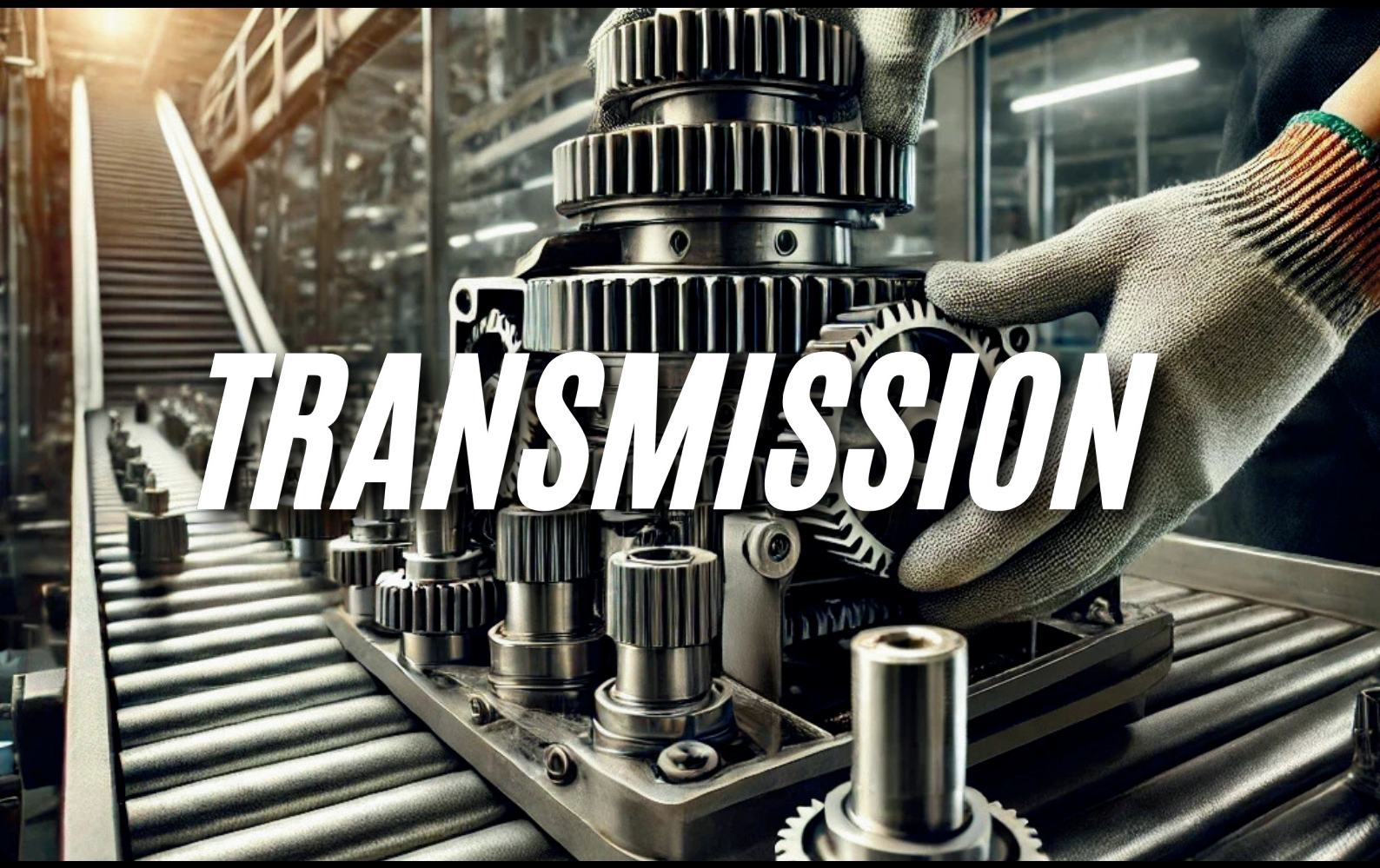
SAS
Synergy Asia Solution

Small AC Gear Motor
CH/CV Series



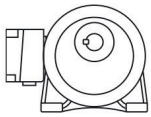
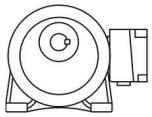
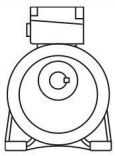
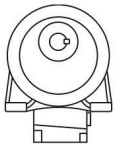
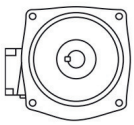
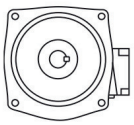
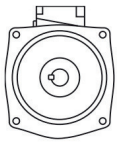
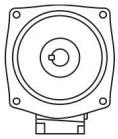
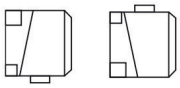
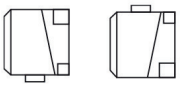
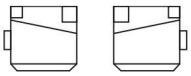
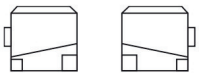
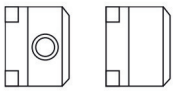
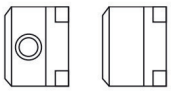
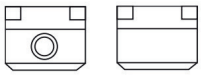
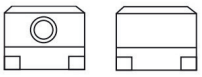
DRIVE TO THE FUTURE

Description On Gear Motor Models

CH	22	-	200	-	100	SZ	B	-	G1	-	LB	-	T1
(1)	(2)		(3)		(4)	(5)	(6)		(7)		(8)		(9)

(1) Frame type	CH: Horizontal, CV: Vertical
(2) Output shaft diameter	18, 22, 28, 32, 40, 50
(3) Motor power (Horsepower)	1/8HP=0.1kW, 1/4HP= 0.2kW, 1/2HP=0.4kW, 1HP=0.75kW, 2HP=1500W, 3HP= 2200W, 5HP=3700W
(4) Reduction ratio	100 refers to 1:100
(5) Motor type	A: Single-phase 110V, C: single phase 220V, S: 3 phases 220V, S2: 3 phases 220V/380V interchangeable, S3: 3 phases 380V, AV: Single-phase centrifugal motor, L: DC motor, C: Special, Z: Reduced frame type, F: Flange trimming, ZQ3: 380V axial flow enforced fan (standard), ZQ2: Single-phase 220V axial flow enforced fan, DQ2: Single-phase 220V electric fan
(6) Brake type	B: DC 90V power-off brake, YB: Hand release brake, DB: DC24V powered brake
(7) Please refer to output shaft for direction of terminal box	G1: Left (standard), G2: Right, G3: Up, G4: Down
(8) Direction of outlet wire	T: Up, D: Down, F: Forward, B: Backward, L: Left, R: Right
(9) Air vent type	T0: No air vent available, please refer to page 65 for details on T1, T2, T3, T4, T5, T6 air vent types

Junction Box Direction Selection

Item	G1-Left	G2-Right	G3-Up	G4-Down
CH Type				
CV Type				
Terminal box: outlet wire direction when facing motor output shaft				
				

Model Description

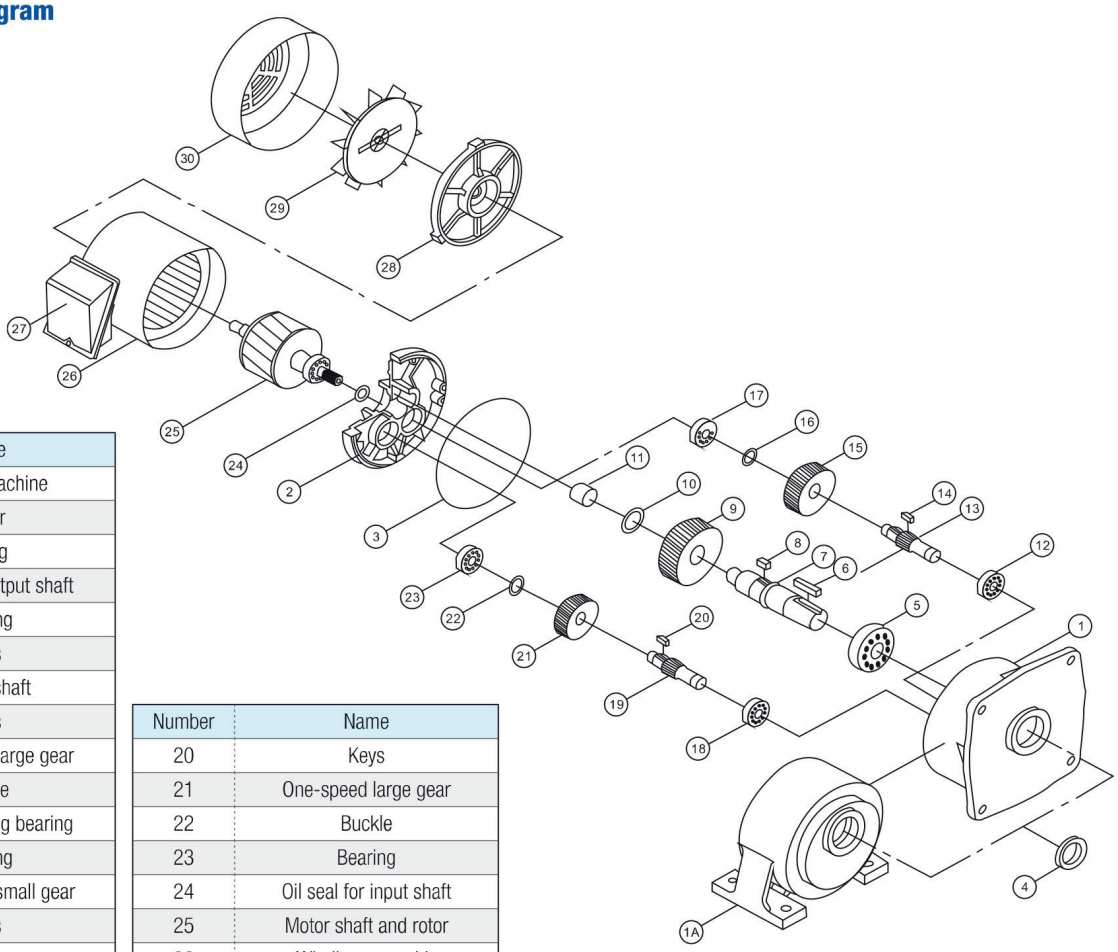
Horizontal

Vertical

Horizontal with brake

Vertical with brake

Product Structure Diagram



Number	Name
1	Body of machine
2	Cover
3	O-ring
4	Oil seal for output shaft
5	Bearing
6	Keys
7	Output shaft
8	Keys
9	Three-speed large gear
10	Buckle
11	Self-lubricating bearing
12	Bearing
13	Three-speed small gear
14	Keys
15	Two-speed large gear
16	Buckle
17	Bearing
18	Bearing
19	Two-speed small gear

Number	Name
20	Keys
21	One-speed large gear
22	Buckle
23	Bearing
24	Oil seal for input shaft
25	Motor shaft and rotor
26	Winding assembly
27	Terminal box
28	Rear cover of motor
29	Fan
30	Fan cover

Use and Installation of Gearbox

Pre-use inspection

- Check if the type, model, horsepower, shaft direction, reduction ratio, gyration direction, and turnover number of the input shaft and output shaft are compliant.
- Keep an eye on the oil and make sure there is oil and the oil level covers at least half of the oil area.

Venues

- It must be installed on a sturdy base.
- The installation area must be dry and well ventilated, the ambient temperature shall be -10°C~+50°C, and abnormal high temperature or low temperature must be indicated.

Connection method

- When the coupling is used to connect to the input or output shaft, it must be secured and parallel to both shafts; the base must be properly secured with appropriate bolts to make sure it is tight.
- All supporting devices must be lightly mounted on the shaft. Do not use a hammer, and avoid tight assembly as it may cause bearing damages.
- Pulley, sprocket or gear must be assembled as close to the bearing as possible to reduce bending stress. Use appropriate size (within 6 times of the output shaft diameter), and the wheel pulley connected to the output shaft must be used with H7 tolerance to avoid abnormal noise and damages.
- CH and CV inlet hole may be applied with appropriate lubricating oil to avoid excessive wear to and abnormal noise of the aperture.
- The shaft surface can be coated with anti-rust paint to prevent rust.

Motor

- When the changes to the power supply voltage exceed 10%, the motor may be burnt down, and it may cause reduced or abnormal output shaft torsion.
- The motor may be burnt out if overloaded.
- Incorrect motor wiring may cause the motor to burn out.
- Environment with excessive moisture may cause the motor brake to rust and cause braking failure.
- When used with a frequency converter, please use a special motor for frequency conversion if it is often used under low frequency.
- Please install a protection switch to the power supply line to minimize the chance of motor burnout.

Motor Characteristics

Item		Three-phase gear motor	Single-phase gear motor
Gearbox	Gear	All internal gears are precisely processed with special alloy steel and have gone through carburizing and quenching heat treatment.	
	Gearbox materials	Aluminium alloy die-casting (shaft diameter 18, 22, 28), cast iron (32, 40, 50)	
	Lubricating oil	The body of the machine has been added with high-grade lubricating oil before delivery, and no extra lubrication is required.	
Motor	Power supply	220/380V	110/220V
	Frequency	50/60Hz	50/60Hz
	Cooling method	Fully closed external fan	Fully closed external fan
	Starting method	Full pressure direct start	Continuous start, capacitor start
	Casing materials	High-grade aluminium alloy	
	Insulation grade	Class F insulation	
	Protection grade	Aluminium terminal box is IP54, steel terminal box is IP20	
Brake	Action mode	Non-activated magnetic brake (power-off brake)	
	Voltage	DC90-110V with AC220V, AC110V rectifier	
Standard environment	Temperature	-10°C~+40°C	
	Humidity	Below 90% (noncondensing)	
	Venue	Indoor, below 1000 meters above sea level	

Three-Phase Voltage and Full-Load Current Value

Output power	50Hz-4P			60Hz-4P		
	220V	380V	RPM	220V	380V	RPM
100W	0.60	0.40	1400	0.60	0.40	1700
200W	1.15	0.67	1400	1.10	0.63	1700
400W	2.13	1.24	1400	1.90	1.10	1700
750W	3.66	2.13	1410	3.40	1.96	1710
1500W	6.58	3.82	1410	6.10	3.53	1710
2200W	8.94	5.18	1430	8.70	5.03	1725
3700W	13.85	8.03	1440	13.5	7.81	1725

Single-Phase Voltage and Full-Load Current Value

Output power	50Hz-4P			60Hz-4P		
	110V	220V	PRM	110V	220V	PRM
100W	2.2	1.1	1400	2.0	1.0	1700
200W	4.0	2.0	1400	3.6	1.8	1700
400W	7.6	3.8	1420	6.6	3.3	1730

Specifications For Single-Phase Motor Capacitor

Output horsepower	Operating capacitance (message type)	Starting capacitance (centrifugal switch type)	Operating capacitance + starting capacitance (centrifugal switch type)
100W	10μf-350V	-	-
200W	16μf-350V	125μf-160V	-
400W	30μf-350V	200μf-160V	30μf-350V+200μf-160V

Output Shaft Diameter Table

Standard type

Reduction ratio	Horsepower						
	1/8HP(100W)	1/4HP(200W)	1/2HP(400W)	1HP(750W)	2HP(1500W)	3HP(2200W)	5HP(3700W)
3	18	18	22	28	32	40	40
5	18	18	22	28	32	40	40
10	18	18	22	28	32	40	40
15	18	22	28	28	32	40	50
20	18	22	28	28	32	40	50
25	18	22	28	28	32	40	50
30	18	22	28	32	32	40	50
40	18	22	28	32	40	40	50
45	18	22	28	32	40	50	50
50	18	22	28	32	40	50	50
60	18	22	28	32	40	50	50
70	22	22	28	32	40	50	
80	22	22	28	32	40	50	
90	22	22	28	32	40	50	
100	22	28	32	32	40	50	
120	22	28	32	32	50		
140	22	28	32	40	50		
150	22	28	32	40	50		
160	22	28	32	40	50		
180	22	28	32	40	50		
200	22	28	32	40			
250-1800	28	32	40	50			

Light load compact frame type

Reduction ratio	Horsepower						
	1/8HP(100W)	1/4HP(200W)	1/2HP(400W)	1HP(750W)	2HP(1500W)	3HP(2200W)	5HP(3700W)
3			18	22	28	32	
5			18	22	28	32	
10			18	22	28	32	
15		18	22	22	28		40
20		18	22	22	28		40
25		18	22	22	28		40
30		18	22	28	32		40
40		18	22	28	32		40
45		18	22	28	32		40
50		18	22	28	32	40	40
60		18	22	28	32	40	40
70	18	18	22	28	32	40	
80	18	18	22	28	32	40	
90	18	18	22	28	32		
100	18	22	28	28	32		
120	18	22	28	28	40		
140	18	22	28	32	40		
150	18	22	28	32	40		
160	18	22	28	32	40		
180	18	22	28	32	40		
200	18	22	28	32			
250-1800	22	28	32	40			

1. Compact frame type is an inappropriate design and shall not be used unless it is extremely required.
2. The motor is provided with a one-year warranty.

Output Torque Table

Standard type

kg·m

Reduction ratio	Output speed		Output torque													
			0.1kW		0.2kW		0.4kW		0.75kW		1.5kW		2.2kW		3.7kW	
	Hz															
	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60
3	500	600	0.19	0.16	0.37	0.31	0.70	0.60	1.30	1.10	2.60	2.20	3.80	3.20	6.00	5.50
5	300	360	0.31	0.26	0.62	0.52	1.20	1.00	2.20	1.90	4.50	3.80	6.72	5.60	11.0	10.0
10	150	180	0.62	0.52	1.24	1.04	2.40	2.00	4.50	3.80	9.10	7.60	13.7	11.2	22.0	20.0
15	100	120	0.91	0.76	1.80	1.50	3.60	3.00	6.80	5.70	13.5	11.3	20.1	16.8	32.6	29.8
20	75	90	1.20	1.00	2.40	2.00	4.80	4.00	9.00	7.50	18.1	15.1	26.8	22.4	43.6	36.0
25	60	72	1.40	1.20	3.00	2.50	6.00	5.00	11.2	9.40	22.6	18.9	33.6	28.0	53.9	49.53
30	50	60	1.80	1.50	3.60	3.00	7.20	6.00	13.5	11.3	27.1	22.6	40.3	33.6	64.7	58.8
40	37	45	2.20	1.90	4.60	3.90	9.30	7.80	17.5	14.6	34.9	29.1	52.0	43.4	86.3	78.4
45	33	40	2.70	2.20	5.40	4.40	10.9	9.10	20.6	17.0	41.1	34.0	59.8	49.6	98.5	81.7
50	30	36	2.80	2.40	5.70	4.80	11.6	9.70	21.9	18.3	43.6	36.4	65.1	54.3	107	97.0
60	25	30	3.40	2.90	6.90	5.80	13.9	11.6	26.2	21.9	52.4	43.7	78.1	65.1	127	115
70	21	25	4.30	3.60	8.00	6.80	16.2	13.5	31.5	26.3	62.4	52.0	92.5	77.1		
80	19	23	4.80	4.00	9.20	7.70	18.4	15.4	35.5	29.6	70.8	59.0	105	87.5		
90	17	20	5.20	4.40	10.30	8.60	20.7	17.3	39.3	32.8	77.1	64.3	113	94.3		
100	15	18	5.80	4.90	11.5	9.60	23.0	19.2	43.2	36.0	83.7	69.8	126	105		
120	12	15	6.90	5.80	13.8	11.5	27.7	23.1	51.8	43.2	101	83.7				
140	11	13	8.00	6.70	16.0	13.4	32.0	26.7	59.7	49.8	116	96.8				
160	9	11	9.10	7.60	18.3	15.3	36.3	30.3	68.0	56.7	132	110				
180	8	10	10.3	8.60	20.7	17.3	40.8	34.0	76.8	64.0	148	123				
200	7	9	11.6	9.70	22.9	19.1	43.2	36.0	82.8	69.0						

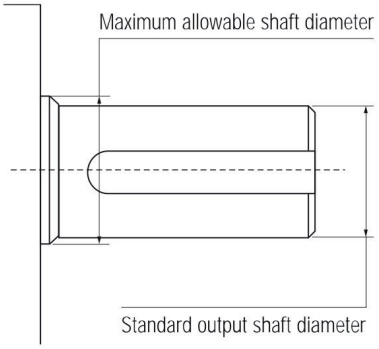
1kg·m=9.8N·m

Overhang Load of Output Shaft

kg

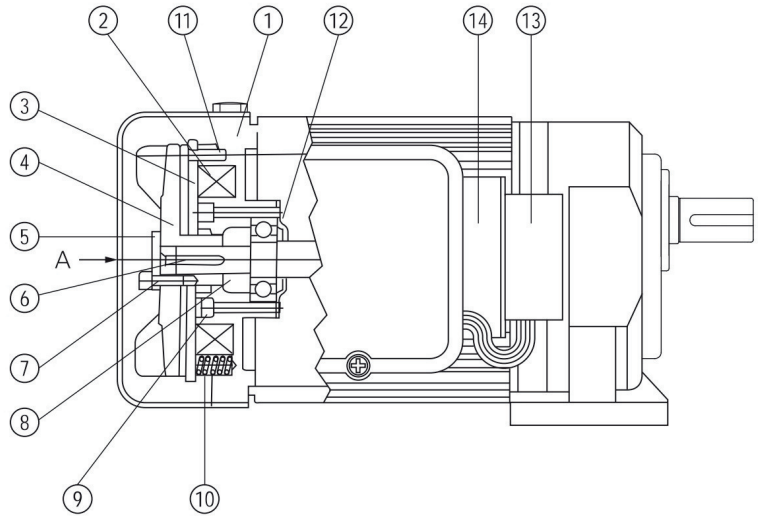
Reduction ratio	Output speed		Output torque													
			0.1kW		0.2kW		0.4kW		0.75kW		1.5kW		2.2kW		3.7kW	
	Hz															
	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60
3	500	600	30	25	30	25	54	45	60	50	145	130	165	150	200	180
5	300	360	36	30	36	30	78	70	85	75	165	150	210	180	270	225
10	150	180	70	60	70	60	150	130	180	180	280	250	430	360	570	550
15	100	120	110	90	110	100	175	160	165	160	355	348	490	450	780	750
20	75	90	150	125	135	125	190	170	175	170	369	365	540	500	850	830
25	60	72	155	140	150	140	210	180	185	180	450	430	650	630	1100	1050
30	50	60	160	150	170	165	235	220	415	400	480	450	690	650	1200	1100
40	38	45	160	160	180	180	270	260	430	420	580	550	710	670	1280	1200
45	33	40	170	170	180	180	335	328	440	430	590	570	820	780	1300	1250
50	30	36	170	170	180	180	350	335	450	440	600	580	850	820	1400	1350
60	25	30	180	180	180	180	350	350	450	450	630	610	900	900	1400	1400
70	21	25	180	180	180	180	350	350	460	460	670	650	1100	1100		
80	18	22	180	180	180	180	350	350	460	460	680	680	1100	1100		
90	16	20	180	180	180	180	350	350	500	500	850	850	1200	1200		
100	15	18	200	200	250	250	380	380	590	590	900	900	1200	1200		
120	12	15	200	200	320	320	390	390	640	640	920	920				
140	11	13	200	200	320	320	400	400	679	679	920	920				
150	10	12	220	220	330	330	420	420	679	679	950	950				
160	9	11	220	220	330	330	420	420	700	700	950	950				
180	8	10	240	240	350	350	430	430	720	720	980	980				
200	7	9	240	240	350	350	430	430	720	720						
1/250-1/1800			300	300	480	480	720	720	1400	1400						

Maximum Allowable Shaft Diameter of Output Shaft



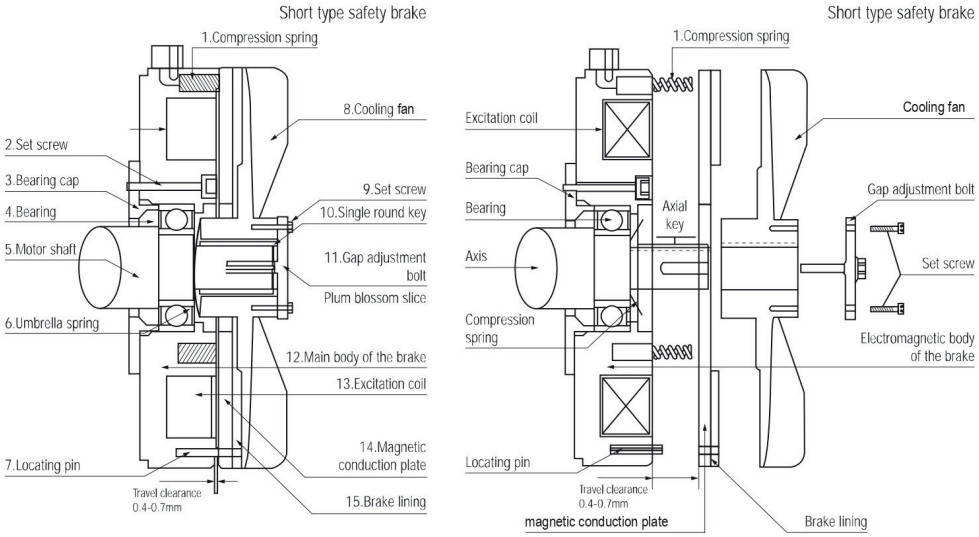
Standard output shaft diameter	Maximum allowable shaft diameter
Φ18	Φ20
Φ22	Φ25
Φ28	Φ30
Φ32	Φ35
Φ40	Φ45
Φ50	Φ55

Brake Assembly Drawing



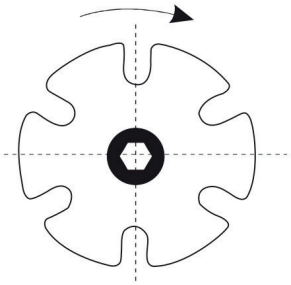
1. Main body of brake
2. Excitation coil of brake
3. Brake lining
4. Cooling fan
5. Adjusting bolt
6. Single round key
7. Set screw
8. Gasket
9. Telescopic screw
10. Compression spring
11. Spring pin
12. Bearing cover
13. Rectifier
14. Iron plate of rectifier

Breakdown Drawing of Brake Parts



1. Compression spring
2. Set screw
3. Bearing cover
4. Bearing
5. Motor shaft
6. Umbrella spring
7. Locating pin
8. Cooling fan
9. Set screw
10. Retaining key
11. Gap adjustment bolt
12. Main body of brake
13. Excitation coil
14. Magnetic conduction plate
15. Brake lining

Brake Clearance Adjustment



Reasons for adjusting brake clearance

1. When the braking action is incorrect after certain period of use.
2. The brake clearance should be adjusted at least once a year.
3. User may decide on the frequency of clearance adjustment independently according to the frequency of use.
4. Please use the thickness gauge to adjust the brake clearance between 0.3-0.5mm.

How to adjust clearance:

1. Open the air cover of the motor, and remove the two set screws on the adjusting bolt.
2. Rotate the adjusting bolt to adjust the brake clearance. Rotate clockwise to reduce the clearance and rotate counter-clockwise to increase the clearance, and adjust around 0.2mm per equidistance.
3. After adjusting the clearance with the thickness gauge, secure the two diagonal out of the four or six holes on the adjustment bolt, and lock the set screws to complete the clearance adjustment, and the adjustment method and the required clearance are subject to the thickness gauge.

1. Please remove the set screws first.
2. Adjust clockwise by one bar and the clearance shall reduce by 0.07-0.10mm.

Small AC Gear Motor

Features and Characteristics

SAS DRIVE TO THE FUTURE

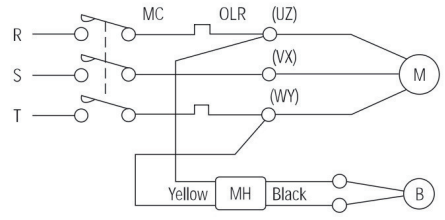
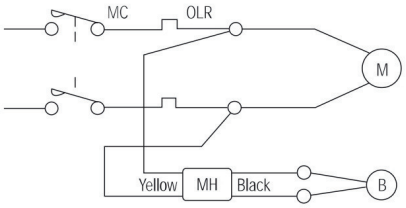
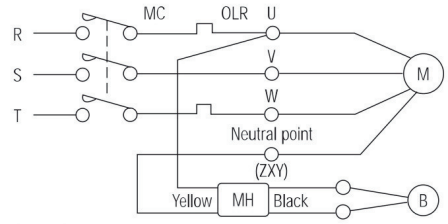
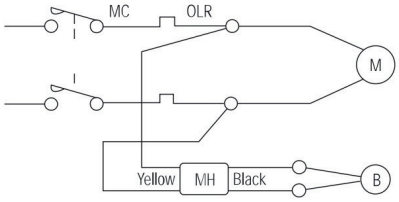
Brake Features

Braking when powered off ..... non-excitation brake, automatic brake when powered off.
Easy connection ..... rectifier is installed on the motor casing and connected to AC power supply.
Small size and light weight ..... minimal increase of motor length when the brake is installed, which guarantees small size and light weight.
Long service life ..... brake lining is made of wear-resistant material to ensure accurate braking action and easy adjustment.

Specification and Standard of Brake

Applicable motor	Three-phase brake gear motor	Single-phase brake gear motor
Input voltage	AC200/208/220V-50/60Hz	AC100/100/-50/60Hz
Output voltage	DC90/108V	DC90/108V
Ambient temperature	-10°C~+40°C	-10°C~+40°C
Insulation and voltage resistance	AC1500V	AC1500V

Wiring Diagram

Applicable motor	Three-phase brake gear motor	Single-phase brake gear motor
Wiring diagram	 AC 200/208V/220V	 AC 100/110V
Wiring diagram	 AC 380/415V/440V	 AC 200/220V

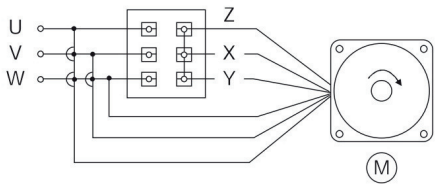
M-------Motor B-----Brake
MH------Rectifier

MC------Magnetic contactor
OLR-----Overload relay

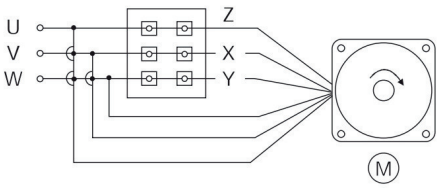
Note: Brake motor is connected to the frequency converter; the brake coil may produce poor suction and the brake coil can be directly connected to the marked municipal power supply.

Three-phase gear motor wiring diagram

AC 380V

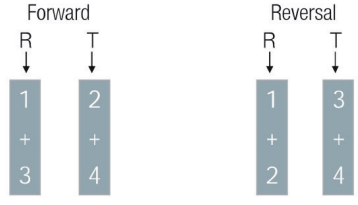


AC 220V

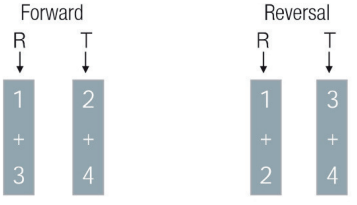


Single-phase gear motor wiring diagram

Single-phase low voltage--110V



Single-phase high voltage--220V



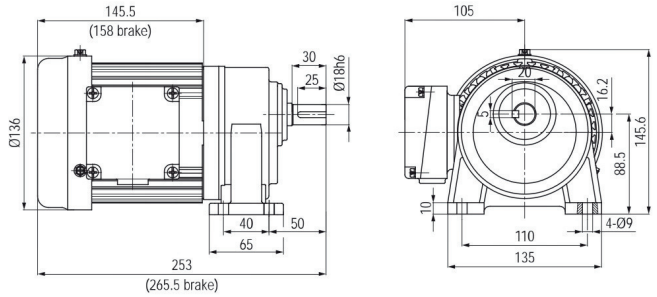
0.1kW

CH Horizontal Type Three-Phase Aluminium Casing (Brake) Gear Motor

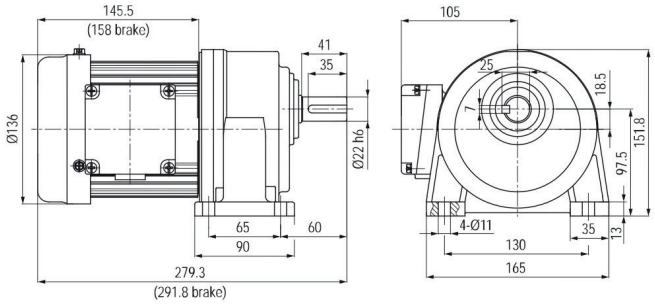
Outline Dimension

CH-18-100-3~60

Light load compact frame type CH-18-100-70~200



CH-22-100-70~200



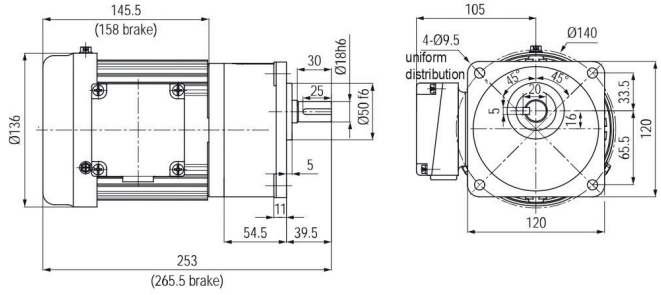
0.1kW

CV Vertical Type Three-Phase Aluminium Casing (Brake) Gear Motor

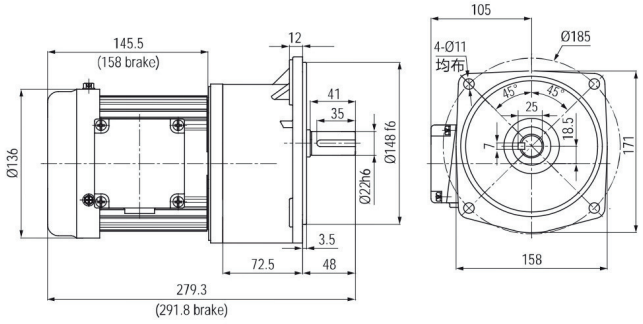
Outline Dimension

CV-18-100-3~60

Light load compact frame type CV-18-100-70~200



CV-22-100-70~200



Note: Compact frame type is a light-load design, and shall not be used in area with large inertia. As it is an inappropriate design, it shall not be used unless it is extremely necessary.

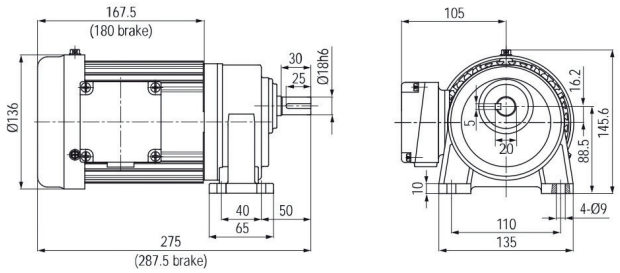
0.2kW

CH Horizontal Type Three-Phase Aluminium Casing (Brake) Gear Motor

Outline Dimension

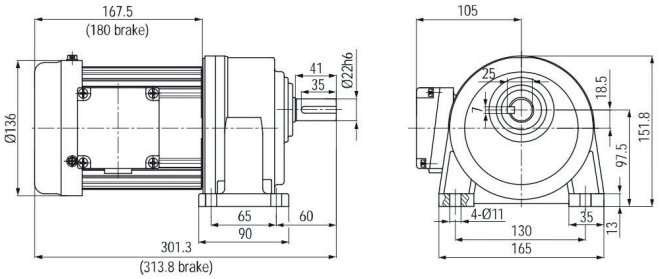
CH-18-200-3~10

Light load compact frame type CH-18-200-15~90

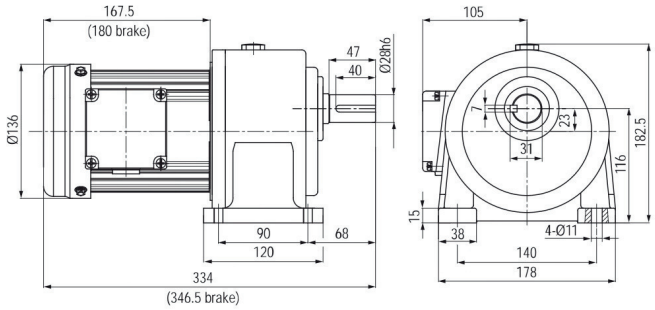


CH-22-200-15~90

Light load compact frame type CH-22-200-100~200



CH-28-200-100~200



Note: Compact frame type is a light-load design, and shall not be used in area with large inertia. As it is an inappropriate design, it shall not be used unless it is extremely necessary.

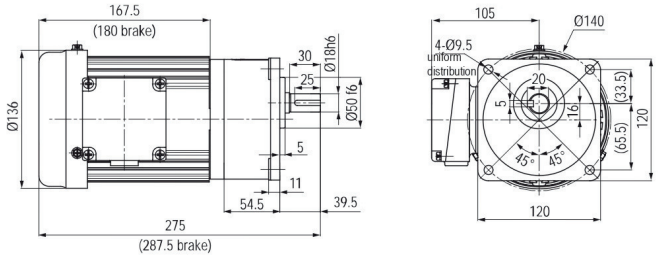
0.2kW

CV Vertical Type Three-Phase Aluminium Casing (Brake) Gear Motor

Outline Dimension

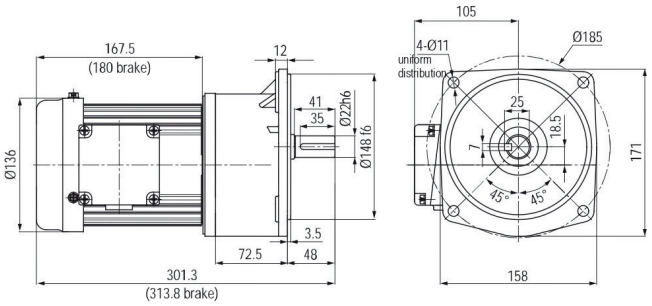
CV-18-200-3~10

Light load compact frame type CV-18-200-15~90

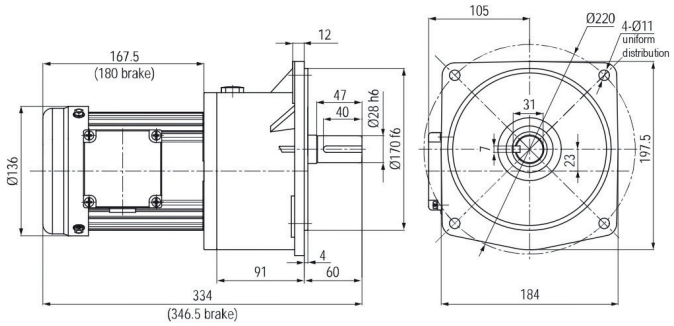


CV-22-200-15~90

Light load compact frame type CV-22-200-100~200



CV-28-200-100~200



Note: Compact frame type is a light-load design, and shall not be used in area with large inertia. As it is an inappropriate design, it shall not be used unless it is extremely necessary.

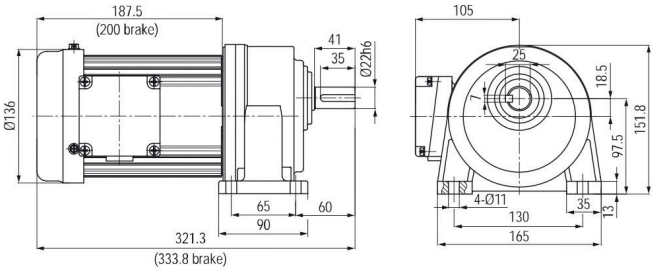
0.4kW

CH Horizontal Type Three-Phase Aluminium Casing (Brake) Gear Motor

Outline Dimension

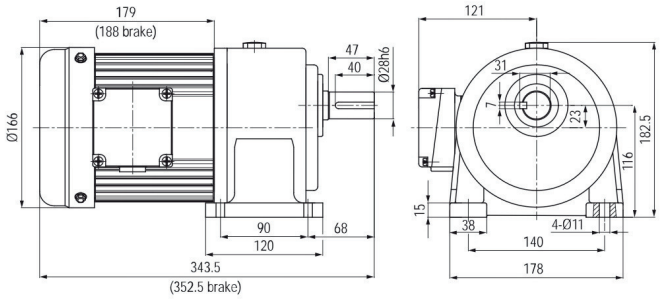
CH-22-400-3~10

Light load compact frame type CH-22-400-15~90

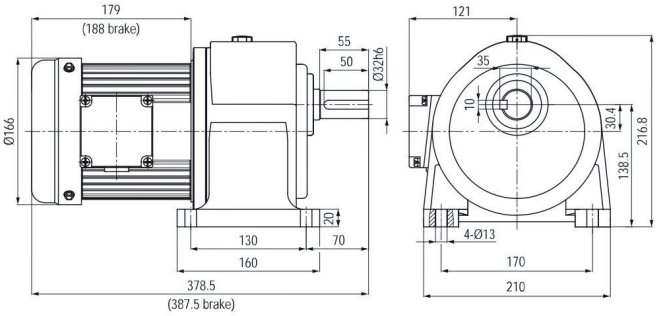


CH-28-400-15~90

Light load compact frame type CH-28-400-100~200



CH-32-400-100~200



Note: Compact frame type is a light-load design, and shall not be used in area with large inertia. As it is an inappropriate design, it shall not be used unless it is extremely necessary.

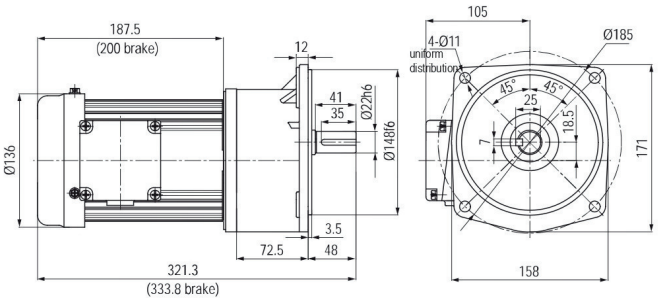
0.4kW

CV Vertical Type Three-Phase Aluminium Casing (Brake) Gear Motor

Outline Dimension

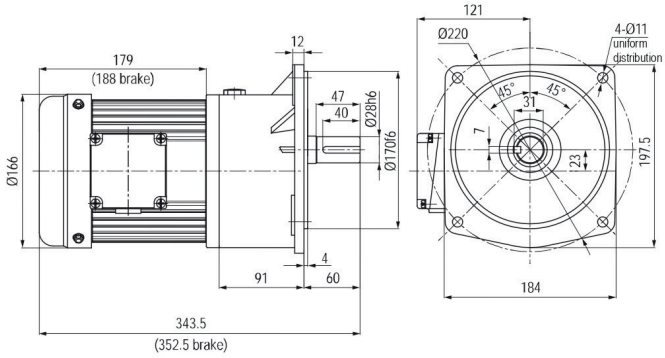
CV-22-400-3~10

Light load compact frame type CV-22-400-15~90

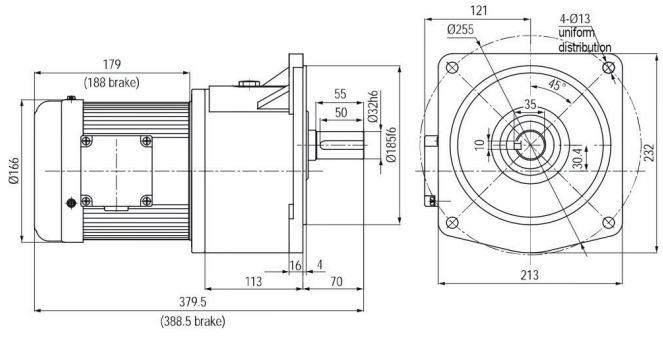


CV-28-400-15~90

Light load compact frame type CV-28-400-100~200



CV-32-400-100~200



Note: Compact frame type is a light-load design, and shall not be used in area with large inertia. As it is an inappropriate design, it shall not be used unless it is extremely necessary.

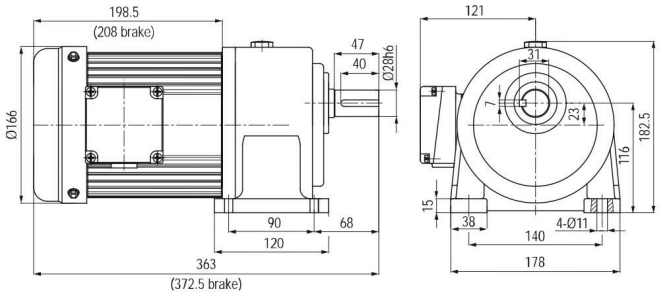
0.75kW

CH Horizontal Type Three-Phase Aluminium Casing (Brake) Gear Motor

Outline Dimension

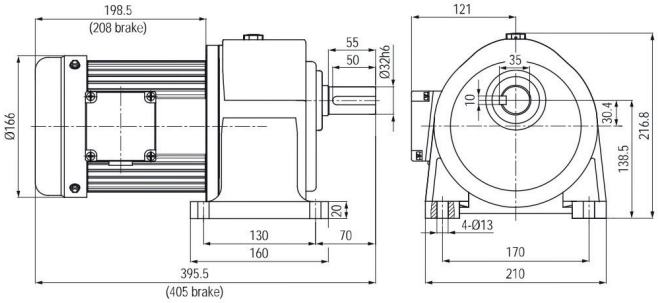
CH-28-750-3~25

Light load compact frame type CH-28-750-30~120

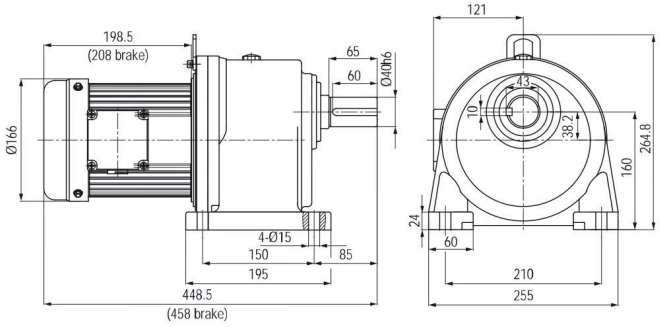


CH-32-750-30~120

Light load compact frame type CH-32-750-130~200



CH-40-750-130~200



Note: Compact frame type is a light-load design, and shall not be used in area with large inertia. As it is an inappropriate design, it shall not be used unless it is extremely necessary.

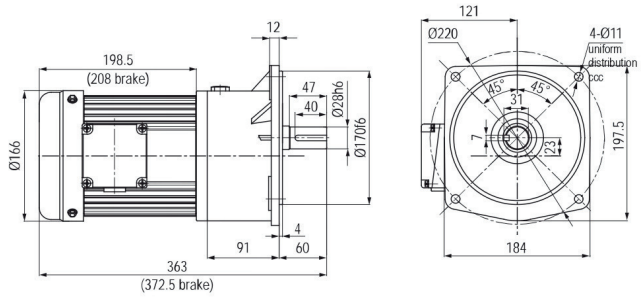
0.75kW

CV Vertical Type Three-Phase Aluminium Casing (Brake) Gear Motor

Outline Dimension

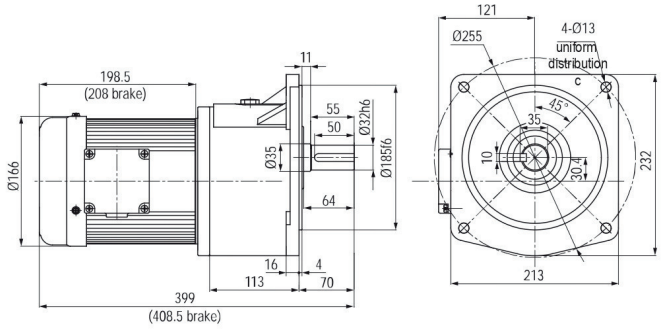
CV-28-750-3~25

Light load compact frame type CV-28-750-30~120

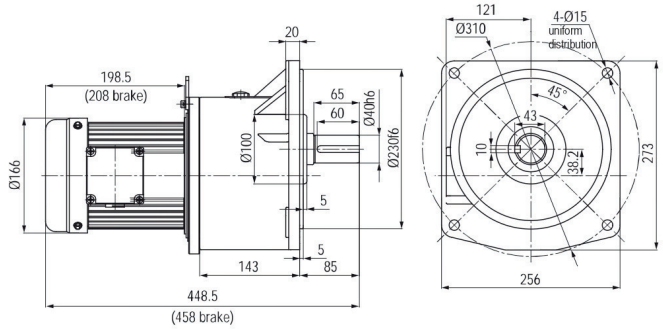


CV-32-750-30~120

Light load compact frame type CV-32-750-130~200



CV-40-750-130~200



Note: Compact frame type is a light-load design, and shall not be used in area with large inertia. As it is an inappropriate design, it shall not be used unless it is extremely necessary.

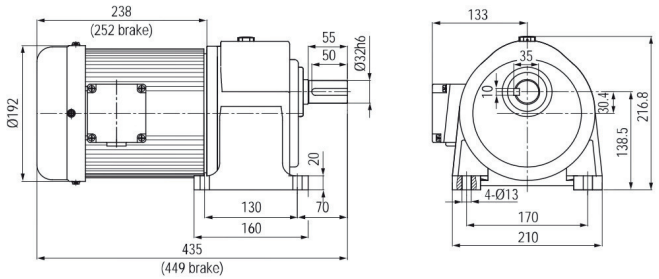
1.5kW

CH Horizontal Type Three-Phase Aluminium Casing (Brake) Gear Motor

Outline Dimension

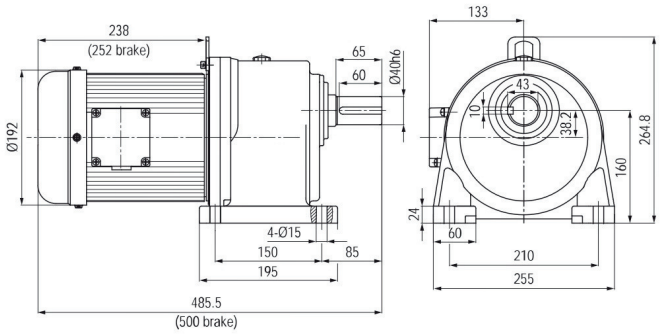
CH-32-1500-3~30

Light load compact frame type CH-32-1500-40~100

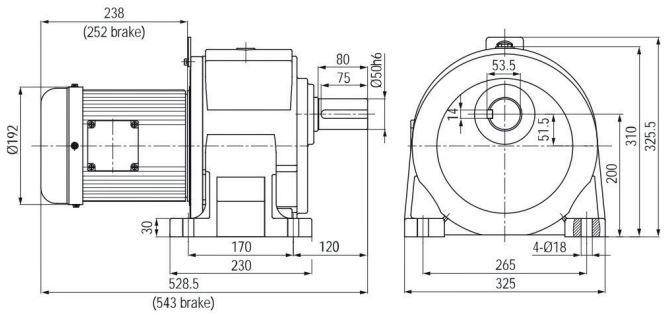


CH-40-1500-35~100

Light load compact frame type CH-40-1500-110~200



CH-50-1500-110~200



Note: Compact frame type is a light-load design, and shall not be used in area with large inertia. As it is an inappropriate design, it shall not be used unless it is extremely necessary.

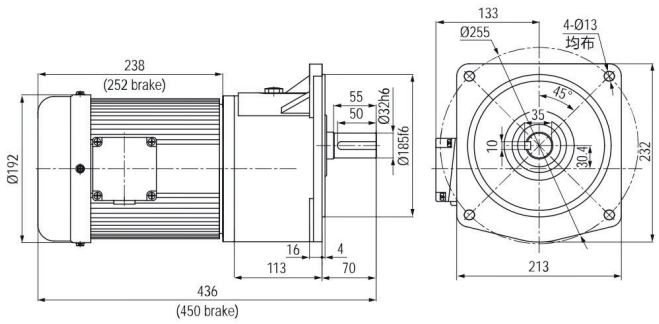
1.5kW

CV Vertical Type Three-Phase Aluminium Casing (Brake) Gear Motor

Outline Dimension

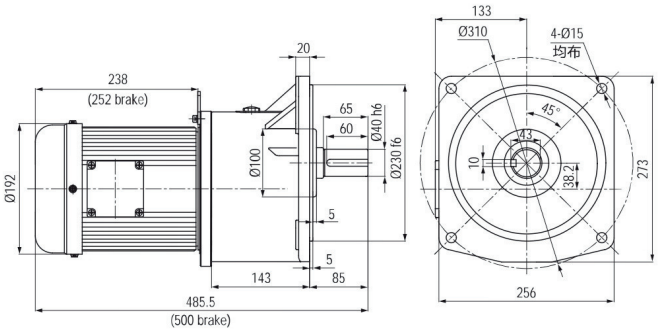
CV-32-1500-3~30

Light load compact frame type CV-32-1500-40~100

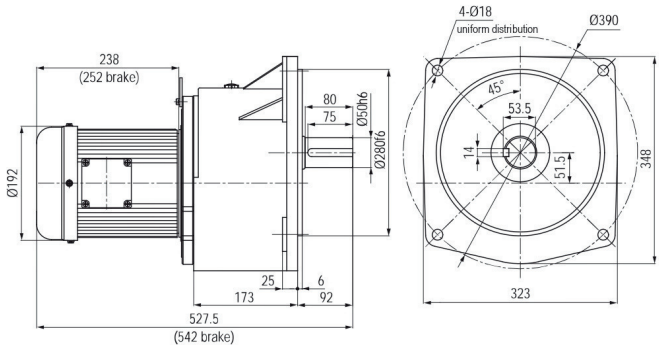


CV-40-1500-35~100

Light load compact frame type CV-40-1500-110~200



CV-50-1500-110~200



Note: Compact frame type is a light-load design, and shall not be used in area with large inertia. As it is an inappropriate design, it shall not be used unless it is extremely necessary.

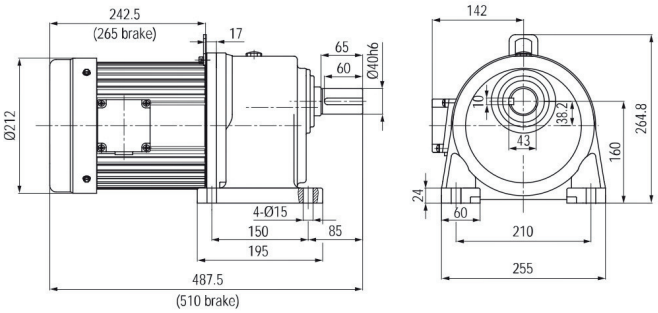
2.2kW

CH Horizontal Type Three-Phase Aluminium Casing (Brake) Gear Motor

Outline Dimension

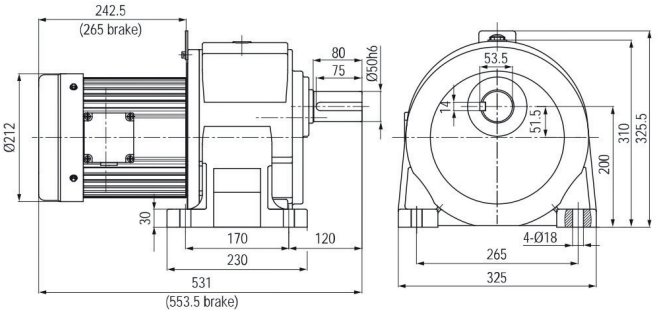
CH-40-2200-3~40

Light load compact frame type CH-40-2200-50~80



CH-50-2200-50~100

Light load compact frame type CH-50-2200-110~200



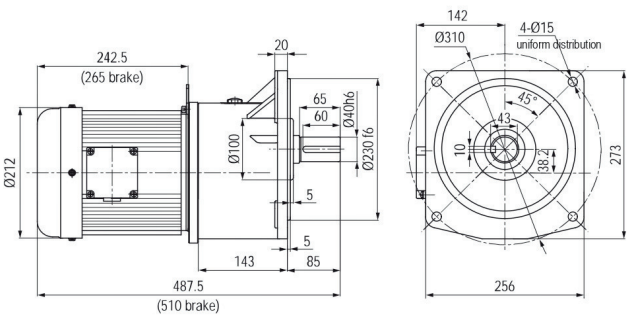
2.2kW

CV vertical type three-phase aluminium casing (brake) gear motor

Outline Dimension

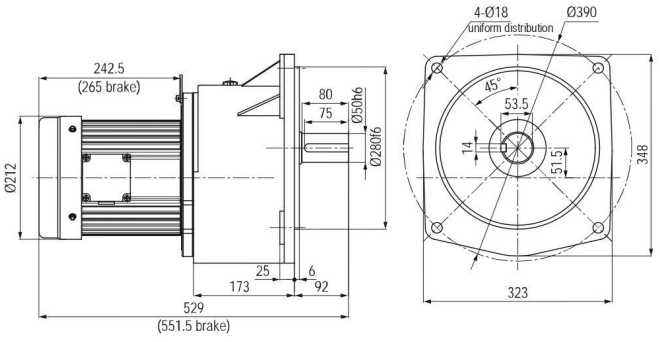
CV-40-2200-3~40

Light load compact frame type CV-40-2200-50~80



CV-50-2200-50~100

Light load compact frame type CV-50-2200-110~200



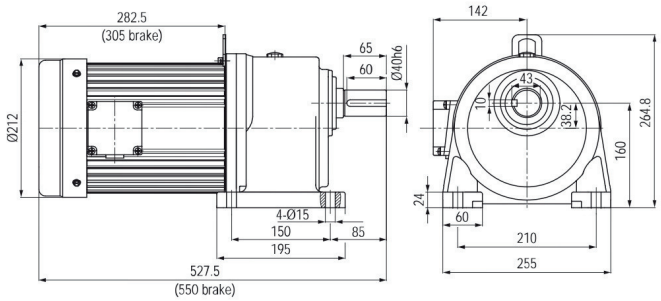
3.7kW

CH horizontal type three-phase aluminium casing (brake) gear motor

Outline Dimension

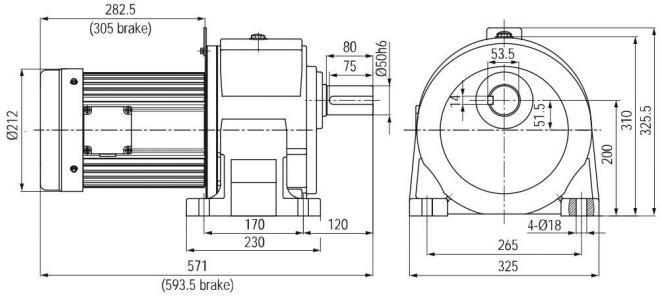
CH-40-3700-3~10

Light load compact frame type CH-40-15~60



CH-50-3700-15~60

Light load compact frame type CH-50-3700-70~200



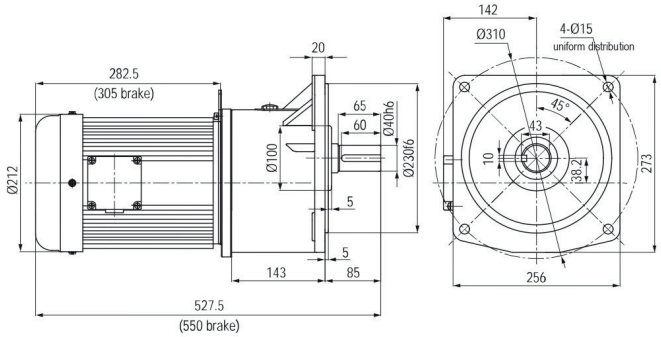
3.7kW

CV Vertical Type Three-Phase Aluminium Casing (Brake) Gear Motor

Outline Dimension

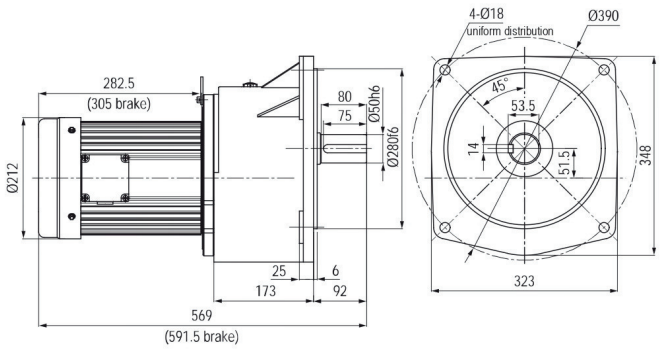
CV-40-3700-3~10

Light load compact frame type CV-40-3700-15~60



CV-50-3700-15~60

Light load compact frame type CV-50-3700-70~200

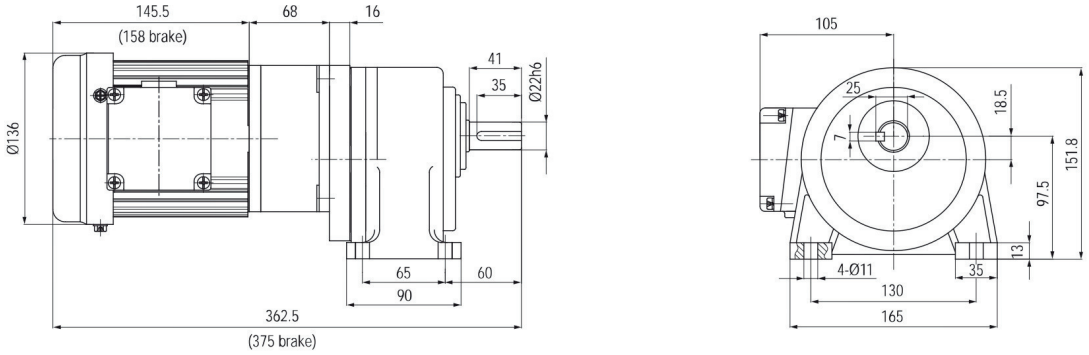


CH, CV Combined Type Three-Phase Aluminum Casing (Brake) Gear Motor

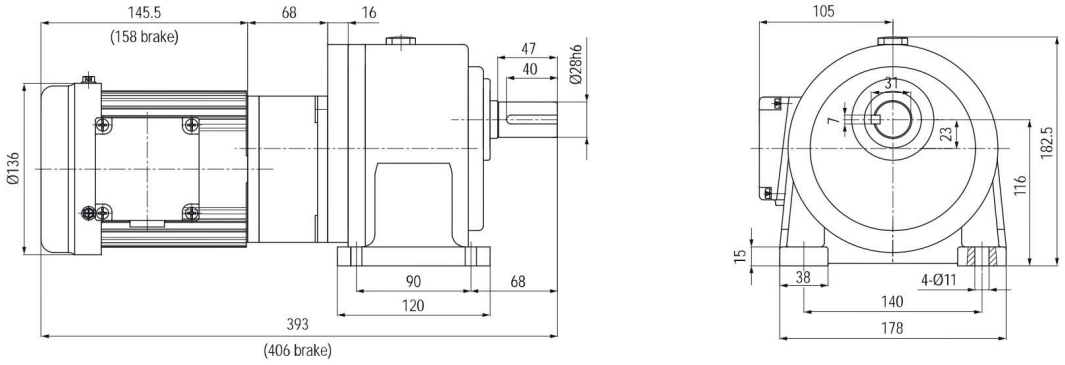
CH+CV 0.1kW

Outline Dimension

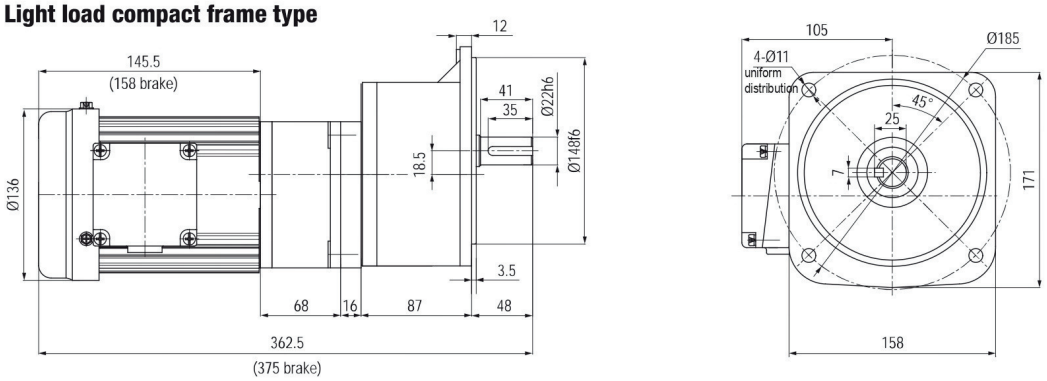
CH22+CV18-100-250~1800 Light load compact frame type



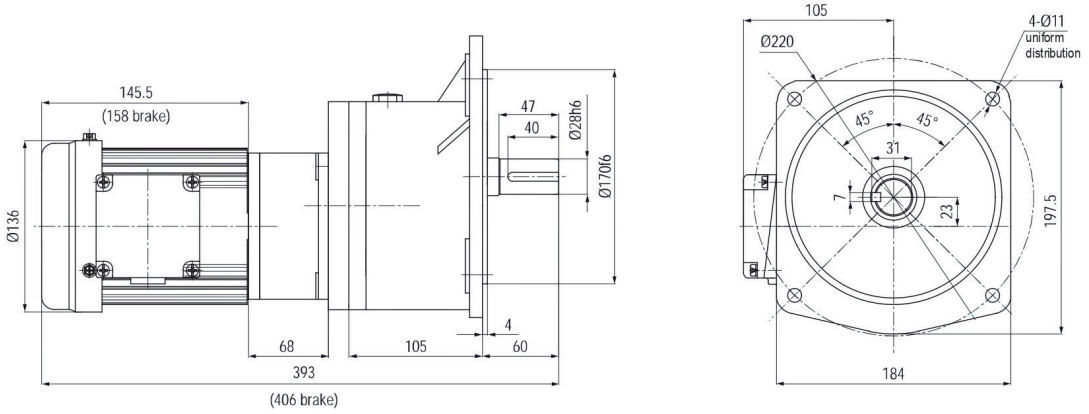
CH28+CV18-100-250~1800



CV22+CV18-100-250~1800 Light load compact frame type



CV28+CV18-100-250~1800

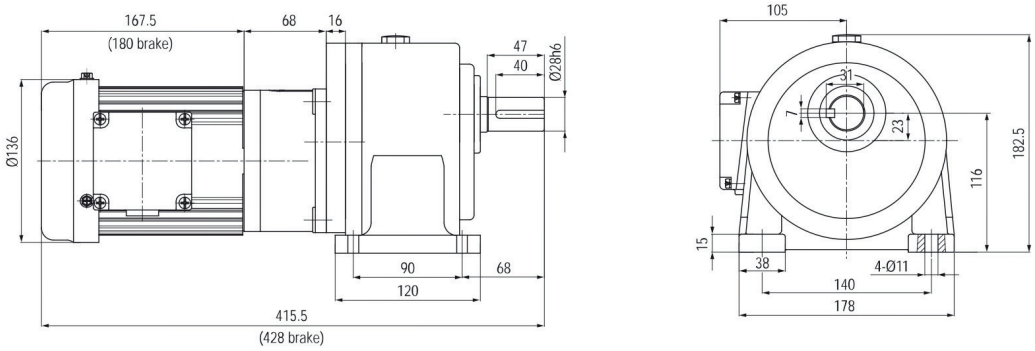


CH, CV Combined Type Three-Phase Aluminum Casing (Brake) Gear Motor

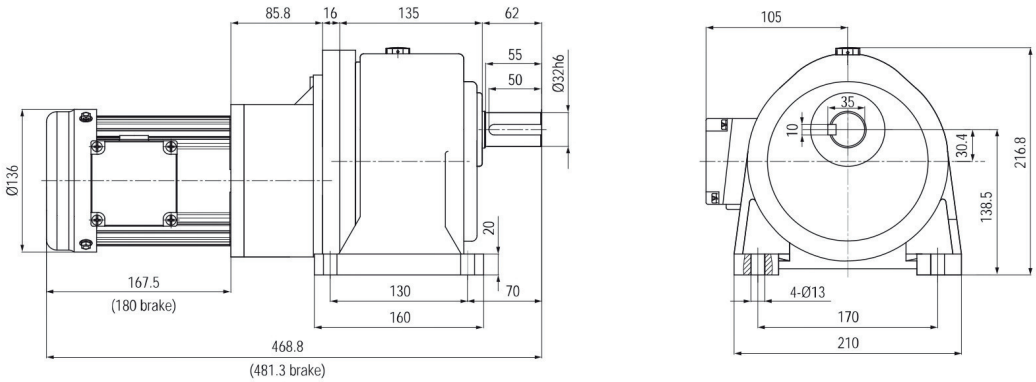
CH+CV 0.2kW

Outline Dimension

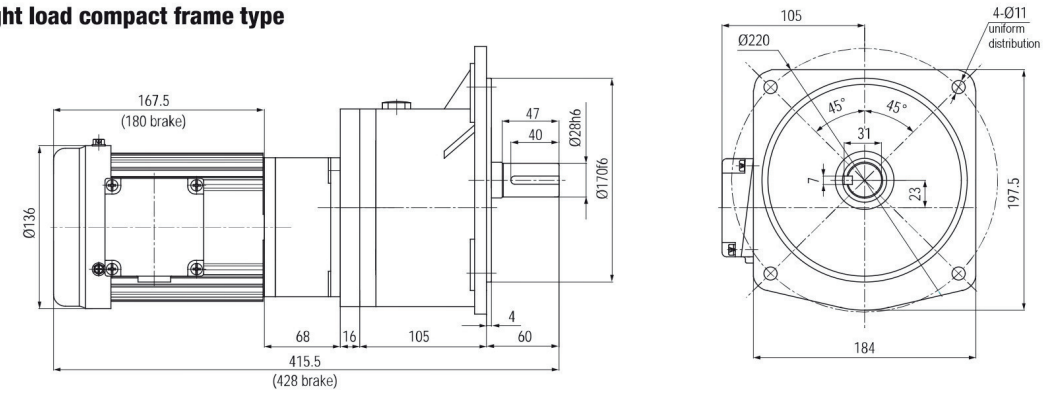
CH28+CV18-200-250~1800 Light load compact frame type



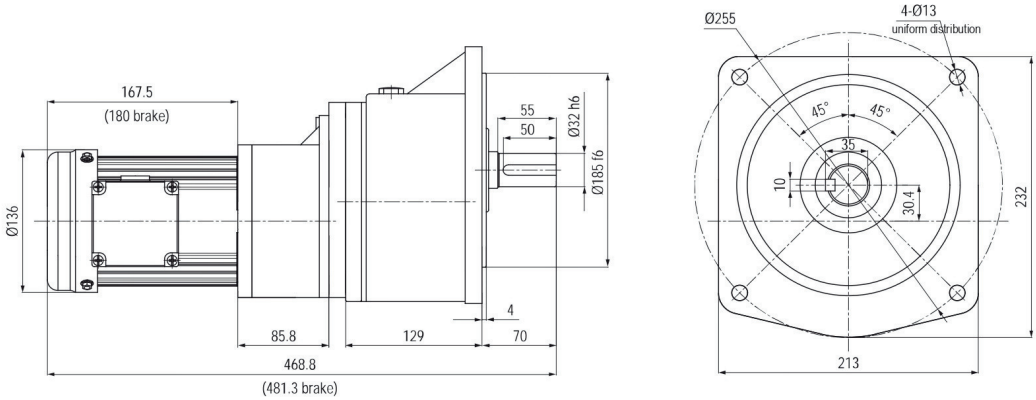
CH32+CV22-200-250~1800



CV28+CV18-200-250~1800 Light load compact frame type



CV32+CV22-200-250~1800

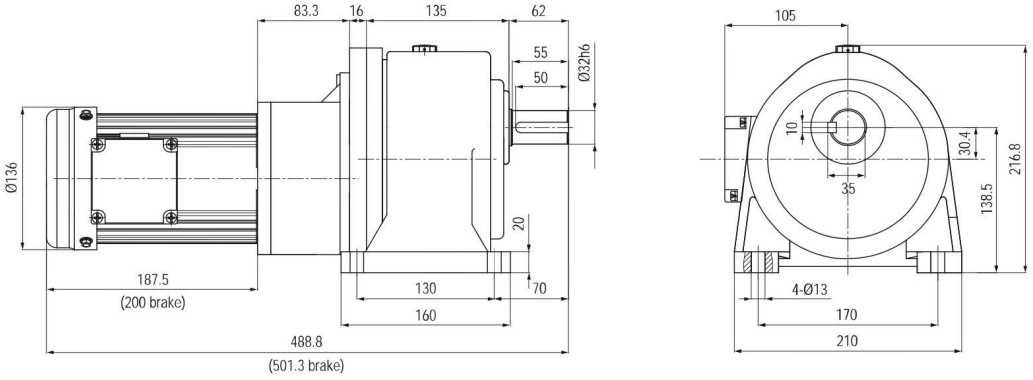


CH, CV Combined Type Three-Phase Aluminum Casing (Brake) Gear Motor

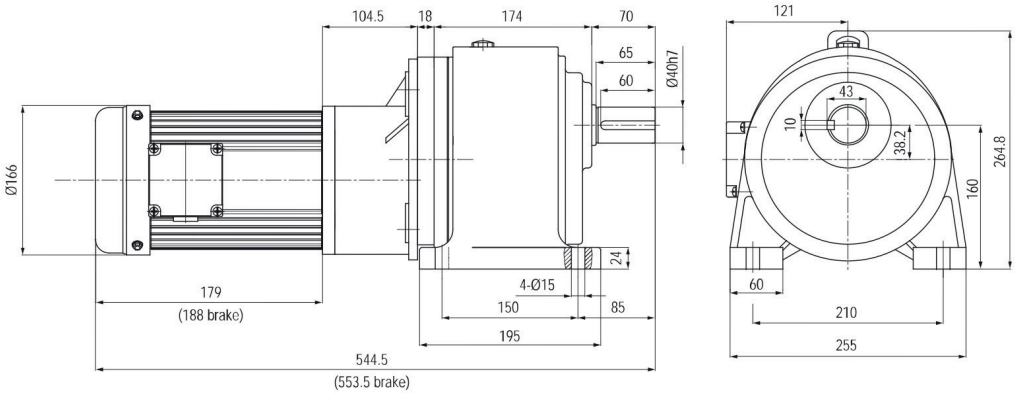
CH+CV 0.4kW

Outline Dimension

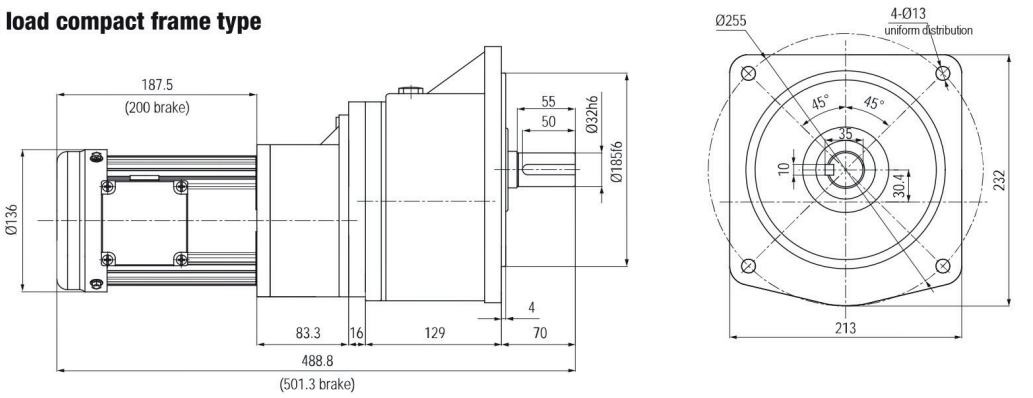
CH32+CV22-400-250~1800
Light load compact frame type



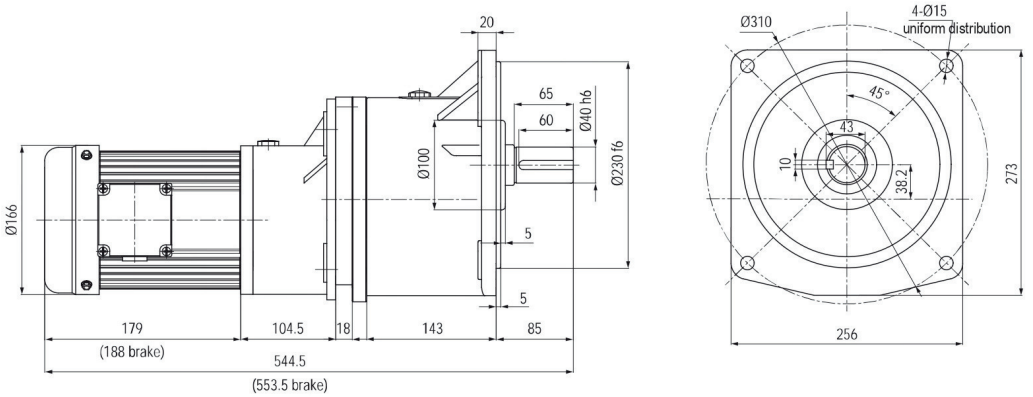
CH40+CV28-400-250~1800



CV32+CV22-400-250~1800 Light load compact frame type



CV40+CV28-400-250~1800

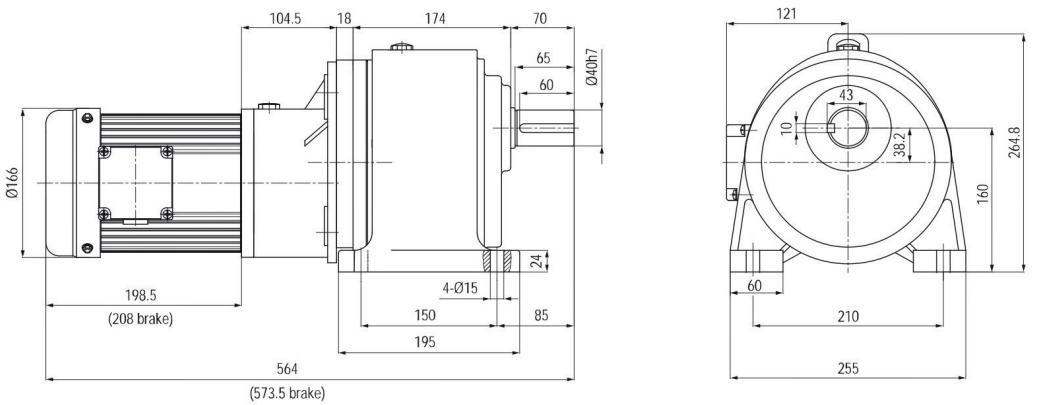


CH, CV Combined Type Three-Phase Aluminum Casing (Brake) Gear Motor

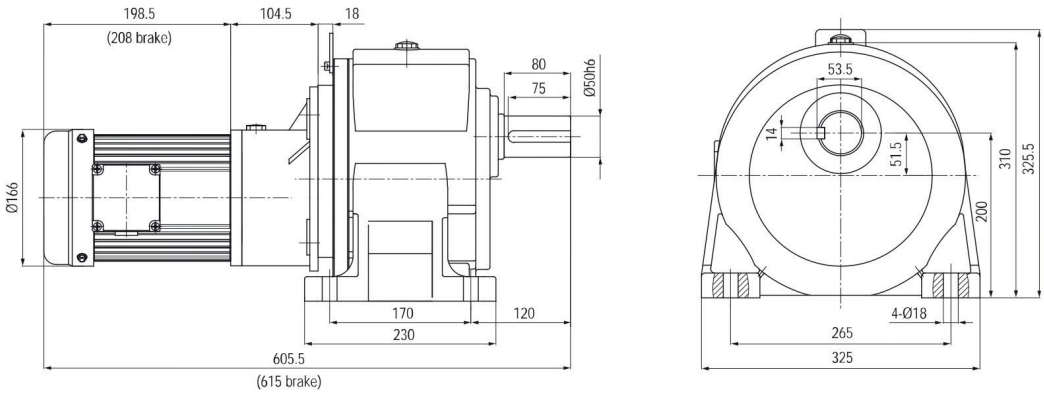
CH+CV 0.75kW

Outline Dimension

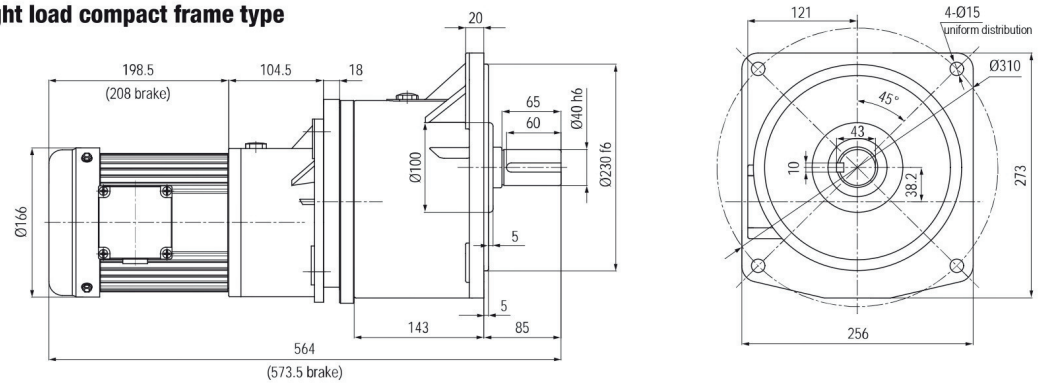
CH40+CV28-750-250~1800
Light load compact frame type



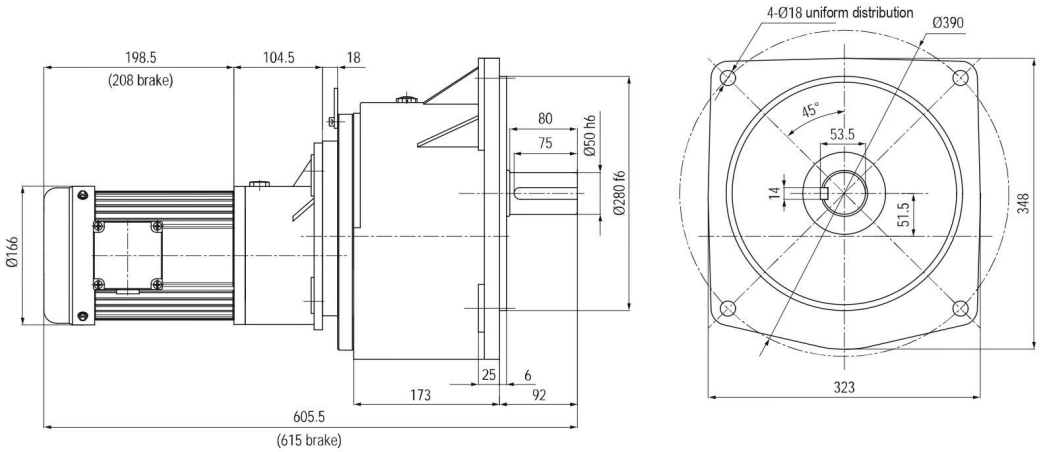
CH50+CV28-750-250~1800



CV40+CV28-750-250~1800 Light load compact frame type



CV50+CV28-750-250~1800



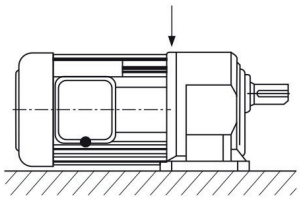
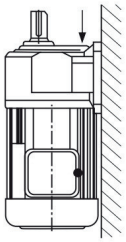
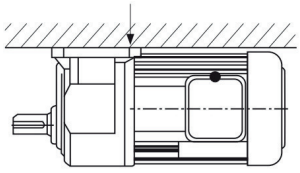
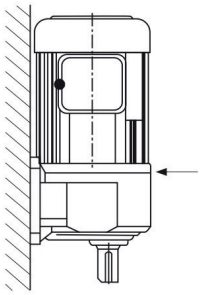
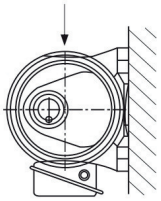
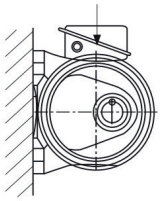
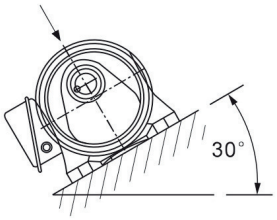
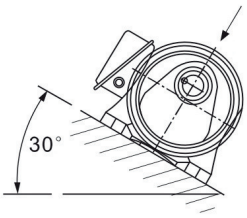
Small AC Gear Motor

Installation Diagram

Installation Diagram of Gear Motor

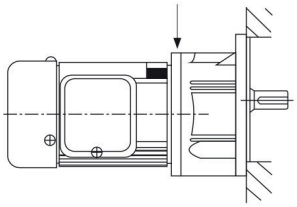
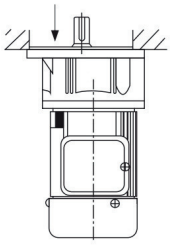
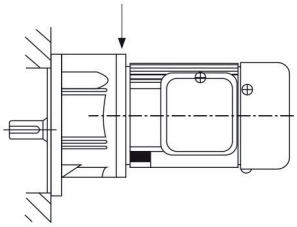
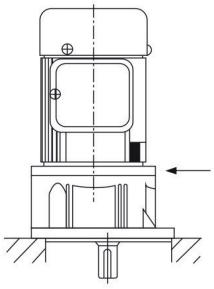
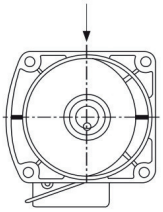
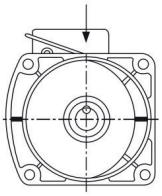
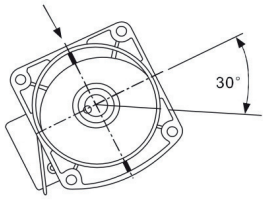
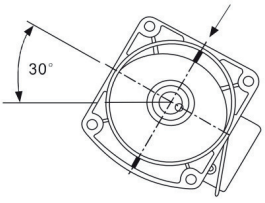
Factory standard and installation type:

- ◆ All types of gear motors manufactured by the company are suitable for the standard installation type shown in the diagram.
- ◆ After gear motor installed, please unlock the pin on the air hole.

T1 air hole direction 	T2 air hole direction 	T3 air hole direction 	T4 
T5 air hole direction 	T6 air hole direction 	T7 air hole direction 	T8 air hole direction 

Special installation type:

- ◆ If the installation types shown in the diagram are required, please let us know, and we will modify the direction and location of the vent.
- ◆ After gear motor installed, please unlock the pin on the air hole.

T1 air hole direction 	T2 air hole direction 	T3 air hole direction 	T4 
T5 air hole direction 	T6 air hole direction 	T7 air hole direction 	T8 air hole direction 

Small AC Gear Motor

Failures and solutions

Solutions for DC Brake failures

Failures	Analysis of causes	Solutions
Brake no operation	No power supply	Supply power
	Brake pad weared	Replace the brake pad
	Excessive gap	Adjust gap
	Power supply damaged	Replace power supply
	Foreign bodies	Clean the parts
	Wrong voltage	Use correct voltage
	Wire disconnected	Connect wire
	Jamming of the brake	Clean the parts
	Brake coil burnout	Replace brake coil
Brake movement	Wear of the friction disc	Replace brake pad
	Excessive gap	Adjust gap
	brake pad covered by oil stains	Clean the brake pad
	Excessive load	Re-design
	Lean of the brake surface	Replace parts
	Excessive descending impulse	Re-design the mechanism
	Selection of wrong type	Select the correct type
	High ambient temperature	Check the ambient temperature

Solutions for Gear motor failures

Failure		Analysis of causes	Solutions
Noise	Gear knocking sound	Gear surface damaged	Replace the damaged gear set
	Continuous noise	Damage to the bearing	Replace the bearing
	Periodic noise	Foreign substance attached to the tooth surface	Check the gear and tooth surface
	Hissing sound	Low oil level	Fill lubricating oil
	Intermittent noise	Dirty lubricating oil	Replace lubricating oil
Vibration	Mounting base vibrating	Mounting surface deflected	Re-adjust the mounting base
	Output shaft vibrating	Bearing damaged	Replace the bearing
	Internal gear vibrating	Gear damaged	Replace the damaged gear
	Housing vibrating	Gear set assemble defective	Re-adjust the gear set
Oil leak	Oil seal leaked	Oil seal harden	Replace oil seal
	Housing oil leaked	Sand hole on housing	Replace housing
	Joining surface oil leaked	O-ring damaged	Replace the damaged O-ring
Overheating	Bad oil seal	Oil seal too tight	Replace the tighten oil seal
	Housing overheating	Overloading	Calculate load power
	Less lubricating oil	Low oil level	Fill lubricating oil
	Motor overheating	Motor defective	Replace a new motor