1	21.6	20.9
		08	108	85.5	80.8	68.9	61.5	56.3	50.1
		11	225	210	209	191	171	156	139
		14	462	429	423	361	321	293	259
	180	04	10.2	9.30	8.80	7.62	6.80	6.23	5.55
		05	12.8	12.3	12.3	12.0	11.7	11.5	11.1
		06	25.3	24.1	24.1	23.5	22.9	22.4	21.8
		08	108	87.3	82.6	71.5	63.9	58.5	52.1
		11	331	280	265	230	205	188	167
		14	760	534	505	437	390	356	316
	210	04	10.2	9.40	8.90	7.81	6.98	6.39	5.70
		05	12.8	12.4	12.4	12.3	12.0	11.7	11.4
		06	25.3	24.4	24.4	24.2	23.5	23.0	22.4
		08	108	88.4	83.7	73.5	65.6	60.1	53.6
		11	331	284	269	236	211	193	172
		14	760	541	512	449	401	367	326
	240	04	10.2	9.47	8.96	7.93	7.11	6.52	5.81
		05	12.8	12.5	12.5	12.5	12.2	12.0	11.7
		06	25.3	24.6	24.6	24.6	24.0	23.5	22.9
		08	108	89.2	84.4	74.7	67.0	61.4	54.8
		11	331	286	271	240	215	197	176
		14	760	545	516	457	409	375	334
	270	04	10.9	10.6	10.6	10.6	10.5	10.3	10.0
		05	19.9	19.5	19.5	19.5	19.3	18.9	18.4
		06	25.3	24.7	24.7	24.7	24.4	23.9	23.3
		08	108	89.7	84.9	75.2	68.1	62.4	55.7
		11	331	288	273	241	219	200	179
		14	760	549	519	460	417	381	340
	300	04	10.9	10.7	10.7	10.7	10.6	10.4	10.2
		05	19.9	19.6	19.6	19.6	19.5	19.1	18.6
		06	63.6	53.2	50.4	44.6	40.8	37.4	33.4
		08	152	103	97	86	79	72	65
		11	331	289	274	242	222	203	181
		14	760	551	522	462	423	387	345
	330	04	10.9	10.7	10.7	10.7	10.7	10.6	10.3
		05	19.9	19.6	19.6	19.6	19.6	19.4	18.9
		06	63.6	53.4	50.5	44.7	41.0	37.9	33.8
		08	152	103	98	86	79	73	65
		11	331	290	275	243	223	206	184
		14	760	553	523	463	425	392	349

Output torque table

■ ZRS-X Flange shaft 1 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 30	60	90	120	150	200
15	90	08	31.8	28.4	27.2	26.2	25.3	24.6	23.5
		11	143	109	99	84	74	67	58
		14	285	254	244	221	195	176	151
	120	08	80.0	63.7	59.6	50.8	45.3	41.4	36.7
		11	200	130	121	103	92	84	74
		14	285	266	263	239	213	193	169
	150	08	80.0	65.2	61.7	53.1	47.4	43.3	38.6
		11	200	133	126	108	96	88	78
		14	420	357	338	290	258	236	208
	180	08	80.0	66.1	62.5	54.7	48.8	44.7	39.8
		11	200	134	127	111	99	91	80
		14	420	362	342	299	267	244	216
	210	08	80.0	66.6	63.0	55.8	49.9	45.7	40.8
		11	200	135	128	113	101	93	82
		14	420	365	345	305	273	250	222
	240	08	80.0	67.0	63.4	56.1	50.8	46.6	41.6
		11	200	136	129	114	103	94	84
		14	420	367	347	307	278	254	227
	270	08	80.0	67.2	63.6	56.3	51.6	47.3	42.2
		11	200	136	129	114	105	96	85
		14	420	368	348	308	282	258	230
	300	08	80.0	67.4	63.8	56.5	51.8	47.8	42.7
		11	200	137	129	115	105	97	86
		14	420	369	349	309	283	262	233
	330	08	80.0	67.5	63.9	56.6	51.9	48.4	43.2
		11	200	137	130	115	105	98	87
		14	420	370	350	310	284	265	236
16	90	08	31.8	28.7	27.7	26.6	25.7	25.0	24.0
		11	143	110	101	85	76	68	59
		14	305	267	257	233	206	185	159
	120	08	31.8	30.0	29.7	28.5	27.7	27.1	26.1
		11	143	115	107	91	81	74	65
		14	285	268	266	242	215	196	171
	150	08	31.8	30.6	30.6	29.8	28.9	28.3	27.4
		11	143	117	110	95	85	77	69
		14	285	274	274	253	225	205	181
	180	08	80.0	66.3	62.8	55.1	49.2	45.0	40.1
		11	143	118	112	98	87	80	71
		14	285	277	277	260	232	212	188
	210	08	80.0	66.8	63.2	56.0	50.2	46.0	41.0
		11	200	136	128	114	102	93	83
		14	285	279	279	265	237	217	193
	240	08	80.0	67.1	63.5	56.2	51.1	46.8	41.8
		11	200	136	129	114	104	95	84
		14	285	281	281	266	242	221	197
	270	08	80.0	67.3	63.7	56.4	51.7	47.5	42.4
		11	200	137	129	114	105	96	86
		14	285	282	282	267	245	224	200
	300	08	80.0	67.5	63.9	56.6	51.9	48.0	42.9
		11	200	137	130	115	105	97	87
		14	285	282	282	268	245	227	203
	330	08	80.0	67.6	64.0	56.7	52.0	48.6	43.4
		11	200	137	130	115	105	98	88
		14	285	283	283	268	246	230	205

MEMO

Output torque table

■ ZRS-X flange shaft 2 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 15	30	45	60	75	100	150	200
16	120	04	16.1	13.0	12.9	12.4	12.1	11.8	11.5	9.8	8.6
		05	19.9	16.2	16.1	15.5	15.1	14.7	14.3	13.7	12.6
		06	63.6	43.9	41.1	35.1	31.3	28.7	25.5	21.5	18.7
		08	164	133	132	120	107	98.4	87.7	74.0	65.1
		11	359	291	285	243	217	198	176	147	127
		14	950	589	552	471	419	383	338	278	234
	150	04	30.6	21.3	20.2	17.4	15.6	14.3	12.7	10.8	9.6
		05	50.1	37.1	35.1	30.3	27.1	24.8	22.1	18.8	16.7
		06	85.1	62.3	59.0	50.9	45.5	41.7	37.2	31.5	27.9
		08	164	142	142	131	117	107	96	81	72
		11	591	378	358	309	276	252	225	190	166
		14	1160	798	755	651	581	532	473	396	344
	180	04	30.6	22.2	21.0	18.5	16.5	15.1	13.5	11.5	10.2
		05	50.1	38.5	36.5	32.0	28.6	26.2	23.4	19.9	17.7
		06	119	74.0	70.1	61.5	54.9	50.3	44.9	38.2	34.0
		08	242	194	183	161	144	132	117	100	89
		11	591	393	372	327	292	267	238	202	178
		14	1160	832	787	690	616	564	503	424	372
	210	04	30.6	22.8	21.6	19.1	17.2	15.7	14.1	12.0	10.7
		05	50.1	39.5	37.4	33.1	29.8	27.3	24.4	20.7	18.5
		06	119	76.0	71.9	63.7	57.2	52.4	46.8	39.8	35.5
		08	242	199	188	166	149	137	122	104	93
		11	591	403	382	338	304	278	248	211	187
		14	1640	1060	1010	890	800	730	650	550	490
	240	04	30.6	23.2	22.0	19.5	17.7	16.2	14.5	12.3	11.0
		05	50.1	40.2	38.1	33.7	30.6	28.1	25.1	21.4	19.1
		06	119	77.3	73.2	64.8	58.9	54.0	48.2	41.1	36.6
		08	242	202	191	169	154	141	126	107	96
		11	591	411	389	344	313	286	256	217	193
		14	1640	1080	1030	910	830	760	670	570	510
	270	04	30.6	23.5	22.3	19.7	18.1	16.6	14.8	12.6	11.3
		05	50.1	40.7	38.5	34.1	31.3	28.7	25.7	21.9	19.5
		06	119	78.3	74.1	65.6	60.2	55.2	49.4	42.1	37.5
		08	242	205	194	172	157	144	129	110	98
		11	591	416	393	348	319	293	262	223	198
		14	1640	1100	1040	920	840	770	690	590	520
	300	04	30.6	23.7	22.5	19.9	18.2	16.9	15.1	12.9	11.5
		05	50.1	41.1	38.9	34.4	31.6	29.3	26.1	22.3	19.9
		06	119	79.0	74.8	66.2	60.7	56.3	50.3	42.9	38.3
		08	262	252	249	220	202	187	167	143	127
		11	738	547	518	459	421	390	348	297	264
		14	1640	1110	1050	930	850	790	700	600	530
	330	04	30.6	23.9	22.6	20.0	18.4	17.2	15.3	13.1	11.7
		05	50.1	41.3	39.1	34.6	31.8	29.7	26.5	22.6	20.2
		06	119	79.5	75.3	66.7	61.1	57.2	51.1	43.6	38.9
		08	262	253	250	222	203	190	170	145	129
		11	738	551	522	462	424	396	354	301	269
		14	1640	1120	1060	940	860	800	720	610	540
18	120	04	10.9	9.12	9.08	8.75	8.52	8.34	8.10	6.86	6.02
		05	37.9	25.8	24.4	20.8	18.6	17.0	15.1	12.8	11.3
		06	85.1	60.6	57.1	48.7	43.5	39.9	35.5	30.0	26.4
		08	152	87.8	82.8	70.6	63.1	57.7	51.3	43.1	37.6
		11	359	302	297	253	226	207	184	154	133
		14	950	612	577	492	439	400	354	293	248

Output torque table

ZRS-X flange shaft 2 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 15	30	45	60	75	100	150	200
18	150	04	10.9	9.65	9.65	9.45	9.20	9.01	8.77	7.47	6.60
		05	37.9	27.3	25.8	22.4	20.0	18.3	16.4	13.9	12.3
		06	85.1	64.1	60.6	52.6	47.0	43.1	38.4	32.6	28.9
		08	164	146	146	136	121	111	99	84	75
		11	359	319	315	274	244	224	199	168	148
		14	950	649	614	532	475	434	386	324	281
	180	04	30.6	22.7	21.5	18.9	16.9	15.5	13.9	11.8	10.5
		05	51.5	39.3	37.2	32.8	29.3	26.9	24.0	20.4	18.2
		06	85.1	66.2	62.7	55.3	49.4	45.3	40.4	34.4	30.6
		08	164	151	151	143	127	117	104	89	79
		11	359	330	326	287	257	235	210	178	157
		14	1160	849	804	709	633	579	516	436	384
	210	04	30.6	23.2	21.9	19.4	17.5	16.1	14.4	12.2	10.9
		05	51.5	40.1	38.0	33.6	30.4	27.8	24.9	21.2	18.9
		06	85.1	67.6	64.0	56.7	51.2	46.9	41.9	35.7	31.8
		08	164	154	154	146	132	121	108	92	82
		11	591	410	388	343	310	284	253	215	191
		14	1160	868	822	727	656	601	536	454	401
	240	04	30.6	23.5	22.3	19.7	18.0	16.5	14.7	12.6	11.2
		05	51.5	40.7	38.5	34.1	31.2	28.6	25.5	21.8	19.4
		06	85.1	68.6	65.0	57.5	52.6	48.2	43.0	36.7	32.7
		08	164	156	156	148	136	124	111	95	84
		11	591	416	393	348	318	292	260	221	197
		14	1160	881	834	738	674	618	551	468	415
	270	04	30.6	23.7	22.5	19.9	18.3	16.9	15.1	12.8	11.5
		05	51.5	41.1	38.9	34.4	31.6	29.2	26.1	22.2	19.8
		06	85.1	69.3	65.6	58.1	53.3	49.2	43.9	37.4	33.4
		08	164	158	158	150	137	127	113	97	86
		11	591	420	397	352	323	298	266	226	201
		14	1160	890	843	746	684	631	563	479	425
	300	04	30.6	23.9	22.7	20.1	18.4	17.1	15.3	13.1	11.7
		05	51.5	41.4	39.2	34.7	31.8	29.6	26.5	22.6	20.2
		06	85.1	69.8	66.1	58.5	53.7	50.0	44.7	38.1	34.0
		08	164	159	159	151	138	129	115	98	88
		11	591	423	400	354	325	303	270	230	205
		14	1160	897	849	752	689	642	573	488	434
	330	04	30.6	24.1	22.8	20.2	18.5	17.3	15.5	13.3	11.8
		05	51.5	41.6	39.4	34.9	32.0	29.9	26.9	22.9	20.5
		06	85.1	70.2	66.4	58.8	54.0	50.5	45.3	38.7	34.5
		08	164	160	160	152	139	130	117	100	89
		11	591	425	402	356	327	306	274	234	208
		14	1160	902	854	756	693	648	582	495	441
20	90	04	10.2	7.92	7.31	6.23	5.55	5.07	4.48	3.70	3.12
		05	19.9	15.8	15.4	14.9	14.5	14.2	13.7	11.7	10.2
		06	25.3	20.0	19.5	18.7	18.2	17.8	17.2	16.2	14.5
		08	108	72.4	66.8	56.9	50.8	46.4	41.1	34.0	28.9
		11	225	178	174	158	141	129	113	92	76
		14	462	362	349	296	263	239	208	164	126
	120	04	10.9	9.39	9.39	9.05	8.81	8.63	8.38	7.12	6.26
		05	37.9	26.6	25.1	21.5	19.2	17.6	15.7	13.3	11.7
		06	63.6	46.9	44.4	37.9	33.8	31.0	27.6	23.3	20.5
		08	152	90.4	85.6	73.1	65.2	59.7	53.1	44.7	39.1
		11	331	255	241	206	184	168	149	125	108
		14	760	483	457	390	348	317	281	231	195

Output torque table

■ ZRS-X flange shaft 2 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 15	30	45	60	75	100	150	200
20	150	04	10.9	9.85	9.85	9.70	9.44	9.25	9.00	7.67	6.79
		05	37.9	27.8	26.3	23.0	20.5	18.8	16.8	14.3	12.6
		06	63.6	49.1	46.5	40.6	36.2	33.2	29.6	25.1	22.2
		08	152	94.8	89.8	78.3	69.9	64.0	57.1	48.3	42.6
		11	359	326	322	280	250	229	204	173	152
		14	760	508	480	418	373	341	303	254	219
	180	04	10.9	10.1	10.1	10.1	9.9	9.7	9.4	8.0	7.1
		05	37.9	28.6	27.1	24.0	21.4	19.6	17.5	14.9	13.3
		06	63.6	50.5	47.8	42.4	37.9	34.7	31.0	26.3	23.4
		08	152	97.6	92.3	81.7	73.1	67.0	59.8	50.8	45.0
		11	359	335	331	293	262	240	214	182	161
		14	950	682	645	571	511	467	416	352	309
	210	04	10.9	10.3	10.3	10.3	10.2	10.0	9.7	8.3	7.4
		05	37.9	29.1	27.5	24.4	22.1	20.3	18.1	15.4	13.7
		06	63.6	51.4	48.7	43.1	39.1	35.8	32.0	27.2	24.2
		08	164	156	156	148	134	123	110	94	83
		11	359	341	337	298	270	248	221	188	167
		14	950	694	657	582	528	483	431	365	322
	240	04	10.9	10.4	10.4	10.4	10.4	10.2	10.0	8.5	7.6
		05	37.9	29.4	27.9	24.7	22.6	20.8	18.5	15.8	14.1
		06	63.6	52.0	49.3	43.6	40.0	36.7	32.8	27.9	24.9
		08	164	158	158	150	137	126	113	96	86
		11	359	345	341	302	277	254	227	193	171
		14	950	703	665	589	540	495	442	375	332
	270	04	10.9	10.5	10.5	10.5	10.5	10.4	10.2	8.7	7.8
		05	37.9	29.7	28.1	24.9	22.8	21.1	18.9	16.1	14.4
		06	63.6	52.5	49.7	44.0	40.3	37.4	33.4	28.5	25.4
		08	164	159	159	151	138	128	115	98	87
		11	359	347	344	304	279	259	231	197	175
		14	950	709	671	594	545	505	451	383	340
	300	04	10.9	10.6	10.6	10.6	10.6	10.6	10.3	8.8	7.9
		05	37.9	29.8	28.2	25.0	22.9	21.4	19.2	16.4	14.6
		06	85.1	70.2	66.5	58.9	54.0	50.5	45.2	38.5	34.4
		08	164	160	160	152	139	130	117	99	89
		11	359	349	346	306	281	262	235	200	178
		14	950	713	675	598	548	513	458	390	346
	330	04	10.9	10.6	10.6	10.6	10.6	10.6	10.5	9.0	8.0
		05	37.9	30.0	28.4	25.1	23.0	21.5	19.4	16.6	14.8
		06	85.1	70.5	66.8	59.1	54.2	50.7	45.8	39.0	34.8
		08	164	161	161	153	140	131	118	101	90
		11	359	351	347	307	282	264	238	203	181
		14	950	717	679	601	551	515	464	395	352
24	90	04	7.19	6.13	5.70	4.86	4.33	3.95	3.49	2.88	2.42
		05	12.8	11.1	10.9	10.5	10.2	10.0	9.7	8.2	7.1
		06	25.3	21.2	20.9	20.1	19.5	19.1	18.5	17.5	15.9
		08	80.0	57.6	53.6	45.7	40.7	37.2	32.9	27.2	23.1
		11	200	119	110	94	83	76	67	53	43
		14	462	386	374	318	283	258	226	181	144
	120	04	7.19	6.49	6.14	5.29	4.72	4.32	3.84	3.21	2.79
		05	12.8	11.7	11.7	11.4	11.1	10.9	10.6	9.0	7.9
		06	25.3	22.8	22.8	22.1	21.5	21.1	20.5	19.5	18.0
		08	108	82.5	78.1	67.2	60.0	55.0	48.9	41.3	36.2
		11	225	203	203	187	167	153	136	114	99
		14	462	414	409	352	314	286	254	210	178

Output torque table

■ ZRS-X flange shaft 2 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 15	30	45	60	75	100	150	200
24	150	04	10.2	9.14	8.65	7.60	6.79	6.22	5.55	4.70	4.14
		05	12.8	12.1	12.1	12.0	11.7	11.4	11.1	9.5	8.4
		06	63.6	50.5	47.8	42.0	37.6	34.4	30.7	26.1	23.1
		08	108	85.5	80.9	71.1	63.5	58.2	51.9	44.0	38.9
		11	225	210	210	198	177	162	144	122	107
		14	462	429	424	373	333	304	270	226	196
	180	04	10.2	9.30	8.80	7.79	7.03	6.44	5.74	4.88	4.32
		05	12.8	12.3	12.3	12.3	12.1	11.8	11.5	9.8	8.7
		06	63.6	51.6	48.8	43.2	39.0	35.7	31.9	27.1	24.1
		08	108	87.3	82.6	73.1	66.0	60.4	53.9	45.8	40.6
		11	225	214	214	203	183	168	150	127	112
		14	462	438	433	384	346	316	282	237	208
	210	04	10.2	9.40	8.90	7.88	7.20	6.60	5.89	5.01	4.45
		05	12.8	12.4	12.4	12.4	12.4	12.1	11.8	10.1	9.0
		06	63.6	52.2	49.5	43.8	40.0	36.7	32.8	27.9	24.8
		08	152	101	95	85	77	71	63	54	48
		11	225	217	217	206	188	172	154	131	116
		14	760	541	512	453	414	379	338	286	253
	240	04	10.2	9.47	8.96	7.93	7.28	6.73	6.01	5.12	4.55
		05	12.8	12.5	12.5	12.5	12.5	12.4	12.0	10.3	9.2
		06	63.6	52.7	49.9	44.2	40.5	37.5	33.5	28.5	25.4
		08	152	102	96	85	78	72	65	55	49
		11	225	219	219	208	190	176	157	134	119
		14	760	545	516	457	419	387	346	293	260
	270	04	10.2	9.51	9.01	7.97	7.31	6.84	6.11	5.20	4.63
		05	37.9	29.9	28.3	25.1	23.0	21.5	19.2	16.4	14.6
		06	63.6	53.0	50.2	44.4	40.7	38.1	34.0	29.0	25.9
		08	152	102	97	86	79	74	66	56	50
		11	225	220	220	209	191	179	160	136	121
		14	760	549	520	460	422	394	352	299	265
	300	04	10.2	9.55	9.04	8.00	7.34	6.86	6.19	5.27	4.70
		05	37.9	30.1	28.5	25.2	23.1	21.6	19.5	16.6	14.8
		06	63.6	53.2	50.4	44.6	40.9	38.3	34.5	29.4	26.2
		08	152	103	97	86	79	74	67	57	51
		11	331	289	274	242	222	208	187	160	142
		14	760	551	522	462	424	396	357	304	270
	330	04	10.2	9.57	9.06	8.02	7.36	6.88	6.26	5.33	4.76
		05	37.9	30.2	28.5	25.3	23.2	21.7	19.7	16.8	15.0
		06	63.6	53.4	50.5	44.7	41.0	38.4	34.9	29.8	26.6
		08	152	103	98	86	79	74	67	57	51
		11	331	290	275	243	223	209	190	162	144
		14	760	553	524	463	425	397	361	307	273
30	90	08	31.8	28.4	28.2	27.1	26.3	25.7	24.8	23.3	20.8
		11	143	109	102	87	78	71	62	50	41
		14	285	254	252	230	204	186	163	130	103
	120	08	80.0	63.7	60.3	52.5	46.8	42.9	38.2	32.2	28.2
		11	200	130	123	107	95	87	77	64	55
		14	285	266	266	248	221	202	178	147	124
	150	08	80.0	65.2	61.7	54.6	48.9	44.8	40.0	33.9	29.9
		11	200	133	126	111	100	91	81	68	59
		14	420	357	338	299	268	245	217	182	158

Output torque table

■ ZRS-X flange shaft 2 stationary

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 15	30	45	60	75	100	150	200
30	180	08	80.0	66.1	62.5	55.4	50.4	46.2	41.2	35.0	31.0
		11	200	134	127	113	102	94	84	71	62
		14	420	362	342	303	276	252	225	190	166
	210	08	80.0	66.6	63.1	55.8	51.2	47.2	42.2	35.9	31.9
		11	200	135	128	113	104	96	85	72	64
		14	420	365	345	306	280	258	230	195	172
	240	08	80.0	67.0	63.4	56.1	51.5	48.1	42.9	36.6	32.5
		11	200	136	129	114	104	98	87	74	65
		14	420	367	347	307	282	263	235	199	176
	270	08	80.0	67.2	63.6	56.3	51.7	48.3	43.6	37.1	33.1
		11	200	136	129	114	105	98	88	75	67
		14	420	368	349	309	283	264	238	202	179
	300	08	80.0	67.4	63.8	56.5	51.8	48.4	44.1	37.6	33.5
		11	200	137	129	115	105	98	89	76	68
		14	420	369	349	309	284	265	241	205	182
	330	08	80.0	67.5	63.9	56.6	51.9	48.5	44.5	38.0	33.9
		11	200	137	130	115	105	98	90	77	68
		14	420	370	350	310	284	266	244	208	185
32	90	08	31.8	28.7	28.6	27.5	26.7	26.1	25.2	23.7	21.3
		11	143	110	104	89	79	72	63	51	42
		14	285	257	256	233	208	189	166	133	106
	120	08	31.8	30.0	29.9	29.5	28.7	28.1	27.2	25.9	23.8
		11	143	115	108	94	84	77	68	57	49
		14	285	268	268	251	223	204	181	149	127
	150	08	31.8	30.6	30.6	30.6	29.9	29.3	28.5	27.2	25.2
		11	143	117	110	98	88	80	71	60	52
		14	285	274	274	260	233	213	190	159	137
	180	08	80.0	66.3	62.8	55.6	50.8	46.5	41.5	35.3	31.3
		11	143	118	112	99	90	83	74	62	55
		14	285	277	277	263	240	220	196	165	144
	210	08	80.0	66.8	63.2	56.0	51.3	47.5	42.4	36.1	32.1
		11	200	136	128	114	104	96	86	73	64
		14	285	279	279	265	243	225	200	169	149
	240	08	80.0	67.1	63.5	56.2	51.6	48.2	43.2	36.8	32.7
		11	200	136	129	114	105	98	87	74	66
		14	285	281	281	266	244	228	204	173	153
	270	08	80.0	67.3	63.7	56.4	51.8	48.4	43.8	37.3	33.2
		11	200	137	129	114	105	98	89	75	67
		14	285	282	282	267	245	229	207	176	156
	300	08	80.0	67.5	63.9	56.6	51.9	48.5	44.3	37.8	33.7
		11	200	137	130	115	105	98	90	76	68
		14	285	282	282	268	246	230	210	178	158
	330	08	80.0	67.6	64.0	56.7	52.0	48.6	44.6	38.2	34.1
		11	200	137	130	115	105	98	90	77	69
		14	285	283	283	268	246	230	211	180	160

MEMO

Output torque table

■ ZRS-Y straight axis

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 15	30	45	60	75	100	150	200
120	360	04	10.9	6.64	6.64	6.50	6.33	6.20	6.04	5.17	4.61
		05	19.9	12.3	12.3	12.1	11.7	11.5	11.2	10.8	10.0
		06	85.1	44.2	41.8	36.2	32.3	29.6	26.5	22.5	19.9
		08	164	100	100	93	83	76	68	58	51
		11	359	220	218	189	168	154	138	116	103
		14	950	444	420	363	324	297	264	222	194
90	300	04	10.2	6.67	6.31	5.45	4.87	4.46	3.98	3.39	3.02
		05	12.8	8.90	8.90	8.68	8.45	8.28	8.06	6.88	6.10
		06	63.6	35.4	33.5	28.9	25.8	23.6	21.1	17.9	15.8
		08	108	59.7	56.5	48.8	43.6	39.9	35.6	30.1	26.6
		11	331	193	182	157	140	129	115	97	85
		14	760	363	343	296	264	241	214	179	155
	360	04	10.9	7.79	7.79	7.72	7.53	7.38	7.18	6.16	5.49
		05	19.9	14.4	14.4	14.3	13.9	13.6	13.3	12.8	11.9
		06	63.6	38.9	36.9	32.3	28.9	26.5	23.6	20.1	17.8
		08	152	75.0	71.0	62.3	55.7	51.0	45.5	38.7	34.3
		11	359	258	255	224	200	183	164	139	123
		14	950	522	494	433	387	354	316	267	234
60	180	04	10.9	6.64	6.53	6.29	6.13	6.01	5.85	5.00	4.44
		05	37.9	18.9	17.6	15.0	13.4	12.3	11.0	9.3	8.2
		06	85.1	44.2	41.1	35.1	31.3	28.7	25.6	21.6	19.0
		08	164	100	99	90	81	74	66	56	49
		11	591	268	250	213	190	174	155	130	113
		14	950	444	413	352	314	286	253	210	178
	240	04	41.6	24.7	23.4	20.2	18.0	16.5	14.8	12.6	11.2
		05	67.0	41.1	38.9	33.5	30.0	27.5	24.5	20.9	18.6
		06	119	59.1	55.9	48.2	43.1	39.5	35.2	29.9	26.6
		08	262	188	186	160	143	131	117	100	89
		11	738	410	388	334	299	274	244	207	183
		14	1640	823	779	671	599	548	488	412	362
	300	04	41.6	27.2	25.8	22.7	20.3	18.6	16.6	14.2	12.6
		05	67.0	45.2	42.8	37.6	33.6	30.8	27.5	23.5	20.9
		06	129	102	102	96	86	79	70	60	54
		08	262	207	204	180	161	147	132	112	100
		11	738	451	427	375	335	307	274	233	207
		14	1640	907	859	755	674	618	551	468	414
	360	04	41.6	28.9	27.4	24.3	21.9	20.1	17.9	15.3	13.7
		05	67.0	47.9	45.4	40.2	36.3	33.2	29.7	25.3	22.6
		06	129	109	109	103	93	85	76	65	58
		08	431	268	253	224	202	185	166	141	126
		11	903	606	574	508	458	420	375	320	285
		14	2230	1190	1130	1000	900	830	740	630	560
45	180	04	10.9	7.79	7.77	7.49	7.29	7.15	6.96	5.95	5.30
		05	50.1	30.9	29.2	24.9	22.2	20.4	18.2	15.5	13.7
		06	85.1	51.8	48.9	41.7	37.2	34.1	30.4	25.8	22.8
		08	164	118	117	107	96	88	78	67	59
		11	359	258	254	217	194	177	158	133	117
		14	950	522	492	420	374	342	304	254	219
	240	04	30.6	20.0	18.9	16.5	14.7	13.5	12.1	10.3	9.2
		05	50.1	34.7	32.9	28.7	25.7	23.5	21.0	17.9	16.0
		06	85.1	58.3	55.2	48.2	43.1	39.5	35.2	30.0	26.7
		08	242	174	165	144	128	118	105	89	80
		11	591	354	335	292	261	239	213	181	161
		14	1160	745	706	616	550	503	449	380	335

Output torque table

ZRS-Y straight axis

Cam curve/MS

Indexing No.	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 15	30	45	60	75	100	150	200
45	300	04	30.6	21.3	20.2	17.9	16.1	14.7	13.2	11.2	10.0
		05	50.1	37.1	35.1	31.1	27.9	25.6	22.9	19.5	17.4
		06	85.1	62.3	59.0	52.3	47.0	43.0	38.5	32.8	29.2
		08	242	186	176	156	140	128	115	98	87
		11	591	378	358	317	285	261	233	198	176
		14	1160	798	755	669	601	550	491	417	370
	360	04	30.6	22.2	21.0	18.6	17.0	15.6	14.0	11.9	10.6
		05	50.1	38.5	36.5	32.3	29.5	27.1	24.2	20.6	18.4
		06	85.1	64.9	61.4	54.4	49.7	45.6	40.7	34.7	31.0
		08	242	194	183	162	148	136	121	104	92
		11	738	513	486	430	393	360	322	274	244
		14	1640	1040	980	870	790	730	650	550	490
30	180	04	7.19	6.13	5.81	5.03	4.49	4.12	3.68	3.13	2.79
		05	12.8	11.1	11.1	10.9	10.6	10.4	10.1	8.6	7.7
		06	25.3	21.3	21.2	20.8	20.2	19.8	19.3	18.5	17.1
		08	108	77.0	72.9	63.1	56.4	51.6	46.1	39.1	34.6
		11	225	189	189	176	157	144	128	108	95
		14	462	386	381	330	294	269	239	201	175
	240	04	10.2	8.87	8.40	7.44	6.67	6.12	5.47	4.66	4.16
		05	12.8	11.8	11.7	11.7	11.5	11.3	11.0	9.4	8.4
		06	25.3	22.8	22.8	22.8	22.3	21.8	21.2	20.4	19.0
		08	108	82.5	78.1	69.2	62.0	56.9	50.8	43.2	38.4
		11	225	203	203	192	173	158	141	120	106
		14	462	414	409	362	325	297	265	224	198
	300	04	10.2	9.14	8.66	7.66	7.02	6.43	5.75	4.90	4.38
		05	12.8	12.1	12.1	12.1	12.1	11.8	11.5	9.9	8.8
		06	25.3	23.6	23.6	23.6	23.5	23.1	22.5	21.6	20.2
		08	108	85.5	81.0	71.7	65.6	60.1	53.7	45.8	40.8
		11	225	210	210	199	182	167	149	127	113
		14	462	429	425	376	344	315	281	239	212
	360	04	10.2	9.30	8.81	7.80	7.15	6.65	5.94	5.07	4.53
		05	12.8	12.3	12.3	12.3	12.3	12.2	11.9	10.2	9.1
		06	25.3	24.1	24.1	24.1	24.1	23.9	23.3	22.4	21.0
		08	108	87.3	82.6	73.2	67.1	62.4	55.8	47.5	42.4
		11	331	280	266	235	216	200	179	153	136
		14	760	534	505	447	410	381	341	290	258

Output torque table

■ ZRS-Y flange shaft

Cam curve/MS

Oscillation angle (deg)	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m)							
				Input axis rotational speed (rpm)							
				15	30	45	60	75	100	150	200
120	360	04	10.9	6.64	6.64	6.49	6.32	6.18	6.01	5.10	4.48
		05	19.9	12.3	12.3	12.0	11.7	11.5	11.2	10.7	9.9
		06	85.1	44.2	41.8	36.2	32.3	29.6	26.4	22.4	19.7
		08	164	100	100	93	83	76	68	58	51
		11	359	220	218	188	168	154	137	115	100
		14	950	444	420	363	324	296	262	218	186
90	300	04	10.2	6.66	6.31	5.44	4.85	4.44	3.95	3.31	2.88
		05	12.8	8.90	8.90	8.67	8.44	8.26	8.02	6.80	5.96
		06	63.6	35.4	33.5	28.9	25.8	23.6	21.0	17.8	15.6
		08	108	59.7	56.5	48.7	43.5	39.8	35.4	29.8	25.9
		11	331	193	182	157	140	128	114	95	82
		14	760	362	343	295	263	240	212	175	147
	360	04	10.9	7.79	7.79	7.72	7.52	7.36	7.16	6.10	5.40
		05	19.9	14.4	14.4	14.3	13.9	13.6	13.3	12.7	11.8
		06	63.6	38.9	36.9	32.3	28.9	26.5	23.6	20.0	17.7
		08	152	75.0	71.0	62.3	55.6	51.0	45.4	38.4	33.9
		11	359	258	255	224	200	183	163	138	121
		14	950	522	494	433	386	353	314	264	229
60	180	04	10.9	6.64	6.52	6.28	6.11	5.97	5.78	4.85	4.18
		05	37.9	18.9	17.6	15.0	13.4	12.3	10.9	9.2	8.0
		06	85.1	44.2	41.1	35.1	31.3	28.6	25.5	21.4	18.6
		08	164	100	99	90	81	74	66	55	48
		11	591	268	249	213	190	173	153	127	108
		14	950	444	412	351	312	284	250	201	163
	240	04	41.6	24.7	23.4	20.2	18.0	16.5	14.7	12.5	11.1
		05	67.0	41.1	38.9	33.5	30.0	27.4	24.5	20.8	18.5
		06	119	59.1	55.9	48.2	43.0	39.4	35.2	29.8	26.3
		08	262	188	186	160	143	131	117	99	88
		11	738	410	388	334	299	273	243	206	180
		14	1640	823	778	670	598	547	486	408	354
	300	04	41.6	27.2	25.8	22.7	20.2	18.5	16.6	14.1	12.5
		05	67.0	45.2	42.8	37.6	33.6	30.8	27.5	23.4	20.8
		06	129	102	102	96	86	79	70	60	53
		08	262	207	204	180	161	147	131	112	99
		11	738	451	427	375	335	307	274	232	206
		14	1640	907	859	754	674	617	550	465	409
	360	04	41.6	28.9	27.4	24.3	21.9	20.1	17.9	15.3	13.6
		05	67.0	47.9	45.4	40.2	36.2	33.2	29.7	25.3	22.6
		06	129	109	109	103	93	85	76	65	58
		08	431	268	253	224	202	185	166	141	126
		11	903	606	574	508	458	420	375	319	283
		14	2230	1190	1130	1000	900	830	740	630	550
45	180	04	10.9	7.79	7.76	7.48	7.28	7.12	6.91	5.85	5.11
		05	50.1	30.9	29.1	24.9	22.2	20.3	18.1	15.4	13.6
		06	85.1	51.8	48.8	41.7	37.2	34.1	30.4	25.6	22.5
		08	164	118	117	107	96	88	78	66	58
		11	359	258	254	217	193	177	157	131	113
		14	950	522	492	419	373	341	301	248	208
	240	04	30.6	20.0	18.9	16.5	14.7	13.5	12.1	10.2	9.1
		05	50.1	34.7	32.9	28.7	25.6	23.5	21.0	17.8	15.8
		06	85.1	58.3	55.2	48.2	43.1	39.4	35.2	29.9	26.5
		08	242	174	165	144	128	118	105	89	79
		11	591	354	335	292	261	239	213	180	158
		14	1160	745	705	615	549	503	447	376	329

Output torque table

ZRS-Y flange shaft

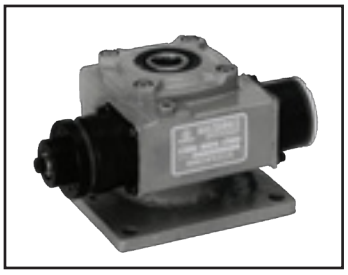
Cam curve/MS

Oscillation angle (deg)	Total allocated angle (deg)	Size	Static rating Output torque (N·m)	Dynamic rated output torque (N·m) Input axis rotational speed (rpm) 15	30	45	60	75	100	150	200
45	300	04	30.6	21.3	20.2	17.9	16.1	14.7	13.2	11.2	10.0
		05	50.1	37.1	35.1	31.1	27.9	25.6	22.9	19.5	17.3
		06	85.1	62.3	59.0	52.3	47.0	43.0	38.4	32.7	29.1
		08	242	186	176	156	140	128	115	98	87
		11	591	378	358	317	285	261	233	197	175
		14	1160	798	755	668	601	550	490	415	366
	360	04	30.6	22.2	21.0	18.6	17.0	15.6	13.9	11.9	10.6
		05	50.1	38.5	36.5	32.3	29.5	27.1	24.2	20.6	18.4
		06	85.1	64.9	61.4	54.4	49.7	45.5	40.7	34.7	30.9
		08	242	194	183	162	148	136	121	103	92
		11	738	513	486	430	393	360	322	274	243
		14	1640	1040	980	870	790	730	650	550	490
30	180	04	7.19	6.13	5.80	5.02	4.48	4.10	3.65	3.06	2.66
		05	12.8	11.1	11.1	10.8	10.6	10.3	10.0	8.5	7.5
		06	25.3	21.3	21.2	20.8	20.2	19.8	19.2	18.4	16.9
		08	108	77.0	72.9	63.1	56.3	51.6	45.9	38.8	34.0
		11	225	189	189	176	157	143	127	107	93
		14	462	386	381	330	294	268	238	197	167
	240	04	10.2	8.87	8.40	7.43	6.67	6.11	5.45	4.62	4.09
		05	12.8	11.8	11.7	11.7	11.5	11.3	10.9	9.3	8.3
		06	25.3	22.8	22.8	22.8	22.2	21.8	21.2	20.3	18.9
		08	108	82.5	78.1	69.1	62.0	56.8	50.7	43.0	38.1
		11	225	203	203	192	172	158	141	119	105
		14	462	414	409	362	324	297	264	222	194
	300	04	10.2	9.14	8.65	7.66	7.01	6.43	5.74	4.88	4.33
		05	12.8	12.1	12.1	12.1	12.1	11.8	11.5	9.8	8.8
		06	25.3	23.6	23.6	23.6	23.5	23.1	22.4	21.6	20.1
		08	108	85.5	81.0	71.7	65.6	60.1	53.7	45.7	40.6
		11	225	210	210	199	182	167	149	127	112
		14	462	429	424	376	344	315	281	237	209
	360	04	10.2	9.30	8.80	7.80	7.15	6.65	5.94	5.05	4.50
		05	12.8	12.3	12.3	12.3	12.3	12.2	11.9	10.2	9.1
		06	25.3	24.1	24.1	24.1	24.1	23.9	23.3	22.4	20.9
		08	108	87.3	82.6	73.2	67.1	62.4	55.7	47.5	42.3
		11	331	280	266	235	216	200	179	152	135
		14	760	534	505	447	410	381	340	289	256

Option

Mechanical indexer

CONTENTS



Option

Worm reducer
HO32 to 80

Features

1. Mechanical indexer performance

Mechanical indexer dedicated worm reducer. Direct installation onto the input shaft enables an ideal rotation and braking operation, as well as full performance of each Mechanical indexer Series.

2. Space saving

By directly installing on the input shaft, the drive part can be made compact.
In addition, work-hours for driving part design and assembly can be reduced.

3. Clutch/brake equipment

Select between type with clutch/brake and type without clutch/brake.

4. 5 sizes in series

Mechanical indexer size enables standardized series variations.

Standard mounted worm reducer list

Standard mounting combinations are shown below.
Check the reducer load torque (Ter) and worm reducer rated output torque before use.

Body model No.		HO reducer Size	Reduction ratio Values in ( ) are for special speed ratio
ZRS	04	**HO32**	1/20, 1/40, 1/60, (1/30, 1/50)
	05	**HO32**	1/20, 1/40, 1/60, (1/30, 1/50)
	06	**HO40**	1/20, 1/40, 1/60, (1/30, 1/50)
	08	**HO50**	1/20, 1/40, 1/60, (1/30, 1/50)
	11	**HO60**	1/20, 1/40, 1/60, (1/30, 1/50)
	14	**HO80**	1/20, 1/40, 1/60, (1/30, 1/50)

How to order

HO50 – 1/40 – Y – A – 5
1 2 3 4 5

1 Model

HO32
HO40
HO50
HO60
HO80

2 Reduction ratio

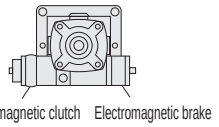
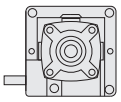
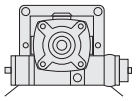
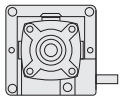
1/20
1/30
1/40
1/50
1/60

3 With/without clutch brake

Y	With clutch brake
N	Without clutch brake

Note) The deceleration ratio of 1/30 and 1/50 is a special speed ratio, so check the delivery date.

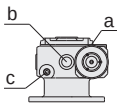
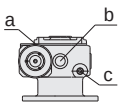
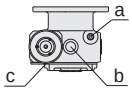
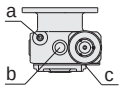
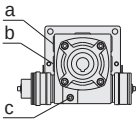
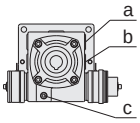
4 Worm axis layout

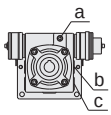
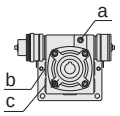
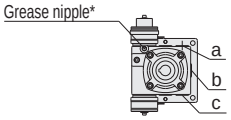
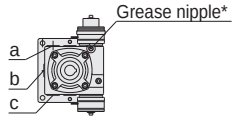
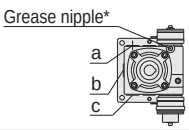
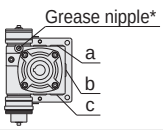
	With clutch brake	Without clutch brake
A	 Electromagnetic clutch Electromagnetic brake	
B	 Electromagnetic brake Electromagnetic clutch	

* A: Input axis on the left axis toward you, B: Input axis on the right axis toward you

5 Reducer orientation

Direction of gravity

	Worm Axis Layout-A	Worm Axis Layout-B
1		
2		
3		

	Worm Axis Layout-A	Worm Axis Layout-B
4		
5	 Grease nipple*	 Grease nipple*
6	 Grease nipple*	 Grease nipple*

a: Lubrication port b: Oil level indicator c: Oil discharge port

* Grease nipple is included at shipment.

Option

Worm reducer [HO32]

Characteristics table

Standard mounting body		ZRS-04/05				
Reduction ratio ( ) is the special speed ratio		1/20, 1/40, 1/60, (1/30, 1/50)				
Internal moment of inertia (converted to input axis)		1/20	(1/30)	1/40	(1/50)	1/60
		4.28×10^{-6}kg·m^2	3.60×10^{-6}kg·m^2	3.95×10^{-6}kg·m^2	2.88×10^{-6}kg·m^2	3.88×10^{-6}kg·m^2
Input shaft max. rotation speed		1800rpm				
Input axis allowable OHL	With C/B	78.5 N				
	Without C/B	147 N				
Internal friction torque (Tinr) ISO viscosity grade VG320	5°C (5500mm^2/s)	0.3 N·m				
	10°C (3200mm^2/s)	0.24 N·m				
	15°C (2000mm^2/s)	0.19 N·m				
	20°C (1400mm^2/s)	0.16 N·m				
	30°C (650 mm^2/s)	0.12 N·m				
	40°C (320 mm^2/s)	0.084 N·m				
Weight	With C/B	5.0 kg				
	Without C/B	4.0 kg				
Lubricant (at shipment)		Bonnock TS320 (ENEOS)				
Oil amount		0.05 to 0.10ℓ				
Worm torsion direction		Right torsion				

Clutch/brake characteristics table

		Clutch (102-04-13-K-35G)	Brake (112-04-12-K-35G)
Kinematic friction torque		1.2 N·m	1.2 N·m
Rotary moment of inertia		1.41×10^{-5}kg·m^2	-
Armature moment of inertia		4.38×10^{-6}kg·m^2	6.15×10^{-6}kg·m^2
Excitation voltage		24 VDC	24 VDC
Coil (20°C)	Current	0.33A	0.33A
	Capacity	8 W	8 W
	Resistance	72 Ω	72 Ω

Rated output torque (N·m)

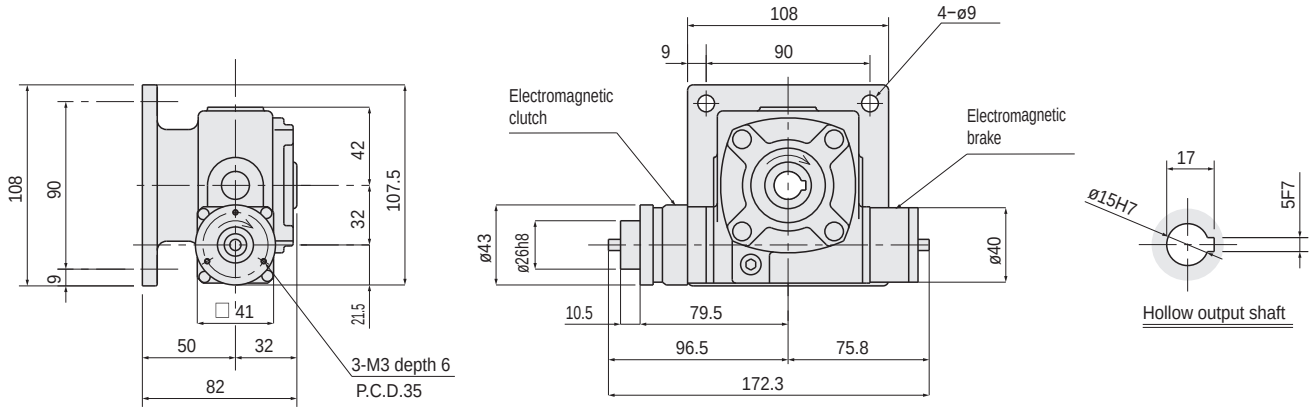
Reduction ratio / Input rpm		1/20	(1/30)	1/40	(1/50)	1/60
1800	With C/B	17	22	22	23	19
	Without C/B	20	26	22	23	19
1700	With C/B	17	22	22	23	19
	Without C/B	21	27	22	23	19
1600	With C/B	17	22	23	23	19
	Without C/B	21	27	23	23	19
1500	With C/B	16	22	23	24	20
	Without C/B	22	28	23	24	20
1400	With C/B	16	22	24	24	20
	Without C/B	22	28	24	24	20
1300	With C/B	16	22	25	25	21
	Without C/B	23	29	25	25	21
1200	With C/B	16	22	25	26	21
	Without C/B	23	30	25	26	21
1100	With C/B	16	22	25	26	21
	Without C/B	24	31	26	26	21
1000	With C/B	16	21	25	27	21
	Without C/B	25	32	26	27	21

Efficiency (%)

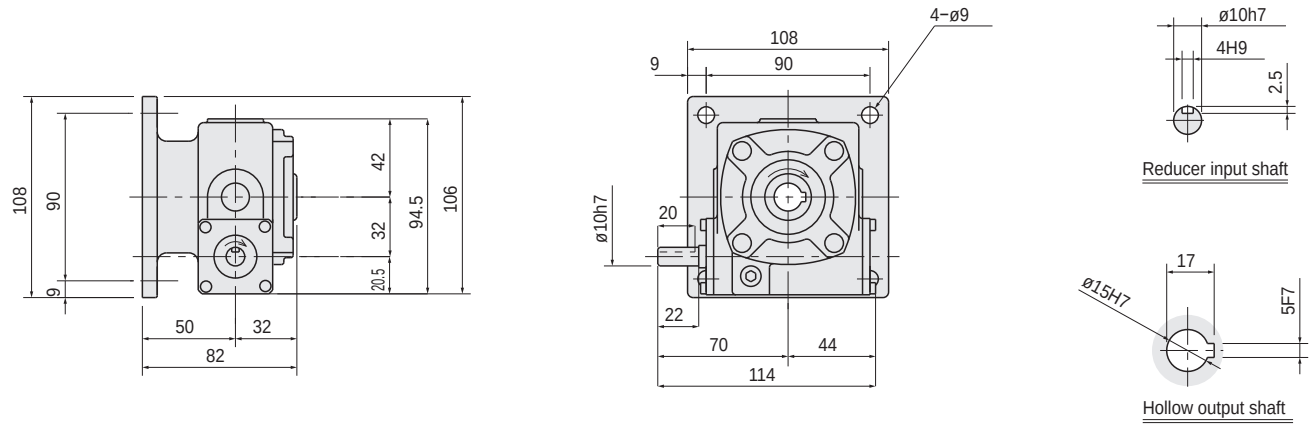
Reduction ratio / Input rpm	1/20	(1/30)	1/40	(1/50)	1/60
1800	69	62	57	54	48
1700	69	61	56	54	47
1600	69	61	56	53	47
1500	68	61	55	53	47
1400	68	60	55	53	46
1300	68	60	55	52	46
1200	67	60	54	51	45
1100	67	59	53	50	44
1000	66	58	52	50	43

Dimensions

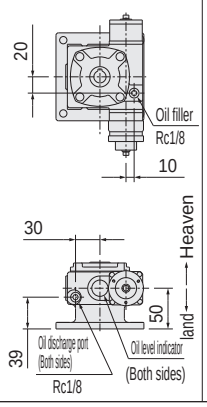
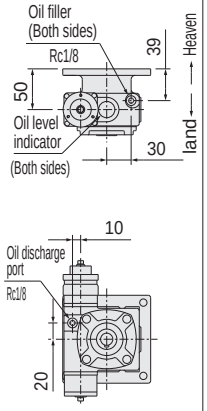
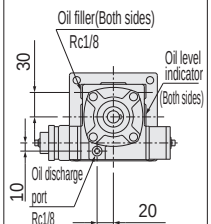
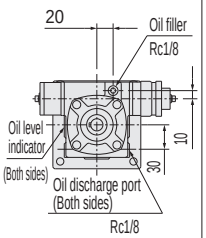
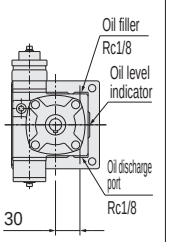
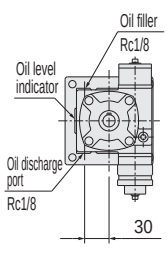
With C/B



Without C/B



Oil level indicator position and supply/exhaust port according to HO reducer mounting orientation

Orientation	1	2	3	4	5	6
Dimensions						

Option

Worm reducer [HO40]

Characteristics table

Standard mounting body		ZRS-06				
Reduction ratio ( ) is the special speed ratio		1/20, 1/40, 1/60, (1/30, 1/50)				
Internal moment of inertia (converted to input axis)		1/20	(1/30)	1/40	(1/50)	1/60
		1.44×10^{-5}kg·m^2	1.33×10^{-5}kg·m^2	1.32×10^{-5}kg·m^2	1.15×10^{-5}kg·m^2	1.23×10^{-5}kg·m^2
Input shaft max. rotation speed		1800rpm				
Input axis allowable OHL	With C/B	104 N				
	Without C/B	196 N				
Internal friction torque (Tinr) ISO viscosity grade VG320	5°C(5500mm^2/s)	0.53 N·m				
	10°C(3200mm^2/s)	0.42 N·m				
	15°C(2000mm^2/s)	0.34 N·m				
	20°C(1400mm^2/s)	0.29 N·m				
	30°C(650 mm^2/s)	0.20 N·m				
	40°C(320 mm^2/s)	0.15 N·m				
Weight	With C/B	6.0 kg				
	Without C/B	5.0 kg				
Lubricant (at shipment)		Bonnock TS320 (ENEOS)				
Oil amount		0.10 to 0.15ℓ				
Worm torsion direction		Right torsion				

Clutch/brake characteristics table

		Clutch (102-05-13-K-35G)	Brake (112-05-12-K-35G)
Kinematic friction torque		2.4 N·m	2.4 N·m
Rotary moment of inertia		3.15×10^{-5}kg·m^2	-
Armature moment of inertia		9.08×10^{-6}kg·m^2	1.38×10^{-5}kg·m^2
Excitation voltage		24 VDC	24 VDC
Coil (20°C)	Current	0.42A	0.42A
	Capacity	10 W	10 W
	Resistance	58 Ω	58 Ω

Rated output torque (N·m)

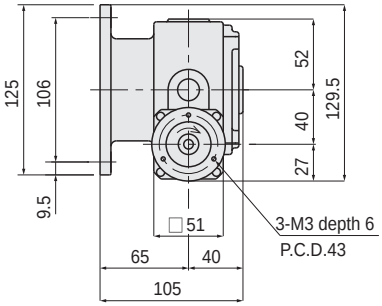
Reduction ratio / Input rpm		1/20	(1/30)	1/40	(1/50)	1/60
1800	With C/B	34	46	42	41	33
	Without C/B	35	47	42	41	33
1700	With C/B	34	45	42	42	33
	Without C/B	36	48	42	42	33
1600	With C/B	34	45	43	43	34
	Without C/B	37	49	43	43	34
1500	With C/B	34	45	44	43	35
	Without C/B	38	51	44	43	35
1400	With C/B	33	45	46	45	35
	Without C/B	39	52	46	45	35
1300	With C/B	33	44	47	46	36
	Without C/B	40	53	47	46	36
1200	With C/B	33	44	48	47	37
	Without C/B	41	54	48	47	37
1100	With C/B	33	43	49	48	38
	Without C/B	43	56	49	48	38
1000	With C/B	33	43	51	50	39
	Without C/B	44	57	51	50	39

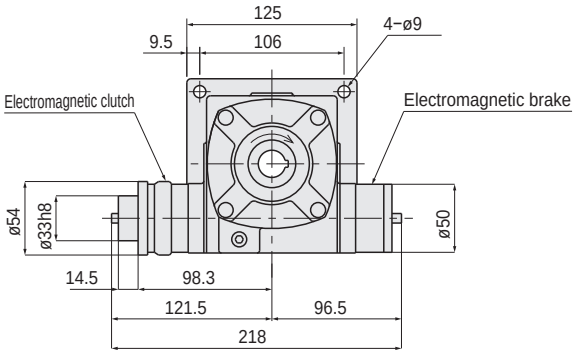
Efficiency (%)

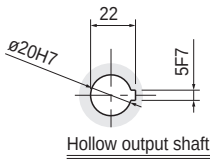
Reduction ratio / Input rpm	1/20	(1/30)	1/40	(1/50)	1/60
1800	71	64	61	56	50
1700	70	63	60	55	49
1600	70	63	60	55	49
1500	70	62	59	54	48
1400	69	62	59	54	48
1300	69	61	58	54	47
1200	68	61	58	53	47
1100	68	60	57	53	46
1000	68	60	56	52	46

Dimentions

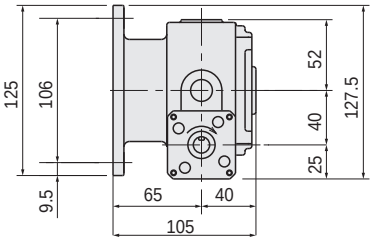
With C/B

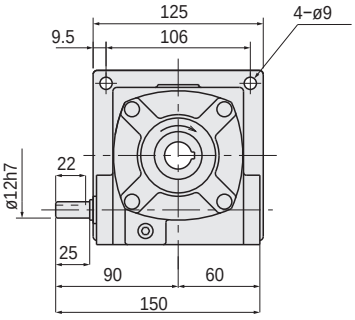


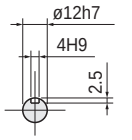


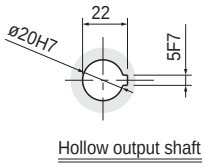


Without C/B

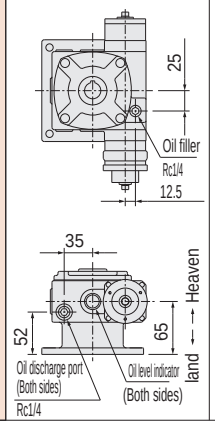
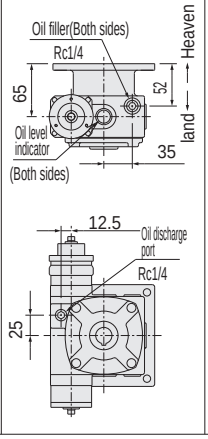
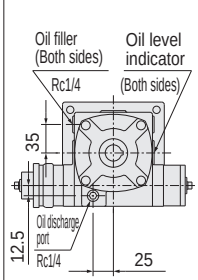
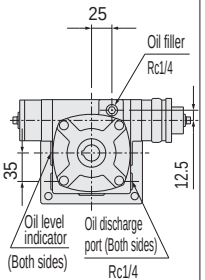
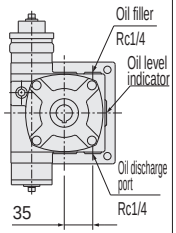
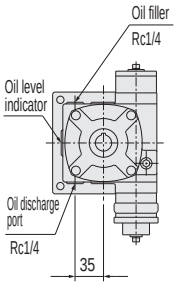








Oil level indicator position and supply/exhaust port according to HO reducer mounting orientation

Orientation	1	2	3	4	5	6
Dimensions						

Option

Worm reducer [HO50]

Characteristics table

Standard mounting body		ZRS-08				
Reduction ratio		1/20, 1/40, 1/60, (1/30, 1/50)				
Internal moment of inertia (converted to input axis)		1/20	1/30	1/40	1/50	1/60
		1.79×10^{-5}kg·m^2	3.15×10^{-5}kg·m^2	1.48×10^{-5}kg·m^2	3.17×10^{-5}kg·m^2	1.23×10^{-5}kg·m^2
Input shaft max. rotation speed		1800rpm				
Input axis allowable OHL	With C/B	196 N				
	Without C/B	491 N				
Internal friction torque (Tinr) ISO viscosity grade VG320	5°C (5500mm^2/s)	0.92 N·m				
	10°C (3200mm^2/s)	0.72 N·m				
	15°C (2000mm^2/s)	0.59 N·m				
	20°C (1400mm^2/s)	0.50 N·m				
	30°C (650 mm^2/s)	0.35 N·m				
	40°C (320 mm^2/s)	0.26 N·m				
Weight	With C/B	9.5 kg				
	Without C/B	8.0 kg				
Lubricant (at shipment)		Bonnock TS320 (ENEOS)				
Oil amount		0.2ℓ				
Worm torsion direction		Right torsion				

Clutch/brake characteristics table

		Clutch (101-06-15-K-35G)	Brake (111-06-12-K-35G)
Static friction torque		5.5 N·m	5.5 N·m
Kinematic friction torque		5.0 N·m	5.0 N·m
Rotary moment of inertia		7.35×10^{-5}kg·m^2	-
Armature moment of inertia		1.05×10^{-4}kg·m^2	6.03×10^{-5}kg·m^2
Excitation voltage		24 VDC	24 VDC
Coil (20°C)	Current	0.46A	0.46A
	Capacity	11 W	11 W
	Resistance	52 Ω	52 Ω

Rated output torque (N·m)

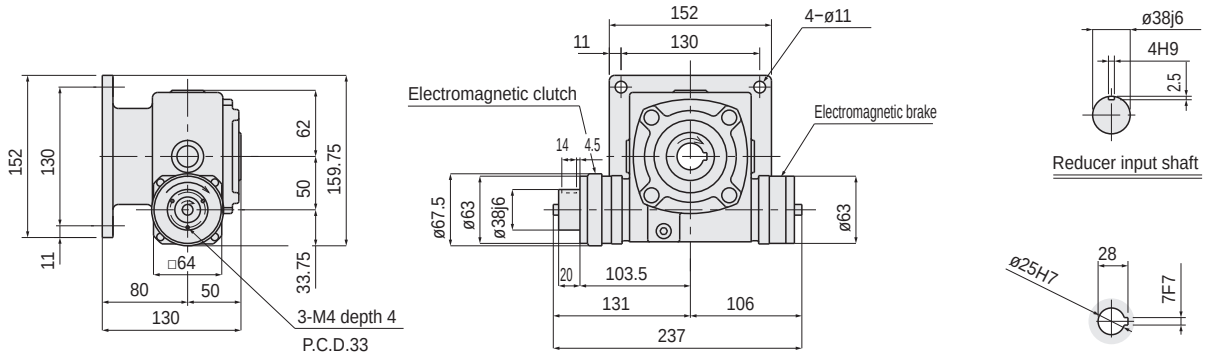
Reduction ratio / Input rpm		1/20	(1/30)	1/40	(1/50)	1/60
1800	With C/B	64	70	68	56	59
	Without C/B	64	70	68	56	59
1700	With C/B	65	72	69	57	60
	Without C/B	65	72	69	57	60
1600	With C/B	66	73	70	58	61
	Without C/B	66	73	70	58	61
1500	With C/B	68	74	72	59	63
	Without C/B	68	74	72	59	63
1400	With C/B	70	76	74	61	64
	Without C/B	70	76	74	61	64
1300	With C/B	72	77	76	62	66
	Without C/B	72	77	76	62	66
1200	With C/B	72	79	77	64	67
	Without C/B	75	79	77	64	67
1100	With C/B	72	81	79	65	69
	Without C/B	77	81	79	65	69
1000	With C/B	72	84	81	67	71
	Without C/B	78	84	81	67	71

Efficiency (%)

Reduction ratio / Input rpm	1/20	(1/30)	1/40	(1/50)	1/60
1800	75	67	64	57	58
1700	74	66	64	56	57
1600	74	65	63	55	57
1500	74	65	63	54	56
1400	73	64	62	54	56
1300	73	63	62	53	55
1200	72	63	61	52	55
1100	72	62	61	52	54
1000	72	61	60	51	53

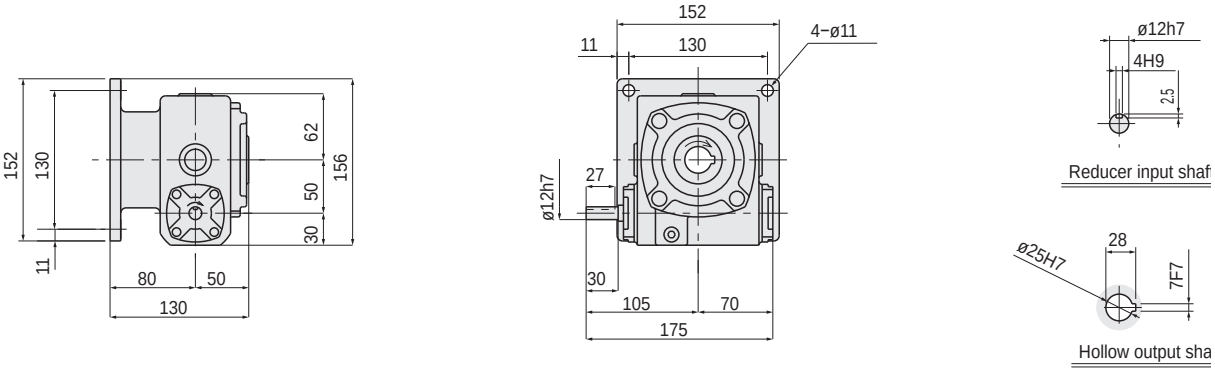
Dimentions

With C/B

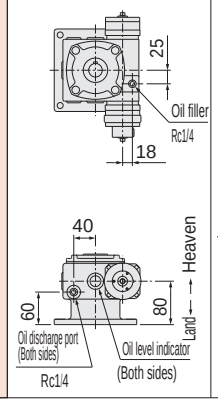
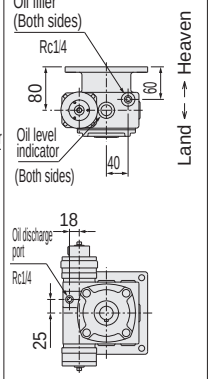
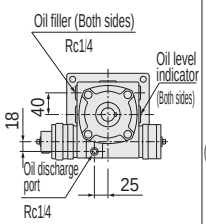
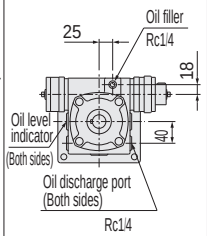
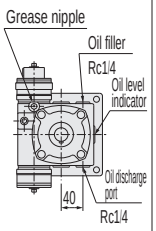
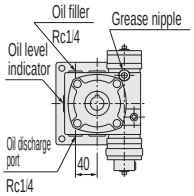


* The positional relationship between the key groove and the 3-M4 screw is arbitrary.

Without C/B



Oil level indicator position and supply/exhaust port according to HO reducer mounting orientation

Orientation	1	2	3	4	5	6
Dimensions						

Option

Worm reducer [HO60]

Characteristics table

Standard mounting body		ZRS-11				
Reduction ratio		1/20, 1/40, 1/60, (1/30, 1/50)				
Internal moment of inertia (converted to input axis)		1/20	1/30	1/40	1/50	1/60
		5.64×10^{-5}kg·m^2	7.19×10^{-5}kg·m^2	5.13×10^{-5}kg·m^2	4.85×10^{-5}kg·m^2	2.48×10^{-5}kg·m^2
Input shaft max. rotation speed		1800rpm				
Input axis allowable OHL	With C/B	294 N				
	Without C/B	785 N				
Internal friction torque (Tinr) ISO viscosity grade VG320	5°C (5500mm^2/s)	1.5 N·m				
	10°C (3200mm^2/s)	1.1 N·m				
	15°C (2000mm^2/s)	0.93 N·m				
	20°C (1400mm^2/s)	0.79 N·m				
	30°C (650 mm^2/s)	0.56 N·m				
	40°C (320 mm^2/s)	0.41 N·m				
Weight	With C/B	14.5 kg				
	Without C/B	11.0 kg				
Lubricant (at shipment)		Bonnock TS320 (ENEOS)				
Oil amount		0.3ℓ				
Worm torsion direction		Right torsion				

Clutch/brake characteristics table

		Clutch (101-08-15-K-35G)	Brake (111-08-12-K-35G)
Static friction torque		11 N·m	11 N·m
Kinematic friction torque		10 N·m	10 N·m
Rotary moment of inertia		2.24×10^{-4}kg·m^2	-
Armature moment of inertia		3.00×10^{-4}kg·m^2	1.71×10^{-4}kg·m^2
Excitation voltage		24 VDC	24 VDC
Coil (20°C)	Current	0.63A	0.63A
	Capacity	15 W	15 W
	Resistance	38 Ω	38 Ω

Rated output torque (N·m)

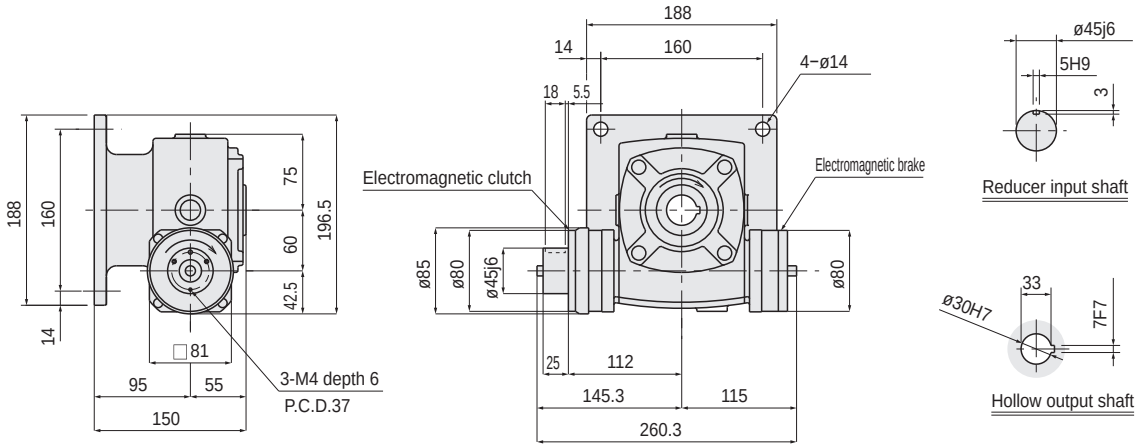
Reduction ratio / Input rpm		1/20	(1/30)	1/40	(1/50)	1/60
1800	With C/B	90	112	99	101	95
	Without C/B	90	112	99	101	95
1700	With C/B	92	115	101	103	97
	Without C/B	92	115	101	103	97
1600	With C/B	93	118	103	105	99
	Without C/B	93	118	103	105	99
1500	With C/B	96	120	106	107	101
	Without C/B	96	120	106	107	101
1400	With C/B	99	123	108	109	103
	Without C/B	99	123	108	109	103
1300	With C/B	102	126	111	112	106
	Without C/B	102	126	111	112	106
1200	With C/B	105	128	114	115	108
	Without C/B	105	128	114	115	108
1100	With C/B	108	131	117	119	111
	Without C/B	108	131	117	119	111
1000	With C/B	111	136	121	122	114
	Without C/B	111	136	121	122	114

Efficiency (%)

Reduction ratio / Input rpm	1/20	(1/30)	1/40	(1/50)	1/60
1800	74	68	63	63	60
1700	74	68	63	62	59
1600	73	67	62	62	59
1500	73	67	61	61	58
1400	72	66	60	61	58
1300	71	65	60	60	57
1200	71	64	59	60	57
1100	70	63	58	59	56
1000	70	63	57	58	56

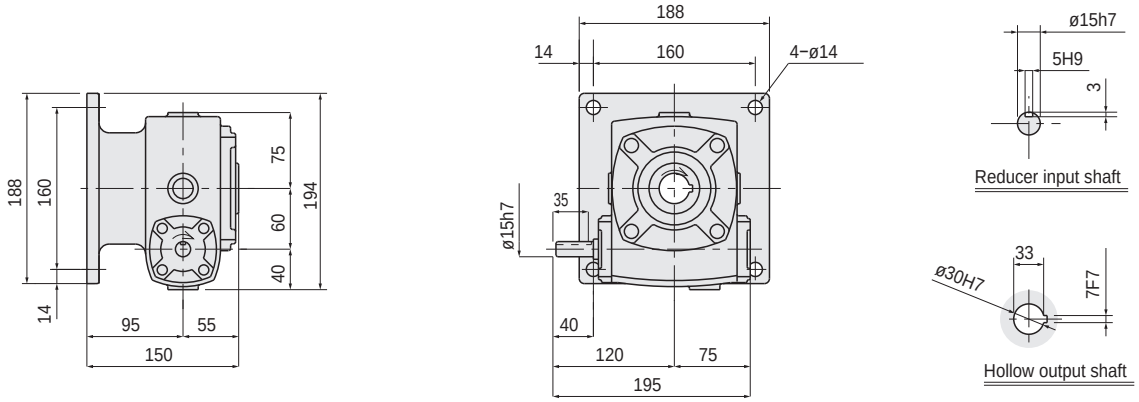
Dimentions

With C/B

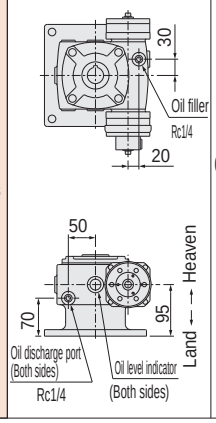
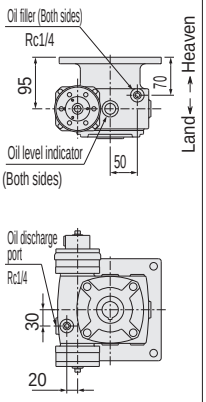
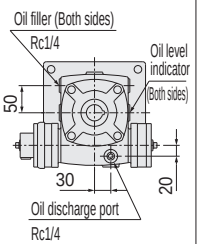
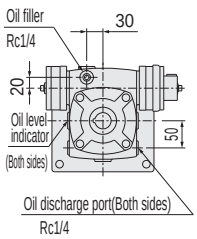
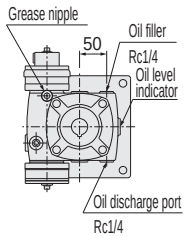
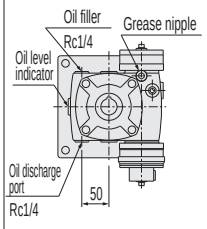


*The positional relationship between the key groove and the 3-M4 screw is arbitrary.

Without C/B



Oil level indicator position and supply/exhaust port according to HO reducer mounting orientation

Orientation	1	2	3	4	5	6
Dimensions						

Option

WormReducer [HO80]

Characteristics table

Standard mounting body		ZRS-14				
Reduction ratio		1/20, 1/40, 1/60, (1/30, 1/50)				
Internal moment of inertia (converted to input axis)		1/20	1/30	1/40	1/50	1/60
		2.65×10^{-4}kg·m^2	3.20×10^{-4}kg·m^2	2.46×10^{-4}kg·m^2	2.44×10^{-4}kg·m^2	1.62×10^{-4}kg·m^2
Input shaft max. rotation speed		1800rpm				
Input axis allowable OHL	With C/B	687 N				
	Without C/B	1570 N				
Internal friction torque (Tinr) ISO viscosity grade VG320	5°C (5500mm^2/s)	2.9 N·m				
	10°C (3200mm^2/s)	2.2 N·m				
	15°C (2000mm^2/s)	1.8 N·m				
	20°C (1400mm^2/s)	1.4 N·m				
	30°C (650 mm^2/s)	1.0 N·m				
	40°C (320 mm^2/s)	0.73 N·m				
Weight	With C/B	35.0 kg				
	Without C/B	30.0 kg				
Lubricant (at shipment)		Bonnock TS320 (ENEOS)				
Oil amount		0.7 to 1.0ℓ				
Worm torsion direction		Right torsion				

Clutch/brake characteristics table

		Clutch (101-10-15-K-35G)	Brake (111-10-12-K-35G)
Static friction torque		22 N·m	22 N·m
Kinematic friction torque		20 N·m	20 N·m
Rotary moment of inertia		6.78×10^{-4}kg·m^2	-
Armature moment of inertia		9.45×10^{-4}kg·m^2	6.63×10^{-4}kg·m^2
Excitation voltage		24 VDC	24 VDC
Coil (20°C)	Current	0.83A	0.83A
	Capacity	20 W	20 W
	Resistance	29 Ω	29 Ω

Rated output torque (N·m)

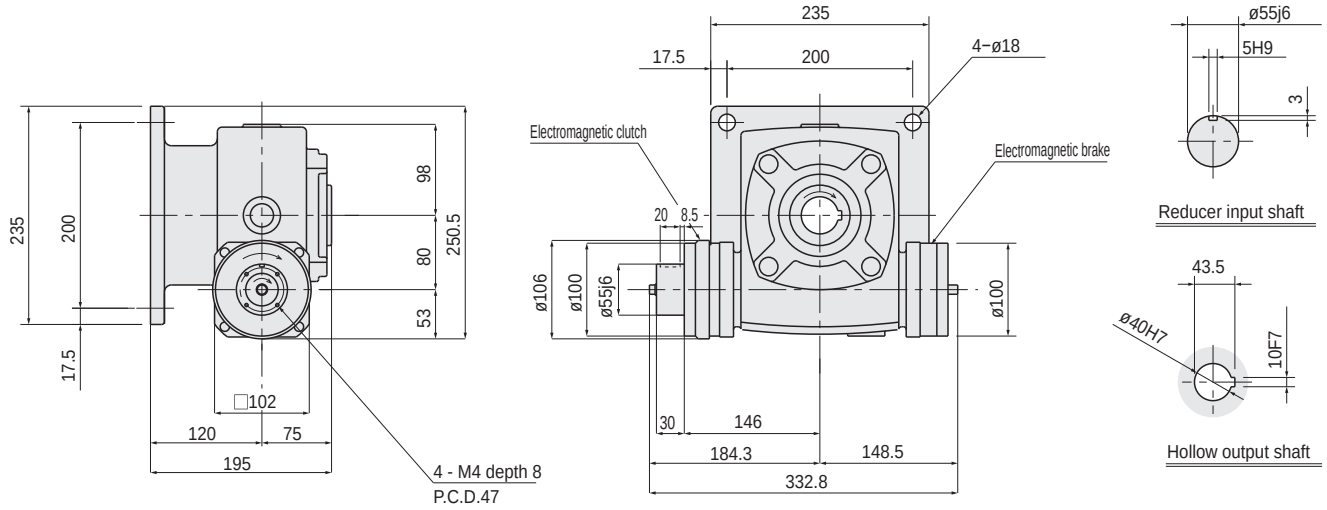
Reduction ratio / Input rpm		1/20	(1/30)	1/40	(1/50)	1/60
1800	With C/B	190	237	210	207	195
	Without C/B	190	237	210	207	195
1700	With C/B	195	242	214	211	200
	Without C/B	195	242	214	211	200
1600	With C/B	200	247	219	217	206
	Without C/B	200	247	219	217	206
1500	With C/B	206	253	225	222	211
	Without C/B	206	253	225	222	211
1400	With C/B	211	260	231	229	215
	Without C/B	211	260	231	229	215
1300	With C/B	216	268	237	233	219
	Without C/B	216	268	237	233	219
1200	With C/B	225	275	245	239	223
	Without C/B	225	275	245	239	223
1100	With C/B	232	284	252	244	230
	Without C/B	232	284	252	244	230
1000	With C/B	238	293	259	252	237
	Without C/B	238	293	259	252	237

Efficiency (%)

Reduction ratio / Input rpm	1/20	(1/30)	1/40	(1/50)	1/60
1800	75	70	65	63	61
1700	75	69	64	63	60
1600	75	69	64	62	60
1500	74	69	64	62	60
1400	74	68	63	61	59
1300	74	68	63	61	58
1200	73	67	62	59	57
1100	73	66	61	58	56
1000	72	65	60	57	55

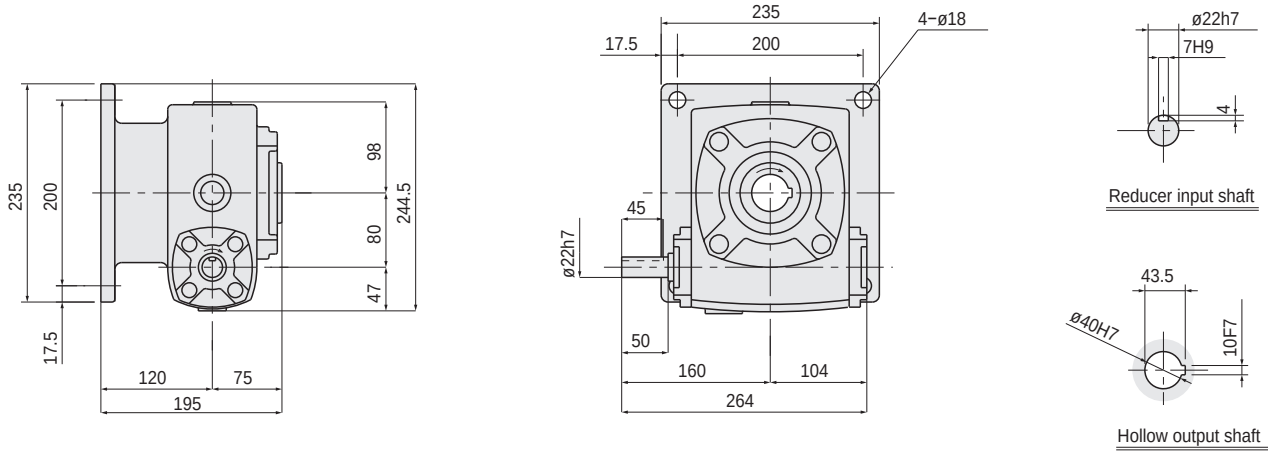
Dimentions

With C/B

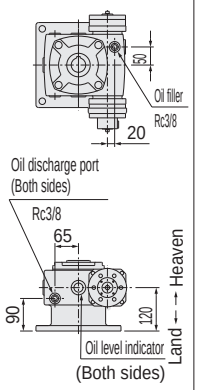
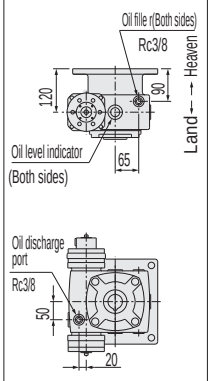
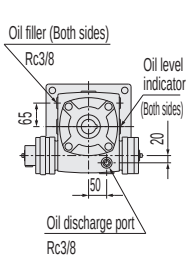
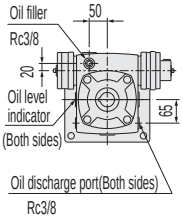
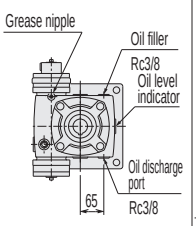
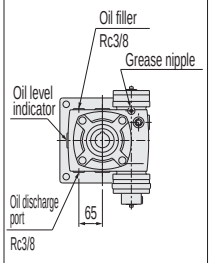


*The positional relationship between the key groove and the 4-M4 screw is arbitrary.

Without C/B



Oil level indicator position and supply/exhaust port according to HO reducer mounting orientation

Orientation	1	2	3	4	5	6
Dimentions						

Option

Torque saver TSF

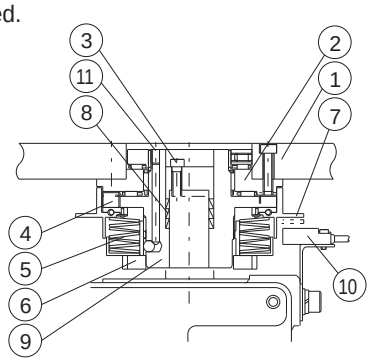
Overload protection device (for table mounting)

Features

1. High return accuracy
2. High rotation rigidity
3. Reliably released during overload
4. Release torque can be adjusted continuously
5. Equipped with one-point setting function
6. Overload detection possible (in combination with proximity switch)
7. Higher thrust and radial rigidity

Operational overview

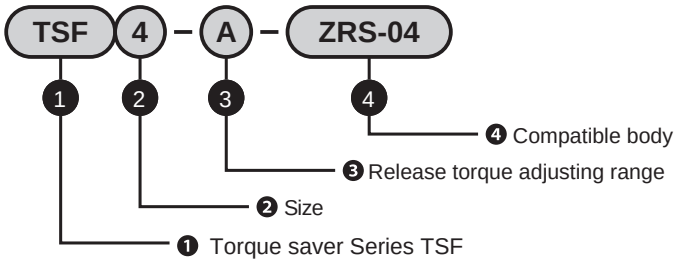
The release torque is adjusted by changing the pressure of the ⑤ spring with the ⑥ adjusting nut. When an overload exceeding the release torque occurs on the table ①, the roller ④ held in the groove of the drive plate ② is pushed out of the groove by the spring pressure ⑤, and the torque transmitted from the output shaft is cut off. At this time, the ⑦ pusher plate moves and can be detected by the ⑩ proximity switch. After the overload is removed, the table automatically returns to its original position when the table is manually rotated.



Mechanical indexer

①	Table	⑦	Pusher plate
②	Drive plate	⑧	Taper ring
③	Hexagon socket head cap screw	⑨	Drive boss
④	Roller	⑩	Proximity switch
⑤	Spring	⑪	Lock pin
⑥	Adjusting nut		

How to order (when ordering separately without a torque saver mounted on the Mechanical indexer)



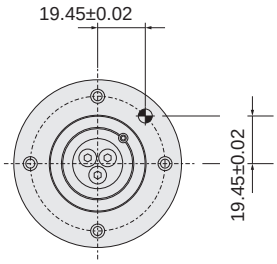
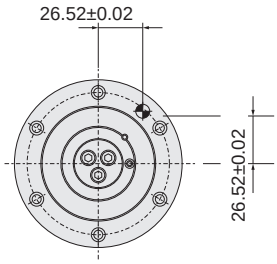
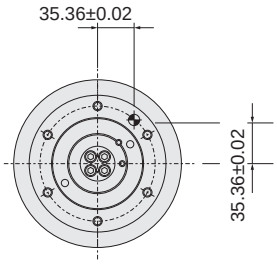
Body model No.		Torque saver
ZRS	04	**TSF4**
		TSF5
	05	**TSF5**
		TSF6
	06	**TSF6**
	08	**TSF8**
	11	**TSF11**
	14	**TSF14**

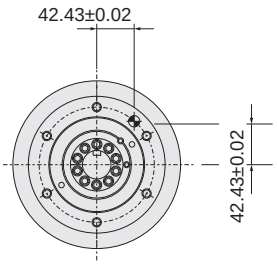
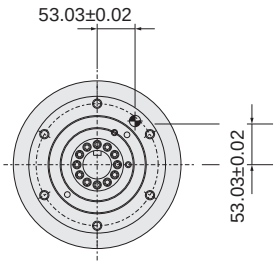
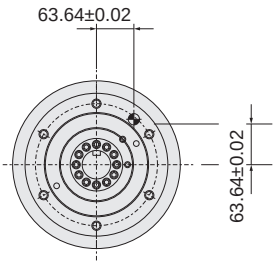
Refer to the table at right for the applicable body of ❹.

(CAUTION)

* When ordering a torque saver as a Discrete unit, please confirm the model number of the main unit to be installed. The applicable main unit shown on the TSF nameplate is uniformly listed as "ZRS-□□□" according to the shaft hole diameter, which may differ from the main unit to be installed.
* When ordering the torque saver as a Discrete unit, please pay attention to the output shaft specifications of the main unit to which the torque saver will be attached.
* Depending on the specifications, the appropriate release torque may not be set even if the Torque Saver is installed. Please confirm that the release torque of the torque saver does not exceed the dynamic rated output torque of the Mechanical indexer. If there is any problem, please contact CKD at the time of model selection.

Positioning pin hole dimension (made to order)

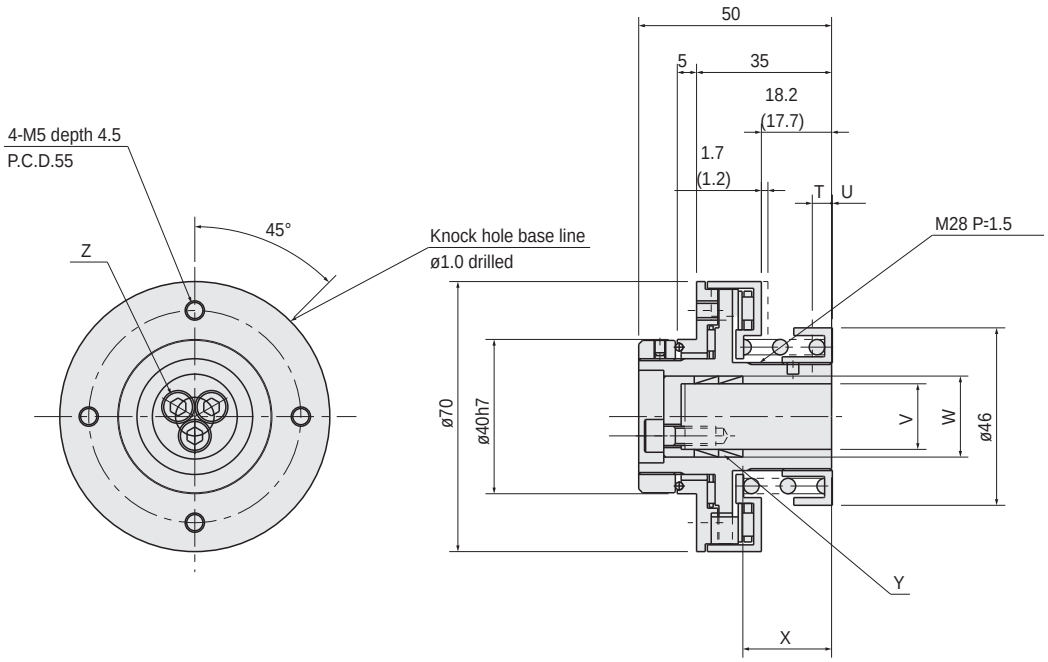
Size	TSF4	TSF5	TSF6
Pitch			
Reference hole diameter	ø5H7 depth 3 P.C.D.55	ø6H7 depth 5 P.C.D.75	ø6H7 depth 7 P.C.D.100

Size	TSF8	TSF11	TSF14
Pitch			
Reference hole diameter	ø8H7 depth 7 P.C.D.120	ø10H7 depth 11 P.C.D.150	ø12H7 depth 12 P.C.D.180

Option

Torque saver [TSF4]

Dimentions



Note) Dimensions in ( ) indicate dimensions for models A and C.

Model	Release torque Adjusting range (N·m)		Allowable thrust force (N)	Allowable radial force (N)	Allowable bending moment (N·m)	Moment of inertia ($kg·m^2$)	Weight (kg)	Torque change amount per rotation of the adjusting nut (N·m)	T	U
TSF4	A	1.47 to 4.91	392	196	9.81	$2.65×10^{-4}$	0.56	1.47	5.3	0.7
	B	1.96 to 7.85						2.94	5.8	0.2
	C	2.94 to 12.8						3.24	5.3	0.7
	D	5.40 to 21.6						5.89	5.8	0.2

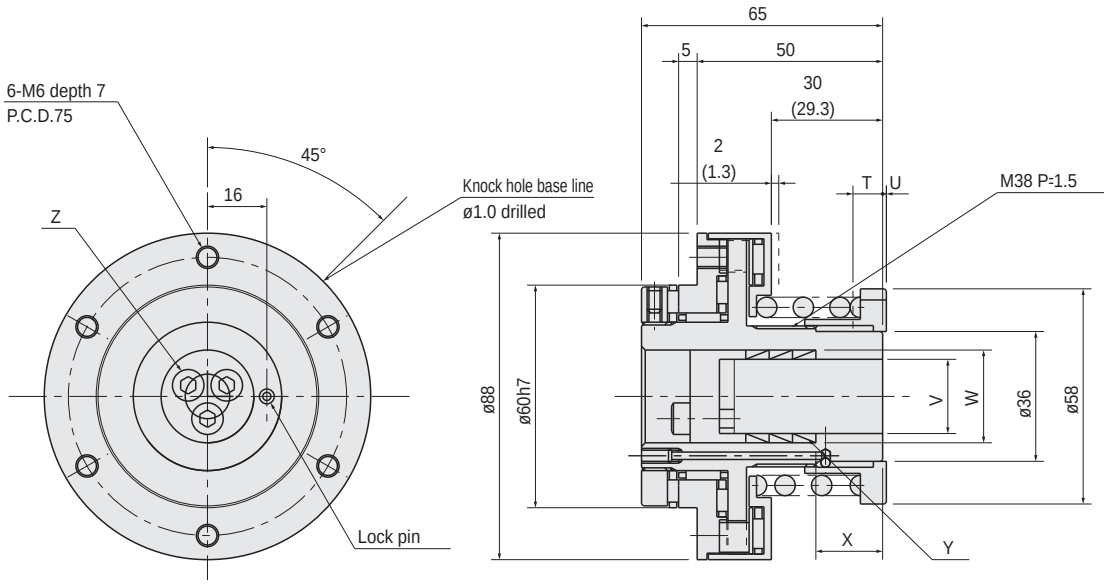
Compatible body	V	W	X	Y	Z	Shaft end mounting hole
ZRS-04	ø17 $^{+0.02}_{0}$	ø21H7	23	2−17×21(S)	3-M5 Special hexagon socket head cap screw	3-M5 depth 10 (P.C.D.9)

U : Adjusting nut popping out at torque 0N·m

T : Max. tightening amount

Contact CKD for information on accuracy.

Dimentions



Note) Dimensions in ( ) indicate dimensions for models A and C.

Model	Release torque Adjusting range (N·m)		Allowable thrust force (N)	Allowable radial force (N)	Allowable bending moment (N·m)	Moment of inertia (kg·m²)	Weight (kg)	Adjusting nut per rotation Torque change rate (N·m)	T	U
TSF5	A	2.94 to 7.85	7850	3430	147	1.01×10^{-3}	1.34	1.18	10.3	1.7
	B	3.92 to 11.8						2.26	11.0	1.0
	C	9.81 to 29.4						4.91	9.3	2.7
	D	19.6 to 58.9						9.81	10.0	2.0

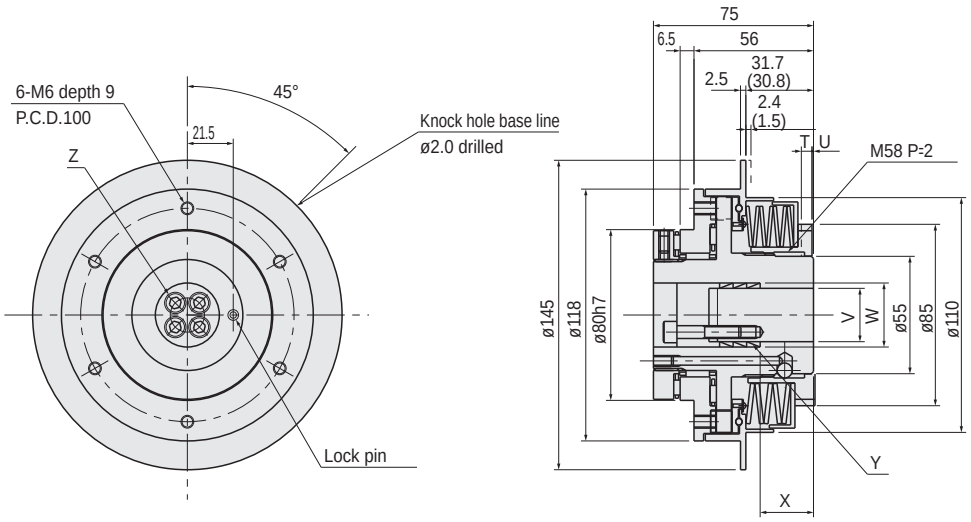
Compatible body	V	W	X	Y	Z	Shaft end mounting hole
ZRS-04	ø17 $^{+0.02}_{0}$	ø21H7	23	2−17×21(S)	3-M5 Special hexagon socket head cap screw	3-M5 depth 10 (P.C.D.9)
ZRS-05	ø20 $^{+0.02}_{0}$	ø25H7	18	3−20×25(S)	3-M5 Hexagon socket head cap screw	3-M5 depth 12 (P.C.D.12)

U : Adjusting nut popping out at torque 0N·m
T : Max. tightening amount
Contact CKD for information on accuracy.

Option

Torque saver [TSF6]

Dimentions



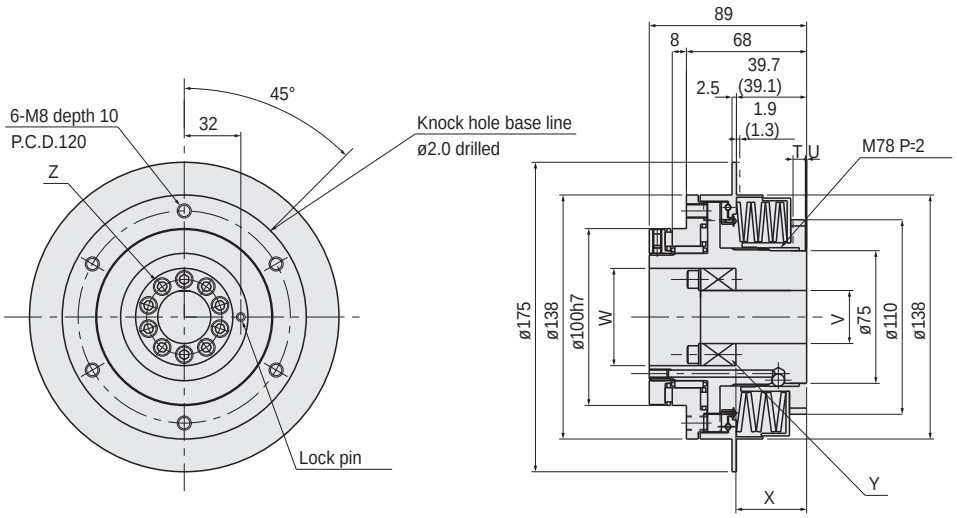
Note) Dimensions in ( ) indicate dimensions for models A and C.

Model	Release torque Adjusting range (N·m)		Allowable thrust force (N)	Allowable radial force (N)	Allowable bending moment (N·m)	Moment of inertia (kg·m²)	Weight (kg)	Adjusting nut per rotation Torque change rate (N·m)	T	U
TSF6	A	9.81 to 29.4	9810	6870	196	5.47×10^{-3}	3.7	14.7	5.4	1.6
	B	19.6 to 58.9						26.5	6.3	0.7
	C	39.2 to 118						39.2	5.8	0.2
	D	58.9 to 177						70.6	6.7	-0.7

Compatible body	V	W	X	Y	Z	Shaft end mounting hole
ZRS-05	ø20 $^{+0.02}_{0}$	ø25H7	18	3−20×25(S)	3−M5 Hexagon socket head cap screw	3-M5 depth 12 (P.C.D.12)
ZRS-06	ø25H6	ø30H7	25	3−25×30(S)	4−M6 Hexagon socket head cap screw	4-M6 depth 18 (P.C.D.16)

U : Adjusting nut popping out at torque 0N·m
T : Max. tightening amount
Contact CKD for information on accuracy.

Dimentions



Note) Dimensions in ( ) indicate dimensions for models A and C.

Model	Release torque Adjusting range (N·m)		Allowable thrust force (N)	Allowable radial force (N)	Allowable bending moment (N·m)	Moment of inertia ($kg·m^2$)	Weight (kg)	Adjusting nut per rotation Torque change rate (N·m)	T	U
TSF8	A	29.4 to 88.3	14700	9810	392	$1.42x10^{-2}$	6.6	19.6	9.9	0.6
	B	49.1 to 147						37.3	10.5	0
	C	88.3 to 294						74.6	10.1	-0.1
	D	147 to 441						98.1	10.7	-0.7

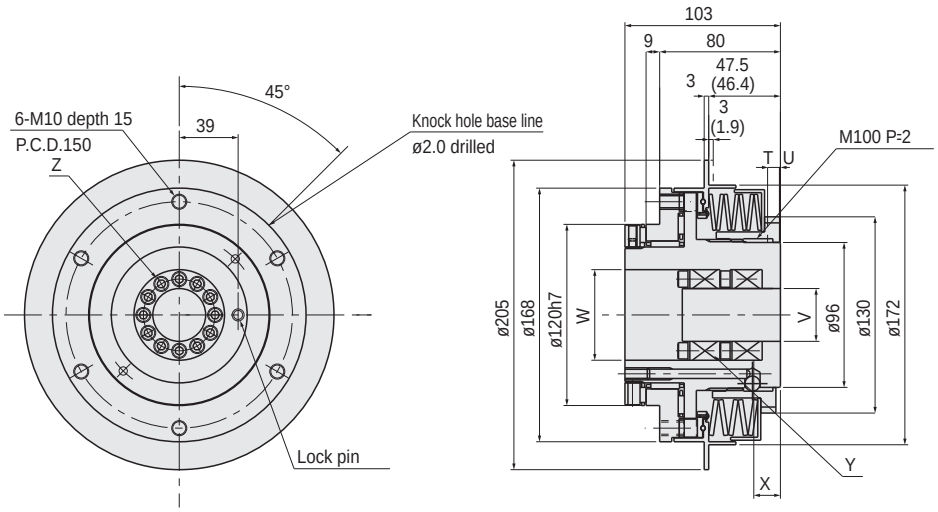
Compatible body	V	W	X	Y	Z	Shaft end mounting hole
ZRS-08	ø30H6	ø55H7	40	1-30x55	10-M6 Hexagon socket head cap screw	-

U : Adjusting nut popping out at torque 0N·m
T : Max. tightening amount
Contact CKD for information on accuracy.

Option

Torque saver [TSF11]

Dimentions



Note) Dimensions in ( ) indicate dimensions for models A and C.

Model	Release torque Adjusting range (N·m)		Allowable thrust force (N)	Allowable radial force (N)	Allowable bending moment (N·m)	Moment of inertia ($kg \cdot m^2$)	Weight (kg)	Adjusting nut per rotation Torque change rate (N·m)	T	U
TSF11	A	68.7 to 196	21600	14700	687	3.74×10^{-2}	11.8	64.7	13.4	0.6
	B	88.3 to 294						108	14.5	-0.5
	C	216 to 589						128	11.9	-1.9
	D	294 to 1180						275	13.0	-3.0

Compatible body	V	W	X	Y	Z	Shaft end mounting hole
ZRS-11	ø35H6	ø60H7	40 16.5	1-35×60 2- ”	12-M6 Hexagon socket head cap screw	-

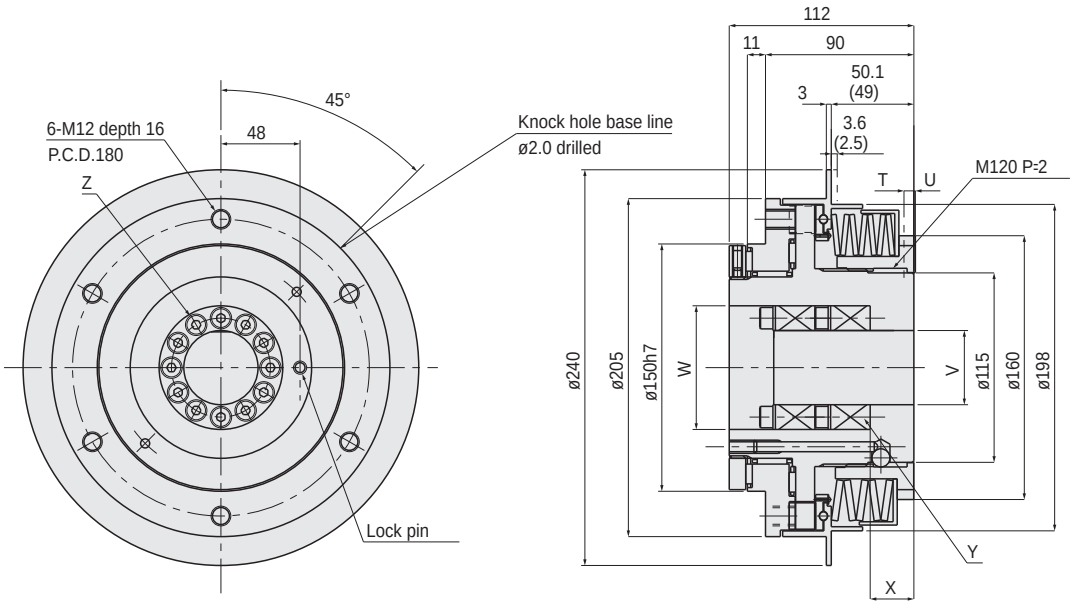
*The lower row of X and Y in the table above indicates dimensions for release torque D.

U : Adjusting nut popping out at torque 0N·m

T : Max. tightening amount

Contact CKD for information on accuracy.

Dimentions



Note) Dimensions in ( ) indicate dimensions for models A and C.

Model	Release torque Adjusting range (N·m)		Allowable thrust force (N)	Allowable radial force (N)	Allowable bending moment (N·m)	Moment of inertia (kg·m²)	Weight (kg)	Adjusting nut per rotation Torque change rate (N·m)	T	U
TSF14	A	98.1 to 294	28400	23500	981	9.10×10^{-2}	19.8	98.1	12.0	2.0
	B	147 to 441						147	13.1	0.9
	C	392 to 1180						265	11.5	1.0
	D	589 to 1860						451	12.6	-0.1

Compatible body	V	W	X	Y	Z	Shaft end mounting hole
ZRS-14	ø45H6	ø75H7	60 26.5	1−45×75 2− "	12−M8 Hexagon socket head cap screw	−

* The lower row of X and Y in the table above indicates dimensions for release torque D.
U : Adjusting nut popping out at torque 0N·m
T : Max. tightening amount
Contact CKD for information on accuracy.

Option

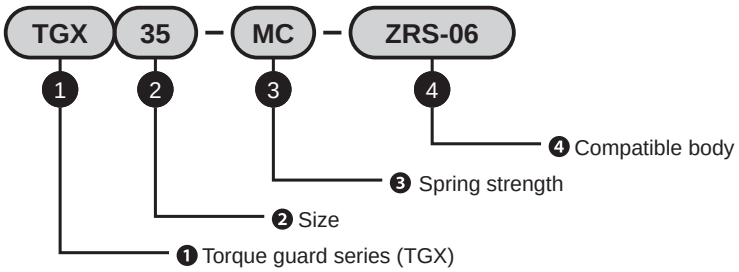
Torque guard TGX

Overload protection device (for shaft mounting)

Features

1. Coupling function
   Misalignment caused by angle error, parallelism, or axial direction are absorbed by the ball & wedge mechanism.
2. High return accuracy ±10 sec
   Less phase deviation between the drive side and load side when re-reset after a trip.
3. High precision trip (release)
   There is no deviation in adjacent trip torque during repeated trip (release) ±3% within the specified range.
4. Easy torque adjustment
   The trip torque can be set freely just by turning the adjusting nut.
5. Confirming set torque
   Set torque can be easily confirmed with easy-to-read rotation scale and angle scale.
6. One-positioned
   The ball and wedge alignment is a unique combination that only fits in one place.
7. Overload detection possible (in combination with proximity switch)

How to order (when ordering separately without a torque guard mounted on the Mechanical indexer)



Body model No.		Torque guard
ZRS	04	**TGX20**
	05	**TGX20**
	06	**TGX35**
	08	**TGX50**
	11	**TGX70**

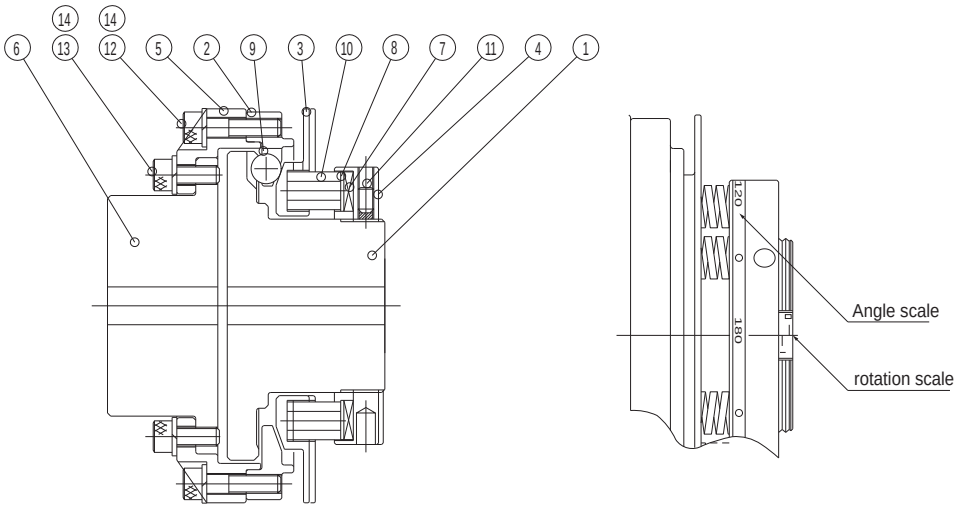
(Note) When ordering the torque guard as a Discrete unit, pay attention to the body output shaft specifications on the mounting side.
Refer to the table on the right for the application of ❹.

Operational overview

Ball & wedge mechanism

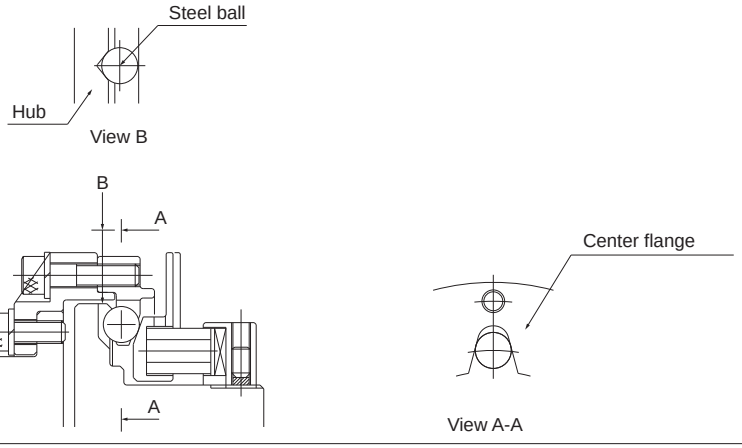
Torque is transmitted from ① hub to ⑨ steel ball to ② center flange to ⑤ flange to ⑥ boss.
The ⑨ steel balls are held in the ① hub and ② center flange by the pressure of the ⑩ coil spring. The contact area of the ③ plate with the ⑨ steel balls is tapered, and the ⑨ steel balls are always pressed against the grooves in the ① hub and ② center flange. This mechanism is the ball and wedge mechanism. (Figures 1 and 2)
When overloaded, the ⑨ steel ball rides up from the pocket and starts rolling. Since there are no slipping parts and all the balls are rolling, the idling frictional torque is very small, resulting in excellent durability. In this case, the ③ plate is pushed down and can be detected by a proximity switch or other means. After removing the overload, the table automatically returns to its original position when it is manually rotated.

Fig. 1



①	Hub	⑥	Boss	⑪	Lock screw
②	Center flange	⑦	Bearing	⑫	Hexagon socket head cap screw
③	Plate	⑧	Side plate	⑬	Hexagon socket head cap screw
④	Adjusting nut	⑨	Steel ball	⑭	Spring washer
⑤	Flange	⑩	Coil spring		

Fig. 2

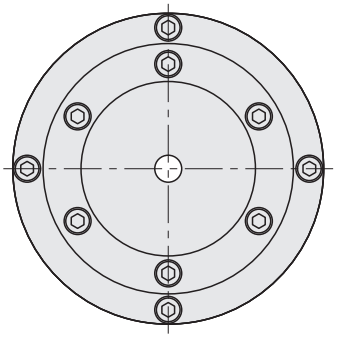


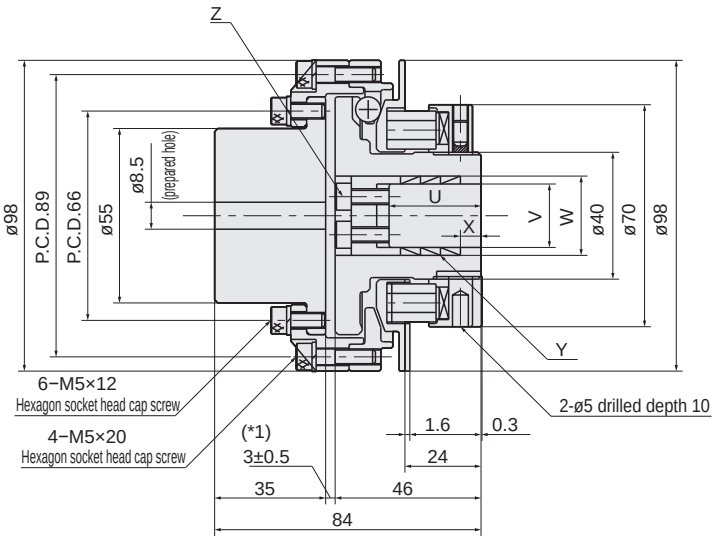
Option

Torque guard [TGX20]

Dimentions

Return accuracy	±10 seconds
Variations in adjacent trip torque	±3%





(*1) Assemble on the device within the dimension range.

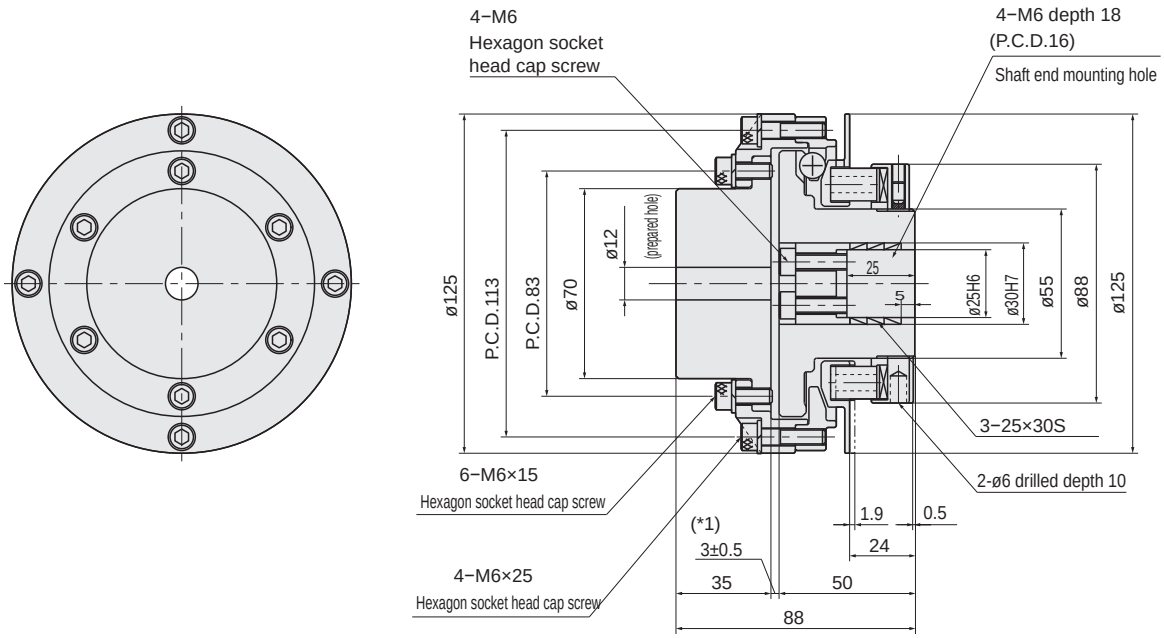
■Characteristic value

Torque guard coupling Model No.	Set torque range (N·m)	Max. rotation speed (rpm)	Number of coil × colors	Torque guard (boss)		Weight (kg)	Moment of inertia ×10^{-2}(kg·m^2)	Allowable angle error (deg)	Allowable parallelism (mm)	Allowable axial displacement (mm)
				Bottom hole diam.	Max. bore size					
TGX20-LC	5.2 to 19	550	Yellow×6	8.5	35	2.38	0.231	0.6	0.1	±0.5
TGX20-MC	9.8 to 27		Red×3							
TGX20-HC	21 to 55		Red×6							

Compatible body	U	V	W	X	Y	Z	Shaft end mounting hole
ZRS-04	33	ø17H7	ø21H7	18	2−17×21(S)	3-M5 special hexagon socket head cap screw	3−M5 depth 10 (P.C.D.9)
ZRS-05	29	ø20H7	ø25H7	6.5	3−20×25(S)	3-M5 hexagon socket head cap screw	3−M5 depth 12 (P.C.D.12)

Dimentions

Return accuracy	±10 seconds
Variations in adjacent trip torque	±3%



(*1) Assemble on the device within the dimension range.

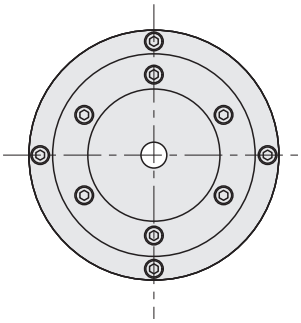
■Characteristic value

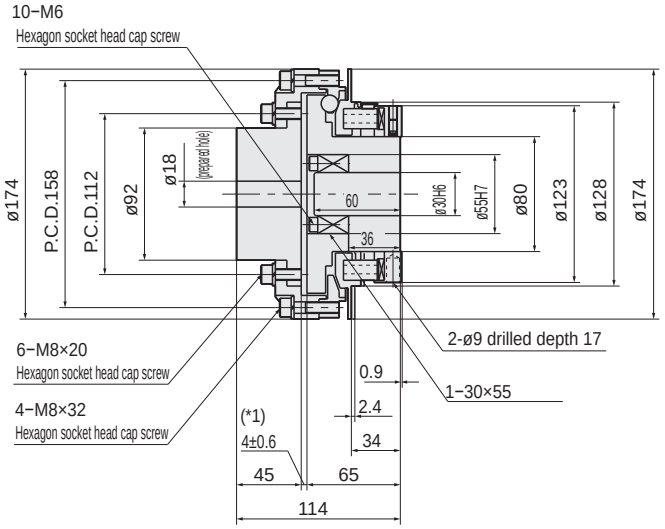
Torque guard coupling Model No.	Set torque range (N·m)	Max. rotation speed (rpm)	Number of coil × colors	Torque guard (boss)		Weight (kg)	Moment of inertia ×10^{-2}(kg·m^2)	Allowable angle error (deg)	Allowable parallelism (mm)	Allowable axial displacement (mm)
				Bottom hole diam.	Max. bore size					
TGX35-LC	19 to 57	400	Red ×5	12	50	3.92	0.663	0.6	0.1	±0.5
TGX35-MC	36 to 84		Green ×5							
TGX35-HC	74 to 167		Green ×10							

Compatible body
ZRS-06

Dimentions

Return accuracy	±10 seconds
Variations in adjacent trip torque	±3%





(*1) Assemble on the device within the dimension range.

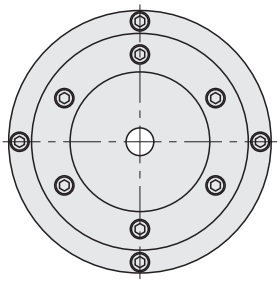
■Characteristic value

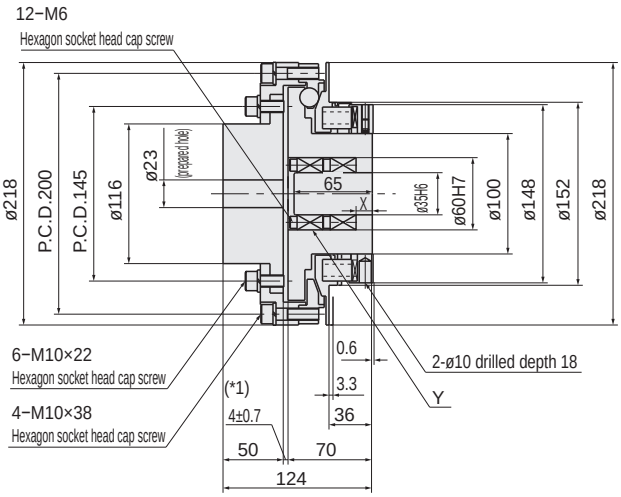
Torque guard coupling Model No.	Set torque range (N·m)	Max. rotation speed (rpm)	Number of coil × colors	Torque guard (boss)		Weight (kg)	Moment of inertia ×10^{-2}(kg·m^2)	Allowable angle error (deg)	Allowable parallelism (mm)	Allowable axial displacement (mm)
				Bottom hole diam.	Max. bore size					
TGX50-LC	40 to 98	300	Red ×5	18	60	10.9	3.35	0.6	0.1	±0.6
TGX50-MC	81 to 176		Green ×5							
TGX50-HC	167 to 343		Green ×10							

Compatible body
ZRS-08

Dimentions

Return accuracy	±10 seconds
Variations in adjacent trip torque	±3%



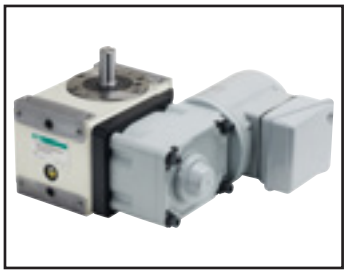


(*1) Assemble on the device within the dimension range.

■Characteristic value

Torque guard coupling Model No.	Set torque range (N·m)	Max. rotation speed (rpm)	Number of coil × colors	Torque guard (boss)		Weight (kg)	Moment of inertia ×10^{-2}(kg·m^2)	Allowable angle error (deg)	Allowable parallelism (mm)	Allowable axial displacement (mm)
				Bottom hole diam.	Max. bore size					
TGX70-LC	118 to 323	240	Red ×8	23	80	16.3	8.93	0.6	0.1	±0.7
TGX70-MC	235 to 461		Green ×8							
TGX70-HC	353 to 696		Green ×12							

Compatible body		X	Y
ZRS-11	**TGX70-LC/MC**	41	1−35×60
	TGX70-HC	13.5	2−35×60



Option

Hollow shaft type geared motor

Features

1. Eco-friendly

   Eliminates the need to dispose of consumable parts by eliminating clutches/brakes and employing inverter-controlled start/stop. Reduces power consumption by improving motor reducer efficiency.

2. Maintenance-free

   By adopting the start/stop of inverter control, maintenance of clutch/brake parts is eliminated.

3. Mechatronics design

   We propose a drive unit with an eye to the DD motor.

Characteristics table

[Applicable models: ZRS-05]

Motor model No. (Nissay)	Output (kW)	True reduction ratio (ir)	Output shaft rotation speed Nrs (rpm)		Output axis allowable torque Trr (N·m)		Motor moment of inertia Jm (kg·m^2)	Weight (kg)
			50Hz	60Hz	50Hz	60Hz		
F3S20N20-MM01TNNTNX	0.1	20	75	90	11	8.6	4.8×10^{-4}	6.5
F3S20N25-MM01TNNTNX		25	60	72	13	11		
F3S20N30-MM01TNNTNX		30	50	60	16	13		
F3S20N40-MM01TNNTNX		40	37.5	45	21	18		
F3S20N50-MM01TNNTNX		50	30	36	25	22		
F3S20N60-MM01TNNTNX		60	25	30	31	25		
F3S25N10-MM02TNNTNX	0.2	10	150	180	11	9.2	5.3×10^{-4}	8.5
F3S25N15-MM02TNNTNX		15	100	120	17	14		
F3S25N20-MM02TNNTNX		20	75	90	23	19		
F3S25N25-MM02TNNTNX		25	60	72	27	24		
F3S25N30-MM02TNNTNX		30	50	60	33	27		
F3S25N40-MM02TNNTNX		40	37.5	45	44	37		
F3S25N50-MM02TNNTNX		50	30	36	55	46		
F3S25N60-MM02TNNTNX		60	25	30	67	55		

[Applicable models: ZRS-06]

Motor model No. (Nissay)	Output (kW)	True reduction ratio (ir)	Output shaft rotation speed Nrs (rpm)		Output axis allowable torque Trr (N·m)		Motor moment of inertia Jm (kg·m^2)	Weight (kg)
			50Hz	60Hz	50Hz	60Hz		
F3S25N20-MM02TNNTNX	0.2	20	75	90	23	19	5.3×10^{-4}	8.5
F3S25N25-MM02TNNTNX		25	60	72	27	24		
F3S25N30-MM02TNNTNX		30	50	60	33	27		
F3S25N40-MM02TNNTNX		40	37.5	45	44	37		
F3S25N50-MM02TNNTNX		50	30	36	55	46		
F3S25N60-MM02TNNTNX		60	25	30	67	55		
F3S30N10-MM04TNNTNX	0.4	10	150	180	23	19	1.1×10^{-3}	11.5
F3S30N15-MM04TNNTNX		15	100	120	33	27		
F3S30N20-MM04TNNTNX		20	75	90	44	37		
F3S30N25-MM04TNNTNX		25	60	72	55	46		
F3S30N30-MM04TNNTNX		30	50	60	67	55		
F3S30N40-MM04TNNTNX		40	37.5	45	88	74		
F3S30N50-MM04TNNTNX		50	30	36	111	92		
F3S30N60-MM04TNNTNX		60	25	30	133	111		

Characteristics table

[Applicable models: ZRS-08]

Motor model No. (Nissay)	Output (kW)	True reduction ratio (ir)	Output shaft rotation speed Nrs (rpm)		Output axis allowable torque Trr (N·m)		Motor moment of inertia Jm (kg·m^2)	Weight (kg)
			50Hz	60Hz	50Hz	60Hz		
F3S30N20-MM04TNNTNX	0.4	20	75	90	44	37	1.1×10^{-3}	11.5
F3S30N25-MM04TNNTNX		25	60	72	55	46		
F3S30N30-MM04TNNTNX		30	50	60	67	55		
F3S30N40-MM04TNNTNX		40	37.5	45	88	74		
F3S30N50-MM04TNNTNX		50	30	36	111	92		
F3S30N60-MM04TNNTNX		60	25	30	133	111		
F3S35N10-MD08TNNTNX	0.75	10	150	180	41	34	3.2×10^{-3}	21
F3S35N15-MD08TNNTNX		15	100	120	63	52		
F3S35N20-MD08TNNTNX		20	75	90	83	70		
F3S35N25-MD08TNNTNX		25	60	72	104	86		
F3S35N30-MD08TNNTNX		30	50	60	124	104		
F3S35N40-MD08TNNTNX		40	37.5	45	166	138		
F3S35N50-MD08TNNTNX		50	30	36	208	173		
F3S35N60-MD08TNNTNX		60	25	30	249	208		

[Applicable models: ZRS-11]

Motor model No. (Nissay)	Output (kW)	True reduction ratio (ir)	Output shaft rotation speed Nrs (rpm)		Output axis allowable torque Trr (N·m)		Motor moment of inertia Jm (kg·m^2)	Weight (kg)
			50Hz	60Hz	50Hz	60Hz		
F3S35N20-MD08TNNTNX	0.75	20	75	90	83	70	3.2×10^{-3}	21
F3S35N25-MD08TNNTNX		25	60	72	104	86		
F3S35N30-MD08TNNTNX		30	50	60	124	104		
F3S35N40-MD08TNNTNX		40	37.5	45	166	138		
F3S35N50-MD08TNNTNX		50	30	36	208	173		
F3S35N60-MD08TNNTNX		60	25	30	249	208		
F3S45N10-MD15TNNTNX	1.5	10	150	180	83	70	6.2×10^{-3}	35.5
F3S45N15-MD15TNNTNX		15	100	120	124	104		
F3S45N20-MD15TNNTNX		20	75	90	166	138		
F3S45N25-MD15TNNTNX		25	60	72	208	173		
F3S45N30-MD15TNNTNX		30	50	60	249	208		
F3S45N40-MD15TNNTNX		40	37.5	45	332	276		
F3S45N50-MD15TNNTNX		50	30	36	416	345		
F3S45N60-MD15TNNTNX		60	25	30	498	416		

[Applicable models: ZRS-14]

Motor model No. (Nissay)	Output (kW)	True reduction ratio (ir)	Output shaft rotation speed Nrs (rpm)		Output axis allowable torque Trr (N·m)		Motor moment of inertia Jm (kg·m^2)	Weight (kg)
			50Hz	60Hz	50Hz	60Hz		
F3S45N20-MD15TNNTNX	1.5	20	75	90	166	138	6.2×10^{-3}	35.5
F3S45N25-MD15TNNTNX		25	60	72	208	173		
F3S45N30-MD15TNNTNX		30	50	60	249	208		
F3S45N40-MD15TNNTNX		40	37.5	45	332	276		
F3S45N50-MD15TNNTNX		50	30	36	416	345		
F3S45N60-MD15TNNTNX		60	25	30	498	416		
Motor model No. (Tsubakimoto Chain)	Output (kW)	True reduction ratio (ir)	Output shaft rotation speed Nrs (rpm)		Output axis allowable torque Trr (N·m)		Motor moment of inertia Jm (kg·m^2)	Weight (kg)
			50Hz	60Hz	50Hz	60Hz		
HMTR220-45H10F1S5	2.2	10	150	180	122	102	8.8×10^{-3}	43
HMTR220-45H15F1S5		15	100	120	182	152		
HMTR220-45H20F1S5		20	75	90	244	203		
HMTR220-45H25F1S5		25	60	72	290	242		
HMTR220-45H30F1S5		30	50	60	349	290		
HMTR220-45H40F1S5		40	37.5	45	465	387		
HMTR220-45H50F1S5		49.286	30	36	581	484		
HMTR220-45H60F1S5		60	25	30	697	581		

Safety Precautions

Be sure to read this section before use.

When designing and manufacturing equipment using units, the manufacturer is obligated to ensure that the safety of the mechanism and the system that runs the electrical controls are secured. It is important to select, use, handle, and maintain CKD products appropriately to ensure their safe usage. Observe warnings and precautions to ensure device safety. Check that device safety is ensured, and manufacture a safe device.

WARNING

1 Use the product within the specifications range.

This product must be used within its stated specifications. Use with load or rotation speed outside the specifications range may result in unit damage, malfunction, or accuracy faults. In addition, never modify or additionally machine this product. This product is intended for use in general industrial machinery equipment or parts. It is not intended for use outdoors or for use under the following conditions or environments.
(Note that this product can be used when CKD is consulted prior to its usage and the customer consents to CKD product specifications. The customer should provide safety measures to avoid danger in the event of problems.)

❶Use for special applications including nuclear energy, railways, aircrafts, marine vessels, vehicles, medicinal devices, Components or applications coming into contact with beverages or foodstuffs, amusement devices, emergency operation (cutoff, release, etc.) circuits, press machines, brake circuits, or safety devices or applications.

❷Use for applications where life or assets could be significantly affected, and special safety measures are required.

2 Do not touch movable parts while the unit is operating.

This may lead to injury.

3 Do not stop the input shaft suddenly during unit output operation.

❶Sudden stop of the input shaft with an inverter, etc., causes load torque exceeding the design value to be applied. This may cause the table, etc., to overrun due to unit damage, resulting in injury or damage to the entire device.

❷If emergency stop is required to ensure safety, etc., consider measures such as avoiding sudden stops and selecting a unit large enough to withstand load torque during emergency stop.

4 Do not perform maintenance and inspection while the power is ON.

Malfunction or breakdown of the control circuit may cause sudden movement and lead to injury.

5 Do not use this product in an atmosphere that may explode or fire.

CAUTION

1 Assemble the product by a person with basic knowledge of machine assembly.

Incorrect assembly could cause injury or equipment damage.

2 Start and stop the unit at the bus stop.

If the input shaft is started/stopped outside the stop section, load torque higher than the design value will be applied, which may damage the unit, etc.

3 If there is a position detection cam on the input shaft, periodically check that the position is not misaligned.

If the detection position is misaligned due to loose screws, the device may malfunction and cause injury.

4 Do not use this product in environments where it may come in contact with water or oil. (no condensation)

This may cause unit malfunction or damage, as the product does not have waterproof or drip-proof specifications. When it will be exposed to water or oil, provide cover, etc.

5 Lubricant is supplied with the unit. Oil may ooze out from the oil seal during use. Implement periodic inspections, and install an oil absorber, etc., if this could cause accidents such as defective workpieces.

■ Precautions are ranked as "DANGER", "WARNING", and "CAUTION" in this section.

DANGER: (DANGER) In the case where the product operation is mishandled and/or when the urgency of a dangerous situation is high, it may lead to fatalities or serious injuries.

WARNING: (WARNING) If handling is mistaken, the employer may be at risk of death or serious injury.

CAUTION: (CAUTION) If handling is mistaken, the user may be slightly injured or property damage alone may occur.

Note that some items indicated with "CAUTION" may lead to serious results depending on the conditions. All items contain important information and must be observed.

Warranty

Terms of warranty
The terms and conditions related to the warranty period and scope are described below.

1 Warranty period

This warranty is valid for one (1) year after delivery to the customer's designated site.

2 Scope of warranty

In case any defect clearly attributable to CKD is found during the warranty period, CKD shall, at its own discretion, repair the defect or replace the relevant product in whole or in part and at no cost, according to its own judgment.
Note that the following failures are excluded from the warranty scope:

(1) Failures due to use outside the conditions and environments set forth in the catalog, specifications, or instruction manuals
(2) Failures resulting from factors exceeding durability (frequency, distance, time, etc.) or relating to consumable parts
(3) Failures resulting from factors other than this product.
(4) Failures caused by improper use of the product.
(5) Failures resulting from modifications or repairs made without CKD consent.
(6) Failures caused by matters that could not be predicted with the technologies in practice when the product was delivered.
(7) Failures resulting from natural disasters or accidents for which CKD is not liable. The warranty covers the actual delivered product, as a single unit, and does not cover any damages resulting from losses induced by malfunctions in the delivered product.

Note) Contact the nearest CKD Sales Office for details on durability and consumable parts.

3 Compatibility check

The customer is responsible for confirming the compatibility of CKD products with the customer's systems, machines and equipment.

Precautions for export

1 Security Trade Control

The products in this catalog and their related technologies may require approval before export or provision.
For the sake of maintaining world peace and safety, there may be cases in which approval under the Foreign Exchange and Foreign Trade Control Law is required in advance, depending on the country to where the product or related technology is being exported or provided.
The scope of products and related technologies requiring approval are listed in the Export Trade Control Order Appendix Table 1 or Foreign Exchange Order Appendix Table.
The Export Trade Control Order Appendix Table 1 and Foreign Exchange Order Appendix Table contain the following two types of information:

- List controls specified for items 1 to 15
- "Catch-all controls" that do not indicate specifications by Item, but restrict by application (Section 16)

An application for approval is
received by the Security Export Licensing Division of the Ministry of Economy, Trade and Industry or local bureaus of the Ministry of Economy, Trade and Industry.

2 Products and related technologies in this catalog

The products and related technologies in this catalog are subject to the catch-all controls of the Foreign Exchange and Foreign Trade Control Law. When exporting or providing the products or related technologies in this catalog, ensure that they are not used for arms or weapons.

3 Inquiries

Contact your local CKD Sales Office for information on the Security Trade Control of products and related technologies in this catalog.

Safety Precautions

Be sure to read this section before use.

IndividualCaution: Mechanical indexer ZRS Series

Design/Selection

CAUTION

1 Selection

1)Set the load torque to the Mechanical indexer's dynamic rated output torque or less.

2)When using the product with an input shaft rotation speed of 200rpm or more, assembly adjustment for the high speed rotation specifications is required. Contact CKD for details. (Special specifications)

3)The max. diameter of the allowable max. table outer diameter table should be within the allowable max. table outer diameter calculated when selecting the Mechanical indexer.
If the allowable max. table is exceeded, contact CKD.

4)Check the clutch/brake operation time when discontinuously operating the Mechanical indexer with the clutch/brake. The operation time of the clutch/brake varies depending on the characteristics of the clutch/brake itself, the rotation speed of the moving shaft/pulley, and the moment of inertia.

5)When installing the detection switch, check the response time of the detection switch.
If the input shaft rotation speed is high, it may not be detectable with the detection switch.

6)The operating ambient temperature of the Mechanical indexer body is 0°C to 40°C. (No condensation) Install a cover in dusty places or places exposed to water or oil drops, etc.

7)Note that optionally mountable parts have specifications, characteristic values, and durability set by their manufacturers; in some cases, depending on the usage environment, speed, or frequency, they may not be available for use or may have shortened service lives. Refer to each manufacturer's catalog for details.

Service life guidelines for optional parts manufacturers (example)

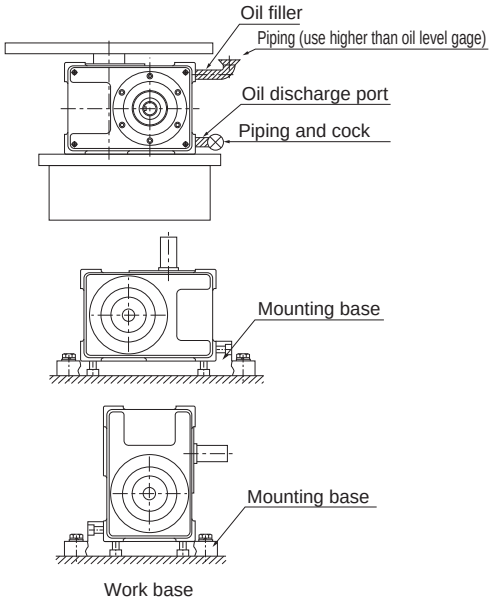
Optional parts	Estimated service life	Manufacturer
Motor with brake, motor with C/B	Operation cycles 2 million times	Oriental Motor

2 Mounting and installation design

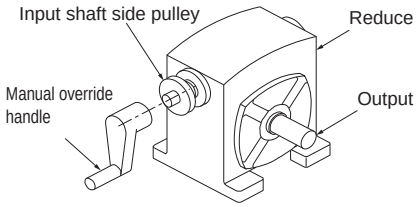
1)Consider that the product can be easily inspected, disassembled and assembled and that the oil level indicator can be confirmed.

2)If the Mechanical indexer is installed in an automatic machine, the lubricant may not be replaced. In such cases, it is recommended that the lubricant be replaced easily by piping the oil filler and exhaust port of the Mechanical indexer when assembling the automatic machine.

3)Mechanical indexer is subject to a heavy load. Fix the base not only in the vertical direction, but also in the horizontal direction as shown in the figure at right.



4)When you are forced to perform an emergency stop for safety, etc., always be sure to manually rotate the motor to the stop slowly before restarting. Provide a manual handle so that the input shaft can be manually rotated in the drive system in case of the above.

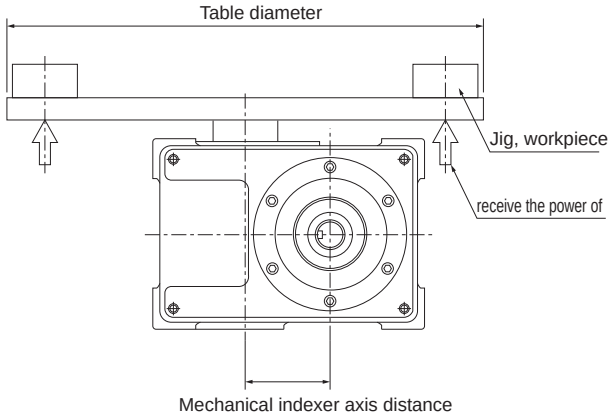


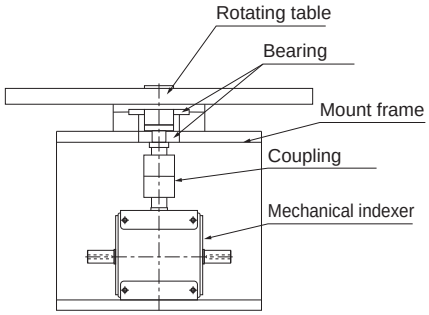
3 Output shaft design

1)Allowable thrust force of output shaft

Use the product within the allowable thrust force.

If load torque is within the dynamic rated output torque of the Mechanical indexer, and thrust force applied to the output shaft exceeds the allowable thrust force, design the rotary table so that it receives force from the thrust bearing, roller, etc., individually.



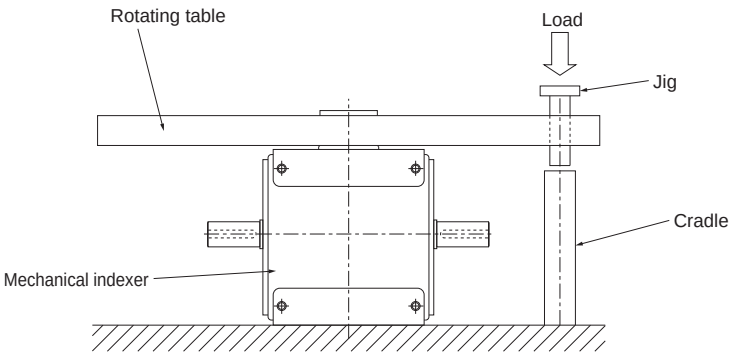


2)Design of rotary table jig

Make sure that the rotary table diameter and jig mounting pitch diameter are small and the weight is light to reduce the load on the Mechanical indexer.

In addition to bolt tightening, the rotating table should also be hit with the positioning pin in two locations to ensure reproducibility after removal. (Flange)

When applying vertical load from above during pressing, stamping, caulking, etc., do not apply load directly to the table or Mechanical indexer. Be sure to install a bearer or an alternative.



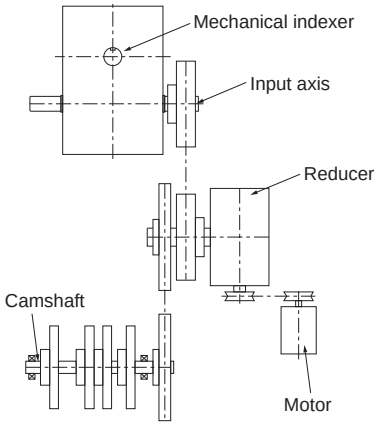
Receiving stand example

⚠ CAUTION

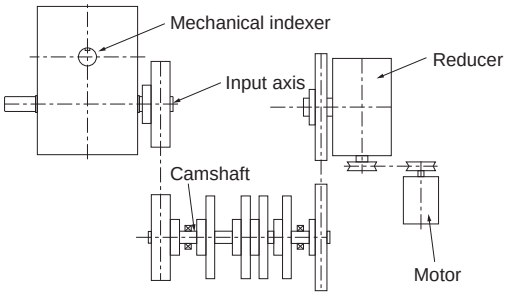
4 Design of input shaft

1)Make the drive system from the motor to the Mechanical indexer input shaft as rigid as possible and minimize backlash. Mechanical indexer's input shaft must, in principle, be rotated at a constant speed. Backlash or uneven rotation in the drive system may cause shock when rotating the table, shortened service life of the body, or damage to parts.

2)Do not put other input shafts in series between the motor and the Mechanical indexer's input shaft.



Good example of driving

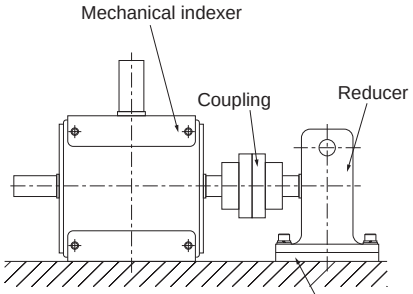


A shock-prone example

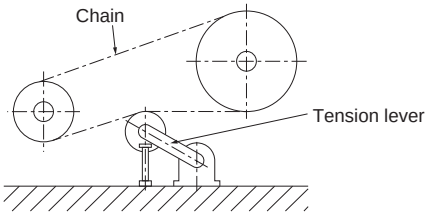
3)When directly connecting the Mechanical indexer's input shaft and the output shaft of the reducer with a coupling, etc., consider the use of a coupling that prevents backlash and the use of a mechanism that can adjust misalignment.

4)A brake motor can also be used when the starting stop frequency is 5 times/minute or less. If the frequency is higher than that, use a clutch/brake device or use a motor with clutch/brake.

5)When using a timing belt or chain, install a tension device. The absence of a tension device may cause shock or vibration.



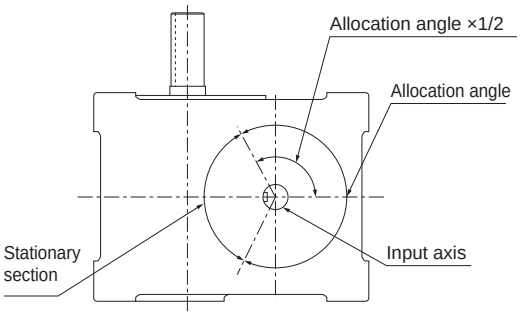
Example of drive



Example of tension lever

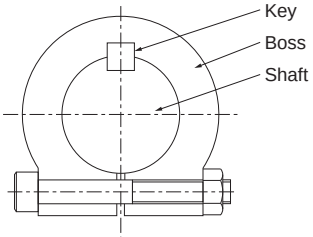
6)When timing another attachment or the like from the input axis, be careful of the relationship between the input axis keyway and output axis stop range.
(Refer to "Timing chart and keyway position" for operation instructions.)

The output shaft rotates when the input shaft keyway is within the range of the allocated angle in the figure at right, and the output shaft stops when it is within the range of the stop section. (For 1 stationary index series)



5 Shaft connection design

1)When using keys as the method for fixing shafts with couplings, gears, sprockets, pulleys, cams, bosses, etc., backlash in the keys may cause shock or vibration. The table below is recommended for key materials. When fixing especially important parts, do not rely only on the key, but also tighten securely with split types and friction tightening material, etc.



(split)

Model	Recommended standards
Standard (ZRS)	Normal (JIS B 1301-1996)

2)When connecting the axes with a coupling, etc., align the axis centers.
Misalignment of the core may lead to shaft damage.

Mounting, installation and adjustment

CAUTION

1 Be sure to stop the start of the Mechanical indexer while the input shaft is stopped.
(Refer to "Input axis keyway position and allocated angle")
Make every effort to avoid emergency stop/start and inching (jog) at the allocation section. Excessive load far exceeding the normal operating load applies to the Mechanical indexer, and this may cause deterioration of accuracy or breakdown.. When an emergency stop is unavoidable for safety, be sure to manually and slowly rotate the cylinder to the stop section before restarting. (A worm reducer is generally used to drive the Mechanical indexer. Turn the input shaft of the reducer when manually rotating the button.) If the input shaft is equipped with a one-rotation detection switch, adjust the position of the detection cam so that the input shaft stops at a stopped section.

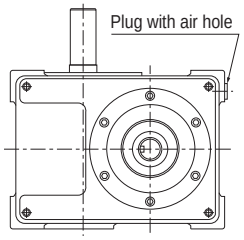
2 When attaching pulleys, sprockets, tables, etc., to the inlet and output shafts, do not apply impact with a hammer, etc. Applying impact may damage the Mechanical indexer or reduce accuracy.

3 Check for looseness and play in the I/O shaft connection.
If there is looseness or play, the table's rotation may become awkward or may cause shock.

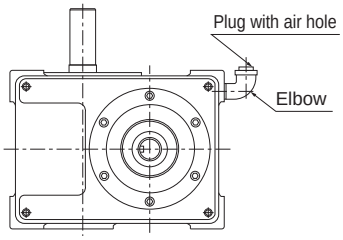
4 Install the product according to the mounting orientation of the specifications.

5 The input axis rotation speed should be the specified rotation speed.

6 Mechanical indexers are shipped with lubricant. Confirm that the oil level is near the center of the oil level indicator. Before starting operation, replace with the supplied air hole plug. Failure to replace the plug may cause oil leakage. The lubricant may leak from the air hole plug due to increases in internal pressure due to operating rotation speed, environment, etc. In this case, use a piping elbow or the like, and additionally pipe so that it does not leak.



under normal circumstances



When piping is required
(Piping must be prepared by your company.)

Use/maintenance

⚠ CAUTION

1 Check that the bolts and screws of each part are not loose.

2 Stop operation immediately if abnormal noise occurs during use. Contact the nearest CKD Sales Office or Factory as interior damage may be caused.

3 Implement waterproof and rust prevention measures
Mechanical indexer's I/O shaft and installation surface have not been anti-rust treated. Rust may occur due to the storage state or working atmosphere. Apply rust preventing agent, grease, or rust preventing agent to the processed surface.

4 Lubricant replacement
Replace the lubricant every 500 hours after the start of operation, and every 2000 hours after that.
Check the oil amount every week and refill if there is any shortfall.
Use the designated lubricant.

Type / Manufacturer	Lubricant		Grease
	Input axis rotation speed less than 200rpm	Input axis rotation speed 200rpm or more	
ENEOS (CKD standard products)	Bonnock TS220	Gear gland GL-5 80W-90	
Cooperative fat and oil (CKD standard products)			CITRUS EP No.2
ENEOS			Epinox grease AP2
Idemitsu Kosan	Daphne Super Gear Oil 220	Apollo Wide Gear LW 80W-90	Daphne Eponex EP No.2
Showa Shell	SHELL OMALA OIL 220	Shell Gelco Power Gear 80W-90	Shell Albania EP Grease R02
Exxon Mobile	Mobile gear 600XP 220	Mobile Lube HD 80W-90	Mobilux EP2
Cosmo Oil	Cosmogear SE220	GL-5 80W-90	Cosmo Grease Dynamax EP No.2

5 The service life of consumable parts such as oil seals is greatly affected by the working environment and operating conditions, and the expected service life may not be achieved. Periodically check for abnormal noise and oil leakage together with the oil amount check above.

Individual cautions: Worm reducer HO

Design/Selection

CAUTION

1. Set the load torque of the reducer to the rated output torque or less.
2. Check the clutch/brake operation time when discontinuously operating the Mechanical indexer with the clutch/brake. The operation time of the clutch/brake varies depending on the characteristics of the clutch/brake itself, the rotation speed of the moving shaft/pulley, and the moment of inertia.
3. When installing the detection switch, check the response time of the detection switch.
   Otherwise, detection may not be possible.
4. When using the reducer for applications other than driving the Mechanical indexer, check the characteristics.
5. Install the product in a location that can be easily inspected, disassembled, and assembled as well as inspected oil level.
6. PIPING FOR REPLACING LUBRICANT
   If the reducer is installed in an automatic mechanism, the lubricant may not be replaced. In such cases, we recommend that the reducer's oil filler be piped when assembling the automatic machine so that the lubricant can be easily replaced.
7. The reducer is filled with lubricant. Oil may ooze out from the oil seal during use. Be sure to conduct periodic inspections, and install an oil absorber, etc., if it leads to defective workpieces..

Mounting, installation and adjustment

CAUTION

1. When attaching a pulley, sprocket, coupling, etc., to the worm shaft, do not forcibly tap or drive in the shaft. The reducer could be damaged if impact is applied. In the case of the type with clutch, note that internal interference may occur if the mounting bolt enters more deeply than the specified depth. (Refer to Dimensions)
2. If the worm shaft is driven with a pulley or sprocket attached, use tension at the allowable O.H.L listed in the instruction manual attached with the product. Applying excessive tension could cause abnormal noise, decrease the life of bearings, damage to the worm shaft, or faulty operation of the clutch and brakes.
3. When connecting the axes with a coupling, etc., align the axis centers. Misalignment could cause abnormal noise, shortened bearing service life, or damage.
4. Install the product according to the mounting orientation of the specifications.
5. As the clutch and brake are dry type, if water or oil adheres to the friction surface, transmission torque will decrease. Do not allow water or oil to come into contact with the friction surface. In addition, when using the product in areas with a lot of dust such as iron powder and fine sand, the service life will be shortened rapidly if the dust adheres to the friction surface. Special consideration should be paid to dust-proofing.
6. The input shaft rotation speed used should be the specified rotation speed.
7. Be sure to mount the attached grease nipple before starting operation of the HO reducer with reducer orientation 5 and 6.

8 The reducer is filled with lubricant. The product can be used as is without initial lubrication. As the product is sealed with a plug at shipment, replace with the included air-hole plug before starting operation. Oil leakage may occur if not replaced with an air hole plug or pressure vent.

9 Do not use this product in an atmosphere that may cause ignition, explosion, or fire.

10 Do not touch the movable parts while the reducer is operating. This may lead to injury.

11 Wiring and connecting the clutch and brake

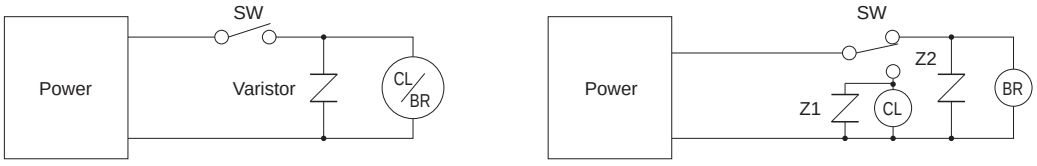
Be sure to ground the ground terminal of the motor and controller. As a grounding method, Class 3 grounding (100 Ω or less, ø1.6 mm or more) is recommended. Use an electric wire size that matches the power supply capacity. If a wire with a small current capacity is used, the insulating film may melt and result in insulation failure, which may cause electric shock or leakage of electricity and may cause fire.

(1)Wiring

The power supply for operation of the clutch/brake is 24 VDC. Keep voltage fluctuation within ±10%. Applying different voltage may cause performance degradation, coil heating, damage, etc. Even if the voltage of the power supply is as specified, if the circuit is long, the terminal voltage of the clutch/brake will drop due to circuit resistance, etc. Check using the lead wire terminals when energized. Install a switch on the direct flow side to perform ON-OFF operation of the clutch and brake. When performed on the AC side, the operation time is delayed. In this case, a time lag should be provided when switching. Do not pull or bend the lead wire.

(2)Surge absorbing protection element (varistor)

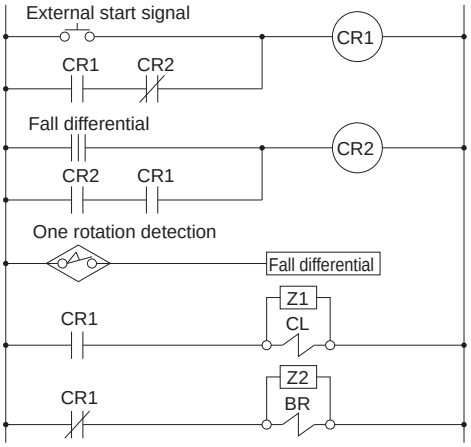
Connect the supplied surge absorbing protection element (varistor) to the clutch (or brake) in parallel. This element has no polarity.



Clutch/brake connection circuit

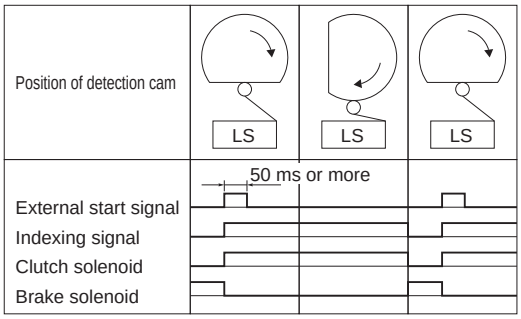
12 Reference circuit example

Design based on a general electrical design.



●Example of timing chart

One-rotation detection: For limit switch (LS)



Use/maintenance

CAUTION

1 Check that the bolts and screws of each part are not loose.

2 Do not perform maintenance and inspection while the unit is energized.
This may cause malfunction or breakdown of the control circuit, etc., and lead to injury.

3 Stop operation immediately if abnormal noise occurs during use.
Contact the nearest CKD Sales Office or Factory for damage to internal parts.

4 Lubricant replacement
Replace the lubricant as follows. In particular, be sure to replace the first time in order to remove the initial wear powder after operation. The lubricant becomes hot immediately after stopping operation. Allow one to two hours after stopping before replacing the lubricant. Check the oil amount every week. If the amount is insufficient, fill in oil with the same manufacturer and product name. If a significant reduction in oil performance (viscosity, color, etc.) is observed, increase the oil replacement cycle.

HO reducer
Perform the first replacement 50 hours after the start of operation. Replace every six months after that. When replacing the lubricant, fill in the grease nipple. Model No.: Alvania Grease S2 (Showa Shell)

5 Adjustment of air gaps
If the clutch/brake air gap is as shown below, adjust it to the appropriate air gap. If the air gap is adjusted, the braking time of the clutch/brake will change. After checking whether the machine is started and stopped within the stop section of the input shaft of the mechanical index, adjust the clutch/brake timing according to the detection cam of the input shaft.

HO reducer (unit: mm)

HO size		32	40	50	60	80
Clutch	Critical void	0.4	0.5	0.5	0.5	0.5
	Default void	0.15	0.2	0.2	0.2	0.2
Brake	Critical void	0.4	0.5	0.5	0.5	0.5
	Default void	0.15	0.2	0.2	0.2	0.2

MEMO

Product-specific cautions: Torque saver (TSF)

Design/Selection

⚠ CAUTION

1. Check that the actual load torque Te×1.3 value of the Mechanical indexer is within the release torque adjustment range.
2. If there is an external load applied while the Mechanical indexer is stopped (paused), make sure that the torque is less than release torque.
3. If emergency stop is performed during Mechanical indexer output section operation, take time to stop the torque saver so that it is not released.
4. If the drive system has backlash or lacks rigidity, a larger load than the calculation value will be applied. Carefully consider the load characteristics, select the Mechanical indexer, and adjust the release torque of the torque saver.
5. When selecting the Mechanical indexer model, select the table, workpiece, etc., to be mounted and the moment of inertia of the torque saver itself, in addition to the load conditions.
6. When the Mechanical indexer body and torque saver are ordered as a set, the output shaft of the Mechanical indexer body will be assembled at shipment with made to order mounting specifications depending on the size. When ordering the torque saver as Discrete, pay attention to the Mechanical indexer output shaft specifications on the mounting side.
7. Depending on the Mechanical indexer specifications, appropriate release torque may not be adjusted even if a torque saver is installed. Please confirm that the release torque of the torque saver does not exceed the dynamic rated output torque of the Mechanical indexer. If there is any problem, please contact CKD at the time of model selection.

Mounting, installation and adjustment

⚠ CAUTION

■Adjusting release torque

The torque saver can adjust release torque steplessly by turning the adjusting nut. Adjust the release torque with the following procedures based on the release torque adjusting range of each characteristic value and the amount of torque change per rotation of the adjusting nut. After making adjustments, use a torque indicator, etc., to confirm that the adjustment is correct.

(1)Mechanical indexer actual load torque Te.
(2)Find release torque Taj. (typically Taj=Te×1.3)
(3)A lock pin on the end face of the drive boss and a hexagon socket head cap screw on the side face of the adjusting nut are loosened.
(4)Adjust nut Tighten the adjust nut using the amount of torque change per rotation as a guide.
(5)To confirm that adjustment is correct with a torque indicator, etc. (Readjust as necessary.)
(6)To securely fix an adjusting nut.
Tighten the lock pin on the drive boss end face and the hexagon socket head cap screw on the adjusting nut side face. Refer to table below for the tightening torque.

● Lock pin tightening torque

Series	TSF5	TSF6	TSF8	TSF11	TSF14
Thread size	M4	M5	M5	M8	M8
Tightening torque (N·m)	1.7	3.1	3.1	14	14

● Hexagon socket head cap screw tightening torque on adjusting nut side

Series	TSF5	TSF6	TSF8	TSF11	TSF14
Thread size	M4	M4	M5	M5	M5
Tightening torque (N·m)	3.7	3.7	7.5	7.5	7.5

Mounting, installation and adjustment

CAUTION

[CAUTION]
1 .When not specified, the release torque is adjusted to the minimum value of the adjusting range before shipping.
Adjust the release torque when assembling the device.
(When a TSF is purchased separately, it is the median value in the adjusting range.)
2 .After adjusting release torque, use a torque indicator, etc., to confirm that the adjustment was correct.

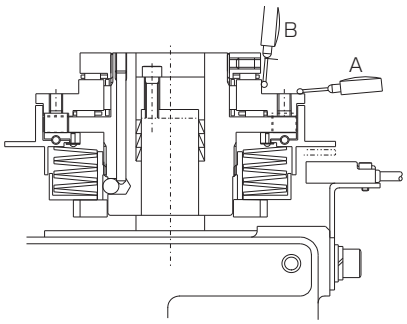
Installation

1 Securely fix the torque saver body and table.

2 With release detection switch
The proximity switch's detection distance may vary with temperature, voltage, etc. After assembling the device, check that the release of the torque saver is correctly detected.

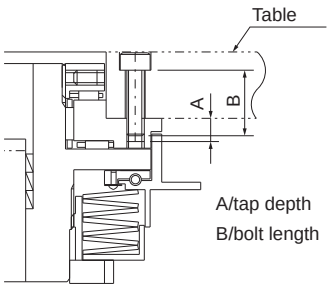
3 When attaching a table or the like to the spigot of the torque saver, if the table is forcibly driven with a hammer, etc., the surface runout or the like of the torque saver may increase.

4 When mounting the torque saver, pay careful attention to the coaxial conductor, etc.
The larger the eccentricity, the larger the indexing error.
Drive plate runout (TSF) during assembly
A: End surface runout within 0.04
B: Radial runout within 0.04
The taper ring insertion direction should be set with the inner ring down and the outer ring up. Also, to ensure sufficient transmission torque, apply oil (machine oil) to the taper ring and tighten as shown in the table below.



Tightening bolt	M4 Hexagon socket head cap screw	M5 Hexagon socket head cap screw	M6 Hexagon socket head cap screw	M8 Hexagon socket head cap screw
Tightening torque (N·m)	3.72	7.5	12.7	34.3

5 Drive plate tap depth (TSF)
When installing a table, etc., on the torque saver (TSF) drive plate, check the tap depth in the table below. Using a bolt exceeding this depth may cause internal interference and prevent proper release.



Series	TSF4	TSF5	TSF6	TSF8	TSF11	TSF14
Tap depth	4-M5 depth 4.5	6-M6 depth 7	6-M6 depth 9	6-M8 depth 10	6-M10 depth 15	6-M12 depth 16

Mounting, installation and adjustment

CAUTION

6 Do not use this product in environments where it may come in contact with water or oil. (no condensation)
This may cause malfunction or damage of the torque saver, as the product does not have waterproof or drip-proof specifications. When it will be exposed to water or oil, provide cover, etc.

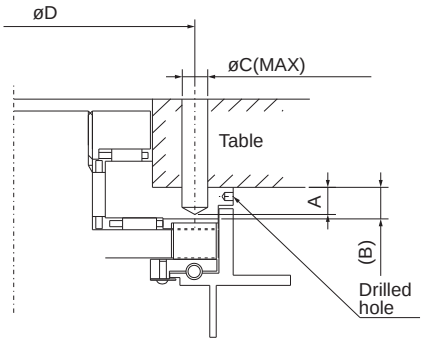
7 The torque saver is greased. Oil may ooze out during use. Ensure periodic inspections are performed, and install an oil absorber, etc., if this could cause defective accidents to the workpiece.

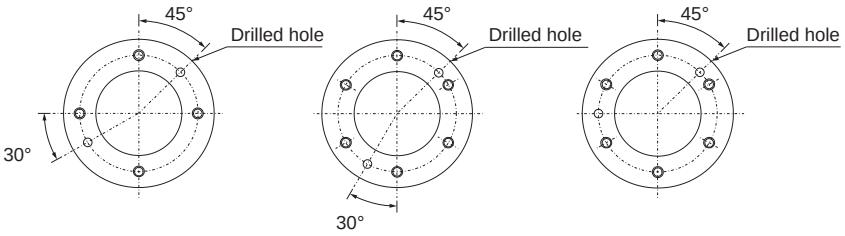
8 Do not use in atmospheres where there is a risk of explosion or fire.

9 Positioning pin hole machining When placing the knock pin for table fixing, observe the dimension positions in the table below and in the figure below.

Positioning pin hole dimensions table

Code / Model	A	B	C	D
TSF4	4.5 or less	(5.5)	5	55
TSF5	7 or less	(8.0)	6	75
TSF6	9 or less	(10)	6	100
TSF8	10 or less	(11)	8	120
TSF11	14 or less	(16)	10	150
TSF14	16 or less	(18)	12	180





TSF4 TSF5 to 8 TSF11 to 14

Use/maintenance

CAUTION

1 Do not perform maintenance and inspection while the power is ON. Malfunction or breakdown of the control circuit may cause the unit to move unexpectedly and lead to injury.

2 Mechanical indexer start/stop at the stop section. If the Mechanical indexer's input shaft is started/stopped outside the stop, load torque equivalent to or greater than the design value will be applied. When the torque saver is released, the table, etc., could overrun and cause injury or damage to the entire device.

3 During torque saver release, return the device with the stop part of the input shaft.

MEMO

Individual caution: Torque guard (TGX)

Design/Selection

⚠ CAUTION

1. Check that the actual load torque Te×1.3 value of the Mechanical indexer is within the trip torque (release torque) adjusting range.
2. If there is an external load applied while the Mechanical indexer is stopped (paused), confirm that the torque is less than the trip torque.
3. If emergency stop is performed during Mechanical indexer output section operation, take time to stop the torque guard so that it does not trip.
4. If the drive system has backlash or lacks rigidity, a larger load than the calculation value will be applied. Carefully consider the load characteristics, then select the Mechanical indexer and adjust the torque guard trip torque.
5. When selecting the Mechanical indexer model, select the table, workpiece, etc., and the moment of inertia of the torque guard itself, in addition to the load conditions.
6. When the Mechanical indexer body and torque guard are ordered as a set, the output shaft of the Mechanical indexer body will be assembled and shipped with a custom-made specification for mounting depending on the size. When ordering the torque guard with Discrete, pay attention to the Mechanical indexer output shaft specifications on the mounting side.
7. If a torque guard is installed with a specification exceeding n=12 Mechanical indexer indexing, appropriate trip torque adjustment may not be possible. Contact CKD during model selection.
8. Friction torque due to bearings, seals, etc., and work torque caused by uneven workpiece/jig mounting, etc., affect the torque guard accuracy. When designing your equipment, take measures to make it as small as possible.

Mounting, installation and adjustment

⚠ CAUTION

■Adjusting the trip torque

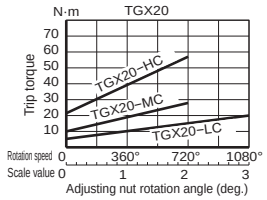
How to adjust trip torque

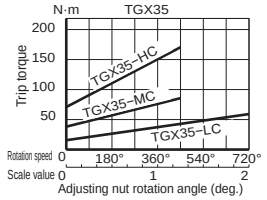
1. Mechanical indexer actual load torque Te.
2. Find the trip torque Taj. (typically Taj=Te×1.3)
3. When not specified, the torque guard is all adjusted to min point (min torque value) at shipment. Notice that the indicator indicates zero for the torque scale.
4. Remove one lock screw for the rotation-stop of the adjusting nut. (Mechanical indexer assembly at shipment)
5. Read the tightening angle of the adjusting nut corresponding to the predetermined trip torque from the tightening amount-torque correlation diagram (table at right), and tighten it. One scale of the torque scale is 60°. First set it to about 60° before the tightening value read from the correlation diagram, mount it on the machine, perform a trip test, and adjust to the optimal trip torque by sequentially tightening. The product's trip torque is not necessarily consistent with the tightening amount-torque correlation diagram in the table at right, so use this as a guideline.
6. Tighten one lock screw with the following torque. [Note 1]
   There are 2 positions where the lock screw is tightened, so if the screw comes into the cutout on the hub, tighten it in a position where the lock screw does not come into contact with the other. If there is a risk of the lock screw loosening due to vibration during operation, etc., apply LOCTITE 242 or an equivalent product to prevent loosening.

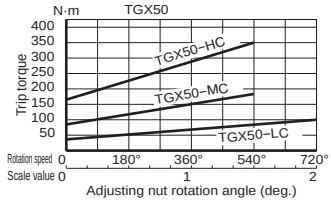
[Note] Check two points below when tightening the lock screw again.
(1)Check that the plug at the end is not dislocated. If a lock screw with the plug at the end dislocated is used, the hub threads could be damaged or the hub cutout could be bitten.
(2)Check that the plug at the end is not deformed significantly. The hub threads may be damaged if a lock screw with a significantly deformed plug is used.
* If (1) or (2) is the case or is likely to be the case, replace the locking screw with a new one.

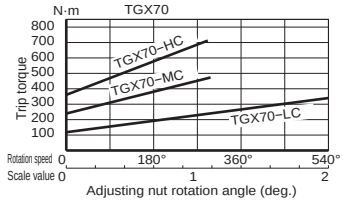
[CAUTION]
(1)When not specified, the trip torque value will be adjusted to the minimum value within the adjusting range before shipping. Adjust the trip torque when assembling the device.
(2)After adjusting the trip torque, use a torque indicator, etc., to confirm that the adjustment was correct.
(3)Do not turn the adjusting nut more than the max. torque scale value. The screw is locked.

Tightening amount - torque correlation diagram









Tightening torque

Lock screw	Tightening torque
M5	3.8Nm
M8	16Nm

Mounting, installation and adjustment

⚠ CAUTION

Mounting

1. Securely fix the torque guard body and table.
2. With trip detection switch
   The proximity switch's detection distance may vary with temperature, voltage, etc. After assembling the device, check that the torque guard trip is correctly detected.
3. When mounting a torque guard on the shaft, if it is forcibly driven with a hammer, etc., the surface runout of the torque guard may increase.
4. Mount with sufficient attention to the coaxial line, etc., of the shaft mounted to the torque guard.
   Install within the allowable misalignment. (Table 1, 2, Fig. 1, 2)
5. Do not use this product in environments where it may come in contact with water or oil. This may cause malfunction or damage of the torque guard, as the product does not have waterproof or drip-proof specifications. When it will be exposed to water or oil, provide cover, etc.
6. The torque guard is greased. Oil may ooze out during use. Ensure periodic inspections are performed, and install an oil absorber, etc., if this could cause defective accidents to the workpiece.
7. Do not use in atmospheres where there is a risk of explosion or fire.

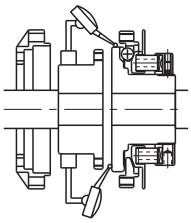
Centering method 1

a. The flange is separated from the boss and the center flange and axially slid
b. Fix the dial on the outer periphery of the boss, and measure the runout on the side and outer periphery of the hub.

(Table 1)

Model No.	Allowable angle error deg	Allowable parallelism mm	Allowable axial displacement mm
TGX20-C	0.6	0.1	±0.5
TGX35-C	0.6	0.1	±0.5
TGX50-C	0.6	0.1	±0.6
TGX70-C	0.6	0.1	±0.7

(Fig. 1)



Centering method 2

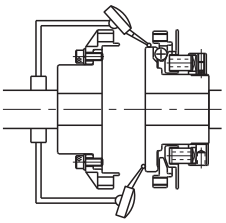
a. Separate the flange from the center flange.
b. To slide a boss with a flange on an axis.
c. Set the dial on the shaft, and measure the runout on the side and outer periphery of the hub.

(Table 2) Hub side runout value per reference angle error θ=0.1°

Model No.	O.D.	Hub runout value mm
TGX20-C	ø75	0.131
TGX35-C	ø98	0.171
TGX50-C	ø138	0.241
TGX70-C	ø177	0.309

* Mount so that the angle error is minimized.

(Fig. 2)



Use/maintenance

⚠ CAUTION

1. Grease lubrication
   Apply a light coat of grease to the ball once a year or every 1,000 trips.
2. Do not perform maintenance and inspection while the power is ON. Malfunction or breakdown of the control circuit may cause the unit to move unexpectedly and lead to injury.
3. Mechanical indexer start/stop at the stop section. If the Mechanical indexer's input shaft is started or stopped outside the stop, load torque higher than the design value will be applied. This can cause the torque guard to trip, causing the table, etc., to overrun and cause injury or damage to the entire device.
4. After a torque guard trip, return the motor at the stop part of the input shaft.

Product-specific cautions: Hollow shaft geared motor

Design/Selection

CAUTION

1. The Mechanical indexer's input shaft torque should be equal to or less than the allowable output shaft torque of the geared motor.
2. When starting and stopping a Mechanical indexer with an inverter, make sure that the total required braking times for both are within the Mechanical indexer stop time.
3. Select an inverter with a capacity equal to or higher than the geared motor capacity for the required inverter capacity.
4. When selecting an inverter, check the motor specifications, then select and design. Inverter drive may not satisfy the motor manufacturer's catalog characteristics. Explosion-proof test certification may not be accredited. (Limited to custom-made specifications)
5. When installing the detection switch, check the response time of the detection switch. Otherwise, detection may not be possible.

Mounting, installation and adjustment

CAUTION

1. Never place flammable materials around the geared motor. There is a risk of fire.
2. Do not place an obstacle that may prevent the ventilation around the geared motor. Burns caused by overheat could cause fire.
3. Operate the unit with an inverter within the specified frequency. This could lead to damage.
4. When work torque such as an eccentric load is applied, depending on the mounting orientation of the Mechanical indexer, the input shaft and geared motor may exceed the set rotational speed, causing the inverter to trip with regenerative power. Install a safety device on the machine side. This may cause falling objects, etc.

Use/maintenance

CAUTION

1. Replacement of lubricating oil for geared motors
   For hypoid gears
   Lubrication is based on grease, so maintenance is basically unnecessary.
2. Do not perform maintenance and inspection while the unit is energized.
   This may cause malfunction or breakdown of the control circuit, etc., and lead to injury.

Mechanical indexer model selection specifications check sheet Table (direct/indirect) drive

Desired model : ☐ZRS
Output shaft shape : ☐S (straight shaft) ☐F (flange shaft)
Housing material : ☐Fc
Installation orientation : ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

■Operating conditions

1. Indexing No.: n= [ ]

2. For table indirect drive

• Output axis deceleration ratio: $io=\frac{D_1}{D_2}=$ [ ] • Number of stations: $ns=\frac{n}{io}=$ [ ]

3. Total allocation angle (θt) = allocation angle (θh) × Number of stops (z)

[ ]° = [ ]° × [ ]

4. Cycle time

☐ Continuous drive	Unit Cycle time (t_0) = indexing time (t_1) + stop time (t_2) [ ] sec = [ ] sec + [ ] sec
☐ For intermittent drive	Machine unit Cycle time (tm) = Cycle time (t0) + Stop time (ts) [ ] sec = [ ] sec + [ ] sec * Time when the input shaft stopped due to ts:C/B, etc.

5. Input axis rotation speed: N

$$N=\frac{60}{\text{Unit cycle time } (t_0) \times \text{No. of stops } (z)}=$$ [ ] rpm

6. Cam curve: ☐MS (standard) ☐Other ( )

7. Input axis drive method
☐ Direct connection to worm [HO, etc., mounting]
☐ Direct connection to worm [Mounted with coupling]
☐ Worm indirect [chain belt drive]
☐ Gear motor

8. Expected service life time
[ ] h
If not specified, it will be calculated as 10000h.

CKD
To ( )

Company		Name	
Department / Division			
TEL		FAX	

[Option]

□Worm reducer: HO Series

・C/B□ Yes □No ・Reduction ratio 1/ ・Mounting direction

□Overload protection device: TSF/TGX —

■Load conditions

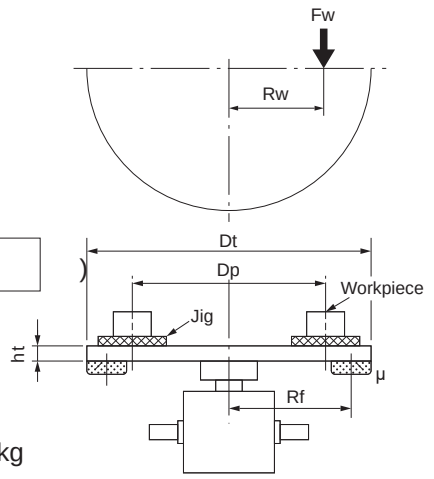
1. Table

・Diameter : Dt = ø mm

・Plate thickness : ht = mm

・Material :□Steel □Aℓ

□Other (material name material density



■Direct drive

2. Workpiece/jig

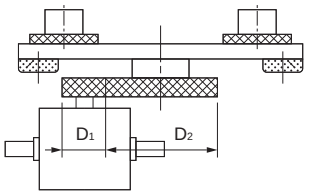
・Number of workpieces : nw = pcs.

・Total weight of workpiece : m_2 = ×nw = kg

・Number of jigs : np = pcs

・Total jig weight : m_3 = ×np = kg

・Workpiece/jig mounting center diameter: Dp=P.C.D mm



■Indirect drive

3. Table bottom instruction (Yes / No)

・Friction radius : Rf = mm

・Coefficient of friction : μ =

4. External load during indexing (output shaft operating)

・External load : Fw = N or kgf

・Action radius : Rw= mm

■If the conditions are not listed above, contact your CKD Sales representative.

	Index side gear	Table side gear
P.C.D	D_1=	D_2=
Tooth width		

Mechanical indexer model selection specifications check sheet Conveyor drive

Desired model : ☐ZRS
Output shaft shape : ☐S (straight shaft) ☐F (flange shaft)
Housing material : ☐Fc
Installation orientation : ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

■Operating conditions

1. Indexing No.: n= ☐

2. Output shaft deceleration ratio: io= $\frac{Zd}{Zc}$ = ☐

3. Total allocation angle (θt) = allocation angle (θh) × Number of stops (z)

☐ °= ☐ °× ☐

4. Cycle time

☐Continuous drive	Unit Cycle time (t_0) = indexing time (t_1) + stop time (t_2) ☐ sec = ☐ sec + ☐ sec
☐For intermittent drive	Machine unit Cycle time (tm) = Cycle time (t_0) + Stop time (ts) ☐ sec = ☐ sec + ☐ sec * Time when the input shaft stopped due to ts:C/B, etc.

5. Input axis rotation speed: N

$$N = \frac{60}{\text{Unit cycle time } (t_0) \times \text{No. of stops } (z)} = \square \text{ rpm}$$

6. Cam curve: ☐ MS (standard) ☐ Other ( )

7. Input axis drive method
- ☐ Direct connection to worm [HO, etc., mounting]
- ☐ Direct connection to worm [Mounted with coupling]
- ☐ Worm indirect [chain belt drive]
- ☐ Gear motor

8. Expected service life time

☐ h

If not specified, it will be calculated as 10000h.

CKD
To ( )

Company		Name	
Department / Division			
TEL		FAX	

[Option]

☐ Worm reducer: HO Series

• C/B ☐ Yes ☐ No • Reduction ratio 1/ • Mounting direction

☐ Overload protection device: TSF/TGX —

■ Load conditions

1. Conveyor feed pitch: St = mm

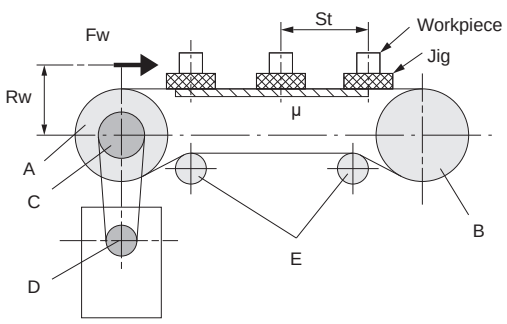
2. Chain Size#

• Chain model No.

• Chain pitch : Sch = mm

• Weight per unit : mch =

3. Number of chains: NB = Section



4. Sprocket

	A (drive)	B	C	D	E
Number of teeth (Z)					
Pitch Diameter (D)					
Tooth width (h)					
number per bar	1	1			

5. Workpiece/jig

• Number of workpieces: nw = individual • Total weight of workpieces: m_2 = × nw = kg

• Number of jigs: np = pcs • Total weight of jigs: m_3 = × np = kg

• Coefficient of friction: μ =

6. External load during indexing (output shaft operating)

• External load: Fw = N or kgf • Action radius: Rw = mm

■ If the conditions are not listed above, contact your CKD Sales representative.

Related products

■ ABSODEX
AX1000/2000/4000TS, TH
AX6000MU Series

The Direct Drive Actuator, which strives for ease of use
From palm-sized to large torques.
Conveyance, positioning, and simple construction of various devices

■ τ DISC Series
The Direct Drive Servo Motor, which boasts high performance
Various requirements such as high precision, high speed and speed stability
Diverse lineup to match.
Achieves one level higher performance.

NIKKI DENSO

Rotary fitting RJF Series

Catalog No. CB-024SA

■ Built-in bearing for high rigidity/low sliding resistance
■ Vast lineup with 4, 6, 8, 12, 16 circuits
■ Space saving types available for 12 and 16 circuits
■ M5 and Rc1/8 port sizes are available.
(Rotation speed 4/6/8)

Electric Actuator Motorless General Catalog

Catalog No. CB-055A

Wide-ranging lineup of motorless electric actuators

■ Slider
For high speed transport EBS-L Series
For high load transport ETS/ECS Series
Long stroke transport ETV/ECV Series
For fast tact transport EKS-L Series

■ Rod
For press fitting and hoisting EBR-L Series

Related products

Electric actuator EJSG Series

Catalog No.CC-1569A

Electric actuator that can be used in various environments

- Full lineup of the environment-resistant series
  Five products in pursuit of ease of use and high rigidity
  Standard, Dust-proof specifications, Low dust specifications
  Compatible with rechargeable battery manufacturing processes, Compatible with food manufacturing processes

- Compact with a highly rigid body
  High rigidity and space saving are realized simultaneously with the use of a wide guide that is integrated with the body.

Electric actuator FLSH/FLCR/FGRC Series

Catalog No.CC-1444A

- 2-Finger Gripper FLSH Series
  For soft handling of multi-model workpieces
- Table FLCR Series
  For short-stroke workpiece transport and positioning
- Rotary FGRC Series
  For indexing operation and workpiece inversion
- Controller ECR Series
  One controller that connects to any actuator
- Ctrller ECG Series
  New Controller with easy inventory management, easy design, and easy configuration

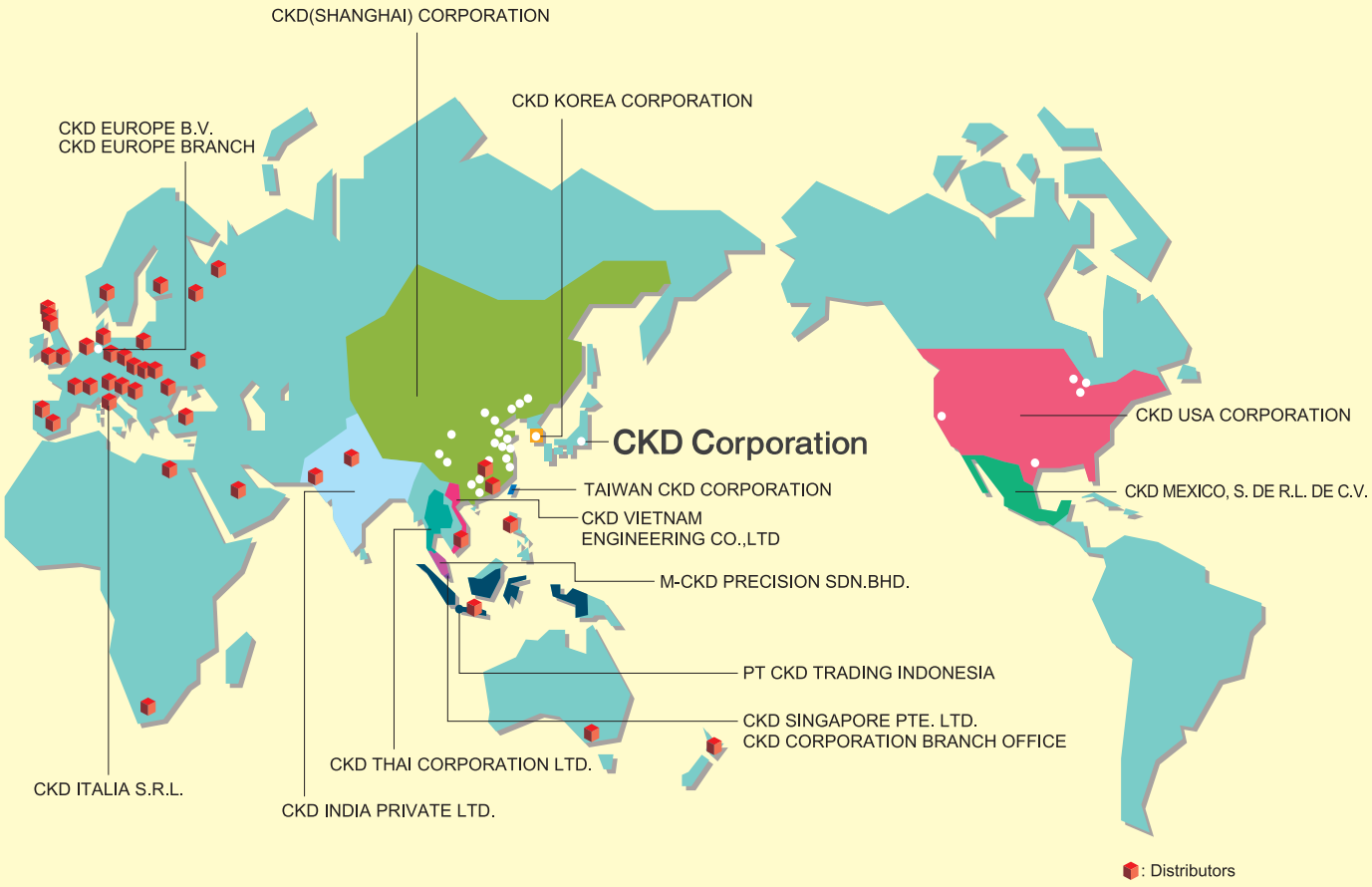
Electric actuator D Series, G Series

Catalog No.CC-1591A

New electric actuator inheriting the DNA of air components

- D Series (screw drive method)
  An actuator specialized for positioning between two points
- D Series (Spring drive method)
  Spring integrated actuator specialized for clamp/grip applications
- G Series (Screw drive method)
  64-point positioning actuator

WORLD-NETWORK



CKD Corporation

Website https://www.ckd.co.jp/en/

□ 2-250 Ouji, Komaki City, Aichi 485-8551, Japan
□ PHONE +81-568-74-1338 FAX +81-568-77-3461

ASIA

喜開理(上海)機器有限公司
CKD(SHANGHAI)CORPORATION

- 営業部/上海浦西事務所(SALES HEADQUARTERS / SHANGHAI PUXI OFFICE)
  Room 612, 6th Floor, Yuanzhongkeyan Building, No. 1905 Hongmei Road, Xinhui District, Shanghai 200233, China
  PHONE +86-21-60906046 FAX +86-21-60906046
- 上海浦東事務所(SHANGHAI PUDONG OFFICE)
- 寧波事務所(NINGBO OFFICE)
- 杭州事務所(HANGZHOU OFFICE)
- 無錫事務所(WUXI OFFICE)
- 昆山事務所(KUNSHAN OFFICE)
- 蘇州事務所(SUZHOU OFFICE)
- 南京事務所(NANJING OFFICE)
- 合肥事務所(HEFEI OFFICE)
- 成都事務所(CHENGDU OFFICE)
- 武漢事務所(WUHAN OFFICE)
- 鄭州事務所(ZHENGZHOU OFFICE)
- 長沙事務所(CHANGSHA OFFICE)
- 重慶事務所(CHONGQING OFFICE)
- 西安事務所(XIAN OFFICE)
- 広州事務所(GUANGZHOU OFFICE)
- 中山事務所(ZHONGSHAN OFFICE)
- 深圳西事務所(WEST SHENZHEN OFFICE)
- 深圳東事務所(EAST SHENZHEN OFFICE)
- 東莞事務所(DONGGUAN OFFICE)
- 厦門事務所(XIAMEN OFFICE)
- 福州事務所(FUZHOU OFFICE)
- 瀋陽事務所(SHENYANG OFFICE)
- 大連事務所(DALIAN OFFICE)
- 長春事務所(CHANGCHUN OFFICE)
- 北京事務所(BEIJING OFFICE)
- 天津事務所(TIANJIN OFFICE)
- 青島事務所(QINGDAO OFFICE)
- 潍坊事務所(WEIFANG OFFICE)
- 済南事務所(JINAN OFFICE)
- 烟台事務所(YANTAI OFFICE)

CKD INDIA PRIVATE LTD.

- HEADQUARTERS
  Unit No. 607, 6th Floor, Welldone Tech Park, Sector 48, Sohna Road, Gurgaon-122018, Haryana, India
  PHONE +91-124-418-8212
- BANGALORE OFFICE
- PUNE OFFICE
- CHENNAI OFFICE
- MUMBAI OFFICE
- HYDERABAD OFFICE

PT CKD TRADING INDONESIA

- HEAD OFFICE
  Menara Bidakara 2, 18th Floor, Jl. Jend. Gatot Subroto Kav. 71-73, Pancoran, Jakarta 12870, Indonesia
  PHONE +62-21-2938-6601 FAX +62-21-2906-9470
- MEDAN OFFICE
- BEKASI OFFICE
- KARAWANG OFFICE
- SEMARANG OFFICE
- SURABAYA OFFICE

CKD KOREA CORPORATION

- HEADQUARTERS
  (3rd Floor), 44, Sinsu-ro, Mapo-gu, Seoul 04088, Korea
  PHONE +82-2-783-5201～5203 FAX +82-2-783-5204
- 水原営業所(SUWON OFFICE)
- 天安営業所(CHEONAN OFFICE)
- 蔚山営業所(ULSAN OFFICE)

M-CKD PRECISION SDN.BHD.

- HEAD OFFICE
  Lot No.6,Jalan Modal 23/2, Seksyen 23, Kawasan MIEL, Fasa 8, 40300 Shah Alam,Selangor Darul Ehsan, Malaysia
  PHONE +60-3-5541-1468 FAX +60-3-5541-1533
- JOHOR BAHRU BRANCH OFFICE
- PENANG BRANCH OFFICE

CKD SINGAPORE PTE. LTD.

No.33 Tannery Lane #04-01 Hoesteel Industrial Building, Singapore 347789, Singapore
PHONE +65-67442623 FAX +65-67442486

CKD CORPORATION BRANCH OFFICE

No.33 Tannery Lane #04-01 Hoesteel Industrial Building, Singapore 347789, Singapore
PHONE +65-67447260 FAX +65-68421022

CKD THAI CORPORATION LTD.

- HEADQUARTERS
  19th Floor, Smooth Life Tower, 44 North Sathorn Road, Silom, Bangrak, Bangkok 10500, Thailand
  PHONE +66-2-267-6300 FAX +66-2-267-6304-5
- NAVANAKORN OFFICE
- EASTERN SEABOARD OFFICE
- LAMPHUN OFFICE
- KORAT OFFICE
- AMATANAKORN OFFICE
- PRACHINBURI OFFICE
- SARABURI OFFICE

台湾喜開理股份有限公司
TAIWAN CKD CORPORATION

- HEADQUARTERS
  16F-3, No. 7, Sec. 3, New Taipei Blvd., Xinzhuang Dist., New Taipei City 242, Taiwan
  PHONE +886-2-8522-8198 FAX +886-2-8522-8128
- 新竹営業所(HSINCHU OFFICE)
- 台中営業所(TAICHUNG OFFICE)
- 台南営業所(TAINAN OFFICE)
- 高雄営業所(KAOHSIUNG OFFICE)

CKD VIETNAM ENGINEERING CO.,LTD.

- HEADQUARTERS
  18th Floor, CMC Tower, Duy Tan Street, Cau Giay District, Hanoi, Vietnam
  PHONE +84-24-3795-7631 FAX +84-24-3795-7637
- HO CHI MINH OFFICE

EUROPE

CKD EUROPE B.V.

- HEADQUARTERS
  Beechavenue 125A, 1119 RB Schiphol-Rijk, the Netherlands
  PHONE +31-23-554-1490
- CKD EUROPE GERMANY OFFICE
- CKD EUROPE UK
- CKD EUROPE CZECH O.Z.

CKD CORPORATION EUROPE BRANCH

Beechavenue 125A, 1119 RB Schiphol-Rijk, the Netherlands
PHONE +31-23-554-1490

CKD ITALIA S.R.L.

Via di Fibbiana 15 Calenzano (FI) CAP 50041, Italy
PHONE +39 0558825359 FAX +39 0558827376

NORTH AMERICA & LATIN AMERICA

CKD MEXICO, S. DE R.L. DE C.V.

Cerrada la Noria No. 200 Int. A-01, Querétaro Park II, Parque Industrial Querétaro, Santa Rosa Jáuregui, Querétaro, C.P. 76220, México
PHONE +52-442-161-0624

CKD USA CORPORATION

- HEADQUARTERS
  1605 Penny Lane, Schaumburg, IL 60173, USA
  PHONE +1-847-648-4400 FAX +1-847-565-4923
- LEXINGTON OFFICE
- SAN ANTONIO OFFICE
- SAN JOSE OFFICE/ TECHNICAL CENTER
- DETROIT OFFICE
- BOSTON OFFICE

The goods and/or their replicas, the technology and/or software found in this catalog are subject to complementary export regulations by Foreign Exchange and Foreign Trade Law of Japan. If the goods and/or their replicas, the technology and/or software found in this catalog are to be exported from Japan, Japanese laws require the exporter makes sure that they will never be used for the development and/or manufacture of weapons for mass destruction.

2023.3