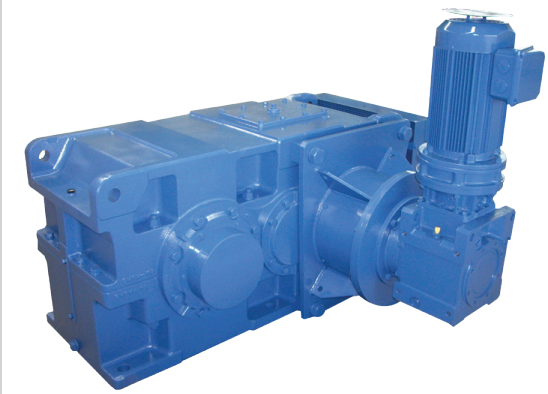
Sumitomo Drive Technologies



PARAMAX®9000

Bucket Elevator Drive

Sumitomo Heavy Industries, Ltd.

No. SCA/AP/BE/.01/2017.12

General Product Line-up

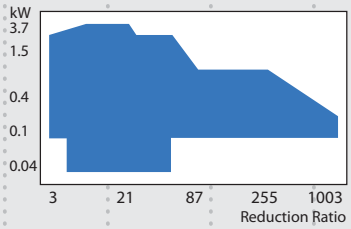
Gearmotor / Reducer

6W 40W 90W 0.1kW 0.2kW 2.2kW 3.7kW 5.5kW 30kW 55kW 132kW 1000kW

Concentric Shaft

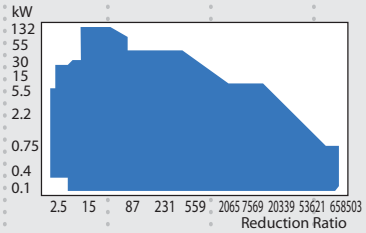
ALTAX® NEO GEARMOTOR

CYCLO® speed reduction concept.
The concentric shaft with the smallest flange size in the industry.
Flexible design.



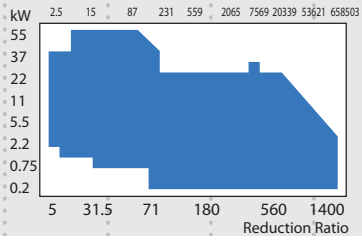
CYCLO® DRIVE

10 million sold.
The benchmark for a reliable gearbox.



COMPOWER® PLANETARY DRIVE

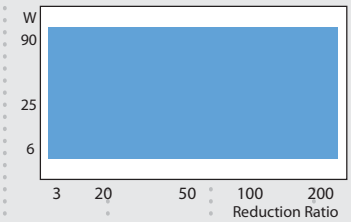
High torque yet exceptionally compact for a high torque design due to the unique reduction mechanism.
- Rating torque 0.46~736kNm



Parallel Shaft

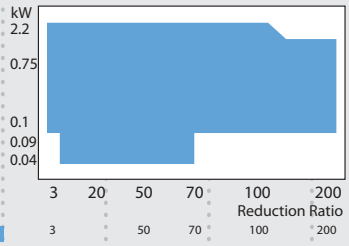
ASTERO® GEARMOTOR

Separable of motor and gear head for easy maintenance.
Available in a wide range of motors



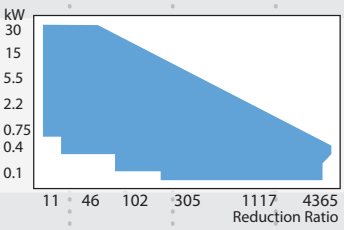
PREST® NEO GEARMOTOR

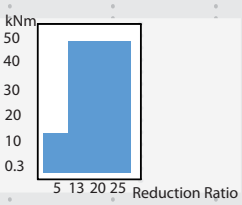
New parallel shaft gearmotor.
A very compact, user friendly design with lower noise levels and high radial load ratings.



Helical BUDDYBOX® & HSM

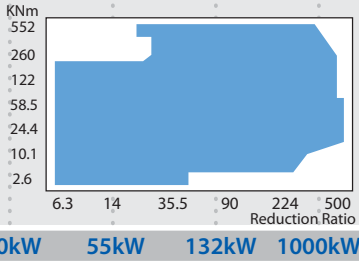
Hollow shaft
Helical Gearbox
and Gearmotor





PARAMAX® 9000Series

A compact reducer with higher tooth strength rating and high-performance.
- Rating torque2.6~552kNm



6W 40W 90W 0.1kW 0.2kW 2.2kW 3.7kW 5.5kW 30kW 55kW 132kW 1000kW

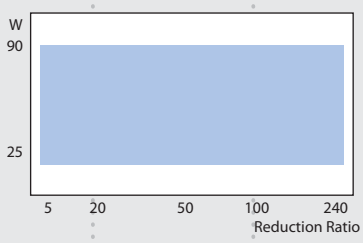
General Product Line-up

15W 25W 90W 0.1kW 5.5kW 11kW 55kW 1400kW

Right Angle Shaft

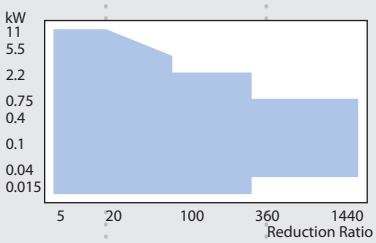
ASTERO® GEARMOTOR

This high performance gearmotor features all steel hypoid gear with a separable motor.



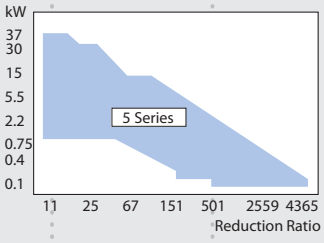
HYPONIC GEARMOTOR®

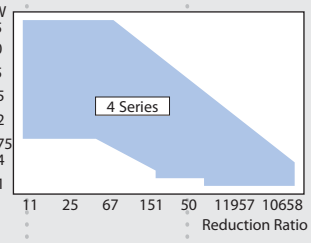
The all steel Hypoid gearing insures long life.
A full range of ratios, motor powers and service factors are available.



Bevel BUDDYBOX®

Taking advantage of CYCLO® gear mechanism. Bevel gear for output shaft.

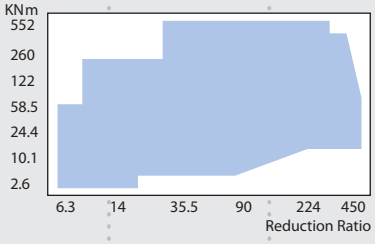




PARAMAX® 9000 Series

A compact reducer with higher strength gearing.
Available in a variety of input arrangements.

- Rating torque 2.6~552kNm



15W 25W 90W 0.1kW 5.5kW 11kW 55kW 1400kW

Inverter

25W 100W 7.5kW 55kW

CAI

Compact and easy-to-use inverter.
The power source is available for single/three phase use.
Output 25 ~ 100W

SF-420

Easy-to-use inverter with sensorless vector control. The lineup includes single and three phase power sources.
Output 0.1 ~ 2.2kW

HF-320 α

High torque and sophisticated inverter with sensorless vector control.
Output 0.2 ~ 7.5kW
Available for d2G4.

HF-430

High performance inverter with sensorless vector control with a wide variety of options.
Output 5.5 ~ 55kW
Available for d2G4.

Mechanical speed control

BEIER® VARIATOR

Stepless variable speed reducer with a 50 year history
High capacity and long-life.

- Power : 0.2kW ~ 150kW

Worm gear speed reducer

HEDCON®

High-efficiency, high-strength worm reducer based on a double enveloping design.

- Torque: 0.8 ~ 82kNm

General Product Line-up

Motion Control Drive (MCD)

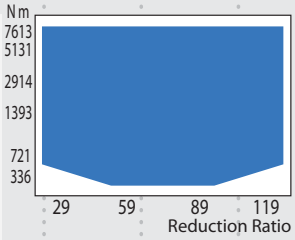
Allowable peak torque

30Nm 35Nm 330Nm 380Nm 410Nm 1000Nm 1370Nm 3000Nm 3100Nm 6200Nm 7600Nm 11000Nm

CYCLO® DRIVE for Precision Control F Series

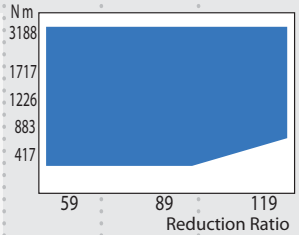
FC-A F1C-A F2C-A Series

For point-to-point applications
Compact type



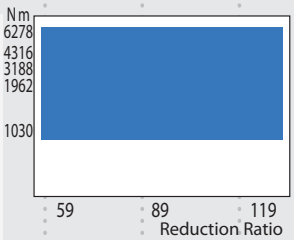
F4C-D Series

For point-to-point applications
High performance compact type



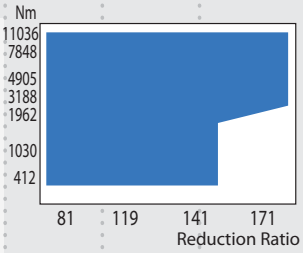
F4C-C F2C-C Series

For point-to-point applications
Large diameter
hollow high speed shaft type



FC-T F2C-T Series

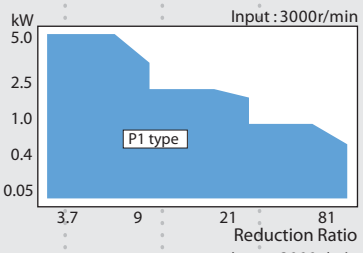
For point-to-point applications
High reduction ratio type

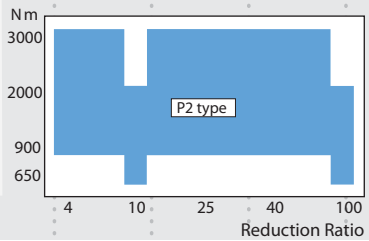


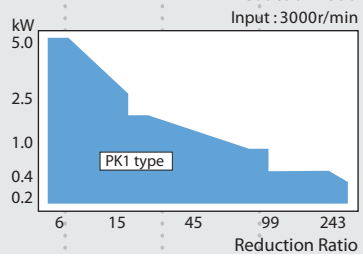
Planetary Gear

IB Series

Planetary gear for servo motor applications.
Best-in-class compact design.
- Backlash : P1 type 3min/15min
  P2 type 3min
  PK1 type 6min/15min



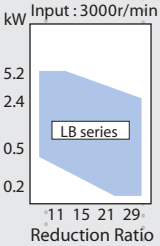


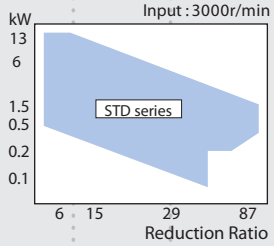


CYCLO® DRIVE

LOW BACKLASH SERVO CYCLO® REDUCERS

Cyclo drive with flange for servo motor applications.
- Backlash : STD Series 60min
  LB Series 6min





30Nm 35Nm 330Nm 380Nm 410Nm 1000Nm 1370Nm 3000Nm 3100Nm 6200Nm 7600Nm 11000Nm

Product Advantages

Paramax® 9000 Series - Bucket Elevator Drives

The Paramax® 9000 Bucket Elevator Drive is designed to handle full loading capacity.

Paramax® 9000 Bucket Elevator Drive has an inching drive mounted to the reducer and coupled by an over-running clutch. The inching drive allows the conveyor to run loaded at reduced operating speeds for inspection and maintenance. Conveyors in harsh, cold climates can also benefit by utilizing an inching drive to keep the belt pliable and prevent system damage.

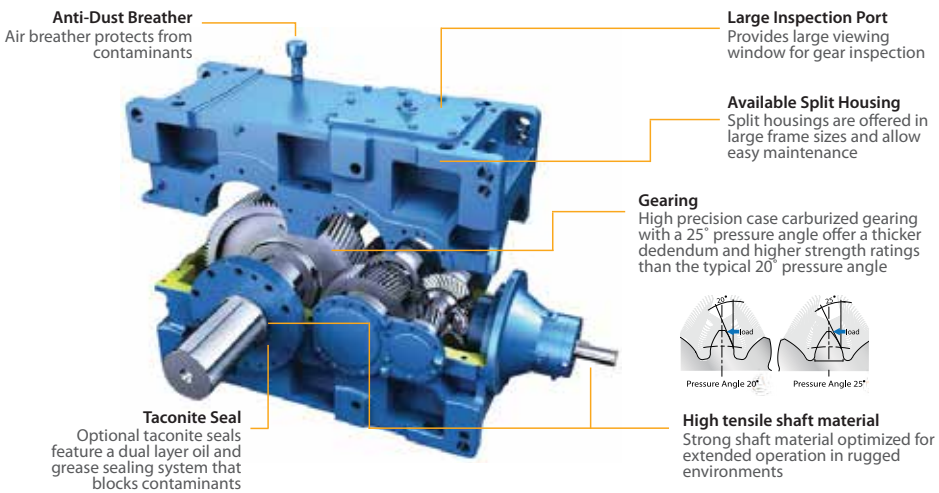
- **Long Life and High Shock Load Capacity**
  Sumitomo's inching drive combines the ruggedness of Paramax® with the proven quality and reliability of an inline Cyclo® 6000 series or a right angle Cyclo® Bevel BuddyBox®.
- **Inching Drive Selected to Handle Full Load Capacity**
  The Inching Drive is connected to the main Paramax® reducer through a maintenancefree over-running clutch, ensuring optimal power and performance.

Paramax® 9000 Series - Parallel and Right Angle Large Industrial Gearboxes

Paramax® parallel and right angle drives are built on seven decades of Sumitomo excellence in power transmission engineering. Some of the largest, and most durable power transmission systems operating in the world were designed and manufactured by Sumitomo. The Paramax® product line features double, triple and quadruple reduction gearboxes, global standardization, availability and support from Sumitomo worldwide locations.

Paramax® 9000 Series Features

- **26 Housing Sizes**
  Offer more precise unit selection and optimized applications
- **High Torque Ratings**
  High ratings of up to 552,000 N•m due to 25˚pressure angle and wide gear tooth face
- **Universal Housings**
  Accommodate horizontal, vertical and upright installations
- **Fan and Shroud Design**
  Delivers up to 87% increased thermal capacity, cooler operation and longer service life vs. previous generation
- **Strong Housing Material**
  Standard gray cast iron with ductile and fabricated steel options for added durability and strength



Specifications Summary

Torque Range:	552,000 N•m*
Ratios:	6.3:1 to 500:1 standard
Housing Material:	Cast Iron *(standard)* Ductile or Fabricated Steel *(optional)*
Universal Housing:	Horizontal, Vertical or Upright Mounting

* additional sizes upto 740,000 Nm available

Mounting Base Options

Engineered steel baseplates, swingbases and transition plates are available as part of the complete drive systems solutions offered for the Paramax® 9000.

Baseplate for base-mounted units

Swingbase for shaft-mounted units

Paramax® 9000 Series - Shaft Options

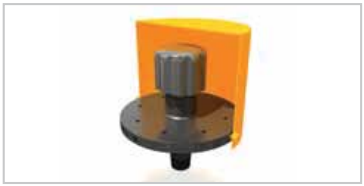
Solid Shaft

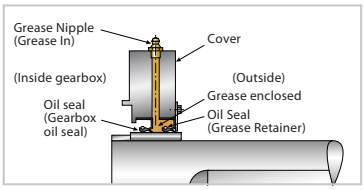
Shrink Disc

Keyed Hollow Bore

Paramax® 9000 Series - Optional Accessories

- Heavy Duty Anti-Dust Breather
- Taconite, Labyrinth and FKM Seals
- Integral Backstop
- Cooling Fan with Split Fan Hood
- Shaft Safety Cover
- Immersion Oil Heater
- Drain Valve, Magnetic Drain Plug
- Resistance Temperature Detector
- Input and Output Coupling Guards
- Cooling Systems
- Heavy Duty Bearings





Optional heavy duty anti-dust breather (top) and taconite seals (above) provide maximum protection from environmental contaminants.

Paramax® 9000 Series - Applications

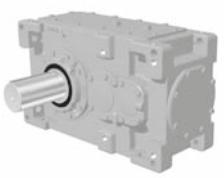
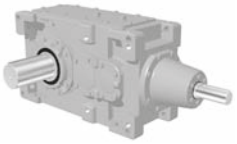
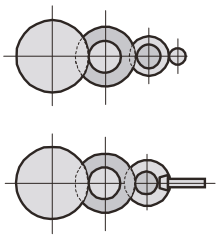
- Agitators and Mixers
- Cement Kilns
- Cranes and Hoists
- Wastewater Treatment
- Mining
- Forestry, Pulp and Paper
- Sugar Processing
- Material Handling
- Steel
- Pumps

Contents

Paramax® 9000
Bucket Elevator Drives offer *Premier Performance* in a powerful and rugged universal housing design.

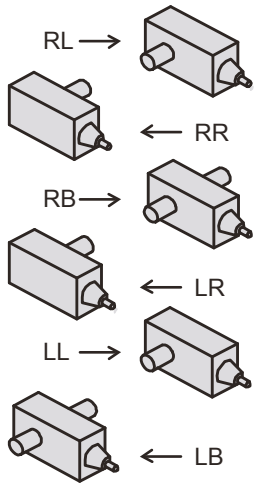
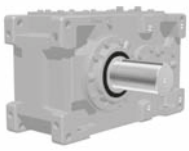
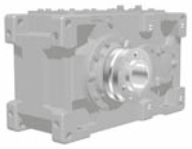
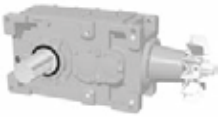
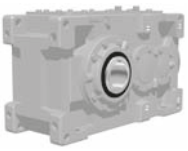
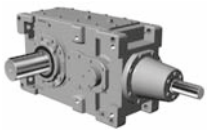
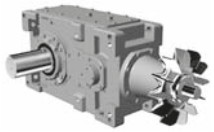
Nomenclature

P H D 9075 R 3

Series	Mounting	Housing	Size	Torque kNm	Shaft Position	No. of Stages
P Paramax	H  Horizontal	A Mono-block	9030	6.4	R  Right-angle	3  Triple-stage
			9035	8.5		
			9040	10.1		
			9045	13.2		
			9050	15.3		
			9055	19.9		
		D Split	9060	24.4		
			9065	31.4		
			9070	38.2		
			9075	47.8		
			9080	58.5		
			9085	73.1		
			9090	85.9		
			9095	101		
			9100	122		
			9105	144		
			9110	174		
			9115	207		
			9118	260		

Nomenclature

— RL K F — 35.5

Shaft Arrangement	Low Speed Shaft Type	Option	Nominal Ratio
	(Blank)  Solid	(Blank) Without Option 	25 28 31.5 35.5 40 45 50 56 63 71
	T  Hollow with Shrink Disc	F With Fan 	
	K  Hollow with Keyway	B With Backstop 	
		FB With Fan and Backstop 	

Nomenclature

L H U M 10 – 4B145 □ – □ – Y1 – B – 46

Product Symbol	
L	Bevel Buddy Box

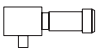
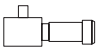
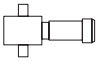
Output Shaft Direction	
H	Horizontal

Mounting Style	
U	Solid shaft, Case mount

Input Method	
M	Gearmotor

Motor Capacity Symbol

Frame Size

Output Shaft Projection		
Symbol	Direction viewed from the side of the Motor	Side View
L	Left	
R	Right	
T	Both	

Auxiliary Specification	
<blank>	Standard Motor
AV	Inverter Duty Motor

Mounting Position
(See Mounting Position and Nomenclature Diagram on page 24 of XXX)

With/Without Brake	
<blank>	No Brake
B	With Brake

Reduction Ratio

Item		Standard Specifications		
		Installation	High Speed Shaft Speed	
Reducer	Lubrication	Horizontal Installation	750 ～ 1800r/min	When the input speed is less than 750rpm, please consult Sumitomo Drive to check if Oil Pump Lubrication is required
	Gear	Material: Alloy Steel Heat Treatment: Carburizing Processing: Precision Machining		
	Shaft	Material: Alloy Steel		
	Housing	Material: Cast Iron		
	Seal	Output Shaft: Dust Lip Seal / Input Shaft: Dust Lip Seal		
	Air Breather	Anti-dust Air breather		
Environmental Conditions	Ambient Temp.	−10℃～+40℃ (According to different uses, can take a cooling fan)		
	Gas Environment	Non-corrosive, explosive gas		
	Altitude	Altitude of 1000 meters below		
	Ambient Humidity	85% or less		
Installation		Horizontal Installation		

Note: When the ambient temperature is below -10°C or more than + 50°C, external heating or cooling devices may be required. Please consult Sumitomo Drive Technologies.

Lubricant Specifications										
Ambient Temp.	Lubri-cants	Viscosity grade (ISO) mm^2/s (40°C)	AGMA	Idemitsu Kosan	Shell Oil	Japan Energy	Nippon Oil	Cosmo Oil	Exxon Mobil	
0 ~ 40°C	Mineral Oil	VG 320	6EP	Daphnie Super Gear Oil 320	Omala Oil 320	JOMO Ledactas 320	Bonknock N320	Cosmo Gear Oil 320	Spartan EP320	Mobil Gear Oil 632
-15 ~ 40°C	Synthet-ic Oil	VG 320	6S	Daphnie Alpha Gear Oil 320	–	JOMO Ledactas STO 320	Bonknock AX 320	–	Mobil Gear SHC XMP320	

※ Note: The selection of the auxiliary drive in the following tables are based on the following assumptions:
1. Auxiliary transmission running time of less than 3 hours / day;
2. Start/stop frequency is less than 10 times / hour;
3. For any other operating conditions, please consult Sumitomo.

Selection Table (PHA9030R3 - PHA9040R3)

n1 = 1500 rpm Input

Main Drive Model: PHA9030R3 [n1=1500rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM1H-4A100L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
53.6	28.0	27.096	37.0	6.4	21.0	37.0	2.4	4.1	35.0	2.4	2.4	35.0
47.6	31.5	32.455	26.9	5.6	21.0	37.0	3.2	3.0	35.0	3.2	3.2	35.0
42.3	35.5	34.983	26.9	6.0	21.0	37.0	3.0	3.2	35.0	3.0	3.0	35.0
37.5	40.0	40.607	25.8	6.7	18.0	32.0	2.6	3.8	35.0	2.6	2.6	35.0
33.3	45.0	43.770	23.2	6.5	18.0	32.0	2.4	4.1	35.0	2.4	2.4	35.0
30.0	50.0	51.411	16.1	5.3	18.0	32.0	3.2	3.0	35.0	3.2	3.2	35.0
26.8	56.0	55.125	16.1	5.7	16.0	29.0	3.0	3.2	35.0	3.0	3.0	35.0
23.8	63.0	63.986	16.1	6.6	16.0	29.0	2.6	3.8	35.0	2.6	2.6	35.0
21.1	71.0	63.986	14.8	6.0	16.0	29.0	2.6	3.8	35.0	2.6	2.6	35.0

Main Drive Model: PHA9035R3 [n1=1500rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM1H-4A100L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
53.6	28.0	27.225	49.0	8.5	28.0	51.0	2.4	4.1	35.0	2.4	4.1	35.0
47.6	31.5	31.331	43.0	8.6	28.0	51.0	2.1	4.7	35.0	2.1	4.7	35.0
42.3	35.5	34.063	39.0	8.5	28.0	51.0	1.9	5.1	35.0	1.9	5.1	35.0
37.5	40.0	40.451	26.9	6.9	25.0	45.0	2.6	3.7	35.0	2.6	3.7	35.0
33.3	45.0	43.979	26.9	7.5	25.0	45.0	2.4	4.1	35.0	2.4	4.1	35.0
30.0	50.0	50.611	26.9	8.7	25.0	45.0	2.1	4.7	35.0	2.1	4.7	35.0
26.8	56.0	55.025	24.6	8.6	21.0	38.0	1.9	5.1	35.0	1.9	5.1	35.0
21.1	71.0	69.300	16.1	7.1	21.0	38.0	2.4	4.1	35.0	2.4	4.1	35.0

Main Drive Model: PHA9040R3 [n1=1500rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM2-4A100L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
53.6	28.0	27.893	55.0	9.8	33.0	54.0	2.3	4.2	35.0	2.1	6.2	39.0
47.6	31.5	31.694	48.0	9.7	33.0	54.0	3.3	2.9	35.0	2.6	5.2	46.0
42.3	35.5	36.165	42.0	9.7	33.0	54.0	2.9	3.3	35.0	2.6	5.0	39.0
37.5	40.0	39.487	41.0	10.3	28.0	40.0	2.6	3.7	35.0	2.4	5.5	39.0
33.3	45.0	45.058	34.0	9.8	28.0	40.0	2.3	4.2	35.0	2.1	6.2	39.0
26.8	56.0	56.987	26.1	9.5	27.0	44.0	2.9	3.3	35.0	2.6	5.0	39.0
23.8	63.0	62.222	26.1	10.3	27.0	44.0	2.6	3.7	35.0	2.4	5.5	39.0
21.1	71.0	71.000	21.9	9.9	27.0	44.0	2.3	4.2	35.0	2.1	6.2	39.0

※ Notes:
1. Thermal Power Rating is calculated based on ambient temperature of 40°C. For higher ambient temperatures, consult Sumitomo.
2. Above tables present two options for Auxiliary (Inching) Drives: (a) for low inching torque (suitable for maintenance purpose), and (b) high inching torque (suitable for inching under loaded condition).
3. Auxiliary Drives selected in the above tables are based on inching operation of less than 3 hrs./day and start/stop frequency of less than 10 times/hr. For other operating conditions, please consult Sumitomo for alternative selection.

Selection Table (PHA9045R3 - PHA9055R3)

Main Drive Model: PHA9045R3 [n1=1500rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM3-4A100L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
53.6	28.0	28.379	67.0	12.1	40.0	65.0	2.3	4.2	35.0	2.3	8.5	35.0
47.6	31.5	31.079	67.0	13.3	40.0	65.0	2.1	4.6	35.0	2.1	9.3	35.0
42.3	35.5	35.357	57.0	12.8	40.0	65.0	3.0	3.3	35.0	3.0	6.5	35.0
37.5	40.0	40.296	48.0	12.3	37.0	60.0	2.6	3.7	35.0	2.6	7.5	35.0
33.3	45.0	45.843	44.0	12.8	37.0	60.0	2.3	4.2	35.0	2.3	8.5	35.0
30.0	50.0	50.205	42.0	13.4	37.0	60.0	2.1	4.6	35.0	2.1	9.3	35.0
26.8	56.0	57.115	36.0	13.1	32.0	52.0	2.9	3.4	35.0	2.9	6.7	35.0
21.1	71.0	72.237	26.1	12.0	32.0	52.0	2.3	4.2	35.0	2.3	8.5	35.0

Main Drive Model: PHA9050R3 [n1=1500rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM3-4A100L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
53.6	28	29.526	80	15	40	87	2.2	6	35	2	9.7	39
47.6	31.5	31.969	79	16.1	40	87	3.3	4	35	2.2	8.8	53
42.3	35.5	36.395	65	15.1	40	87	2.9	4.6	35	2.2	8.7	46
37.5	40	41.895	61	16.3	36	78	2.5	5.3	35	2.3	8.5	39
33.3	45	47.695	50	15.2	36	78	2.2	6	35	2	9.7	39
30.0	50	51.869	49	16.2	36	78	2.5	5.3	35	2.3	8.5	39
26.8	56	59.051	40	15	33	71	2.2	6	35	2.2	8.8	35
23.8	63	64.640	39	16.1	33	71	2.5	5.3	35	2.3	8.5	39
21.1	71	73.590	32	15	33	71	2.2	6	35	2.2	8.8	35

Main Drive Model: PHA9055R3 [n1=1500rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM4-4A100L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
53.6	28.0	27.706	103.0	18.2	51.0	110.0	2.3	5.7	35.0	2.3	11.3	35.0
47.6	31.5	32.319	103.0	21.2	51.0	110.0	2.0	6.6	35.0	2.0	13.2	35.0
42.3	35.5	36.309	84.0	19.4	51.0	110.0	1.8	7.4	35.0	2.2	11.8	28.0
37.5	40.0	39.838	79.0	20.0	46.0	99.0	2.6	5.0	35.0	2.4	11.0	39.0
33.3	45.0	44.756	68.0	19.4	46.0	99.0	2.3	5.7	35.0	2.3	11.3	35.0
30.0	50.0	52.207	65.0	21.6	46.0	99.0	2.0	6.6	35.0	2.0	13.2	35.0
26.8	56.0	58.652	52.0	19.4	43.0	94.0	1.8	7.4	35.0	2.2	11.8	28.0
23.8	63.0	64.637	52.0	21.4	43.0	94.0	2.0	6.6	35.0	2.0	13.2	35.0
21.1	71.0	72.617	42.0	19.4	43.0	94.0	1.8	7.4	35.0	2.2	11.8	28.0

※ Notes:
1. Thermal Power Rating is calculated based on ambient temperature of 40°C. For higher ambient temperatures, consult Sumitomo.
2. Above tables present two options for Auxiliary (Inching) Drives: (a) for low inching torque (suitable for maintenance purpose), and (b) high inching torque (suitable for inching under loaded condition).
3. Auxiliary Drives selected in the above tables are based on inching operation of less than 3 hrs./day and start/stop frequency of less than 10 times/hr. For other operating conditions, please consult Sumitomo for alternative selection.

Selection Table (PHD9060R3 - PHD9070R3)

n1 = 1500 rpm Input

Main Drive Model: PHD9060R3 [n1=1500rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM5-4A115L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
53.6	28.0	29.291	127.0	23.7	56.0	111.0	2.2	8.8	35.0	2.0	16.1	39.0
47.6	31.5	30.157	117.0	22.5	56.0	111.0	3.4	5.7	35.0	2.6	12.4	46.0
42.3	35.5	35.140	106.0	23.7	56.0	111.0	2.9	6.7	35.0	2.6	12.3	39.0
37.5	40.0	39.520	103.0	25.9	51.0	99.0	2.6	7.5	35.0	2.4	13.8	39.0
33.3	45.0	46.051	81.0	23.7	51.0	99.0	2.2	8.8	35.0	2.0	16.1	39.0
30.0	50.0	50.273	81.0	25.9	51.0	99.0	2.6	7.5	35.0	2.4	13.8	39.0
26.8	56.0	58.582	64.0	23.9	46.0	90.0	2.2	8.8	35.0	2.0	16.1	39.0
23.8	63.0	63.984	63.0	25.7	46.0	90.0	2.6	7.5	35.0	2.4	13.8	39.0
21.1	71.0	74.559	50.0	23.7	46.0	90.0	2.2	8.8	35.0	2.0	16.1	39.0

Main Drive Model: PHD9065R3 [n1=1500rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM5-4A115L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
53.6	28.0	27.509	162.0	28.4	70.0	137.0	2.4	8.2	35.0	2.2	15.1	39.0
47.6	31.5	31.521	162.0	32.5	70.0	137.0	2.1	9.4	35.0	1.9	17.4	39.0
42.3	35.5	36.050	133.0	30.5	70.0	137.0	1.8	10.8	35.0	1.8	18.2	35.0
37.5	40.0	37.815	117.0	28.2	63.0	123.0	2.7	7.2	35.0	2.1	15.6	46.0
33.3	45.0	43.250	111.0	30.6	63.0	123.0	2.4	8.2	35.0	2.2	15.1	39.0
30.0	50.0	49.557	110.0	34.7	63.0	123.0	2.1	9.4	35.0	1.9	17.3	39.0
26.8	56.0	56.678	85.0	30.7	58.0	115.0	1.8	10.8	35.0	1.8	18.1	35.0
23.8	63.0	63.041	81.0	32.5	58.0	115.0	2.1	9.4	35.0	1.9	17.3	39.0
21.1	71.0	72.101	67.0	30.8	58.0	115.0	1.8	10.8	35.0	1.8	18.1	35.0

Main Drive Model: PHD9070R3 [n1=1500rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM8-4B125L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
53.6	28.0	27.941	210	37.4	77	135	2.3	11.3	35	2.1	22.8	39
47.6	31.5	31.129	190	37.7	77	135	3.3	8.1	35	2.5	19.1	46
42.3	35.5	34.879	169	37.5	77	135	2.9	9	35	2.3	21.5	46
37.5	40.0	38.912	162	40.1	70	124	2.6	10.1	35	2.4	20.3	39
33.3	45.0	43.599	135	37.5	70	124	2.3	11.3	35	2.1	22.8	39
30.0	50.0	49.500	128	40.3	70	124	2.6	10.1	35	2.4	20.3	39
26.8	56.0	55.462	107	37.8	63	112	2.3	11.3	35	2.1	22.8	39
23.8	63.0	63.000	92	36.9	63	112	2.6	10.1	35	2.4	20.3	39
21.1	71.0	70.588	84	37.8	63	112	2.3	11.3	35	2.1	22.8	39

※Notes: 1. Thermal Power Rating is calculated based on ambient temperature of 40°C. For higher ambient temperatures, consult Sumitomo.

2. Above tables present two options for Auxiliary (Inching) Drives: (a) for low inching torque (suitable for maintenance purpose), and (b) high inching torque (suitable for inching under loaded condition).

3. Auxiliary Drives selected in the above tables are based on inching operation of less than 3 hrs./day and start/stop frequency of less than 10 times/hr. For other operating conditions, please consult Sumitomo for alternative selection.

Selection Table (PHD9075R3 - PHD9085R3)

Main Drive Model: PHD9075R3 [n1=1500rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM10-4B140L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
53.6	28.0	27.718	246	43.4	96	170	2.4	11.2	35	3	22.4	28
47.6	31.5	30.875	246	48.4	96	170	2.1	12.5	35	2.7	25	28
42.3	35.5	34.647	223	49.2	96	170	1.9	14	35	2.4	28	28
37.5	40.0	38.541	190	46.6	87	154	2.6	10	35	2.4	27.3	39
33.3	45.0	43.250	179	49.3	87	154	2.4	11.2	35	2.2	30.6	39
30.0	50.0	48.176	170	52.1	87	154	2.1	12.5	35	1.9	34.1	39
26.8	56.0	54.062	144	49.6	83	147	1.9	14	35	2.4	28	28
23.8	63.0	61.286	132	51.5	83	147	2.1	12.5	35	1.9	34.1	39
21.1	71.0	68.773	113	49.5	83	147	1.9	14	35	2.4	28	28

Main Drive Model: PHD9080R3 [n1=1500rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM4-4A110L-Y2			Model: LHUM10-4B140L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
53.6	28.0	27.165	328	56.7	97	239	1.9	14.2	46	2.2	30	39
47.6	31.5	32.280	280	57.5	97	239	2.5	10.6	46	2.2	30.5	53
42.3	35.5	35.603	251	56.9	97	239	2.3	11.7	46	2.3	29.1	46
37.5	40.0	39.346	239	59.9	89	221	2	12.9	46	2	32.2	46
33.3	45.0	43.397	207	57.2	89	221	1.9	14.2	46	2.2	30	39
30.0	50.0	48.889	193	60.1	89	221	2	12.9	46	2	32.2	46
26.8	56.0	53.922	167	57.3	81	201	1.9	14.2	46	2.2	30	39
23.8	63.0	62.222	143	56.6	81	201	2	12.9	46	2	32.2	46
21.1	71.0	68.627	132	57.7	81	201	1.9	14.2	46	2.2	30	39

Main Drive Model: PHD9085R3 [n1=1500rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM5-4A115L-Y2			Model: LHUM15-4B140L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
53.6	28.0	27.041	417	71.8	120	297	2.2	14.8	39	2.2	43.9	39
47.6	31.5	30.017	399	76.3	120	297	2	16.4	39	2	48.7	39
42.3	35.5	32.960	343	72	120	297	1.8	18	39	2.5	38.9	28
37.5	40.0	39.341	280	70.1	111	274	2.4	13.5	39	2.4	40	39
33.3	45.0	43.198	263	72.3	111	274	2.2	14.8	39	2.2	43.9	39
30.0	50.0	47.953	252	76.9	111	274	2	16.4	39	2	48.7	39
26.8	56.0	52.655	216	72.4	106	262	1.8	18	39	2.5	38.9	28
23.8	63.0	59.583	202	76.6	106	262	2	16.4	39	2	48.7	39
21.1	71.0	65.425	175	72.9	106	262	1.8	18	39	1.8	53.5	39

※Notes: 1. Thermal Power Rating is calculated based on ambient temperature of 40°C. For higher ambient temperatures, consult Sumitomo.
2. Above tables present two options for Auxiliary (Inching) Drives: (a) for low inching torque (suitable for maintenance purpose), and (b) high inching torque (suitable for inching under loaded condition).
3. Auxiliary Drives selected in the above tables are based on inching operation of less than 3 hrs./day and start/stop frequency of less than 10 times/hr. For other operating conditions, please consult Sumitomo for alternative selection.

Selection Table (PHD9090R3 - PHD9100R3)

n1 = 1500 rpm Input

Main Drive Model: PHD9090R3 [n1=1500rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM5-4A115L-Y2			Model: LHUM15-4C140L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
53.6	28.0	27.941	468	83.3	148	329	1.8	18	46	2.1	45.4	39
47.6	31.5	32.063	425	86.8	148	329	2.5	13.2	46	2.1	45.5	53
42.3	35.5	34.879	376	83.5	148	329	2.3	14.4	46	2	49.5	53
37.5	40.0	40.078	341	87	136	302	2	16.5	46	2	49.3	46
33.3	45.0	43.599	302	83.8	136	302	1.8	18	46	2.1	45.3	39
30.0	50.0	50.984	269	87.3	136	302	2	16.5	46	2	49.3	46
26.8	56.0	55.462	238	84	126	278	1.8	18	46	2.1	45.4	39
23.8	63.0	64.889	212	87.6	126	278	2	16.5	46	2	49.3	46
21.1	71.0	70.588	188	84.5	126	278	1.8	18	46	2.1	45.4	39

Main Drive Model: PHD9095R3 [n1=1500rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM5-4A115L-Y2-46			Model: LHUM20-4C145L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
53.6	28.0	28.500	536.0	97.3	161.0	357.0	1.8	18.4	46.0	2.1	63.2	39.0
47.6	31.5	30.922	498.0	98.0	161.0	357.0	1.6	19.9	46.0	1.9	68.6	39.0
42.3	35.5	35.576	448.0	101.5	161.0	357.0	1.4	22.9	46.0	1.8	72.1	35.0
37.5	40.0	38.599	401.0	98.5	154.0	341.0	2.0	15.9	46.0	2.0	64.7	39.0
33.3	45.0	44.471	364.0	103.1	154.0	341.0	1.8	18.4	46.0	2.1	63.2	39.0
30.0	50.0	48.249	322.0	98.9	154.0	341.0	1.6	19.9	46.0	1.9	68.5	39.0
26.8	56.0	56.571	287.0	103.4	135.0	300.0	1.4	23.4	46.0	1.8	73.5	35.0
23.8	63.0	61.378	254.0	99.3	135.0	300.0	1.6	19.9	46.0	1.9	68.5	39.0
21.1	71.0	72.000	226.0	103.6	135.0	300.0	1.4	23.4	46.0	1.8	73.5	35.0

Main Drive Model: PHD9100R3 [n1=1500rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM5-4A115L-Y2-46			Model: LHUM25-4C160L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
53.6	28.0	27.119	679.0	117.2	192.0	502.0	1.9	17.5	46.0	2.2	74.2	39.0
47.6	31.5	32.716	592.0	123.3	192.0	502.0	2.5	13.2	46.0	2.5	66.2	46.0
42.3	35.5	35.108	527.0	117.8	192.0	502.0	2.3	14.2	46.0	2.3	71.0	46.0
37.5	40.0	40.322	483.0	124.0	179.0	468.0	2.0	16.3	46.0	2.4	69.1	39.0
33.3	45.0	43.271	429.0	118.2	179.0	468.0	1.9	17.5	46.0	2.2	74.2	39.0
30.0	50.0	50.875	384.0	124.4	179.0	468.0	2.0	16.3	46.0	2.4	69.1	39.0
26.8	56.0	54.596	342.0	118.9	168.0	438.0	1.9	17.5	46.0	2.2	74.2	39.0
23.8	63.0	63.843	307.0	124.8	168.0	438.0	2.0	16.3	46.0	2.4	69.1	39.0
21.1	71.0	68.512	273.0	119.1	168.0	438.0	1.9	17.5	46.0	2.2	74.2	39.0

※ Notes:
1. Thermal Power Rating is calculated based on ambient temperature of 40°C. For higher ambient temperatures, consult Sumitomo.
2. Above tables present two options for Auxiliary (Inching) Drives: (a) for low inching torque (suitable for maintenance purpose), and (b) high inching torque (suitable for inching under loaded condition).
3. Auxiliary Drives selected in the above tables are based on inching operation of less than 3 hrs./day and start/stop frequency of less than 10 times/hr. For other operating conditions, please consult Sumitomo for alternative selection.

Selection Table (PHD9105R3 - PHD9115R3)

Main Drive Model: PHD9105R3 [n1=1500rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM5-4A115L-Y2-46			Model: LHUM25-4C160L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
53.6	28.0	27.662	825.0	145.3	212.0	553.0	1.8	17.8	46.0	2.2	75.7	39.0
47.6	31.5	30.012	734.0	140.3	212.0	553.0	1.7	19.3	46.0	2.0	82.1	39.0
42.3	35.5	35.811	640.0	145.9	212.0	553.0	2.2	14.5	46.0	2.2	72.4	46.0
37.5	40.0	38.853	570.0	141.0	200.0	523.0	2.1	15.7	46.0	2.1	78.6	46.0
33.3	45.0	44.136	522.0	146.7	200.0	523.0	1.8	17.8	46.0	2.2	75.7	39.0
30.0	50.0	47.886	464.0	141.5	200.0	523.0	1.7	19.3	46.0	2.0	82.1	39.0
26.8	56.0	55.688	415.0	147.1	184.0	479.0	1.8	17.8	46.0	2.2	75.6	39.0
23.8	63.0	60.419	369.0	141.9	184.0	479.0	1.7	19.3	46.0	2.0	82.1	39.0
21.1	71.0	69.882	332.0	147.7	184.0	479.0	1.8	17.8	46.0	2.2	75.6	39.0

Main Drive Model: PHD9110R3 [n1=1500rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM5-4A115L-Y2-46			Model: LHUM30-4D165L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
53.6	28.0	27.730	949.0	167.5	243.0	605.0	1.8	17.9	46.0	2.1	90.4	39.0
47.6	31.5	31.413	823.0	164.6	243.0	605.0	2.6	12.7	46.0	2.2	87.2	53.0
42.3	35.5	36.045	734.0	168.4	243.0	605.0	2.2	14.6	46.0	2.2	86.8	46.0
37.5	40.0	38.716	723.0	178.2	234.0	582.0	2.1	15.6	46.0	2.1	93.2	46.0
33.3	45.0	44.425	598.0	169.1	234.0	582.0	1.8	17.9	46.0	2.1	90.4	39.0
30.0	50.0	48.680	578.0	179.1	234.0	582.0	2.1	15.6	46.0	2.1	93.2	46.0
26.8	56.0	55.858	478.0	170.0	212.0	527.0	1.8	17.9	46.0	2.1	90.4	39.0
23.8	63.0	61.300	456.0	178.0	212.0	527.0	2.1	15.6	46.0	2.1	93.2	46.0
21.1	71.0	70.339	381.0	170.6	212.0	527.0	1.8	17.9	46.0	2.1	90.4	39.0

Main Drive Model: PHD9115R3 [n1=1500rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM5-4A115L-Y2-46			Model: LHUM30-4D165L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
53.6	28.0	27.389	1090.0	190.1	272.0	678.0	1.8	17.7	46.0	1.8	105.6	46.0
47.6	31.5	31.331	978.0	195.1	272.0	678.0	1.6	20.3	46.0	1.9	102.1	39.0
42.3	35.5	35.601	823.0	186.5	272.0	678.0	2.3	14.4	46.0	2.0	98.8	53.0
37.5	40.0	40.726	775.0	200.9	255.0	635.0	2.0	16.4	46.0	1.7	113.0	53.0
33.3	45.0	43.878	739.0	206.4	255.0	635.0	1.8	17.7	46.0	1.8	105.6	46.0
30.0	50.0	50.194	632.0	202.0	255.0	635.0	1.6	20.3	46.0	1.9	102.1	39.0
26.8	56.0	55.170	588.0	206.5	237.0	591.0	1.8	17.7	46.0	1.8	105.6	46.0
23.8	63.0	63.112	504.0	202.5	237.0	591.0	1.6	20.3	46.0	1.9	102.1	39.0
21.1	71.0	69.474	456.0	201.7	237.0	591.0	1.8	17.7	46.0	1.8	105.6	46.0

※Notes: 1. Thermal Power Rating is calculated based on ambient temperature of 40°C. For higher ambient temperatures, consult Sumitomo.
2. Above tables present two options for Auxiliary (Inching) Drives: (a) for low inching torque (suitable for maintenance purpose), and (b) high inching torque (suitable for inching under loaded condition).
3. Auxiliary Drives selected in the above tables are based on inching operation of less than 3 hrs./day and start/stop frequency of less than 10 times/hr. For other operating conditions, please consult Sumitomo for alternative selection.

Selection Table (PHD9118R3)

n1 = 1500 rpm Input

Main Drive Model: PHD9118R3 [n1=1500rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduc-tion Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM8-4A125L-Y2-35			Model: LHUM30-4D165L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
60.0	25.0	24.837	1270.0	200.8	299.0	515.0	2.6	18.6	35.0	1.8	110.4	53.0
47.6	31.5	31.500	1150.0	230.6	299.0	515.0	2.6	18.6	35.0	1.8	110.4	53.0
42.3	35.5	36.176	1110.0	255.7	299.0	515.0	1.8	27.1	35.0	1.4	139.5	46.0
37.5	40.0	38.824	1030.0	254.6	280.0	483.0	2.1	22.9	35.0	1.4	136.1	53.0
33.3	45.0	45.882	882.0	257.6	280.0	483.0	1.8	27.1	35.0	1.4	139.5	46.0
30.0	50.0	49.040	827.0	258.2	280.0	483.0	2.1	22.9	35.0	1.4	136.1	53.0
26.8	56.0	57.957	702.0	259.0	269.0	462.0	1.8	27.1	35.0	1.4	139.5	46.0
23.8	63.0	61.661	638.0	250.5	269.0	462.0	2.1	22.9	35.0	1.4	136.1	53.0
21.1	71.0	72.872	638.0	296.0	269.0	462.0	1.8	27.1	35.0	1.2	160.8	53.0

※Notes:
1. Thermal Power Rating is calculated based on ambient temperature of 40°C. For higher ambient temperatures, consult Sumitomo.
2. Above tables present two options for Auxiliary (Inching) Drives: (a) for low inching torque (suitable for maintenance purpose), and (b) high inching torque (suitable for inching under loaded condition).
3. Auxiliary Drives selected in the above tables are based on inching operation of less than 3 hrs./day and start/stop frequency of less than 10 times/hr. For other operating conditions, please consult Sumitomo for alternative selection.

Selection Table (PHD9030R3 - PHD9040R3)

Main Drive Model: PHD9030R3 [n1=1800rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM1H-4A100L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
64.3	28.0	27.096	44.4	6.4	21.7	43.1	2.9	3.4	35.0	2.0	3.4	35.0
57.1	31.5	32.455	32.3	5.6	21.7	43.1	3.8	2.5	35.0	2.7	2.5	35.0
50.7	35.5	34.983	32.3	6.0	21.7	43.1	3.6	2.7	35.0	2.5	2.7	35.0
45.0	40.0	40.607	31.0	6.7	18.2	37.2	3.1	3.2	35.0	2.2	3.2	35.0
40.0	45.0	43.770	27.8	6.5	18.2	37.2	2.9	3.4	35.0	2.0	3.4	35.0
36.0	50.0	51.411	19.3	5.3	18.2	37.2	3.8	2.5	35.0	2.7	2.5	35.0
32.1	56.0	55.125	19.3	5.7	17.5	35.0	3.6	2.7	35.0	2.5	2.7	35.0
28.6	63.0	63.986	19.3	6.6	17.5	35.0	3.1	2.2	35.0	2.2	3.2	35.0
25.4	71.0	63.986	17.8	6.0	17.5	35.0	3.1	2.2	35.0	2.2	3.2	35.0

Main Drive Model: PHD9035R3 [n1=1800rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM1H-4A100L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
64.3	28.0	27.225	58.8	8.5	28.0	57.7	2.9	3.4	35.0	2.0	3.4	35.0
57.1	31.5	31.331	51.6	8.6	28.0	57.7	2.5	3.9	35.0	1.8	3.9	35.0
50.7	35.5	34.063	46.8	8.5	28.0	57.7	2.3	4.3	35.0	1.6	4.3	35.0
45.0	40.0	40.451	32.3	6.9	25.9	53.3	3.1	3.1	35.0	2.2	3.1	35.0
40.0	45.0	43.979	32.3	7.5	25.9	53.3	2.9	3.4	35.0	2.0	3.4	35.0
36.0	50.0	50.611	32.3	8.7	25.9	53.3	2.5	3.9	35.0	1.8	3.9	35.0
32.1	56.0	55.025	29.5	8.6	21.7	45.3	2.3	4.3	35.0	1.6	4.3	35.0
25.4	71.0	69.300	19.3	7.1	21.7	45.3	2.9	3.4	35.0	2.0	3.4	35.0

Main Drive Model: PHD9040R3 [n1=1800rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM2-4A100L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
64.3	28.0	27.893	66.0	9.8	34.3	62.1	2.8	3.5	35.0	1.8	5.2	39.0
57.1	31.5	31.694	57.6	9.7	34.3	62.1	4.0	2.4	35.0	2.2	4.3	46.0
50.7	35.5	36.165	50.4	9.7	34.3	62.1	3.5	2.8	35.0	2.2	4.2	39.0
45.0	40.0	39.487	49.2	10.3	30.8	55.5	3.1	3.1	35.0	2.0	4.6	39.0
40.0	45.0	45.058	40.8	9.8	30.8	55.5	2.8	3.5	35.0	1.8	5.2	39.0
32.1	56.0	56.987	31.3	9.5	28.7	51.8	3.5	2.8	35.0	2.2	4.2	39.0
28.6	63.0	62.222	31.3	10.3	28.7	51.8	3.1	3.1	35.0	2.0	4.6	39.0
25.4	71.0	71.000	26.3	9.9	28.7	51.8	2.8	3.5	35.0	1.8	5.2	39.0

※Notes:
1. Thermal Power Rating is calculated based on ambient temperature of 40°C. For higher ambient temperatures, consult Sumitomo.
2. Above tables present two options for Auxiliary (Inching) Drives: (a) for low inching torque (suitable for maintenance purpose), and (b) high inching torque (suitable for inching under loaded condition).
3. Auxiliary Drives selected in the above tables are based on inching operation of less than 3 hrs./day and start/stop frequency of less than 10 times/hr. For other operating conditions, please consult Sumitomo for alternative selection.

Selection Table (PHD9045R3 - PHD9055R3)

n1 = 1800 rpm Input

Main Drive Model: PHD9045R3 [n1=1800rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM3-4A100L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
64.3	28.0	28.379	80.4	12.1	41.3	75.2	2.8	3.5	35.0	1.9	7.1	35.0
57.1	31.5	31.079	80.4	13.3	41.3	75.2	2.5	3.8	35.0	1.8	7.8	35.0
50.7	35.5	35.357	68.4	12.8	41.3	75.2	3.6	2.8	35.0	2.5	5.4	35.0
45.0	40.0	40.296	57.6	12.3	37.8	68.6	3.1	3.1	35.0	2.2	6.3	35.0
40.0	45.0	45.843	52.8	12.8	37.8	68.6	2.8	3.5	35.0	1.9	7.1	35.0
36.0	50.0	50.205	50.4	13.4	37.8	68.6	2.5	3.8	35.0	1.8	7.8	35.0
32.1	56.0	57.115	43.2	13.1	33.6	61.3	3.5	2.8	35.0	2.4	5.6	35.0
25.4	71.0	72.237	31.3	12.0	33.6	61.3	2.8	3.5	35.0	1.9	7.1	35.0

Main Drive Model: PHD9050R3 [n1=1800rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM3-4A100L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
64.3	28.0	29.526	96.0	15.0	40.6	98.6	2.6	5.0	35.0	1.7	8.1	39.0
57.1	31.5	31.969	94.8	16.1	40.6	98.6	4.0	3.0	35.0	1.8	7.3	53.0
50.7	35.5	36.395	78.0	15.1	40.6	98.6	3.5	3.8	35.0	1.8	7.3	46.0
45.0	40.0	41.895	73.2	16.3.	37.1	89.8	3.0	4.4	35.0	1.9	7.1	39.0
40.0	45.0	47.695	60.0	15.2	37.1	89.8	2.6	5.0	35.0	1.7	8.1	39.0
36.0	50.0	51.869	58.8	16.2	37.1	89.8	3.0	4.4	35.0	1.9	7.1	39.0
32.1	56.0	59.051	48.0	15.0	34.3	83.2	2.6	5.0	35.0	1.8	7.3	35.0
28.6	63.0	64.640	46.8	16.1	34.3	83.2	3.0	4.4	35.0	1.9	7.1	39.0
25.4	71.0	73.590	38.4	15.0	34.3	83.2	2.6	5.0	35.0	1.8	7.3	35.0

Main Drive Model: PHD9055R3 [n1=1800rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM4-4A100L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
64.3	28.0	27.706	123.6	18.2	51.8	124.8	2.8	4.8	35.0	1.9	9.4	35.0
57.1	31.5	32.319	123.6	21.2	51.8	124.8	2.4	5.5	35.0	1.7	11.0	35.0
50.7	35.5	36.309	100.8	19.4	51.8	124.8	2.2	6.2	35.0	1.8	9.8	28.0
45.0	40.0	39.838	94.8	20.0	46.9	113.2	3.1	4.2	35.0	2.0	9.2	39.0
40.0	45.0	44.756	81.6	19.4	46.9	113.2	2.8	4.8	35.0	1.9	9.4	35.0
36.0	50.0	52.207	78.0	21.6	46.9	113.2	2.4	5.5	35.0	1.7	11.0	35.0
32.1	56.0	58.652	62.4	19.4	44.8	108.0	2.2	6.2	35.0	1.8	9.8	28.0
28.6	63.0	64.634	62.4	21.4	44.8	108.0	2.4	5.5	35.0	1.7	11.0	35.0
25.4	71.0	72.617	50.4	19.4	44.8	108.0	2.2	6.2	35.0	1.8	9.8	28.0

※Notes:
1. Thermal Power Rating is calculated based on ambient temperature of 40°C. For higher ambient temperatures, consult Sumitomo.
2. Above tables present two options for Auxiliary (Inching) Drives: (a) for low inching torque (suitable for maintenance purpose), and (b) high inching torque (suitable for inching under loaded condition).
3. Auxiliary Drives selected in the above tables are based on inching operation of less than 3 hrs./day and start/stop frequency of less than 10 times/hr. For other operating conditions, please consult Sumitomo for alternative selection.

Selection Table (PHD9060R3 - PHD9070R3)

Main Drive Model: PHD9060R3 [n1=1800rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM5-4A115L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
64.3	28.0	29.291	152.4	23.7	56.7	125.6	2.6	7.3	35.0	13.4	7.1	39.0
57.1	31.5	30.157	140.4	22.5	56.7	125.6	4.1	4.8	35.0	10.3	7.8	46.0
50.7	35.5	35.140	127.2	23.7	56.7	125.6	3.5	5.6	35.0	10.3	5.4	39.0
45.0	40.0	39.520	123.6	25.9	51.8	113.2	3.1	6.3	35.0	11.5	6.3	39.0
40.0	45.0	46.051	97.2	23.7	51.8	113.2	2.6	7.3	35.0	13.4	7.1	39.0
36.0	50.0	50.273	97.2	25.9	51.8	113.2	3.1	6.3	35.0	11.5	7.8	39.0
32.1	56.0	58.582	76.8	23.9	47.6	104.4	2.6	7.3	35.0	13.4	5.6	39.0
28.6	63.0	63.984	75.6	25.7	47.6	104.4	3.1	6.3	35.0	11.5	7.1	39.0
25.4	71.0	74.559	60.0	23.7	47.6	104.4	2.6	7.3	35.0	13.4	7.1	39.0

Main Drive Model: PHD9065R3 [n1=1800rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM5-4A115L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
64.3	28.0	27.509	194.4	28.4	69.3	152.6	2.9	6.8	35.0	1.8	12.6	39.0
57.1	31.5	31.521	194.4	32.5	69.3	152.6	2.5	7.8	35.0	1.6	14.5	39.0
50.7	35.5	36.050	159.6	30.5	69.3	152.6	2.2	9.0	35.0	1.5	15.2	35.0
45.0	40.0	37.815	140.4	28.2	63.7	140.2	3.2	6.0	35.0	1.8	13.0	46.0
40.0	45.0	43.250	133.2	30.6	63.7	140.2	2.9	6.8	35.0	1.8	12.6	39.0
36.0	50.0	49.557	132.0	34.7	63.7	140.2	2.5	7.8	35.0	1.6	14.4	39.0
32.1	56.0	56.678	102.0	30.7	60.2	132.1	2.2	9.0	35.0	1.5	15.1	35.0
28.6	63.0	63.041	97.2	32.5	60.2	132.1	2.5	7.8	35.0	1.6	14.4	39.0
25.4	71.0	72.101	80.4	30.8	60.2	132.1	2.2	9.0	35.0	1.5	15.1	35.0

Main Drive Model: PHD9070R3 [n1=1800rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM8-4B125L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
64.3	28.0	27.941	252.0	37.4	76.3	151.8	2.8	9.4	35.0	1.8	19.0	39.0
57.1	31.5	31.129	228.0	37.7	76.3	151.8	4.0	6.8	35.0	1.9	15.9	46.0
50.7	35.5	34.879	202.8	37.5	76.3	151.8	3.5	7.5	35.0	1.8	17.9	46.0
45.0	40.0	38.912	194.4	40.1	71.4	141.6	3.1	8.4	35.0	2.0	16.9	39.0
40.0	45.0	43.599	162.0	37.5	71.4	141.6	2.8	9.4	35.0	1.8	19.0	39.0
36.0	50.0	49.500	153.6	40.3	71.4	141.6	3.1	8.4	35.0	2.0	16.9	39.0
32.1	56.0	55.462	128.4	37.8	65.1	129.2	2.8	9.4	35.0	1.8	19.0	39.0
28.6	63.0	63.000	110.4	36.9	65.1	129.2	3.1	8.4	35.0	2.0	16.9	39.0
25.4	71.0	70.588	100.8	37.8	65.1	129.2	2.8	9.4	35.0	1.8	19.0	39.0

※Notes: 1. Thermal Power Rating is calculated based on ambient temperature of 40°C. For higher ambient temperatures, consult Sumitomo.
2. Above tables present two options for Auxiliary (Inching) Drives: (a) for low inching torque (suitable for maintenance purpose), and (b) high inching torque (suitable for inching under loaded condition).
3. Auxiliary Drives selected in the above tables are based on inching operation of less than 3 hrs./day and start/stop frequency of less than 10 times/hr. For other operating conditions, please consult Sumitomo for alternative selection.

Selection Table (PHD9075R3 - PHD9085R3)

n1 = 1800 rpm Input

Main Drive Model: PHD9075R3 [n1=1800rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM1H-4A100L-Y2			Model: LHUM10-4B140L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
64.3	28.0	27.718	295.2	43.4	95.2	189.1	2.9	9.3	35.0	2.5	18.7	28.0
57.1	31.5	30.875	295.2	48.4	95.2	189.1	2.5	10.4	35.0	2.3	20.8	28.0
50.7	35.5	34.647	267.6	49.2	95.2	175.2	2.3	11.7	35.0	2.0	23.3	28.0
45.0	40.0	38.541	228.0	46.6	88.2	175.2	3.1	8.3	35.0	2.0	22.8	39.0
40.0	45.0	43.250	214.8	49.3	88.2	175.2	2.9	9.3	35.0	1.8	25.5	39.0
36.0	50.0	48.176	204.4	52.1	88.2	175.2	2.5	10.4	35.0	1.6	28.4	39.0
32.1	56.0	54.062	172.8	49.6	84.7	167.9	2.3	11.7	35.0	2.0	23.3	28.0
28.6	63.0	61.286	158.4	51.5	84.7	167.9	2.5	10.4	35.0	1.6	28.4	39.0
25.4	71.0	68.773	135.6	49.5	84.7	167.9	2.3	11.3	35.0	2.0	23.3	28.0

Main Drive Model: PHD9080R3 [n1=1800rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM4-4A110L-Y2			Model: LHUM10-4B140L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
64.3	28.0	27.165	393.6	56.7	95.9	265.7	2.3	11.8	46.0	1.8	25.0	39.0
57.1	31.5	32.280	336.0	57.5	95.9	265.7	3.0	8.8	46.0	1.8	25.4	53.0
50.7	35.5	35.603	301.2	56.9	95.9	265.7	2.8	9.8	46.0	1.9	24.3	46.0
45.0	40.0	39.346	286.8	59.9	90.3	249.7	2.4	10.8	46.0	1.7	26.8	46.0
40.0	45.0	43.397	248.4	57.2	90.3	249.7	2.3	11.8	46.0	1.8	25.0	39.0
36.0	50.0	48.889	231.6	60.1	90.3	249.7	2.4	10.8	46.0	1.7	26.8	46.0
32.1	56.0	53.922	200.4	57.3	82.6	229.2	2.3	11.8	46.0	1.8	25.0	39.0
28.6	63.0	62.222	171.6	56.6	82.6	229.2	2.4	10.8	46.0	1.7	26.8	46.0
25.4	71.0	68.627	158.4	57.7	82.6	229.2	2.3	11.8	46.0	1.8	25.0	39.0

Main Drive Model: PHD9085R3 [n1=1800rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM5-4A115L-Y2			Model: LHUM15-4B140L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
64.3	28.0	27.041	500.4	71.8	117.6	326.3	2.6	12.3	39.0	1.8	36.6	39.0
57.1	31.5	31.129	478.8	76.3	117.6	326.3	2.4	13.7	39.0	1.7	40.6	39.0
50.7	35.5	32.960	411.6	72.0	117.6	326.3	2.2	15.0	39.0	2.1	32.4	28.0
45.0	40.0	39.341	336.0	70.1	111.3	308.1	2.9	11.3	39.0	2.0	33.3	39.0
40.0	45.0	43.198	315.6	72.3	111.3	308.1	2.6	12.3	39.0	1.8	36.6	39.0
36.0	50.0	47.953	302.4	76.9	111.3	308.1	2.4	13.7	39.0	1.7	40.6	39.0
32.1	56.0	52.655	259.2	72.4	107.1	297.8	2.2	15.0	39.0	2.1	32.4	28.0
28.6	63.0	59.583	242.4	76.6	107.1	297.8	2.4	13.7	39.0	1.7	40.6	39.0
25.4	71.0	65.425	210.0	72.9	107.1	297.8	2.2	15.0	39.0	1.5	44.6	39.0

※Notes:
1. Thermal Power Rating is calculated based on ambient temperature of 40°C. For higher ambient temperatures, consult Sumitomo.
2. Above tables present two options for Auxiliary (Inching) Drives: (a) for low inching torque (suitable for maintenance purpose), and (b) high inching torque (suitable for inching under loaded condition).
3. Auxiliary Drives selected in the above tables are based on inching operation of less than 3 hrs./day and start/stop frequency of less than 10 times/hr. For other operating conditions, please consult Sumitomo for alternative selection.

Selection Table (PHD9090R3 - PHD9100R3)

Main Drive Model: PHD9090R3 [n1=1800rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM5-4A115L-Y2			Model: LHUM15-4C140L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
64.3	28.0	27.941	561.6	83.3	147.0	366.5	2.2	15.0	46.0	1.8	37.8	39.0
57.1	31.5	32.063	510.0	86.8	147.0	366.5	3.0	11.0	46.0	1.8	37.9	53.0
50.7	35.5	34.879	451.2	83.5	147.0	366.5	2.8	12.0	46.0	1.7	41.3	53.0
45.0	40.0	40.078	409.2	87.0	137.2	341.6	2.4	13.8	46.0	1.7	41.1	46.0
40.0	45.0	43.599	362.4	83.8	137.2	341.6	2.2	15.0	46.0	1.8	37.8	39.0
36.0	50.0	50.984	322.8	87.3	137.2	341.6	2.4	13.8	46.0	1.7	41.1	46.0
32.1	56.0	55.462	285.6	84.0	127.4	318.3	2.2	15.0	46.0	1.8	37.8	39.0
28.6	63.0	64.889	254.4	87.6	127.4	318.3	2.4	13.8	46.0	1.7	41.1	46.0
25.4	71.0	70.588	225.6	84.5	127.4	318.3	2.2	15.0	46.0	1.8	37.8	39.0

Main Drive Model: PHD9095R3 [n1=1800rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM5-4A115L-Y2-46			Model: LHUM20-4C145L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
64.3	28.0	28.500	643.2	97.3	160.3	399.3	2.2	15.3	46.0	1.8	52.7	39.0
57.1	31.5	30.922	597.6	98.0	160.3	399.3	1.9	16.6	46.0	1.6	57.2	39.0
50.7	35.5	35.576	537.6	101.5	160.3	399.3	1.7	19.1	46.0	1.5	60.1	35.0
45.0	40.0	38.599	481.2	98.5	153.3	382.5	2.4	13.3	46.0	1.7	53.9	39.0
40.0	45.0	44.471	436.8	103.1	153.3	382.5	2.2	15.3	46.0	1.8	52.7	39.0
36.0	50.0	48.249	386.4	98.9	153.3	382.5	1.9	16.6	46.0	1.6	57.1	39.0
32.1	56.0	56.571	344.4	103.4	137.9	344.6	1.7	19.5	46.0	1.5	61.3	35.0
28.6	63.0	61.378	304.8	99.3	137.9	344.6	1.9	16.6	46.0	1.6	57.1	39.0
25.4	71.0	72.000	271.2	103.6	137.9	344.6	1.7	19.5	46.0	1.5	61.3	35.0

Main Drive Model: PHD9100R3 [n1=1800rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM5-4A115L-Y2-46			Model: LHUM25-4C160L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
64.3	28.0	27.119	814.8	117.2	190.4	557.7	2.3	14.6	46.0	1.8	61.8	39.0
57.1	31.5	32.716	710.4	123.3	190.4	557.7	3.0	11.0	46.0	2.1	55.2	46.0
50.7	35.5	35.108	632.4	117.8	190.4	557.7	2.8	11.8	46.0	1.9	59.2	46.0
45.0	40.0	40.322	579.6	124.0	180.6	528.5	2.4	13.6	46.0	2.0	57.6	39.0
40.0	45.0	43.271	514.8	118.2	180.6	528.5	2.3	14.6	46.0	1.8	61.8	39.0
36.0	50.0	50.875	460.8	124.4	180.6	528.5	2.4	13.6	46.0	2.0	57.6	39.0
32.1	56.0	54.596	410.4	118.9	170.1	498.6	2.3	14.6	46.0	1.8	61.8	39.0
28.6	63.0	63.843	368.4	124.8	170.1	498.6	2.4	13.6	46.0	2.0	57.6	39.0
25.4	71.0	68.512	327.6	119.1	170.1	498.6	2.3	14.6	46.0	1.8	61.8	39.0

※Notes: 1. Thermal Power Rating is calculated based on ambient temperature of 40°C. For higher ambient temperatures, consult Sumitomo.
2. Above tables present two options for Auxiliary (Inching) Drives: (a) for low inching torque (suitable for maintenance purpose), and (b) high inching torque (suitable for inching under loaded condition).
3. Auxiliary Drives selected in the above tables are based on inching operation of less than 3 hrs./day and start/stop frequency of less than 10 times/hr. For other operating conditions, please consult Sumitomo for alternative selection.

Selection Table (PHD9105R3 - PHD9115R3)

n1 = 1800 rpm Input

Main Drive Model: PHD9105R3 [n1=1800rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM5-4A115L-Y2-46			Model: LHUM25-4C160L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
64.3	28.0	27.662	990.0	145.3	208.6	612.5	2.2	14.8	46.0	1.8	63.1	39.0
57.1	31.5	30.012	880.8	140.3	208.6	612.5	2.0	16.1	46.0	1.7	68.4	39.0
50.7	35.5	35.811	768.0	145.9	208.6	612.5	2.6	12.1	46.0	1.8	60.3	46.0
45.0	40.0	38.853	684.0	141.0	199.5	584.7	2.5	13.1	46.0	1.8	65.5	46.0
40.0	45.0	44.136	626.4	146.7	199.5	584.7	2.2	14.8	46.0	1.8	63.1	39.0
36.0	50.0	47.886	556.8	141.5	199.5	584.7	2.0	16.1	46.0	1.7	68.4	39.0
32.1	56.0	55.688	498.0	147.1	186.9	547.5	2.2	14.8	46.0	1.8	63.0	39.0
28.6	63.0	60.419	442.8	141.9	186.9	547.5	2.0	16.1	46.0	1.7	68.4	39.0
25.4	71.0	69.882	398.4	147.7	186.9	547.5	2.2	14.8	46.0	1.8	63.0	39.0

Main Drive Model: PHD9110R3 [n1=1800rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM5-4A115L-Y2-46			Model: LHUM30-4D165L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
64.3	28.0	27.730	1138.8	167.5	238.0	665.8	2.2	14.9	46.0	1.8	75.3	39.0
57.1	31.5	31.413	987.6	164.6	238.0	665.8	3.1	10.6	46.0	1.8	72.7	53.0
50.7	35.5	36.045	880.8	168.4	238.0	665.8	2.6	12.2	46.0	1.8	72.3	46.0
45.0	40.0	38.716	867.8	178.2	231.0	646.1	2.5	13.0	46.0	1.8	77.7	46.0
40.0	45.0	44.425	717.6	169.1	231.0	646.1	2.2	14.9	46.0	1.8	75.3	39.0
36.0	50.0	48.680	693.6	179.1	231.0	646.1	2.5	13.0	46.0	1.8	77.7	46.0
32.1	56.0	55.858	573.6	170.0	214.2	599.3	2.2	14.9	46.0	1.8	75.3	39.0
28.6	63.0	61.300	547.2	178.0	214.2	599.3	2.5	13.0	46.0	1.8	77.7	46.0
25.4	71.0	70.339	457.2	170.6	214.2	599.3	2.2	14.9	46.0	1.8	75.3	39.0

Main Drive Model: PHD9115R3 [n1=1800rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM5-4A115L-Y2-46			Model: LHUM30-4D165L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
64.3	28.0	27.389	1308.0	190.1	263.2	735.1	2.2	14.8	46.0	1.5	88.0	46.0
57.1	31.5	31.331	1173.6	195.1	263.2	735.1	1.9	16.9	46.0	1.6	85.1	39.0
50.7	35.5	35.601	987.6	186.5	263.2	735.1	2.8	12.0	46.0	1.7	82.3	53.0
45.0	40.0	40.726	930.0	200.9	253.4	707.4	2.4	13.7	46.0	1.4	94.2	53.0
40.0	45.0	43.878	886.8	206.4	253.4	707.4	2.2	14.8	46.0	1.5	88.0	46.0
36.0	50.0	50.194	758.4	202.0	253.4	707.4	1.9	16.9	46.0	1.6	85.1	39.0
32.1	56.0	55.170	705.6	206.5	240.8	672.3	2.2	14.8	46.0	1.5	88.0	46.0
28.6	63.0	63.112	604.8	202.5	240.8	672.3	1.9	16.9	46.0	1.6	85.1	39.0
25.4	71.0	69.474	547.2	201.7	240.8	672.3	2.2	14.8	46.0	1.5	88.0	46.0

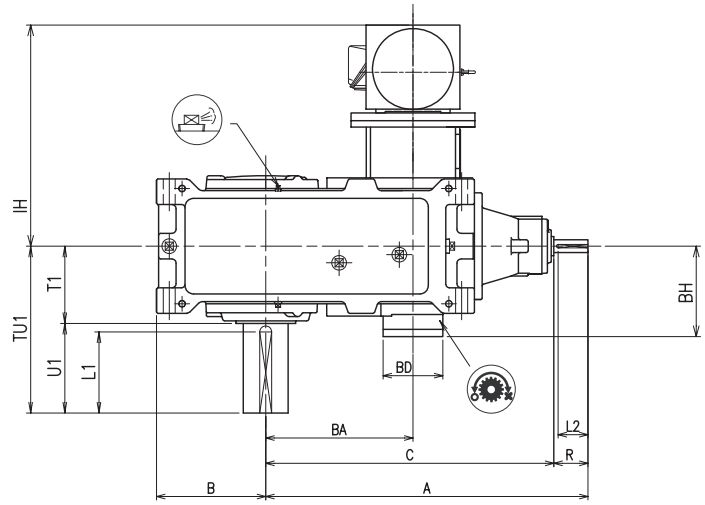
※Notes:
1. Thermal Power Rating is calculated based on ambient temperature of 40°C. For higher ambient temperatures, consult Sumitomo.
2. Above tables present two options for Auxiliary (Inching) Drives: (a) for low inching torque (suitable for maintenance purpose), and (b) high inching torque (suitable for inching under loaded condition).
3. Auxiliary Drives selected in the above tables are based on inching operation of less than 3 hrs./day and start/stop frequency of less than 10 times/hr. For other operating conditions, please consult Sumitomo for alternative selection.

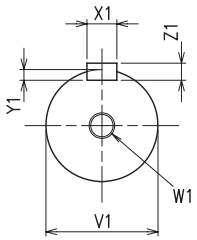
Selection Table (PHD9118R3)

Main Drive Model: PHD9118R3 [n1=1800rpm Input]							Auxiliary Drive Options					
Nominal Output Speed	Nominal Reduction Ratio	Exact Ratio	Power Rating	Torque Rating	Thermal Power Rating at 40˚C ambient temp		Low Inching Torque Option			High Inching Torque Option		
							Model: LHUM8-4A125L-Y2-35			Model: LHUM30-4D165L-Y2		
					No Fan	With Fan	Inching Speed	Inching Torque	Inching Drive Ratio	Inching Speed	Inching Torque	Inching Drive Ratio
n2 (rpm)			kW	kNm	kW	kW	n3 (rpm)	kNm		n3 (rpm)	kNm	
72.0	25.0	24.837	1524.0	200.8	291.9	502.2	3.1	15.5	35.0	1.5	92.0	53.0
57.1	31.5	31.500	1380.0	230.6	291.9	502.2	3.1	15.5	35.0	1.5	92.0	53.0
50.7	35.5	36.176	1332.0	255.7	291.9	502.2	2.2	22.6	35.0	1.2	116.3	46.0
45.0	40.0	38.824	1236.0	254.6	279.3	480.3	2.5	19.1	35.0	1.2	113.4	53.0
40.0	45.0	45.882	1058.4	257.6	279.3	480.3	2.2	22.6	35.0	1.2	116.3	46.0
36.0	50.0	49.040	992.4	258.2	279.3	480.3	2.5	19.1	35.0	1.2	113.4	53.0
32.1	56.0	57.957	842.4	259.0	270.9	466.5	2.2	22.6	35.0	1.2	116.3	46.0
28.6	63.0	61.661	765.6	250.5	270.9	466.5	2.5	19.1	35.0	1.2	113.4	53.0
25.4	71.0	72.872	765.6	296.0	270.9	466.5	2.2	22.6	35.0	1.0	134.0	53.0

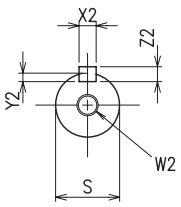
※Notes:
1. Thermal Power Rating is calculated based on ambient temperature of 40°C. For higher ambient temperatures, consult Sumitomo.
2. Above tables present two options for Auxiliary (Inching) Drives: (a) for low inching torque (suitable for maintenance purpose), and (b) high inching torque (suitable for inching under loaded condition).
3. Auxiliary Drives selected in the above tables are based on inching operation of less than 3 hrs./day and start/stop frequency of less than 10 times/hr. For other operating conditions, please consult Sumitomo for alternative selection.

Dimensions (Main Drive Frame Size: 9030-9055)

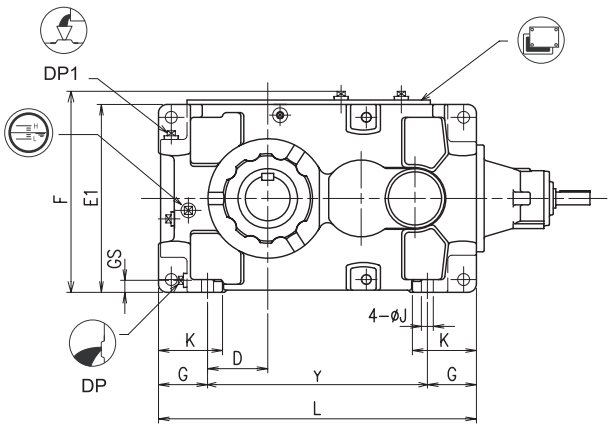


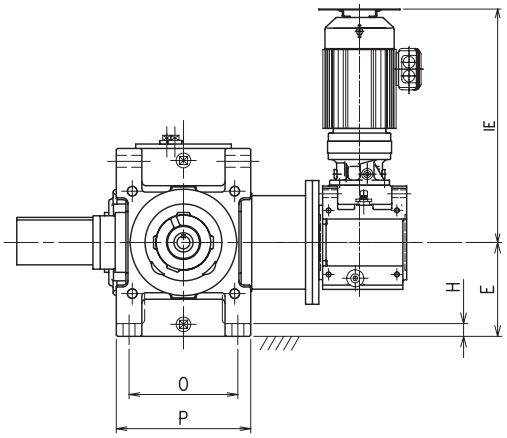


Low Speed Shaft



High-speed Shaft





** Drawing shows RL shaft configuration. For other shaft configurations contact your sales representative.

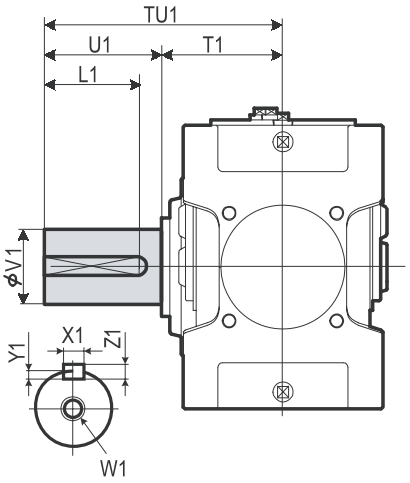
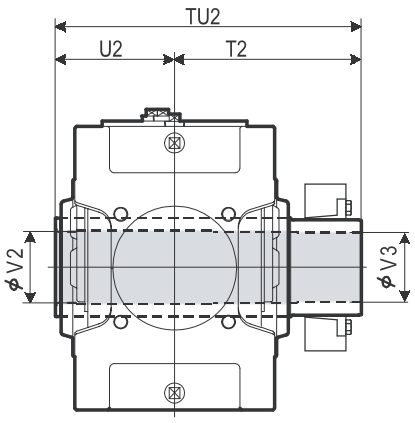
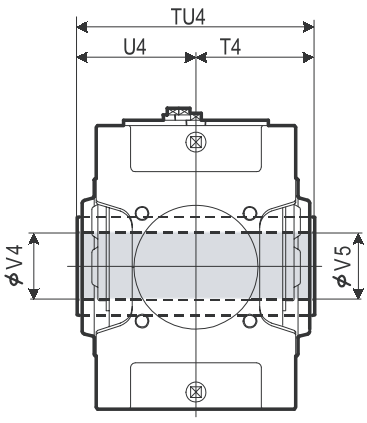
Model	A	B	BA	C	D	E	E1	F	G	H	J	K	L	O	P	Y
9030	656	200	264	576	110	160	320	349	90	28	24	120	590	215	265	410
9035	687	219	295	607	129	185	370	399	90	28	24	120	640	215	265	460
9040	716	235	306	636	120	200	400	431	115	30	28	150	685	255	315	455
9045	755	256	345	676	141	220	440	471	115	30	28	150	745	255	315	515
9050	808	255	358	728	138.5	210	420	451	116.5	32	28	150	775	285	345	542
9055	847	286	397	767	171	245	490	521	115	32	28	150	845	285	345	615

Model	High-speed Shaft				Key[1]			Cooling Fan				Backstop		DP1	DP2	Weight	Oil Quantity[2]
	R	S	W2 / Depth	X2	Y2	Z2	L2	FA	FB	FC	FD	BD	BH			kg	L
9030	80	28k6	M10/22	8	4	7	70	150	125	50	30	105	216	3/4"	3/4"	210	10
9035	80	28k6	M10/22	8	4	7	70	150	125	50	30	110	216	3/4"	3/4"	230	12
9040	80	30k6	M10/22	8	4	7	70	170	125	50	30	132	237	1"	1"	305	16
9045	80	30k6	M10/22	8	4	7	70	170	125	50	30	140	238	1"	1"	365	18
9050	80	35k6	M12/28	10	5	8	70	190	140	50	22	150	263	1"	1"	445	21
9055	80	35k6	M12/28	10	5	8	70	190	140	50	22	150	263	1"	1"	505	28

※ Notes: 1. Shaft key and keyway are in accordance with JIS B1301-1996 and ISO R773-1969 standards.
2. Oil quantity is approximate. Please fill up the oil within the range shown on the oil gauge.

Dimensions (Main Drive Frame Size: 9030-9055)

Main Drive Low Speed Shaft Dimensions

Solid Shaft	Hollow Shaft (Shrink Disk type)	Hollow Shaft (Key type)
		

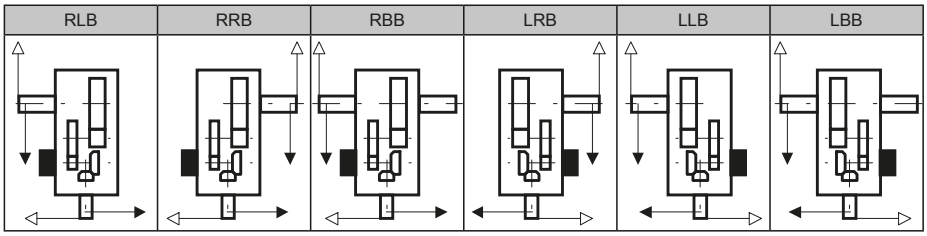
Model	Solid Shaft					Key				Hollow Shaft (Shrink Disk type)					Hollow Shaft (Key type)				
	TU1	TI	U1	V1	W1/ Depth	X1	Y1	Z1	L1	TU2	T2	U2	V2	V3	TU4	T4	U4	V4	V5
9030	330	160	170	80m6	M20/42	22	9	14	150	393	233	160	83	80	330	165	165	75	75
9035	330	160	170	90m6	M20/42	25	9	14	150	403	243	160	88	85	330	165	165	85	85
9040	349	179	170	95m6	M24/50	25	9	14	150	448	268	180	98	95	360	180	180	90	90
9045	391	181	210	105m6	M24/50	28	10	16	190	463	283	180	108	105	370	185	185	105	105
9050	411	201	210	110m6	M24/50	28	10	16	190	503	303	200	108	105	410	205	205	105	105
9055	411	201	210	120m6	M24/50	32	11	18	185	528	323	205	123	120	410	205	205	115	115

Auxiliary Drive Dimensions

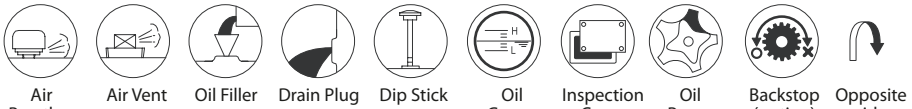
unit: mm

Model	Auxiliary Drive Dimensions							
	Low Inching Torque Option	IH	IE		High Inching Torque Option	IH	IE	
			Standard Motor	Motor with Brake			Standard Motor	Motor with Brake
9030	LHUM1H-4A100L-G2	495	507	569	LHUM1H-4A100L-G2	495	507	569
9035	LHUM1H-4A100L-G2	495	507	569	LHUM1H-4A100L-G2	495	507	569
9040	LHUM1H-4A100L-G2	510	507	569	LHUM2-4A100L-G2	510	507	569
9045	LHUM1H-4A100L-G2	510	507	569	LHUM3-4A100L-G2	510	527	590
9050	LHUM1H-4A100L-G2	529	507	569	LHUM3-4A100L-G2	529	527	590
9055	LHUM1H-4A100L-G2	529	507	569	LHUM4-4A110L-G2	529	569	641

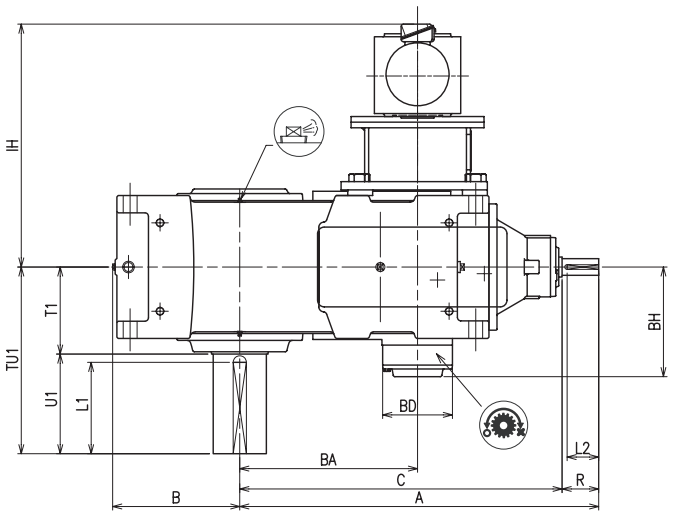
Standard Shaft Arrangement Configuration

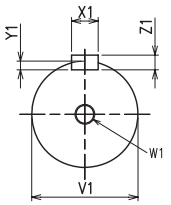


(■ : Backstop)

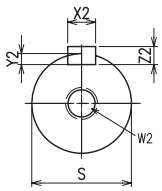


Dimensions (Main Drive Frame Size: 9060-9085)

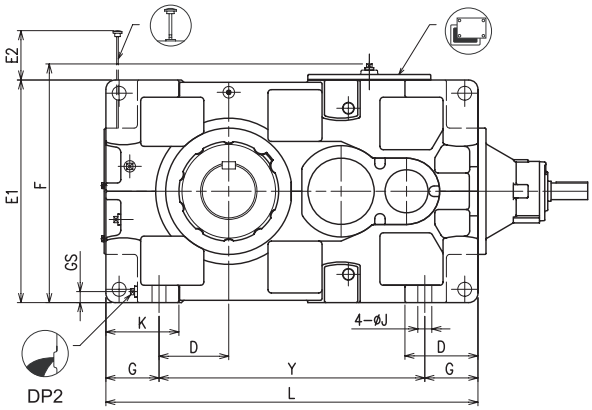


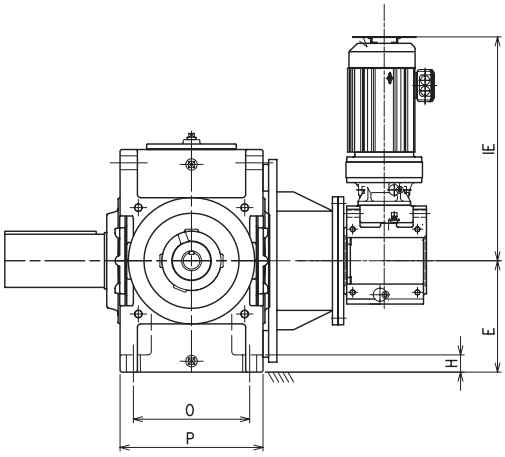


Low Speed Shaft



High-speed Shaft





** Drawing shows RL shaft configuration. For other shaft configurations contact your sales representative.

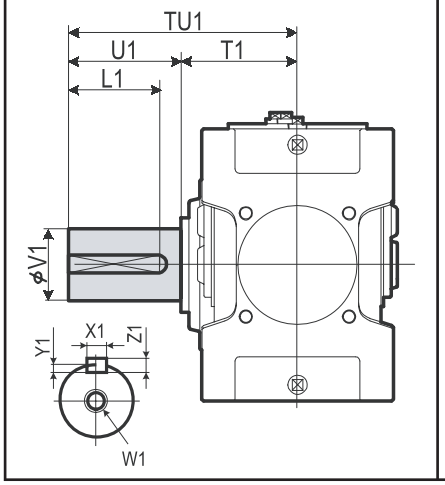
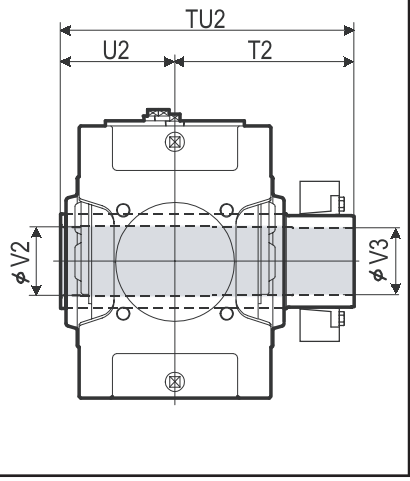
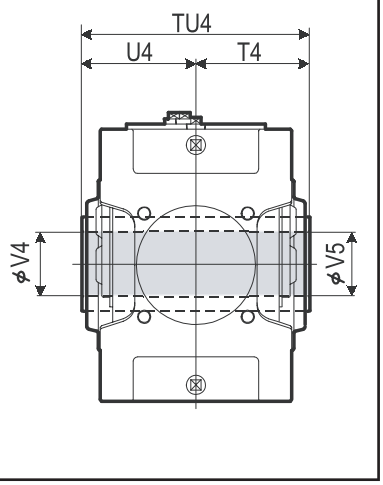
Model	A	B	BA	C	D	E	E1	E2	F	G	H	J	K	L	O	P	Y
9060	939	299	414	829	151	265	530	158	578	135	35	35	180	885	310	380	615
9065	985	338	460	875	190	300	600	123	648	135	35	35	180	970	310	380	700
9070	1027	336	482	917	163	300	600	183	648	160	40	42	215	1020	350	430	700
9075	1080	383	535	970	210	335	670	148	718	160	52	42	220	1120	350	430	800
9080	1176	378	556	1036	205	335	670	208	718	160	52	42	220	1155	380	460	835
9085	1232	422	612	1092	249	375	750	168	798	160	52	42	220	1255	380	460	935

Model	High-speed Shaft			Key[1]				Cooling Fan				Backstop		DP2	Weight kg	Oil Quantity[2] L
	R	S	W2/ Depth	X2	Y2	Z2	L2	FA	FB	FC	FD	BD	BH			
9060	110	45k6	M16/36	14	5.5	9	95	220	160	80	52	175	308	1"	660	29
9065	110	45k6	M16/36	14	5.5	9	95	220	160	80	52	175	308	1"	785	33
9070	110	50k6	M16/36	14	5.5	9	95	245	160	80	52	210	340	1"	940	45
9075	110	50k6	M16/36	14	5.5	9	95	245	160	80	52	210	340	1"	1190	52
9080	140	60m6	M20/42	18	7	11	125	270	160	105	65	210	365	1"	1350	60
9085	140	60m6	M20/42	18	7	11	125	270	160	105	65	210	365	1"	1610	75

※ Notes: 1. Shaft key and keyway are in accordance with JIS B1301-1996 and ISO R773-1969 standards.
2. Oil quantity is approximate. Please fill up the oil within the range shown on the oil gauge.

Dimensions (Main Drive Frame Size: 9060-9085)

Main Drive Low Speed Shaft Dimensions

Solid Shaft	Hollow Shaft (Shrink Disk type)	Hollow Shaft (Key type)
		

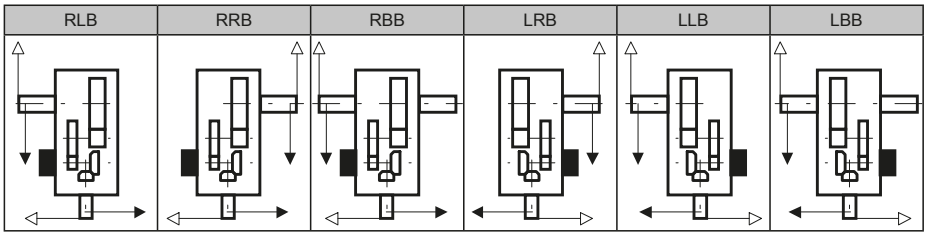
Model	Solid Shaft					Key				Hollow Shaft (Shrink Disk type)					Hollow Shaft (Key type)				
	TU1	TI	U1	V1	W1/ Depth	X1	Y1	Z1	L1	TU2	T2	U2	V2	V3	TU4	T4	U4	V4	V5
9060	440	230	210	125m6	M24/50	32	11	18	185	583	353	230	128	125	470	235	235	125	123
9065	484	234	250	140m6	M30/60	36	12	20	225	594	359	235	143	140	480	240	240	145	143
9070	509	259	250	145m6	M30/60	36	12	20	225	644	384	260	148	145	530	265	265	145	143
9075	562	262	300	160m6	M30/60	40	13	22	275	651	386	265	158	155	530	265	265	150	148
9080	582	282	300	165m6	M30/60	40	13	22	275	714	429	285	173	170	570	285	285	165	163
9085	585	285	300	175m6	M30/60	45	15	25	270	714	429	285	183	180	570	285	285	175	173

Auxiliary Drive Dimensions

unit: mm

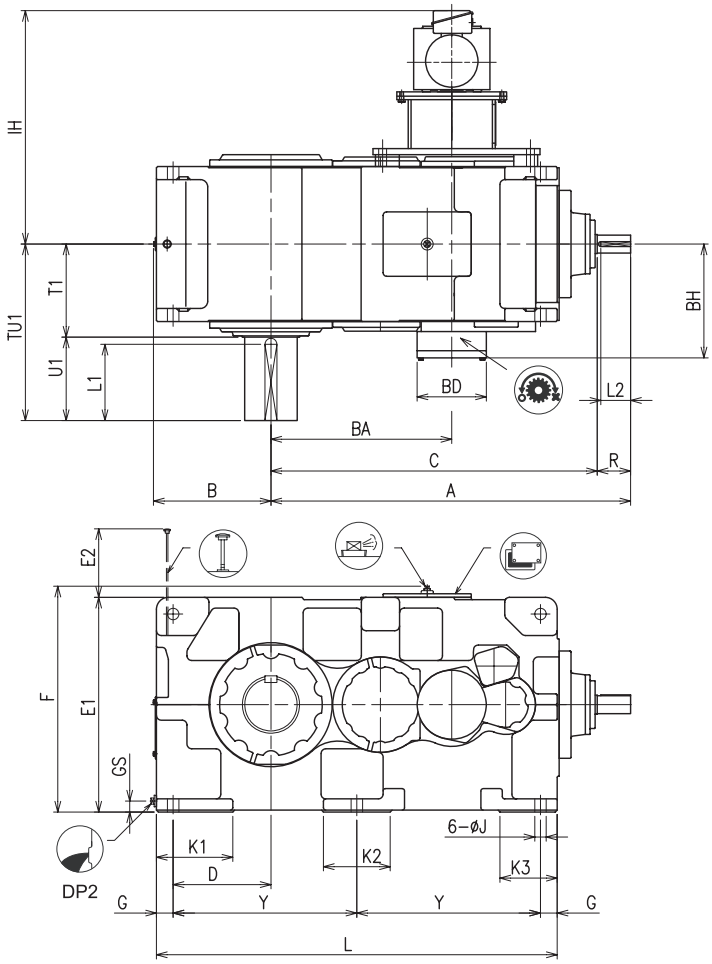
Model	Auxiliary Drive Dimensions							
	Low Inching Torque Option	IH	IE		High Inching Torque Option	IH	IE	
			Standard Motor	Motor with Brake			Standard Motor	Motor with Brake
9060	LHUM1H-4A100L-G2	586	507	569	LHUM5-4A115L-G2	586	569	641
9065	LHUM1H-4A100L-G2	586	507	569	LHUM5-4A115L-G2	586	569	641
9070	LHUM1H-4A100L-G2	611	507	569	LHUM8-4B125L-G2	652	637	709
9075	LHUM1H-4A100L-G2	611	507	569	LHUM10-4B140L-G2	652	677	772
9080	LHUM4-4A110L-G2	660	569	641	LHUM10-4B140L-G2	701	677	772
9085	LHUM5-4A115L-G2	660	569	641	LHUM15-4B140L-G2	701	737	832

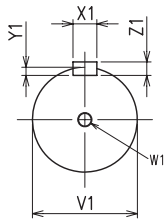
Standard Shaft Arrangement Configuration



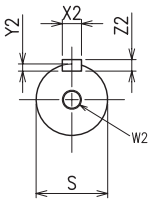
(■ : Backstop)

Dimensions (Main Drive Frame Size: 9090-9118)

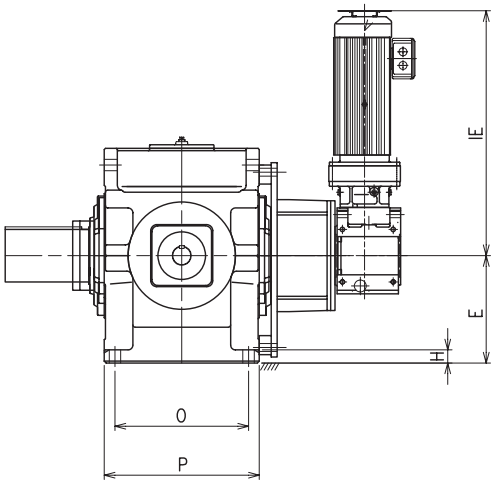




Low Speed Shaft



High-speed Shaft



** Drawing shows RL shaft configuration. For other shaft configurations contact your sales representative.

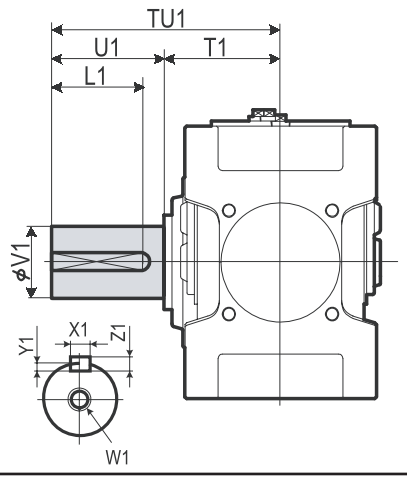
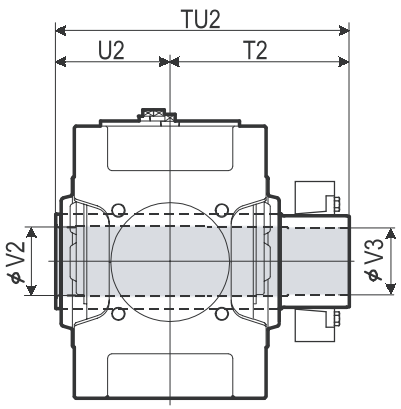
Model	A	B	BA	C	D	E	E1	E2	F	G	H	J	K1	K2	K3	L	O	P	Y
9090	1320	428	640	1180	345	375	750	253	797	60	50	42	270	250	210	1440	480	570	660
9095	1350	458	670	1210	375	400	800	258	847	60	50	42	290	250	210	1500	480	570	690
9100	1474	468		1334	375	425	850	282	897	70	55	48	300	280	240	1610	560	650	735
9105	1508	493		1368	410	450	900	287	947	70	55	48	320	280	240	1680	560	650	770
9110	1684	508		1514	420	475	950	303	997	75	60	56	340	310	260	1810	610	710	830
9115	1733	558		1563	470	500	1000	302	1047	75	60	56	350	310	260	1910	610	710	880
9118	1774	608		1604	490	535	1070	343	1117	95	65	56	350	320	260	1990	610	710	900

Model	High-speed Shaft							Cooling Fan				Backstop		DP2	Weight	Oil Quantity[2]
	R	S	W2/Depth	Key[1] X2	Y2	Z2	L2	FA	FB	FC	FD	BD	BH		kg	L
9090	140	65m6	M20/42	18	7	11	125	340	200	105	65	245	445	1 1/2"	2150	120
9095	140	65m6	M20/42	18	7	11	125	340	200	105	65	245	445	1 1/2"	2400	155
9100	140	75m6	M20/42	20	7.5	12	125	380	225	105	60	290	498	1 1/2"	2880	180
9105	140	75m6	M20/42	20	7.5	12	125	380	225	105	60	290	498	1 1/2"	3440	220
9110	170	85m6	M20/42	22	9	14	150	410	225	135	90	290	528	1 1/2"	4160	250
9115	170	85m6	M20/42	22	9	14	150	410	225	135	90	290	528	1 1/2"	4610	310
9118	170	85m6	M20/42	22	9	14	150					290	558	1 1/2"	5200	350

※ Notes: 1. Shaft key and keyway are in accordance with JIS B1301-1996 and ISO R773-1969 standards.
2. Oil quantity is approximate. Please fill up the oil within the range shown on the oil gauge.

Dimensions (Main Drive Frame Size: 9090-9118)

Main Drive Low Speed Shaft Dimensions

Solid Shaft	Hollow Shaft (Shrink Disk type)
	

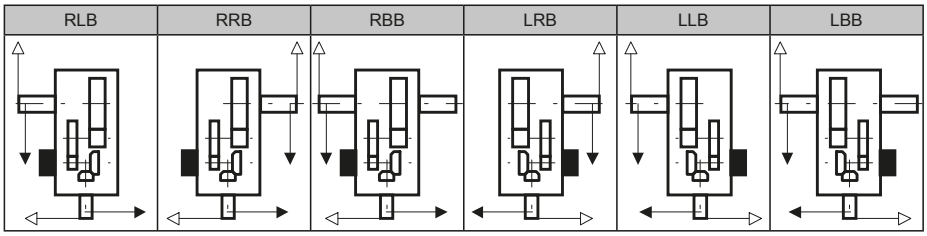
Model	Solid Shaft									Hollow Shaft (Shrink Disk type)				
	TU1	Tl	U1	V1	W1/ Depth	Key X1	Key Y1	Key Z1	Key L1	TU2	T2	U2	V2	V3
9090	650	350	300	180m6	M30/60	45	15	25	270	844	494	350	193	190
9095	700	350	350	190m6	M30/60	45	15	25	320	859	509	350	203	200
9100	740	390	350	200m6	M30/60	45	15	25	320	934	544	390	213	210
9105	740	390	350	220m6	M30/60	50	17	28	320	949	559	390	223	220
9110	770	420	350	220m6	M30/60	50	17	28	320	1030	610	420	243	240
9115	830	420	410	240m6	M30/60	56	20	32	375	1065	645	420	253	250
9118	850	440	410	260m6	M36/70	56	20	32	375					

Auxiliary Drive Dimensions

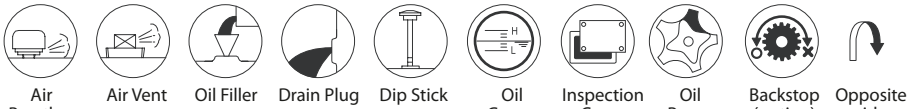
unit: mm

Model	Auxiliary Drive Dimensions							
	Low Inching Torque Option	IH	IE		High Inching Torque Option	IH	IE	
			Standard Motor	Motor with Brake			Standard Motor	Motor with Brake
9090	LHUM5-4A115L-G2	706	569	569	LHUM15-4C140L-G2	821	796	891
9095	LHUM5-4A115L-G2-46	706	569	569	LHUM20-4C145L-G2	821	886	991
9100	LHUM5-4A115L-G2-46	811	569	569	LHUM25-4C160L-G2	906	1002	1167
9105	LHUM5-4A115L-G2-46	811	569	569	LHUM25-4C160L-G2	906	1002	1167
9110	LHUM5-4A115L-G2-46	841	569	569	LHUM30-4D165L-G2	990	1002	1167
9115	LHUM5-4A115L-G2-46	841	569	569	LHUM30-4D165L-G2	990	1002	1167
9118	LHUM8-4A125L-G2-35	841	600	672	LHUM30-4D165L-G2	990	1002	1167

Standard Shaft Arrangement Configuration



(■ : Backstop)



Technical Data (Lubricant, Installation)

Lubricant

The following table shows appropriate viscosity of oil based on ISO and AGMA for respective ambient temperatures and slow speed shaft r/min.

Operation Condition / Application	Output Speed		Ambient Temperature °C		
			-10 to 15	0 to 30	10 to 50
Continuous Operation	Over 100r/min	ISO* AGMA	VG68 2EP	VG150 4EP	VG220 5EP
	Under 100r/min	ISO* AGMA	VG100 3EP	VG220 5EP	VG320 6EP
Intermittent Operation (ex. Crane Drive)	All	ISO* AGMA	VG68 2EP	VG150 4EP	VG220 5EP

* Kinetic Viscosity (mm^2/s) at ISO 40˚C

Note 1. When the ambient temperature is lower than -10 deg or higher than +50 deg, a heating or cooling unit is necessary, in general.

2. PARAMAX DRIVE is shipped without lubrication oil.
Supply oil within the range shown on the dip stick before operation.

Recommended Lubricants

	Brand	BP	CASTROL			CHEVRON TEXACO		EXXON MOBIL		SHELL	TOTAL
Gear Oil	ISO VG68 AGMA 2EP	ENERGOL GR-XP-68	ALPHA SP68	OPTIGEAR BM68	TRIBOL 1100/68	GEAR COMPOUNDS EP68	MEROPA WM68	SPARTAN EP68	MOBIL-GEAR 626	Shell Omala S2 G 68	CARTER EP68
	ISO VG100 AGMA 3EP	ENERGOL GR-XP-100	ALPHA SP100	OPTIGEAR BM100	TRIBOL 1100/100	GEAR COMPOUNDS EP100	MEROPA WM100	SPARTAN EP100	MOBIL-GEAR 627	Shell Omala S2 G 100	CARTER EP100
	ISO VG150 AGMA 4EP	ENERGOL GR-XP-150	ALPHA SP150	OPTIGEAR BM150	TRIBOL 1100/150	GEAR COMPOUNDS EP150	MEROPA WM150	SPARTAN EP150	MOBIL-GEAR 629	Shell Omala S2 G 150	CARTER EP150
	ISO VG220 AGMA 5EP	ENERGOL GR-XP-220	ALPHA SP220	OPTIGEAR BM220	TRIBOL 1100/220	GEAR COMPOUNDS EP220	MEROPA WM220	SPARTAN EP220	MOBIL-GEAR 630	Shell Omala S2 G 220	CARTER EP220
	ISO VG320 AGMA 6EP	ENERGOL GR-XP-320	ALPHA SP320	OPTIGEAR BM320	TRIBOL 1100/320	GEAR COMPOUNDS EP320	MEROPA WM320	SPARTAN EP320	MOBIL-GEAR 632	Shell Omala S2 G 320	CARTER EP320
Bearing grease		ENER-GREASE LS EP2	SPHEEROL AP3	Olista Long-time 3EP	TRIBOL 3020/ 1000-2	DURALITH GREASE 68	MULTI-FAK EP2	BEACON EP2	MOBIL-PLEX 48	Shell Gadus S2 V 220 2	MULTIS EP2

For recommended lubrication of the Inching Drive (Bevel Buddy Box®), please refer to Maintenance Manual No. CM2020E.

Installation

(1) Consult us when PARAMAX DRIVE is to be installed on an inclined surface or on a ceiling. Additional lubrication system may be necessary.

(2) Install PARAMAX DRIVE horizontally on a sufficiently rigid base. When the unit is made for inclined installation according to your specification, do not install it at any other angle other than the specified angle.

(3) Installation bolts for PARAMAX DRIVE shall be equivalent to JIS strength classification 10.9. Consult us when the force that pushes up PARAMAX DRIVE is to be applied.

(4) Refer to the maintenance manual attached to the unit for other installation notes.
For Paramax® 9000 Gearbox : Maintenance Manual No. GM2002E
For Inching Drive Bevel Buddy Box® : Maintenance No. CM2020E

Painting Specifications

Painting Area	Surface Conditioning	Kind of Painting		Painting Specification of				Application
		Class	Painting of Finish Coat	Type	Coating	Thickness μ	Type of Coating	
Outside Painting	Cast Iron Class 1	Standard painting	Acrylic modified phthalic	Under	1	20 ~ 40	Modified alkyd resin	Standard under coat
				Finish	1	15 ~ 30	Modified alkyd resin	Standard under coat
		Standard export painting	Acrylic modified phthalic	Under	2	40 ~ 80	Modified alkyd resin	Export standard
				Finish	1	15 ~ 30	Acrylic modified alkyd resin	
		Special painting (Including rust-proof and heat resisting painting) One layer of Unigrand PTC Primer as the first primer	Acrylic modified phthalic	Under	2	40 ~ 80	Modified alkyd resin	Moderate corrosive atmosphere, seaside, outdoor humid atmosphere, chemical plant area, ... etc.
				Finish	2	30 ~ 60	Acrylic modified alkyd resin	
			Long of oil phthalic	Under	2	40 ~ 80	Modified alkyd resin	Ocean-going vessel & boat, bridge, seaside, outdoor humid atmosphere, ... etc.
				Finish	2	30 ~ 60	Synthetics resin paint	
			Chloride rubber	Under	2	40 ~ 80	Modified alkyd resin	Ocean-going vessel & boat, bridge, seaside, outdoor humid atmosphere, ... etc.
				Second	1	20 ~ 40	Phenol M.I.O paint	
				Finish	2	30 ~ 60	Chloride rubber paint	
			Phenol	Under	2	40 ~ 80	Modified alkyd resin	In-and-outdoor of acid treating plant and chemical plant etc...
				Finish	2	30 ~ 60	Phenol resin enamel	
			Heat-proof silver	Under	1	20 ~ 40	Modified alkyd resin	Heating furnace (120 deg), ... etc.
				Finish	1	15 ~ 30	Aluminum paint	
	Steel Plate Class 2	Extra rust-proof painting	Epoxy	Under	2	40 ~ 80	Special permeability epoxy aluminium paint	Indoor anti-corrosion area, Chemical plant
				Finish	3	120 ~ 240	Polyamide epoxy	
			Polyurethane	Under	2	40 ~ 80	Special permeability epoxy aluminium paint	Outdoor anti-corrosion area, Chemical plant
				Finish	3	45 ~ 90	Polyisocianate urethane resin paint	
		Extra rust-proof painting (Sand blast under coating)	Thick film epoxy		5	250 ~ 350	Thick film type modified epoxy resin paint	Submersible equipment, marine structure, ... etc.
Inside Painting	Cast Iron Class 1 Steel Plate Class 3	Standard painting			1	20 ~ 40	Modified alkyd resin	Standard inside painting

Note : SUMITOMO standard color is Donau Blue (equivalent Munsell color: 6.5PB 3.6 / 8.2)

Rust Proof Standard

Rust proofing treatment has been conducted on all completely assembled models, prior to shipment.

1. Standard rust proofing specifications

(1) Outside rust proofing

Rust proofing oil has been applied to products before shipment.

Check the rust proofing conditions every 6 months after shipment, and conduct proofing treatment as necessary.

Rust proofing period	6 months
Storage condition	Generally to be stored inside the shop or warehouse, relatively free of humidity, dust, extreme temperature fluctuation, corrosive gas, and similar atmosphere. After shipment, the product shall be operated 5-10 minutes every 2-3 months with recommended lubricants.

2. Export rust proofing specifications

Consult us for export rust proofing when export specifications or severe specifications are required.

Feature and Benefits

PARAMAX DRIVE units have a number of outstanding features compared to conventional solid shaft speed reducers.

1. There is no necessity for a large sized coupling, permitting substantial cost reduction.
2. It can be directly mounted onto the driven shaft, eliminating the necessity for foundation working for speed reducer installation and alignment operation.
3. Any unit is designed for compactness and ease of operation.

How to Install Unit

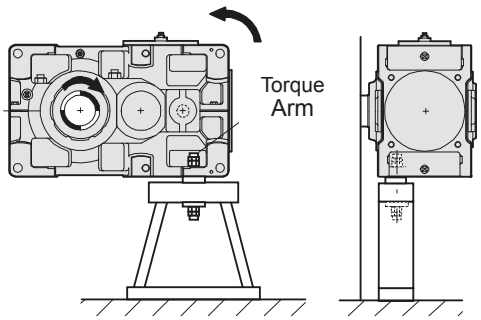
a. Torque Arm (Option)

The hollow shaft type PARAMAX DRIVE is secured with the torque arm to prevent it from being turned by the counter force.

A torque arm is subjected to a compression or tensile load depending upon the direction of rotation of the slow speed shaft, and it must have a sufficient strength against shock loading at the start and during operation.

Being prepared as a optional accessory, the torque arm is designed in consideration of such loading conditions.

The construction and strength of the torque arm mounting legs must be determined in consideration of impact load.



(DRG C1701)

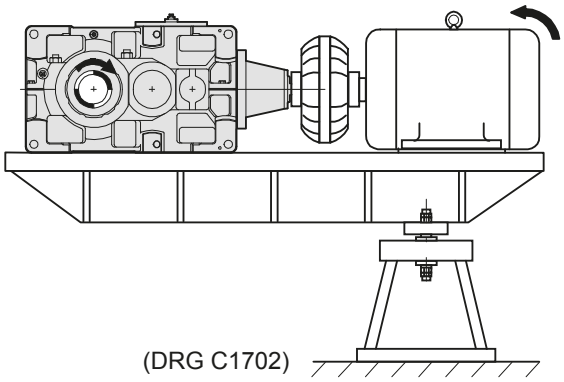
b. How to Use Torque Arm

(1) When the torque arm is used with the speed reducer housing

The torque arm must be mounted in an installation hole closer to the application machine. (For torque arm mounting dimensions, refer to the dimension drawing.)

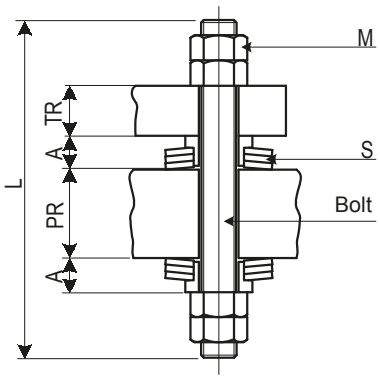
(2) When the torque arm is used with the common base plate

The torque arm must be mounted in a position as far from the low speed shaft as possible.



(DRG C1702)

Torque Arm Dimensions



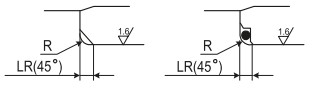
(DRG C1703)

Use bolt and nut classified as JIS strength class 8.8

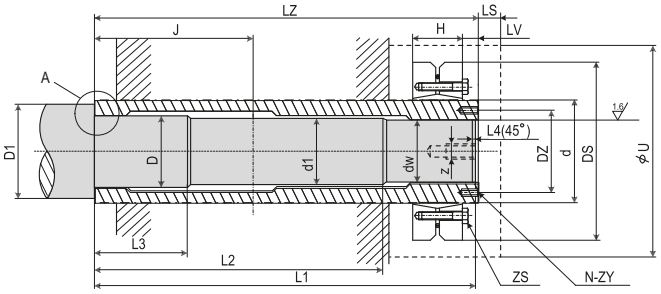
Size	A	L	M (nut)	PR max	TR	S (bellevile spring)	
						DIN2093(nom.)	Qty
9015	13.1	140	M12	35	22	A50	2X2
9025	16.1	170	M16	40	25	A50	2X3
9030	18.9	200	M20	50	28	A63	2X3
9035	18.9	200	M20	50	28	A63	2X3
9040	21.7	240	M24	60	30	A80	2X2
9045	21.7	240	M24	60	30	A80	2X2
9050	21.7	240	M24	60	32	A80	2X2
9055	21.7	240	M24	60	32	A80	2X2
9060	32.2	310	M30	85	35	A100	2X3
9065	32.2	310	M30	85	35	A100	2X3
9070	38.2	370	M36	95	40	A100	2X4
9075	38.2	370	M36	95	52	A100	2X4
9080	38.2	370	M36	95	52	A100	2X4
9085	38.2	370	M36	95	52	A100	2X4
9090	38.6	370	M36	95	50	A125	2X3
9095	38.6	370	M36	95	50	A125	2X3
9100	47.6	420	M42	100	55	A125	2X4
9105	47.6	420	M42	100	55	A125	2X4
9110	48.5	460	M48	110	60	A160	2X3
9115	48.5	460	M48	110	60	A160	2X3

1. Hollow Shaft Dimensions

Shrink Disk Coupling



Detail A



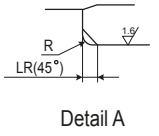
(DRG C1801)

Unit: mm

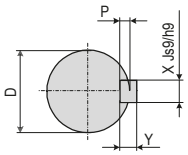
Size	Shrink Disk					Clamping Bolt	Hollow Shaft								Driven Shaft								
	MODEL (note 1)	d	Ds	H	ZS	TA N·m	J	LZ	LR	LV	N-ZY	DZ	LS	U	dw	d1	D h7	D1 min	L1	L2	L3	L4	R	Z (Thread depth)
9015	TAS3091.4-080	80	145	38	M8	35	135	328	3	14	4 - M6	70	15	159	60h6	61	63	78	325	240	80	3	2.5	M20 (30)
9025	TAS3081. -090	90	155	39	M8	35	145	358	3	14	4 - M6	80	17	174	70h6	71	73	88	355	270	80	3	2.5	M20 (30)
9030	TAS3091.1-100	100	170	54	M10	59	160	393	3	14	4 - M6	90	20	207	80h6	81	83	98	390	295	90	3	2.5	M20 (30)
9035	TAS3093. -110	110	185	60	M10	70	160	403	3	14	4 - M6	97	20	237	85h6	86	88	103	400	295	90	3	2.5	M24 (35)
9040	TAS3081. -125	125	215	54	M10	70	180	448	3	20	4 - M8	110	17	237	95h6	96	98	113	445	335	110	3	2.5	M24 (35)
9045	TAS3093. -140	140	230	74	M12	120	180	463	3	20	4 - M10	124	17	277	105h6	106	108	123	460	355	110	3	2.5	M24 (35)
9050	TAS3093. -140	140	230	74	M12	120	200	503	3	22	4 - M10	124	17	277	105h6	106	108	123	500	380	110	3	2.5	M24 (35)
9055	TAS3091. -165	165	290	88	M16	250	205	528	3	27	4 - M12	146	17	307	120h6	121	123	138	525	385	120	3	2.5	M24 (35)
9060	TAS3091. -165	165	290	88	M16	250	230	583	4.5	27	4 - M12	146	17	319	125h6	126	128	143	580	435	130	3	3	M24 (35)
9065	TAS3091. -175	175	300	88	M16	250	235	594	4.5	26	4 - M12	157.5	21	349	140h6	141	143	158	589	450	130	5	3	M30 (45)
9070	TAS3081. -185	185	330	86	M16	290	260	644	4.5	26	4 - M12	167	21	349	145h6	146	148	163	640	475	160	5	3	M30 (45)
9075	TAS3081. -200	200	350	86	M16	290	265	651	4.5	26	4 - M12	177	21	379	155h6	156	158	173	646	475	160	5	3	M30 (45)
9080	TAS3081. -220	220	370	104	M16	290	285	714	4.5	26	4 - M12	195	21	399	170g6	171	173	192	709	520	190	5	3	M30 (45)
9085	TAS3081. -240	240	405	109	M20	570	285	714	4.5	27	4 - M12	210	21	429	180g6	181	183	198	709	520	190	5	3	M30 (45)
9090	TAS3081. -240	240	405	109	M20	570	350	844	6	27	6 - M12	215	21	451	190g6	191	193	212	840	635	200	5	4.5	M36 (55)
9095	TAS3081.1-260	260	440	120	M20	535	350	859	6	27	6 - M12	230	14	450	200g6	201	203	222	855	640	205	5	4.5	M36 (55)
9100	TAS3081.1-260	260	440	120	M20	535	390	934	6	27	6 - M12	235	21	491	210g6	211	213	234	930	705	215	5	4.5	M36 (55)
9105	TAS3081.1-280	280	460	134	M20	535	390	949	6	27	6 - M12	250	19	480	220g6	221	223	244	945	715	225	5	4.5	M36 (55)
9110	TAS3081.1-300	300	485	142	M20	535	420	1030	6	32	6 - M16	270	15	551	240g6	241	243	263	1025	770	245	5	4.5	M36 (55)
9115	TAS3091. -320	320	520	184	M20	490	420	1065	6	32	6 - M16	285	15	550	250g6	251	253	273	1060	785	245	5	4.5	M36 (55)

Note: 1 Shrink disc (manufactured by SCHÄFER) type code.
2 Mount a thrust washer on a vertical reducer to prevent the reducer from moving when locking bolts(ZS) is loosened.

Key Coupling

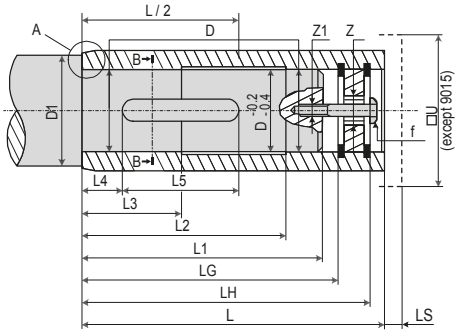


Detail A

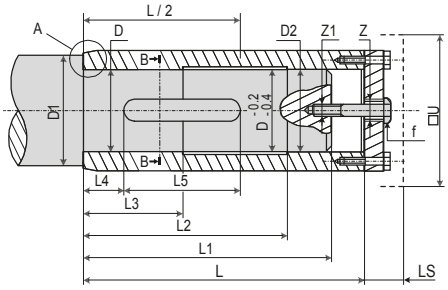


B - B

9015~9055



9060~9085



(DRG C1802)

Unit: mm

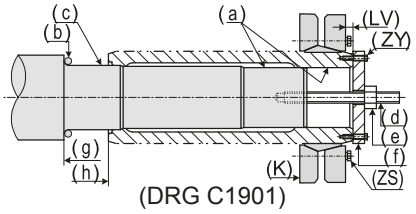
Size	Hollow Shaft					Safety Cover		Driven Shaft											Locking Screw Thread Size X Body Length DRG C1802(f)	Locking Distance Ring O.D. X W DRG C1906,1910(h)
	L	LG	LH	LR	Z	LS	U	D j6	D1 min	D2 j6	L1	L2	L3	L4	L5 min	X	Y	P	R	Z1 (Thread depth)		
9015	270	240	258	3	M24	7.5	φ161	55	70		235	200	70	30	115	16	10	6	2.5	M20(30)	M20X50	φ 55X5
9025	300	265	286	3	M24	10	190	65	80		260	220	80	35	125	18	11	7	2.5	M20(30)	M20X50	φ 65X5
9030	330	290	314	3	M24	9.5	230	75	90		285	240	90	35	145	22	14	9	2.5	M20(30)	M20X55	φ 75X5
9035	330	290	315	3	M24	10	260	85	100		285	240	90	35	160	22	14	9	2.5	M20(30)	M20X55	φ 85X5
9040	360	314	340	3	M30	10	260	90	105		310	260	100	40	180	25	14	9	2.5	M24(35)	M24X60	φ 90X4
9045	370	316	348	3	M30	10	300	105	120		310	260	100	40	180	28	16	10	2.5	M24(35)	M24X65	φ 105X6
9050	410	356	388	3	M30	10	300	105	120		350	300	110	45	220	28	16	10	2.5	M24(35)	M24X65	φ 105X6
9055	410	356	388	3	M30	10	330	115	130		350	300	110	45	220	32	18	11	2.5	M24(35)	M24X65	φ 115X6
9060	470			4.5	M30	47	340	125	140	123	445	395	90	5	260	32	18	11	3	M24(35)	M24X80	φ 125X25
9065	480			4.5	M36	54	350	145	160	143	455	405	100	5	265	36	20	12	3	M30(45)	M30X100	φ 145X30
9070	530			4.5	M36	54	370	145	160	143	500	445	120	5	310	36	20	12	3	M30(45)	M30X100	φ 145X30
9075	530			4.5	M36	54	400	150	165	148	500	445	120	5	365	40	22	13	3	M30(45)	M30X100	φ 150X30
9080	570			4.5	M36	54	400	165	180	163	540	480	125	5	370	40	22	13	3	M30(45)	M30X100	φ 165X30
9085	570			4.5	M36	54	450	175	190	173	540	480	125	5	385	45	25	15	3	M30(45)	M30X100	φ 175X30

Note: 1 The key and keyway conform to JIS B 1301-1996(ISO)"Sunk keys and keyways" parallel keys (regular class)
2 The locking screw and distance ring will not be supplied. Please prepare, if they are necessary.
3 Dimension from center of housing to shaft end is L/2.

2. Shrink Disk Coupling / Mounting & Removal Procedure

Mounting Procedure (DRG C1901)

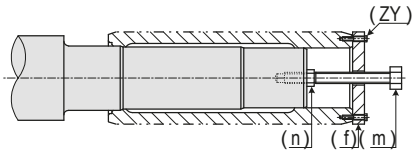
(1) Clean and degrease contact surface (a) and (c).
(2) Smear surface (c) with "Molykote 321" or its equivalent.
However, keep surface (a) as clean as possible (no grease).
(3) Slide O-ring (b) onto the shaft. (Size 9090 to 9115)
(4) Mount the reducer on the driven shaft and screw nuts (e) until faces (g) and (h) make contact.
(5) Set the shrink disk (k) at dimensions (LV). Tighten locking bolt (ZS) at specified torque (TA) (using a torque wrench).



(DRG C1901)

Removal Procedure (DRG C1902)

(1) Loosen locking bolt (ZS) and remove shrink disk (k).
(2) Set thrust washer (f) and hexagon head bolt (n).
Remove the reducer from the driven shaft using bolt (m).
Note: Parts (d), (e), (f), (ZY), (m) and (n) are optional.
Order these as required.



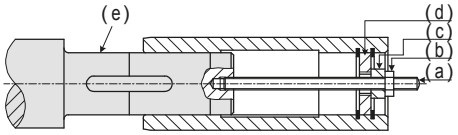
(DRG C1902)

3. Key Coupling / Mounting & Removal Procedure

Size 9015 to 9055

Mounting Procedure (DRG C1903)

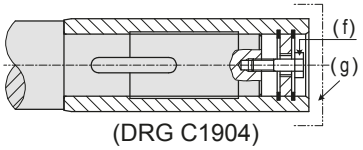
The Hollow shaft bore is provided with retaining ring (d).
Ring (d) is the essential component for mounting, securing, and removing the unit.
(1) Smear surface of the shaft (e) with "molykote 321" or its equivalent.
(2) Turn nut (b) and slide the reducer over the driven shaft.
Use plain washer (c), if they are necessary.



(DRG C1903)

Securing (DRG C1904)

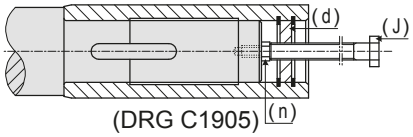
(1) After mounting the reducer on the driven shaft, fix bolt (f). (Bolt (f) is not supplied with the unit.)
(2) The bore should be protected by cover (g).



(DRG C1904)

Removal Procedure (DRG C1905)

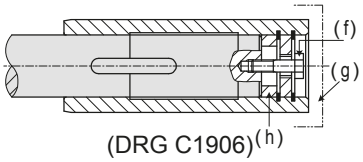
(1) Remove ring (d), mount bolt (n), and reset ring (d).
Attach bolt (J) to ring (d), and turn bolt (J) to disconnect the hollow shaft from the driven shaft.
Screw size, refer to the lower table (Z) of the page C-18.



(DRG C1905)

Special Cases (DRG C1906)

(1) If the driven shaft has no shoulder (DRG C1906) when mounting, provide a distance ring (h) for fixing in place. (Ring (h) is not supplied with the unit).

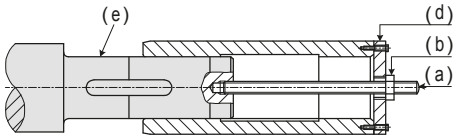


(DRG C1906)

Size 9060 to 9085

Mounting Procedure (DRG C1907)

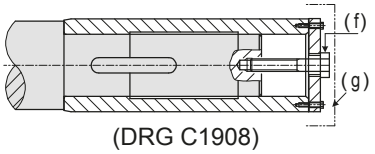
The Hollow shaft end is provided with thrust washer (d).
Thrust washer (d) is the essential component for mounting, securing, and removing the unit.
(1) Smear surface of the shaft (e) with "molykote 321" or its equivalent.
(2) Turn nut (b) and slide the reducer over the driven shaft.



(DRG C1907)

Securing (DRG C1908)

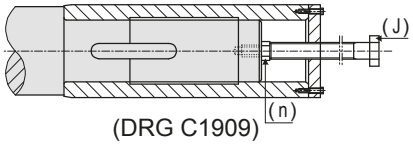
(1) After mounting the reducer on the driven shaft, fix bolt (f). (Bolt (f) is not supplied with the unit.)
(2) The bore should be protected by cover (g)



(DRG C1908)

Removal Procedure (DRG C1909)

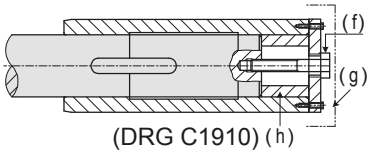
(1) Remove thrust washer (d), mount bolt (n), and reset thrust washer (d).
Attach bolt (J) to thrust washer (d), and turn bolt (J) to disconnect the hollow shaft from the driven shaft.
Screw size, refer to the lower table (Z) of the page C-18.



(DRG C1909)

Special Cased (DRG C1910)

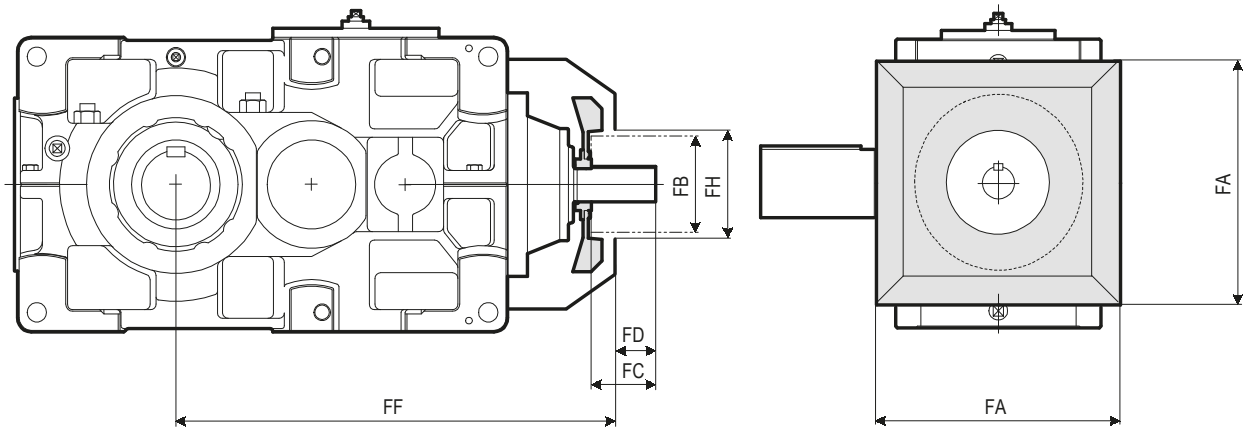
(1) If the driven shaft has no shoulder (DRG D1906) when mounting, provide a distance ring (h) for fixing in place.(Ring (h) is not supplied with the unit.)
Distance ring dimension, refer to the lower table of the page C-18.



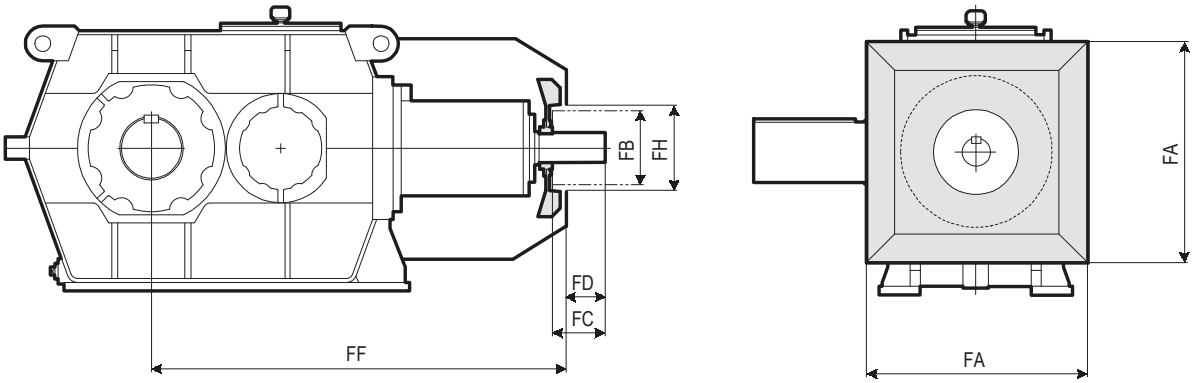
(DRG C1910)

Note : Parts (a),(b),(c),(n) and (J) are optional. Order these as required.

9015 ▶ 9085 Right Angle Double Reduction



9090 ▶ 9115 Right Angle Double Reduction



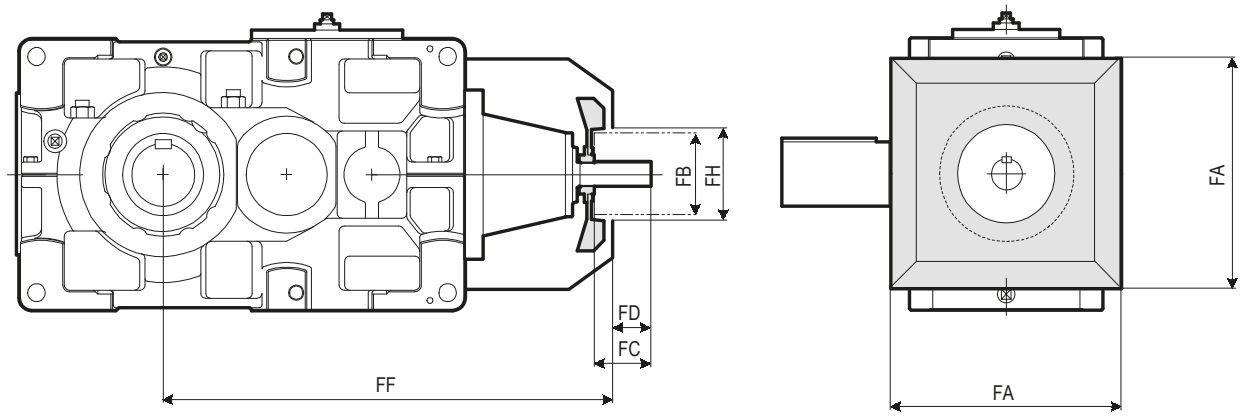
Size	FA	FB	FC	FD	FF	FH
9015	250	125	50	30	477	145
9025	270	140	50	30	515	160
9030	300	140	80	52	593	160
9035	300	140	80	52	624	160
9040	340	160	80	52	653	180
9045	340	160	80	52	692	180
9050	380	160	80	52	703	180
9055	380	160	80	52	742	180
9060	440	160	105	65	800	180
9065	440	160	105	65	846	180
9070	490	200	105	65	900	220
9075	490	200	105	65	953	220
9080	540	225	105	60	1020	245
9085	540	225	105	60	1076	245

Size	FA	FB	FC	FD	FF	FH
9095	680	250	135	90	1303	270
9105	760	250	175	130	1459	270
9115	820	250	175	130	1672	270

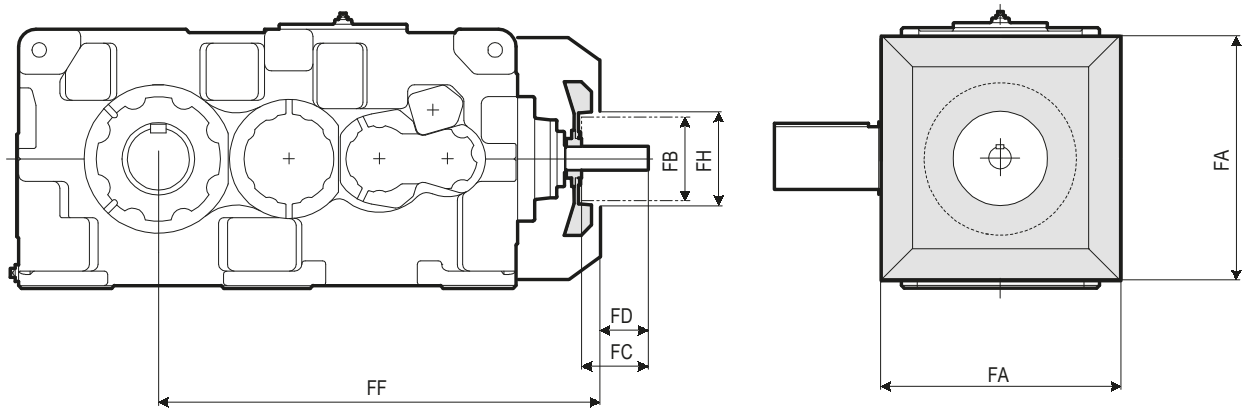
- Sufficient space must be allowed for air intake when mounting the safety guards for the coupling or other component.
- The split fan hood is prepared as a optional accessory for conducting maintenance work on a large coupling. 【Refer to the "PARAMAX 9000 Series Option Catalog No.G2052E".】

Technical Data (Cooling Fan Dimension)

9015 ▶ 9085 Right Angle Triple Reduction



9090 ▶ 9115 Right Angle Triple Reduction

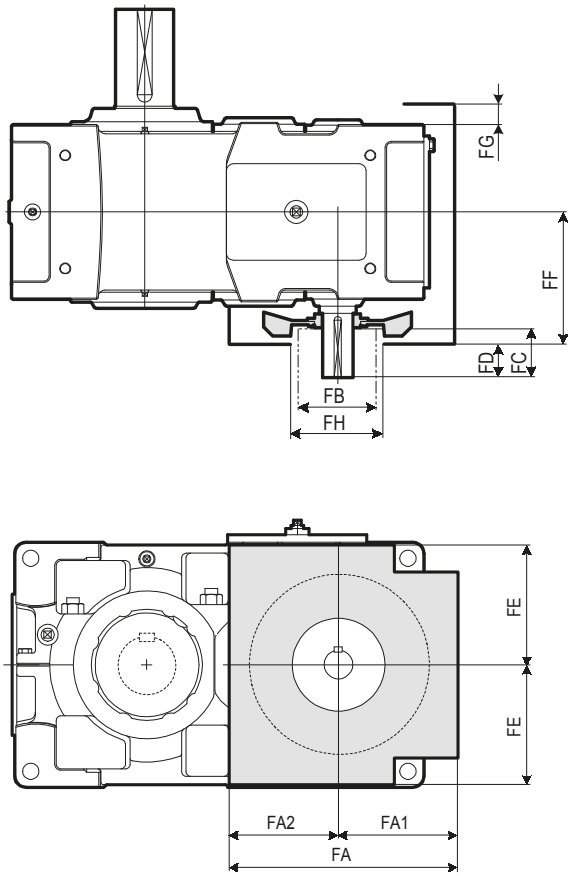


Size	FA	FB	FC	FD	FF	FH
9030	300	125	50	30	626	145
9035	300	125	50	30	657	145
9040	340	125	50	30	686	145
9045	340	125	50	30	725	145
9050	380	140	50	22	786	160
9055	380	140	50	22	825	160
9060	440	160	80	52	887	180
9065	440	160	80	52	933	180
9070	490	160	80	52	975	180
9075	490	160	80	52	1028	180
9080	540	160	105	65	1111	180
9085	540	160	105	65	1167	180

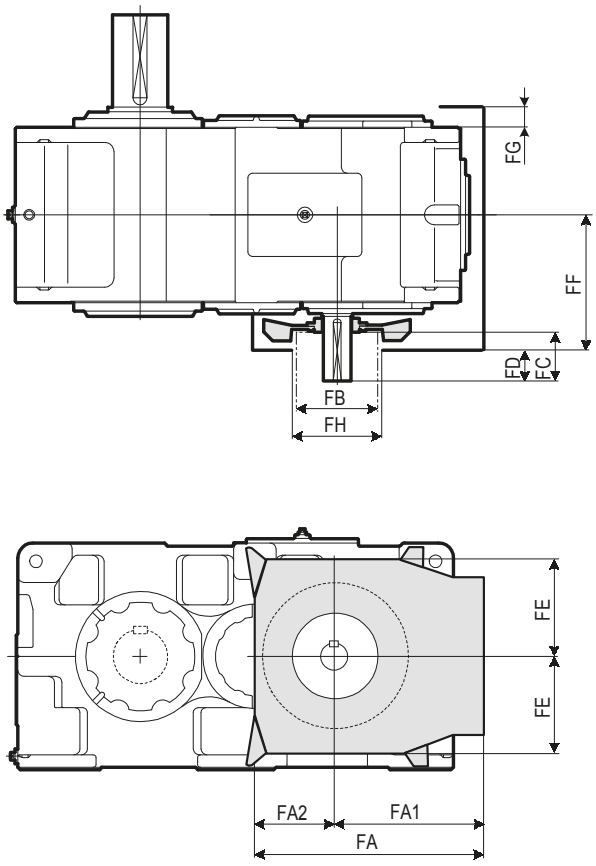
Size	FA	FB	FC	FD	FF	FH
9090	680	200	105	65	1255	220
9095	680	200	105	65	1285	220
9100	760	225	105	60	1414	245
9105	760	225	105	60	1448	245
9110	820	225	135	90	1594	245
9115	820	225	135	90	1643	245

Note) Consult us for cooling fan dimension of size 9118 and 9136.

9015 ▶ 9085 Parallel Double Reduction



9090 ▶ 9115 Parallel Double Reduction



※ When tightening installation bolt, remove fan hood.

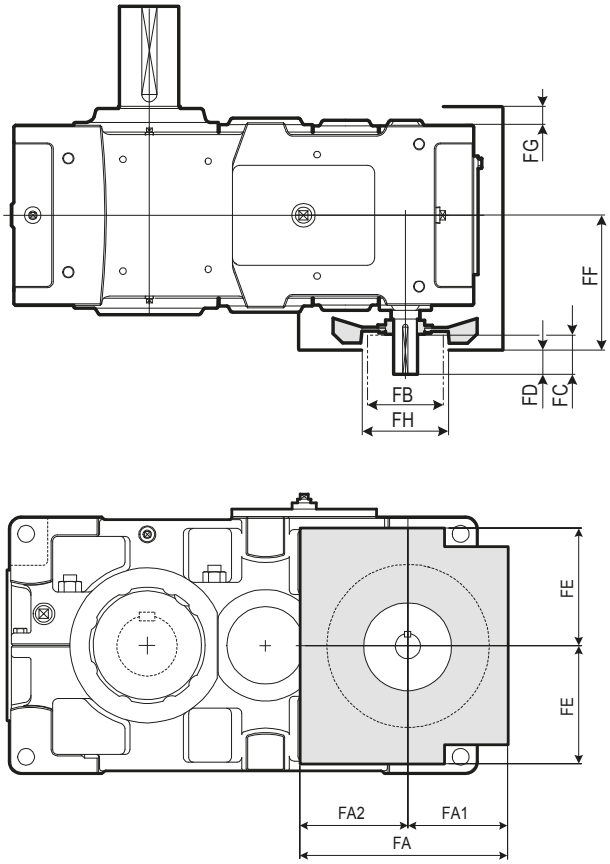
Size	FA1	FA2	FA	FB	FC	FD	FE	FF	FG	FH
9015	129	129	258	125	50	30	130	181	32.5	145
9025	143	143	286	140	50	30	150	196	27.5	160
9030	169	169	338	140	80	52	155	217	27.5	160
9035	169	169	338	140	80	52	180	217	27.5	160
9040	188	188	376	160	80	52	195	232	21.5	180
9045	188	188	376	160	80	52	215	232	21.5	180
9050	208	208	416	160	80	52	205	251	28.5	180
9055	208	208	416	160	80	52	240	251	28.5	180
9060	240	240	480	200	105	65	260	295	40	220
9065	240	240	480	200	105	65	295	295	40	220
9070	274	274	548	225	105	65	295	320	44	245
9075	274	274	548	225	105	65	330	320	44	245
9080	296	296	592	225	135	95	330	339	52	245
9085	296	296	592	225	135	95	370	339	52	245

Size	FA1	FA2	FA	FB	FC	FD	FE	FF	FG	FH
9090	465	277	742	250	135	90	345	410	65	270
9095	465	277	742	250	135	90	345	410	65	270
9100	515	314	829	250	175	130	395	455	65	270
9105	515	314	829	250	175	130	395	455	65	270
9110	565	356	921	250	175	130	445	485	65	270
9115	565	356	921	250	175	130	445	485	65	270

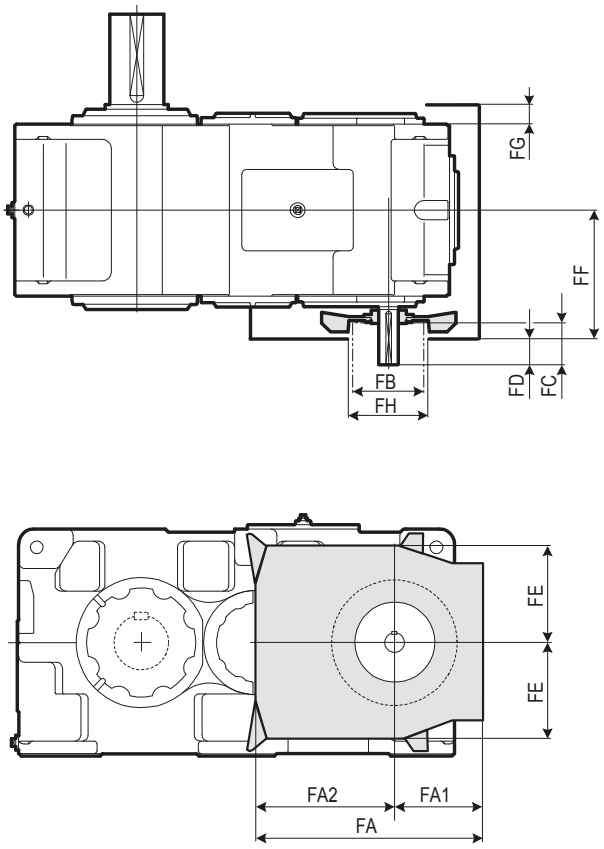
- Sufficient space must be allowed for air intake when mounting the safety guards for the coupling or other component.
- The split fan hood is prepared as a optional accessory for conducting maintenance work on a large coupling.【Refer to the "PARAMAX 9000 Series Option Catalog No.G2052E".】

Technical Data (Cooling Fan Dimension)

9015 ▶ 9085 Parallel Triple Reduction



9090 ▶ 9115 Parallel Triple Reduction



※ When tightening installation bolt, remove fan hood.

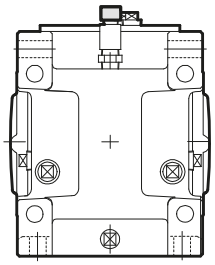
Size	FA1	FA2	FA	FB	FC	FD	FE	FF	FG	FH
9015	111	111	222	125	30	10	105	180	32.5	145
9025	129	129	258	125	30	10	125	194	27.5	145
9030	140	140	280	125	50	30	125	211	27.5	145
9035	150	150	300	140	50	22	150	219	27.5	160
9040	170	170	340	140	50	22	165	234	21.5	160
9045	170	170	340	140	50	22	185	234	21.5	160
9050	172	172	344	140	80	52	170	252	28.5	160
9055	172	172	344	140	80	52	205	252	28.5	160
9060	199	199	398	160	80	52	220	277	40	180
9065	199	199	398	160	80	52	255	277	40	180
9070	221	221	442	160	80	52	250	302	44	180
9075	221	221	442	160	80	52	285	302	44	180
9080	247	247	494	200	105	65	280	340	52	220
9085	247	247	494	200	105	65	320	340	52	220

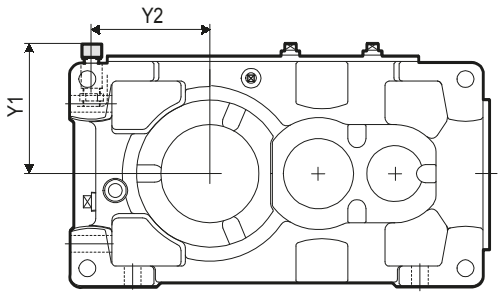
Size	FA1	FA2	FA	FB	FC	FD	FE	FF	FG	FH
9090	268	474	742	200	105	65	345	405	65	220
9095	268	474	742	200	105	65	345	405	65	220
9100	289	540	829	225	105	65	395	450	65	245
9105	289	540	829	225	105	65	395	450	65	245
9110	339	582	921	225	135	95	445	480	65	245
9115	339	582	921	225	135	95	445	480	65	245

Note) Consult us for cooling fan dimension of size 9118 and 9136.

9015 ▶ 9055 Right Angle Double, Triple, Quadruple
/ Parallel Double, Triple, Quadruple

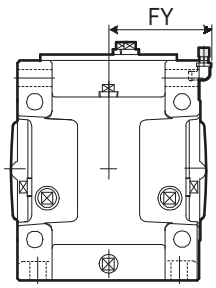
Air Breather

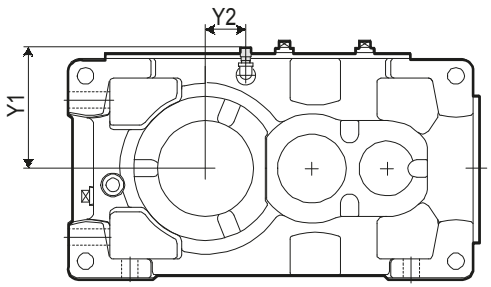




Size	Y1	Y2
9015	216	135
9025	233	149
9030	235	173

[9015~9030 Reduction Ratio 6.3~7.1]



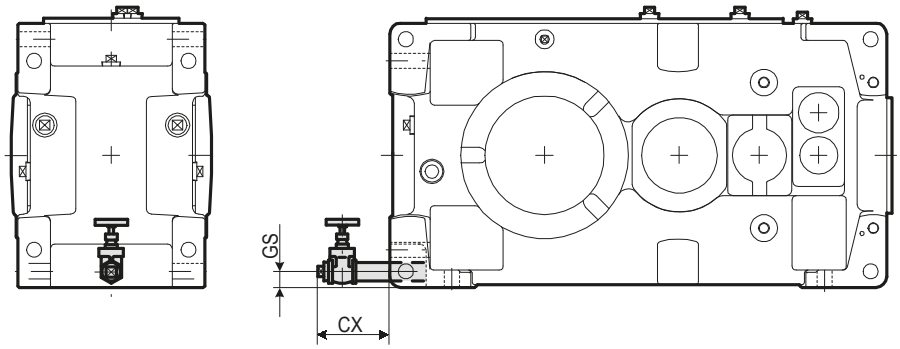


[9015~9030 Reduction Ratio 8 or above]
[9035~9055 Reduction Ratio All]

Size	Y1	Y2	FY
9015	162	35	129
9025	182	25	141
9030	187	0	154
9035	212	0	154
9040	227	30	171
9045	247	*30	171
9050	232	25	191
9055	267	0	191

* Double and triple reduction right angle, and double reduction parallel is 29mm.

Drain Valve

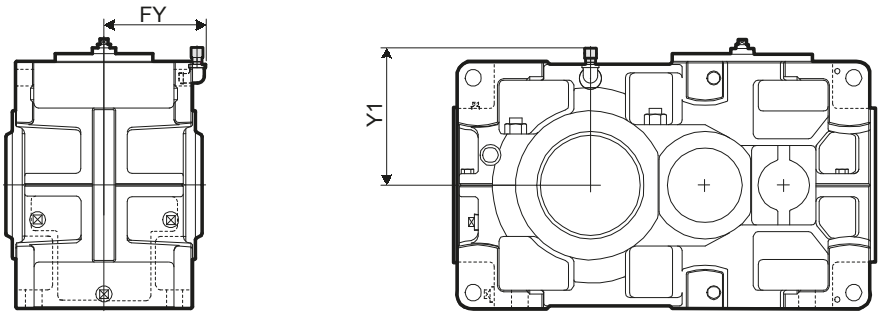


Size	CX	GS
9015	122	23
9025	122	24
9030	119	24
9035	119	24
9040	133	28
9045	133	28
9050	133	29
9055	133	29

Technical Data (Option Dimension)

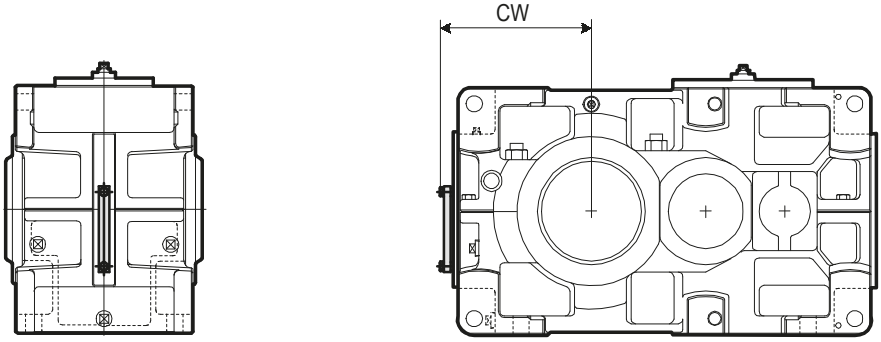
9060 ▶ 9085 Right Angle Double, Triple, Quadruple
/ Parallel Double, Triple, Quadruple

Air Breather



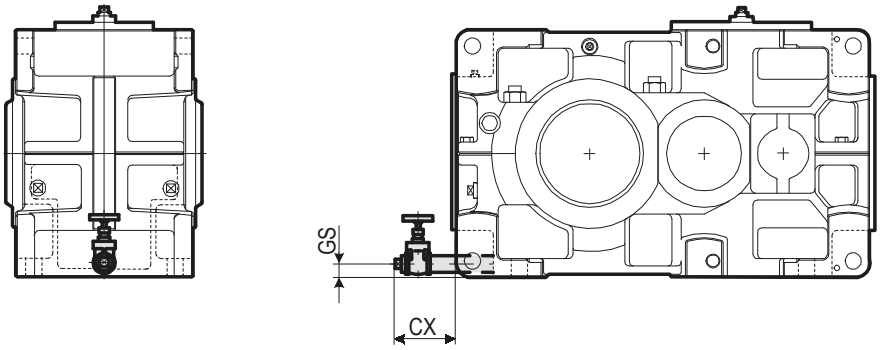
Size	Y1	FY
9060	281	211
9065	316	211
9070	315	236
9075	350	236
9080	350	256
9085	390	256

Oil Level Gauge



Size	CW
9060	318
9065	357
9070	355
9075	402
9080	397
9085	441

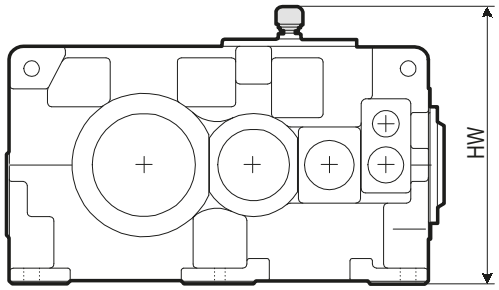
Drain Valve



Size	CX	GS
9060	170	31
9065	170	31
9070	155	33
9075	155	33
9080	155	34
9085	157	34

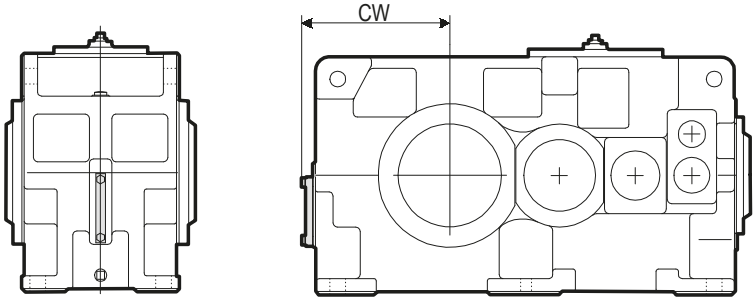
9090 ▶ 9115 Right Angle Double, Triple, Quadruple
/ Parallel Double, Triple, Quadruple

Air Breather



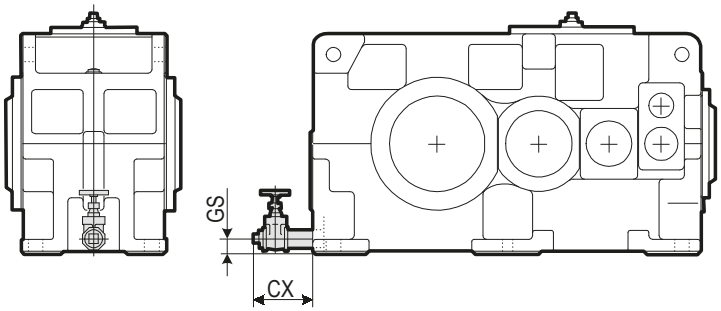
Size	HW
9090	839
9095	889
9100	939
9105	989
9110	1039
9115	1089

Oil Level Gauge

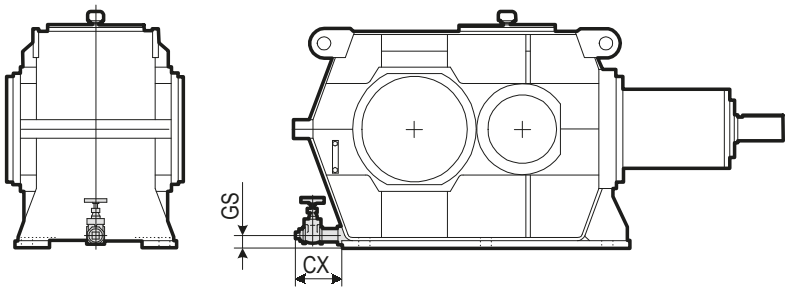


Size	CW
9090	435
9095	465
9100	475
9105	510
9110	525
9115	575

Drain Valve



Size	CX	GS
9090	162	45
9095	162	45
9100	162	46
9105	162	46
9110	162	48
9115	162	48



Size	CX	GS
9095R2	172	62
9105R2	172	62
9115R2	172	69

Option

	Standard Specifications	Optional Specifications
Housing	Cast Iron Housing	
Slow / High Speed Shaft	Solid Single-end Shaft Slow Speed Shaft Hollow Shaft (Shrink) Slow Speed Shaft Hollow Shaft (Key)	Solid Both-end Shaft
Bearing		Heavy Duty LSS Bearing
Air Vent	Air Vent	Air Breather
Oil Gauge	Dip Stick Round Gauge	Oil Sight Gauge (Stick Type)
Drain	Drain Plug	Drain Valve
Auxiliary Cooling Unit		Cooling Fan
Hollow Shaft Auxiliary Unit		Torque Arm Mounting & Removal Kit
Coating	Standard Paint (Indoor)	Rust-Proof Paint (Acrylic / Epoxy) Anticorrosion Paint (Epoxy / Polyurethane)

Keeper Plate with Washer

Keeper Plate is for retaining the high speed shaft, slow speed shaft, etc.
It is attached when mounting coupling and gears.

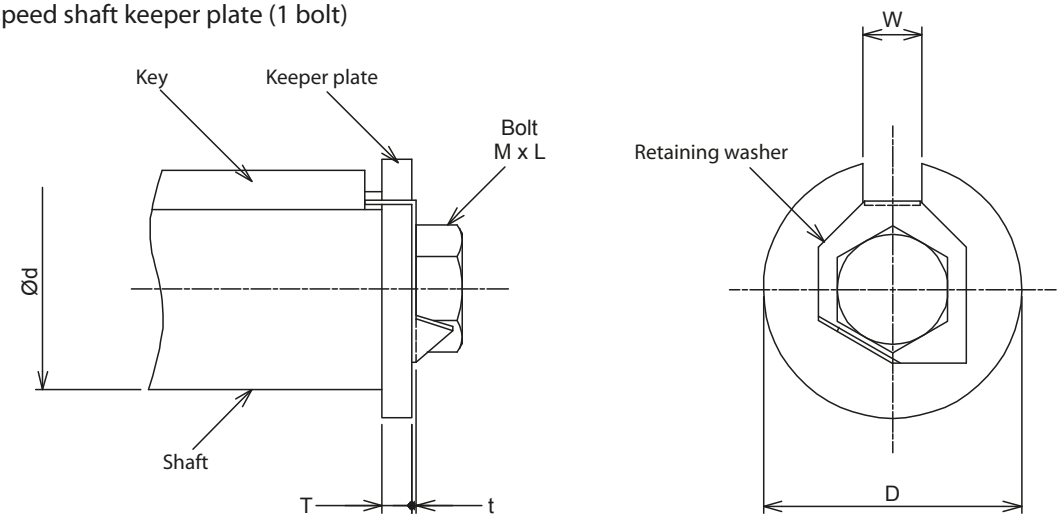
Specification

- There is a standard keeper plate for each shaft size.
- Keeper plate of high speed shaft is fixed by used by affixing a bolt by bending a retaining washer along the keyway.
- Keeper plate of slow speed shaft is used by affixing two bolts by bending a retaining washer.

Note: ・Key length is shorter than the standard models for keeper plate on a high speed shaft. This is because the retaining washer is bent along the keyway.
・Two tap holes are added on the shaft end for keeper plate on slow speed shaft.

Dimension

High speed shaft keeper plate (1 bolt)



Shaft diameter d	Outer diameter D	Keyway width W	Thickness T	Thickness t	Nominal bolt diameter x Screw length M × L		Reduced key length
25	35	8	5	0.8	M10	25	5
28	35	8	5	0.8	M10	25	5
30	35	8	5	0.8	M10	25	5
35	45	10	5	0.8	M12	30	5
40 (a)	50	12	5	1.2	M16	40	5
40 (b)	50	14	6	1.2	M16	40	5
45	60	14	8	1.2	M16	40	5
50	60	14	8	1.2	M16	40	5
55	70	16	8	1.2	M20	45	5
58	75	18	8	1.2	M20	45	5
60	75	18	8	1.2	M20	45	5
65	75	18	8	1.2	M20	45	5
70	90	20	8	1.2	M20	45	5
75	90	20	8	1.2	M20	45	5
80	100	22	8	1.2	M20	45	5
85	100	22	8	1.2	M20	45	5
90	110	25	10	1.6	M24	55	6
95	120	25	10	1.6	M24	55	6
100	120	28	10	1.6	M24	55	6
105	130	28	10	1.6	M24	55	6
110	140	28	10	1.6	M24	55	6
120	140	32	10	1.6	M24	55	6
125	150	32	10	1.6	M24	55	6
130	160	32	10	1.6	M24	55	6

Refer to the shaft diameter table for the suitable reducer size that corresponds to a specific shaft diameter. Unit: mm

Keeper Plate with Washer

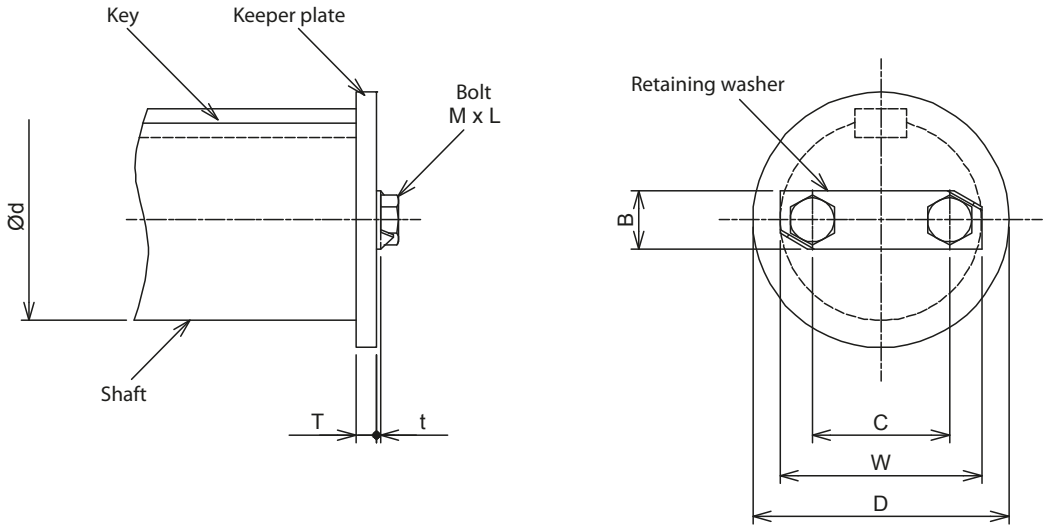
High Speed Shaft Diameter

Size	P2	P3	P4	R2	R3	R4
9015	30	25	-	28	-	-
9025	35	28	-	35	-	-
9030	40 (a)	30	25	40 (b)	28	-
9035	40 (a)	30	25	40 (b)	28	-
9040	50	35	28	45	30	28
9045	50	35	28	45	30	28
9050	55	40 (a)	30	50	35	28
9055	55	40 (a)	30	50	35	28
9060	65	50	35	60	45	30
9065	65	50	35	60	45	30
9070	75	55	40 (a)	65	50	35
9075	75	55	40 (a)	65	50	35
9080	85	65	45	75	60	45
9085	85	65	45	75	60	45
9090	90	65	50	-	65	50
9095	90	65	50	90	65	50
9100	100	75	60	-	75	60
9105	100	75	60	100	75	60
9110	110	80	60	-	85	60
9115	110	80	60	110	85	60

Unit: mm

Dimension

Slow speed shaft keeper plate (2 bolts)



Size	Shaft diameter d	Pitch C	Outer diameter D	Thickness T	W	B	Thickness t	Nominal bolt diameter x Screw length M × L	
9015	58	42	75	9	65	25	0.8	M10	25
9025	70	46	85	9	75	25	0.8	M12	30
9030	80	50	100	9	77	25	0.8	M12	30
9035	90	55	105	9	85	25	1.2	M12	30
9040	95	60	120	12	95	32	1.2	M16	40
9045	105	60	120	12	95	32	1.2	M16	40
9050	110	75	140	12	110	32	1.2	M16	40
9055	120	75	140	12	110	32	1.2	M16	40
9060	125	85	150	16	130	40	1.2	M20	50
9065	140	95	175	16	140	40	1.2	M20	50
9070	145	95	175	16	140	40	1.2	M20	50
9075	160	110	190	16	155	40	1.2	M20	50
9080	165	110	190	16	155	40	1.2	M20	50
9085	175	130	210	16	175	40	1.2	M20	50
9090	180	130	210	16	175	40	1.2	M20	50
9095	190	140	220	16	185	40	1.2	M20	50
9100	200	145	230	16	197	48	1.2	M24	55
9105	220	165	250	16	217	48	1.2	M24	55
9110	220	165	250	16	217	48	1.2	M24	55
9115	240	180	270	16	232	48	1.2	M24	55
9118	260	190	290	18	254	55	1.6	M30	75
9121	280	200	310	18	264	55	1.6	M30	75
9126	300	220	330	18	284	55	1.6	M30	75
9128	320	200	350	21	272	64	1.6	M36	90
9131	340	215	370	21	287	64	1.6	M36	90
9136	360	230	390	21	302	64	1.6	M36	90

Unit: mm

Shaft-End Tapped Hole (LSS)

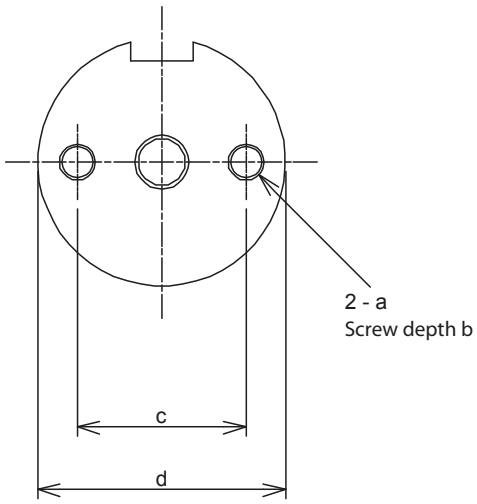
Shaft end tap on LSS end is to fix keeper plate etc. using two bolts.

Specification

- This adds two tap holes to the end of a standard low speed shaft, which has one tap hole at the center.

Dimension

Slow speed shaft

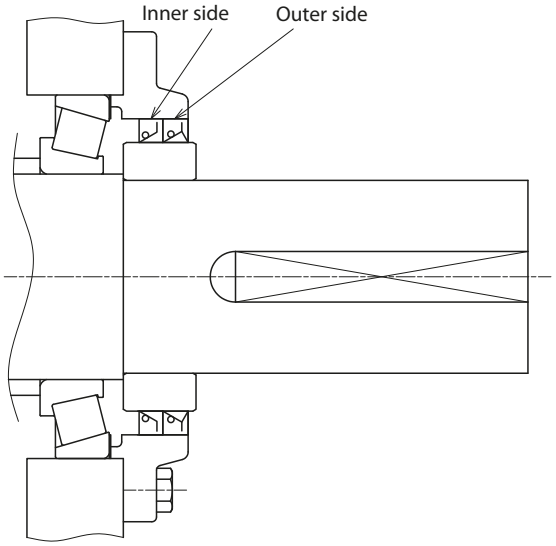


Size	d	a	b	c
9015	58	M10	20	42
9025	70	M12	25	46
9030	80	M12	25	50
9035	90	M12	25	55
9040	95	M16	30	60
9045	105	M16	30	60
9050	110	M16	30	75
9055	120	M16	30	75
9060	125	M20	38	85
9065	140	M20	38	95
9070	145	M20	38	95
9075	160	M20	38	110
9080	165	M20	38	110
9085	175	M20	38	130
9090	180	M20	38	130
9095	190	M20	38	140
9100	200	M24	45	145
9105	220	M24	45	165
9110	220	M24	45	165
9115	240	M24	45	180

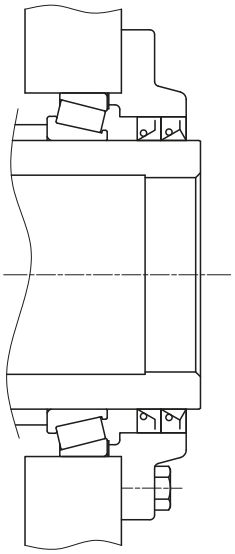
Unit: mm

Double Shaft Seals (LSS)

Oil seal may be doubled in applications where oil leakage may have severe impact on production or the environment. Use of double oil seal enhances the reliability of the oil leakage prevention.



Solid Shaft



Hollow Shaft

Specification

- This specification comes with double nitrile rubber oil seal.
- The optional double oil seals on slow speed shaft is available for the combinations marked with "S" in the table below.

Note: ▪ Double oil seal on the slow speed shaft is standard for quadruple stage reduction horizontal mounting models, vertical mounting slow speed shaft models facing the bottom, and upright models.

▪ Double oil seal is used only for the seal at the bottom for vertical mounting hollow shaft models.

Standard specifications of slow speed shaft oil seal

Installation	Number of reduction stage	Right angle shaft						Parallel shaft								
		RL	RR	RB	LR	LL	LB	RL	RR	RB	LR	LL	LB	BR	BL	BB
Horizontal	Double stage	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
	Triple stage	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
	Quadruple stage	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Vertical	Double stage	D	S	-	-	-	-	D	S	-	-	-	-	-	-	-
	Triple stage	D	S	-	-	-	-	D	S	-	-	-	-	-	-	-
	Quadruple stage	-	-	-	S	D	-	D	S	-	-	-	-	-	-	-
Upright	Double stage	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	Triple stage	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	Quadruple stage	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D

S : Single oil seal, D : Double oil seal

FKM Seal

FKM seal has better heat resistance compared to the nitrile rubber seal.
Use FKM seal when the ambient temperature is 60 degrees Celsius or higher.
FKM seal is also recommended for ambient environment requiring chemical resistance.

Specification

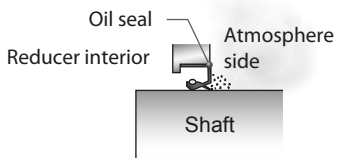
- This is an oil seal with dust lip made of fluorine-containing rubber.

Dimension

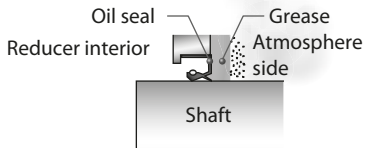
The installation dimension is the same as the standard oil seal.
FKM seal do not affect the installation dimension of high speed and slow speed shafts.

Taconite Seal

Taconite seal is suitable used when operating a reducer in a dusty environment, such as applications for coal conveyors.



Oil seal

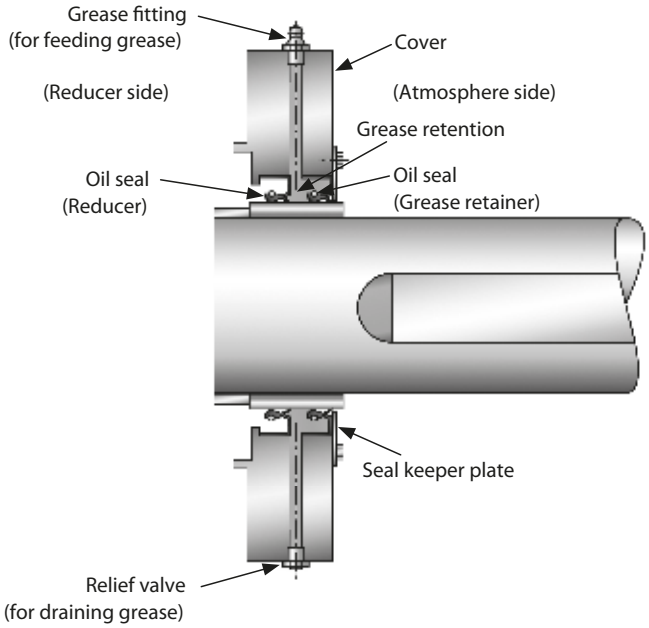


Taconite Seal

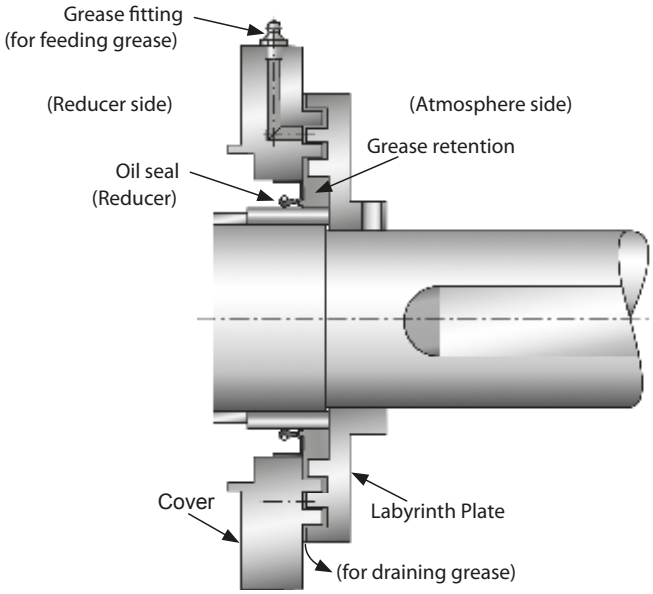
Specification

- The seal structure has grease on the open air side. This prevents dust particles from reaching the oil seal lip to prevent wear and tear.
- There are two types of seal structures, “standard” and “labyrinth.”

Standard type



Labyrinth type



Seal structure application table

S: Standard type L: Labyrinth type

Size	High speed shaft						Slow speed shaft
	P2	P3	P4	R2	R3	R4	
9015	S	S	—	S	—	—	S
9025	S	S	—	S	—	—	
9030	S	S	S	S	S	—	
9035	S	S	S	S	S	—	
9045 ~ 9085	S	S	S	S	S	S	
9090 ~ 9115	L	L	S	S	S	S	

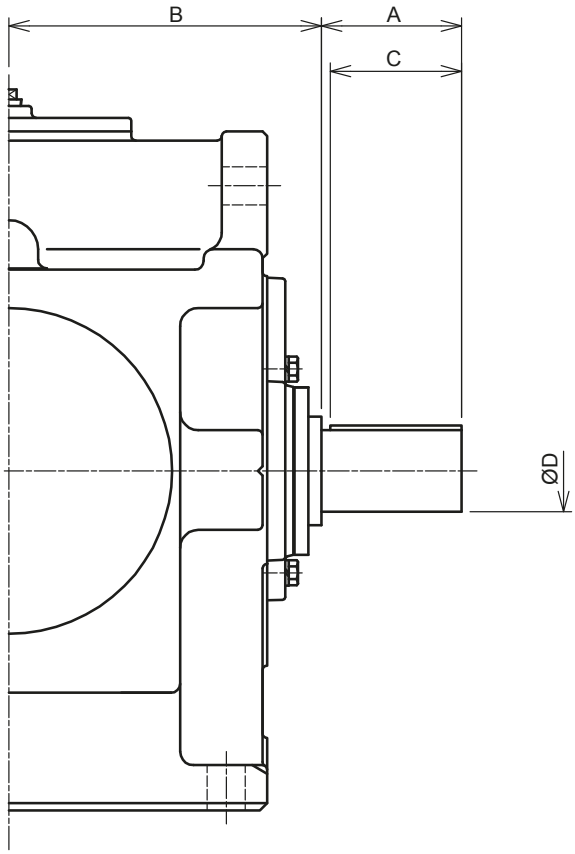
Dimension

- The above table shows that output dimension of the shaft with “Standard type” taconite seal is the same as those described in this catalog as standard.
- The high speed shaft seal for 9090 - 9115 P2 , P3 is the “Labyrinth type (L)” with different shaft output dimensions and collar-end dimensions from standard.

Taconite Seal

Dimension

Taconite seal “labyrinth type” high speed shaft-end



Parallel Shaft Double Stage Reduction Horizontal Mounting

Size	A	B	C	D	Key
9090	155	345	150	90m6	25x14
9095	155	345	150	90m6	25x14
9100	195	390	190	100m6	28x16
9105	195	390	190	100m6	28x16
9110	195	420	190	110m6	28x16
9115	195	420	190	110m6	28x16

Unit : mm

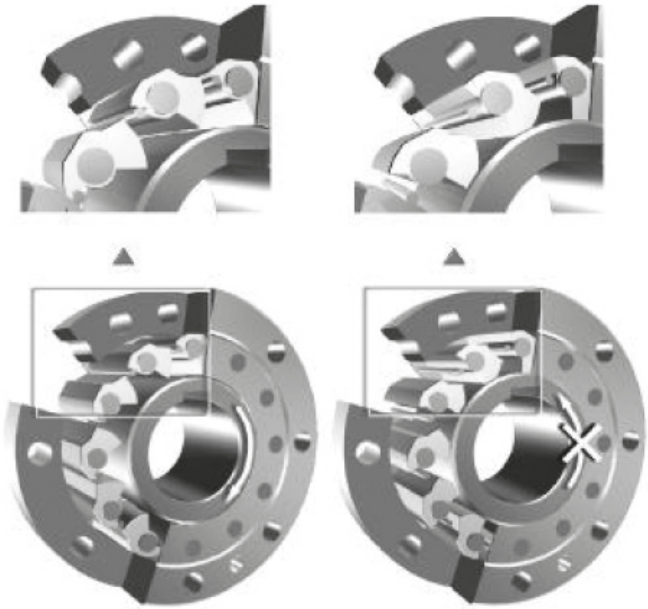
Parallel Shaft Triple Stage Reduction Horizontal Mounting

Size	A	B	C	D	Key
9090	125	345	125	65m6	18x11
9095	125	345	125	65m6	18x11
9100	125	390	125	75m6	20x12
9105	125	390	125	75m6	20x12
9110	155	420	150	80m6	22x14
9115	155	420	150	80m6	22x14

Unit : mm

Internal Backstop

Internal backstop is mounted directly on the intermediate shaft of the reducer. Internal type does not require the torque arm for the back stop, bearing, oil seal, and specialized lubrication, unlike the exterior-mount type. It makes the application device more simple, compact, and maintenance free.



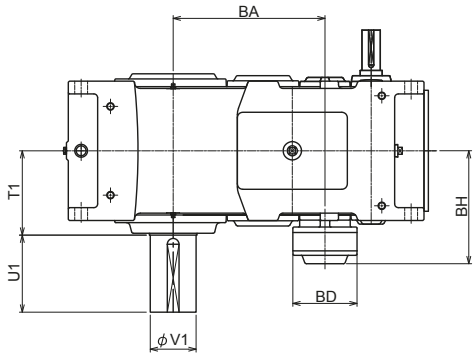
Specification

- Inner race rotate in single direction only. This is a centrifugal lift-off backstop with no contact of cam.

Internal Backstop

Dimension

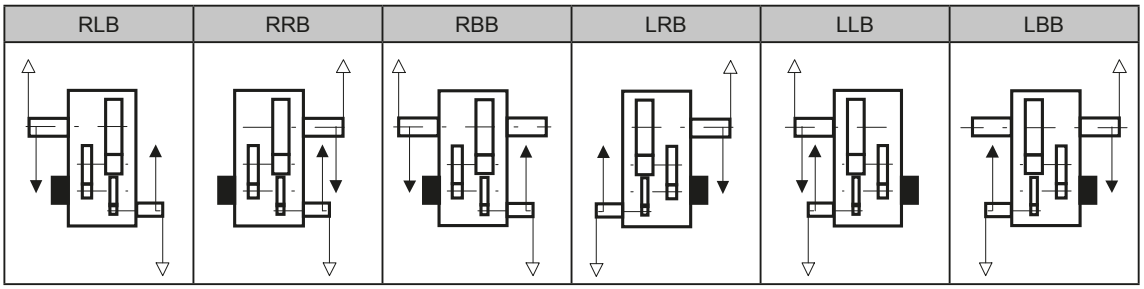
Parallel Shaft Triple Stage Reduction Horizontal Mounting



Size	BA	BH	BD	T1	V1	U1	Approx. oil quantity [ℓ]
9050	358	263	150	201	110	210	24
9055	397	263	150	201	120	210	24
9060	414	308	175	230	125	210	35 *
9065	460	308	175	234	140	250	40 *
9070	482	330	190	259	145	250	53 *
9075	535	330	190	262	160	300	64 *
9080	556	365	210	282	165	300	69 *
9085	612	365	210	285	175	300	85 *

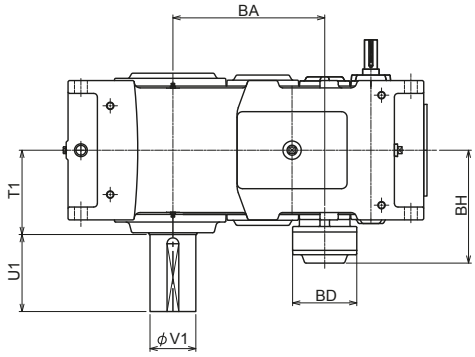
Note: The oil volumes marked with "*" are different from the standard oil volume. Unit : mm

Standard Shaft Arrangement Configuration



(■ : Backstop)

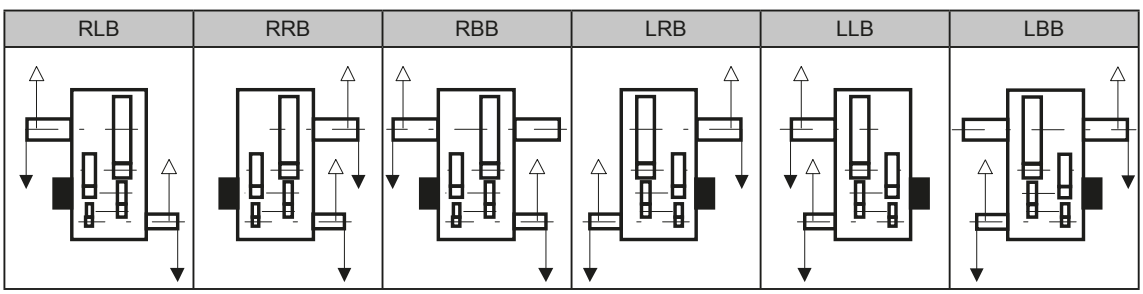
Parallel Shaft Quadruple Stage Reduction Horizontal Mounting



Size	BA	BH	BD	T1	V1	U1	Approx. oil quantity [ℓ]
9050	358	263	150	201	110	210	56
9055	397	263	150	201	120	210	56
9060	414	308	175	230	125	210	37
9065	460	308	175	234	140	250	42
9070	482	330	190	259	145	250	56
9075	535	330	190	262	160	300	67
9080	556	365	210	282	165	300	73
9085	612	365	210	285	175	300	90

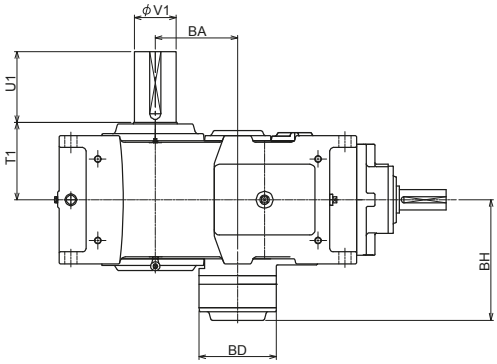
Unit : mm

Standard Shaft Arrangement Configuration



(■ : Backstop)

Right Angle Shaft Double Stage Reduction Horizontal Mounting

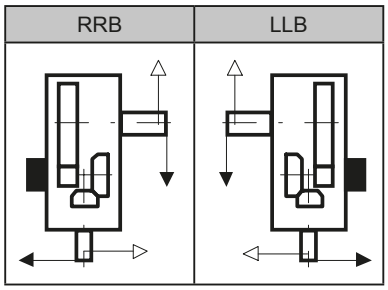


Size	BA	BH	BD	T1	V1	U1	Approx. oil quantity [ℓ]
9060	245	358	230	230	125	210	25
9065	291	358	230	234	140	250	34
9070	285	402.5	290	259	145	250	37
9075	338	402.5	290	262	160	300	46
9080	330	416.5	322	282	165	300	53
9085	386	416.5	322	285	175	300	67

Note: Consult us when a backstop is used more than twenty times per an hour.

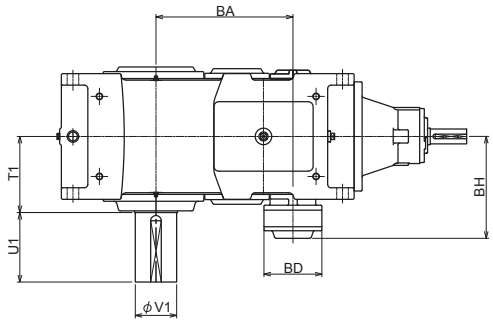
Unit : mm

Standard Shaft Arrangement Configuration



（ ■ : Backstop）

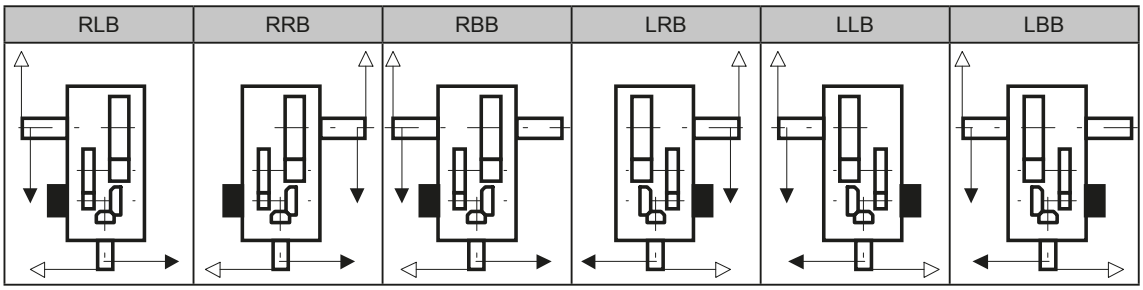
Right Angle Shaft Triple Stage Reduction Horizontal Mounting



Size	BA	BH	BD	T1	V1	U1	Approx. oil quantity [ℓ]
9050	358	263	150	201	110	210	32
9055	397	263	150	201	120	210	32
9060	414	308	175	230	125	210	29
9065	460	308	175	234	140	250	33
9070	482	330	190	259	145	250	45
9075	535	330	190	262	160	300	52
9080	556	365	210	282	165	300	60
9085	612	365	210	285	175	300	75

Unit : mm

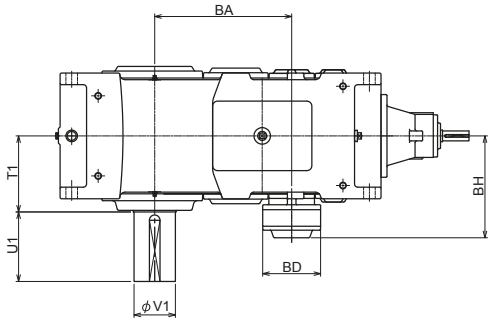
Standard Shaft Arrangement Configuration



（ ■ : Backstop）

Internal Backstop

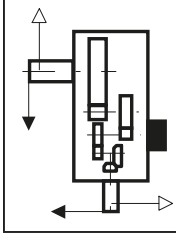
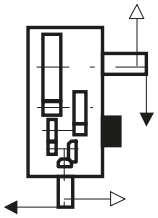
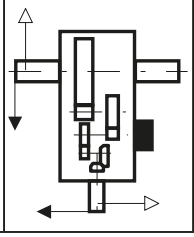
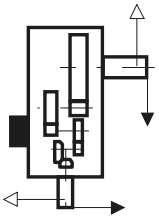
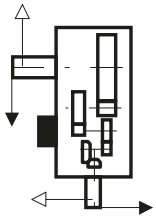
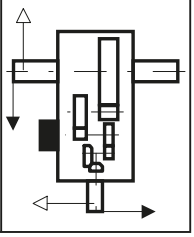
Right Angle Shaft Quadruple Stage Reduction Horizontal Mounting



Size	BA	BH	BD	T1	V1	U1	Approx. oil quantity [ℓ]
9050	358	263	150	201	110	210	24
9055	397	263	150	201	120	210	24
9060	414	308	175	230	125	210	38
9065	460	308	175	234	140	250	43
9070	482	330	190	259	145	250	57
9075	535	330	190	262	160	300	67
9080	556	365	210	282	165	300	73
9085	612	365	210	285	175	300	90

Unit : mm

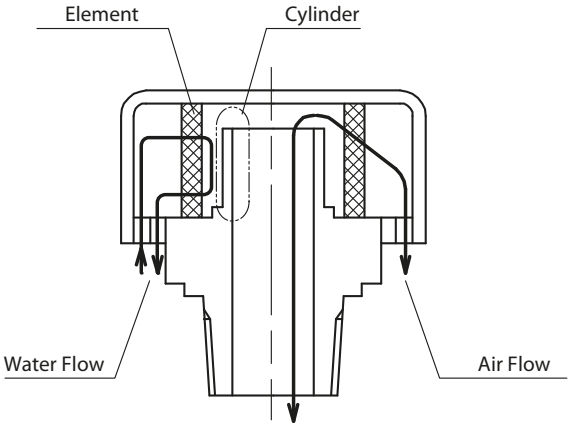
Standard Shaft Arrangement Configuration

RLB	RRB	RBB	LRB	LLB	LBB
					

(■ : Backstop)

Washdown Breather

Select washdown breather for outdoor environment with exposure to rain or water splash.



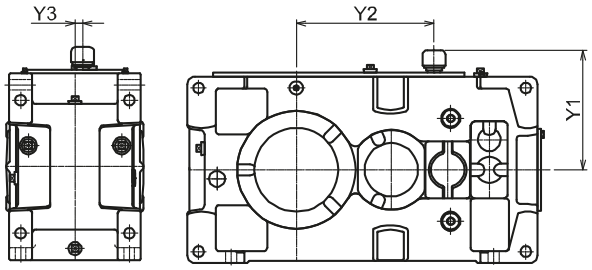
Specification

- Compared to the normal air breather, this one has an internal cylindrical section to prevent drops of water from the outside from entering into the inside of the reducer.
- The element is made of stainless steel.

Dimension

Horizontal Mounting

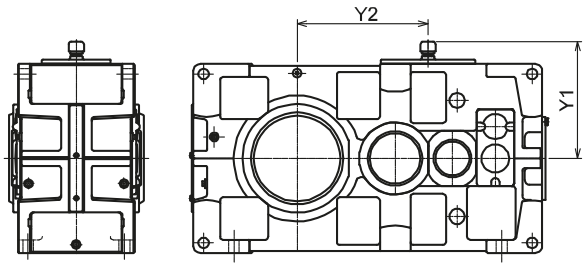
PHA9015-9055 Right Angle Shaft Double, Triple, Quadruple Stage Reduction;
Parallel Shaft Double, Triple, Quadruple Stage Reduction



Size	Y1	Y2	Y3
9015	205	150	0
9025	225	200	18
9030	230	232	20
9035	255	263	20
9040	270	274	20
9045	290	313	20
9050	280	322	20
9055	315	361	20

Unit : mm

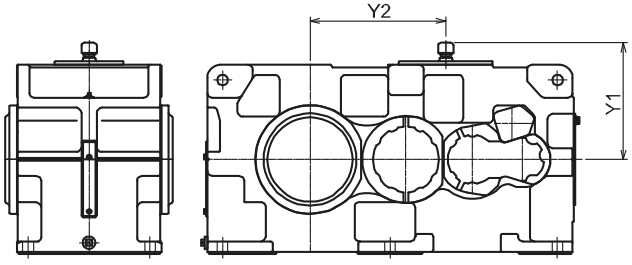
PHD9060-9085 Right Angle Shaft Double, Triple, Quadruple Stage Reduction;
Parallel Shaft Double, Triple, Quadruple Stage Reduction



Size	Y1	Y2
9060	354	325
9065	389	371
9070	389	370
9075	424	423
9080	424	460
9085	464	516

Unit : mm

PHD9090-9115 Right Angle Shaft Double, Triple, Quadruple Stage Reduction;
Parallel Shaft Double, Triple, Quadruple Stage Reduction

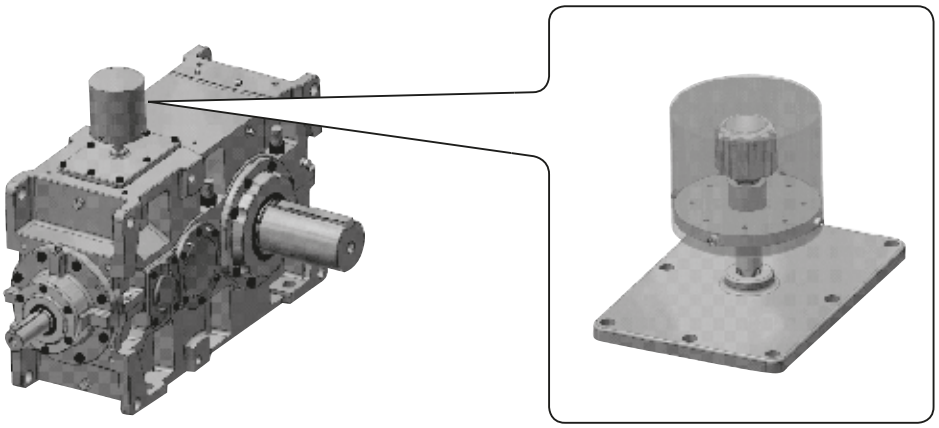


Size	Y1	Y2
9090	464	535
9095	489	565
9100	514	620
9105	539	655
9110	564	710
9115	589	760

Unit : mm

Anti-Dust Breather

This air breather should be used when installing a reducer in a very dusty environment.
This unit may be used even in an environment whereby the unit with a normal air breather becomes buried under dust.

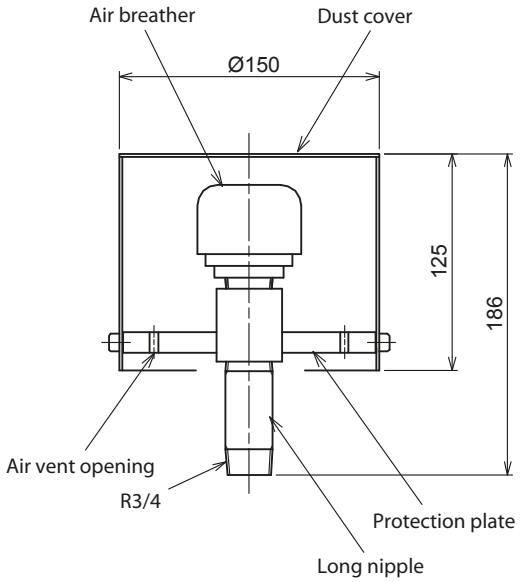


Specification

- A long nipple is used to raise the unit from the standard installation position, so as to prevent it from becoming buried under dust.
- A dustproof cover is installed over the air breather to prevent direct accumulation of dust.

Dimension

9015 ～ 9136 (all sizes)



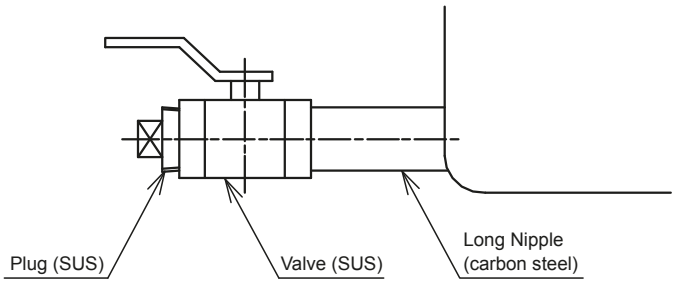
Stainless Steel Drain Valve

This drain valve is less corrosive than a bronze valve, and can be used in a corrosive atmosphere for an extended period of time.

Specification

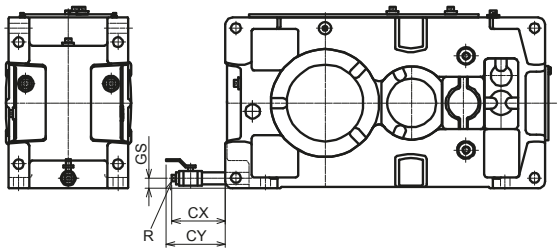
- If you require anticorrosive performance, use a stainless-steel drain valve.
- The drain valve uses a ball valve made of stainless steel (equivalent to SUS304).

  * Consult us for gate valves, which can be also manufactured.



Dimension (Horizontal Mounting)

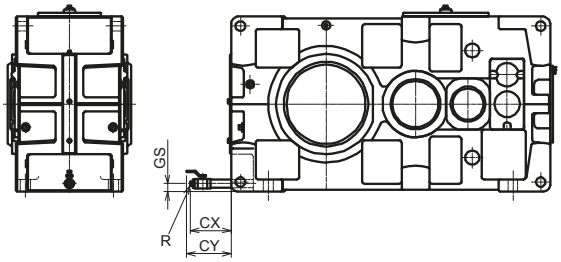
PHA9015-9055 Right Angle Shaft Double, Triple, Quadruple Stage Reduction;
Parallel Shaft Double, Triple, Quadruple Stage Reduction



Size	R	CX	CY	GS
9015	3/4"	133	170	23
9025	3/4"	133	170	24
9030	3/4"	130	167	24
9035	3/4"	130	167	24
9040	1"	154	198	28
9045	1"	154	198	28
9050	1"	154	198	29
9055	1"	154	198	29

Unit : mm

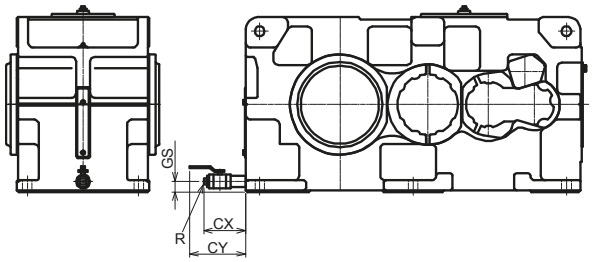
PHD9060-9085 Right Angle Shaft Double, Triple, Quadruple Stage Reduction;
Parallel Shaft Double, Triple, Quadruple Stage Reduction



Size	R	CX	CY	GS
9060	1"	191	235	31
9065	1"	191	235	31
9070	1"	176	220	33
9075	1"	176	220	33
9080	1"	176	220	34
9085	1"	176	220	34

Unit : mm

PHD9090-9115 Right Angle Shaft Triple, Quadruple Reduction,
Parallel Shaft Double, Triple, Quadruple Stage Reduction



Size	R	CX	CY	GS
9090	1 1/2"	181	241	45
9095	1 1/2"	181	241	45
9100	1 1/2"	181	241	45
9105	1 1/2"	181	241	45
9110	1 1/2"	181	241	48
9115	1 1/2"	181	241	48

Unit : mm

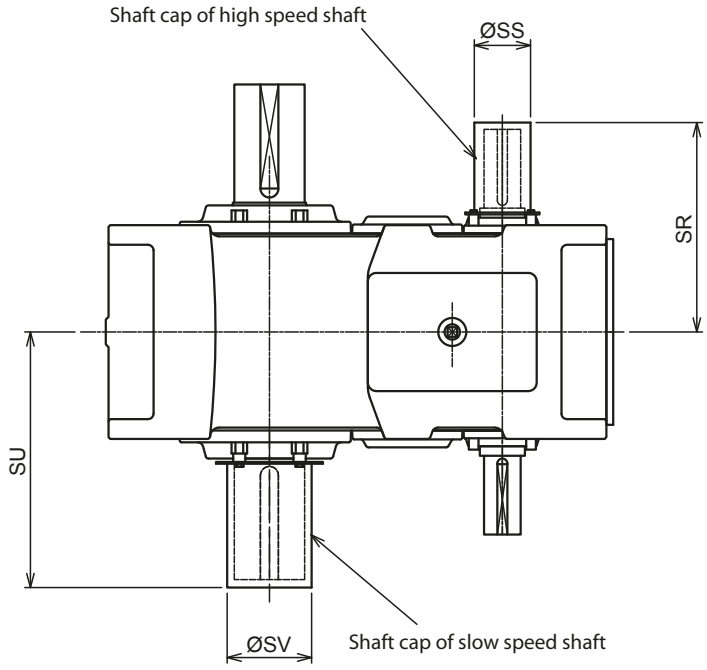
Shaft Cap

For a machine or auxiliary unit that has to use a different shaft due to layout change, a dual output shaft reducer is often chosen so that either side may be used for the output.
This cap is used as a safety cover in such cases.

Specification

- The cap is made of welded thin sheet metal.
- The cap is processed for installation on both sides. You can remove a fitted shaft cap, and place it over the shaft on the other side.

Dimension



For high speed shaft

Size		SR	ØSS
9050	2 stage	312	90
	3 stage	278	70
9055	2 stage	312	90
	3 stage	278	70
9060	2 stage	372	100
	3 stage	337	80
9065	2 stage	372	100
	3 stage	337	80
9070	2 stage	394	100
	3 stage	362	90
	4 stage	362	70
9075	2 stage	394	100
	3 stage	362	90
	4 stage	362	70
9080	2 stage	444	110
	3 stage	414	100
	4 stage	384	75
9085	2 stage	444	110
	3 stage	414	100
	4 stage	384	75
9090	2 stage	508	120
	3 stage	478	90
	4 stage	448	75
9095	2 stage	508	120
	3 stage	478	90
	4 stage	448	75
9100	2 stage	595	130
	3 stage	525	100
	4 stage	526	85

Unit: mm

For slow speed shaft

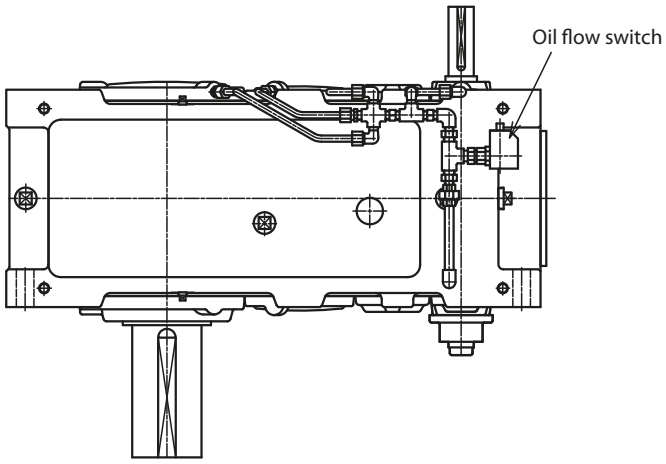
Size	SU	ØSV
9030	345	120
9035	342	130
9040	362	135
9045	404	145
9050	424	150
9055	424	160
9060	454	150
9065	499	170
9070	524	170
9075	577	190
9080	597	190
9085	601	230
9090	666	230
9095	716	230
9100	756	240

Unit: mm

Oil Flow Switch

This flow switch may be directly installed on the forced lubrication pipe to sound an alarm if a pump stops to terminate the oil flow or to control the operation of the reducer. This is useful to prevent reducer damage attributable to poor lubrication.

The diagram on the right shows an installation example of the flow switch.



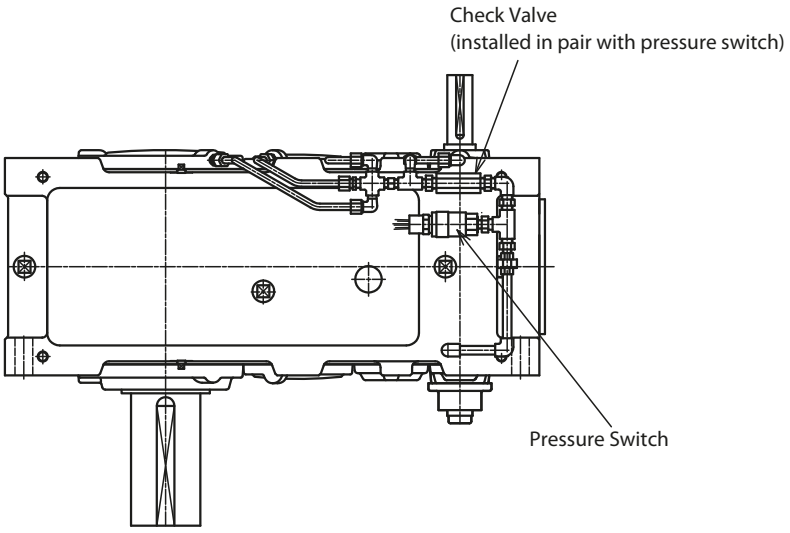
Specification

- This flow switch (fluid sensor) uses an electronic sensor system, and therefore has no moving parts to remain free from problems caused by grime accumulation or blockage. This feature makes it a maintenance-free switch.
- The sensor is adjusted at the factory on shipment, and requires no further adjustment by users.

Oil Pressure Switch

This pressure switch may be directly installed on the forced lubrication pipe to sound an alarm if a pump stops to terminate oil circulation and reduces hydraulic pressure, or to stop the operation of the reducer. This is useful to prevent reducer damage attributable to poor lubrication.

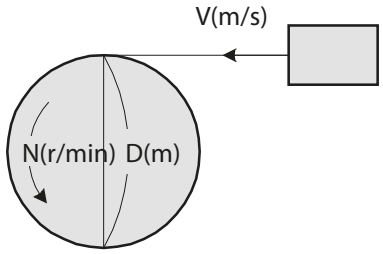
The diagram below shows an installation example of the pressure switch.



Specification

- The pressure in the forced lubrication pipe fluctuates largely according to oil temperature. However, this option applies a check valve to generate pressure above a certain level as long as there is oil flow, and therefore allows you to positively determine whether there is oil flow or not. The sensor is adjusted at the factory on shipment, and requires no further adjustment by users.

1. Revolving Speed N(r/min), Velocity V(m/s)

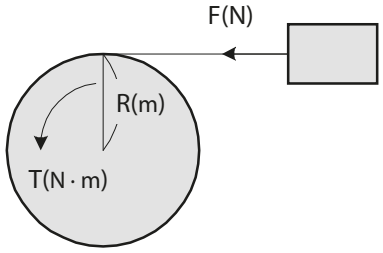


$$V = \pi \cdot D \cdot \frac{N}{60} \quad (m/s)$$

π : Circular constant (≈ 3.14)
D : Wheel Diameter (m)

---

2. Torque T (Nm)

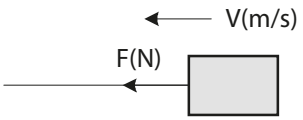


$$T = F \cdot R \quad (N \cdot m)$$

F : Load (N)
R : Wheel Radius (m)

---

3. Power P(kW)



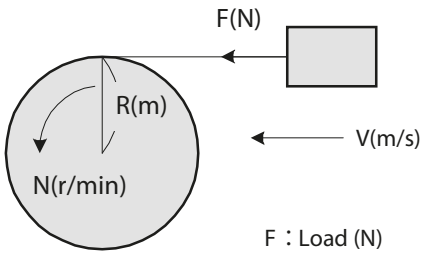
$$P = \frac{F \cdot V}{1000} \quad (kW)$$

F : Load (N)
V : Velocity (m/s)

---

4. Power P(kW), Torque T(Nm), Revolving Speed N(r/min)

$$P = \frac{N \cdot T}{9550} \ (kW), \qquad T = \frac{9550 \cdot P}{N} \ (N \cdot m) \qquad P = \frac{F \cdot V}{1000} \ (kW), \qquad V = \pi \cdot 2 \cdot R \cdot \frac{N}{60} \ (m/s)$$



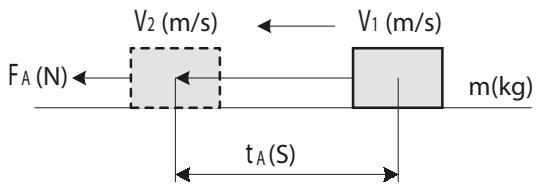
F : Load (N)

$$\text{Therefore, } P = \frac{F \cdot \pi \cdot 2 \cdot R \cdot \frac{N}{60}}{1000} = \frac{2 \cdot \pi}{1000 \times 60} \cdot N \cdot F \cdot R \ (kW)$$

Since $T = F \cdot R$

$$P = \frac{2 \cdot \pi}{1000 \times 60} \cdot N \cdot T = \frac{N \cdot T}{9550} \ (kW)$$

5. Acceleration Force F_A (N)



$$F_A = m \cdot a = m \cdot \frac{V_2 - V_1}{t_A} \text{ (N)}$$

$$a = \frac{V_2 - V_1}{t_A}$$

m : Mass (kg)
α : Acceleration (m/s²)
t_A : Acceleration Time (s)

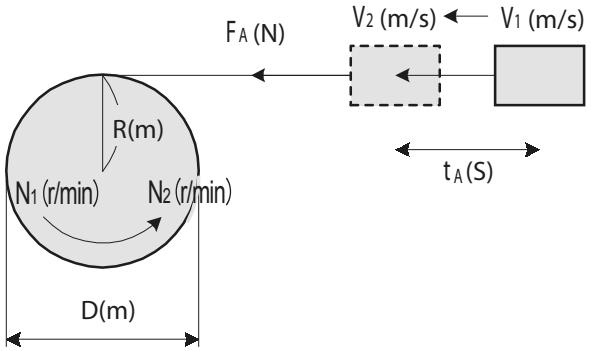
---

6. Acceleration Torque T_A (Nm)

$$T_A = F_A \cdot R, \quad F_A = m \cdot \frac{V_2 - V_1}{t_A}$$

$$V_2 = \pi \cdot D \cdot \frac{N_2}{60}, \quad V_1 = \pi \cdot D \cdot \frac{N_1}{60},$$

$$D = 2 \cdot R$$



$$\text{Therefore, } T_A = m \cdot \frac{\frac{\pi \cdot 2 \cdot R}{60}(N_2 - N_1)}{t_A} \cdot R$$

$$= \frac{2\pi \cdot m \cdot R}{60} \cdot \frac{N_2 - N_1}{t_A} \cdot R$$

$$= \frac{m \cdot R^2}{9.55} \cdot \frac{N_2 - N_1}{t_A} \text{ (N · m)}$$

Since $m \cdot R^2$ is J (Moment of Inertia: kg-m²)

$$T_A = \frac{J}{9.55} \cdot \frac{N_2 - N_1}{t_A} \text{ (N · m)}$$

---

7. Synchronized Revolving Speed of AC Motor N_0 (r/min)

$$N_o = \frac{120 \cdot f}{P} \text{ (r/min)}$$

f : Power Supply Frequency (Hz)
P : No. of Motor Poles

---

8. Rated Revolving Speed of AC Motor N(r/min)

$$N = N_o(1 - S) \text{ (r/min)}$$

N_o : Synchronized Revolving Speed (r/min)
S : Slippage

Selection Procedure

For the selection of Bucket Elevator Drive reducer, please provide the following information (with * are optional items)

1. Load

	No.	Parameter	Data
Main Drive	1	Motor (AC, DC, Frequency or other)	
	2	Motor Power	kW
	3	Actual Motor Power (Nominal / Min. / Max.)	/ / kW
	4	Motor Input Speed (Nominal / Min. / Max.)	/ / r/min
	5	Low Speed Shaft Output Speed	/ / r/min
	6	Low Speed Shaft Output Torque	/ / kNm
	7*	Equipment Running Time	hours/day
	8	Service Factor Requirements	
	9*	Reducer Installation	☐ Foot Mounting ☐ Torque Arm Mounting
	10*	Connection between Low Speed Shaft and Load	
	11	Low Speed Shaft types	☐ Solid Shaft with Keyway ☐ Solid Shaft without Keyway ☐ Hollow Shaft with Shrink Disc ☐ Hollow Shaft with Keyway ☐ Others （ ）
	12	Low Speed Shaft load conditions	Axial Load kN Radial Load kN Load point to the distance from the shaft shoulder mm
	13	High Speed Shaft load conditions	Axial Load kN Radial Load kN Load point to the distance from the shaft shoulder mm
Shaft Rotation	14	Required Low Speed Shaft Speed	r/min
	15	Required Low Speed Shaft Torque	kNm
	16	Running Time	hours/day
	17	Operating Frequency	no. of time/hour
Inching	18	Desired Inching Speed	r/min
	19	Desired Inching Torque	kNm

※ Notes: 1. To ensure safe operation of equipment, we recommend that you use a speed sensor to detect the over running clutch speed, excessive speed may damage the clutch. 2. For encoder and speed sensor related issues, please consult us.

2. Installation Environment

No.	Parameter	Data
20	Ambient Temperature	˚C
21*	Installation Altitude (above sea level)	metre
22	Operating Environment	☐ Normal ☐ Dusty ☐ Presence of corrosive gases & liquids, etc ☐ Others （ ）
23	Power Source Information	（ ）V （ ）Hz （ ）Phase
	Level of Protection	IP（ ）
	Explosion-proof requirement	☐ Required ☐ Not Required
24	Acceptable Cooling Method	Fan Cooling: ☐ Allow ☐ Disallow Air Cooling for Oil Cooler unit: ☐ Allow ☐ Disallow Water Cooling for Oil Cooler unit: ☐ Allow ☐ Disallow
	Whether Cooling Water is available	☐ Yes ☐ No
	Cooling Water Temperature	˚C

Miscellaneous

Warranty

Warranty Period	The warranty period for the Products shall be 18 months after the commencement of delivery or 18 months after the shipment of the Products from the seller's works or 12 months from the Products coming into operation, whether comes first.
Warranty Condition	In the event that any problem or damage to the Product arises during the "Warranty Period" from defects in the Product whenever the Product is properly installed and combined with the Buyer's equipment or machines, maintained as specified in the maintenance manual, and properly operated under the conditions described in the catalog or as otherwise agree upon in writing between the Seller and the Buyer or its customers; the Seller will provide, at its sole discretion, appropriate repair or replacement of the Product, without charge, at a designated facility, except as stipulated in the "Warranty Exclusions" described below. However, if the Product is installed or integrated into the Buyer's equipment or machines, the Seller shall not reimburse the cost of: removal or re-installation of the Product or other incidental costs related thereto, any lost opportunity, any profit loss or other incidental or consequential losses or damages incurred by the Buyer or its customers.
Warranty Exclusions	Not withstanding the above warranty, the warranty as set forth herein shall not apply to any problem or damage to the Product that is caused by : 1. installation, connection, combination or integration of the Product in or to the other equipment or machine that is rendered by any person or entity other than the Seller ; 2. insufficient maintenance or improper operation by the Buyer or its customers, such that the Product is not maintained in accordance with the maintenance manual provided or designated by the Seller ; 3. improper use or operation of the Product by the Buyer or its customers that is not informed to the Seller, including, without limitation, the Buyer's or its customers' operation of the Product not in conformity with the specifications, or use of lubricating oil in the Product that is not recommended by the Seller ; 4. any problem or damage to any equipment or machine to which the Product is installed, connected or combined, or on any specifications particular to the Buyer or its customers ; 5. any changes, modifications, improvements or alterations to the Product or those functions that are rendered on the Product by any person or entity other than the Seller ; 6. any parts in the Product that are supplied or designated by the Buyer or its customers ; 7. earthquake, fire, flood, sea-breeze, gas, thunder, acts of God or any other reasons beyond the control of the Seller ; 8. normal wear and tear, or deterioration of the Product's parts, such as bearings, oil-seals ; 9. any other troubles, problems or damage to the Product that are not attributable to the Seller.

Safety Precautions

⚠ SAFETY PRECAUTIONS

■ Strictly observe the safety rules for the installation place and the equipment to use. (Industrial Safety and Health Law, Technical Standard for Electric Facilities, Extension Rules, Plant Explosion Guidelines, Building Standards Law, etc.)

■ Carefully read the maintenance manual before use. If the maintenance manual is not on hand, make a request for one to the distributor from which you purchased the product or to our sales department. The maintenance manual should be sent to the actual user.

■ Select an appropriate product that matches the operating environment and usage.

■ Install protective equipment on the machine side when the machine is used for transportation of passengers or for elevators, escalators, and dumbwaiters.

■ Use an explosion-proof type motor in an explosive environment.
Select an explosion-proof type motor whose specifications is best suited to the danger zone.

■ When a 400V-class inverter is used for driving the motor, mount a control filter or reactor on the inverter side or use a sufficiently insulated motor.

■ When the machine is used for food processing equipment and others that are susceptible to oil, install an oil pan or other damage preventive devices in case of oil leakage or termination of service life.

When driving a 400V-class general-purpose motor by an inverter

■ Contact us in cases where a standard motor is driven by an inverter. The withstand voltage of the motor may have to be taken into consideration when a high carrier frequency type (IGBT, for example) inverter that has high input voltage (400V or more) is used or when the wiring distance is long.

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