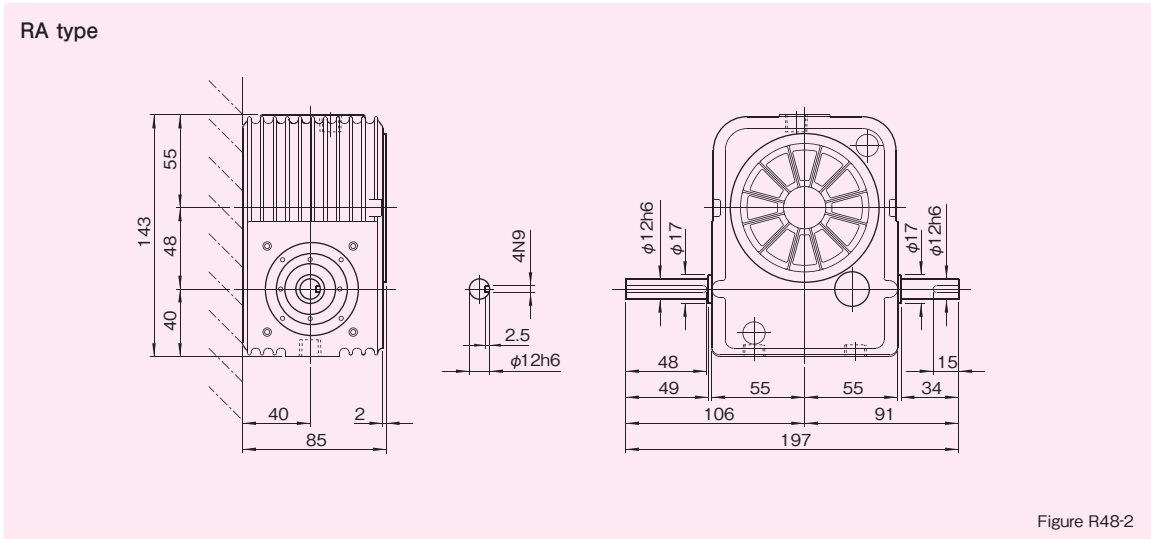
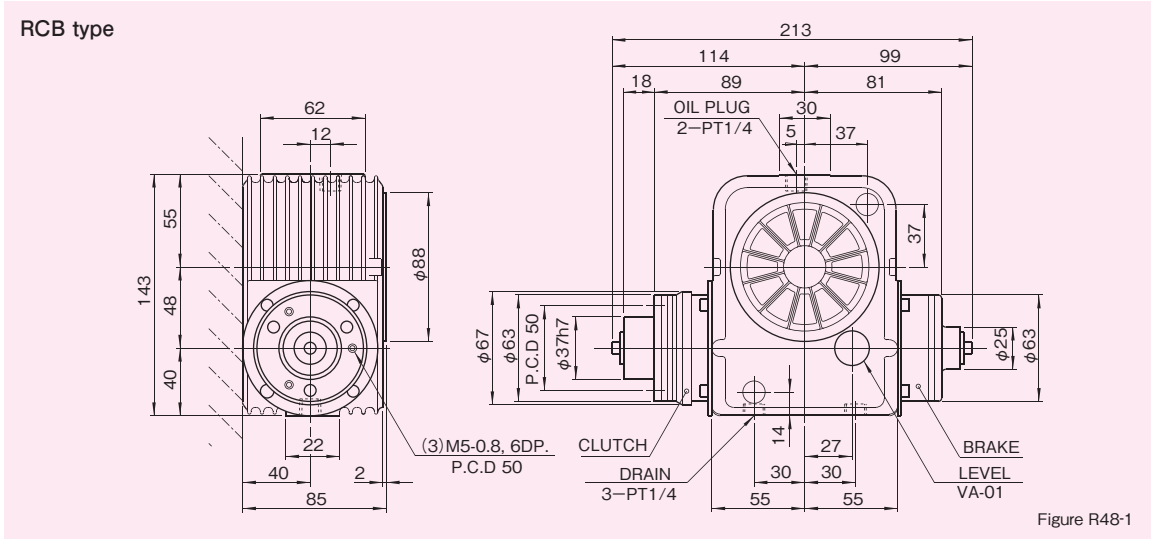


Reducer R48

R48 Dimensions



To find the dimensions for the clutch only RC type or the brake only RB type, compare figures R48-1 and R48-2.

R48 Specifications

Table R48-1

Item	Symbol	Unit	R48
Reducer specifications (R48)			
Maximum speed	Nw	rpm	1800
Wheel inertia	C ₂	kg·m ²	8.05×10 ⁻⁴
Wormshaft inertia	C ₃	kg·m ²	3.1×10 ⁻⁵
Backlash on wheel shaft	b	degree	(0.2)
Wormshaft frictional torque	T _{xw}	N·m	(0.45)
Product Weight		kg	3
Clutch specifications (size 06)			
Static frictional torque	T _{sc}	N·m	5.5
Dynamic frictional torque	T _{dc}	N·m	5
Stator and rotor weight	W _{sc}	kg	0.4
Armature weight	W _{ac}	kg	0.06
Rotor inertia	C ₄	kg·m ²	7.35×10 ⁻⁵
Armature inertia	C ₅	kg·m ²	4.23×10 ⁻⁵
Rated voltage		V	DC24
Minimum power		W	12
Brake specifications (size 06)			
Static frictional torque	T _{sb}	N·m	5.5
Dynamic frictional torque	T _{db}	N·m	5
Stator and rotor weight	W _{sb}	kg	0.22
Armature weight	W _{ab}	kg	0.06
Armature inertia	C ₆	kg·m ²	4.23×10 ⁻⁵
Rated voltage		V	DC24
Minimum power		W	12

Precautions

1. The values for T_{dc} and T_{db} (dynamic frictional torque) in the Table of Specifications apply for relative speeds of 100 rpm.

2. Equivalent inertia : J1

$$J1 = \frac{C1+C2}{i^2} + C3+C4+C6 \quad (1)$$

i Actual gear ratio

C1..... Inertia of input shaft (cam shaft)

Table of Input power ratings and Output torque

Table R48-2

Nominal gear ratio (Actual gear ratio i)	Input shaft rotating speed rpm	Output shaft rotating speed rpm	Nominal input power rating N _{IN} kw	Allowable continuous output torque T _{2N} N·m	Allowable maximum output torque T _{2max} N·m
10 (10)	1800	180	0.52	24.5	37.24
	1500	150	0.51	28.42	44.1
	1000	100	0.39	32.34	49.98
	750	75	0.33	35.28	53.9
	500	50	0.26	42.14	64.68
	300	30	0.19	49.0	75.46
20 (20)	1800	90	0.25	21.56	33.32
	1500	75	0.23	23.52	36.26
	1000	50	0.18	26.46	40.18
	750	37.5	0.15	28.42	44.1
	500	25	0.12	33.32	50.96
	300	15	0.08	37.24	57.82
30 (30)	1800	60	0.18	20.58	31.36
	1500	50	0.16	21.56	33.32
	1000	33.3	0.13	25.48	39.2
	750	25	0.12	28.42	44.1
	500	16.7	0.09	31.36	49.0
	300	10	0.06	35.28	54.88
50 (50)	1800	36	0.1	15.68	24.5
	1500	30	0.09	16.66	25.48
	1000	20	0.08	19.6	30.38
	750	15	0.06	20.58	31.36
	500	10	0.05	23.52	36.26
	300	6	0.04	26.46	41.16
	150	3	0.03	31.36	49.0

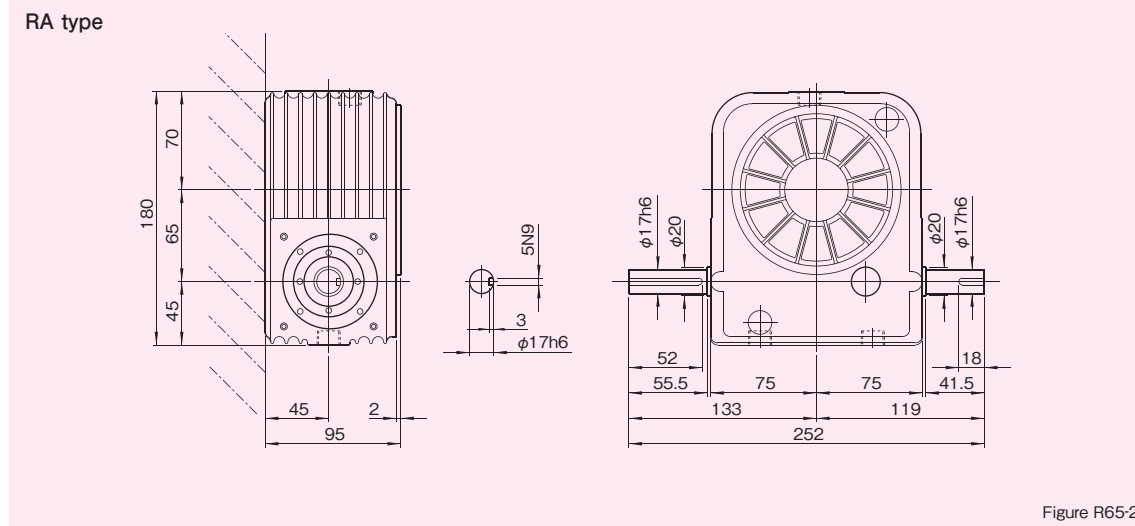
(1N≒0.102kgf)

Locations of oil plug, etc., and oil capacity

Figure R48-3

Mount	Worm shaft on top	Worm shaft positioned upright	Worm shaft on bottom
Location			
Oil capacity (ℓ)	0.23	0.30	0.20

R65 Dimensions



To find the dimensions for the clutch only RC type or the brake only RB type, compare figures R65-1 and R65-2.

Locations of oil plug, etc., and oil capacity

Mount	Worm shaft on top	Worm shaft positioned upright	Worm shaft on bottom
Location			
Oil capacity (ℓ)	0.41	0.59	0.27

Figure R65-3

R65 Specifications

Table R65-1

Item	Symbol	Unit	R65
Reducer specifications (R65)			
Maximum speed	Nw	rpm	1800
Wheel inertia	C ₂	kg·m ²	2.43×10 ⁻³
Wormshaft inertia	C ₃	kg·m ²	9.0×10 ⁻⁵
Backlash on wheel shaft	b	degree	(0.12)
Wormshaft frictional torque	T _{xw}	N·m	(0.6)
Product Weight		kg	10
Clutch specifications (size 08)			
Static frictional torque	T _{sc}	N·m	11
Dynamic frictional torque	T _{dc}	N·m	1.0
Stator and rotor weight	W _{sc}	kg	0.725
Armature weight	W _{ac}	kg	0.1
Rotor inertia	C ₄	kg·m ²	2.24×10 ⁻⁴
Armature inertia	C ₅	kg·m ²	1.18×10 ⁻⁴
Rated voltage		V	DC24
Minimum power		W	15
Brake specifications (size 08)			
Static frictional torque	T _{sb}	N·m	11
Dynamic frictional torque	T _{db}	N·m	10
Stator and rotor weight	W _{sb}	kg	0.4
Armature weight	W _{ab}	kg	0.1
Armature inertia	C ₆	kg·m ²	1.18×10 ⁻⁴
Fan inertia	C ₇	kg·m ²	9.65×10 ⁻⁵
Rated voltage		V	DC24
Minimum power		W	15

Precautions

1. The values for Tdc and Tdb (dynamic frictional torque) in the Table of Specifications apply for relative speeds of 100 rpm.

2. Equivalent inertia : J1

$$J1 = \frac{C1+C2}{i^2} + C3+C4+C6+C7 \quad (1)$$

i Actual gear ratio

C1..... Inertia of input shaft (cam shaft)

Table of Input power ratings and Output torque Table R65-2

Nominal gear ratio (Actual gear ratio _i)	Input shaft rotating speed rpm	Output shaft rotating speed rpm	Nominal input power rating N _{in} kw	Allowable continuous output torque T _{2N} N·m	Allowable maximum output torque T _{2max} N·m
5 (5.2)	1800	346	3.55	85.75	210.7
	1500	288	3.05	94.08	230.3
	1000	192	2.35	107.8	279.3
	750	144	2	122.5	318.5
	500	96.2	1.7	151.9	362.6
	300	57.7	1.35	200.9	411.6
	150	28.8	1.05	303.8	460.6
	60	11.5	0.57	396.9	509.6
10	1.92	0.105	406.7	539.0	
10 (10.33)	1800	174	2.1	102.9	225.4
	1500	145	1.9	112.7	245.0
	1000	96.8	1.45	127.4	289.1
	750	72.6	1.25	147.0	323.4
	500	48.4	1.05	181.3	362.6
	300	29	0.88	240.1	401.8
	150	14.5	0.65	347.9	445.9
	60	5.81	0.285	362.6	485.1
10	0.968	0.054	377.3	519.4	
20 (20.5)	1800	87.8	1.4	132.3	245.0
	1500	73.2	1.3	147.0	259.7
	1000	48.8	1	166.6	303.8
	750	36.6	0.88	191.1	328.3
	500	24.4	0.76	240.1	367.5
	300	14.6	0.54	274.4	396.9
	150	7.32	0.31	298.9	416.5
	60	2.93	0.145	333.2	431.2
10	0.488	0.029	352.8	441.0	
31.5 (31)	1800	58.1	0.865	112.7	249.9
	1500	48.4	0.79	122.5	269.5
	1000	32.3	0.64	137.2	318.5
	750	24.2	0.55	156.8	347.9
	500	16.1	0.46	191.1	392.0
	300	9.68	0.4	259.7	441.0
	150	4.84	0.325	396.9	490.0
	60	1.94	0.15	416.5	519.4
10	0.323	0.03	431.2	539.0	
40 (41)	1800	43.9	0.8	132.3	249.9
	1500	36.6	0.74	147.0	269.5
	1000	24.4	0.59	171.5	318.5
	750	18.3	0.53	205.8	343.0
	500	12.2	0.45	240.1	382.2
	300	7.32	0.345	294.0	411.6
	150	3.66	0.21	323.4	421.4
	60	1.46	0.096	347.9	431.2
10	0.244	0.02	372.4	441.0	
50 (51)	1800	35.3	0.695	137.2	225.4
	1500	29.4	0.64	147.0	240.1
	1000	19.6	0.51	171.5	274.4
	750	14.7	0.45	191.1	298.9
	500	9.8	0.38	230.3	328.3
	300	5.88	0.295	289.1	343.0
	150	2.94	0.175	308.7	362.6
	60	1.18	0.078	323.4	377.3
10	0.196	0.016	338.1	387.1	

 $(1\text{N}\doteq 0.102\text{kgf})$

Reducer R100

R100 Dimensions

RCB type

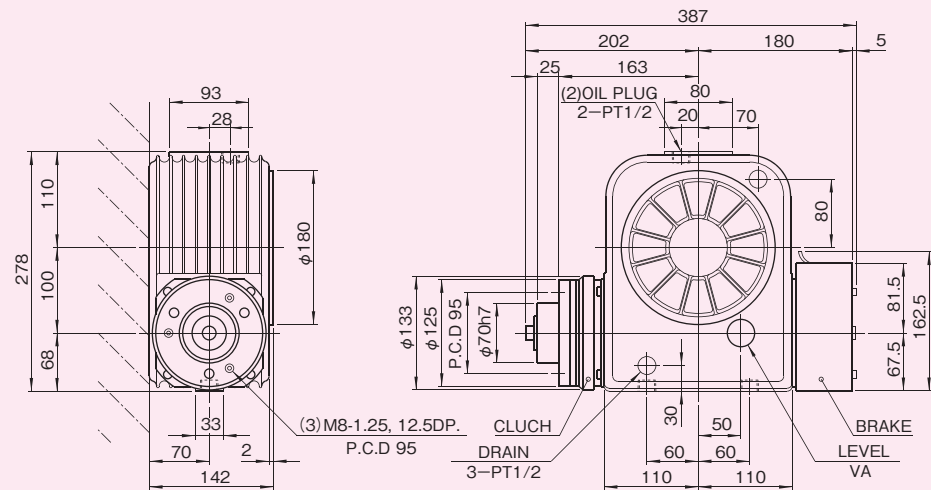


Figure R100-1

RA type

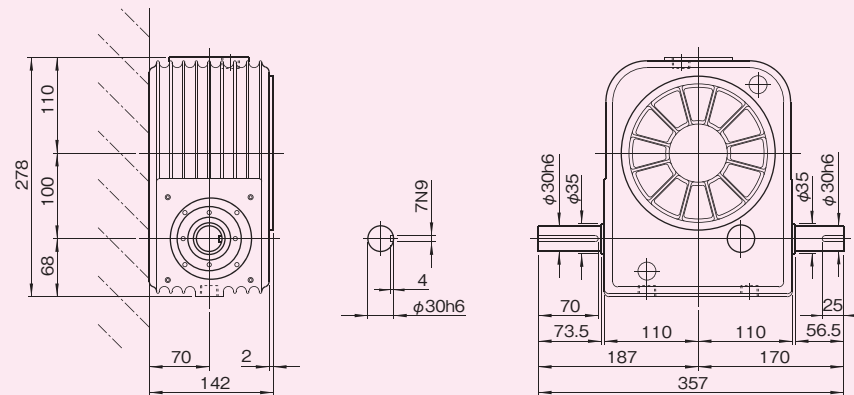


Figure R100-2

To find the dimensions for the clutch only RC type or the brake only RB type, compare figures R100-1 and R100-2.

Locations of oil plug, etc., and oil capacity

Figure R100-3

Mount	Worm shaft on top	Worm shaft positioned upright	Worm shaft on bottom
Location			
Oil capacity (ℓ)	1.34	1.73	0.80

R100 Specifications

Table R100-1

Item	Symbol	Unit	R100
Reducer specifications (R100)			
Maximum speed	Nw	rpm	1800
Wheel inertia	C ₂	kg·m ²	1.73×10 ⁻²
Wormshaft inertia	C ₃	kg·m ²	6.68×10 ⁻⁴
Backlash on wheel shaft	b	degree	(0.09)
Wormshaft frictional torque	T _{xw}	N·m	(1.5)
Product Weight		kg	30
Clutch specifications (size 12)			
Static frictional torque	T _{sc}	N·m	45
Dynamic frictional torque	T _{dc}	N·m	40
Stator and rotor weight	W _{sc}	kg	2.3
Armature weight	W _{ac}	kg	0.46
Rotor inertia	C ₄	kg·m ²	2.14×10 ⁻³
Armature inertia	C ₅	kg·m ²	1.31×10 ⁻³
Rated voltage		V	DC24
Minimum power		W	25
Brake specifications (size 12)			
Static frictional torque	T _{sb}	N·m	45
Dynamic frictional torque	T _{db}	N·m	40
Stator and rotor weight	W _{sb}	kg	1.22
Armature weight	W _{ab}	kg	0.46
Armature inertia	C ₆	kg·m ²	1.31×10 ⁻³
Fan inertia	C ₇	kg·m ²	8.35×10 ⁻⁴
Rated voltage		V	DC24
Minimum power		W	25

Precautions

1. The values for T_{dc} and T_{db} (dynamic frictional torque) in the Table of Specifications apply for relative speeds of 100 rpm.

2. Equivalent inertia : J1

$$J1 = \frac{C1 + C2}{i^2} + C3 + C4 + C6 + C7 \quad (1)$$

i Actual gear ratio

C1..... Inertia of input shaft (cam shaft)

Table of Input power ratings and Output torque Table R100-2

Nominal gear ratio (Actual gear ratio i)	Input shaft rotating speed rpm	Output shaft rotating speed rpm	Nominal input power rating N _{IN} kw	Allowable continuous output torque T _{2N} N·m	Allowable maximum output torque T _{2max} N·m
5 (4.8)	1800	375	14.6	346.92	710.5
	1500	313	12.9	367.5	774.2
	1000	208	10.4	441.0	960.4
	750	156	8.0	457.66	1078.0
	500	104	5.7	490.0	1274.0
	300	62.5	4.1	563.5	1470.0
	150	31.5	2.8	759.5	1715.0
	60	12.5	1.7	1102.5	1911.0
	10	2.08	0.3	1183.84	2009.0
	10	2.08	0.3	1183.84	2009.0
10 (10.33)	1800	174	7.5	371.42	735.0
	1500	145	6.8	408.66	803.6
	1000	96.8	6.0	539.0	980.0
	750	72.6	5.1	595.84	1127.0
	500	48.4	3.7	644.84	1274.0
	300	29	2.7	751.66	1470.0
	150	14.5	1.7	980.0	1715.0
	60	5.81	0.8	1021.16	1813.0
	10	0.968	0.1	1061.34	1813.0
	10	0.968	0.1	1061.34	1813.0
20 (20.5)	1800	87.8	4.2	403.76	754.6
	1500	73.2	4.0	448.84	823.2
	1000	48.8	3.7	571.34	980.0
	750	36.6	3.0	661.5	1127.0
	500	24.4	2.1	693.84	1225.0
	300	14.6	1.4	735.0	1274.0
	150	7.32	0.9	857.5	1372.0
	60	2.93	0.4	898.66	1470.0
	10	0.488	0.07	980.0	1519.0
	10	0.488	0.07	980.0	1519.0
31.5 (31)	1800	58.1	3.7	497.84	808.5
	1500	48.4	3.3	531.16	882.0
	1000	32.3	2.7	629.16	1078.0
	750	24.2	2.1	644.84	1225.0
	500	16.1	1.6	686.0	1372.0
	300	9.68	1.2	800.66	1617.0
	150	4.84	0.8	1102.5	1813.0
	60	1.94	0.4	1183.84	1862.0
	10	0.323	0.07	1225.0	1862.0
	10	0.323	0.07	1225.0	1862.0
40 (41)	1800	43.9	2.7	465.5	803.6
	1500	36.6	2.5	506.66	862.4
	1000	24.4	2.1	644.84	1029.0
	750	18.3	1.8	710.5	1127.0
	500	12.2	1.3	751.66	1274.0
	300	7.32	0.9	791.84	1372.0
	150	3.66	0.6	938.84	1421.0
	60	1.46	0.3	1021.16	1470.0
	10	0.244	0.05	1061.34	1519.0
	10	0.244	0.05	1061.34	1519.0
50 (51)	1800	36	2.1	428.26	705.6
	1500	30	1.9	465.5	764.4
	1000	20	1.7	588.0	921.2
	750	15	1.4	620.34	1029.0
	500	10	1.0	644.84	1127.0
	300	6	0.7	727.16	1176.0
	150	3	0.4	816.34	1225.0
	60	1.2	0.2	898.66	1274.0
	10	0.2	0.04	938.84	1323.0
	10	0.2	0.04	938.84	1323.0

(1N=0.102kgf)

Reducer R125

R125 Dimensions

RCB type

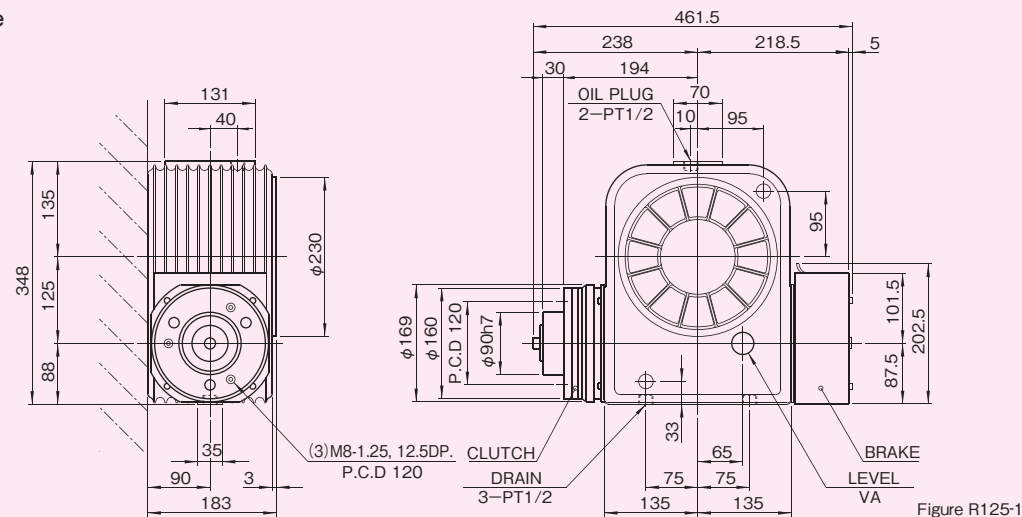


Figure R125-1

RA type

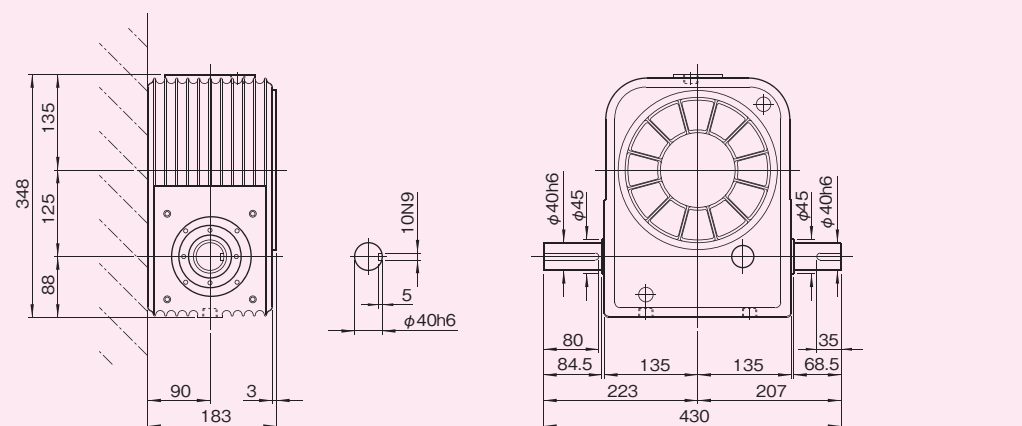
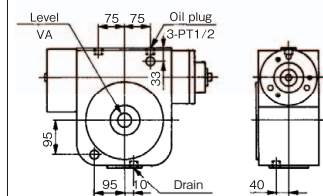
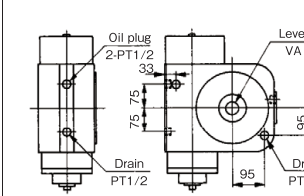
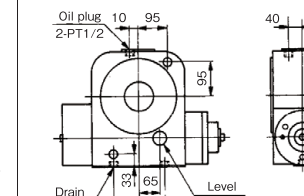


Figure R125-2

To find the dimensions for the clutch only RC type or the brake only RB type, compare figures R125-1 and R125-2.

Locations of oil plug, etc., and oil capacity

Figure R125-3

Mount	Worm shaft on top	Worm shaft positioned upright	Worm shaft on bottom
Location			
Oil capacity (ℓ)	2.66	3.50	1.79

R125 Specifications

Table R125-1

Item	Symbol	Unit	R125
Reducer specifications (R125)			
Maximum speed	Nw	rpm	1800
Wheel inertia	C ₂	kg·m ²	5.5×10 ⁻²
Wormshaft inertia	C ₃	kg·m ²	2.09×10 ⁻³
Backlash on wheel shaft	b	degree	(0.08)
Wormshaft frictional torque	T _{xw}	N·m	(2.2)
Product Weight		kg	45
Clutch specifications (size 16)			
Static frictional torque	T _{sc}	N·m	90
Dynamic frictional torque	T _{dc}	N·m	80
Stator and rotor weight	W _{sc}	kg	4.2
Armature weight	W _{ac}	kg	0.9
Rotor inertia	C ₄	kg·m ²	6.3×10 ⁻³
Armature inertia	C ₅	kg·m ²	4.8×10 ⁻³
Rated voltage		V	DC24
Minimum power		W	35
Brake specifications (size 16)			
Static frictional torque	T _{sb}	N·m	90
Dynamic frictional torque	T _{db}	N·m	80
Stator and rotor weight	W _{sb}	kg	2.25
Armature weight	W _{ab}	kg	0.9
Armature inertia	C ₆	kg·m ²	4.8×10 ⁻³
Fan inertia	C ₇	kg·m ²	2.5×10 ⁻³
Rated voltage		V	DC24
Minimum power		W	35

Precautions

- The values for T_{dc} and T_{db} (dynamic frictional torque) in the Table of Specifications apply for relative speeds of 100 rpm.

- Equivalent inertia : J1

$$J1 = \frac{C1+C2}{i^2} + C3+C4+C6+C7 \quad (1)$$

i Actual gear ratio

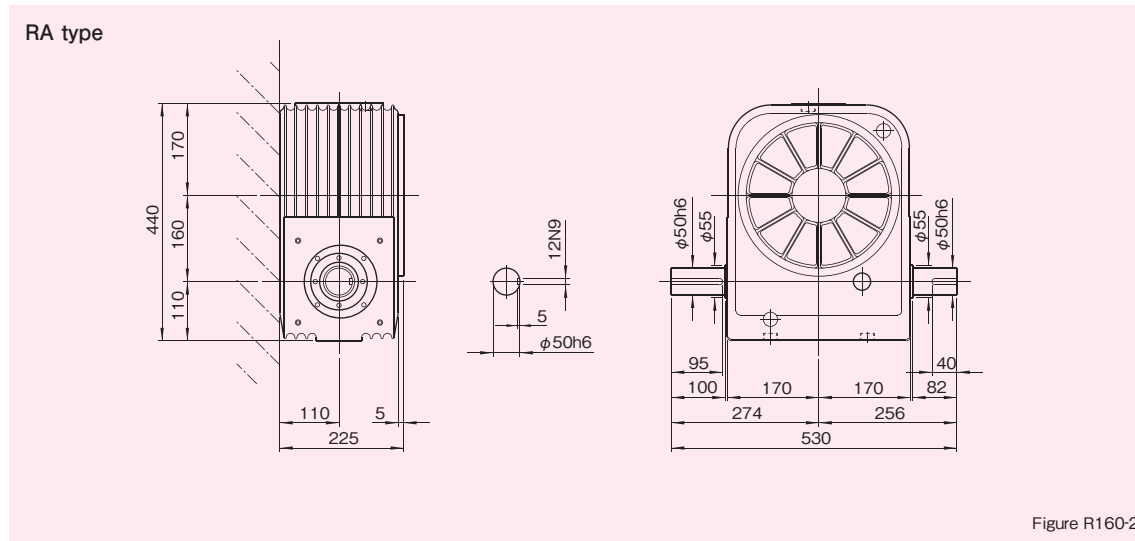
C1..... Inertia of input shaft (cam shaft)

Table of Input power ratings and Output torque Table R125-2

Nominal gear ratio (Actual gear ratio i)	Input shaft rotating speed rpm	Output shaft rotating speed rpm	Nominal input power rating N _{IN} kw	Allowable continuous output torque T _{2N} N·m	Allowable maximum output torque T _{2max} N·m
5 (4.8)	1800	375	23.3	555.66	1176.0
	1500	313	20.8	595.84	1323.0
	1000	208	17.5	750.68	1666.0
	750	156	13.7	767.34	1911.0
	500	104	9.6	808.5	2303.0
10 (10.33)	300	62.5	6.7	938.84	2744.0
	150	31.5	4.6	1271.06	3234.0
	60	12.5	3.1	2041.34	3724.0
	10	2.08	0.6	2205.0	4018.0
	1800	174	12.5	629.16	1274.0
20 (20.5)	1500	145	11.7	693.84	1421.0
	1000	96.8	10.4	938.84	1764.0
	750	72.6	8.7	1021.16	2009.0
	500	48.4	6.2	1102.5	2352.0
	300	29	4.4	1266.16	2744.0
31.5 (31)	150	14.5	3.0	1673.84	3185.0
	60	5.81	1.5	1960.0	3675.0
	10	0.968	0.3	2041.34	3675.0
	1800	87.8	7.2	697.76	1323.0
	1500	73.2	6.8	791.84	1470.0
40 (41)	1000	48.8	6.0	1021.16	1813.0
	750	36.6	5.4	1102.5	2009.0
	500	24.4	4.0	1347.5	2352.0
	300	14.6	2.6	1388.66	2548.0
	150	7.32	1.5	1551.34	2744.0
50 (51)	60	2.93	0.8	1837.5	2940.0
	10	0.488	0.1	1918.84	2989.0
	1800	60	6.4	816.34	1421.0
	1500	50	5.7	898.66	1568.0
	1000	33.3	4.6	1061.34	1911.0
50 (51)	750	25	3.6	1102.5	2205.0
	500	16.7	2.7	1143.66	2548.0
	300	10	2.0	1347.5	2989.0
	150	5	1.4	1756.16	3528.0
	60	2	0.8	2246.16	3724.0
50 (51)	10	0.333	0.2	2450.0	3773.0
	1800	43.9	4.6	812.42	1421.0
	1500	36.6	4.2	898.66	1568.0
	1000	24.4	3.7	1143.66	1862.0
	750	18.3	3.2	1306.34	2107.0
50 (51)	500	12.2	2.4	1388.66	2450.0
	300	7.32	1.7	1511.16	2744.0
	150	3.66	1.0	1715.0	2891.0
	60	1.46	0.5	2001.16	2989.0
	10	0.244	0.1	2082.5	3038.0
50 (51)	1800	36	3.5	731.08	1225.0
	1500	30	3.2	808.5	1372.0
	1000	20	2.8	1026.06	1666.0
	750	15	2.5	1183.84	1911.0
	500	10	1.8	1225.0	2156.0
50 (51)	300	6	1.2	1347.5	2303.0
	150	3	0.8	1551.34	2450.0
	60	1.2	0.4	1756.16	2597.0
	10	0.2	0.07	1796.34	2646.0

(1N=0.102kgf)

R160 Dimensions



To find the dimensions for the clutch only RC type or the brake only RB type, compare figures R160-1 and R160-2.

Locations of oil plug, etc., and oil capacity

Mount	Worm shaft on top	Worm shaft positioned upright	Worm shaft on bottom
Location			
Oil capacity (ℓ)	4.85	6.46	3.46

R160 Specifications

Table R160-1

Item	Symbol	Unit	R160
Reducer specifications (R160)			
Maximum speed	Nw	rpm	1800
Wheel inertia	C ₂	kg·m ²	0.22
Wormshaft inertia	C ₃	kg·m ²	6.05×10 ⁻³
Backlash on wheel shaft	b	degree	(0.07)
Wormshaft frictional torque	T _{xw}	N·m	(3.0)
Product Weight		kg	100
Clutch specifications (size 20)			
Static frictional torque	T _{sc}	N·m	175
Dynamic frictional torque	T _{dc}	N·m	160
Stator and rotor weight	W _{sc}	kg	7.5
Armature weight	W _{ac}	kg	1.8
Rotor inertia	C ₄	kg·m ²	1.93×10 ⁻²
Armature inertia	C ₅	kg·m ²	1.37×10 ⁻²
Rated voltage		V	DC24
Minimum power		W	45
Brake specifications (size 20)			
Static frictional torque	T _{sb}	N·m	175
Dynamic frictional torque	T _{db}	N·m	160
Stator and rotor weight	W _{sb}	kg	4.1
Armature weight	W _{ab}	kg	1.8
Armature inertia	C ₆	kg·m ²	1.37×10 ⁻²
Fan inertia	C ₇	kg·m ²	9.25×10 ⁻³
Rated voltage		V	DC24
Minimum power		W	45

Precautions

1. The values for Tdc and Tdb (dynamic frictional torque) in the Table of Specifications apply for relative speeds of 100 rpm.

2. Equivalent inertia : J_1

$$J_1 = \frac{C_1 + C_2}{j^2} + C_3 + C_4 + C_6 + C_7 \quad (1)$$

i Actual gear ratio

C1..... Inertia of input shaft (cam shaft)

Table of Input power ratings and Output torque Table R160-2

Nominal gear ratio (Actual gear ratio _i)	Input shaft rotating speed rpm	Output shaft rotating speed rpm	Nominal input power rating N _{in} kw	Allowable continuous output torque T _{2N} N·m	Allowable maximum output torque T _{2max} N·m
5 (4.8)	1800	375	41.6	980.0	1871.8
	1500	313	36.6	1058.4	2077.6
	1000	208	29.5	1264.2	2646.0
	750	156	23.3	1303.4	3057.6
	500	104	16.2	1381.8	3675.0
	300	62.5	11.2	1548.4	4488.4
	150	31.5	7.5	2116.8	5301.8
	60	12.5	4.8	3224.2	5635.0
10 (10.33)	1800	174	22.5	1097.6	1999.2
	1500	145	20.4	1225.0	2205.0
	1000	96.8	18.3	1626.8	2773.4
	750	72.6	14.5	1715.0	3185.0
	500	48.4	10.4	1871.8	3792.6
	300	29	7.3	2116.8	4566.8
	150	14.5	4.9	2773.4	5468.4
	60	5.81	2.7	3626.0	5958.4
20 (20.5)	1800	87.8	12.9	1264.2	2156.0
	1500	73.2	12.0	1421.0	2361.8
	1000	48.8	10.8	1832.6	2940.0
	750	36.6	9.5	2116.8	3302.6
	500	24.4	6.8	2283.4	3831.8
	300	14.6	4.9	2646.0	4165.0
	150	7.32	2.9	3018.4	4488.4
	60	2.93	1.4	3547.6	4733.4
31.5 (31)	1800	58.1	11.25	1548.4	2322.6
	1500	48.4	10	1626.8	2528.4
	1000	32.3	7.5	1832.6	3096.8
	750	24.2	6	1991.0	3508.4
	500	16.1	4.4	1999.2	4243.4
	300	9.68	3.1	2283.4	5056.8
	150	4.84	2.2	3018.4	5958.4
	60	1.94	1.3	4243.4	6281.8
40 (41)	1800	43.9	8.3	1509.2	2205.0
	1500	36.6	7.5	1626.8	2450.0
	1000	24.4	6.7	2116.8	3057.6
	750	18.3	5.4	2205.0	3508.4
	500	12.2	4	2361.8	4076.8
	300	7.32	3	2812.6	4566.8
	150	3.66	1.8	3263.4	4655.0
	60	1.46	0.9	3792.6	4900.0
50 (51)	1800	36	6.1	1347.5	2038.4
	1500	30	5.8	1470.0	2244.2
	1000	20	5.1	1911.0	2773.4
	750	15	4.6	2244.2	3136.0
	500	10	3.4	2401.0	3586.8
	300	6	2.3	2695.0	3831.8
	150	3	1.5	3057.6	4076.8
	60	1.2	0.73	3430.0	4243.4
50 (51)	10	0.2	0.15	3547.6	4321.8

 $(1\text{N} \doteq 0.102\text{kgf})$