TORQUE MOTOR

CHARACTERISTICS OF THE TORQUE MOTOR

1. A torque motor possesses strong starting torque and sloping characteristics. Within the full range of revolution-torque curve, especially under low speed and constraint, it can rotate steadily.
2. The motor torque changes approximately proportion to the square of the voltage. The speed can be changed easily by varying the voltage supplied to the motor.
3. The torque motor is designed differently than other motors. It can obtain stable torque in low speed under a restrained condition. Suitable in force static-torque situation, or restraints mode is required when the high-speed operation is finished. Continuously operation is available at 60V, rated for short interval operation is required above 60V, and 5 minutes rated at 110V. ※When operated under the restraint mode with speed reducer, the motor output torque would increase greatly. Please do not exceed the allowable torque of the speed reducer, and NEVER strike with force to stop the motor to prevent impact damage to the speed reducer.
4. In an application where an object is released continuously at a constant speed and wound up with constant tension, the torque must be doubled and the speed must be halved if the diameter of the winding spool is doubled.
5. Within the range of the revolution-torque characteristic curve, the motor can be used as a brake when the rotating motion is in the opposite direction.

TYPES OF THE TORQUE MOTOR

REGULATOR BUILT-IN TYPE

The voltage regulator is stored inside the terminal box, where it can control the motor speed easily with the speed controller it is attached to. No need to attach the regulator on the exterior of the motor, making the installation more convenient.

STANDARD TYPE

External voltage regulator is required to adjust speed and torque.

MODEL	RATED TIME	MAX. OUTPUT (W)	VOLTAGE (V)	FREQ. (HZ)	RATED SPEED (rpm)	STARTING TORQUE (Kg.cm)	RATED TORQUE (Kg.cm)	RATED CURRENT (A)	CAPACITY (μF)
2TK3(C)A(GN)-AP	5 min./ Continuous	3/1	110/60	60	990/570	0.59/0.33	0.19/0.14	0.44/0.37	6 μ f/300V
	5 min./ Continuous	3/1	110/60	50	1150/880	1.02/0.39	0.26/0.11	0.47/0.33	6 μ f/300V
3TK6(C)A(GN)-AP	5 min./ Continuous	6/2	110/60	60	1550/1070	2.23/0.57	0.38/0.18	0.76/0.44	10 μ f/300V
	5 min./ Continuous	6/2	110/60	50	1250/840	2.20/0.58	0.47/0.23	0.59/0.36	10 μ f/300V
4TK10(C)A(GN)-AP	5 min./ Continuous	10/3	110/60	60	1500/700	2.87/0.99	0.65/0.41	0.91/0.61	12 μ f/300V
	5 min./ Continuous	10/3	110/60	50	1140/1050	2.94/1.15	0.86/0.28	0.67/0.49	12μ f/300V
5TK20(C)A(GN)-AP	5 min./ Continuous	20/5	110/60	60	1340/1170	4.61/2.37	1.45/0.42	1.87/1.25	20 μ f/300V
	5 min./ Continuous	20/5	110/60	50	1100/1010	4.57/1.95	1.76/0.48	1.36/0.92	20 μ f/300V
5TK40(C)A(GX)-AFP	5 min./ Continuous	40/10	110/60	60	1510/1280	7.89/2.09	2.58/0.76	1.55/0.97	24 μ f/300V
	5 min./ Continuous	40/10	110/60	50	1360/680	6.9/2.37	0.72/1.44	1.10/0.92	24 μ f/300V

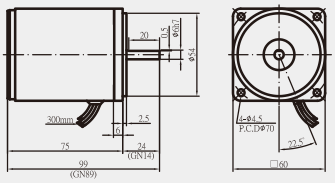
MODEL	RATED TIME	MAX. OUTPUT (W)	VOLTAGE (V)	FREQ. (HZ)	RATED SPEED (rpm)	STARTING TORQUE (Kg.cm)	RATED TORQUE (Kg.cm)	RATED CURRENT (A)	CAPACITY (μF)
2TK3(C)A(GN)-CP	5 min./ Continuous	3/1	220/120	60	1170/1180	0.63/0.36	0.23/0.08	0.18/0.14	1 μ f/450V
	5 min./ Continuous	3/1	220/120	50	1070/650	0.76/0.32	0.27/0.15	0.15/0.10	1 μ f/450V
3TK6(C)A(GN)-CP	5 min./ Continuous	6/2	220/120	60	1240/1050	1.38/0.62	0.47/0.18	0.33/0.22	2 μ f/450V
	5 min./ Continuous	6/2	220/120	50	1100/1180	1.63/0.7	0.54/0.17	0.27/0.20	2 μ f/450V
4TK10(C)A(GN)-CP	5 min./ Continuous	10/3	220/120	60	1200/1300	2.76/1.23	0.80/0.22	0.37/0.28	2.5 μ f/450V
	5 min./ Continuous	10/3	220/120	50	1050/1020	2.84/1.19	0.91/0.28	0.29/0.21	2.5 μ f/450V
5TK20(C)A(GN)-CP	5 min./ Continuous	20/5	220/120	60	1350/1240	3.97/1.24	1.44/0.39	0.5/0.32	3 μ f/450V
	5 min./ Continuous	20/5	220/120	50	1070/760	4.26/1.35	1.83/0.65	0.37/0.24	3 μ f/450V
5TK40(C)A(GX)-CFP	5 min./ Continuous	40/10	220/120	60	1480/1360	7.9/2.4	2.63/0.72	0.45/0.5	6 μ f/450V
	5 min./ Continuous	40/10	220/120	50	1100/900	7.1/3.2	3.53/1.1	0.71/0.54	6 μ f/450V

NOTES：Custom order is required when applied voltage exceeding the rated voltage.

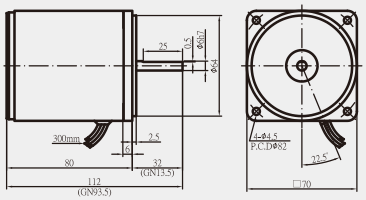
Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

TORQUE MOTOR

- OUTLINE & SPECIFICATION
- UNIT：mm



3W 2TK3A(GN)-AP(CP)



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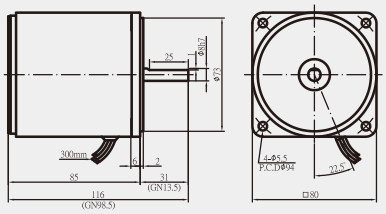

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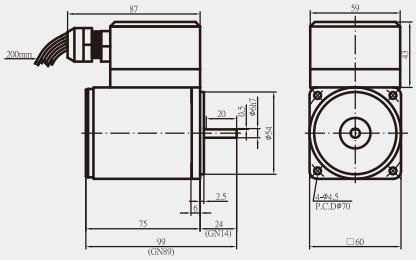

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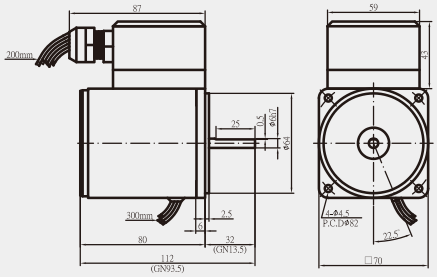

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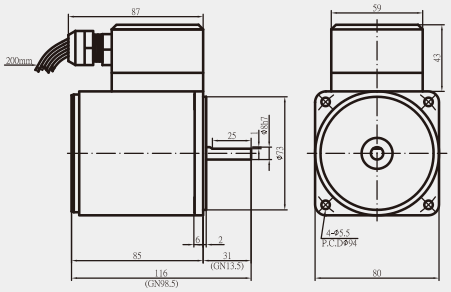

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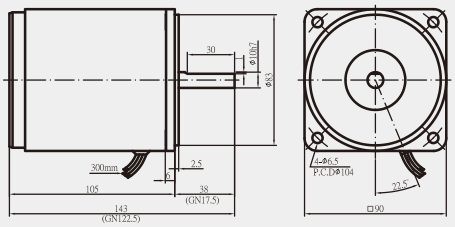

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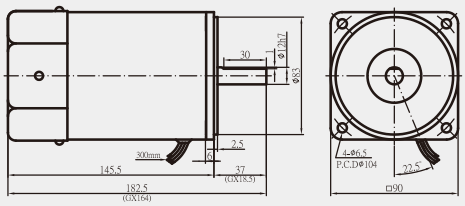
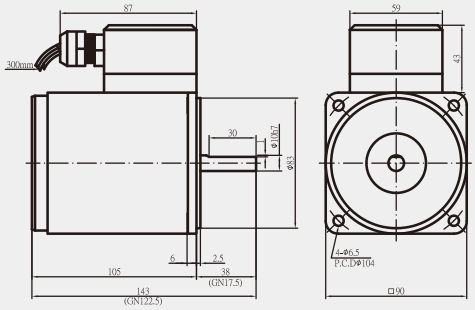


40W 5TK40A(GN/GX)-AP(CP)



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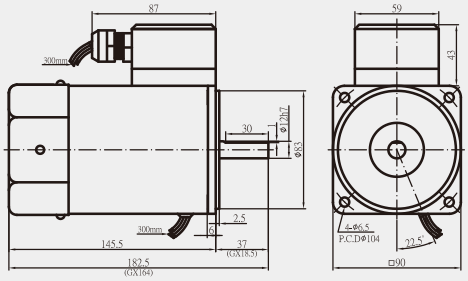


40W 5TK40CA(GN/GX)-AP(CP)

SPEED REDUCER

■ OUTLINE & SPECIFICATION
■ UNIT : mm

HOW TO SELECT A SPEED REDUCER

■ ROTATION AND TORQUE GIVEN FROM CONJUNCTION WITH SPEED REDUCER

Following is the calculation formula:

Rotations : $N_G = \frac{N_m}{i}$

Torque : $T_G = T_M \bullet i \bullet \eta$

N_G : Rotations after conjunction with speed reducer (rpm)

N_M : Rotations of motor (rpm)

i : Ratio

T_G : Torque after conjunction with speed reducer (kg•cm)

T_M : Torque of motor (kg•cm)

η : The transmission efficiency of speed reducer

■ MAXIMUM TORQUE ALLOWED

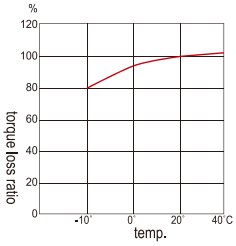
The maximum torque a speed reducer can tolerate is limited due to materials or other specs. Please see the specification of speed reducer for maximum torque allowed at different ratio.

■ ALLOWABLE RADIAL LOAD AND AXIAL LOAD

Radial load refers to the bending load of output shaft at the 1/2 point, commonly used in units linked by chains. Radial load can be disregarded if a coupling is used. Do not over-load since radial load and axial load may affect service life and strength.

■ ADJUSTED THE SPEED REDUCER RATIO VIA ENVIRONMENT TEMPERATURE

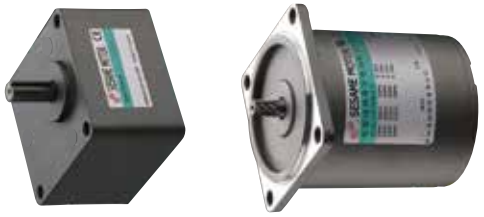
Transmission efficiency of a speed reducer apparently does affected by the environment temperature. The graphic display the torque loss percentage at different ambient temperature (for reference only).



■ MOTOR EQUIP WITH ROUND SHAFT AND GEAR SHAFT, ONLY GEAR SHAFT CAN CONJUNCT WITH SPEED REDUCER.

Speed Reducer
4GN15K
▲△

Motor (Gear shaft)
4IK25GN-A
▲ △

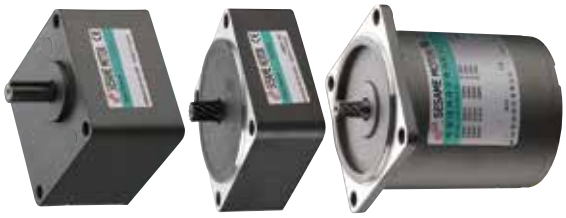


Motor (Round shaft)
4IK25A-A

Speed Reducer
4GN15K

Intermediate
Speed Reducer
4GN10X

Motor (Gear shaft)
4IK25GN-A



■ LOAD PATTERNS VS. LIFESPAN OF SPEED REDUCER

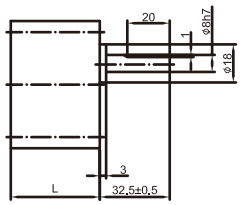
Speed Reducer lifespan will be vary by ways of loading including but not limit to operation time frame, different type of bearing. The following table assumes that the load gear is under the maximum permissible torque. (Reference for engineers)

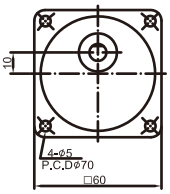
Unit : hrs

	BEARING			BALL BEARING			
LOAD PATTERN	5 hrs/day	8 hrs/day	24 hrs/day	5 hrs/day	8 hrs/day	24 hrs/day	Application instructions
FIXED LOAD	2000	1500	1000	6250	5000	3400	Operated in one direction, such as conveyors.
SLIGHT IMPACT	1500	1250	800	4200	3400	2500	**Frequent start/stop, ex. cam operaton.**
STRONG IMPACT	800 ~1000	700 ~1000	600 ~700	2000 ~2500	1700 ~2500	1400 ~1700	Reversible motors, instant moment reversed, with brake system in an instant brake.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

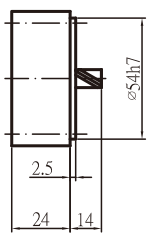
■2 GN□KE . 2 GN□ / SPEED REDUCER

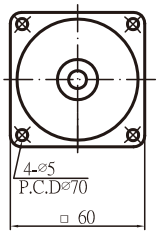




2GN3-18 L=32
2GN25-180 L=42

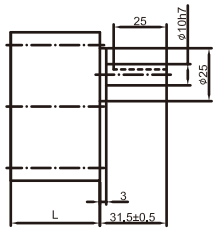
■2GN10X . 2GN10XK / INTERMEDIATE SPEED REDUCER

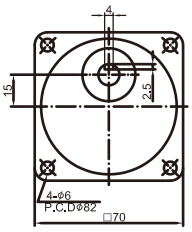




SPEED(rpm)	500	300	200	180	150	120	100	60	50	30	20	15	10
SPEED REDUCTION RATIO 50HZ	3	5	7.5	-	10	12.5	15	25	30	50	75	100	150
SPEED REDUCTION RATIO 60HZ	3.6	6	9	10	-	15	18	30	36	60	90	120	180
MAX. TORQUE (kgf.cm)	1.1	1.8	2.7	3.0	3.9	4.5	5.4	8.1	9.7	15	23	25	25

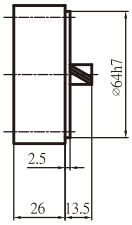
■3 GN□KE . 3 GN□ / SPEED REDUCER

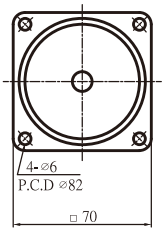




3GN3-18 L=32
3GN25-180 L=42

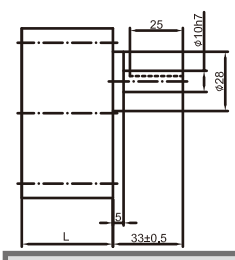
■3GN10X . 3GN10XK / INTERMEDIATE SPEED REDUCER

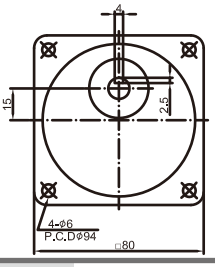




SPEED(rpm)	500	300	200	180	150	120	100	60	50	45	37.5	30	20	15	10
SPEED REDUCTION RATIO 50HZ	3	5	7.5	-	10	12.5	15	25	30	-	40	50	75	100	150
SPEED REDUCTION RATIO 60HZ	3.6	6	9	10	-	15	18	30	36	40	-	60	90	120	180
MAX. TORQUE (kgf.cm)	2.6	4.4	6.6	7.4	9.8	11	13	20	24	24	32	36	50	50	50

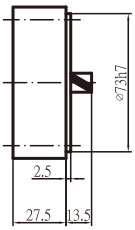
■4 GN□KE . 4 GN□ / SPEED REDUCER

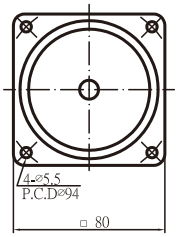




4GN3-180 L=43

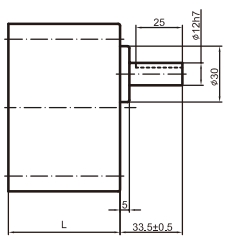
■4GN10X . 4GN10XK / INTERMEDIATE SPEED REDUCER

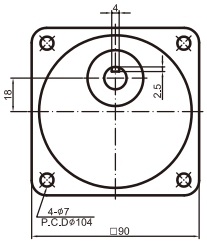




SPEED(rpm)	500	300	200	180	150	120	100	60	50	45	37.5	30	20	15	10
SPEED REDUCTION RATIO 50HZ	3	5	7.5	-	10	12.5	15	25	30	-	40	50	75	100	150
SPEED REDUCTION RATIO 60HZ	3.6	6	9	10	-	15	18	30	36	40	-	60	90	120	180
MAX. TORQUE (kgf.cm)	4.4	7.4	11	12	15	11	22	33	40	40	50	60	80	80	80

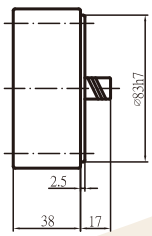
■5 GN□KE . 5 GN□ / SPEED REDUCER

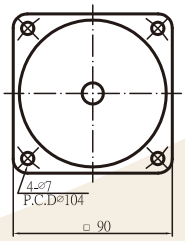




5GN3-18 L=42
5GN20-180 L=60

■5GN10X . 5GN10XK / INTERMEDIATE SPEED REDUCER



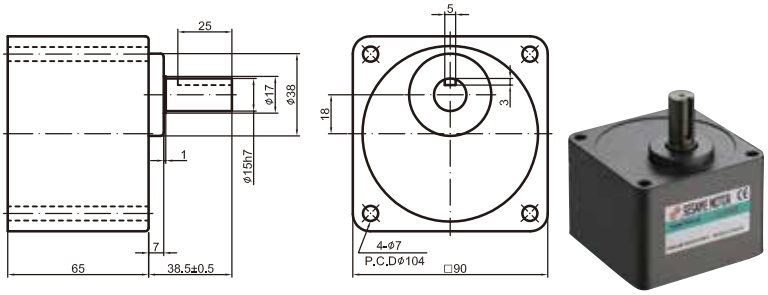


SPEED(rpm)	500	300	200	180	150	120	100	90	75	60	50	45	37.5	30	20	15	10
SPEED REDUCTION RATIO 50HZ	3	5	7.5	-	10	12.5	15	-	20	25	30	-	40	50	75	100	150
SPEED REDUCTION RATIO 60HZ	3.6	6	9	10	-	15	18	20	-	30	36	40	-	60	90	120	180
MAX. TORQUE (kgf.cm)	10	17	26	29	36	43	52	52	65	78	93	93	100	100	100	100	100

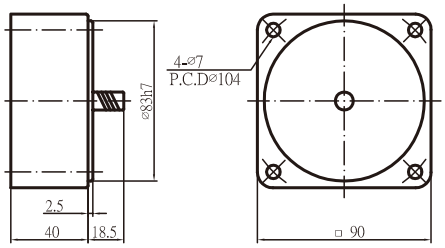
SPEED REDUCER

OUTLINE & SPECIFICATION
UNIT : mm

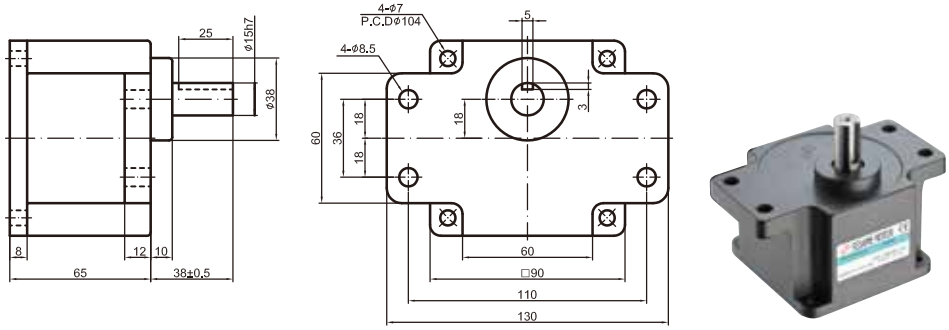
■5 GX□KB / SPEED REDUCER



■5GX10XK / INTERMEDIATE SPEED REDUCER

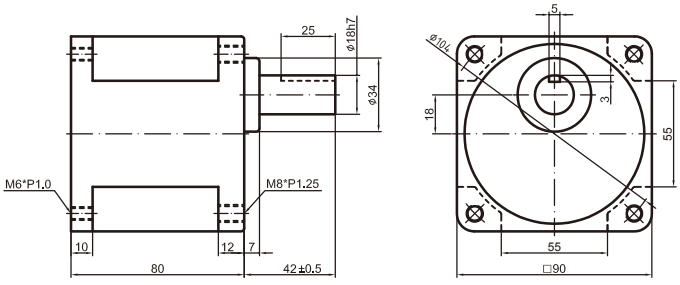


■5 GX□K / SPEED REDUCER



SPEED(rpm)	500	300	200	120	100	90	75	60	50	30	20	15	10	9	7.5
SPEED REDUCTION RATIO 50HZ	3	5	7.5	12.5	15	-	20	25	30	50	75	100	150	-	200
SPEED REDUCTION RATIO 60HZ	3.6	6	9	15	18	20	-	30	36	60	90	120	180	200	-
MAX. TORQUE (kgf.cm)	15	26	38	57	69	69	86	103	124	200	200	200	200	200	200

■5 GX□KBH / GRAVITY FORCE TYPE REDUCER



SPEED(rpm)	30	20	15	10	9	7.5
SPEED REDUCTION RATIO 50HZ	50	75	150	150	-	200
SPEED REDUCTION RATIO 60HZ	60	90	180	120	200	-
MAX. TORQUE(kgf.cm)	350	350	350	350	350	350

NOTES :

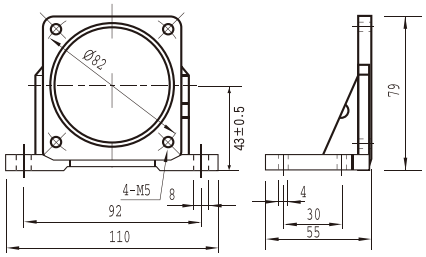
1. Please fill in the required speed reduction ratio in the ☐ (square) after the speed reducer model no.
2. Rotational speed is calculated by dividing the synchronous speed of the motor (50Hz: 1500rpm; 60Hz: 1800rpm) with the reduction ratio. Depending on total load, actual rotational speed is 2%~20~ less.
3. Speed reducers marked in the highlighted areas have opposite rotational direction to the motor. Others unmarked have the same rotational direction as the motor.
4. Attention: metal chips or objects in speed reducer will result in gear damage, noise and shorten service-life when assembling with motor.
5. Please make sure that the shaft size of the motor matches to that of the accompanying reducer model before assembly, otherwise inconformity will occur.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

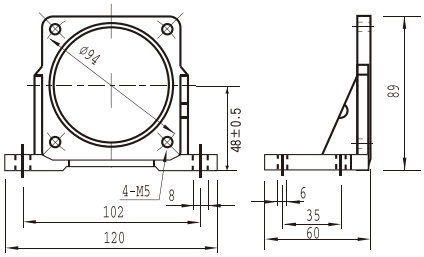
COMPONENTS

L TYPE BASE BRACKET FOR MOTOR INSTALLATION

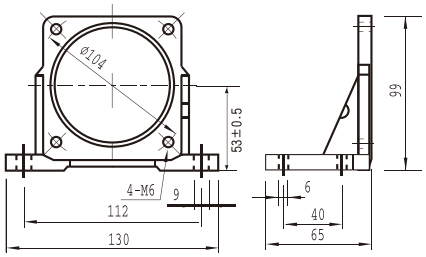
PAL-3N (□70mm)



PAL-4N (□80mm)

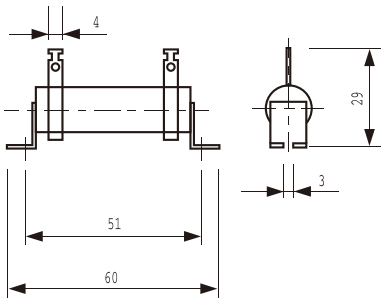


PAL-5N (□90mm)

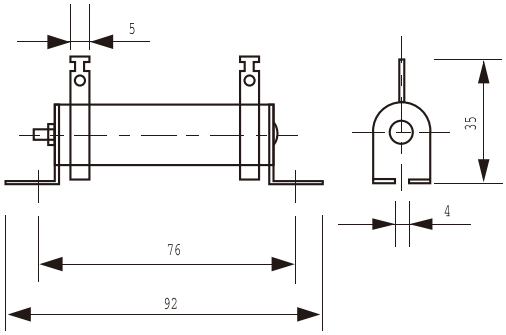


EXTERNAL RESISTOR FOR ELECTRONIC BRAKE CIRCUITS

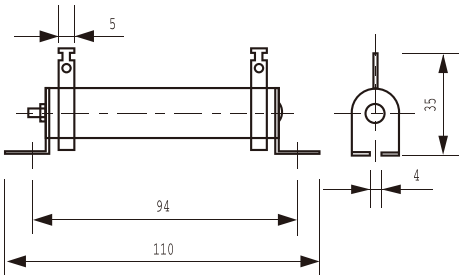
DDR10W10ΩJ (10/10)



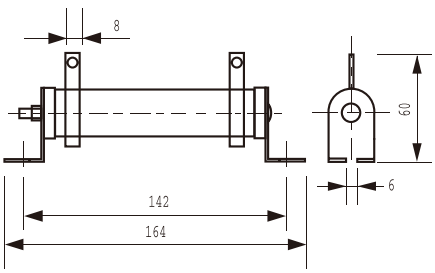
DDR20W20ΩJ (20/20)



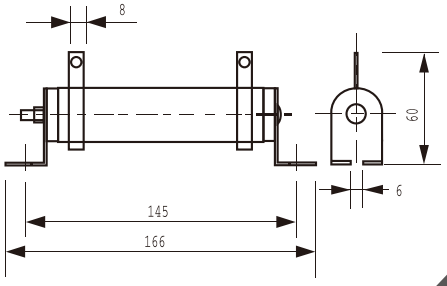
DDR30W20ΩJ (30/20)



DDR50W50ΩJ (50/50)

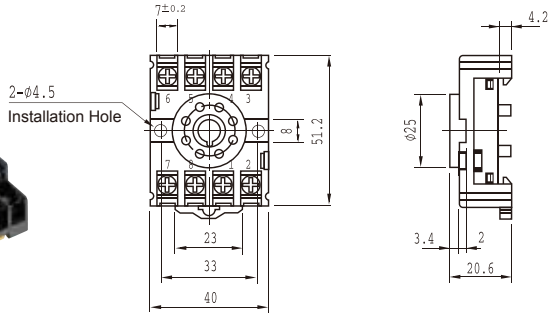


DDR80W50ΩJ (80/50)



EXTENDED BASE BRACKET

PF-083A PIN Base (8 PIN)



11-PFA PIN Base (11 PIN)