POPULAR SERVO

DC SERVO DRIVE SYSTEM PS SERIES FOR POSITIONING CONTROL

SERVOMOTOR: TYPES UGTMEM, UGPMEG, UGPMEE
SERVOPACK: TYPES CPCR-PSA3CWY (FOR TWO AXES),
CPCR-PSA3CSY (FOR ONE AXIS)

YASKAWA

With the manufacturing technology enhanced over a half-century and accmulated servo application knowhow, YASKAWA is dedicated to developing YASKAWA DC SERVO DRIVES.

We have developed the single-axis specialized POPULAR SERVO (PS series) to meet market demands. This servo allows selecting a single-axis as a component of a combination of axes. Adding to the conventional double-axis specialized PS, the new POPULAR SERVO offers a broader range of selection of machine types for different purposes.

This manual consists of three sections: PRODUCT OUTLINE, DESIGN and SERVICE. PRODUCT OUTLINE describes specifications, dimensions and configurations. DESIGN shows details of product specifications and SERVICE adjusting methods and troubleshooting.

FEATURES

(1) Free combination of axes by selecting indivisual axes

The single-axis specialized POPULAR SERVO offers free axis combinations for different purposes by selecting every component axis.

(2) 2 axes provided on one board

PS Series is composed of a cable and two motors exclusively used for one-board type controllers (SERVOPACK), which utilizes user's space factor effectively.

(3) Various types

A suitable motor can be available for any machine by selecting high/low torque and high/low revolution types.

(4) Higher accuracy

Comparison of resolution
- Stepping motor: 0.72 deg/step (Approx. 500 pulses/rev)
- DC servo: 0.3 deg/step (600 pulses/rev × 2-multiplier)

(5) High-speed

Comparison of instructed frequency
- Stepping motor: 10 kpps (1200 r/min)
- DC servo: 60 kpps (3000r/min) (600 pulses/rev × 2-multiplier)

(6) High-acceleration

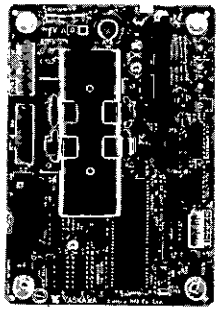
(7) Smooth operation at low speed

(8) Low noise

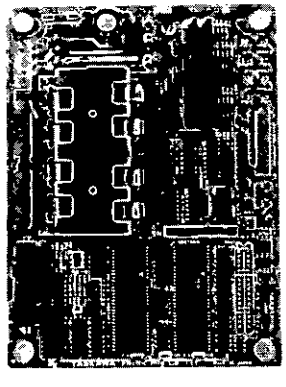
Free from magnetic noise peculiar to stepping motors.

(9) The optical encoder is provided with zero point pulse.

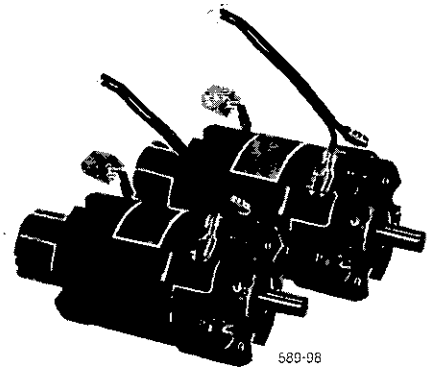
(10) The motors and the SERVOPACK can easily be connected with the cable attached.



SERVOPACK
(For 1 Axis Type)



SERVOPACK
(For 2 Axes Type)



Minertia Mother

CONTENTS

PRODUCT OUTLINE

1. CONFIGURATION

Fig. 1 and 2 show the configuration of PS Series.

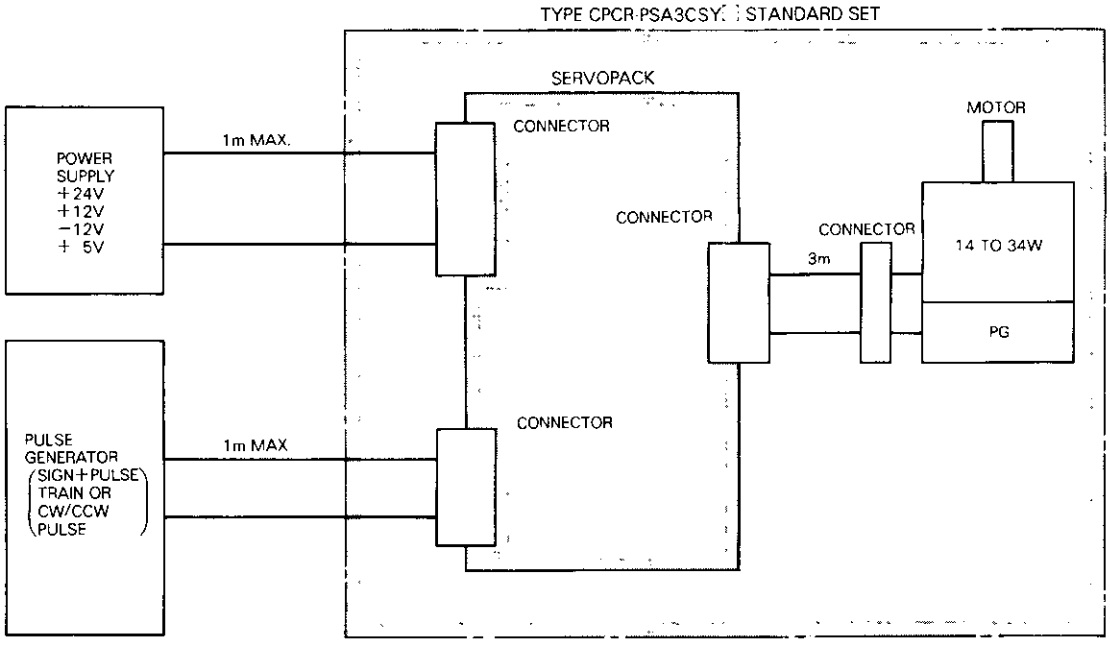


Fig. 1 Configuration (For 1 Axis Type)

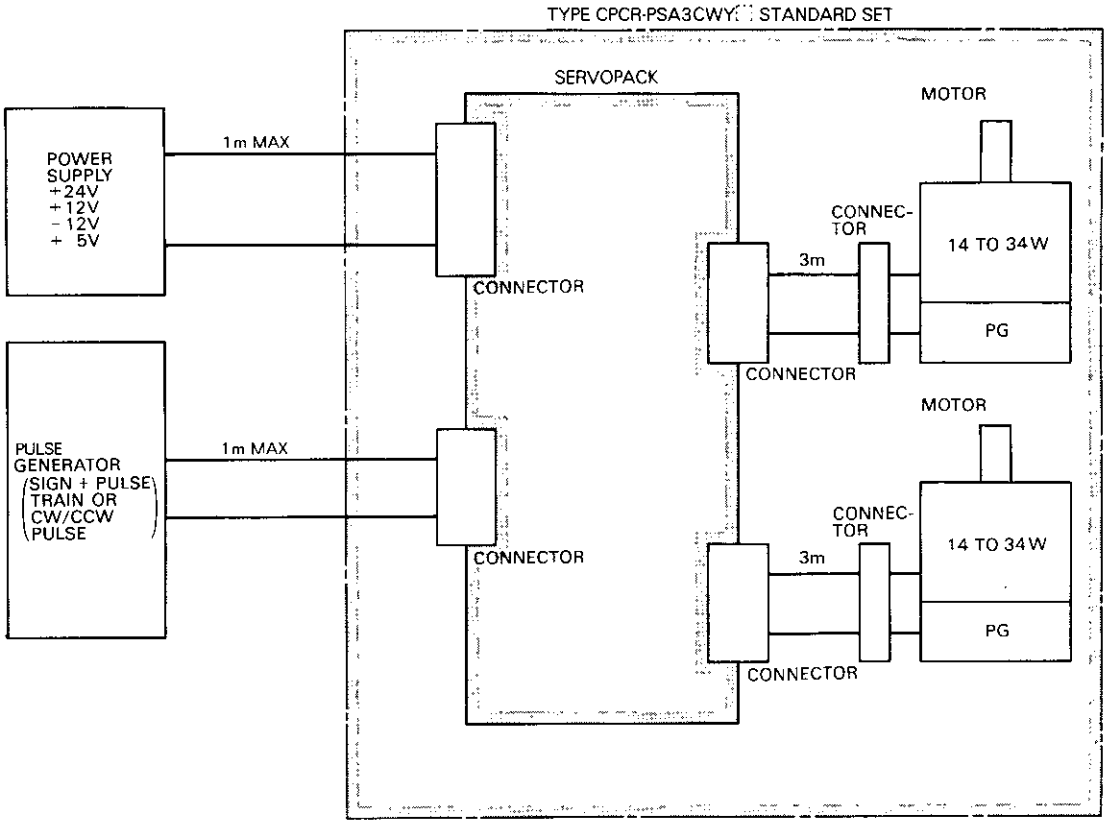


Fig. 2 Configuration (For 2 Axes Type)

2. STANDARD CONFIGURATION

PS Series is a set consisting of one SERVOPACK, one or two motors with the same capacity and connection cable.
Refer to Table 1 and 2 for your inquiries.

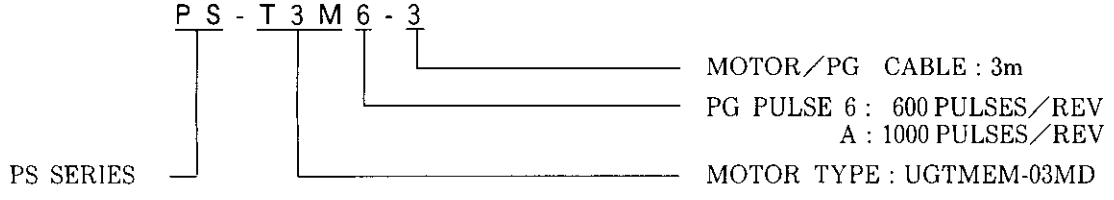
(1) TYPES CPCR-PSA 3 CSY ☐ (For 1 Axis Type)

Table 1 Standard Set Contents

Product Code	SERVOPACK (1 Unit)	Motor (1 Units)	Cable		
			For motor, PG (3m × 2)	For command input (1m × 1)	For power supply (1m × 1)
PS-P7J6-3	CPCR-PSA 3 CSY 1	UGPMEG-07D*	CPCR-CC 03	CPCR-CC 02	CPCR-CC 01
PS-P9J6-3	CPCR-PSA 3 CSY 3	UGPMEE-09D*			
PS-T1S6-3	CPCR-PSA 3 CSY 5	UGTMEM-01SD	CPCR-CC 04		
PS-T1M6-3	CPCR-PSA 3 CSY 7	UGTMEM-01MD			
PS-T1L6-3	CPCR-PSA 3 CSY 9	UGTMEM-01LD			
PS-T3S6-3	CPCR-PSA3CSY11	UGTMEM-03SD			
PS-T3M6-3	CPCR-PSA3CSY13	UGTMEM-03MD			
PS-T3L6-3	CPCR-PSA3CSY15	UGTMEM-03LD			
PS-T6S6-3	CPCR-PSA3CSY17	UGTMEM-06SD			
PS-T6M6-3	CPCR-PSA3CSY19	UGTMEM-06MD			
PS-T6L6-3	CPCR-PSA3CSY21	UGTMEM-06LD			
PS-T1SA-3	CPCR-PSA3CSY25	UGTMEM-01SD			
PS-T1MA-3	CPCR-PSA3CSY26	UGTMEM-01MD			
PS-T1LA-3	CPCR-PSA3CSY27	UGTMEM-01LD			
PS-T3SA-3	CPCR-PSA3CSY28	UGTMEM-03SD			
PS-T3MA-3	CPCR-PSA3CSY29	UGTMEM-03MD			
PS-T3LA-3	CPCR-PSA3CSY30	UGTMEM-03LD			
PS-T6SA-3	CPCR-PSA3CSY31	UGTMEM-06SD			
PS-T6MA-3	CPCR-PSA3CSY32	UGTMEM-06MD			
PS-T6LA-3	CPCR-PSA3CSY33	UGTMEM-06LD			

* DC reactor is provided. (Type : X 5040)

Notes : 1. Any combination other than the standard is available on consultant.
(EX.: With 500 pulses/rev)
2. Product code description



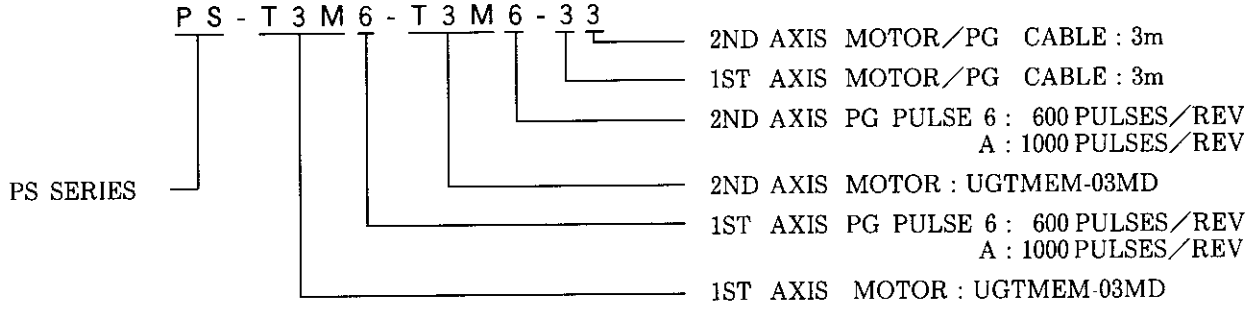
(2) TYPES CPCR-PSA3CWY□ (For 2 Axes Type)

Table 2 Standard Set Contents

Product Code	SERVOPACK (1 Unit)	Motor (2 Units)	Cable		
			For motor, PG (3m × 2)	For command input (1m × 1)	For power supply (1m × 1)
PS-P7J6-P7J6-33	CPCR-PSA3CWY1	UGPMEG-07D*	CPCR-CC03	CPCR-CC02	CPCR-CC01
PS-P9J6-P9J6-33	CPCR-PSA3CWY3	UGPMEE-09D*			
PS-T1S6-T1S6-33	CPCR-PSA3CWY5	UGTMEM-01SD	CPCR-CC04		
PS-T1M6-T1M6-33	CPCR-PSA3CWY7	UGTMEM-01MD			
PS-T1L6-T1L6-33	CPCR-PSA3CWY9	UGTMEM-01LD			
PS-T3S6-T3S6-33	CPCR-PSA3CWY11	UGTMEM-03SD			
PS-T3M6-T3M6-33	CPCR-PSA3CWY13	UGTMEM-03MD			
PS-T3L6-T3L6-33	CPCR-PSA3CWY15	UGTMEM-03LD			
PS-T6S6-T6S6-33	CPCR-PSA3CWY17	UGTMEM-06SD			
PS-T6M6-T6M6-33	CPCR-PSA3CWY19	UGTMEM-06MD			
PS-T6L6-T6L6-33	CPCR-PSA3CWY21	UGTMEM-06LD			
PS-T1SA-T1SA-33	CPCR-PSA3CWY25	UGTMEM-01SD			
PS-T1MA-T1MA-33	CPCR-PSA3CWY26	UGTMEM-01MD			
PS-T1LA-T1LA-33	CPCR-PSA3CWY27	UGTMEM-01LD			
PS-T3SA-T3SA-33	CPCR-PSA3CWY28	UGTMEM-03SD			
PS-T3MA-T3MA-33	CPCR-PSA3CWY29	UGTMEM-03MD			
PS-T3LA-T3LA-33	CPCR-PSA3CWY30	UGTMEM-03LD			
PS-T6SA-T6SA-33	CPCR-PSA3CWY31	UGTMEM-06SD			
PS-T6MA-T6MA-33	CPCR-PSA3CWY32	UGTMEM-06MD			
PS-T6LA-T6LA-33	CPCR-PSA3CWY33	UGTMEM-06LD			

* Two DC reactors are provided.

Notes : 1. The motor is provided with optical encoder having 90° difference 2-phase pulse and zero point pulse.
2. Any combination other than the standard is available on consultant.
(EX.: With 500 pulses/rev)
3. Product code description



3. CONNECTION

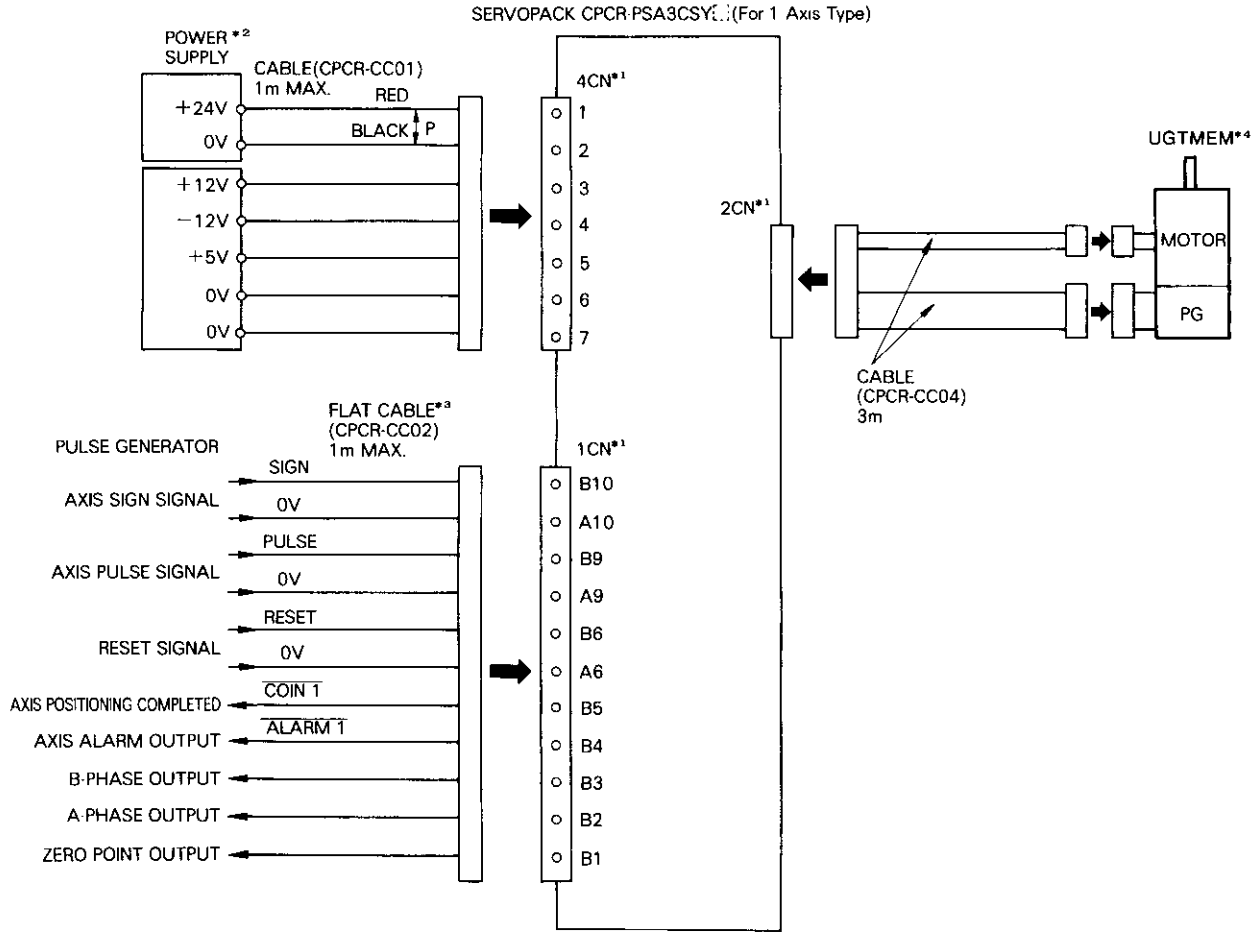
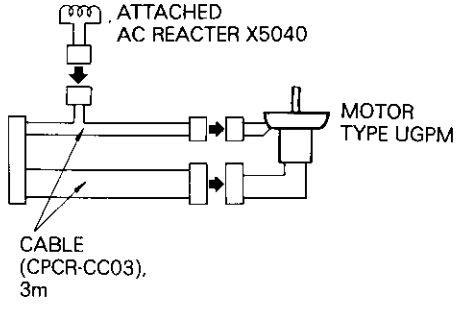


Fig. 3 Typical Connection of SERVOPACK (CPCR-PSA3CSY□), Motor and Peripheral Devices

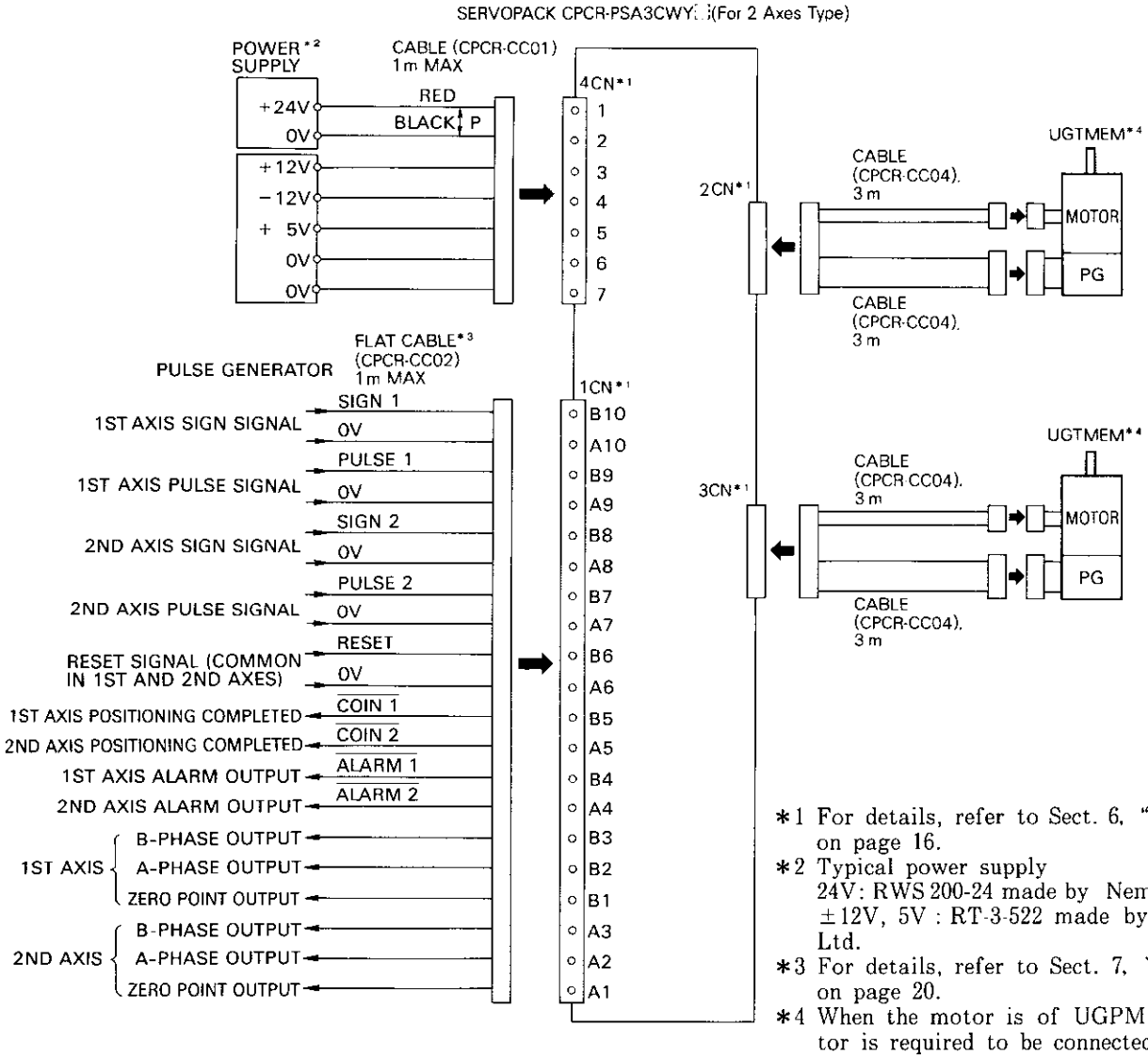
Table 3 Connector List

	SERVOPACK Side Connector Type	Cable Side Connector Type	Cable Side Pin Type	Remarks
CN 1	PS-20PE-D4T1-LP 1 (JAE)	PS-20SEN-D4P 1-IC	–	Flat cable
CN 2	5273-08A (MOLEX)	5195-08	5225TL 5194TL	Caulking tool JHTR5906 (5225TL) JHTR5904 (5194TL)
CN 4	5273-07A (MOLEX)	5195-07		

*1 For details, refer to Sect. 6, "CONNECTORS" on page 16.
*2 Typical power supply
24V: RWS 200-24 made by Nemic Ramda, Ltd.
±12V, 5V : RT-3-522 made by Nemic Ramda, Ltd.
*3 For details, refer to Sect. 7, "I/O SIGNALS" on page 20.
*4 When the motor is of UGPM type, DC reactor is required to be connected.



3. CONNECTION (Cont'd)



*1 For details, refer to Sect. 6, "CONNECTORS" on page 16.
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24V: RWS 200-24 made by Nemic Ramda, Ltd.
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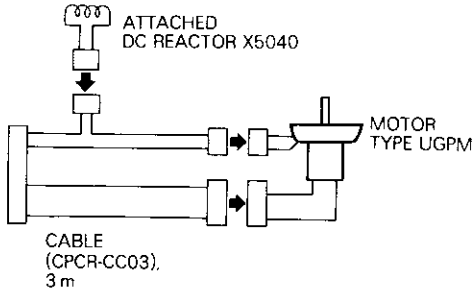
*3 For details, refer to Sect. 7, "I/O SIGNALS" on page 20.
*4 When the motor is of UGPM type, DC reactor is required to be connected.

Fig. 4 Typical Connection of SERVOPACK (CPCR-PSA3CWY□), Motor and Peripheral Devices

Table 4 Connector List

	SERVOPACK Side Connector Type	Cable Side Connector Type	Cable Side Pin Type	Remarks
CN 1	PS-20PE-D4T1-LP 1 (JAE)	PS-20SEN-D4P 1-1C	–	Flat cable
CN 2 CN 3	5273-08A (MOLEX)	5195-08	5225TL 5194TL	Caulking tool JHTR5906 (5225TL) JHTR5904 (5194TL)
CN 4	5273-07A (MOLEX)	5195-07		

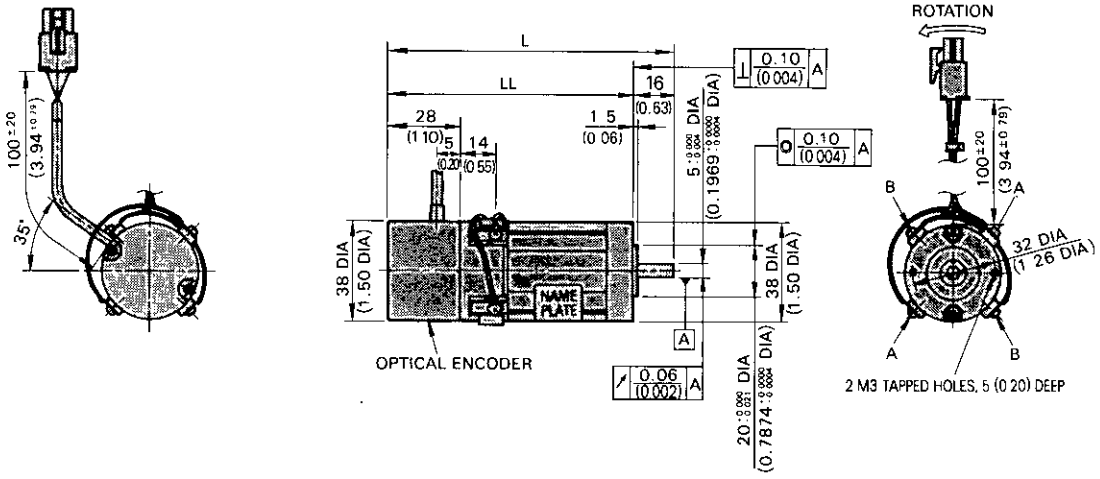


4. DIMENSIONS in mm (inches)

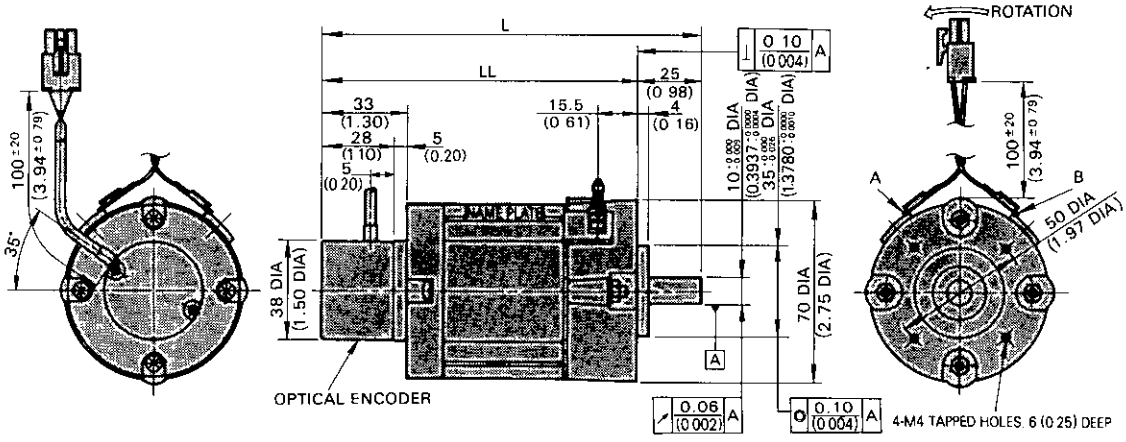
4.1 MOTORS

A, B: External terminal
Note: For dimensions of L and LL, see the next page.

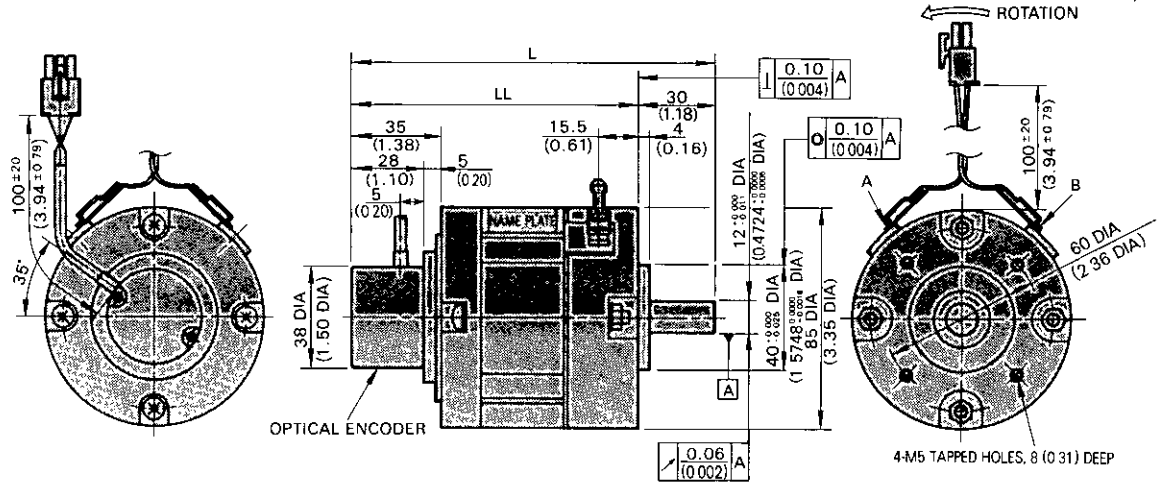
• UGTMEM - 01



• UGTMEM - 03

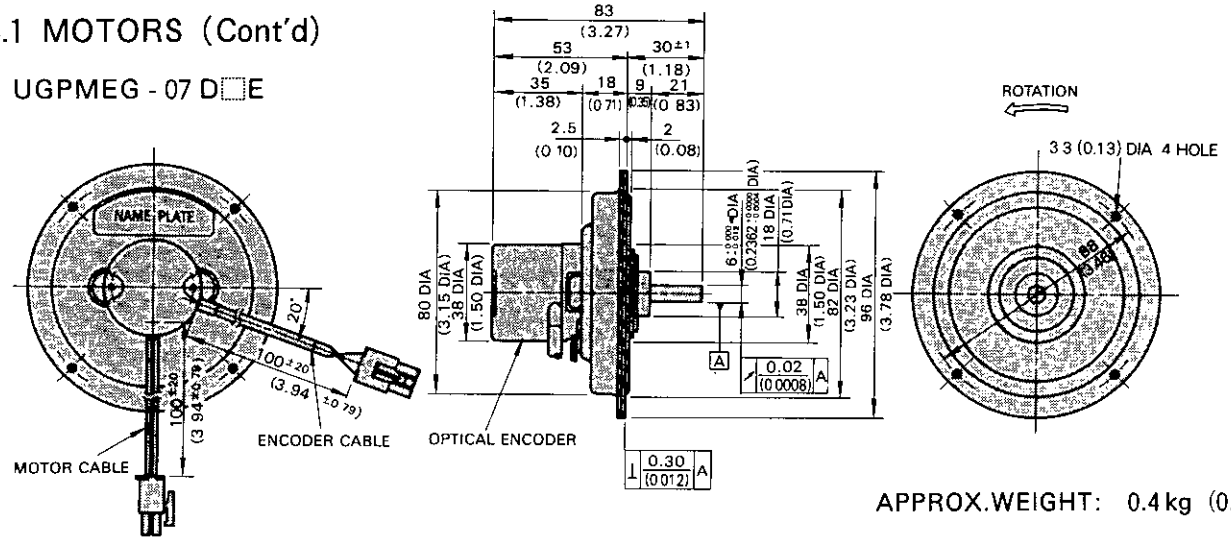


• UGTMEM - 06



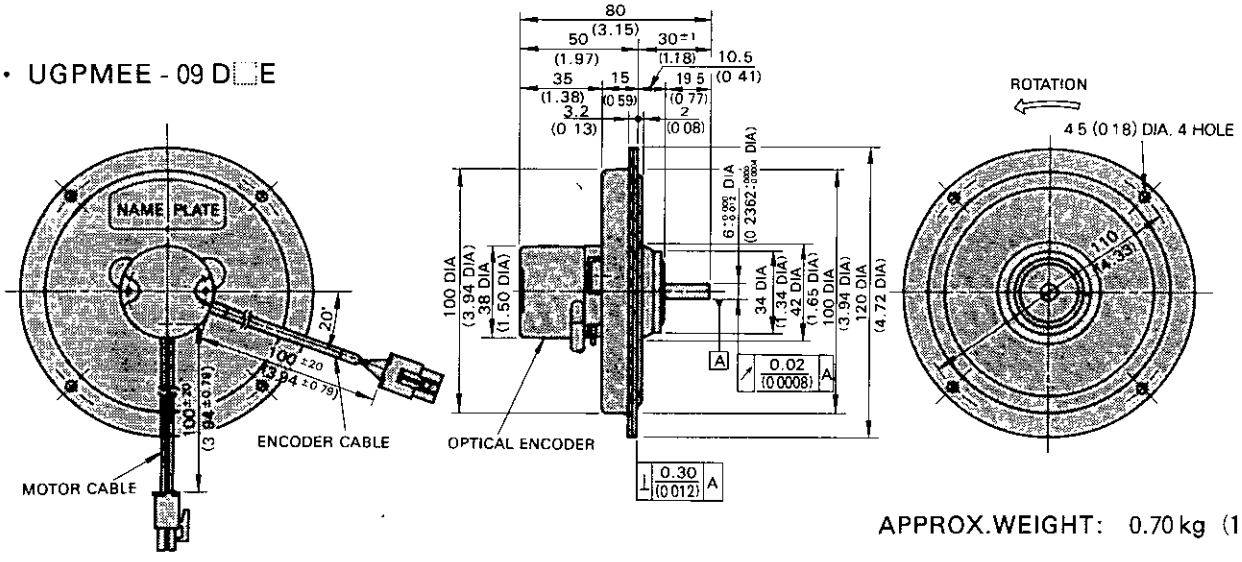
4.1 MOTORS (Cont'd)

• UGPMEG - 07 D□E



APPROX.WEIGHT: 0.4 kg (0.9 lb)

• UGPMEE - 09 D□E



APPROX.WEIGHT: 0.70 kg (1.5 lb)

Motor Type	L	LL	Approx Weight kg / lbs
UGTMEM-01SD4□E	91.5	75.5	0.28
	3.60	2.97	0.62
UGTMEM-01MD4□E	101	85	0.34
	3.98	3.35	0.75
UGTMEM-01LD4□E	110.5	94.5	0.42
	4.35	3.72	0.92
UGTMEM-03SD2□E	135	110	1.1
	5.31	4.33	2.4
UGTMEM-03MD2□E	149	124	1.3
	5.87	4.88	2.9
UGTMEM-03LD2□E	163	138	1.5
	6.42	5.43	3.3
UGTMEM-06SD2□E	140	110	1.6
	5.51	4.33	3.5
UGTMEM-06MD2□E	147	117	1.7
	5.79	4.61	3.7
UGTMEM-06LD2□E	168	138	2.6
	6.61	5.43	5.5

Note:
ALL DIMENTIONS in $\frac{\text{mm}}{\text{in}}$

Optical Encoder Type	Pulse/Rev
UTOPI - 050 MX	500
UTOPI - 060 MX *	600
UTOPI - 100MX *	1000

*: STANDARD

MOTOR CONNECTOR
AMP 172165 - 1

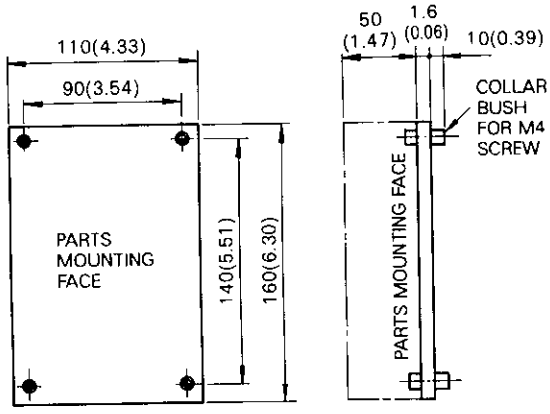
1	A(+)	Red
2	B(−)	Black

ENCODER CONNECTOR
AMP 172168 - 1

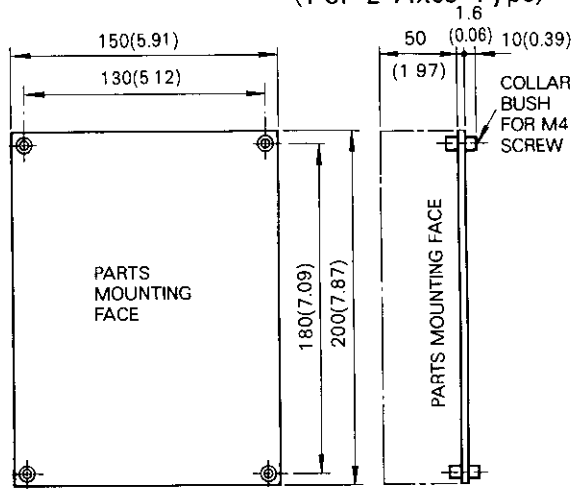
1	+5V	Red
2	0V	Black
3	Channel A Output	Blue
4	Channel B Output	Yellow
5	Channel Z Output	Green
6	Shield	−

4.2 SERVOPACK

(1) TYPES CPCR-PSA 3 CSY□
(For 1 Axis Type)

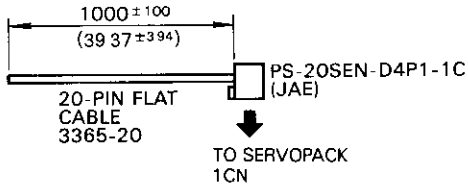


(2) TYPES CPCR-PSA 3 CWY□
(For 2 Axes Type)

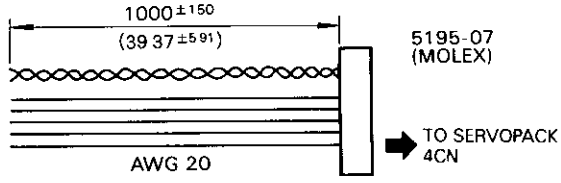


4.3 CABLES

(1) CPCR-CC02* (For Command Input)

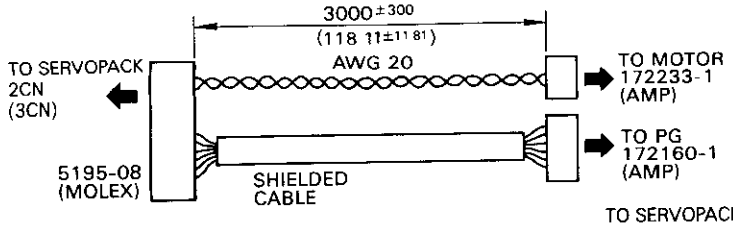


(2) CPCR-CC01* (FOR POWER SUPPLY)

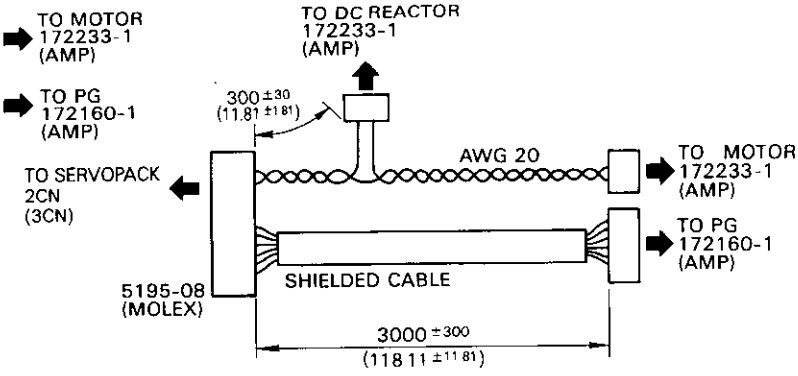


*Cut these wires to the length required.

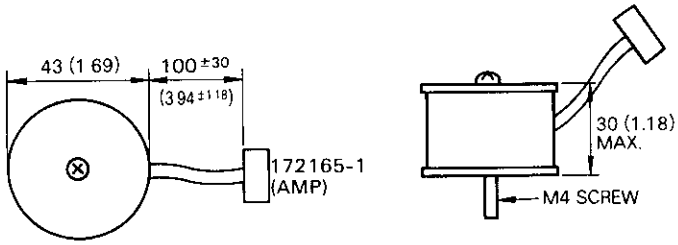
(3) CPCR-CC04 (FOR MOTOR UGTMEM)



(4) CPCR-CC03 (FOR MOTOR UGPM)



4.4 DC REACTOR



5. SPECIFICATIONS

Table 5 Specifications (Combination Characteristics of SERVOPACK and Motor)*1

	Item \ Kind		Flat Type		Low Torque/ High Speed Type			Medium Torque/ Medium Speed Type			High Torque/ Low Speed Type		
SERVOMOTOR	Type		UGPMEG -07D	UGPMEE -09D	UGTMEM -01SD	UGTMEM -01MD	UGTMEM -01LD	UGTMEM -03SD	UGTMEM -03MD	UGTMEM -03LD	UGTMEM -06SD	UGTMEM -06MB	UGTMEM -06LD
	Rated Output	W	16	32	14	16	16	34	33	30	30	27	25
	Rated Torque	N·m (oz·in)	0.05 (7.09)	0.0775 (11.0)	0.0441 (6.25)	0.0618 (8.76)	0.0784 (11.1)	0.216 (30.6)	0.314 (44.5)	0.412 (58.4)	0.353 (50.0)	0.520 (73.7)	0.784 111
	Peak Torque	N·m (oz·in)	0.081 (11.5)	0.11 (15.7)	0.13 (18.3)	0.18 (25.7)	0.22 (30.9)	0.31 (44.6)	0.44 (62.6)	0.58 (82.1)	0.52 (71.2)	0.72 (102)	1.06 150
	Rated Speed	r/min*2	3000	4000	3000	2500	2000	1500	1000	700	800	500	300
SERVOPACK	Type	For 1 Axis Type PS-CPCR-	PSA3 CS Y1	PSA3 CS Y3	PSA3 CS Y5, Y25	PSA3 CS Y7, Y26	PSA3 CS Y9, Y27	PSA3 CS Y11, Y28	PSA3 CS Y13, Y29	PSA3 CS Y15, Y30	PSA3 CS Y17, Y31	PSA3 CS Y19, Y32	PSA3 CS Y21, Y33
		For 2 Axes Type PS-CPCR-	PSA3 CW Y1	PSA3 CW Y3	PSA3 CW Y5, Y25	PSA3 CW Y7, Y26	PSA3 CW Y9, Y27	PSA3 CW Y11, Y28	PSA3 CW Y13, Y29	PSA3 CW Y15, Y30	PSA3 CW Y17, Y31	PSA3 CW Y19, Y32	PSA3 CW Y21, Y33
	Combination Spec	Continuous Output Current (Effective Current) ADC	2.7	3	1.7	1.7	1.7	3	3	3	3	3	3
		Max Output Current ADC	4	4	4	4	4	4	4	4	4	4	4
	Basic Specifications	Input Power Supply: Main Circuit	24VDC±10%, 6A; Continuous, 8A at peak										
		Input Power Supply: Control Power Supply	+5VDC ±5 %, 1A / 12VDC±5 %, 0.2A / −12VDC ±5 %, 0.15A										
		Control method	FET PWM method										
		Feedback	Optical encoder (f/V converter provided)										
		Environmental condition: Temperature	0 to +40 ℃										
		Environmental condition: Storage Temp	−20 to +75 ℃										
		Environmental condition: Humidity	90 % or less (non-condensing)										
		Structure	Board type										
	Signal I/O	Command Pulse	Sign + pulse train input (CW/CCW available depending on setting), 5V level, 50 % duty pulse										
		Command Pulse Frequency kpps*3	0 to 30	0 to 40	0 to 30	0 to 25	0 to 20	0 to 15	0 to 10	0 to 7	0 to 8	0 to 5	0 to 3
		Control Signal	Reset (common in 1st and 2nd axes)										
	Functions Provided	Output Signal	Encoder (Phase-A, -B, zero point) Pulse, alarm for each axis, positioning completed in each axis										
		Protective Function	Error counter overflow, encoder, base block by detection of phase-A or -B, fuse										
		Indication	Alarm LED for each axis										
		Function Switching	D/A bit: 9, 10, 11, 12 bits Feedback pulse: 1-, 2-multiplier Command input form: sign + pulse train, CW/CCW Command input logic switching										

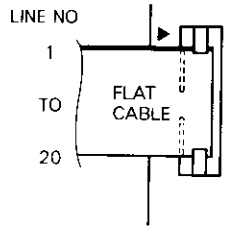
*1 For details of the motor, refer to Sect. 9. "MOTORS" on page 24.
*2 When the load torque is the same as rated torque, only operation at rated speed is possible.
*3 The speed when the feedback is multiplied by 1.
The speed can be doubled when the feedback is multiplied by 2
If pulse generator has a value other than 600 pulses/rev, contact your YASKAWA representative.

DESIGN

6. CONNECTORS

6.1 TYPES CPCR-PSA 3 CSY □ (For 1 Axis Type)

6.1.1 1CN for I/O Signal



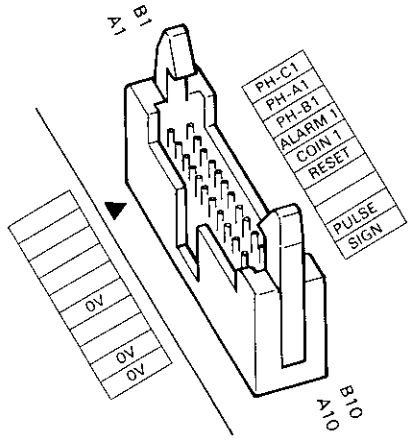


Table 6 1CN

Line No.	Pin No.	Signal Name	Function	Effective Logic	I/O
1	A 1	—	Zero point pulse Z Signal output	H	Output
2	B 1	PH−C 1			
3	A 2	—	Phase-A pulse	H	Output
4	B 2	PH−A 1			
5	A 3	—	Phase-B pulse	H	Output
6	B 3	PH−B 1			
7	A 4	—	Alarm	At alarm L	Output
8	B 4	ALARM 1			
9	A 5	—	Positioning completed	At completion L	Output
10	B 5	COIN 1			
11	A 6	0 V	Reset	At reset L	Input
12	B 6	RESET			
13	A 7	—	not used	——	—
14	B 7	—			
15	A 8	—	not used	——	—
16	B 8	—			
17	A 9	0 V	Command pulse	H*	Input
18	B 9	PULSE			
19	A 10	0 V	Command sign	Forward at H*	Input
20	B 10	SIGN			

*For datails, refer to Sect. 7, "I/O SIGNALS" on page 20.

Note : For the datails of connector types, refer to Sect. 3, "CONNECTION" on page 9.
For cables, refer to Sect.4 "DIMENSIONS in mm (inch)" on page 11.

6.1.2 2CN for Motor and Optical Encoder

Table 7 2CN

Pin No. *	Name	Contents
1	Motor (−)	Motor main circuit
2	Motor (+)	
3	+5V	Power supply for encoder
4	0V	
5	PG−A	Encoder phase-A
6	PG−B	Encoder phase-B
7	PG−C	Encoder phase-C
8	0V	Shielded

* Pin Nos. 1 and 8 are indicated on the SERVOPACK board.
Connect the other cables in accordance with these numbers.

6.1.3 4CN for Power Supply

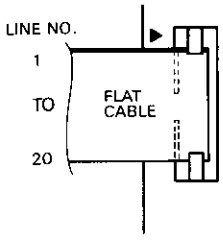
Table 8 4CN

Pin No. *1	Name	Contents
1	+24V	For main circuit power circuit
2 *2	0V	
3	+12V	For control power
4	−12V	
5	+5V	
6 *2	0V	
7 *2 *3	0V	

*1 Pin Nos. 1 and 7 are indicated on the SERVOPACK board.
Connect the other cables in accordance with these numbers.
*2 Pin Nos. 2, 6 and 7 are connected inside the SERVOPACK.
*3 Ground pin No.7. The shield of 2CN is grounded.
Note : For details of the connector types, refer to Sect. 3, "CONNECTION" on page 9.

6.2 TYPES CPCR-PSA 3 CWY □ (For 2 Axis Type)

6.2.1 1CN for I/O Signal



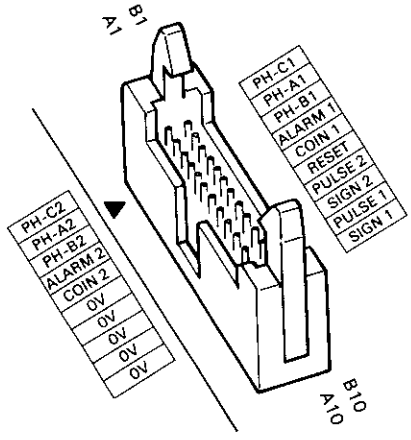


Table 9 1CN

Line No.	Pin No.	Signal Name	Axis	Function	Effective Logic	I/O
1	A 1	PH−C 2	2	Zero point pulse	H	Output
2	B 1	PH−C 1	1			
3	A 2	PH−A 2	2	Phase-A pulse	H	Output
4	B 2	PH−A 1	1			
5	A 3	PH−B 2	2	Phase-B pulse	H	Output
6	B 3	PH−B 1	1			
7	A 4	ALARM 2	2	Alarm	At alarm L	Output
8	B 4	ALARM 1	1			
9	A 5	COIN 2	2	Positioning completed	At completion L	Output
10	B 5	COIN 1	1			
11	A 6	0 V	1, 2	Reset	At reset L	Input
12	B 6	RESET				
13	A 7	0 V	2	Command pulse *	H *	Input
14	B 7	PULSE 2				
15	A 8	0 V	2	Command sign *	Forward at H *	Input
16	B 8	SIGN 2				
17	A 9	0 V	1	Command pulse *	H *	Input
18	B 9	PULSE 1				
19	A 10	0 V	1	Command sign *	Forward at H *	Input
20	B 10	SIGN 1				

*For datails, refer to Sect. 7, "I/O SIGNALS" on page 20.

Note : For datails of connector types, refer to Sect. 3 "CONNECTION" on page 9. For cables, refer to Sect.4 "DIMENSIONS in mm (inch)" on page 11.

6.2.2 2CN, 3CN for Motor and Optical Encoder

Table 10 2CN and 3CN *1

Pin No. *2	Name	Contents
1	Motor (−)	Motor main circuit
2	Motor (+)	
3	+5V	Power supply for encoder
4	0V	
5	PG−A	Encoder phase−A
6	PG−B	Encoder phase−B
7	PG−C	Encoder phase−C
8	0V	Shielded

*1 2CN for 1st axis ; 3CN for 2nd axis
*2 Pin Nos. 1 and 8 are indicated on the SERVOPACK board. Connect the other cables in accordance with these numbers.
Note: For detail of the connector type, refer to Sect. 3, "CONNECTION" on page 9.

6.2.3 4CN for Power Supply

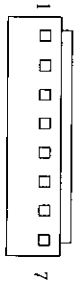


Table 11 4CN

Pin No. *1	Name	Contents
1	+24V	For main circuit power supply
2 *2	0V	
3	+12V	For control power
4	−12V	
5	+5V	
6 *2	0V	
7 *2 *3	0V	

*1 Pin Nos. 1 and 7 are indicated on the SERVOPACK board. Connect the other cables in accordance with these numbers.
*2 Pin Nos. 2, 6 and 7 are connected inside the SERVOPACK.
*3 Ground pin No.7. The shield of 2CN is grounded.
Note : For details of the connector types, refer to Sect. 3, "CONNECTION" on page 9.

7. I/O SIGNALS

7.1 INPUT SIGNAL

7.1.1 Command Pulse Form and Command Logic

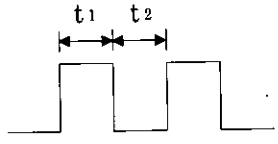
Command mode and command logic can be switched by setting SERVOPACK internal switch SW1 (In case of 2 axes specialized type, 1st and 2nd axes are set in the same way).

Table 12 Command Pulse Form and Command Logic

Form			Sign + Pulse Train		CW/CCW	
	Pin No.					
SW 1 *1	1	1	*2	*2		
	6	2	*2		*2	
Pulse Input	H L					
Sign Input	H L		FWD RVS	FWD RVS	RVS FWD	RVS FWD
			At shipping			

*1 For details of SW1, refer to Par. 11.4 "INTERNAL SWITCH" on page 38.
*2 Shows short switch insertion.
*3 Forward rotation indicates ↺ direction shown in the motor dimensions of Par. 4.1 "MOTORS" on page 11.

7.1.2 Least Command Pulse Width and Command Pulse Frequency



$t_1, t_2 \geqq t$ min

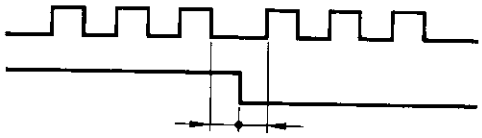
Table 13 Least Command Pulse Width and Command Pulse Frequency*3

SERVOPACK Type CPCR-	For 1 Axis Type	PSA3CS Y1	PSA3CS Y3	PSA3CS Y5	PSA3CS Y7	PSA3CS Y9	PSA3CS Y11	PSA3CS Y13	PSA3CS Y15	PSA3CS Y17	PSA3CS Y19	PSA3CS Y21	PSA3CS Y25	PSA3CS Y26	PSA3CS Y27	PSA3CS Y28	PSA3CS Y29	PSA3CS Y30	PSA3CS Y31	PSA3CS Y32	PSA3CS Y33
	For 2 Axes Type	PSA3CW Y1	PSA3CW Y3	PSA3CW Y5	PSA3CW Y7	PSA3CW Y9	PSA3CW Y11	PSA3CW Y13	PSA3CW Y15	PSA3CW Y17	PSA3CW Y19	PSA3CW Y21	PSA3CW Y25	PSA3CW Y26	PSA3CW Y27	PSA3CW Y28	PSA3CW Y29	PSA3CW Y30	PSA3CW Y31	PSA3CW Y32	PSA3CW Y33
Least Command Pulse Width min μS *1		5	5	5	5	5	10	10	15	15	20	20	5	5	5	5	5	10	10	15	15
Command Pulse Frequency kpps *2		0 to 30	0 to 40	0 to 30	0 to 25	0 to 20	0 to 15	0 to 10	0 to 7	0 to 8	0 to 5	0 to 3	0 to 50	0 to 42	0 to 33	0 to 24	0 to 16.6	0 to 11.6	0 to 13.3	0 to 8.3	0 to 5

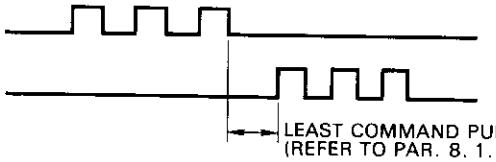
*1 When 50 % duty ($t_1 = t_2$) is provided, least command pulse width is satisfied.
*2 At 1-multiplier mode (at shipping). The frequency can be doubled at 2-multiplier mode.
*3 When setting other than in standard (for example, PG:500 pulses/rev), contact your YASKAWA representative.

7.1.3 Timing of Command Pulse Forward/Reverse Rotations

· Sign + Pulse



· CW/CCW

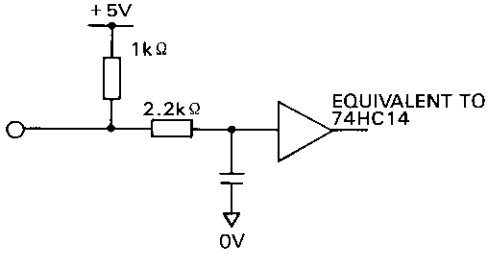


7.1.4 Reset Input Signal

- Resets by L-level signal. Clears deviation counter by resetting and releases an alarm.
- In case of 2 axes specialized type, two axes of the motors coast while applying L-level signal.
- Apply more than 20 μS of reset pulses.

7.1.5 Input Signal Circuit

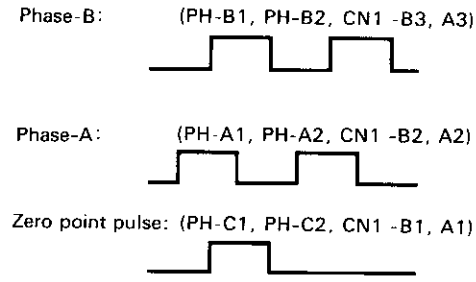
- The following figure shows input signal circuit of SERVOPACK.
- Do not apply a voltage over 5V or minus voltage as input signal.



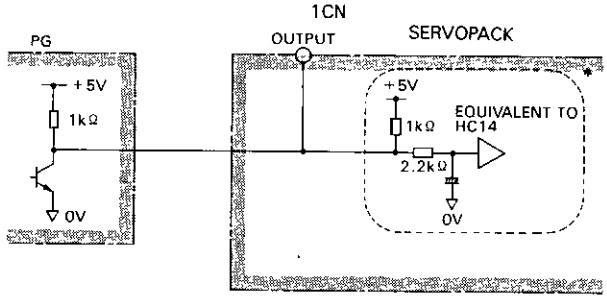
7.2 OUTPUT SIGNAL

7.2.1 Encoder Signal

- Phase: Phase-A advance 50 % duty, 90° phase difference



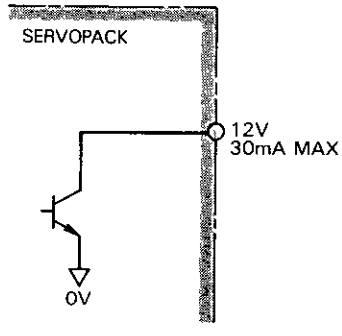
- Output circuit



* Zero pulse is not used in SERVOPACK.

7.2.2 Positioning Completion Signal (COIN 1, COIN 2)

- This signal is output by open collector.
- When positioning is completed within ±4 pulses, output transistor is turned on so as to be used for stepping sequence.

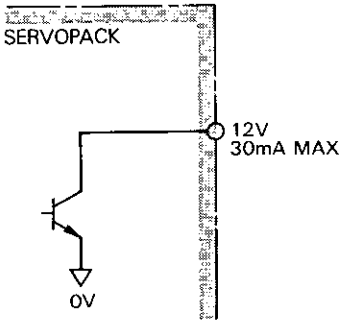


7.2.2 Positioning Completion Signal (COIN1, COIN2) (Cont'd)

- Interruption by loading, low gain or displacement of zero adjustment may stop the signal from outputting.
- When the relay is driven, do not apply surge voltage.

7.2.3 Alarm Signal (ALARM1, ALARM2)

- This signal is output by open collector.
- Output transistor is turned on when an alarm occurs.



- When the relay is driven, do not apply surge voltage.

Note: For troubleshooting of alarms, etc., refer to Sect. 12, "TROUBLESHOOTING" on page 39.

8. INSTALLATION

8.1 MOTOR INSTALLATION

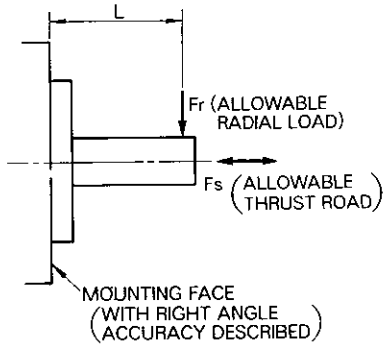
Refer to Sect. 4, "DIMENSIONS in mm (inch)" on page 11 for installation.

8.1.1 Allowable Radial Load and Thrust Load

Table 14 shows allowable loads according to output axis.

Table 14 Allowable Radial load and Thrust Load

Type	Length L mm (in)	Allowable Radial Load Max. Fr N (lb)	Allowable Thrust Load Max. Fs N (lb)
UGTMEM-01 S	16.0 (0.63)	19.6 (4.4)	9.8 (2.2)
UGTMEM-01 M			
UGTMEM-01 L			
UGTMEM-03 S	25.0 (0.98)	78.4 (17.7)	19.6 (4.4)
UGTMEM-03 M			
UGTMEM-03 L			
UGTMEM-06 S	30.0 (1.18)	142 (32)	
UGTMEM-06 M			
UGTMEM-06 L			
UGPMEG-07		19.6 (4.4)	9.8 (2.2)
UGPMEE-09		24.5 (5.5)	



8.1.2 Impact Resistance

When mounted horizontally and exposed to vertical shock impulses, the motor can withstand up to two impacts with impact acceleration of 10 G.

8.1.3 Vibration Resistance

When mounted horizontally, the motor can withstand vibration (vertical, lateral, axial) of 2.5 G.

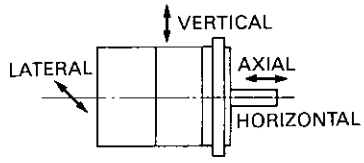


Fig. 5 Vibration Resistance

8.2 INSTALLATION OF SERVOPACK

8.2.1 Mounting Holes in mm (inch)

(1) Types CPCR - PSA 3 CSY□ (For 1 Axis Type)

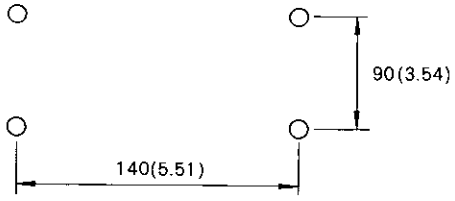


Fig. 6 Mounting Holes

(2) Types CPCR - PSA 3 CWY□ (For 2 Axes Type)

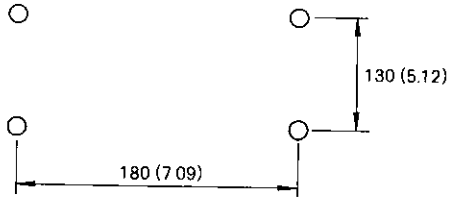
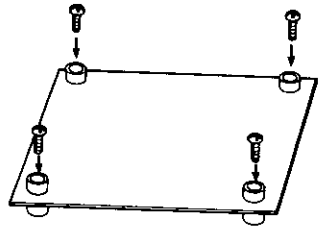
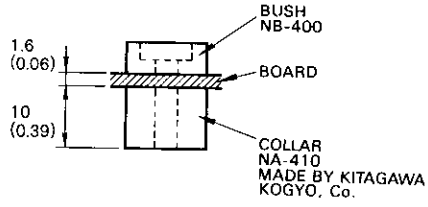


Fig. 7 Mounting Holes

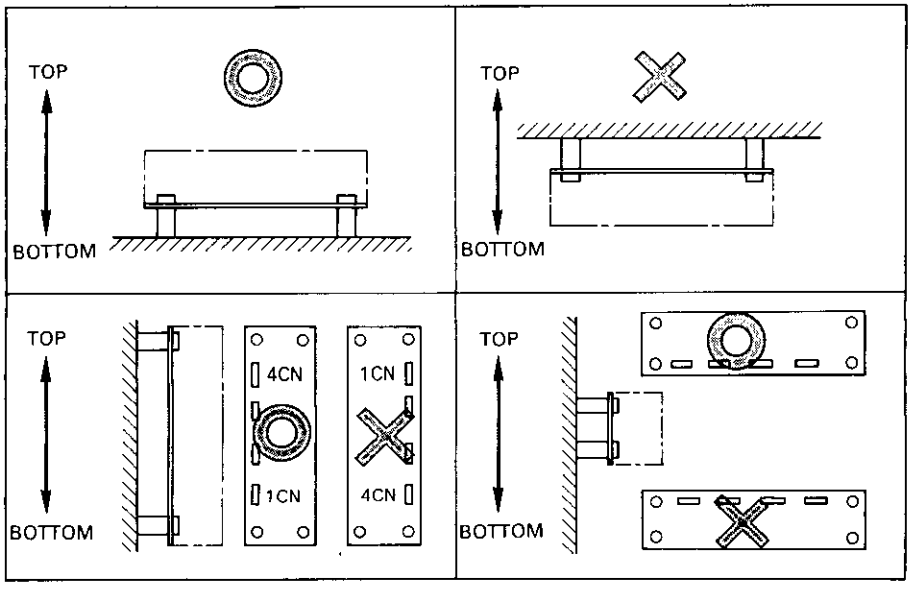
8.2.2 Mounting Method





Note that screws are not provided.

8.2.3 Mounting Direction



○ Correct
× Wrong

8.2.4 Location

Use the motor, following the conditions below.

- Avoid Vibration or impact.
- Keep away from metallic powder/dust, oil or water.
- Keep away from AC power supply lines, noise sources or static electric power sources.
- Do not let the cable lines pass over the board.
- Auto convection is used for cooling method. Avoid heat radiation.
- If the air does not flow well, use a fan at 1m³/min (in³/min) of air capacity for cooling.

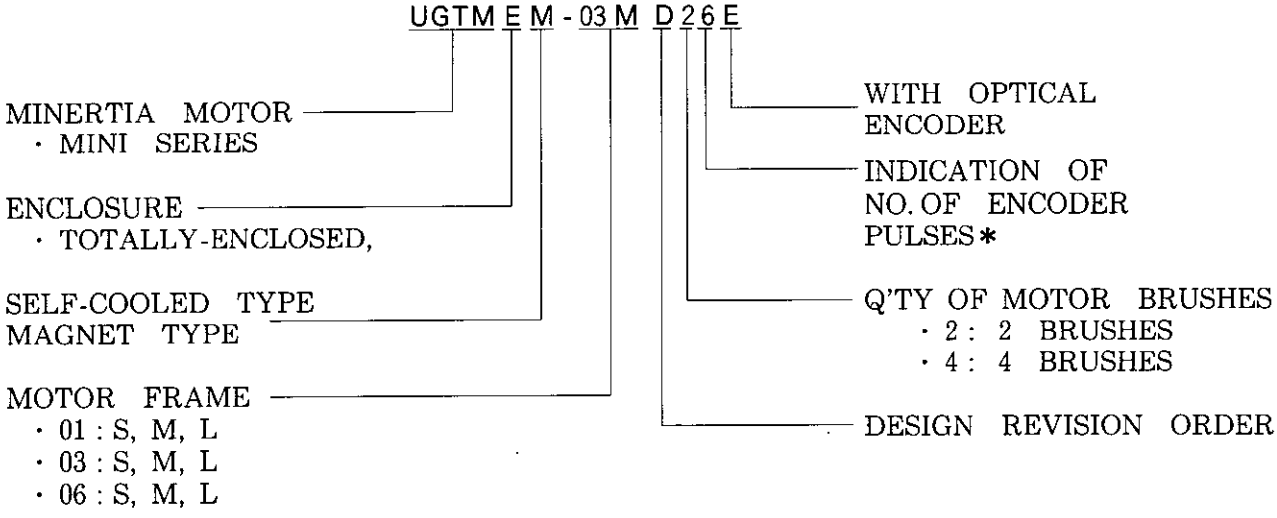
9. MOTORS

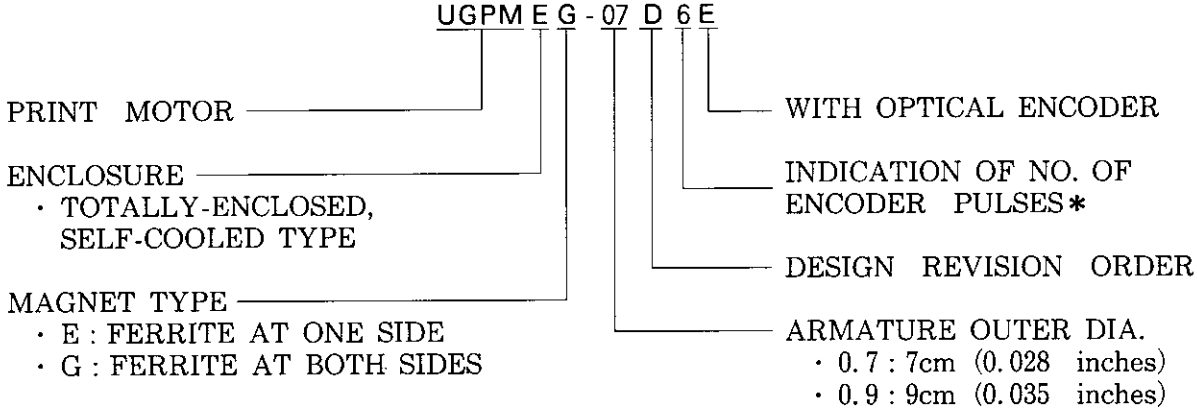
9.1 RATINGS AND SPECIFICATIONS

- Time Rating : Continuous
- Insulation : Class B
- Enclosure : Totally-enclosed, self-cooled
- Ambient Temperature
  : 0 to +40℃ when operated
  −20 to +60℃ when stored
  (non-condensing)
- Ambient Humidity
  : 35 to 80 %RH when operated
  10 to 80 %RH when stored
  (non-condensing)
- Vibration : 15 μm or below
- Excitation : Permanent magnet
- Drive Method : Direct drive

9.2 TYPE DESIGNATION

The following shows type designation of PS Series motors.





*No. of encoder pulses
5 : 500 pulses/rev
6 : 600 pulses/rev
A : 1000 pulses/rev

9.3 MOTOR CHARACTERISTICS

Table 15 Motor Ratings and Specifications

Specifications	Symbol	Unit	UGTMEM-01			UGTMEM-03			UGTMEM-06			UGPMEG-07 D□E	UGPMEE-09 D□E
			SD4□E	MD4□E	LD4□E	SD2□E	MD2□E	LD2□E	SD2□E	MD2□E	LD2□E		
Rated Output *	P_R	W	14	16	16	34	33	30	30	27	25	16	32
Rated Torque *	T_R	N·m	0.0441	0.0618	0.0784	0.216	0.314	0.412	0.353	0.520	0.784	0.05	0.0775
		oz·in	6.25	8.76	11.1	30.6	44.5	58.4	50.0	73.7	111	7.09	11.0
Rated Speed *	N_R	r/min	3000	2500	2000	1500	1000	700	800	500	300	3000	4000
Rated Armature Voltage *	V_R	V	18.5	20	20	20	20	20	20	20	20	13	18
Rated Armature Current *	I_R	A	1.7	1.7	1.7	3.0	3.0	3.0	3.0	3.0	3.0	2.7	3.0
Rated power rate *	Q_R	kW/s	1.1	1.56	2.16	1.98	2.95	4.55	1.31	2.57	3.48	0.125	0.176
Rated Angular Acceleration *	α_R	rad/s²	25000	25200	27600	9170	9410	11100	3710	4950	4440	2500	2280
Peak Torque *	Tp	N·m	0.129	0.181	0.218	0.315	0.442	0.579	0.502	0.721	1.06	0.0809	0.111
		oz·in	18.3	25.7	30.9	44.6	62.6	82.1	71.2	102	150	11.5	15.7
Peak Armature Current *	I_P	A	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Maximum Speed *	Nmax	r/min	4500	4500	4500	2500	2000	1500	1500	1000	800	5000	5000
Rotor Moment of Inertia	J_M	kg·m²	1.76×10^{-6}	2.45×10^{-6}	2.84×10^{-6}	2.35×10^{-5}	3.33×10^{-5}	3.72×10^{-5}	9.51×10^{-5}	1.05×10^{-4}	1.76×10^{-4}	2.0×10^{-5}	3.4×10^{-5}
		oz·in·s²	2.49×10^{-4}	3.47×10^{-4}	4.03×10^{-4}	3.33×10^{-3}	4.72×10^{-3}	5.27×10^{-3}	1.35×10^{-2}	1.49×10^{-2}	2.49×10^{-2}	2.83×10^{-3}	4.82×10^{-3}
Armature Winding Resistance	Ra	Ω	3.2	3.3	3.4	1.67	1.72	2.0	2.2	2.4	2.8	1.26	1.02
Armature Inductance	La	mH	0.8	0.8	0.8	1.5	1.9	2.9	4.0	4.3	7.8	0.05	0.07
EMF Constant	K_E	mV/(r/min)	3.6	5.0	6.0	8.8	12.3	16.1	13.9	19.8	28.7	2.4	3.3
Torque Constant	K_T	N·m/A	0.0344	0.0477	0.0573	0.084	0.117	0.154	0.133	0.189	0.274	0.0227	0.0312
		oz·in/A	4.88	6.76	8.12	11.9	16.6	21.8	18.9	26.8	38.8	3.22	4.42
Static Friction Torque	Tf	N·m	8.53×10^{-3}	0.0101	0.0114	0.0216	0.0275	0.0363	0.0294	0.0353	0.0392	3.33×10^{-3}	5.20×10^{-3}
		oz·in	1.21	1.43	1.62	3.06	3.90	5.14	4.17	5.00	5.56	0.472	0.737
Viscous Damping Constant	Fd	Nm/(r/min)	1.96×10^{-6}	3.53×10^{-6}	5.0×10^{-6}	9.8×10^{-6}	1.37×10^{-5}	1.86×10^{-5}	1.37×10^{-5}	1.76×10^{-5}	2.16×10^{-5}	1.35×10^{-6}	1.35×10^{-6}
		oz·in/1000rpm	0.278	0.500	0.709	1.39	1.94	2.64	1.94	2.49	3.06	0.191	0.191
Mechanical Time Constant	tm	ms	4.8	3.6	2.9	5.6	4.2	3.2	12	7.1	6.6	48	35
Electrical Time Constant	te	ms	0.25	0.24	0.24	0.9	1.1	1.5	1.8	1.8	2.8	0.040	0.069
Armature Winding Maximum Temperature Rise	θ	℃	100	100	100	100	100	100	100	100	100	100	100
Thermal Resistance	$R\theta$	℃/W	5.2	4.7	4.6	2.55	2.50	2.45	2.35	1.85	1.8	4.0	2.5

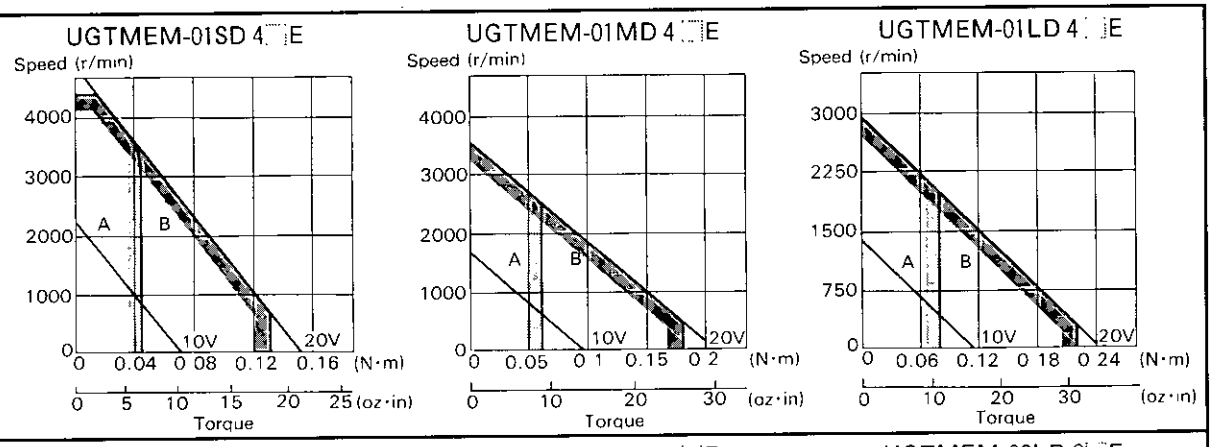
*Shows the value when the armature winding temperature is 100℃.
Other specifications shows the value when it is 20℃.

Notes:

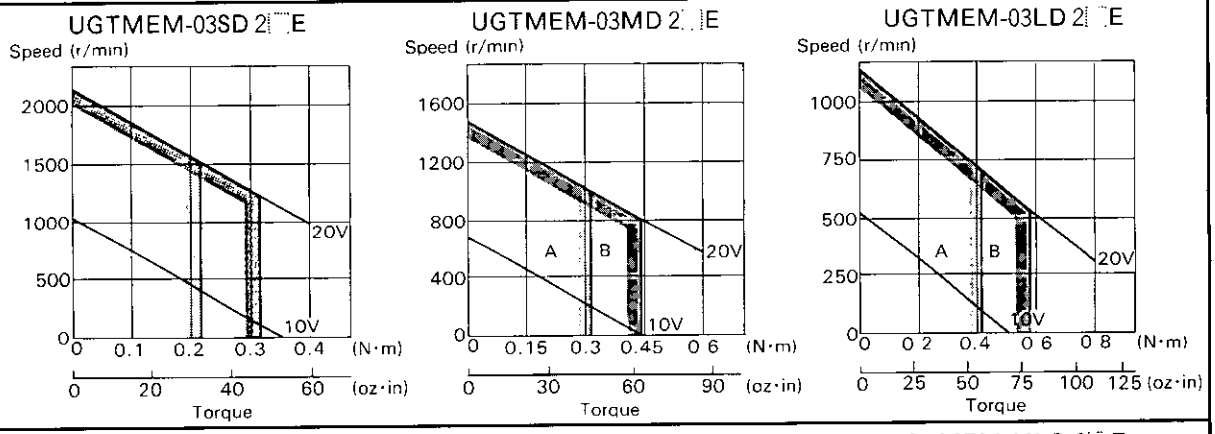
1. Rated torque is indicated by allowable continuous torque value at ambient temperature 40℃, when the following heat dissipating aluminum plate is mounted on motor:
   - Type UGTMEM-01 and UGPMEG-07 — 150 × 150 × 3 (mm) 6 × 6 × 1/8 (inch)
   - Type UGTMEM-03, -06 and UGPMEE-09 — 250 × 250 × 6 (mm) 10 × 10 × 1/4 (inch)
2. Dielectric stength of motor is 500VAC per minute.
   Never perform dielectric strength test of encoder.

9.4 TORQUE-SPEED CHARACTERISTICS

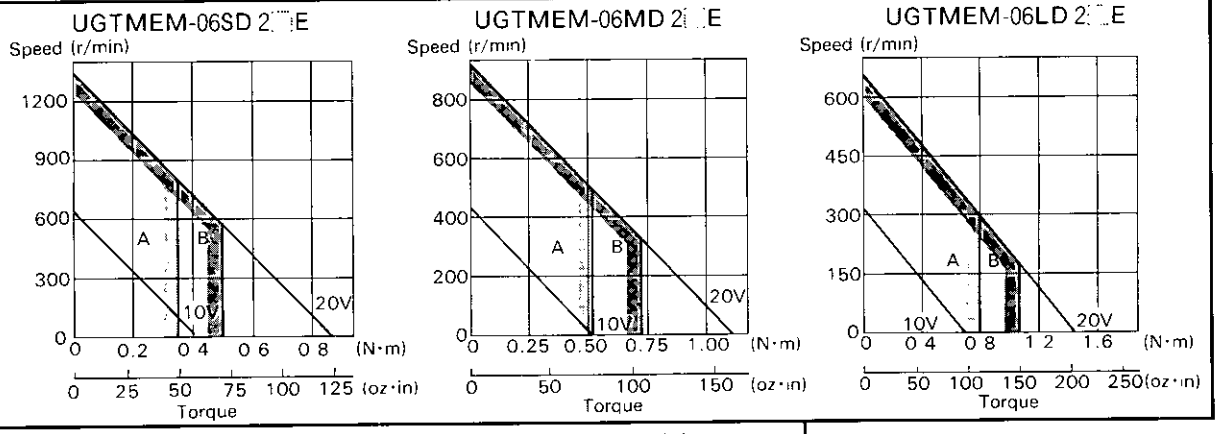
Low Torque/High Speed Torque



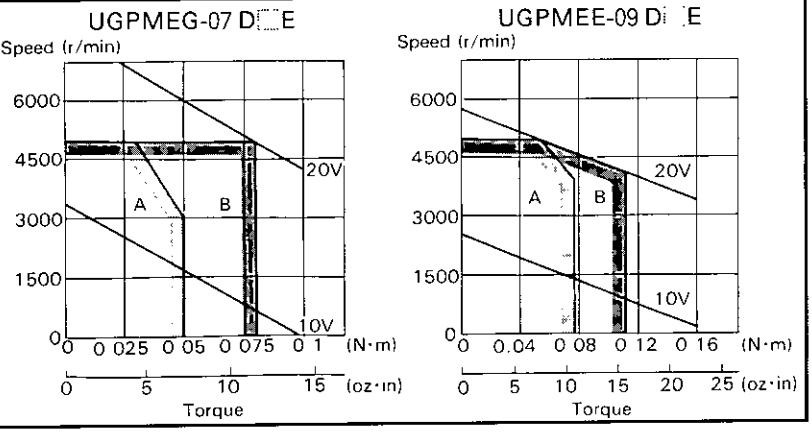
Medium Torque/ Medium Speed Type



High Torque/ Low Speed Type



Flat Type

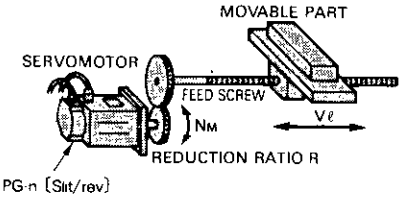


A: Continuous duty zone
B: Acceleration/deceleration duty zone

9.5 SELECTION GUIDE FOR MOTOR

· MOTOR SELECTION GUIDE

(1) Speed Detection Unit



$$A=\frac{P}{R\times n}$$

(2) Reference Pulse Frequency

$$\upsilon s=\frac{V\ell}{60\times A}=\frac{N_M}{60}\times n$$

(3) Step Input of Reference Pulses

· Speed controller starting time

$$ta=\frac{(J_M+J_L)}{375\times\ (T_P-T_L)}$$

· Position loop gain

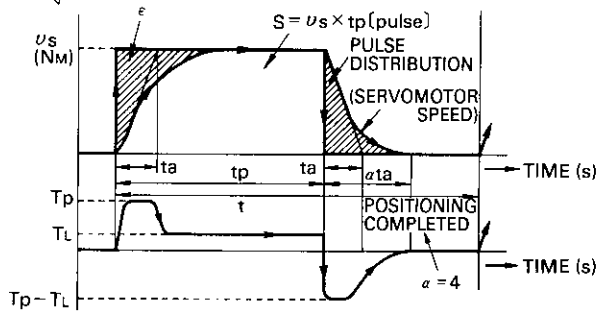
$$Kp=1.4\times\frac{1}{ta}$$

· Error counter lag pulses

$$\epsilon=\frac{Vs}{Kp}$$

· Effective torque value

$$Tms=\sqrt{\frac{Tp^2\times ta+TL^2\times(tp-ta)+(Tp-T_L)^2\times ta}{t}}$$



(4) Ramp Input of Reference Pulses

· Speed controller starting time

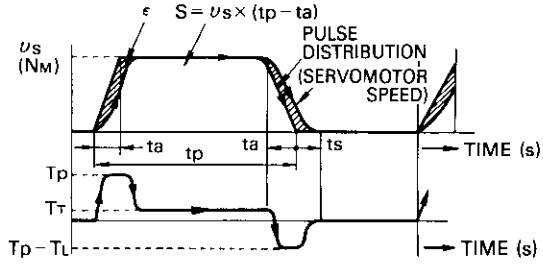
$$ta=\frac{(J_M+J_L)\ N_M}{375\times\ (T_P-T_L)}$$

· Error counter lag pulses

$$\epsilon=\frac{\upsilon s}{Kp}$$

· Effective torque value

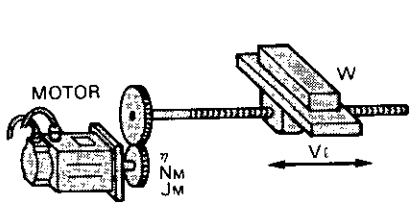
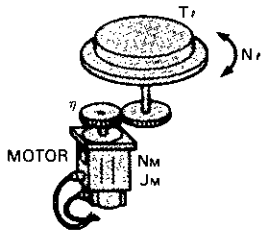
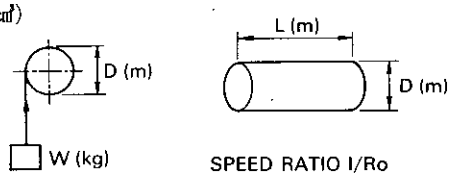
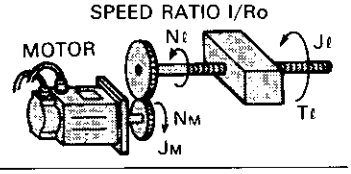
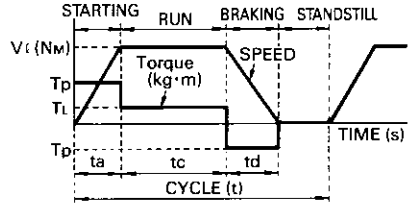
$$Tms=\sqrt{\frac{Tp^2\times ta+T_L^2\times(tp-ta)+(Tp-T_L)^2\times ta}{t}}$$



A : Position Detection Unit (mm/pulse)	t : 1 Cycle Time (s)
υs : Reference Pulse Frequency (pulses/s)	J_M : Moment of Motor Inertia (kgf·m²=10000kg·cm²)
n : No. of Encoder Slits (slits/rev)	J_L : Moment of Load Inertia (for motor shaft) (kgf·m²=10000kg·cm²)
p : Feed Screw Lead	Tp : Servomotor Starting Peak Torque (kgf·m=100kgf·cm)
R : Deceleration Ratio	T_L : Load Torque (for motor shaft) (kgf·m=100kgf·cm)
$V\ell$: Movable Part Speed (mm/min)	K_P : Position Loop Gain (S^{-1})
N_M : Motor Rated Speed	ϵ : Error Counter Lag Pulses
ta : Speed Controller Starting Time (s)	$Trms$: Effective Torque Value (kgf·m=100kgf·cm)
tp : Pulse Distribution Time (s)	
ts : Setting Time (s)	

9.6 DYNAMICS FORMULA FOR ELECTRIC FORCE

The drive system calculation is possible by knowing the efficiency of the inlet (motor), the outlet (load), and intermediate (reduction gear), etc.

Item		Linear Motion	Rotating Motion
Basic Dynamics Formula	Reference Figure		
	Load Constant Power	$Po = \frac{\mu \cdot W \cdot V\ell}{6120 \cdot \eta}$	$Po = \frac{T\ell \cdot N\ell}{973 \cdot \eta}$
	Load Accelerating Power	$Pa = \frac{J\ell \cdot N\ell^2}{365 \times 10^3 \times ta}$	$Pa = \frac{J\ell \cdot N\ell^2}{365 \times 10^3 \times ta}$
	Load Torque	$T_L = \frac{\mu \cdot W \cdot V\ell}{2\pi \cdot N_M \cdot \eta}$	$T_L = \frac{N\ell}{N_M \cdot \eta} \cdot T\ell$
	Load Inertia	$J_L = W \cdot \left[\frac{V\ell}{\pi \cdot N_M}\right]^2$	$J_L = \left[\frac{N\ell}{N_M}\right] \cdot J\ell$
	Starting Time	$ta = \frac{(J_M + J_L) \cdot N_M}{375\ (Tp - T_L)}$	$ta = \frac{(J_M + J_L) \cdot N_M}{375\ (Tp - T_L)}$
	Braking Time	$td = \frac{(J_M + J_L) \cdot N_M}{375\ (Tp + T_L)}$	$td = \frac{(J_M + J_L) \cdot N_M}{375\ (Tp + T_L)}$
Optimum Reduction Ratio	Solid Cylinder	$J_L = 125\pi\ \rho\ LD^4$ ($\rho = 7.866\ g/cm^3$)	
	Linear Motion Body Equivalent	$J_L = W \cdot D^2$	
	Optimum Speed Ratio	$Ro = \sqrt{\frac{\frac{J\ell \cdot N\ell}{375 \cdot ta} + T\ell}{\frac{JM \cdot N\ell}{375 \cdot ta}}}$	
Torque RMS Value	Torque RMS Value	$Trms = \sqrt{\frac{Tp^2 \cdot ta + T_L^2 \cdot tc + Tp^2 \cdot td}{t}}$	

Po : Constant Power (kW)
Pa : Accel Power (kW)
$N\ell$: Driven Motor Speed (rpm)
N_M: Motor Speed (rpm)
$V\ell$: Load Speed (m/min=100cm/min)
η : Speed Reducer Efficiency

μ : Friction Coefficient
W : Weight of Linear Motion Part (kgf)
$J\ell$: Load Inertia
J_L: Moment of Load Inertia
J_M: Moment of Motor Inertia
$T\ell$: Load Torque

T_L : Load Torque
Tp: Average Motor Start Torque
$Trms$: Effective Average Torque
ta : Starting Time (s)
tc : Running Time (s)
td : Braking Time (s)

10. PRECAUTIONS

(1) Motors other than those specially designed cannot be used.

Examples of non-applicable motors :

Type UGTMEM-C (e.g. UGTMEM-03SC)
UGTMEM-B (e.g. UGTMEM-03SB)

(2) PS series cannot be used in cases where the motor is rotated by the load.

(3) Use accel/decel pulses when the load inertia is large (more than 3 times that of the motor), overshooting must be avoided, or follow-up characteristics must be improved.

(4) Locate PS series as far away from AC power lines as possible.

(5) When external noise is large or SERVOPACK is connected to our sequencer JAMSC-B2813, the use of another series is recommended. (A controller with reference pulse and encoder output of 12V specifications, or of line driver specifications (e.g. : CPCR-PF).

(6) Fuses are provided to prevent a secondary breakdown caused by any failure of SERVOPACK. They can, however, fail to protect the motors when overloaded. If the fuses are blown, replace the entire PS set.

(7) Never apply a megger test or withstand voltage test to the PS set.

(8) Keep the distance between the motors and SERVOPACK within 3m.

(9) Keep the distance between the power supply and SERVOPACK as short as possible.

(10) No measure is taken to prevent EMI.

(11) During a motor stop. there will be vibration of a degree of ±1 pulse.

Note : That the contents of this manual may be modified without notification.

NOTES

SERVICE

11. ADJUSTMENT

11.1 ADJUSTMENT OF RUN

Perform the setting of the shorting switch (SW1) and the adjustment of rheostats in accordance with the following flow.

Be sure to push in and pull out the shorting switch and connectors with power sources (+24V, ±12, +5V) .

(1) Types CPCR-PSA 3 CSY□ (For 1 Axis Type)

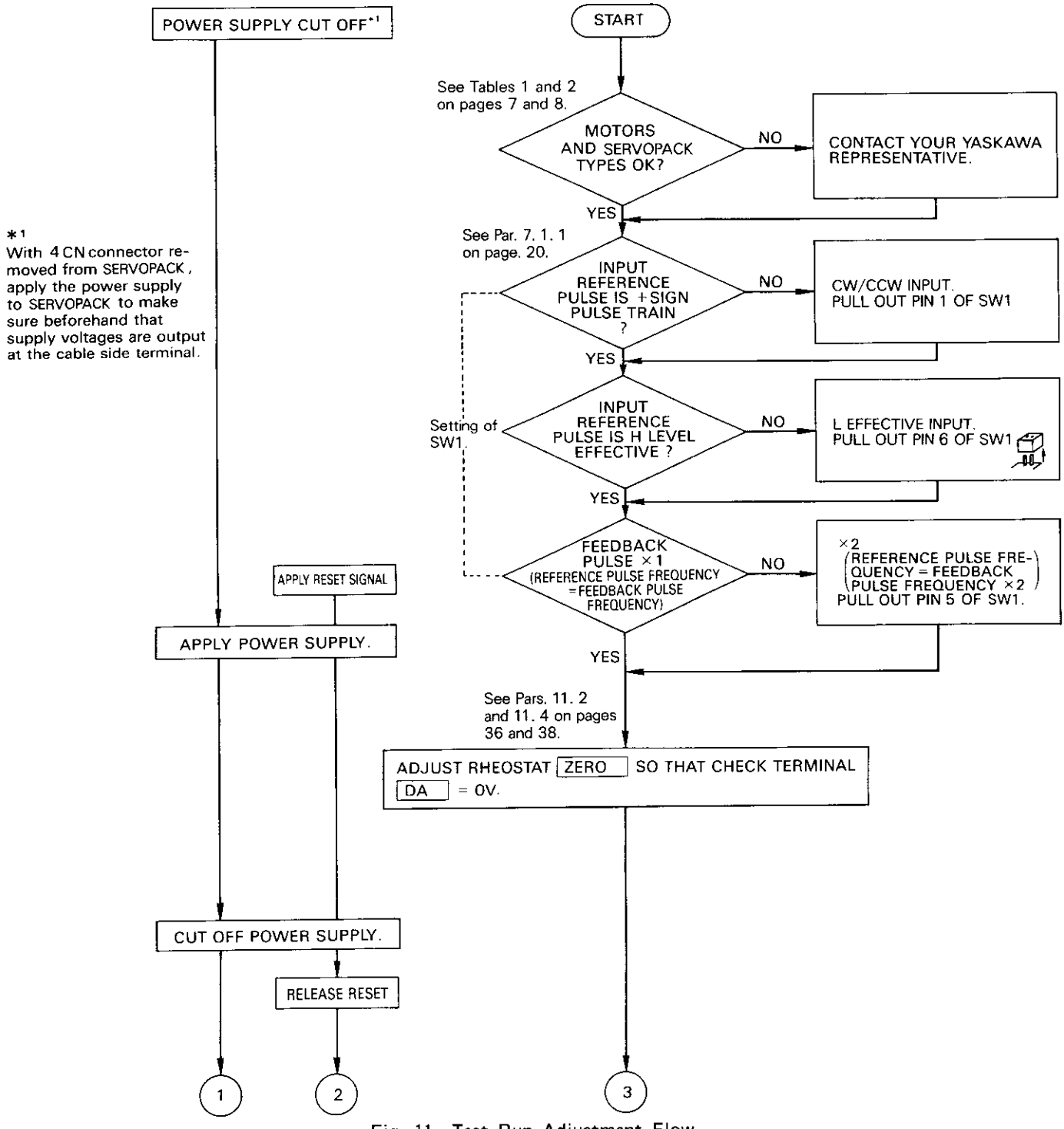


Fig. 11 Test Run Adjustment Flow

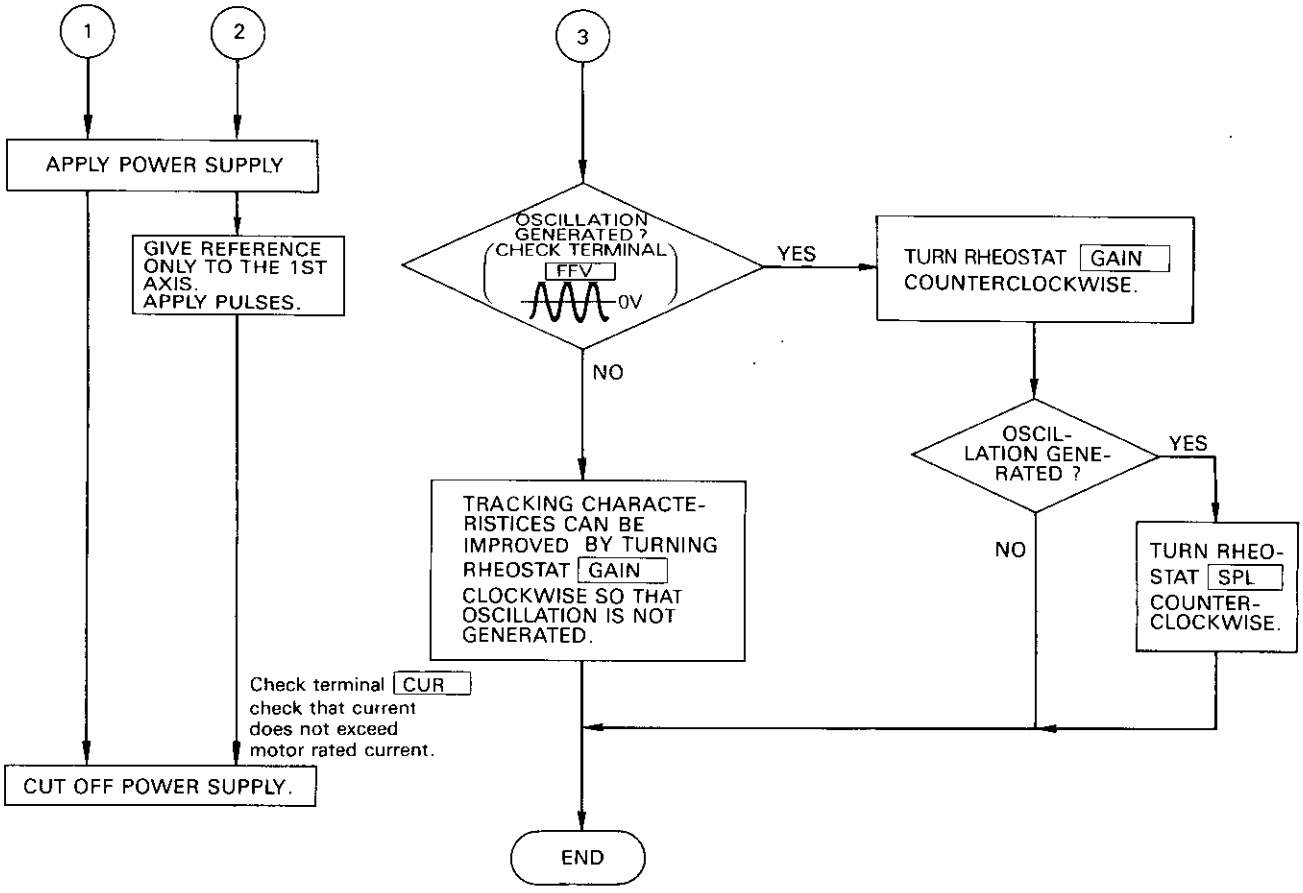


Fig. 11 Test Run Adjustment Flow (Cont'd)

(2) Types CPCR-PSA 3 CWY□ (For 2 Axes Type)

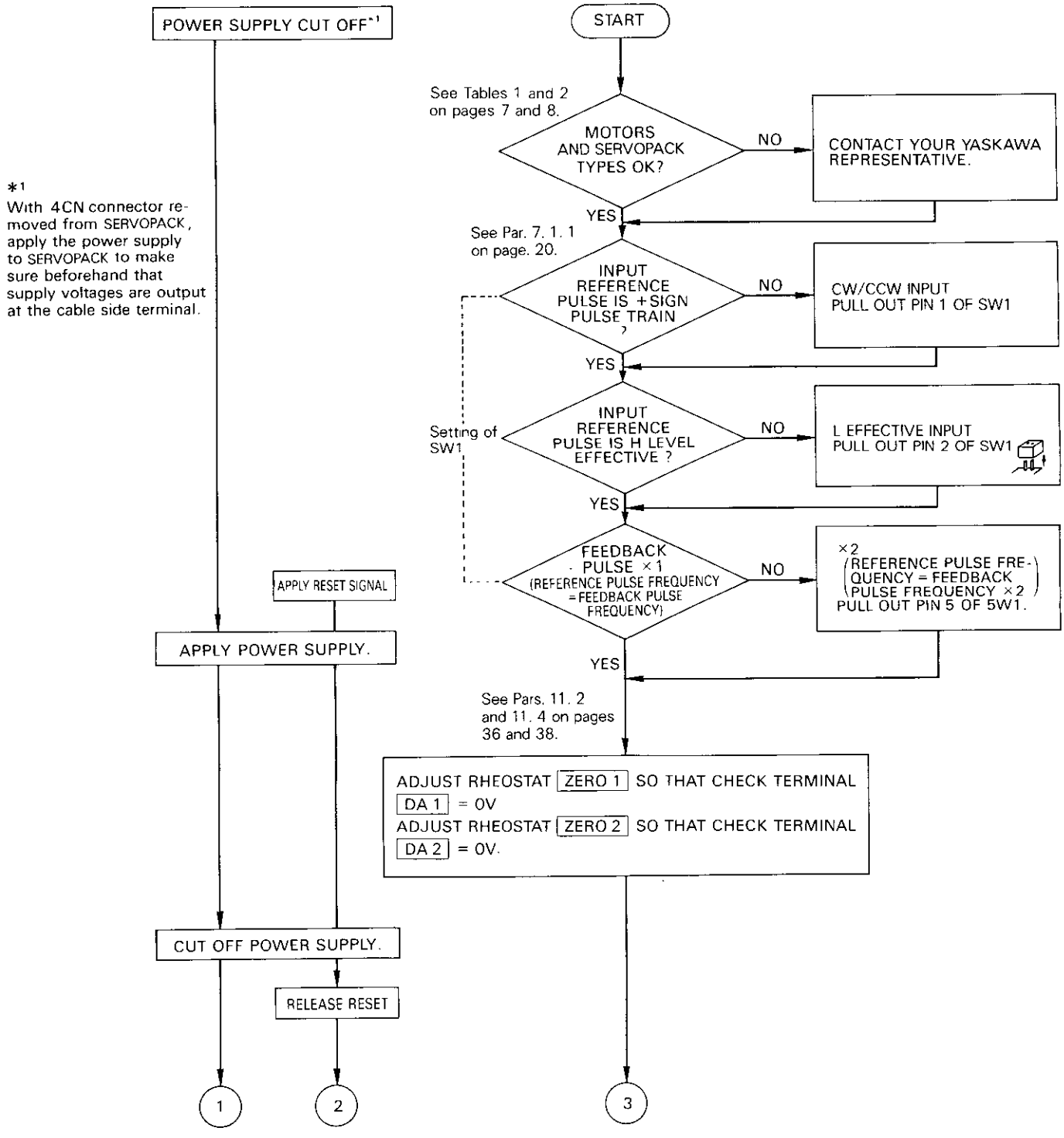


Fig. 12 Test Run Adjustment Flow

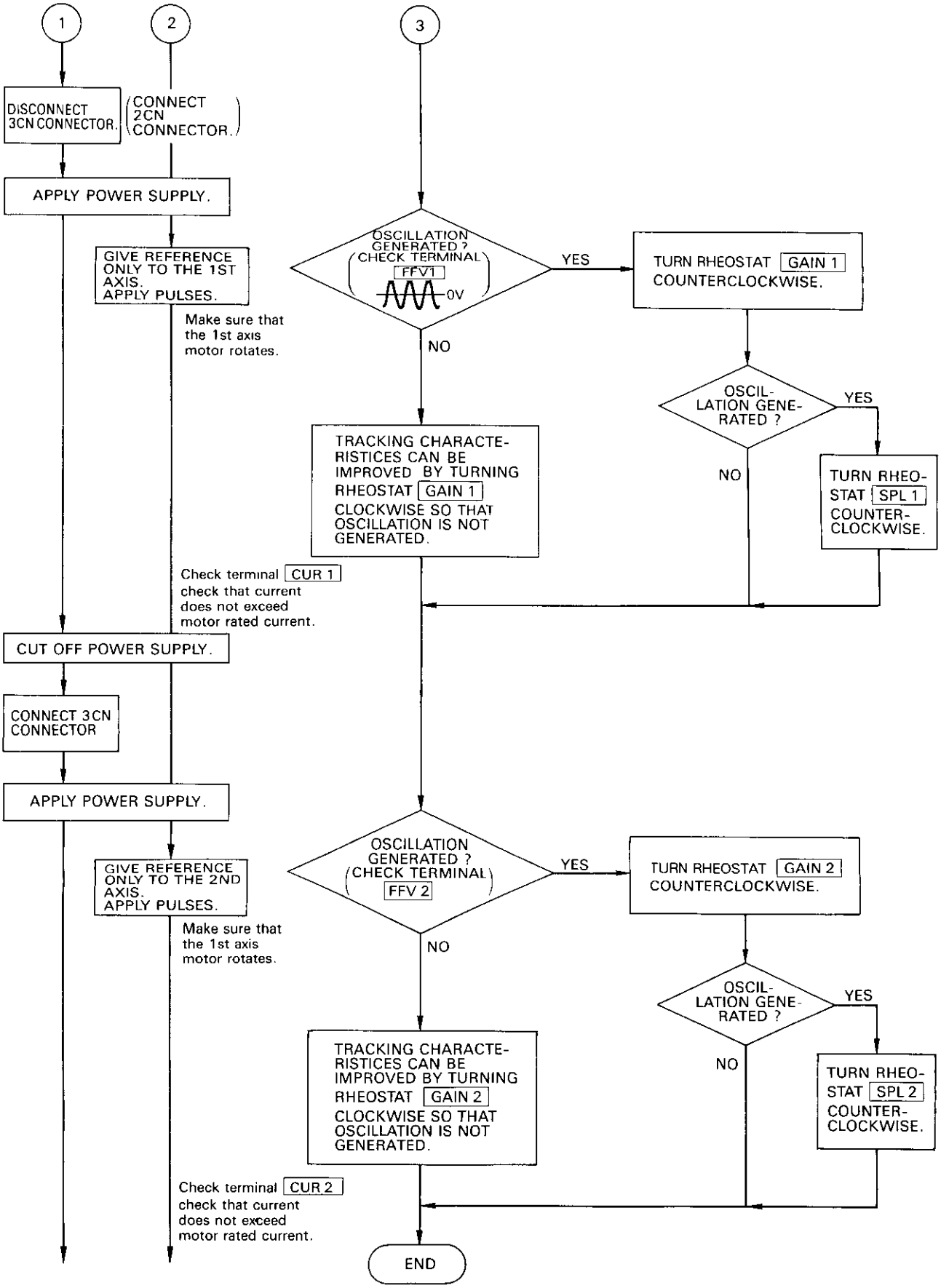


Fig. 12 Test Run Adjustment Flow (Cont'd)

11.2 ADJUSTMEMT OF RHEOSTATS

(1) Usually it is unnecessary to readjust speed loop gain and speed feedback.

(2) Perform zero adjustment the positioning completed signal is not given during motor stop.

(3) Adjust position loop gain when oscillation is generated or follow-up characteristics must be improved.

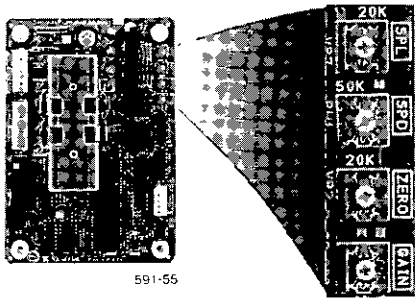


Fig. 13 Position of Rheostats for 1 Axis Type
(Types CPCR-PSA 3 CSY□)

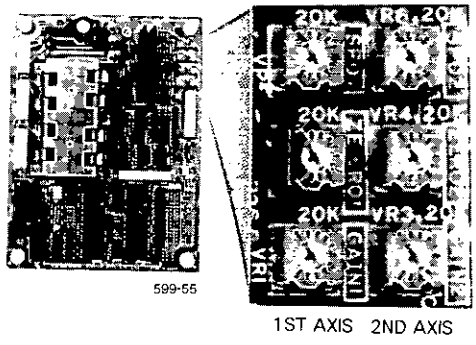


Fig. 14 Position of Rheostats for 2 Axes Type
(Types CPCR-PSA 3 CWY□)

Table 16 Adjustment of Rheostats

Item	Speed Loop Gain	Speed Feedback	Zero Adjustment	Position Loop Gain
For 1 Axis Type	SPL	SPD	ZERO	GAIN
For 2 Axes Type	SPL1, SPL2	SPD1, SPD2	ZERO1, ZERO2	GAIN1, GAIN2
Adjustment	Turn speed loop gains counterclockwise when oscillation is not stopped by adjusting position loop gains.	Readjustment is not necessary	Adjust zero adjustments so that DA 1 and 2 become 0V during motor stop.	Turn position loop gains clockwise to increase follow-up characteristics, Kp. Kp :See Table 17 on page 37.
Excessive Turning Clockwise	Oscillation is generated.	Oscillation is generated and vibration alarm can be given	Oscillation is generated and positioning deviated positioning completion signal is not given.	Oscillation is generated.
Excessive Turning Counter-clockwise	Adjustment of position loop gains can become impossible.			Follow-up erroneous, alarm be given.

11.3 CHECK TERMINALS

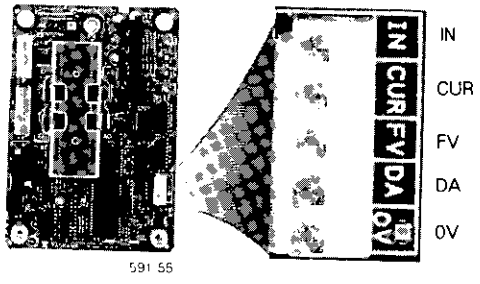


Fig. 15 Position of Check Terminals for 1 Axis Type (Types CPCR-PSA 3 CSY□)

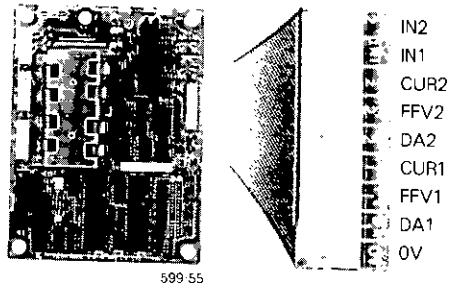


Fig. 16 Position of Check Terminals for 2 Axes Type (Types CPCR-PSA 3 CWY□)

Table 17 Check Terminals

Item		0V	DA Output	Speed Monitor	Current Monitor	Special Input Terminal
For 1 Axis Types		0V	DA	FFV	CUR	IN
For 2 Axes Types	1st		DA1	FFV1	CUR1	IN1
	2nd		DA2	FFV2	CUR2	IN2
Contents		0V of check terminal	Position loop gain can be measured. *1 *2	Approx. ±2.5V/ rated speed ±10% *2	Approx. ±0.1V/A ±20% *2	Not used.

*1 K_p: Position loop gain

$$K_p = \frac{\text{Input reference pulse frequency (pps)} \times 6.8}{\text{DA output (V)} \times 2^N}$$

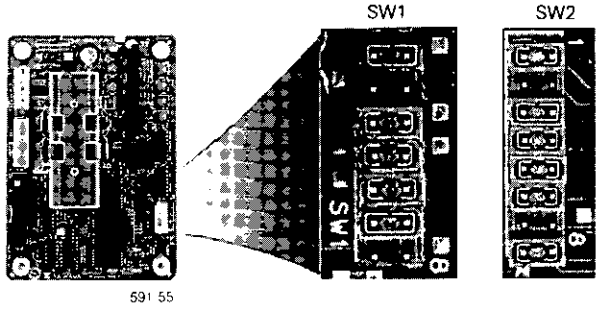
N=Number of set bits (9, 10, 11, 12)

*2 Impedance of the signal source is 10 kΩ. The use of a low-impedance meter would cause errors.

Notes: 1. Connect check terminals only when checked.
2. A few noise is superimposed on current monitor.

11.4 INTERNAL SWITCH

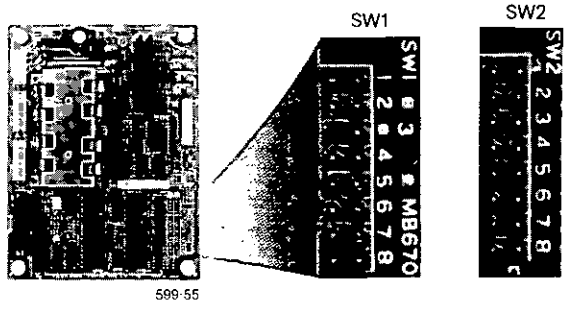
(1) Types CPCR-PSA 3 CSY□
(For 1 Axis Type)



Note: Do not touch SW2.

Fig. 17 Position of Internal Switches (SW1, SW2)

(2) Types CPCR-PSA 3 CWY□
(For 2 Axis Type)



Note: Do not touch SW2.

Fig. 18 Position of Internal Switches (SW1, SW2)

Table 18 SW1 Setting

SW1 Pin No.	Name	○○ *1	○ ○ *1
1	Reference pulse form	Sign + pulse train	CW pulse + CCW pulse
2	Alarm output	H alarm	L alarm
3 4	DA bit*2	3: ○○ / 4: ○○ — 9-bit 3: ○○ / 4: ○ ○ — 10-bit 3: ○ ○ / 4: ○○ — 11-bit 3: ○ ○ / 4: ○ ○ — 12-bit	
5	Feedback pulse	×1	×2
6	Reference logic	H effective	L effective
7 8	Speed feedback pulse	7: ○○ / 8: ○○ — Large 7: ○ ○ / 8: ○○ 7: ○○ / 8: ○ ○ 7: ○ ○ / 8: ○ ○ — Small	

Table 19 SW1 Setting

SW1 Pin No.	Name	○○ *1	○ ○ *1
1	Reference pulse form	Sign + pulse train	CW pulse + CCW pulse
2	Reference logic	H effective	L effective
3 4	DA bit*2	3: ○○ / 4: ○○ — 9-bit 3: ○○ / 4: ○ ○ — 10-bit 3: ○ ○ / 4: ○○ — 11-bit 3: ○ ○ / 4: ○ ○ — 12-bit	
5	Feedback Pulse	×1	×2
6 7 8	Not used	Use these pins for keeping remove shorting pins when setting has been changed.	

*1 ○○ : Shorting pin inserted.
○ ○ : Shorting pin not inserted.

*2 Kp is doubled by decreasing DA bit from 12 to 9 one by one.
For details, refer to Par. 11.3. "CHECK TERMINALS" on page 37.

12. TROUBLESHOOTING

12.1 MOTOR

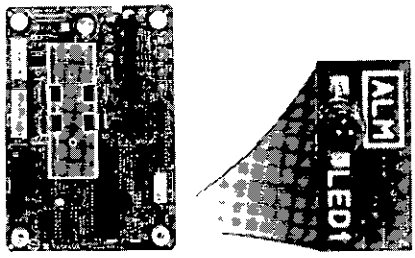
Trouble	Cause	Inspection Method	Remedial Action
Motor does not start.	Motor not powered	———	Supply AC power.
	Motor overloaded	Run motor unloaded.	When motor starts unloaded, reduce load or replace motor with another one with larger torque.
	Main circuit current capacity insufficient	Check power source capacity.	Replace power supply with another one with proper capacity.
	Defective motor	Use a good motor tentatively.	Original motor is defective if the replacement motor starts.
Unstable rotation	Broken lead wire suspected	Check lead wire by pulling it.	Replace lead wire.
	Unstable reference	Compare waveform of speed reference with that of F/V transformed encoder F/B pulse	Stabilize reference.
Overheated	Wrong combination of motor and SERVOPACK	Make sure of types of motor and SERVOPACK.	Run system with proper combination.
	High ambient temperature.	Measure ambient temperature.	Lower ambient temperature to 40℃ or below.
	Motor overloaded	Run motor unloaded.	Reduce load when no-load running does not cause overheat.
Abnormal noise	Wrong mounting	Check screws for tightness. Check motor-load shaft alignment for correctness.	Re-tighten mounting screws. Perform alignment.
	Defective bearing	Listen for sound from bearing-adjoining part.	Replace motor.
	Sliding sound of bearing	———	Normal
	Resonance with load measure	Measure resonance frequency.	Increase rigidity of lord.

12.2 SERVOPACK

Do not apply a megger test or withstand voltage to SERVOPACK.

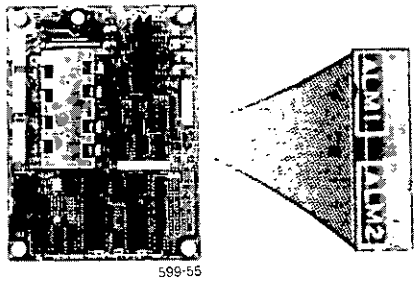
12.2.1 Alarm LED (ALM1, ALM2) Lights

- Lights when an alarm occurs.
- Reset by turning on the power supply or by reset signal.



591-55

Types CPCR-PSA3CSY□ (For 1 Axis Type)



599-55

Types CPCR-PSA3CWY□□ (For 2 Axes Type)

Table 20 Alarm Indications (LED ALM, ALM1, ALM2)

For 1 Axis Type		ALM	Cause	Check and Corrective Action
For 2 Axes Type	1st Axis	ALM1		
	2nd Axis	ALM2		
Contents		Error Counter Overflow	Motor and encoder are not connected.	Make sure of connectors.
			Wrong combination between motor, encoder and SERVOPACK.	Make sure of correct combination.
			High reference input frequency.	Lower the frequency.
			Heavy load.	Make sure of motor current. Give accel/decel reference.
			Motor locked.	Release rocked motor.
			Mechanical brake applied.	Make sure of braking sequence.
			Gain too low.	Increase position loop gain. Give accel/decel reference.
			Oscillation generated.	Reduce position loop gain.
		Encoder Open Phase	Poor contact of encoder connectors.	Check for connectors.
			Pulses disrupted by a shock to PG.	Remove the shock.
			Wrong circuit connected to A- and B- phase output of 1CN.	Disconnect the circuit for test.

12.2.2 SERVOPACK will not Run with Reference Pulses.

(1) Power supply is not applied. Power supply voltage is out of the specified range.
(2) Wrong connection of power supply. (SERVOPACK will be damaged. Replace it.)
(3) The fuses are blown. (Replace the fuse after checking supply voltage, load and wiring.)
(4) Wrong wiring of 1CN connector.
(5) Reference pulses are not given.
(6) Logical error in reference pulses.
(7) Narrow width of reference pulses.
(8) Reset signal is input.

12.2.3 Large Positional Deviation

(1) The number of reference pulses is out of order.
(2) Narrow width of reference pulses.
(3) CW and CCW reference pulses are given simultaneously (CW/CCW mode).
(4) Pulses are produced at the time of forward/running switching.
(5) Noise is carried on feedback pulses.
(6) Reset signal is given.
(7) Power supply is cut off. Power supply voltage is out of the specified range.
(8) Zero adjustment has drifted.
(9) Load is too heavy.
(10) Inadequate customer circuits (counter, etc.) connected to PG pulse, A- and B-phase of 1CN connector.

POPULAR SERVO

DC SERVO DRIVE SYSTEM PS SERIES FOR POSITIONING CONTROL

SERVOMOTOR: TYPES UGTMEM, UGPMEG, UGPMEE
SERVOPACK: TYPES CPCR-PSA3CWY (FOR TWO AXES),
CPCR-PSA3CSY (FOR ONE AXIS)

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