

ELECTRIC Multi-Turn Type ACTUATOR

DATA SHEET

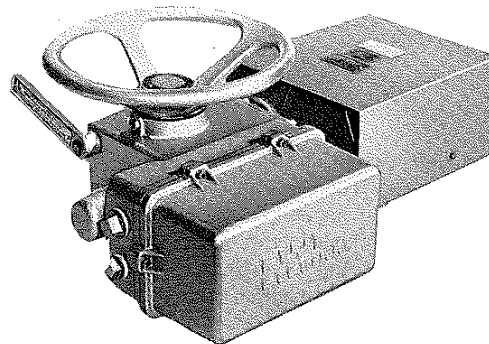
ZJS

The Electric Actuator Type ZJS permits highly efficient actuation of the final control elements for automatic control system as various types of valves and so on.

The actuator makes it possible to start and stop the final control elements with high reliability and at high repetition rate, with brake motors having strong and excellent braking characteristics.

FEATURS

1. The actuator withstands very frequent start and stop operations.
2. The actuator performs start and stop operations with high reliability to signals.
3. Torque limit switches are built in to assure adequate closing torque for fully closed conditions of valves and to protect them from abnormal overload.
4. The actuator can be equipped with a high performance slide rheostat as a position transmitter or a contactless induction potentiometer for current signal output.
5. The torque limit switches, travel limit switches, position transmitters, etc. are concentrated at a single junction box for easy adjusting.
6. Such an automatic reset system is employed, as with only operating the motor, the actuator is simply changed from "manual" to "auto" mode.
7. The motor comprises overheat protective PTC thermistor sensors.
8. The mounting with the final control elements is designed in accordance with international flange standards.



ZJS2

Output torque:	ZJS1	2,	3 kgm
	ZJS2	5,	8 kgm
	ZJS3	15,	25 kgm
	ZJS4	40,	70 kgm
	ZJS5	118,	200 kgm

Output shaft speed:	4.5 (5.4) rpm	50(60) Hz
	5 (6) rpm	50(60) Hz
	6 (7.2) rpm	50(60) Hz
	7 (8.4) rpm	50(60) Hz
	10 (12) rpm	50(60) Hz
	15 (18) rpm	50(60) Hz
	20 (24) rpm	50(60) Hz
	7/28(8.4/33.6) rpm	50(60) Hz

Pole-change motor used.

Note 1) 7/28 (8.4/33.6) rpm is available with ZJS3 only.

SPECIFICATIONS

- Control signal:** Normal-reverse contact signal
Maximum operating number of switching per hour
1200 sw/h at motor output of 2.2kW or lower
600 sw/h at motor output exceeding 2.2kW
Percentage duty switching; 25% ED
- Starting time:** 0.2 sec or less (time required to reach the rated speed after the power is applied to motor)
- Braking time:** 0.2 sec or less (time required to reach full stop after the power to motor is cut off)

Full stroke: 4.5, 5, 6, 7, 10, 15, 20 rev.

Full stroke traveling time (sec at 50 Hz)

Output shaft speed Full stroke	4.5(5.4) rpm	5(6) rpm	6(7.2) rpm	7(8.4) rpm	10(12) rpm	15 (18) rpm	20(24) rpm	7/28(8.4/33.6) rpm
4.5	60 (50)	54 (45)	45 (38)	39 (32)	27 (23)	18 (15)	14 (11)	39/10 (32/8)
5	67 (56)	60 (50)	50 (42)	43 (36)	30 (25)	20 (17)	15 (13)	43/11 (36/9)
6	80 (67)	72 (60)	60 (50)	51 (43)	36 (30)	24 (20)	18 (15)	51/13 (43/11)
7	93 (78)	84 (70)	70 (58)	60 (50)	42 (35)	28 (23)	21 (18)	60/15 (50/13)
10	133 (111)	120 (100)	100 (83)	86 (71)	60 (50)	40 (33)	30 (25)	86/21 (71/18)
15	200 (167)	180 (150)	150 (125)	129 (107)	90 (75)	60 (50)	45 (38)	129/32 (107/27)
20	267 (222)	240 (200)	200 (167)	171 (143)	120 (100)	80 (67)	60 (50)	171/43 (143/38)

Note 1) Numerals in parentheses denote traveling times at 60 Hz.

Motor: Output see Table 1
 Power supply
 AC 200/220²⁰⁰V, 50/60 Hz, 3 ϕ
 AC 400/440⁴⁰⁰V, 50/60 Hz, 3 ϕ
 AC 220V, 50 Hz, 3 ϕ
 AC 440V, 50 Hz, 3 ϕ
 AC 380V, 50/60 Hz, 3 ϕ
 Number of poles; 4, 8/2 pole-change motor

Class of insulation; F
 Brake; Electromagnetic brake operating in non-excited condition
 PTC thermistor sensors comprised
Torque limit switch, travel limit switch, intermediate switch:
 Torque limit switch; 1 each for opening and closing (1a, 1b)
 Travel limit switch; 1 each for opening and closing (1a, 1b)
 Intermediate switch;
 Up to 2 attachable (1a, 1b)

Contact capacity

Power supply Voltage (V)	Resistive load (A)				Inductive load (A)			
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
AC	125	10	3	1.5	10	4	2	
	250	10	2	1	10	3	1.5	
DC	8	10	6	3	10	6	6	
	14	10	6	3	10	6	6	
	30	6	4	3	6	4	4	
	125	0.4	0.1	0.1	0.4	0.1	0.1	
	250	0.3	0.05	0.05	0.2	0.05	0.05	

Position transmitter:
 Slide rheostat;
 Total resistance 120 Ω , variable resistance 100 Ω up to 2 attachable
 Electronic position transmitter;
 Power supply DC 24V
 Output DC 4~20mA, two-wire system

Heater: For prevents water-drop in switching and signalling unit
 Heater capacity; 10W
 Power supply; AC 100V or AC 200V

Type of output shaft:
 Female shaft with key

Note) Male shaft with key also available inquiry to be made to the manufacturer.

Conduit connection:
 Motor; See external view
 Switching and signalling unit;
 internal thread PF1 x 1
 internal thread PF $\frac{3}{4}$ x 1

Ambient temperature:
 -20~+60 $^{\circ}$ C

Ambient humidity:
 95% RH or less

Enclosure: All weather type (JIS F 8001 Class-3 waterproof construction)

Lubricating fluid:
 Grease

External dimensions:
 See external view

Weight: See Table 1

Finish color: Silver (melamine coating)
 Finish in specified color, acid- and alkali-proof treatment also available.

Scope of delivery:
 Electric actuator

Table 1 Output torque—Output shaft speed—Motor Output—Weight (at 50 Hz)

Type	Output torque (kgm)	Output shaft speed (rpm)	Motor output (kW)	Weight (approx.) (kg)	
ZJS 1	2	4.5 (5.4)	0.1	32	
		5 (6)			
		6 (7.2)			
		7 (8.4)			
		10 (12)			
	15 (18)				
	3	4.5 (5.4)	0.1		
		5 (6)			
		6 (7.2)			
		7 (8.4)			
10 (12)					
ZJS 2	5	4.5 (5.4)	0.1	41	
		5 (6)			
		6 (7.2)			
		7 (8.4)			
		10 (12)			
	15 (18)				
	8	4.5 (5.4)	0.2		45
		5 (6)			
		6 (7.2)			
		7 (8.4)			
10 (12)					
ZJS 3	15	4.5 (5.4)	0.4	79	
		5 (6)			
		6 (7.2)			
		7 (8.4)			
		10 (12)			
	15 (18)				
	25	4.5 (5.4)	0.75		82
		5 (6)			
		6 (7.2)			
		7 (8.4)			
10 (12)					
ZJS 4	40	4.5 (5.4)	0.75	171	
		5 (6)			
		6 (7.2)			
		7 (8.4)			
		10 (12)			
	15 (18)				
	70	4.5 (5.4)	1.5		190
		5 (6)			
		6 (7.2)			
		7 (8.4)			
10 (12)					
ZJS 5	118	4.5 (5.4)	2.2	286	
		5 (6)			
		6 (7.2)			
		7 (8.4)			
		10 (12)			
	200	4.5 (5.4)	3.7		306
		5 (6)			
		6 (7.2)			
		7 (8.4)			
		10 (12)			

Note 1) Numerals in parentheses denote output shaft speed at 60 Hz.

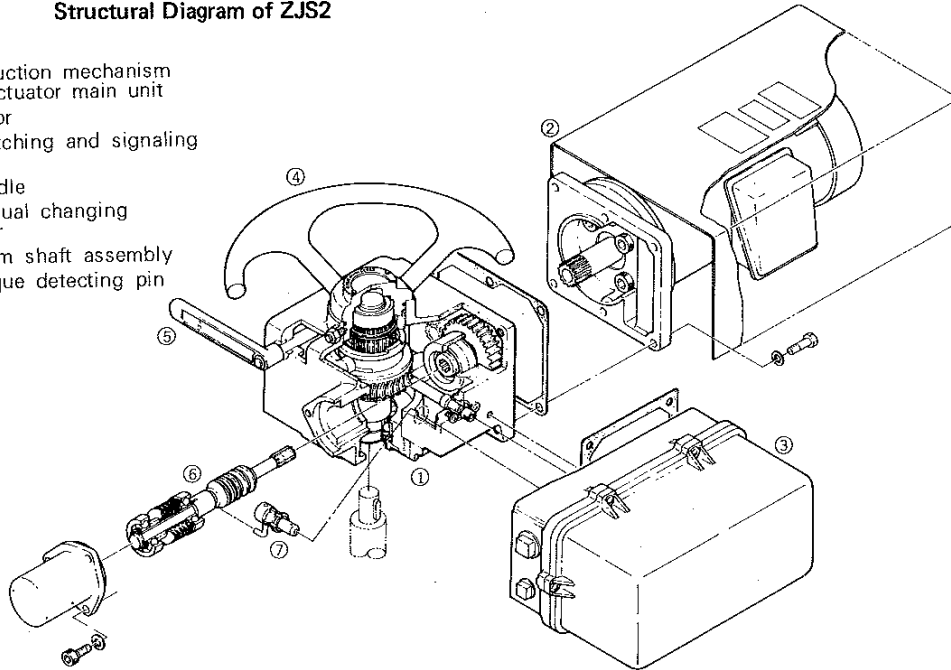
CODE SYMBOLS

Z	J	S				1				
1	A									Output torque
1	B									2 kg m (setting; CW, CCW is same)
2	C									3 kg m (setting; CW, CCW is same)
2	D									5 kg m (setting; CW, CCW is same)
3	E									8 kg m (setting; CW, CCW is same)
3	F									15 kg m (setting; CW, CCW is same)
4	G									25 kg m (setting; CW, CCW is same)
4	H									40 kg m (setting; CW, CCW is same)
5	J									70 kg m (setting; CW, CCW is same)
5	K									118 kg m (setting; CW, CCW is same)
4	L									200 kg m (setting; CW, CCW is same)
4	M									40 kg m (setting; CW 40, CCW 29,5 kg.m)
5	N									70 kg m (setting; CW 70, CCW 52 kg.m)
5	P									118 kg m (setting; CW118, CCW 87 kg.m)
										200 kg m (setting; CW200, CCW148 kg.m)
										Output shaft speed at 50(60) Hz
	A									5 (6) rpm
	B									7 (8.4) rpm
	C									10 (12) rpm (Not applicable to ZJS5K,ZJS5P)
	D									15 (18) rpm (Not applicable to ZJS5J,ZJS6K,
	E									20 (24) rpm ZJS5N,ZJS5P)
	F									7/28(8.4/33.6)rpm (ZJS3 only)
	G									4.5 (5.4) rpm
	H									6 (7.2) rpm
										Full stroke
	1									5 revolution
	2									7 revolution
	3									10 revolution
	4									15 revolution
	5									20 revolution
	6									4.5 revolution
	7									6 revolution
										Position transmitter
	0									None
	1									With slide rheostat: Total resistance 120Ω and variable resistance 100Ω x 1 each
	2									With slide rheostat; Total resistance 120Ω and variable resistance 100Ω x 2 each
	3									With electronic position transmitter (output increased by turning output shaft CW)
	4									With electronic position transmitter (output increased by turning output shaft CCW) Note) Output shaft rotating direction when looking toward output shaft
										Power supply
	F									AC200/200 V, 50/60 Hz 220
	H									AC220V 50 Hz
	K									AC400/400 V, 50/60 Hz 440
	M									AC440V 50 Hz
	P									AC380V 50/60 Hz
										Intermediate switch
	0									None
	1									With 1a and 1b, one each
	2									With 1a and 1b, 2 each
										Heater
	0									None
	1									With space heater (for AC 100V)
	2									With space heater (for AC 200V)
										Treatment
	Y									None (standard)
	B									Acid and alkali-proof treatment

CONSTRUCTION

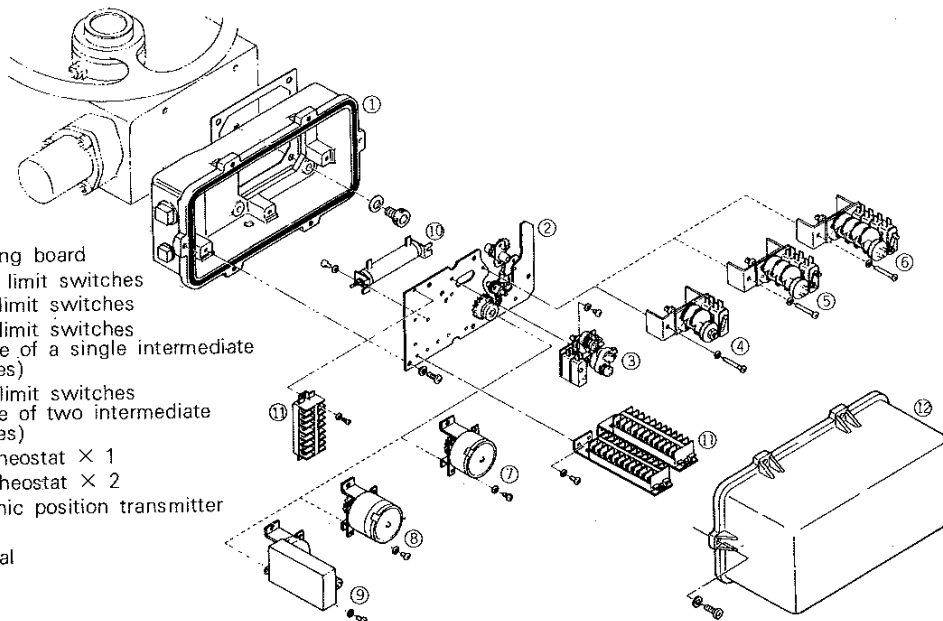
Structural Diagram of ZJS2

- ① Reduction mechanism of actuator main unit
- ② Motor
- ③ Switching and signaling unit
- ④ Handle
- ⑤ Manual changing lever
- ⑥ Worm shaft assembly
- ⑦ Torque detecting pin

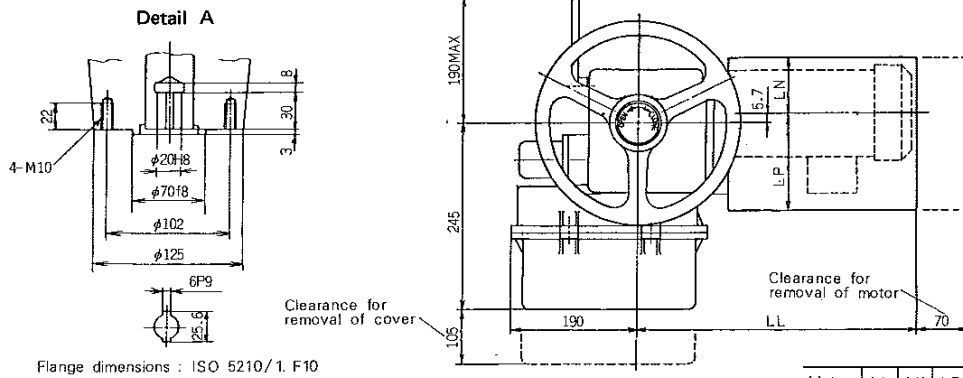


**Structural Diagram of Switching and Signaling Unit
(Common to All Types)**

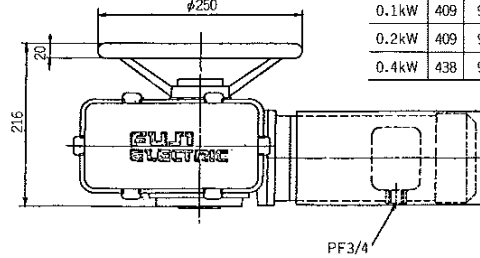
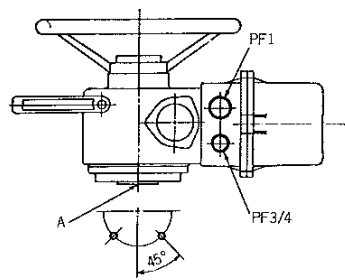
- ① Casing
- ② Mounting board
- ③ Torque limit switches
- ④ Travel limit switches
- ⑤ Travel limit switches (in case of a single intermediate switches)
- ⑥ Travel limit switches (in case of two intermediate switches)
- ⑦ Slide rheostat × 1
- ⑧ Slide rheostat × 2
- ⑨ Electronic position transmitter
- ⑩ Heater
- ⑪ Terminal
- ⑫ Cover



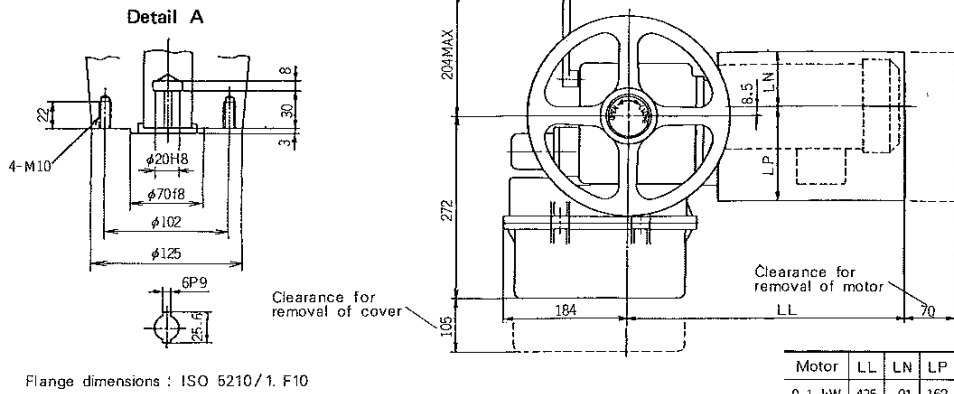
EXTERNAL VIEW (Unit : mm)



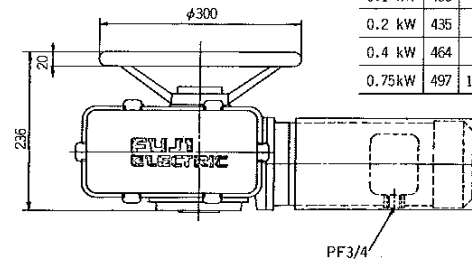
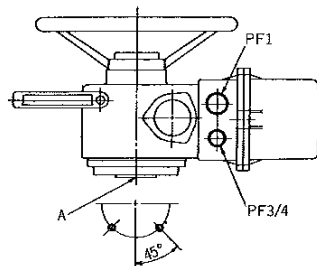
Motor	LL	LN	LP
0.1kW	409	91	162
0.2kW	409	91	162
0.4kW	438	91	162



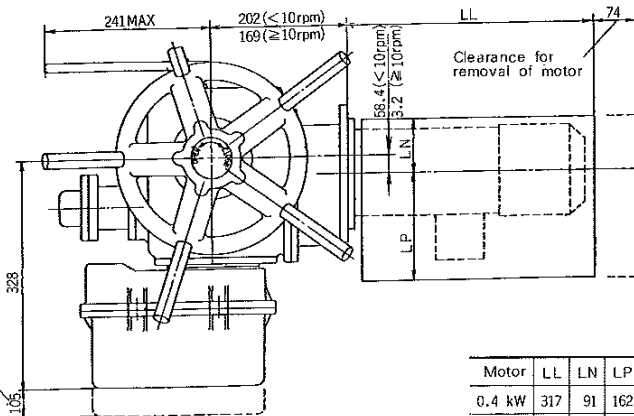
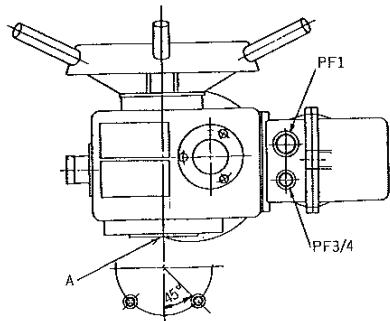
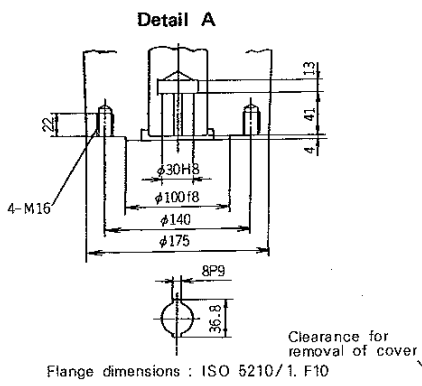
ZJS1



Motor	LL	LN	LP
0.1 kW	435	91	162
0.2 kW	435	91	162
0.4 kW	464	91	162
0.75kW	497	122	167

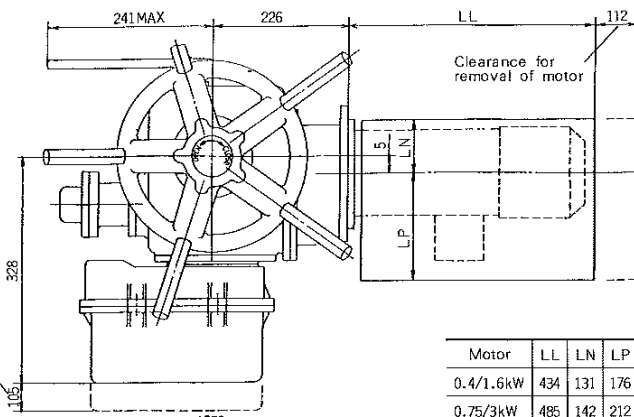
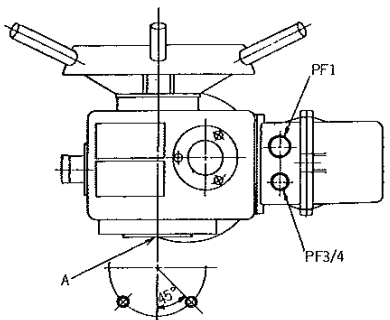
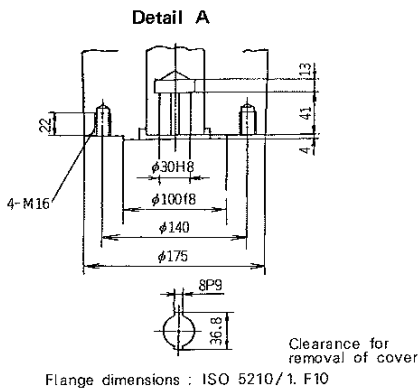


ZJS2



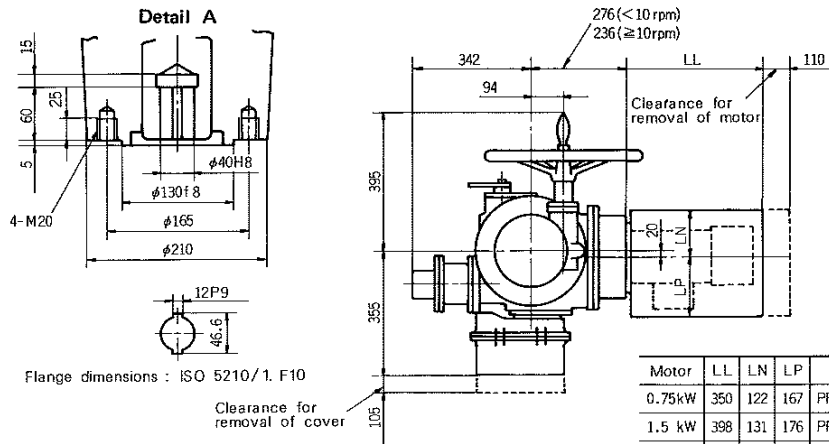
Motor	LL	LN	LP
0.4 kW	317	91	162
0.75kW	350	122	167
1.5 kW	398	131	176

ZJS3

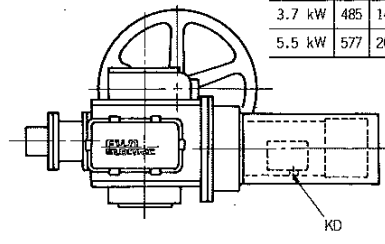
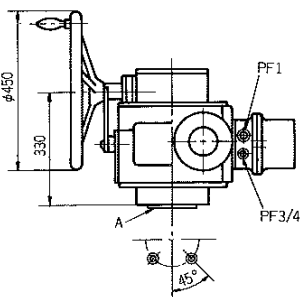


Motor	LL	LN	LP
0.4/1.6kW	434	131	176
0.75/3kW	485	142	212

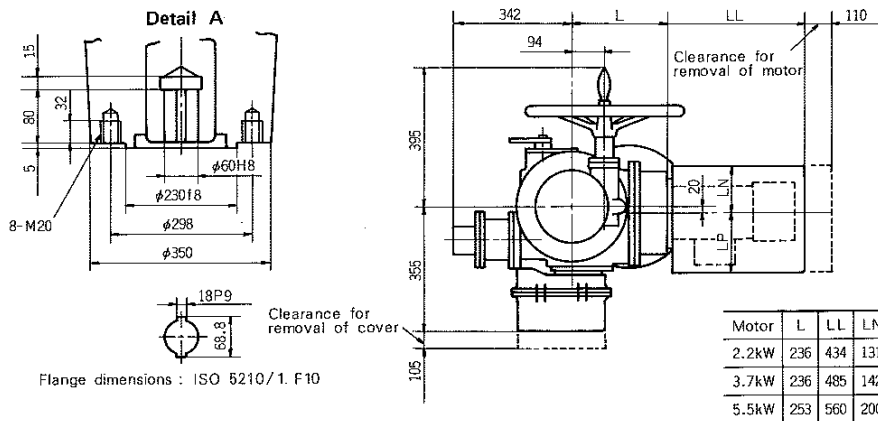
ZJS3 □ F (using pole-change motor)



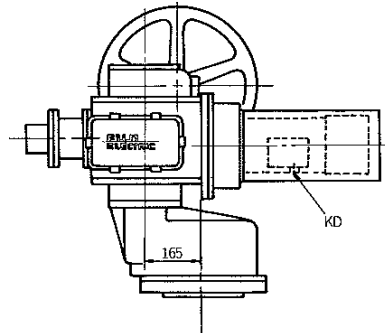
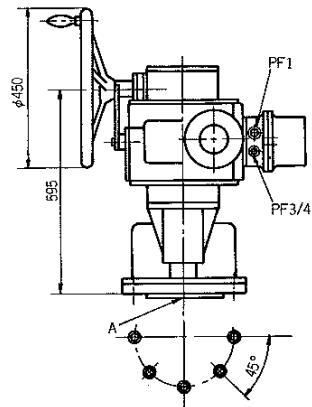
Motor	LL	LN	LP	KD
0.75kW	350	122	167	PF3/4
1.5 kW	398	131	176	PF3/4
2.2 kW	434	131	176	PF3/4
3.7 kW	485	142	212	PF3/4
5.5 kW	577	200	290	PF1



ZJS4



Motor	L	LL	LN	LP	KD
2.2kW	236	434	131	176	PF3/4
3.7kW	236	485	142	212	PF3/4
5.5kW	253	560	200	290	PF1



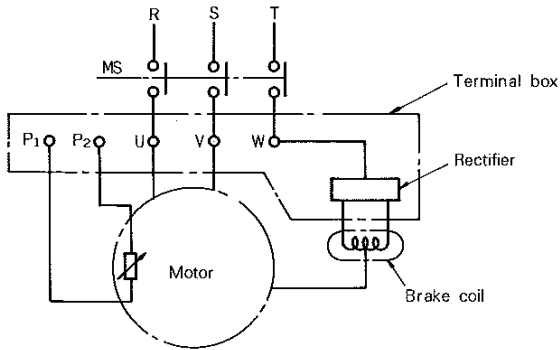
ZJS5

Note: By the turn of the handle clockwise, the output shaft turns counterclockwise as seen from the flange side.

CONNECTION DIAGRAM

Motor

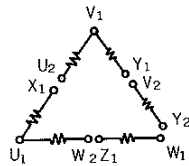
(1) For output of 0.4kW or less



(2) For output of 0.75kW to 3.7kW (double voltage system)

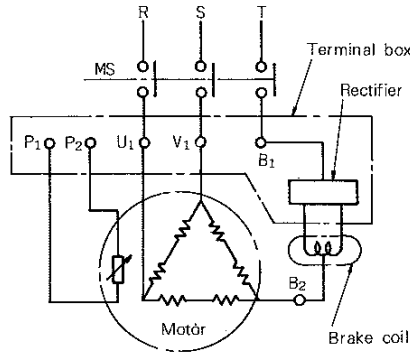
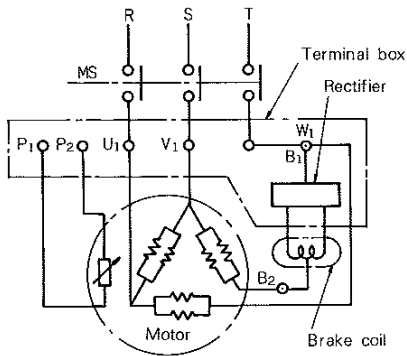
200/200 V 50/60 Hz

R	S	T
U ₁	V ₁	W ₁
U ₂	V ₂	W ₂
Z ₁	X ₁	B ₁
Y ₁ -Y ₂ -B ₂		



400/400 V 50/60 Hz

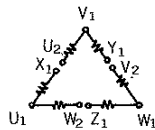
R	S	T
U ₁	V ₁	B ₁
U ₂	V ₂	W ₂
X ₁	Y ₁	Z ₁
W ₁ -Y ₂ -B ₂		



(3) For output of 5.5kW (double voltage system)

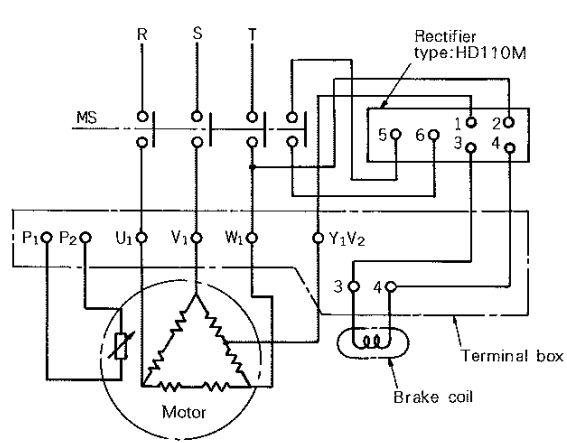
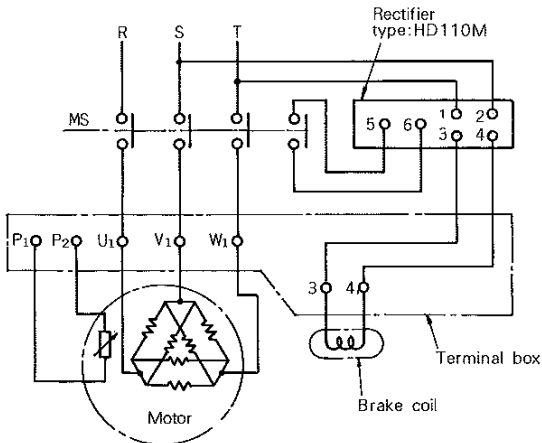
200/200 V 50/50 Hz

R	S	T
U ₁	V ₁	W ₁
U ₂	V ₂	W ₂
Z ₁	X ₁	Y ₁



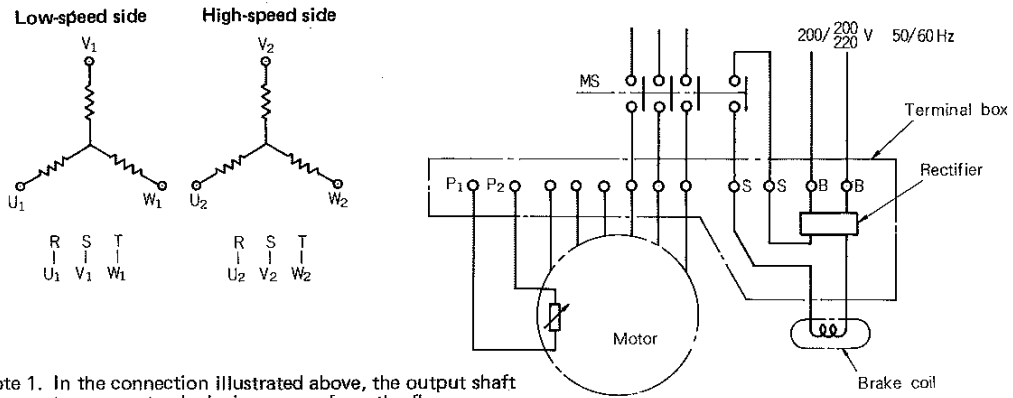
400/400 V 50/60 Hz

R	S	T
U ₁	V ₁	W ₁
U ₂	V ₂	W ₂
X ₁	Y ₁	Z ₁



Note: In case of motor output of 5.5 kW, the rectifier for motor brake (type; HD110M) is separated from electric actuator.

(4) Pole-change motor 0.4/1.6, 0.75/3kW, 8/2P



Note 1. In the connection illustrated above, the output shaft turns counterclockwise as seen from the flange.

However, it turns clockwise in case of ZJS3

E	A
F	B
G	C
H	D

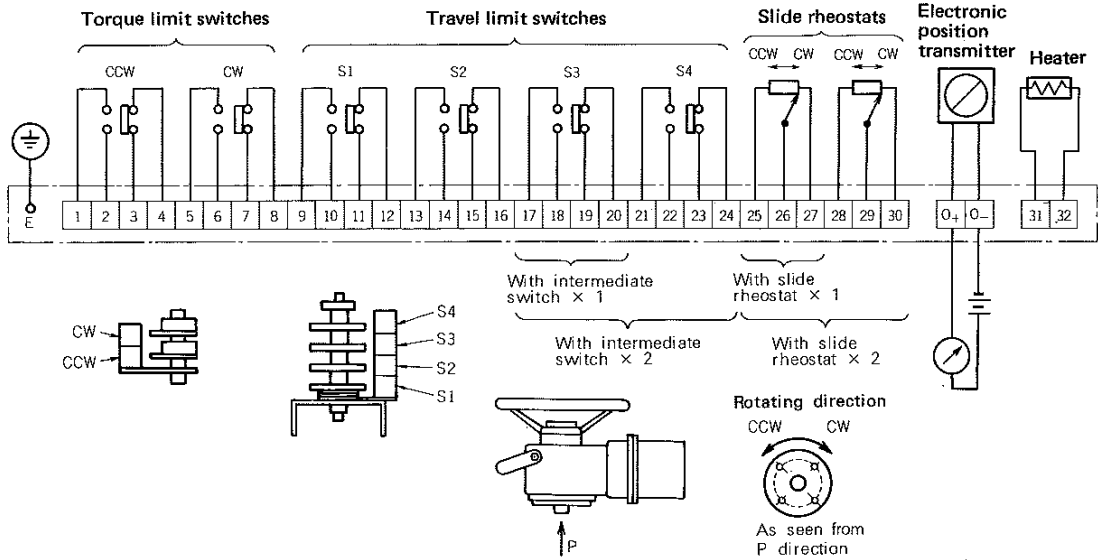
ZJS4

G	A
H	B
L	C
M	D

, ZJS5

Note 2. Terminals P₁ and P₂ are connected only when a motor guard relay unit is used.

Switching and signaling

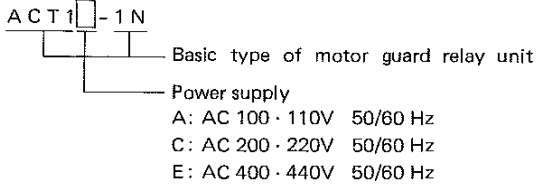


RELATED UNITS

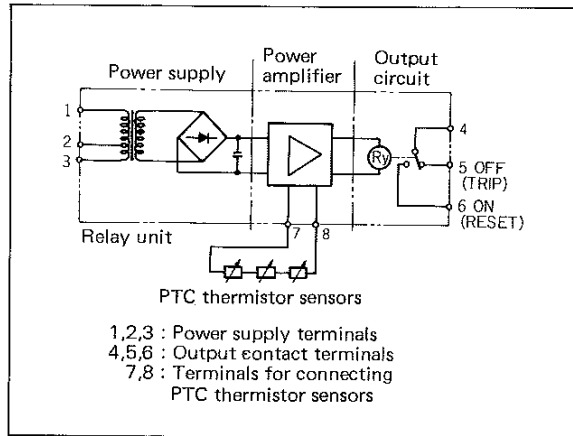
Motor guard relay unit (to be prepared separately)

It is to be prepared for protecting the motor with PTC thermistor sensors.

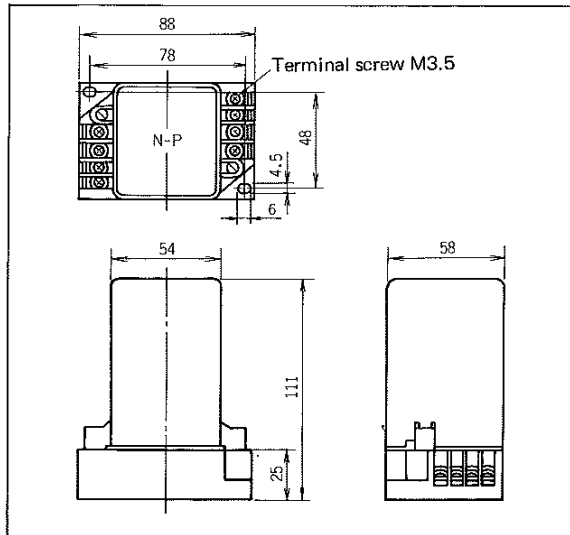
1. Type



2. Motor Guard Relay Unit Circuit



3. External View



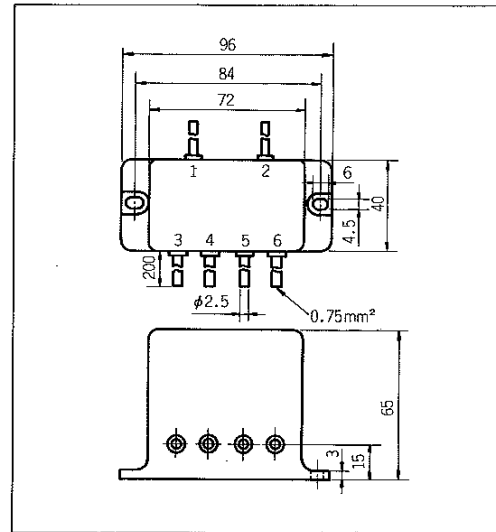
Rectifier for motor brake (separate type)

This rectifier is added to a motor rated for output of 5.5kW. (Type; ZJS4HE or ZJS5KB)

1. Type

HD110M

2. External view (unit; mm)



Note) · Alterations reserved without notice.
 · Contact us for specifications unlisted herein.
 · Asterisk (*) items; Non-standard.



Fuji Electric Co.,Ltd.

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