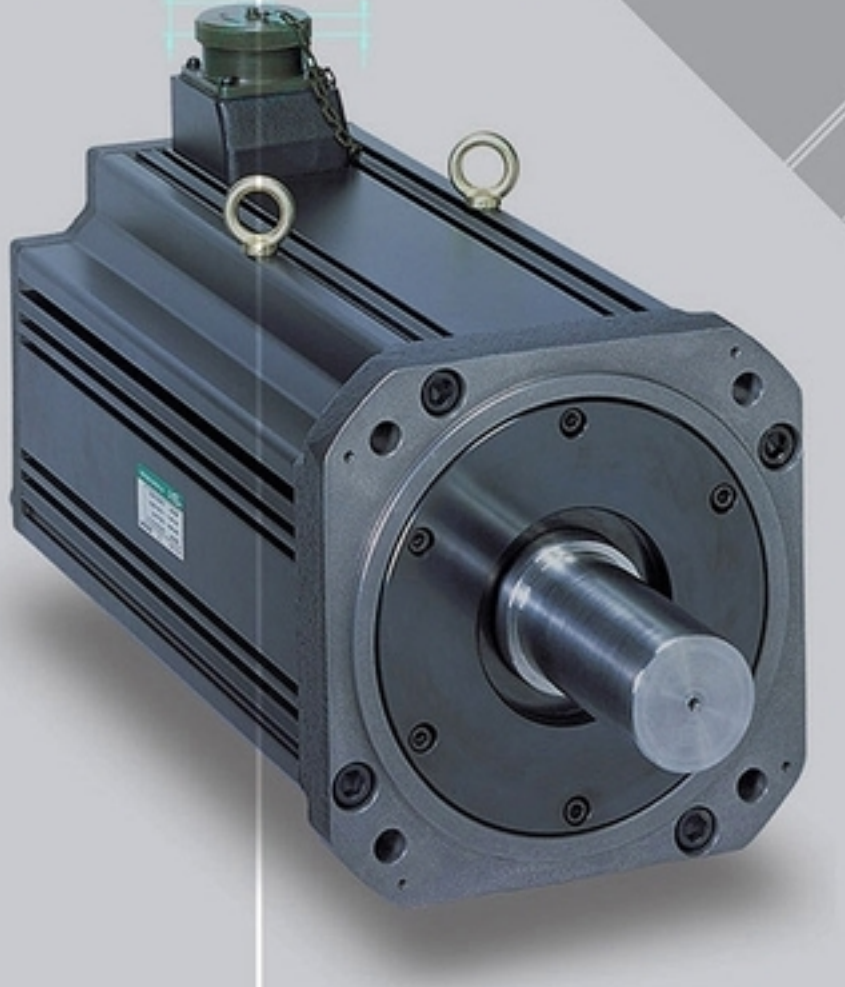
www.mecapion.com



INTERNATIONAL UKAS CE RoHS

Moving towards tomorrow

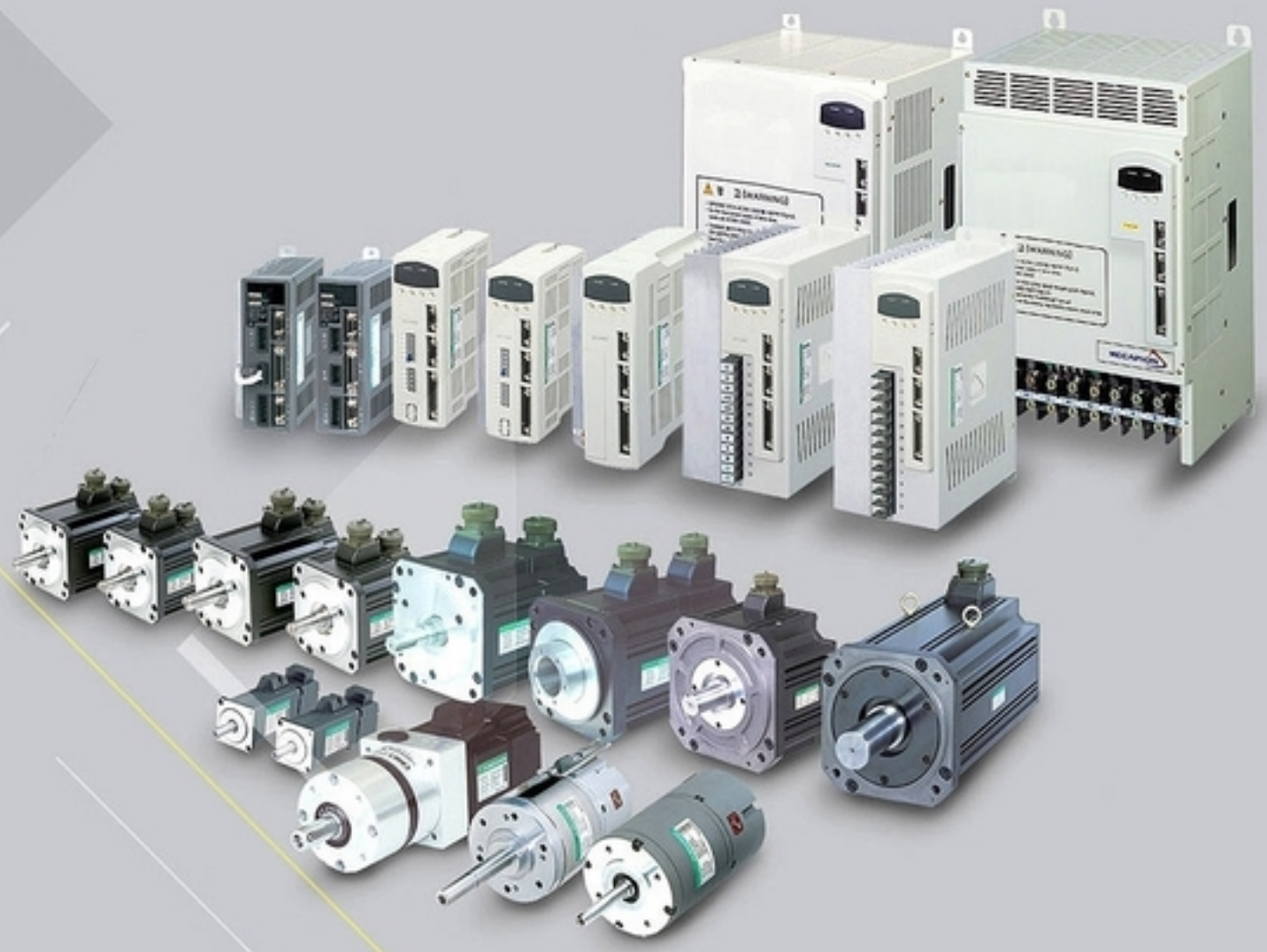
MECAPION

New name of **metronix** in korea

AC Servo System

Products Collection

Vol. 5.2



Moving Towards Tomorrow ..... MECAPION

Change Up History

The leader in "High Precision, Digital Control"

2010 System Engineering

2008 Industrial Robot System

2005 Motion System & ASIC

2001 AC Servo System

1995 Rotary Encoder

Total Solution of Digital Mechatronics

SALES NETWORK

Domestic Network

Kyungin area
Kyungin Center / R&D Center
14 Agents

Chungchong area
2 Agents

Youngnam area
Head office/ Factory / R&D Center
10 Agents

Honam area
1 Agent

Overseas Network

China Factory
WUXI MECAPION MACHINERY & ELECTRICAL CO., LTD.

Agent

Asia	Singapore / Vietnam / Indonesia / China
Europe	Germany / Italy / Turkey / France
	Greece / Spain / Sweden
America	U.S.A.
Others	India / Iran / Israel / South Africa / Venezuela

Global
FA Leading Company
MECAPION

AC Servo System

- Unique (Exclusive Design Service)
- Technical (Technical Supporting & Training Service)
- Comfortable (Quick Service)
- Global (Global Standardization Service)

Mechatronics + Champion

Mechatronics + New Pioneer

Certificates

Certificate of ISO 9001
Quality Management System

CE Certificate for Rotary
Encoder

CE Certificate for AC Servo
Motor

CE Certificate for AC Servo
Drive

UL

RoHS
Encoder H Type

History

- Sep. 1995 MECAPION was established and started Sensor business
- Jun. 1996 FA and OA encoder series were developed
- Mar. 1997 Rotary encoder for Servo Motor was developed
- May. 1997 Rotary encoder for elevator was developed and provided
- Nov. 1999 Robot encoder was developed
  Achieved CE mark for Rotary encoder
  Be selected as Venture Enterprise
- Jan. 2000 Moved and expanded company (Seongseo Industrial Complex)
- May. 2000 Started Servo business
- Aug. 2000 Changed into corporation
- Dec. 2000 Authorized by Small and Medium Business Corporation Authority
- Feb. 2001 Servo Motor was developed
- Jun. 2001 Expanded and relocated the plant(Seongseo 3rd Industrial Complex)
- Aug. 2001 Servo Drive(VS, VP) was developed
- Sep. 2001 R&D Center was established
- Feb. 2002 Be awarded the prize of the 1st Venture Enterprise of Daegu City
- Apr. 2002 Established Kyungin Center
- May. 2002 Be qualified on participation of industry-university cooperation consortium
  Be selected as a special technical company for component and material
  (By ministry of Commerce, Industry and Energy)
- Jun. 2002 Be qualified by ISO 9001
  Spinner motor for semiconductor was developed
- Jul. 2002 Be selected as the best enterprise of grade valuation for
  Venture enterprises(By the Federation of Korean Industries)
- Nov. 2002 Be awarded the prize of the 2nd Venture Enterprise of Daegu City
- Dec. 2002 Be selected as INNO-BIZ Company
- May. 2003 Achieved CE mark for Servo Motor
- Jun. 2004 Be selected as prospective export company
  (By the Small and Medium Industry Promotion Corporation)
- Aug. 2004 Economy Servo Drive(VK) was developed
- Sep. 2004 Be awarded a Gold Prize of 5th Inno Tech Show(By The Prime Minister)
- Oct. 2004 Achieved CE mark for Servo Drive
  Be awarded the chairman prize of Special Committee on Small and
  Medium Enterprise in 2004 Venture Show
- Nov. 2004 Be awarded a memorial tablet for export of 1 million
- Jan. 2005 Be selected as Daegu 5 Star Enterprises
  (By Ministry of Commerce, Industry and Energy)
  Started Motion system business
- Feb. 2005 Established China factory in Wuxi, China
- Jun. 2005 Be attracted the 3rd investment and issued of new share by Korea
  Development Bank
- Nov. 2005 Registered 2 kind of patens
- Dec. 2005 Invested to ASIC design and development company(30%)
- Dec. 2006 Be awarded a memorial tablet for export of 3 millions
- Mar. 2007 Be selected as Star Enterprises
- Oct. 2007 Win Grand Enterprise prise by Daegu City
- Nov. 2007 Open Guangdong Center in China
- Jan. 2008 Start Robot business

RoHS
Encoder S Type

RoHS
Servo Motor

Patent 1

Patent 2

Certificate of Superior
Technology Company

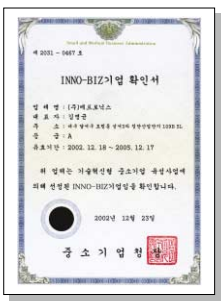
Certificate as promising
export company

Moving Towards Tomorrow

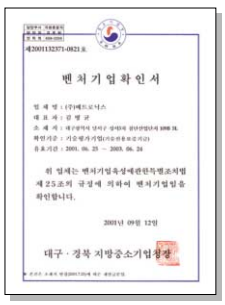
Digital AC Servo System

MECAPION

AC SERVO MOTOR
30W~37kW

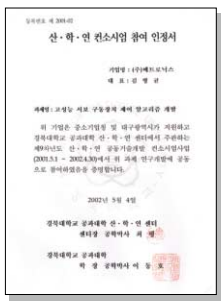


Certificate of INNO-BIZ



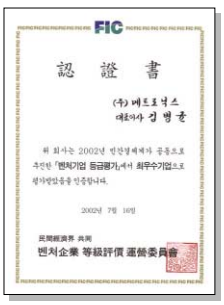
Certificate of Venture Enterprise

Certificate of Special Technical Company for Component and material



Certificate on Participation of Industry-University Cooperation Consortium

Certificate of Excellent Company in Technical Competitiveness



Certificate of Best Enterprise on Grade Valuation for Venture Enterprises

C·O·N·T·E·N·T·S

Moving towards tomorrow

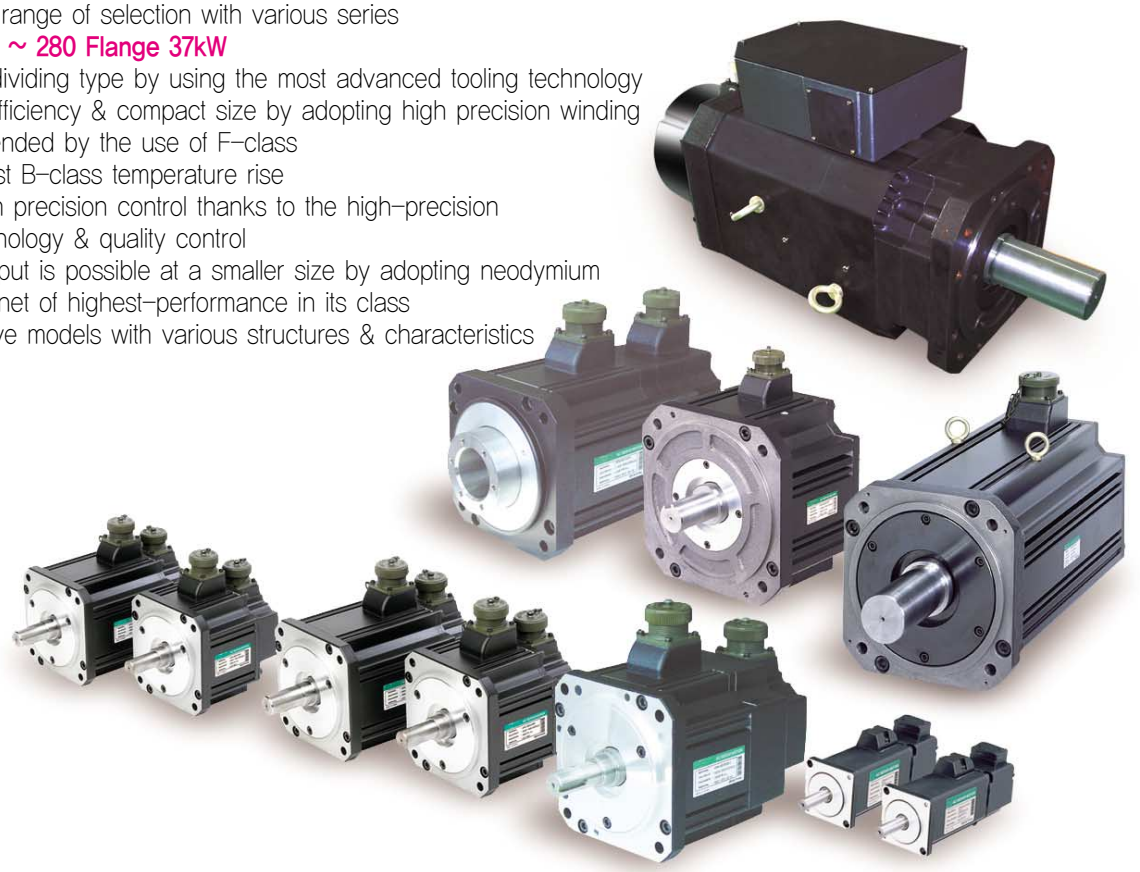
MECAPION

Servo & Sensors
Motion & Robot System

AC Servo Motor

30W~37kW Servo Motor & Drive released

- Provide a wide range of selection with various series
- **40 Flange 30W ~ 280 Flange 37kW**
- Adopted core-dividing type by using the most advanced tooling technology
- Realized high efficiency & compact size by adopting high precision winding
- Motor's life extended by the use of F-class insulation against B-class temperature rise
- Suitable for high precision control thanks to the high-precision fabricating technology & quality control
- High torque output is possible at a smaller size by adopting neodymium permanent magnet of highest-performance in its class
- Provide exclusive models with various structures & characteristics



Spinner Motor

- **Spinner Motor for semi-conductor equipment 8″ & 12″ developed**
- Used at Coater, Developer & Scrubber
- Realized high instantaneous acceleration characteristic- higher than 100,000 rps
- Manufactured custom made-spinner motor in response to customer's demands
- Secured various diameters of hollow shaft as per customer's requirement
- Environment-resistance strengthened by adopting magnetic fluid seal
- Anti-corrosion strengthened by the special coating process on the surface

Hollow Shaft Motor

- **Provide various diameters of hollow shaft(Max.ϕ50-□130 Flange)**
- Realized a compact size by the use of high- performance permanent magnet
- Compact design by adopting an exclusive encoder
- Motor's life extended by the use of F-class insulation against B-class temperature rise
- Designing various shapes of Exclusive Motor(customized type) is provided for customer's requirement

Moving towards tomorrow
MECAPION AC Servo System

AC Servo Drive

The Rated Specifications of Standard Servo Drive 「APD - VS Series」

- High-efficiency power transformation technologies realized by developing dedicated ASIC featuring latest control theory.
- Diversified functions added and convenience of use stregthened by the use of large-capacity flash memory.
- Precision control realized by the application of high-performance control algorithm.
- Additional services provided through various kinds of communication options.
  (PC Communication, Touch Screen, High-order Network Communication)
- Loader(6 digits) is basically mounted for the convenience of use
- Various menu function that is applied instantly after changing.

The Rated Specifications of Servo Drive with controller-embeded 「APD - VP Series」

- Products are subdivided by application sector and private control functions are provided so that anyone can use the system easily.
- Linear Coordinates Position Operation Type (VP-1): Linear motion machine, X-Y table
- Rotary Coordinates Position Operation Type (VP-2): Index, Turret.
- Position operation type after feeder and sensor (VP-3): Packing machine, All sorts of feeder, conveyor, I-mark.
- Program operation type (VP-5): 800 step operation.
- Other private soft : Program operation, All sorts of private machine.
- Tension control Operation type : Winder

Compact Servo Drive 「APD - VK Series」

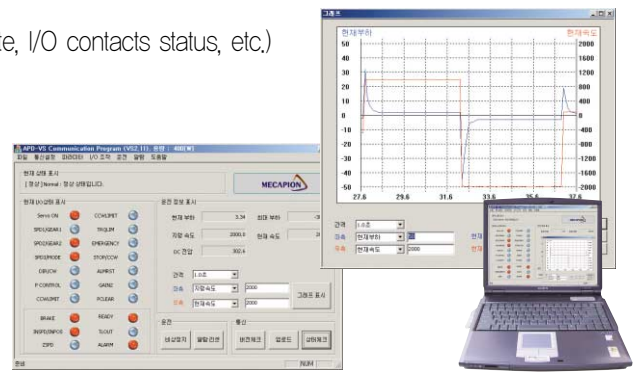
- Quick : Hi-Performance, Hi-Response, Hi-Efficiency.
- Simple : Position Control, Digital Speed Control.
- Easy Operation.

PC Loader

PC communication software also provides the graphic function in which the operation by using a computer. Reading/writing the menu data and displaying speed & torque information are all possible

Characteristics

- Display the current status information (Motor Speed, Load Rate, I/O contacts status, etc.)
- Saving the menu data & download function.
- Display the motor speed & torque with a graph.
- Easy changing of mode & menu data.
- Display function of Alarm status.
- Operation handling function by using communication protocol
- Data editing function by using communication-code
- Auto Jog operation test function
- PC Specifications : Window 98,WindowXP



Feature for Servo System

Encoder and Servo Motor Provide the Optimized Servo System for Customer needs with various Design and Characteristics

Servo Motor

APM – S B 04 A D K 1 G2 3

Flange Size
- A : 40 Flange
- B : 60 Flange
- C : 80 Flange
- E : 130 Flange
- F : 180 Flange
- G : 220 Flange
- H : 250 Flange
- J : 280 Flange

Rated Rotation Speed
- A : 3000 rpm
- D : 2000 rpm
- G : 1500 rpm
- M : 1000 rpm

Shape of Shaft
- N : Straight
- K : One Side Round Key (Standard)
- L : L Cut
- D : D Cut
- T : Taper Shape
- R : Both Sides Round Key
- H : Hollow Shaft

Speed Reducer (Gearbox)
- None : No Reducer
- G2 : For General Industry (Flange Mount)
- G3 : Precision Gearbox (Flange Mount)

Motor Shaft
- S : Solid Shaft
- H : Hollow Shaft

Motor Capacity
- R3 : 30W
- R5 : 50W
- 01 : 100W
- 02 : 200W
- 04 : 400W
- 05 : 450W
- 06 : 550W/600W
- 07 : 650W
- 08 : 750W/800W
- 09 : 850W/900W
- 10 : 1,000W
- :
- 110 : 11,000W
- 150 : 15,000W
- 220 : 22,000W
- 300 : 30,000W
- 370 : 37,000W

Encoder Type (Note1)
- A : Inc. 1,024 P/R(15 Lines)
- B : Inc. 2,000 P/R(15 Lines)
- C : Inc. 2,048 P/R(15 Lines)
- D : Inc. 2,500 P/R(15 Lines)
- E : Inc. 3,000 P/R(15 Lines)
- F : Inc. 5,000 P/R(15 Lines)
- G : Inc. 6,000 P/R(15 Lines)
- K : Abs.2,048 P/R
- L : Abs.4,096 P/R
- S : Inc. 2,000 P/R(9 Lines)
- T : Inc. 2,048 P/R(9 Lines)
- U : Inc. 2,500 P/R(9 Lines)
- V : Inc. 3,000 P/R(9 Lines)

Existence of Oil Seal,Brake (Note2)
- None : None
- 1 : Oil Seal Attached
- 2 : Brake Attached(DC 24[V])
- 3 : Oil Seal, Brake Attached(DC 24[V])
- 4 : Brake Attached(DC 90[V])
- 5 : Oil Seal, Brake Attached(DC 90[V])

Reduction ratio
- 3 : 1/3
- 10 : 1/10
- .
- .
- .

Note1) Standard, Encoder type for Motor Inc. 3,000P/R(15 Lines)
- 40 Flange : Inc. 2048P/R(15Lines) 3,000 & Over P/R is impossible
- 60, 80 Flange : Inc. 2,500P/R(15Lines) 5,000 & Over P/R is impossible
- 130, 180,220 Flange : Inc. 3,000P/R(15Lines)

Note2) Brake Power Supply
- 40,60,80,130,180 Flange : DC 24[V]
- 220 Flange : DC 90[V]

Note3) SA,SB,SC,SE Models : Approved by UL
Note4) Gearheaded Motor : Contact to Mecapion

Configuration of Servo Drive

Provide The Optimized Control System with 32bit High-Performance DSP and Various Interface Communication for Multi-Function control parts and High Credibility and Self-Protective Function for IPM Power Module

Servo Drive

APD – VS 04 N A4

Type Classification
- VS : Standard
- VP : Controller-embedded
- VK : Compact

Drive Capacity
- R5 : 50W
- 01 : 100W
- 02 : 200W
- 04 : 400W
- 05 : 500W
- 10 : 1,000W
- 15 : 1,500W
- 20 : 2,000W
- 35 : 3,500W
- 50 : 5,000W
- 75 : 7,500W
- 110 : 11,000W
- 150 : 15,000W
- 220 : 22,000W
- 300 : 30,000W
- 370 : 37,000W

Encoder Type
- N : Incremental
- A : Absolute

Exclusive Code

VS	Exclusive Option Code
VP	AS per the operating software 1. Linear coordinates position drive 2. Rotary coordinates position drive 3. Feeder and sensor-input position type 5. Program operation drive 9. Customized Position Drive
VK	P : Position Mode S : Speed Mode

Note1) VS Drive : 30W~37KW
VP Drive : 50W~15KW
VK Drive : 50W~800KW

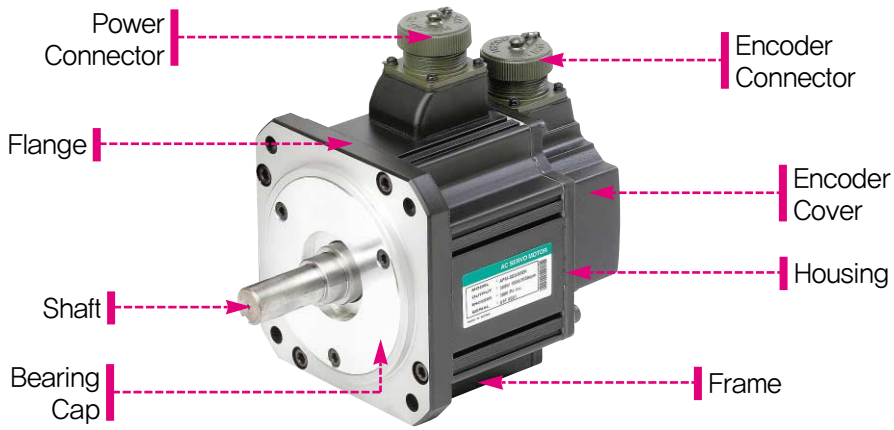
Application Table for Servo Motor and Drive

Servo Motor					Applicable drive	Encoder Used		IP grade
Rated Speed (r/min)	Maximum Speed (r/min)	Flange	Capacity (kW)	Model (APM-)	Model (APD-)	Standard Incremental	Standard Absolute	
3,000	5,000	□40	0.03	SAR3A	VS/VP/VKR5	·15pin type ·2048 P/R	·N/A	IP 55
			0.05	SAR5A	VS/VP/VKR5			
			0.1	SA01A	VS/VP/VK01			
		□60	0.1	SB01A	VS/VP/VK01	·15pin type ·2,500 P/R	·13pin type ·2,048 P/R ·11/13bit	IP 55
			0.2	SB02A	VS/VP/VK02			
			0.4	SB04A	VS/VP/VK04			
		□80	0.4	SC04A	VS/VP/VK04			IP 65
			0.6	SC06A	VS/VP/VK04			
			0.8	SC08A	VS/VP05			
			1.0	SC10A	VS/VP10			
		□130	0.9	SE09A	VS/VP10	·15pin type ·3,000 P/R	·13pin type ·2,048 P/R ·11/13bit	IP 65
			1.5	SE15A	VS/VP15			
			2.2	SE22A	VS/VP20			
			3.0	SE30A	VS/VP35			
		□180	3.0	SF30A	VS/VP35			
			5.0	SF50A	VS/VP50			
2,000	3,000	□80	0.3	SC03D	VS/VP/VK04	·15pin type ·2,500 P/R	·13pin type ·2,048 P/R ·11/13bit	IP 65
			0.45	SC05D	VS/VP/VK04			
			0.55	SC06D	VS/VP05			
			0.65	SC07D	VS/VP05			
		□130	0.6	SE06D	VS/VP05	·15pin type ·3,000 P/R	·13pin type ·2,048 P/R ·11/13bit	IP 65
			1.1	SE11D	VS/VP10			
			1.6	SE16D	VS/VP15			
			2.2	SE22D	VS/VP20			
		□180	2.2	SF22D	VS/VP20			
			3.5	SF35D	VS/VP35			
			5.5	SF55D	VS/VP50			
	2,500		7.5	SF75D	VS/VP75			
	3,000	□220	2.2	SG22D	VS/VP20			
			3.5	SG35D	VS/VP35			
			5.5	SG55D	VS/VP50			
	2,500		7.5	SG75D	VS/VP75			
			11.0	SG110D	VS/VP110			
1,500	3,000	□130	0.45	SE05G	VS/VP05	·15pin type ·3,000 P/R	·13pin type ·2,048 P/R ·11/13bit	IP 65
			0.85	SE09G	VS/VP10			
			1.3	SE13G	VS/VP15			
			1.7	SE17G	VS/VP20			
		□180	1.8	SF20G	VS/VP20			
			2.9	SF30G	VS/VP35			
			4.4	SF44G	VS/VP50			
	2,500		6.0	SF60G	VS/VP75			
			7.5	SF75G	VS/VP110			
	3,000	□220	2.0	SG20G	VS/VP20			
			3.0	SG30G	VS/VP35			
			4.4	SG44G	VS/VP50			
	2,500		6.0	SG60G	VS/VP75			
			8.5	SG85G	VS/VP110			
	2,000		11.0	SG110G	VS/VP150			
			15.0	SG150G	VS/VP150			
		□250	22.0	SH220G	VS220		·N/A	IP 55
			30.0	SH300G	VS300			
		□280	37.0	SJ370G	VS370			
1,000	2,000	□130	0.3	SE03M	VS/VP/VK04	·15pin type ·3,000 P/R	·13pin type ·2,048 P/R ·11/13bit	IP 65
			0.6	SE06M	VS/VP05			
			0.9	SE09M	VS/VP10			
			1.2	SE12M	VS/VP15			
		□180	1.2	SF12M	VS/VP15			
			2.0	SF20M	VS/VP20			
			3.0	SF30M	VS/VP35			
			4.4	SF44M	VS/VP50			
		□220	1.2	SG12M	VS/VP15			
			2.0	SG20M	VS/VP20			
			3.0	SG30M	VS/VP35			
			4.4	SG44M	VS/VP50			
			6.0	SG60M	VS/VP75			
3,000	5,000	□60	0.1	HB01A	VS/VP/VK01	·15pin type ·1,024 P/R	·N/A	IP 55
			0.2	HB02A	VS/VP/VK02			
			0.4	HB04A	VS/VP/VK04			
		□130	0.9	HE09A	VS/VP10			
			1.5	HE15A	VS/VP15			

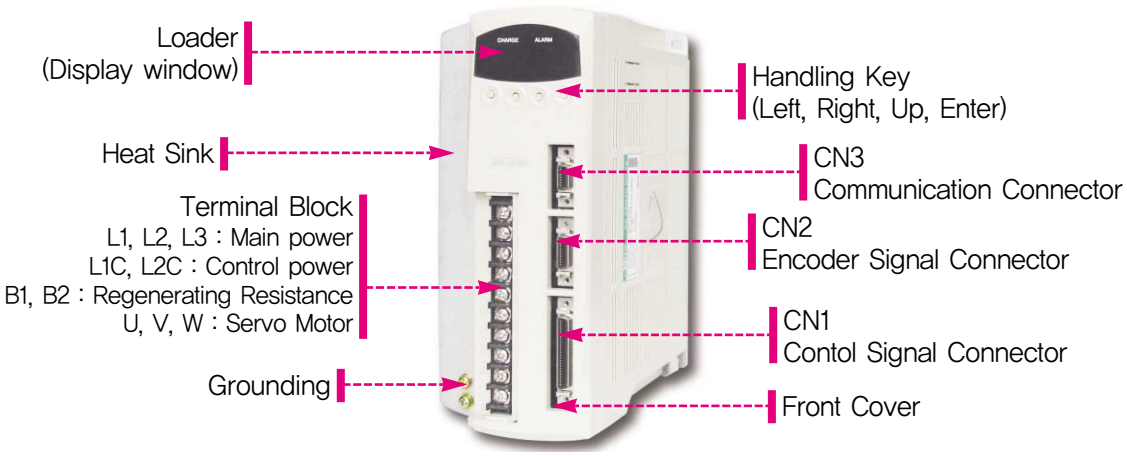
Note1) IP grade of Servo Motor excludes the shaft section.

Designation of Each Part

Motor



Drive



Built-in Loader Designation and Handling key function

Left	① Menu display window : Reduced the menu No. one by one. ② Data display window : Shift the row to left
Right	① Menu display window : Increased the menu No. one by one. ② Data display window : Shift the row to right
Up	① Menu display window : Menu group increased ② Data display window : The number of current row is increased
Enter	① Menu display window : Convert into data display window ② Data display window : Save the current data

PC Loader, Handy Loader

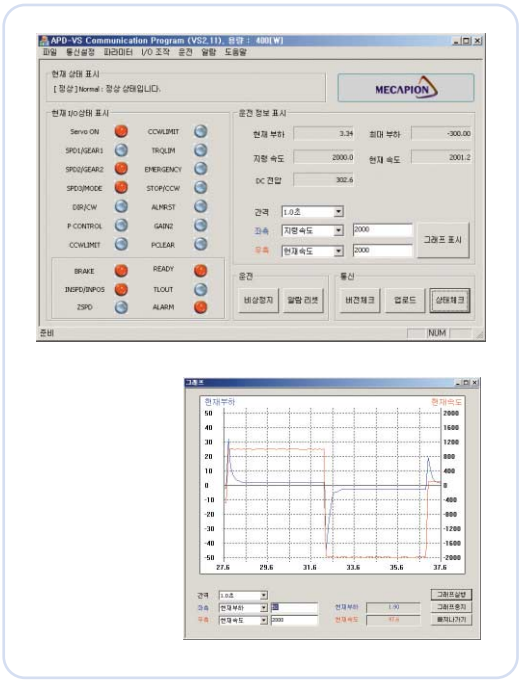
PC communication software also provides the grapic function in which the operation by using a computer. Reading/writing the menu data and displaying speed & torque information are all possible

CN3 connection

RS232/485 communication

PC Loader Characteristics

- Display the current status information (Motor Speed, Load Rate, I/O contacts status, etc.)
- Saving the menu data & download function.
- Display the motor speed & torque with a graph.
- Easy changing of mode & menu data.
- Display function of Alarm status.
- Operation handling function by using communication protocol
- Data editing function by using communication-code
- Auto Jog operation test function
- PC Specifications : Window 98,WindowXP



Note1) PC Communication software can be downloaded from our web site(www.mecapion.com).

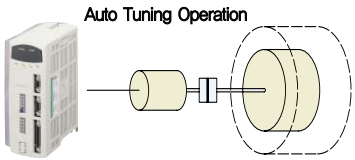
Main Function of Servo System

Built-In Loader Installation

Loader indicating 7 segments of 6 digits is installed for user's convenience.

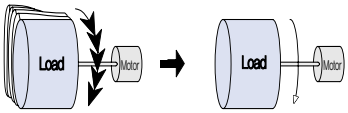
Auto Tuning Operation

Load inertia, speed gain and integral time constant are set up automatically by auto tuning operation.



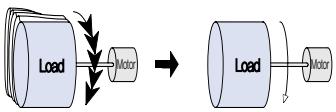
Anti-vibration during Operation

When noise is occurred by the vibration of shaft during operation, the noise can be reduced by setting the filter of speed control part.



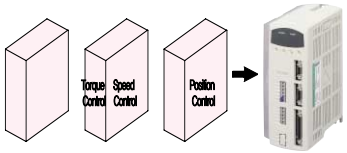
Anti-vibtation at Stop

At motor's stop, it prevents the noise caused produced by vibration and the damage of machine.



Position, Speed, Torque are All in One.

With a unit, individual control and switching operation for torque, speed and position are possible.



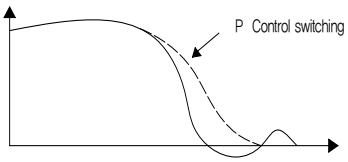
Test Operation

By Servo only, test operation is possible without upper controller.

(Test operation is possible without connecting to Upper controller)

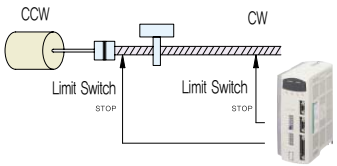
Anti-overshoot

By switching PI control and P control in order to improve the transitional characteristic at acceleration/deceleration, it is possible to control the overshoot and undershoot.



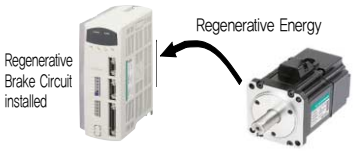
Preventing Over-trouble

If the moving part of motor outruns the movable area, it prevents the machine from damaging by stopping the rotation of motor.



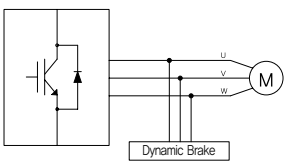
Bulit-in Regenerative Brake Function

Stable decelerating operation is possible by consuming the regenerative energy that is produced during motor deceleration through the regenerative circuit.



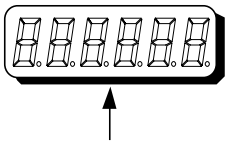
Built-in Dynamic Brake

At a sudden electricity failure or emergency stop, sudden braking operation is possible by consuming the generating energy of motor to prevent the machine from damaging.



Various Load Ratio Display Function

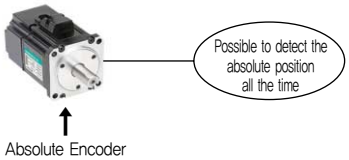
Display the current load ratio, instantaneous maximum load ratio and the average load ratio for 5 seconds during servo operation.



Load ratio display window

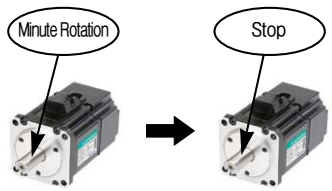
Applying an Absolute Encoder

Using an absolute encoder, the current position is always recognized even at an electricity failure, and the returning operation to the starting point is not necessary. And at power ON, the immediate operation is possible.



Zero Clamp Function

Motor might be rotated by the minute noise voltage even at 0[V] of analog command voltage. This function prevents it and stops the motor.



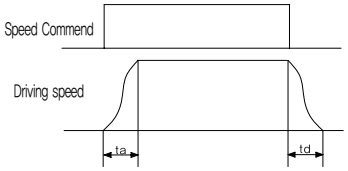
Selecting Various Speed

Analog command and 7 internal speed commands could be selected by external contact.

	SPD3	SPD2	SPD1
AnalogSpeed	off	off	off
Internal Speed 1	off	off	on
Internal Speed 2	off	on	off
Internal Speed 3	off	on	on
Internal Speed 4	on	off	off
Internal Speed 5	on	off	on
Internal Speed 6	on	on	off
Internal Speed 7	on	on	on

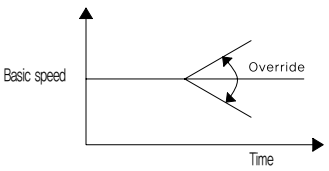
Smooth Acceleration/Deceleration Operation

Can select Linear acceleration/deceleration and S-shape acceleration/deceleration operation with 0~100[second].



Speed Override Operation

The speed by analog voltage command could be piled up on the basic setting speed



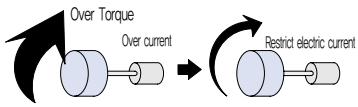
Switching Function of the Rotating Direction

Switching the rotating direction by external contact could be possible without any changing of wiring of motor or encoder

	DIR contact off	DIR contact on
CW command	CCW	CW
CCW command	CW	CCW

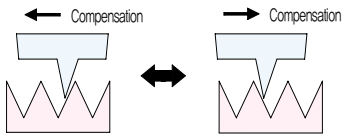
Torque Limit Function

Restrict excessive torque by control maximum electric current of motor.
It prevents mechanical damage of motor.



Backlash Compensation

Compensate the repeatedly swerved position that is caused by backlash of mechanical part at forward/reverse operation.



Various Positon Command Pulse

Various command pulse could be applicable

Pulse		negative logic		positive logic	
		CW	CCW	CW	CCW
A+B Phase	PF				
	PR				
Forward/ Reverse	PF				
	PR				
Pulse + Direction	PF				
	PR				

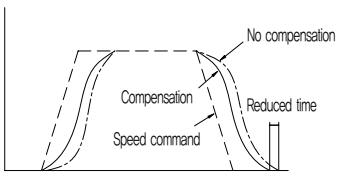
Selecting Electronic Gear Ratio & Offset Function

Can select 4 of electronic gear ratios with the input contact. And Minute Offset can also be controlled.

	EGEAR2	EGEAR1
Electronic gear ratio1	off	off
Electronic gear ratio2	off	on
Electronic gear ratio3	on	off
Electronic gear ratio4	on	on

Feed-Forward Compensation

By selecting the feed-forward compensation, the position decision time can be reduced.



The Origin Point Searching Function

It is possible to stop at origin (Z phase) within a rotation of motor. It is used at combining shaft of motor with machine.

Speed Limit Function at Torque's Operation

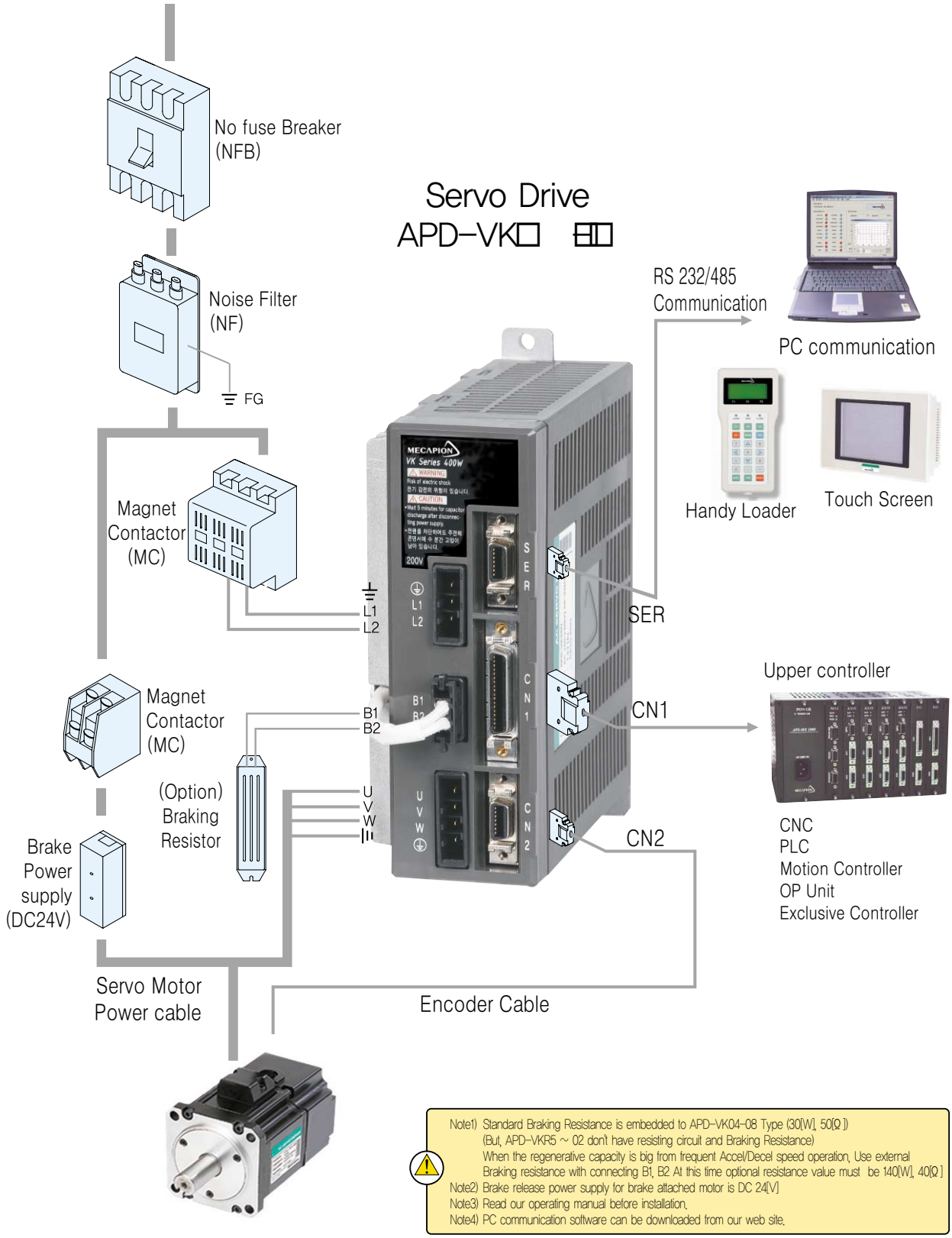
4 of speed limit setting is possible at torque control operation.

	SPD2	SPD1
Analog Speed	off	off
Internal Speed 1	off	on
Internal Speed 2	on	off
Internal Speed 3	on	on

System Configuration

50W~800W

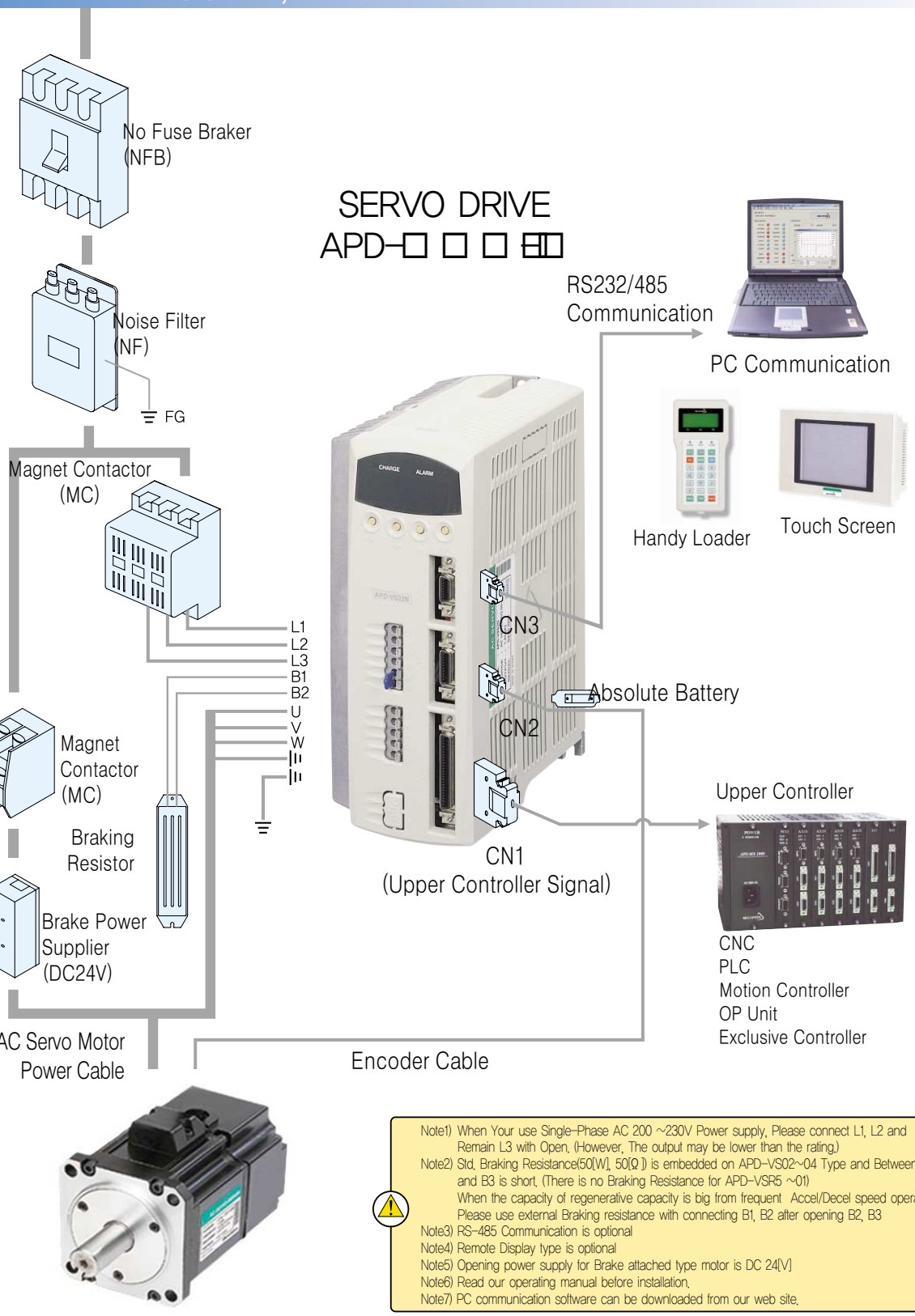
Single Phase 200 ~ 230[V] +10%, -15% (50/60Hz)



Note1) Standard Braking Resistance is embedded to APD-VK04-08 Type (30[W], 50[Ω])
(But, APD-VKR5 ~ 02 don't have resisting circuit and Braking Resistance)
When the regenerative capacity is big from frequent Accel/Decel speed operation, Use external Braking resistance with connecting B1, B2 At this time optional resistance value must be 140[W], 40[Ω]
Note2) Brake release power supply for brake attached motor is DC 24[V]
Note3) Read our operating manual before installation.
Note4) PC communication software can be downloaded from our web site.

Below 400W

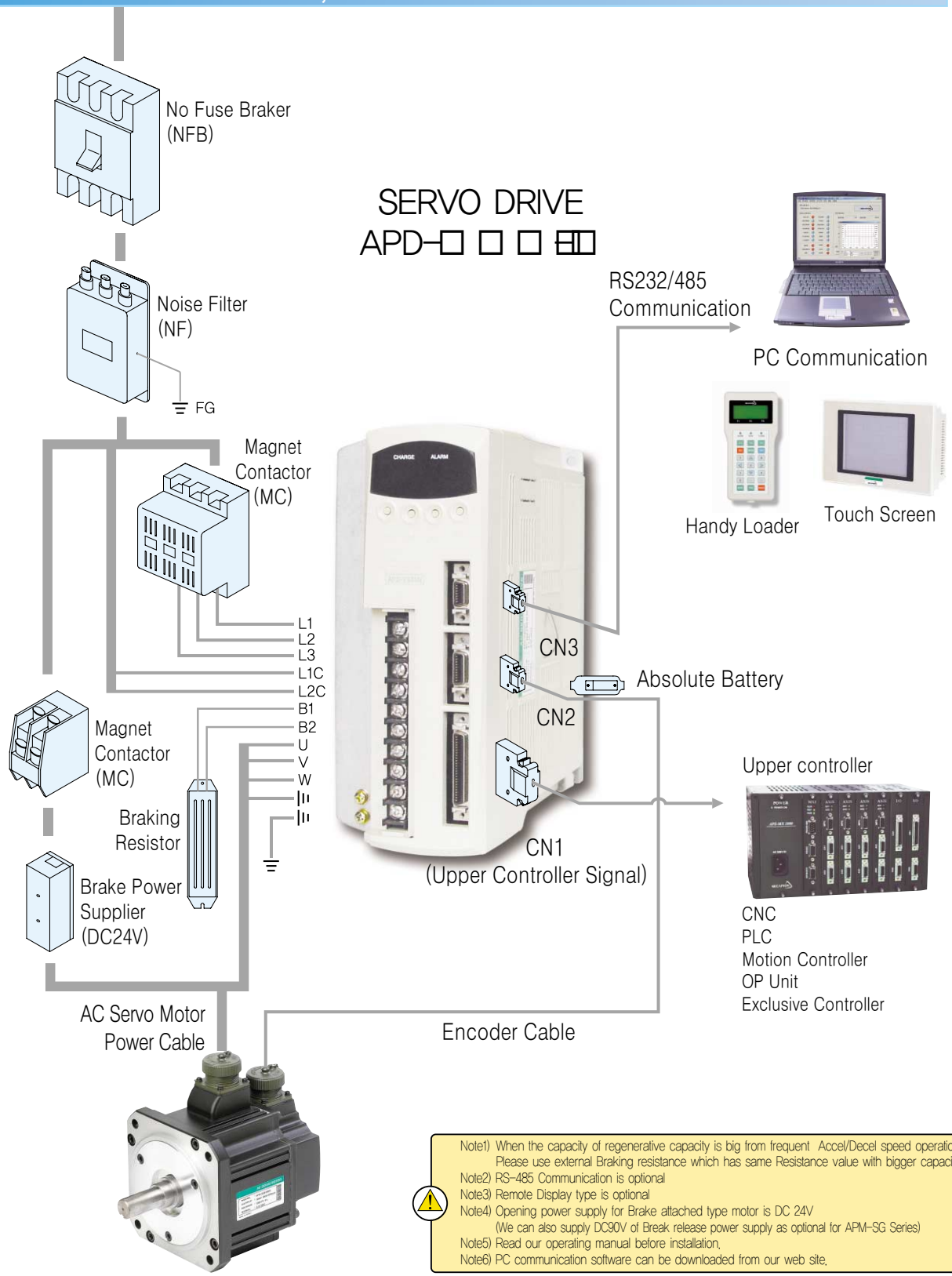
3 Phase AC 200-230[V] +10%, -15% (50/60Hz)



Note1) When Your use Single-Phase AC 200 ~230V Power supply, Please connect L1, L2 and Remain L3 with Open. (However, The output may be lower than the rating.)
Note2) Std. Braking Resistance(50[W], 50[Ω]) is embedded on APD-VS02~04 Type and Between B2 and B3 is short. (There is no Braking Resistance for APD-VSR5 ~01)
When the capacity of regenerative capacity is big from frequent Accel/Decel speed operation, Please use external Braking resistance with connecting B1, B2 after opening B2, B3
Note3) RS-485 Communication is optional
Note4) Remote Display type is optional
Note5) Opening power supply for Brake attached type motor is DC 24[V]
Note6) Read our operating manual before installation.
Note7) PC communication software can be downloaded from our web site.

500W~1kW

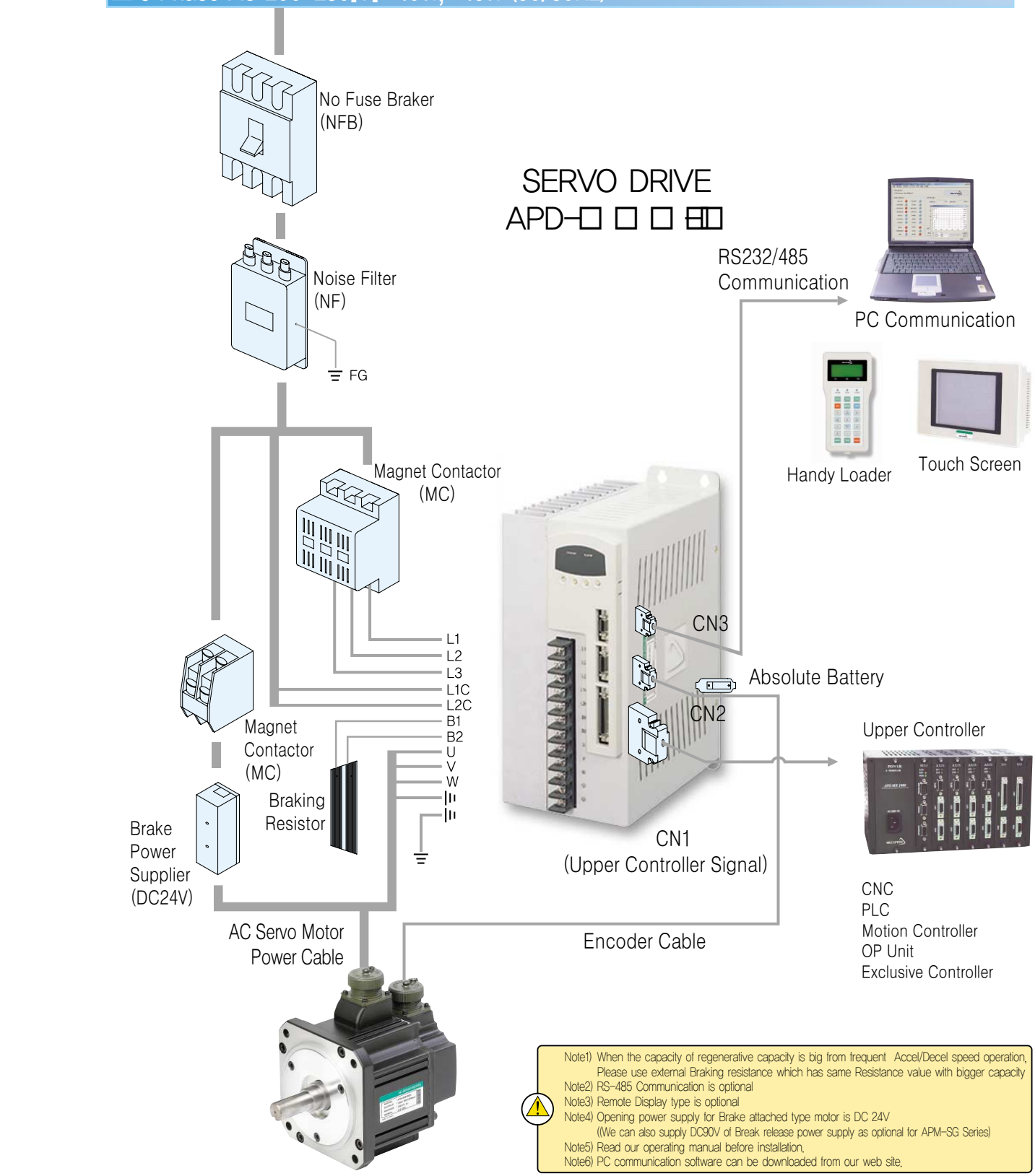
3 Phase AC 200-230[V] +10%, -15% (50/60Hz)



Note1) When the capacity of regenerative capacity is big from frequent Accel/Decel speed operation, Please use external Braking resistance which has same Resistance value with bigger capacity
Note2) RS-485 Communication is optional
Note3) Remote Display type is optional
Note4) Opening power supply for Brake attached type motor is DC 24V
(We can also supply DC90V of Break release power supply as optional for APM-SG Series)
Note5) Read our operating manual before installation.
Note6) PC communication software can be downloaded from our web site.

1.5kW~7.5kW

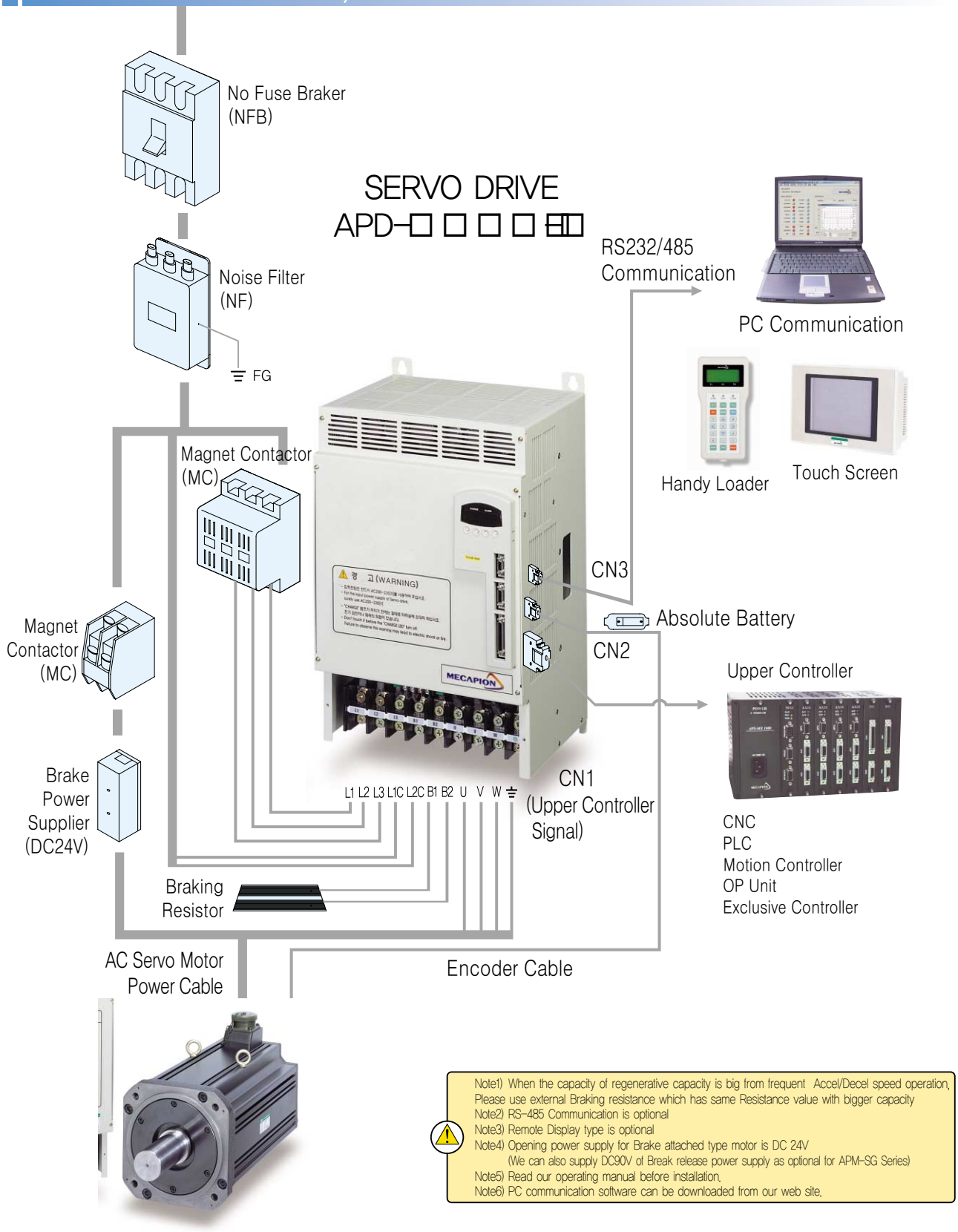
3 Phase AC 200-230[V] +10%, -15% (50/60Hz)



Note1) When the capacity of regenerative capacity is big from frequent Accel/Decel speed operation, Please use external Braking resistance which has same Resistance value with bigger capacity
Note2) RS-485 Communication is optional
Note3) Remote Display type is optional
Note4) Opening power supply for Brake attached type motor is DC 24V
((We can also supply DC90V of Break release power supply as optional for APM-SG Series)
Note5) Read our operating manual before installation.
Note6) PC communication software can be downloaded from our web site.

11kW~15kW

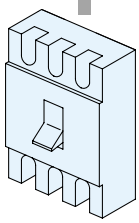
3 Phase AC 200-230[V] +10%, -15% (50/60Hz)



Note1) When the capacity of regenerative capacity is big from frequent Accel/Decel speed operation, Please use external Braking resistance which has same Resistance value with bigger capacity
Note2) RS-485 Communication is optional
Note3) Remote Display type is optional
Note4) Opening power supply for Brake attached type motor is DC 24V
(We can also supply DC90V of Break release power supply as optional for APM-SG Series)
Note5) Read our operating manual before installation.
Note6) PC communication software can be downloaded from our web site.

22kW, 30kW, 37kW

3 Phase AC 200-230[V] +10%, -15% (50/60Hz)



No Fuse Braker
(NFB)

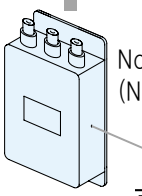
SERVO DRIVE
APD-□ □ □ ⊟□

PC Communication

RS232/485
Communication

Handy Loader

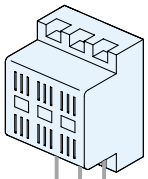
Touch Screen



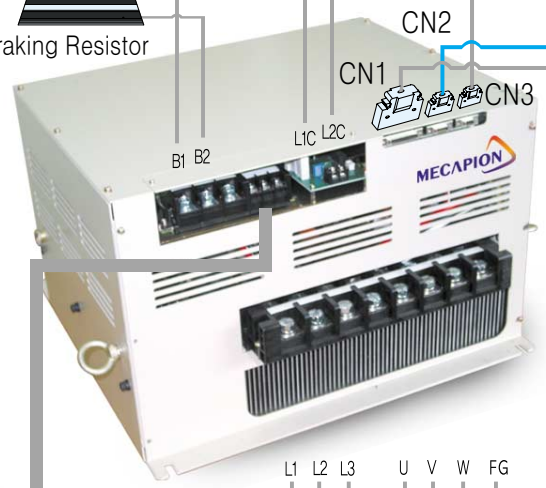
Noise Filter
(NF)

FG

Magnet Contactor
(MC)



Braking Resistor



Absolute Battery

Upper Controller

CNC
PLC
Motion Controller
OP Unit
Exclusive Controller

AC Servo Motor
Power Cable

Encoder Cable

Cooling Fan
Power

Note1) When the capacity of regenerative capacity is big from frequent Accel/Decel speed operation, Please use external Braking resistance which has same Resistance value with bigger capacity
Note2) RS-485 Communication is optional
Note3) Remote Display type is optional
Note4) Opening power supply for Brake attached type motor is DC 24V
(We can also supply DC90V of Break release power supply as optional for APM-SG Series)
Note5) Read our operating manual before installation.
Note6) PC communication software can be downloaded from our web site.

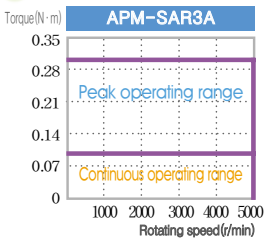
Characteristics of Servo Motor

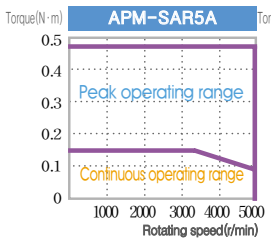
Servo Motor's Characteristics 〈Rated Speed 3000r/min〉

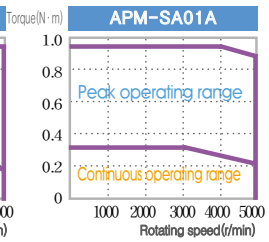
Servo Motor Model (APM-□□□□□)		SAR3A	SAR5A	SA01A	SB01A	SB02A	SB04A	SC04A	SC06A	SC08A	SC10A
Servo Drive Model (APD-□□□□□)		VSR5		VS01	VS01	VS02	VS04	VS04		VS05	VS10
Flange Size (□)		□40			□60			□80			
Rated Power	[kW]	0.03	0.05	0.1	0.1	0.2	0.4	0.4	0.6	0.8	1.0
Rated Torque	[N · m]	0.095	0.159	0.318	0.318	0.637	1.274	1.27	1.91	2.55	3.19
	[kgf · cm]	0.97	1.62	3.25	3.25	6.50	13.0	13.0	19.5	26.0	32.5
Max. Instantaneous torque	[N · m]	0.286	0.477	0.955	0.955	1.912	3.822	3.82	5.34	6.88	9.56
	[kgf · cm]	2.92	4.87	9.74	9.74	19.5	39.0	39.0	54.5	70.2	97.5
Rated rpm	[r/min]	3,000									
Max. rpm	[r/min]	5,000									
Monent of inertia	[kg·m²×10⁻⁴]	0.011	0.021	0.045	0.114	0.182	0.321	0.674	1.092	1.509	1.927
	[gf·cm·s²]	0.0112	0.0214	0.0459	0.116	0.186	0.327	0.687	1.114	1.539	1.966
Allowable Load Inertia Ratio		30times of motor inertia			20times of motor inertia			15times of motor inertia			
Rated Power Rate	[kW/S]	5.57	10.52	23.80	8.92	22.26	50.65	24.07	33.45	43.02	52.65
Speed, Potion Transducer	Standard(Note1)	Incremental 2048 [P/R]			Incremental 2500 [P/R]						
	Option	-			Absolute, 11/13bit Manchester communication						
Specification & Features	Protective Method	Totally enclosed, Non ventilated IP55(Excluding the shaft-through section and connectors)						Totally enclosed, Non ventilated IP65(Excluding the shaft-through section and connectors)			
	Insulation rate	B									
	Ambient Temp.	Operating Temp. : 0~40[°C] ·Storage Temp. : −20~80[°C]									
	Ambient Humidity	Lower than 90[%] (Avoid condensation)									
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust									
	E/V	Elevation/Vibration 49[m/s²](5G)									
Weight	[kg]	0.32	0.38	0.5	0.82	1.08	1.58	1.88	2.52	3.18	3.90

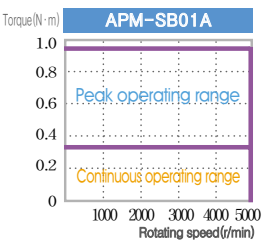
Note) Standard Encoder specification is 5[V] Line Driver.

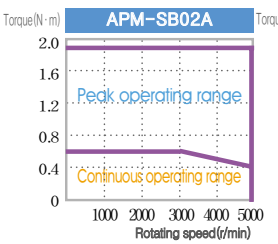
Rotation Speed-Torque's Characteristics

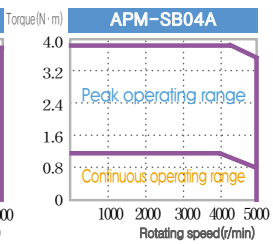


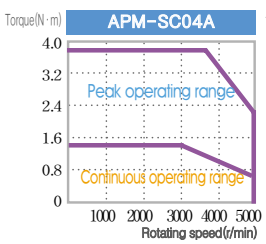


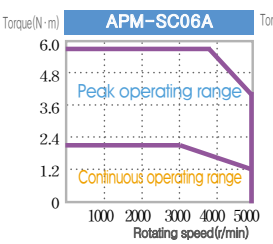


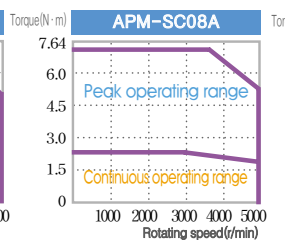


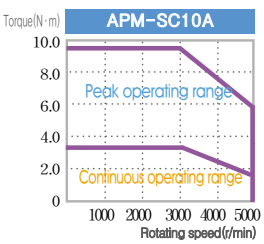










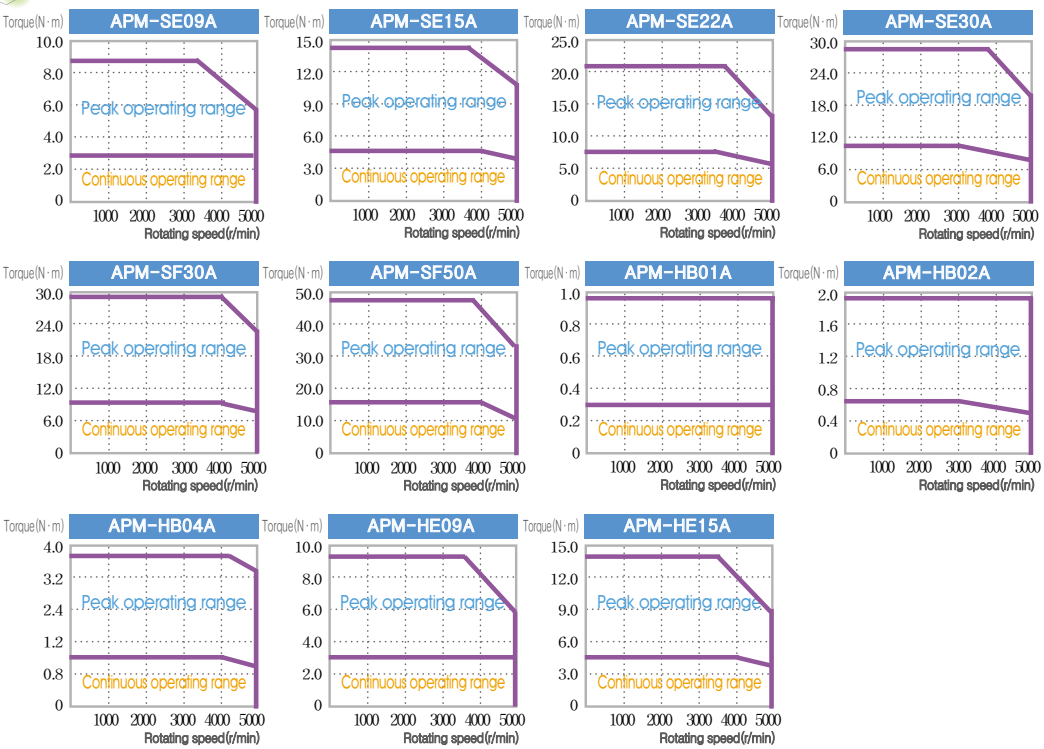


Servo Motor's Characteristics 〈Rated Speed 3000r/min〉

Servo Motor Model (APM-□□□□□)		SE09A	SE15A	SE22A	SE30A	SF30A	SF50A	HB01A	HB02A	HB04A	HE09A	HE15A
Servo Drive Model (APD-□□□□□)		VS10	VS15	VS20	VS35	VS35	VS50	VS01	VS02	VS04	VS10	VS15
Flange Size (□)		□130				□180		□60			□130	
Rated Power	[kW]	0.9	1.5	2.2	3.0	3.0	5.0	0.1	0.2	0.4	0.9	1.5
Rated Torque	[N · m]	2.86	4.77	7.0	9.55	9.55	15.91	0.318	0.637	1.274	2.86	4.77
	[kgf · cm]	29.2	48.7	71.4	97.4	97.4	162.3	3.25	6.50	13.0	29.2	48.7
Max. Instantaneous torque	[N · m]	8.59	14.32	21.01	28.65	28.64	47.74	0.955	1.912	3.822	8.59	14.32
	[kgf · cm]	87.7	146.1	214.3	292.2	292.2	487.0	9.74	19.5	39.0	87.7	146.1
Rated rpm	[r/min]	3,000										
Max. rpm	[r/min]	5,000										
Monent of inertia	[kg·m²×10⁻⁴]	6.659	11.999	17.339	22.679	30.74	52.13	0.269	0.333	0.461	19.558	22.268
	[gf·cm · s²]	6.792	12.238	17.685	23.132	31.35	53.16	0.274	0.339	0.470	19.943	22.707
Allowable Load Inertia Ratio		10 times of motor inertia				5 times of motor inertia		10 times of motor inertia			5 times of motor inertia	
Rated Power Rate	[kW/S]	12.31	18.98	28.25	40.17	29.66	48.56	3.34	11.98	34.47	4.10	10.01
Speed, Potion Transducer	Standard(Note1)	Incremental 3000[P/R]						Incremental 1024[P/R]			Incremental 2048[P/R]	
	Option	Absolute, 11/13bit Manchester communication						–			–	
Specification & Features	Protective Method	Totally enclosed, Non ventilated IP65(Excluding the shaft-through section and connectors)										
	Insulation rate	B										
	Ambient Temp.	Operating Temp. : 0~40[°C] ·Storage Temp. : −20~80[°C]										
	Ambient Humidity	Lower than 90[%] (Avoid condensation)										
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust										
	E/V	Elevation/Vibration 49[m/s²](5G)										
Weight	[kg]	5.5	7.54	9.68	11.78	12.11	17.7	0.89	1.16	1.69	5.82	7.43

⚠ Note) Standard Encoder specification is 5[V] Line Driver.

Rotation Speed-Torque's Characteristics

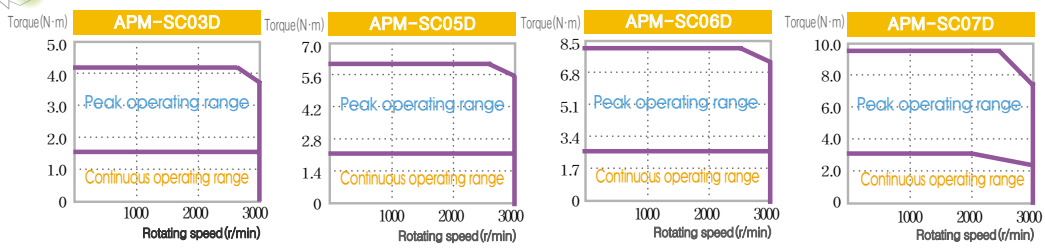


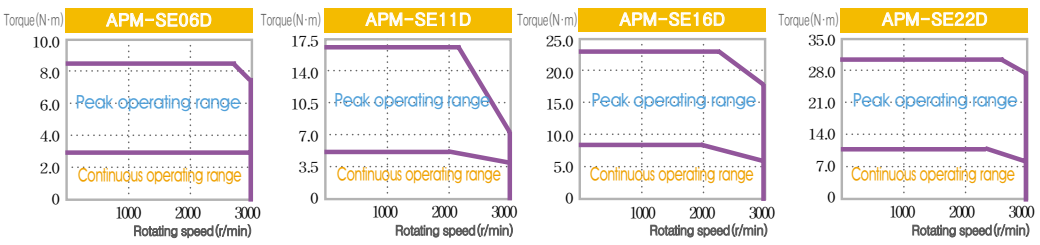
Servo Motor's Characteristics 〈Rated Speed 2000r/min〉

Servo Motor Model (APM-□□□□□)		SC03D	SC05D	SC06D	SC07D	SE06D	SE11D	SE16D	SE22D
Servo Drive Model (APD-□□□□□)		VS04		VS05		VS05	VS10	VS15	VS20
Flange Size (□)		□80				□130			
Rated Power	[kW]	0.3	0.45	0.55	0.65	0.6	1.1	1.6	2.2
Rated Torque	[N · m]	1.43	2.15	2.63	3.09	2.86	5.25	7.63	10.5
	[kgf · cm]	14.6	21.9	26.8	31.6	29.2	53.6	77.9	107.1
Max. Instantaneous torque	[N · m]	4.29	6.44	7.88	9.29	8.59	15.75	22.92	31.51
	[kgf · cm]	43.8	65.7	80.4	94.8	87.7	160.7	233.8	321.4
Rated rpm	[r/min]	2,000							
Max. rpm	[r/min]	3,000							
Monent of inertia	[kg·m²×10⁻⁴]	0.674	1.092	1.509	1.927	6.569	11.999	17.339	22.67
	[gf·cm·s²]	0.687	1.114	1.539	1.966	6.792	12.238	17.685	23.132
Allowable Load Inertia Ratio		15 times of motor inertia		10 times of motor inertia		10 times of motor inertia			
Rated Power Rate	[kW/S]	30.36	42.19	43.68	47.90	12.31	22.97	33.63	48.61
Speed, Potion Transducer	Standard(Note1)	Incremental 2500[P/R]				Incremental 3000[P/R]			
	Option	Absolute, 11/13bit Manchester communication				Absolute, 11/13bit Manchester communication			
Specification & Features	Protective Method	Totally enclosed, Non ventilated IP65(Excluding the shaft-through section and connectors)							
	Insulation rate	B							
	Ambient Temp.	Operating Temp. : 0~40[°C] ·Storage Temp. : -20~80[°C]							
	Ambient Humidity	Lower than 90[%] (Avoid condensation)							
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust							
	E/V	Elevation/Vibration 49[m/s²](5G)							
Weight	[kg]	1.85	2.52	3.18	3.90	5.5	7.54	9.68	11.78

⚠ Note) Standard Encoder specification is 5[V] Line Driver.

Rotation Speed-Torque's Characteristics



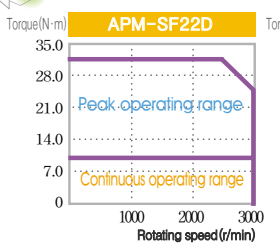


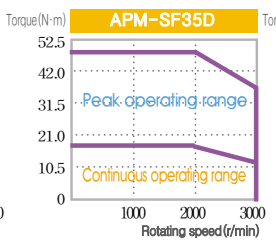
Servo Motor's Characteristics 〈Rated Speed 2000r/min〉

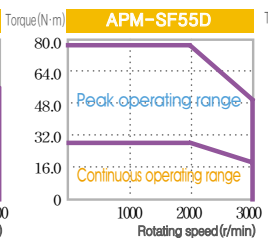
Servo Motor Model (APM-□□□□□)		SF22D	SF35D	SF55D	SF75D	SG22D	SG35D	SG55D	SG75D	SG110D
Servo Drive Model (APD-□□□□□)		VS20	VS35	VS50	VS75	VS20	VS35	VS50	VS75	VS110
Flange Size (□)		□180				□220				
Rated Power	[kW]	2.2	3.5	5.5	7.5	2.2	3.5	5.5	7.5	11.0
Rated Torque	[N · m]	10.5	16.7	26.25	35.81	10.5	16.7	26.3	35.8	52.5
	[kgf · cm]	107.1	170.4	267.8	365.41	107.2	170.5	267.9	365.4	535.9
Max. Instantaneous torque	[N · m]	31.5	50.12	78.76	89.53	31.5	50.1	78.8	89.5	131.3
	[kgf · cm]	321.3	511.3	803.4	913.53	321.3	511.5	803.8	913.4	1339.7
Rated rpm	[r/min]	2,000								
Max. rpm	[r/min]	3,000			2,500	3,000			2,500	
Monent of inertia	[kg·m²×10⁻⁴]	30.74	52.13	80.60	121.35	51.42	80.35	132.41	172.91	291.36
	[gf·cm · s²]	31.35	53.16	85.24	123.74	52.47	81.99	135.11	176.44	297.31
Allowable Load Inertia Ratio		5 times of motor inertia								
Rated Power Rate	[kW/S]	35.88	53.56	82.56	105.75	21.45	34.75	52.07	74.15	94.65
Speed, Potion Transducer	Standard(Note1)	Incremental 3000[P/R]								
	Option	Absolute, Manchester communication								
Specification & Features	Protective Method	Totally enclosed, Non ventilated IP65(Excluding the shaft-through section and connectors.)								
	Insulation rate	B								
	Ambient Temp.	Operating Temp. : 0~40[°C] ·Storage Temp. : −20~80[°C]								
	Ambient Humidity	Lower than 90[%] (Avoid condensation)								
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust								
	E/V	Elevation/Vibration 49[m/s²](5G)								
Weight	[kg]	12.4	17.7	26.3	35.6	16.95	21.95	30.8	37.52	66.2

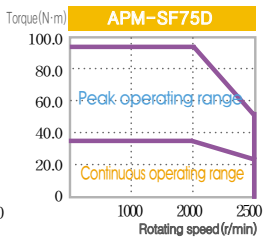
⚠ Note) Standard Encoder specification is 5[V] Line Driver.

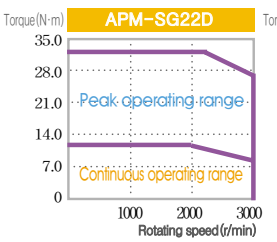
Rotation Speed-Torque's Characteristics

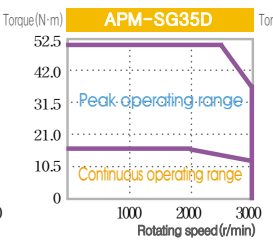


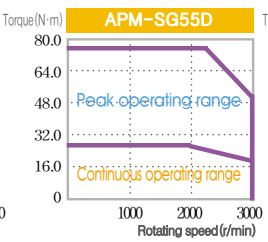


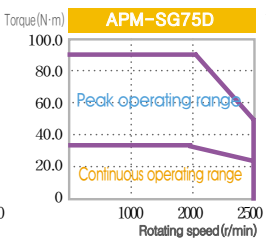


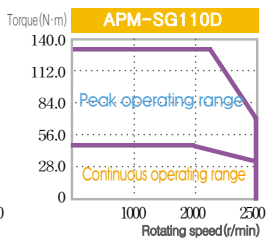










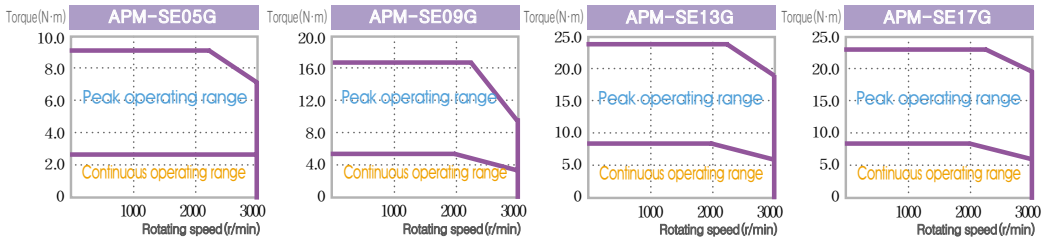


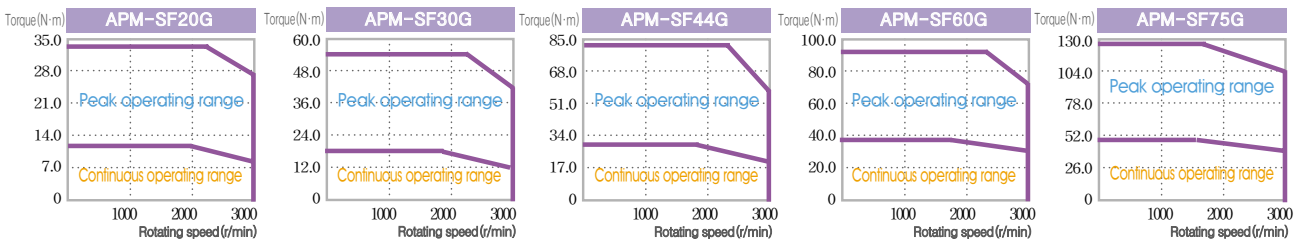
Servo Motor's Characteristics 〈Rated Speed 1500r/min〉

Servo Motor Model (APM-□□□□□)		SE05G	SE09G	SE13G	SE17G	SF20G	SF30G	SF44G	SF60G	SF75G
Servo Drive Model (APD-□□□□□)		VS05	VS10	VS15	VS20	VS20	VS35	VS50	VS75	VS110
Flange Size (□)		□130				□180				
Rated Power	[kW]	0.45	0.85	1.3	1.7	1.8	2.9	4.4	6.0	7.5
Rated Torque	[N · m]	2.86	5.41	8.27	10.82	11.45	18.46	28.0	38.2	47.7
	[kgf · cm]	29.22	55.19	84.41	110.38	116.88	188.3	285.7	389.8	487.2
Max. Instantaneous torque	[N · m]	8.59	16.23	24.82	32.46	34.35	55.38	84.03	95.5	128.8
	[kgf · cm]	87.66	165.57	253.23	331.14	350.64	564.9	857.1	974.9	1315.4
Rated rpm	[r/min]	1,500								
Max. rpm	[r/min]	3,000							2,500	
Monent of inertia	[kg·m²×10⁻⁴]	6.659	11.999	17.339	22.679	30.74	52.13	83.60	121.35	143.82
	[gf·cm·s²]	6.792	12.238	17.685	23.132	31.35	53.16	85.24	123.74	146.76
Allowable Load Inertia Ratio		10 times of motor inertia				5 times of motor inertia				
Rated Power Rate	[kW/S]	12.28	24.39	39.54	51.61	42.70	65.36	93.84	120.32	158.48
Speed, Potion Transducer	Standard(Note1)	Incremental 3000[P/R]								
	Option	Absolute, Manchester communication								
Specification & Features	Protective Method	Totally enclosed, Non ventilated IP65(Excluding the shaft-through section and connectors.)								
	Insulation rate	B								
	Ambient Temp.	Operating Temp. : 0~40[°C] ·Storage Temp. : −20~80[°C]								
	Ambient Humidity	Lower than 90[%] (Avoid condensation)								
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust								
	E/V	Elevation/Vibration 49[m/s²](5G)								
Weight	[kg]	5.5	7.54	9.68	11.78	12.4	17.7	26.3	35.6	39.4

⚠ Note) Standard Encoder specification is 5[V] Line Driver.

Rotation Speed-Torque's Characteristics



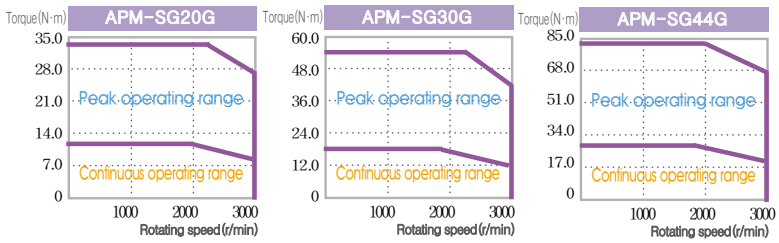


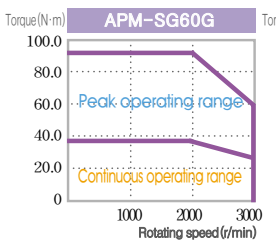
Servo Motor's Characteristics 〈Rated Speed 1500r/min〉

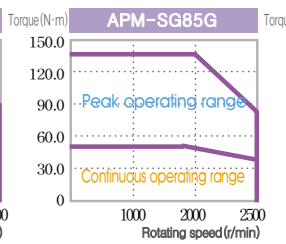
Servo Motor Model (APM-□□□□□)		SG20G	SG30G	SG44G	SG60G	SG85G	SG110G	SG150G
Servo Drive Model (APD-□□□□□)		VS20	VS35	VS50	VS75	VS110	VS150	VS150
Flange Size (□)		□220						
Rated Power	[kW]	1.8	2.9	4.4	6.0	8.5	11.0	15.0
Rated Torque	[N · m]	11.5	18.5	28.0	38.2	54.1	70.0	95.5
	[kgf · cm]	116.9	188.4	285.8	389.7	552.1	714.5	974.3
Max. Instantaneous torque	[N · m]	34.4	55.4	84.0	95.5	135.3	149.1	224.4
	[kgf · cm]	350.8	565.1	857.4	974.3	1380.3	1521.8	2289.6
Rated rpm	[r/min]	1,500						
Max. rpm	[r/min]	3,000			2,500		2,000	
Monent of inertia	[kg·m²×10⁻⁴]	51.42	80.35	132.41	172.91	291.36	291.36	385.54
	[gf·cm·s²]	52.47	81.99	135.11	176.44	297.31	297.31	393.41
Allowable Load Inertia Ratio		5 times of motor inertia						
Rated Power Rate	[kW/S]	25.53	42.41	59.25	84.36	78.23	168.27	236.47
Speed, Potion Transducer	Standard(Note1)	Incremental 3000[P/R]						
	Option	Absolute, Manchester communication						
Specification & Features	Protective Method	Totally enclosed, Non ventilated IP65(Excluding the shaft-through section and connectors.)						
	Insulation rate	B						
	Ambient Temp.	Operating Temp. : 0~40[°C] ·Storage Temp. : -20~80[°C]						
	Ambient Humidity	Lower than 90[%] (Avoid condensation)						
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust						
	E/V	Elevation/Vibration 49[m/s²](5G)						
Weight	[kg]	16.95	21.95	30.8	37.52	66.2	66.3	92.2

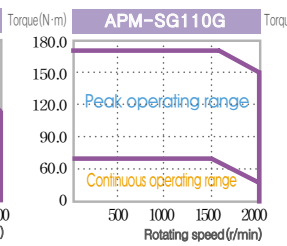
Note) Standard Encoder specification is 5[V] Line Driver.

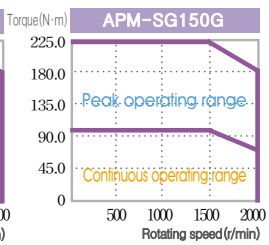
Rotation Speed-Torque's Characteristics









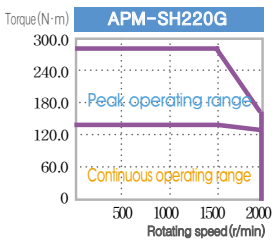


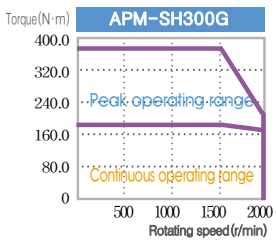
Servo Motor's Characteristics 〈Rated Speed 1500r/min〉

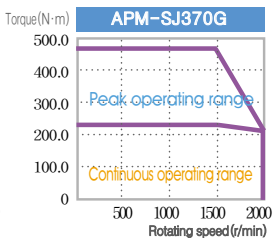
Servo Motor Model (APM-□□□□□)		SH220G	SH300G	SJ370G
Servo Drive Model (APD-□□□□□)		V3S220	V3S300	V3S370
Flange Size (□)		□250		□280
Rated Power	[kW]	22,000	30,000	37,000
Rated Torque	[N · m]	140.04	190.96	235.52
	[kgf · cm]	1,429.0	1,948.6	2,403.3
Max. Instantaneous torque	[N · m]	280.08	381.93	471.04
	[kgf · cm]	2,858.0	3,897.2	4,806.6
Rated rpm	[r/min]	1,500		
Max. rpm	[r/min]	2,000		
Monent of inertia	[kg·m²×10⁻⁴]	628.51	800.81	1,314.31
	[gf·cm·s²]	641.34	817.15	1,341.13
Allowable Load Inertia Ratio		5 times of motor inertia		
Rated Power Rate	[kW/S]	312.03	455.38	422.05
Speed, Potion Transducer	Standard(Note1)	Incremental 3000[P/R]		
	Option	Absolute, Manchester communication		
Specification & Features	Protective Method	Totally enclosed, Non ventilated IP55(Excluding the shaft-through section and connectors.)		
	Insulation rate	B		
	Ambient Temp.	Operating Temp. : 0~50[°C] ·Storage Temp. : -20~80[°C]		
	Ambient Humidity	Lower than 90[%] (Avoid condensation)		
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust		
	E/V	Elevation/Vibration 49[m/s²](5G)		
Weight	[kg]	117	138	232

⚠ Note) Standard Encoder specification is 5[V] Line Driver.

Rotation Speed-Torque's Characteristics





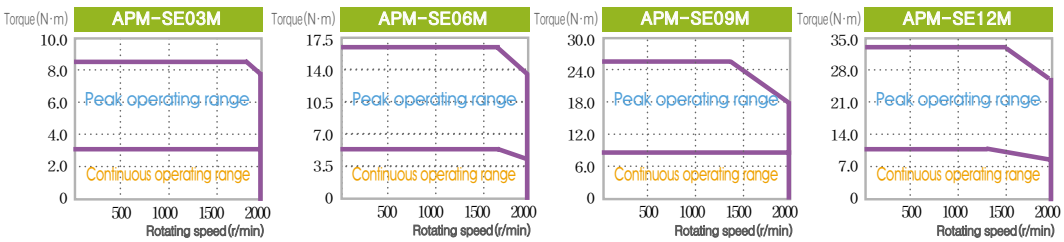


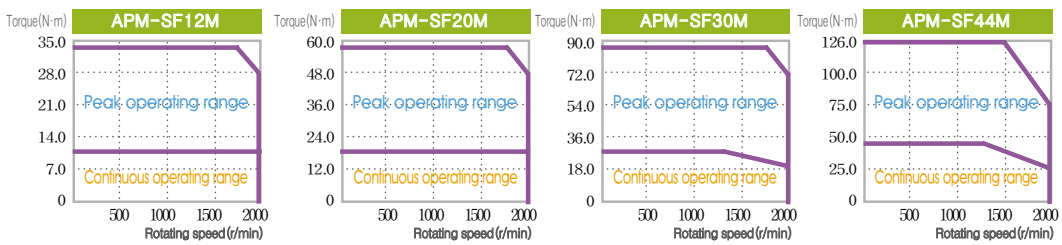
Servo Motor's Characteristics 〈Rated Speed 1000r/min〉

Servo Motor Model (APM-□□□□□)		SE03M	S06M	SE09M	SE12M	SF12M	SF20M	SF30M	SF44M
Servo Drive Model (APD-□□□□□)		VS04	VS05	VS10	VS15	VS15	VS20	VS35	VS50
Flange Size (□)		□130				□180			
Rated Power	[kW]	0.3	0.6	0.9	1.2	1.2	2.0	3.0	4.4
Rated Torque	[N · m]	2.86	5.72	8.59	11.46	11.46	19.09	28.64	42.02
	[kgf · cm]	29.2	58.4	87.7	116.9	116.9	194.8	292.2	428.7
Max. Instantaneous torque	[N · m]	8.59	17.18	25.77	34.22	34.38	57.29	85.94	126.05
	[kgf · cm]	87.7	175.3	262.9	349.1	350.7	584.4	876.6	1286.2
Rated rpm	[r/min]	1,000							
Max. rpm	[r/min]	2,000							
Monent of inertia	[kg·m²×10⁻⁴]	6.659	11.999	17.339	22.679	30.74	52.13	83.60	121.35
	[gf·cm·s²]	6.792	12.238	17.685	23.132	31.35	53.16	85.24	123.74
Allowable Load Inertia Ratio		10 times of motor inertia				5 times of motor inertia			
Rated Power Rate	[kW/S]	12.31	27.34	42.56	57.85	42.70	69.96	98.16	145.55
Speed, Potion Transducer	Standard(Note1)	Incremental 3000[P/R]							
	Option	Absolute, Manchester communication							
Specification & Features	Protective Method	Totally enclosed, Non ventilated IP65(Excluding the shaft-through section and connectors.)							
	Insulation rate	B							
	Ambient Temp.	Operating Temp. : 0~40[°C] ·Storage Temp. : -20~80[°C]							
	Ambient Humidity	Lower than 90[%] (Avoid condensation)							
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust							
	E/V	Elevation/Vibration 49[m/s²](5G)							
Weight	[kg]	5.5	7.54	9.68	11.78	12.4	17.7	26.3	35.6

⚠ Note) Standard Encoder specification is 5[V] Line Driver.

Rotation Speed-Torque's Characteristics



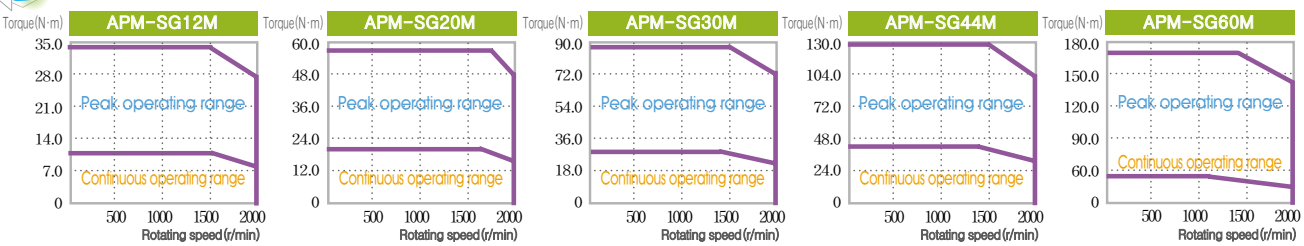


Servo Motor's Characteristics 〈Rated Speed 1000r/min〉

Servo Motor Model (APM-□□□□□)		SG12M	SG20M	SG30M	SG44M	SG60M
Servo Drive Model (APD-□□□□□)		VS15	VS20	VS35	VS50	VS75
Flange Size (□)		□220				
Rated Power	[kW]	1.2	2.0	3.0	4.4	6.0
Rated Torque	[N · m]	11.5	19.1	28.6	42.0	57.3
	[kgf · cm]	116.9	194.9	292.3	428.7	584.6
Max. Instantaneous torque	[N · m]	34.4	57.3	85.9	126.0	149.8
	[kgf · cm]	350.8	584.6	876.9	1286.1	1528.6
Rated rpm	[r/min]	1,000				
Max. rpm	[r/min]	2,000				
Monent of inertia	[kg·m²×10⁻⁴]	51.42	80.35	132.41	172.91	291.36
	[gf·cm·s²]	52.47	81.99	135.11	176.44	297.31
Allowable Load Inertia Ratio		5 times of motor inertia				
Rated Power Rate	[kW/S]	25.53	45.39	61.97	102.08	112.64
Speed, Potion Transducer	Standard(Note1)	Incremental 3000[P/R]				
	Option	Absolute, Manchester communication				
Specification & Features	Protective Method	Totally enclosed, Non ventilated IP65(Excluding the shaft-through section and connectors.)				
	Insulation rate	B				
	Ambient Temp.	Operating Temp. : 0~40[°C] ·Storage Temp. : −20~80[°C]				
	Ambient Humidity	Lower than 90[%] (Avoid condensation)				
	Atmosphere	Avoid direct sunlight, no corrosive gas, inflammable gas, oil mist, or dust				
	E/V	Elevation/Vibration 49[m/s²](5G)				
Weight	[kg]	16.95	21.95	30.8	37.52	66.2

Note) Standard Encoder specification is 5[V] Line Driver.

Rotation Speed-Torque's Characteristics



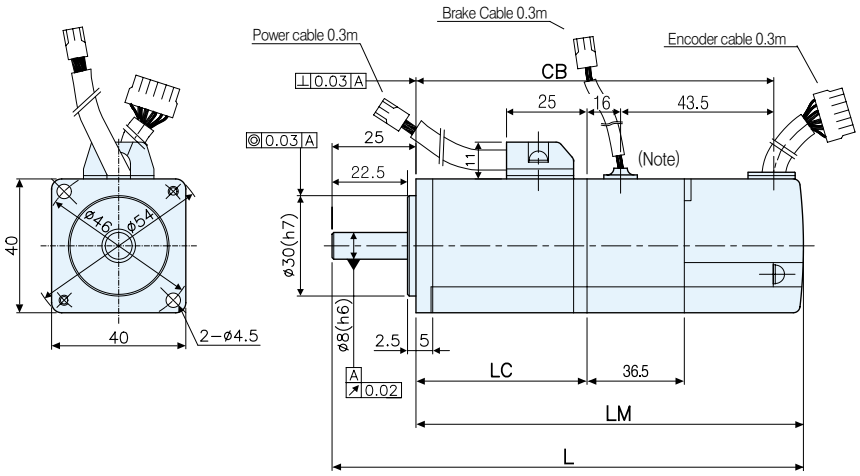
Brake Specification

Applicable Motor Series	APM-SA	APM-SB	APM-SC	APM-SE	APM-SF	APM-SG
Use	Maintenance	Maintenance	Maintenance	Maintenance	Maintenance	Maintenance
Power supply [V]	DC 24V	DC 24V	DC 24V	DC 24V	DC 24V	DC 90V
Rated Friction Torque [N • m]	0.32	1.47	3.23	10.4	40	74
Capacity [W]	6	6.5	9	19.4	25	25
Coil Resistance [Ω]	96	89	64	29.6	23	327
Rated Current [A]	0.25	0.27	0.38	0.81	1.04	0.28
Braking Type	Spring brake	Spring brake	Spring brake	Spring brake	Spring brake	Spring brake
Insulation Class	F− class	F− class	F− class	F− class	F− class	F− class

Note 1) For the electronic Brake that is attached to our Servo Motor, the same specifications are to be applied as per the series
2) Never use it for braking purpose because the electronic brake is only for maintenance of stopped condition
3) The characteristic of electronic brake is measured at 20 C
4) APM-SA,SB,SC,SE,SF Series-DC24[V], APM-SG Series-DC90[V]

Servo Motor Dimension

SA Series | APM-SAR3A, APM-SAR5A, APM-SA01A



Model	External Dimension				Weight (kg)
	L	LM	LC	CB	
SAR3A	100.5(137)	75.5(112)	42.5	65.5(102)	0.32(0.67)
SAR5A	107.5(144)	82.5(119)	49.5	72.5(109)	0.38(0.73)
SA01A	124.5(161)	99.5(136)	66.5	89.5(126)	0.5(0.85)

Plug Specification

Plug Specification
: 172167-1
(Made by AMP)

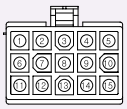
Pin No.	Color	Phase
1	Red	U
2	White	V
3	Black	W
4	Green	Ground

〈Power connector Pin〉

Plug Specification
: 172165-1
(Made by AMP)

Pin No.	Color	Phase
1	Red	BK+
2	White	BK-

〈Brake connector Pin〉



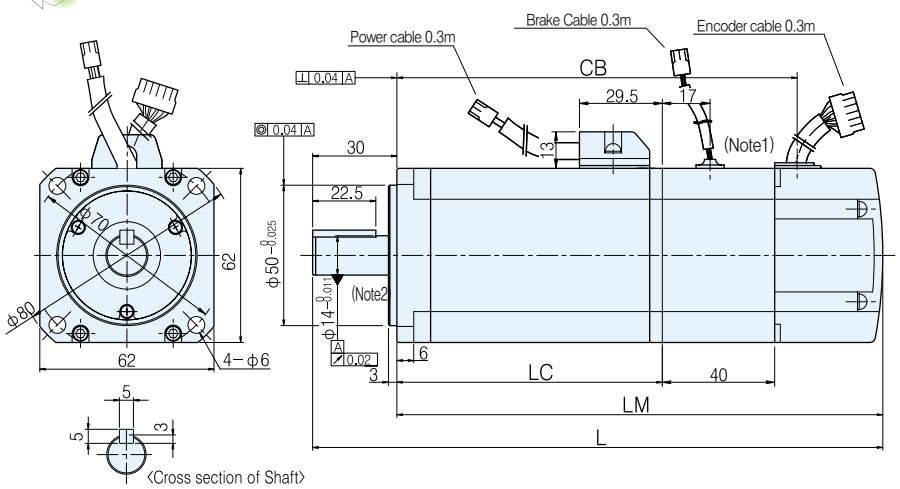
Plug Specification
: 172171-1
(Made by AMP)

Pin No.	Phase	Pin No.	Phase
1	A	9	V
2	$\bar{A}$	10	$\bar{V}$
3	B	11	W
4	$\bar{B}$	12	$\bar{W}$
5	Z	13	+5V
6	$\bar{Z}$	14	0V
7	U	15	SHIELD
8	$\bar{U}$		

〈Encoder connector Pin〉

Note
1) Use DC24V for brake input supply
2) The dimension in ( ) is for Brake attached motor

SA Series | APM-SB01A, APM-SB02A, APM-SB04A



Model	External Dimension				Weight (kg)
	L	LM	LC	CB	
SB01A	122(162)	92(132)	52	59.5(99.5)	0.82(1.4)
SB02A	136(176)	106(146)	66	73.5(113.5)	1.08(1.66)
SB04A	164(204)	134(174)	94	101.5(141.5)	1.58(2.16)

Plug Specification

Plug Specification
: 172167-1
(Made by AMP)

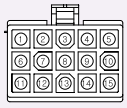
Pin No.	Color	Phase
1	Red	U
2	White	V
3	Black	W
4	Green	Ground

〈Power connector Pin〉

Plug Specification
: 172165-1
(Made by AMP)

Pin No.	Color	Phase
1	Red	BK+
2	White	BK-

〈Brake connector Pin〉



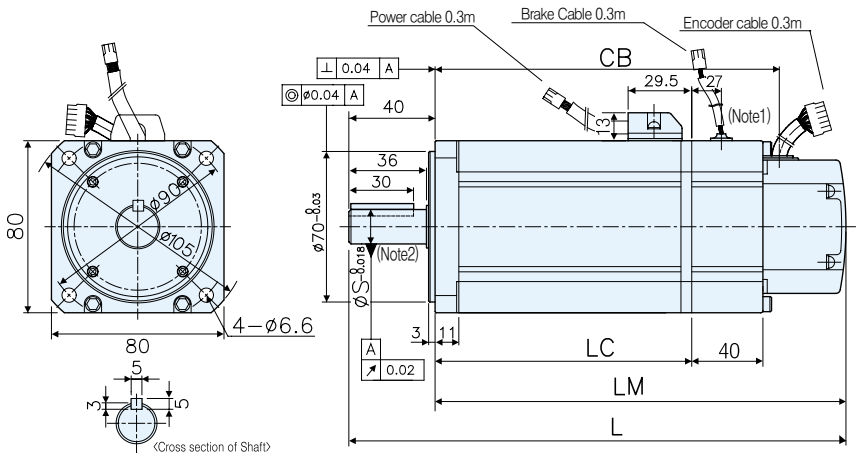
Plug Specification
: 172171-1
(Made by AMP)

Pin No.	Phase	Pin No.	Phase
1	A	9	V
2	$\bar{A}$	10	$\bar{V}$
3	B	11	W
4	$\bar{B}$	12	$\bar{W}$
5	Z	13	+5V
6	$\bar{Z}$	14	0V
7	U	15	SHIELD
8	$\bar{U}$		

〈Encoder connector Pin〉

Note 1) Use DC24V for brake input supply
2) The dimension in ( ) is for Brake attached motor
3) When Drawing for oil seal attached type motor is needed, Please contact to us The dimension for Oil seal attached motor is different with standard motor.

SC Series | APM-SC04A, SC03D, APM-SC06A, SC05D, APM-SC08A, SC06D, APM-SC10A, SC07D



Model	External Dimension					Weight (kg)
	L	LM	LC	CB	S	
SC04A, SC03D	158(198)	118(158)	79	86.5(127)	14	1.88(2.92)
SC06A, SC05D	178(218)	138(178)	99	106.5(147)	16	2.52(3.56)
SC08A, SC06D	198(238)	158(198)	119	126.5(167)	16	3.18(4.22)
SC10A, SC07D	218(258)	178(218)	139	146.5(187)	16	3.90(4.94)

Plug Specification

Plug Specification
: 172167-1
(Made by AMP)

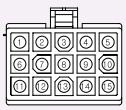
Pin No.	Color	Phase
1	Red	U
2	White	V
3	Black	W
4	Green	Ground

〈Power connector Pin〉

Plug Specification
: 172165-1
(Made by AMP)

Pin No.	Color	Phase
1	Red	BK+
2	White	BK-

〈Brake connector Pin〉



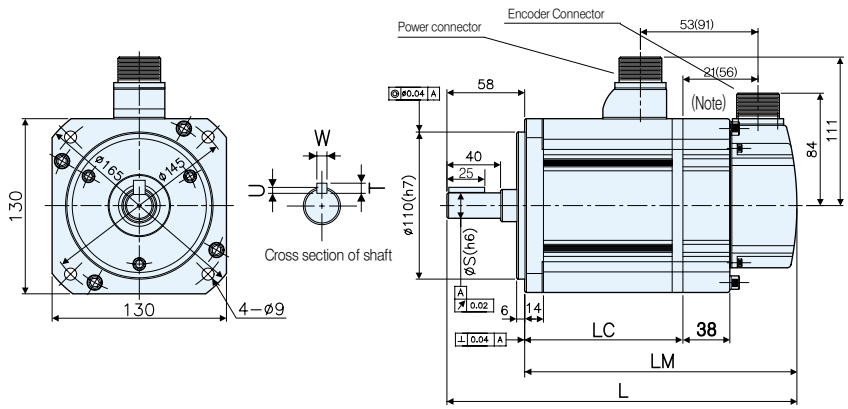
Plug Specification
: 172171-1
(Made by AMP)

Pin No.	Phase	Pin No.	Phase
1	A	9	V
2	$\bar{A}$	10	$\bar{V}$
3	B	11	W
4	$\bar{B}$	12	$\bar{W}$
5	Z	13	+5V
6	$\bar{Z}$	14	0V
7	U	15	SHIELD
8	$\bar{U}$		

〈Encoder connector Pin〉

Note 1) Use DC24V for brake input supply
2) The dimension in ( ) is for Brake attached motor
3) When Drawing for oil seal attached type motor is needed, Please contact to us The dimension for Oil seal attached motor is different with standard motor.

SE Series | APM-SE09A, SE06D, SE05G, SE03M, APM-SE15A, SE11D, SE09G, SE06M, APM-SE22A, SE16D, SE13G, SE09M, APM-SE30A, SE22D, SE17G, SE12M



Model	External Dimension				Key			Weight (kg)
	L	LM	LC	S	T	W	U	
SE09A, SE06D, SE05G, SE03M	202(240)	144(182)	94	19	5	5	3	5.5(7.04)
SE15A, SE11D, SE09G, SE06M	226(264)	168(206)	118	19	5	5	3	7.54(9.08)
SE22A, SE16D, SE13G, SE09M	250(288)	192(230)	142	22	6	6	3.5	9.68(11.22)
SE30A, SE22D, SE17G, SE12M	274(312)	216(254)	166	22	6	6	3.5	11.78(13.32)

Plug Specification

Specification
: MS3102A20-4P
(Standard)

Pin No.	Phase
A	U
B	V
C	W
D	Ground

Specification
: MS3102A20-15P
(Brake attached type)

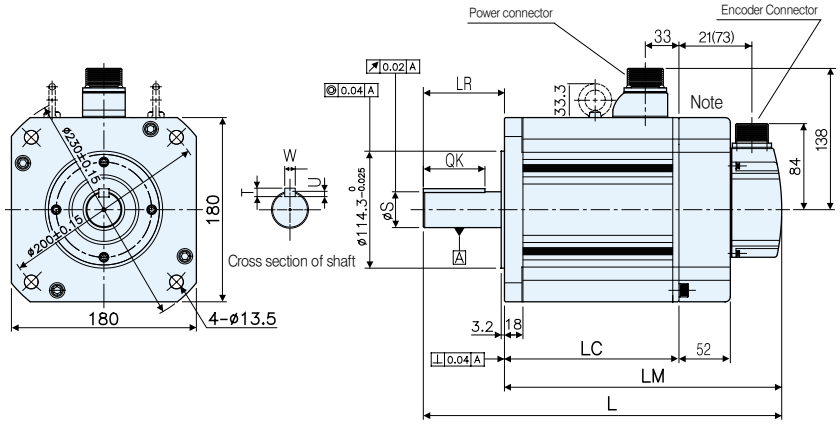
Pin No.	Phase	Pin No.	Phase
A	U	D	Ground
B	V	E	BK+
C	W	F	BK-

Specification
: MS3102A20-29P

Pin No.	Phase	Pin No.	Phase
A	A	M	V
B	$\bar{A}$	N	$\bar{V}$
C	B	P	W
D	$\bar{B}$	R	$\bar{W}$
E	Z	H	+5V
F	$\bar{Z}$	G	0V
K	U	J	SHIELD
L	$\bar{U}$		

Note 1) Use DC24V for brake input supply depending on Brake specification
2) The dimension in ( ) is for Brake attached motor

SF Series | APM-SF30A, SF22D, SF20G, SF12M, APM-SF50A, SF35D, SF30G, SF20M, APM-SF55D, SF44G, SF30M, APM-SF75D, SF60G, SF44M, APM-SF75G



Model	External Dimension				Shaft, Key					Weight (kg)
	L	LM	LC	LR	S	QK	T	W	U	
SF30A, SF22D, SF20G, SF12M	261.8(313.8)	182.8(234.8)	132.8	79	$35^{+0.01}_{+0}$	60	8	10	5	12.4(19.2)
SF50A, SF35D, SF30G, SF20M	294.8(346.8)	215.8(267.8)	165.8	79	$35^{+0.01}_{+0}$	60	8	10	5	17.7(24.9)
SF55D, SF44G, SF30M	344.8(396.8)	265.8(317.8)	215.8	79	$35^{+0.01}_{+0}$	60	8	10	5	26.3(33.4)
SF75D, SF60G, SF44M	404.8(456.8)	325.8(377.8)	275.8	79	$35^{+0.01}_{+0}$	60	8	10	5	35.6(42.8)
SF75G	458.9(510.8)	345.8(397.8)	295.8	113	$42^{-0}_{-0.016}$	96	8	12	5	39.4(45.1)

Plug Specification

Specification : MS3102A22-22P (Standard)

Pin No.	Phase
A	U
B	V
C	W
D	Ground

Specification : MS3102A24-10P (Brake attached type)

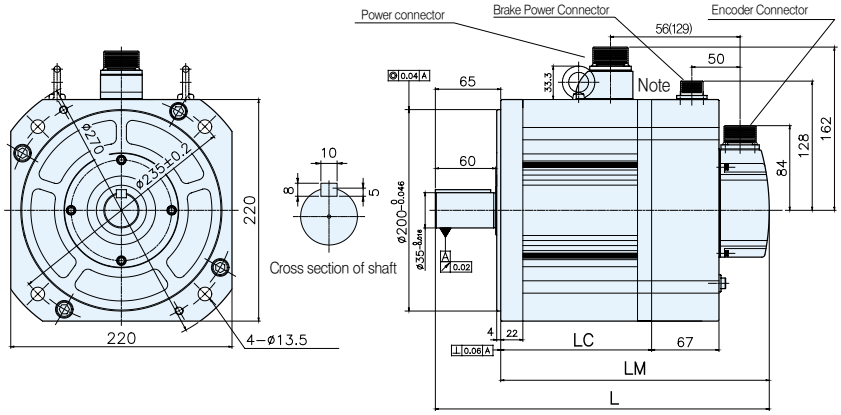
Pin No.	Phase	Pin No.	Phase
A	U	D	Ground
B	V	E	BK+
C	W	F	BK-

Specification : MS3102A20-29P

Pin No.	Phase	Pin No.	Phase
A	A	M	V
B	$\overline{A}$	N	$\overline{V}$
C	B	P	W
D	$\overline{B}$	R	$\overline{W}$
E	Z	H	+5V
F	$\overline{Z}$	G	0V
K	U	J	SHIELD
L	$\overline{U}$		

Note 1) Use DC24V for brake input supply depending on Brake specification
2) The dimension in ( ) is for Brake attached motor

SG Series | APM-SG22D, SG20G, SG12M, APM-SG35D, SG30G, SG20M, APM-SG55D, SG44G, SG30M, APM-SG75D, SG60G, SG44M



Model	External Dimension			Weight (kg)
	L	LM	LC	
SG22D, SG20G, SG12M	237(303)	172(238)	122	16.95(30.76)
SG35D, SG30G, SG20M	257(323)	192(258)	142	21.95(35.7)
SG55D, SG44G, SG30M	293(359)	228(294)	178	30.8(44.94)
SG75D, SG60G, SG44M	321(387)	256(322)	206	37.52(50.94)

Plug Specification

Specification : MS3102A22-22P (Standard)

Pin No.	Phase
A	U
B	V
C	W
D	Ground

Specification : MS3102A14S-7P (Brake attached type)

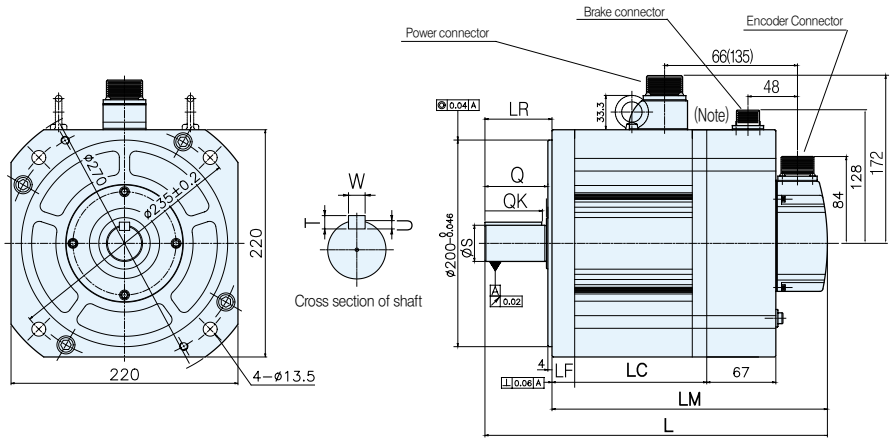
Pin No.	Phase
A	BK+
B	BK-
C	NC

Specification : MS3102A20-29P

Pin No.	Phase	Pin No.	Phase
A	A	M	V
B	$\overline{A}$	N	$\overline{V}$
C	B	P	W
D	$\overline{B}$	R	$\overline{W}$
E	Z	H	+5V
F	$\overline{Z}$	G	0V
K	U	J	SHIELD
L	$\overline{U}$		

Note 1) Use DC90V for brake input supply depending on Brake specification
2) The dimension in ( ) is for Brake attached motor

SG Series | APM-SG110D, SG85G, SG60M, APM-SG110G, APM-SG150G



Model	External Dimension					Shaft, Key						Weight (kg)
	L	LM	LC	LR	LF	S	Q	QK	T	W	U	
SG110D, SG85G, SG60M	421 (486)	356 (421)	306 (304)	65	22	45 $^{0}_{-0.016}$	60	55	8	10	5	66.2 (82.6)
SG110G	469	354	304	115	22	42 $^{0}_{-0.016}$	110	96	10	12	5	66.3 (82.7)
SG150G	575	459	409	116	35	55 $^{+0.030}_{+0.011}$	110	96	10	16	6	92.2 (108.6)

Plug Specification

Specification
: MS3102A32-17P
(Standard)

Pin No.	Phase
A	U
B	V
C	W
D	Ground

Specification
: MS3102A14S-7P
(Brake attached type)

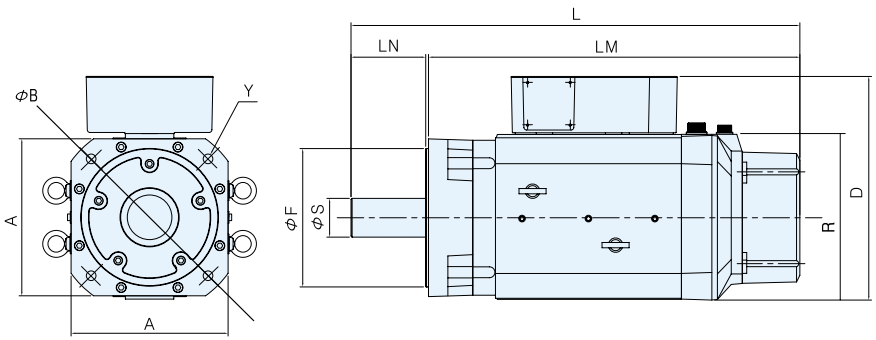
Pin No.	Phase
A	BK+
B	BK-
C	NC

Specification
: MS3102A20-29P

Pin No.	Phase	Pin No.	Phase
A	A	M	$\overline{V}$
B	$\overline{A}$	N	$\overline{V}$
C	B	P	W
D	$\overline{B}$	R	$\overline{W}$
E	Z	H	+5V
F	$\overline{Z}$	G	0V
K	U	J	SHIELD
L	$\overline{U}$		

Note 1) Use DC90V for brake input supply depending on Brake specification
2) The dimension in ( ) is for Brake attached motor

SH, SJ Series | APM-SH220G, SH300G, SJ370G



Model	External Dimension									
	L	LM	LN	D	R	A	B	F	S	Y
SJ370G	811	671	135	405	300	285	350	250	70	4-Φ17.5 PCD 300
SH300G	823	683	135	356	256	254	304	230	60	4-Φ13.5 PCD 265
SH220G	755	615	135	356	256	254	304	230	60	4-Φ13.5 PCD 265

Plug 사양

Specification
:MS3102A20-4P
(Standard)

Pin No.	Phase
A	FU
B	FV
C	FC
D	Ground

Fan Power Connector Pin

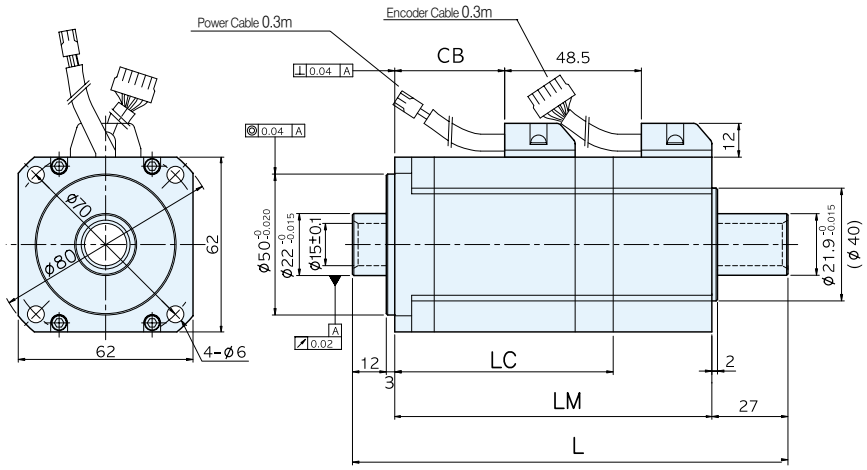
Specification
:MS3102A20-29P
(Standard)

Pin No.	Phase	Pin No.	Phase
A	A	M	$\overline{V}$
B	$\overline{A}$	N	$\overline{V}$
C	B	P	W
D	$\overline{B}$	R	$\overline{W}$
E	Z	H	+5V
F	$\overline{Z}$	G	0V
K	U	J	SHIELD
L	$\overline{U}$		

Encder Connector Pin

Note) Power Cable
-Customer have to buy it in their market

HB Series(Hollow Shaft Type) | APM-HB01A, APM-HB02A, APM-HB04A



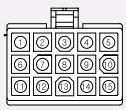
Model	External Dimension					Weight (kg)
	L	LM	LC	CB	Hollow Shaft Type	
HB01A	140.5	98.5	52.5	25	15	0.89
HB02A	154.5	112.5	66.5	39	15	1.16
HB04A	182.5	140.5	94.5	67	15	1.69

Plug Specification

Plug Specification
: 172167-1
(Made by AMP)

Pin No.	Color	Phase
1	Red	U
2	White	V
3	Black	W
4	Green	Ground

〈Power connector Pin〉

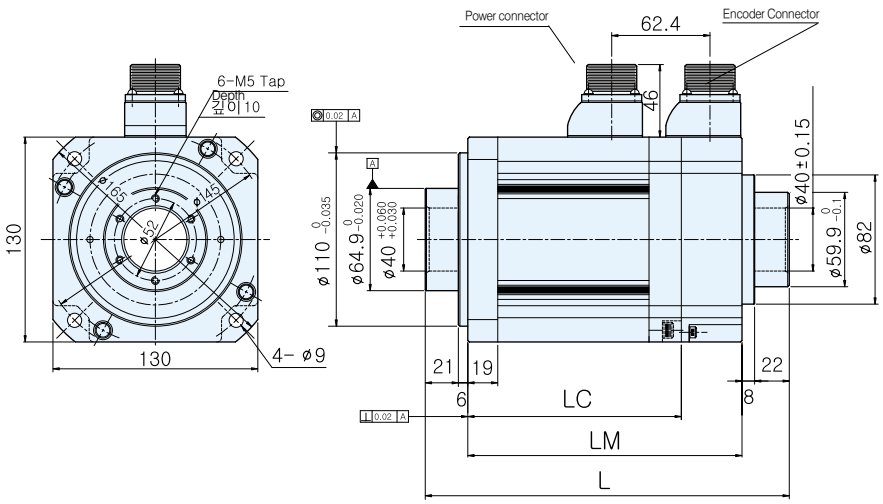


Plug Specification
: 172171-1
(Made by AMP)

Pin No.	Phase	Pin No.	Phase
1	A	9	V
2	$\overline{A}$	10	$\overline{V}$
3	B	11	W
4	$\overline{B}$	12	$\overline{W}$
5	Z	13	+5V
6	$\overline{Z}$	14	0V
7	U	15	SHIELD
8	$\overline{U}$		

〈Encoder connector Pin〉

HE Series(Hollow Shaft Type) | APM-HE09A, APM-HE15A



Model	External Dimension				Weight (kg)
	L	LM	LC	Hollow shaft Dia	
HE09A	207	150	111.5	40	5.82
HE15A	231	174	135.5	40	7.43

Plug Specification

Specification
: MS3102A20-4P
(Standard)

Pin No.	Phase
A	U
B	V
C	W
D	Ground

Specification
: MS3102A20-29P

Pin No.	Phase	Pin No.	Phase
A	A	M	$\overline{V}$
B	$\overline{A}$	N	W
C	B	P	$\overline{W}$
D	$\overline{B}$	R	+5V
E	Z	H	0V
F	$\overline{Z}$	G	SHIELD
K	U	J	
L	$\overline{U}$		

Standard Servo Drive

APD-VS Series

- High – efficiency power transformation technologies realized by developing dedicated ASIC featuring latest control theory
- Additional services provided through various kinds of communication options
- Loader(6 Digits) is basically mounted for the convenience of use.
- Various menu function that is applied instantly after changing

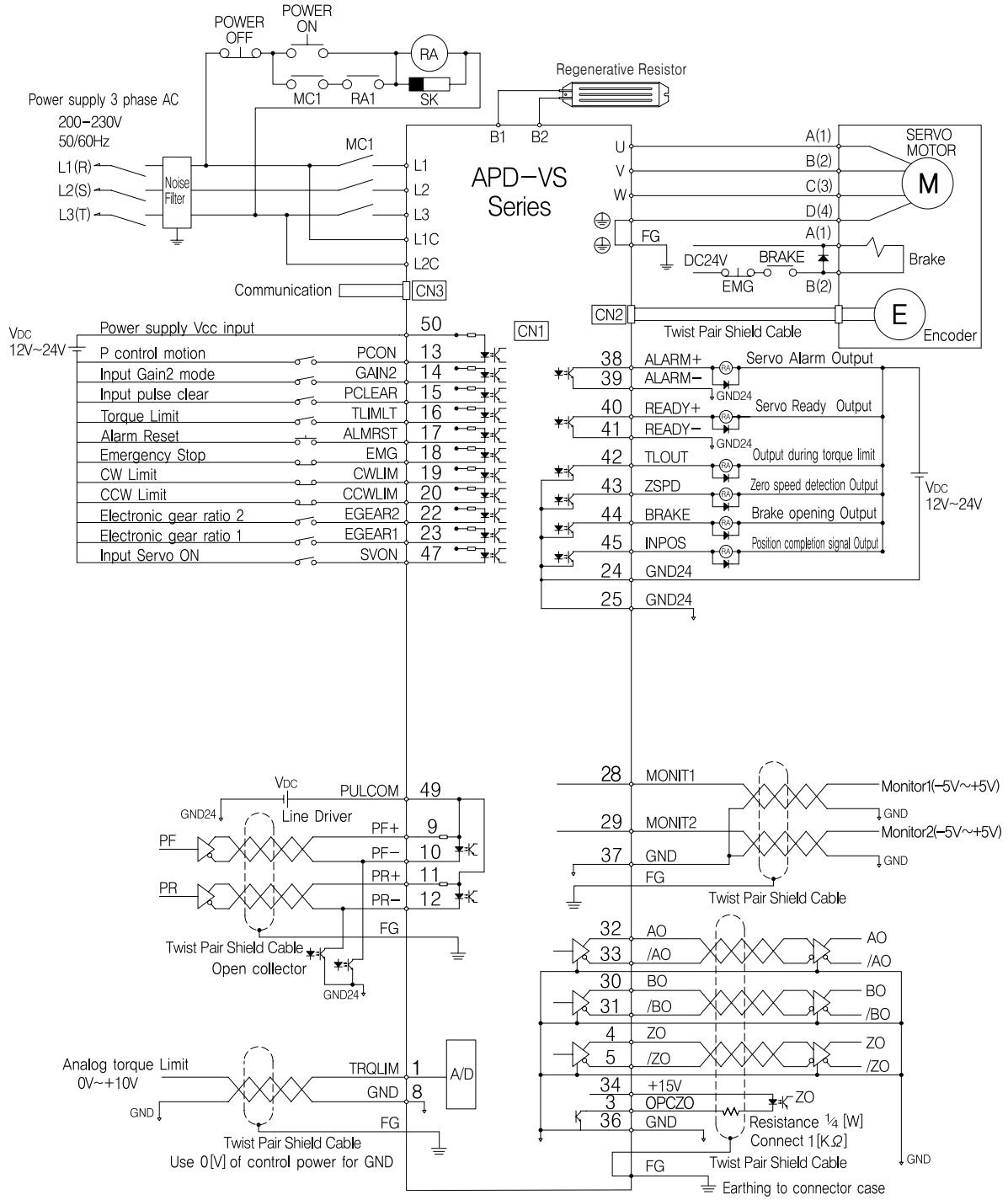
Feature of Standard Servo Drive

Model (APD-VS)		R5	01	02	04	05	10	15	20	35	50	75	110	150	220	300	370
Input Power supply (★Note)		3 phase AC200~230[V] +10%-15%, 50/60[Hz]															
Applicable Motor	Voltage Type	3 phase sine wave PWM driven Ac Servo Motor															
	Rated Current[A]	1.2	1.65	1.65	3.2	4.3	6.4	11	16	21	32	38	50	76	125	185	210
	MAx. Current[A]	3.6	4.95	4.95	9.6	12.9	19.2	33	48	63	96	102	125	190	250	370	420
Detector Type		Standard : Incremental 5V Line Drive 2000~10000P/rev Option : Absolute 11/13bit															
Speed Control Mode	Control function	Speed control range(1:10000), frequency Response(400Hz)															
	Speed command	DC-10~+10 (-Voltage: Reverse Rotation), Digital Command 7 Speeds.															
	Acceleration/Deceleration time	Linear, S Type Acceleration/Deceleration (0~100000[msec])															
	Speed variation ratio	± 0.01% or less(Load Variation 0-100%), ± 0.1% or less (Temperature 25 + - 10C)															
Position Control Mode	Input frequency	500[kpps]													400[kpps]		
	Pulse	A+B Phase, Forward+Reverse Pulse, Direction + Pulse(Line driver, Open collector)															
	Electronic gear ratio	Digital 4 speed (1/50~50)															
Torque Control mode		Torque Command : DC -10 ~ +10V(- Voltage : Reverse), Linearity is less than 4%													Linearity is less than 2%		
Braking Type		Generative Brake, regenerative Brake													Braking resistor is option		
Ambient Environment		Operating Temp. : 0~50[℃], Storage Temp. : -20~+80[℃], Humidity : Less than 90C(Avoid condensation)															

⚠ Note 1) Single-phase AC220 -230V may be used : However, the output may be lower than the rating.
(the use of single-phase AC 220-230V for 500W and lower drive is acceptable)

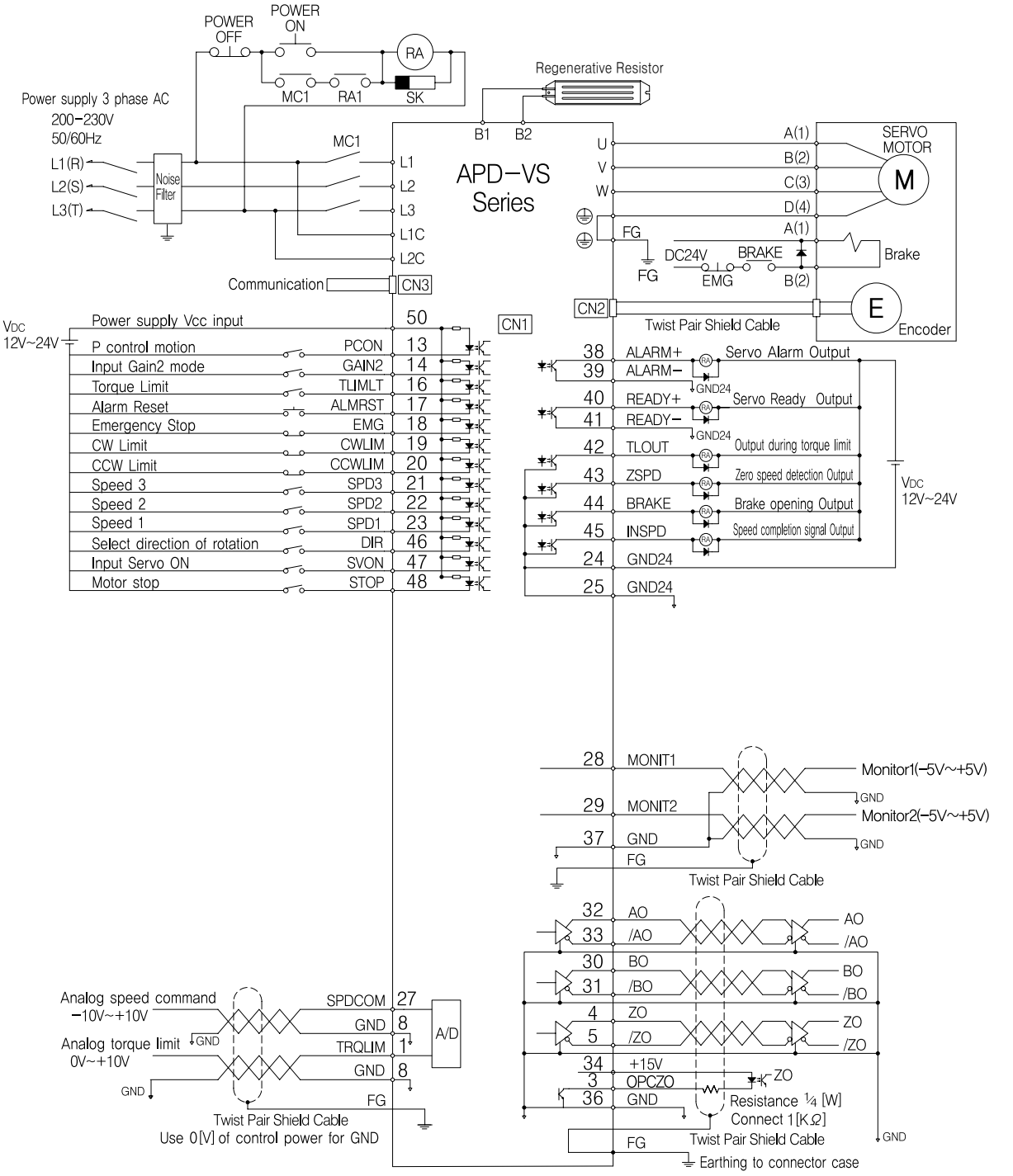
Connection Diagrams for APD-VS Series

APD-VS Series : Position Operating Mode



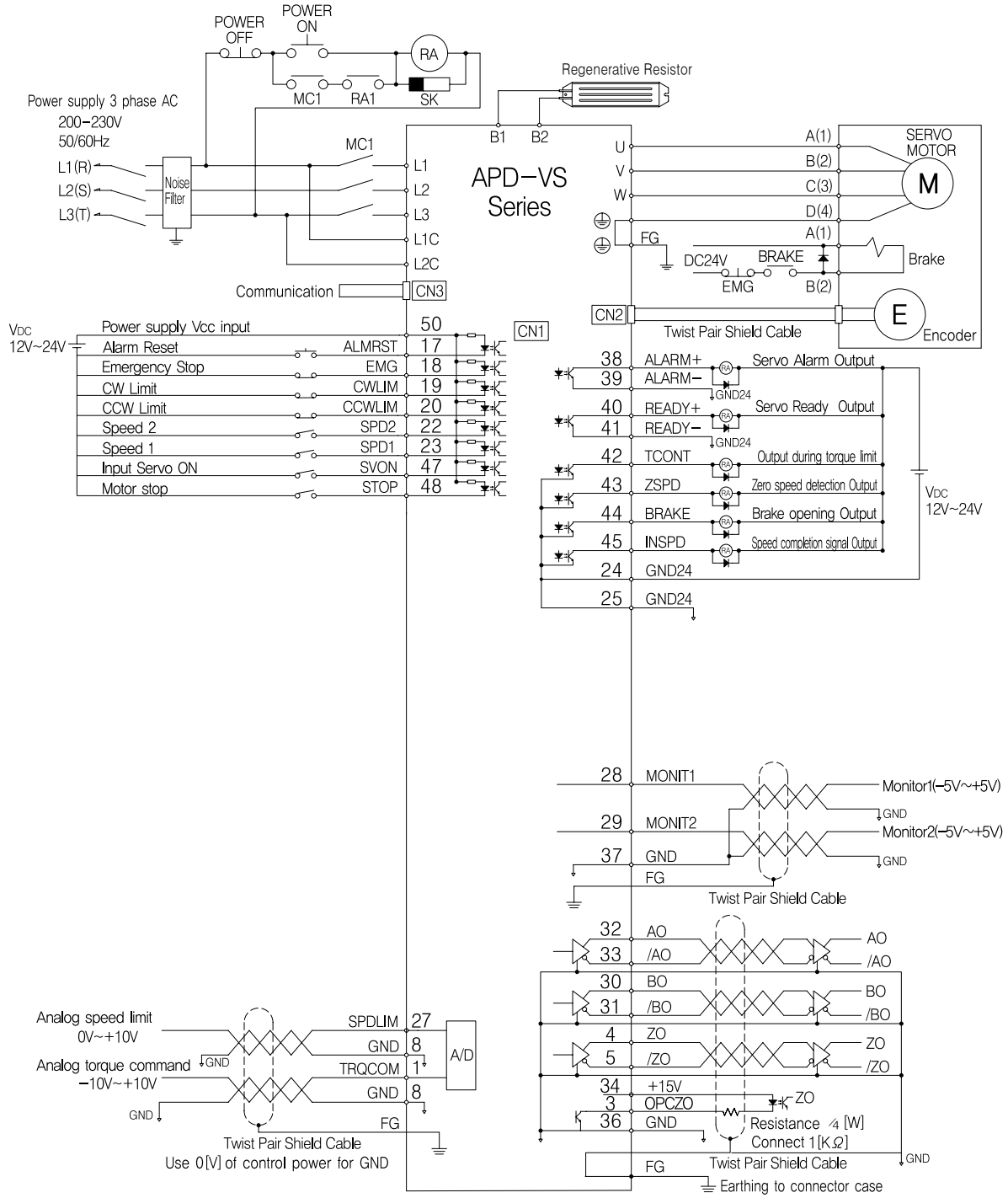
Note 1) 400W and lower size of Drive don't have control power terminals(L1C, L2C)
2) When Single-phase power supply(AC200-230V) is use, Connect L1 and L2 terminals but, in this case the output may be lower than the rating. (the use of single-phase AC 220-230V for 500W and lower drive is acceptable)
3)Take care of diode direction, Mis-connecting of Diode direction cab be reason of drive output signal problem
4) Emergency Stop, CWLIM, and CCWLIM terminals are in Contacts B for safety
5) To prevent Electric shock and Noise, FG terminal of servo drive must be connected to FG terminal of Control panel
6) Shield cable is connected to plate in the connector
7) Please refer our APD-VS operating manual for detailed information.

APD-VS Series : Speed operating mode



Note 1) 400W and lower size of Drive don't have control power terminals(L1C, L2C)
2) When Single-phase power supply(AC200-230V) is use, Connect L1 and L2 terminals but, in this case the output may be lower than the rating. (the use of single-phase AC 220-230V for 500W and lower drive is acceptable)
3)Take care of diode direction, Mis-connecting of Diode direction cab be reason of drive output signal problem
4) Emergency Stop, CWLIM, and CCWLIM terminals are in Contacts B for safety
5) To prevent Electric shock and Noise, FG terminal of servo drive must be connected to FG terminal of Control panel
6) Shield cable is connected to plate in the connector
7) Please refer our APD-VS operating manual for detailed information.

APD-VS Series : Torque operating mode



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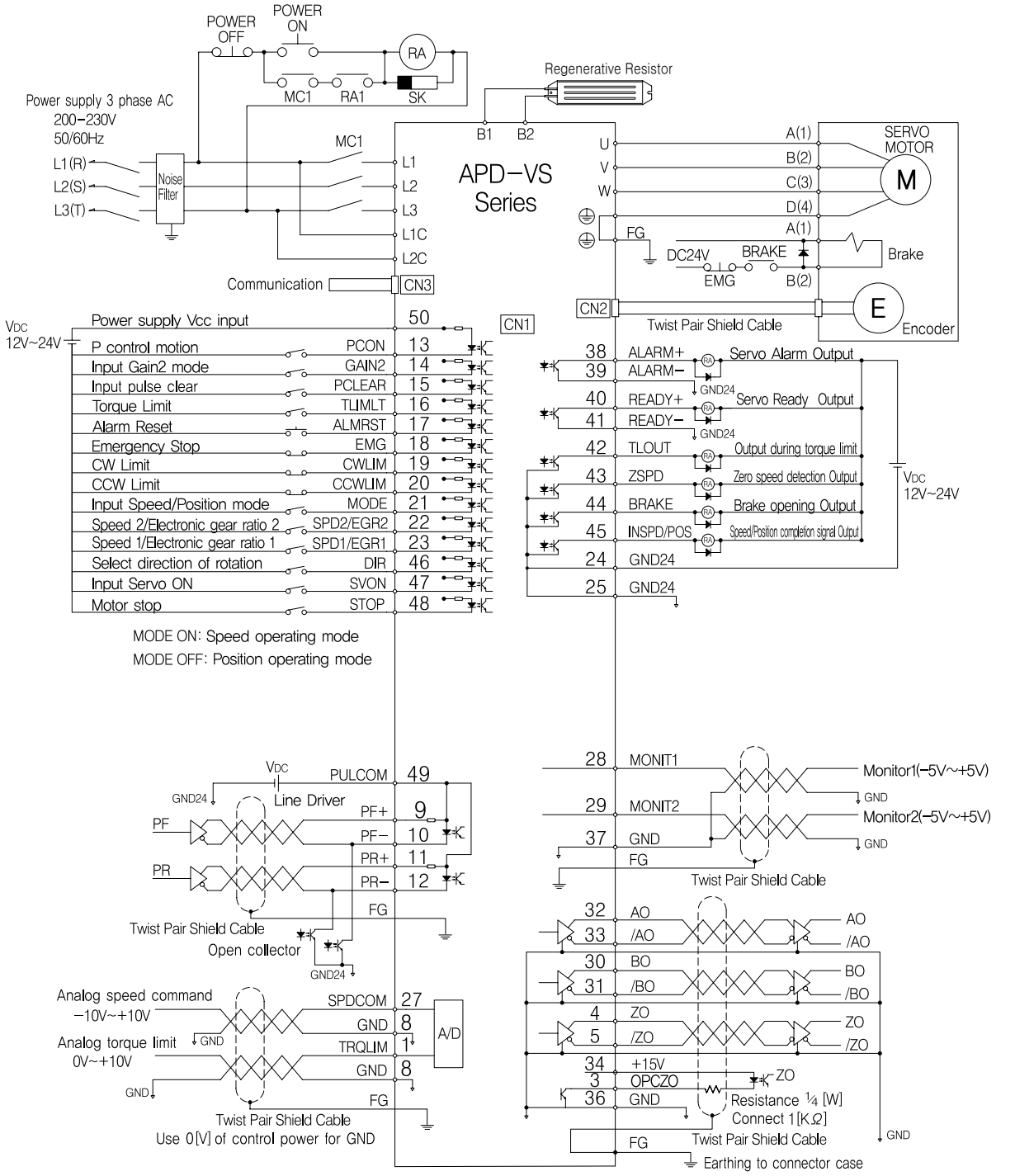
6) Shield cable is connected to plate in the connector
7) Please refer our APD-VS operating manual for detailed information.

APD-VS Series : Speed/Position operating mode



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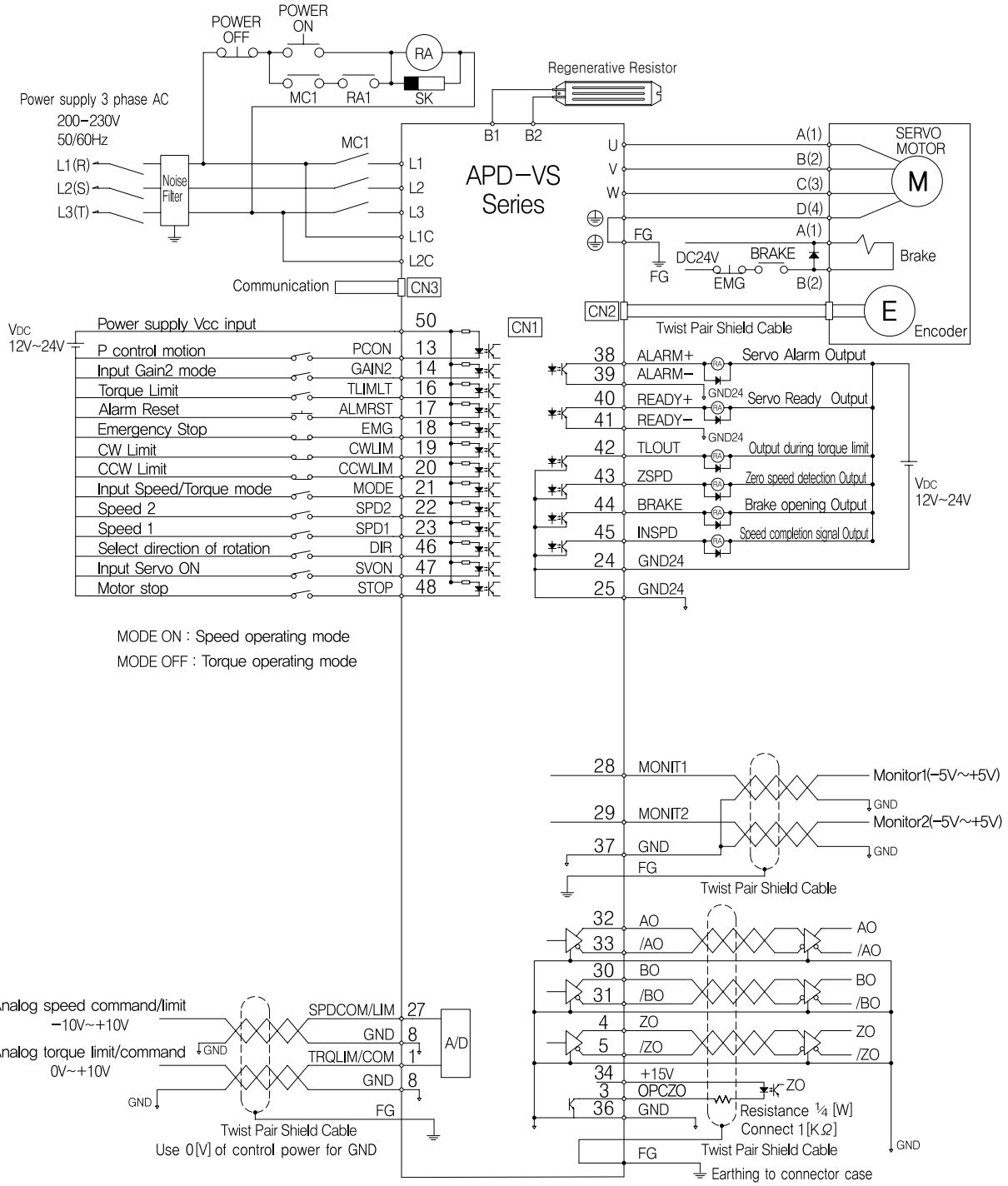
7) Please refer our APD-VS operating manual for detailed information.

APD-VS Series : Speed/Torque operating mode



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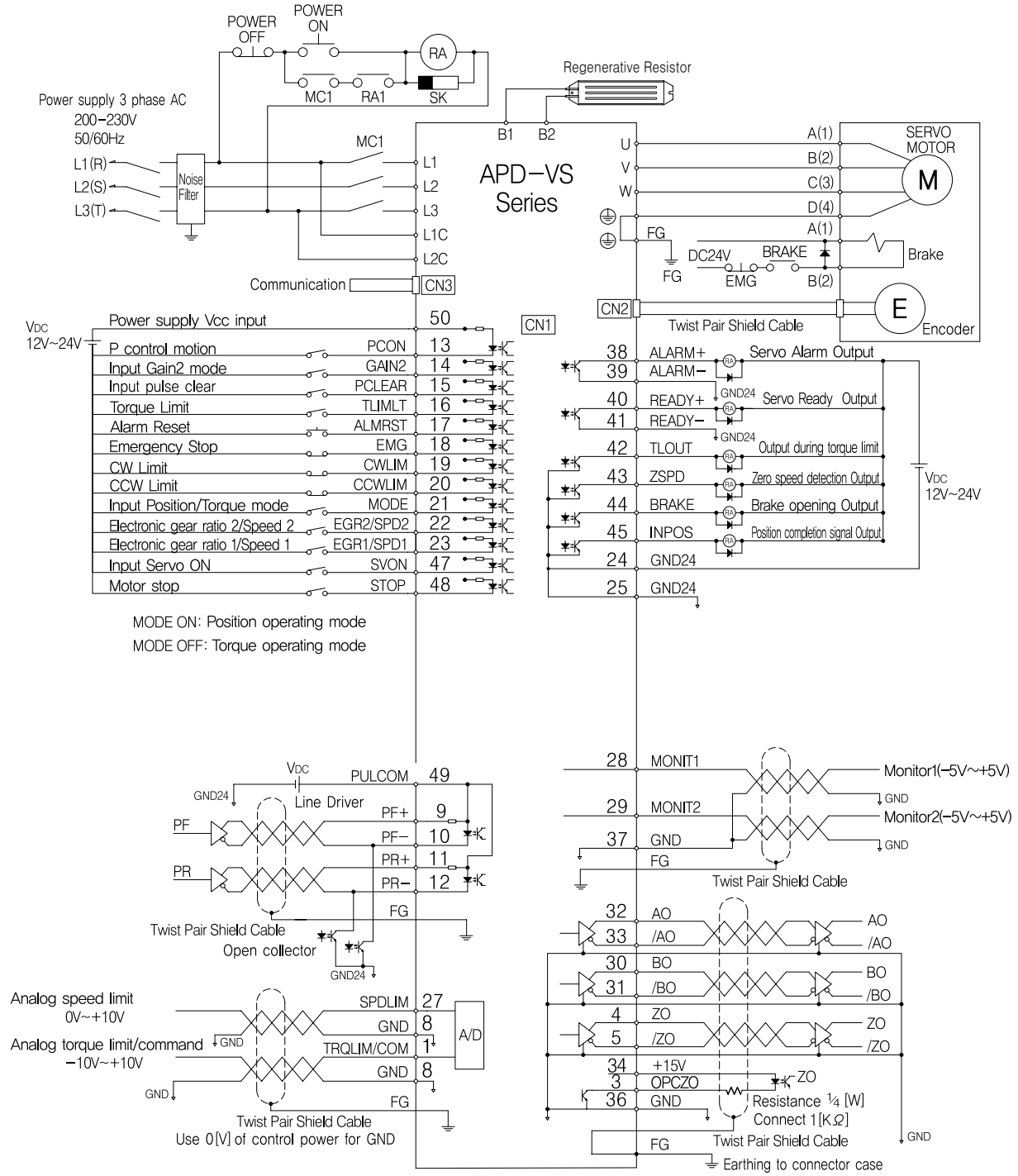
7) Please refer our APD-VS operating manual for detailed information.

APD-VS Series : Position/Torque operating mode



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6) Shield cable is connected to plate in the connector
7) Please refer our APD-VS operating manual for detailed information.

Controller Embedded Type Servo Drive

APD-VP Series

- Linear Coordinates Position Type(VP-1) : Linear motion machine, X-Y table
- Rotary Coordinates Position(VP-2) : Index, Turret
- Position Operation type after feeder and sensor(VP-3) : Packing machine, all sorts of feeder, conveyor, I-mark
- Program operation type(VP-5) : 800 step operation.
- Other customized soft: Program operation, all shorts of private machine
- Tension control Operation type : Winder

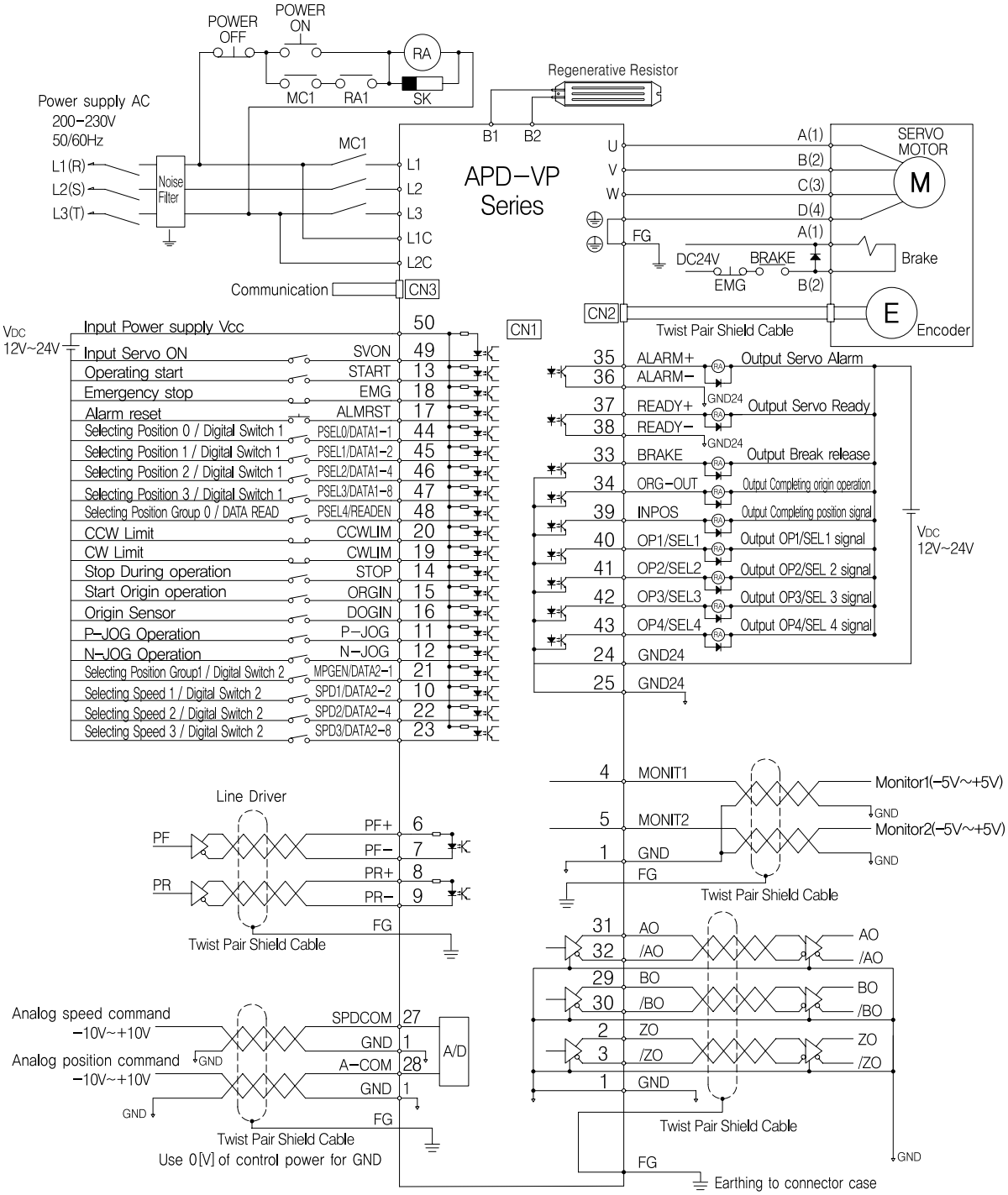
Feature of Standard Servo Drive

Model (APD-VS)		R5	01	02	04	05	10	15	20	35	50	75	110	150
Input Power supply (★Note)		3 phase AC200~230[V] +10%-15%, 50/60[Hz]												
Applicable Motor	Voltage Type	3 phase sine wave PWM driven Ac Servo Motor												
	Rated Current[A]	1.2	1.65	1.65	3.2	4.3	6.4	11	16	21	32	38	50	76
	MAx. Current[A]	3.6	4.95	4.95	9.6	12.9	19.2	33	48	63	96	102	125	190
Detector Type		Standard : Incremental 5V Line Drive 2000~10000P/rev Option : Absolute 11/13bit												
Setting Up Position Coordinates		Set up Max. 64 Points by input contacts, set up 6-digits of position, 2-digits of speed by digital switch												
Extermal Input / Output	Input/Output Contacts	Input : 20 Point, Output : 9 Point												
	Position Pulse Input	Maximum input frequency : 500[kpps]												
		Input system : A+B Phase, Forward+Reverse Pulse, Direction+Pulse(Line Driver, Open Collector)												
	Analog Input	Maximum 4 Channels, DC-10~+10[V]												
	Analog Output	Maximum 2 Channels, DC0~5[V]												
	Encoder Output	A, B and Z Phase, 5V Line Driver, 1/1~1/16 frequency deviding possible.												
Braking Type		Power generated Braking, Regenerated Braking												
Ambient Environment		Operating Temp. : 0~50[℃], Storage Temp. : -20~+80[℃], Humidity : Less than 90C(Avoid condensation)												

⚠ Note 1) Single-phase AC220 -230V may be used : However, the output may be lower than the rating.
(the use of single-phase AC 220-230V for 500W and lower drive is acceptable)

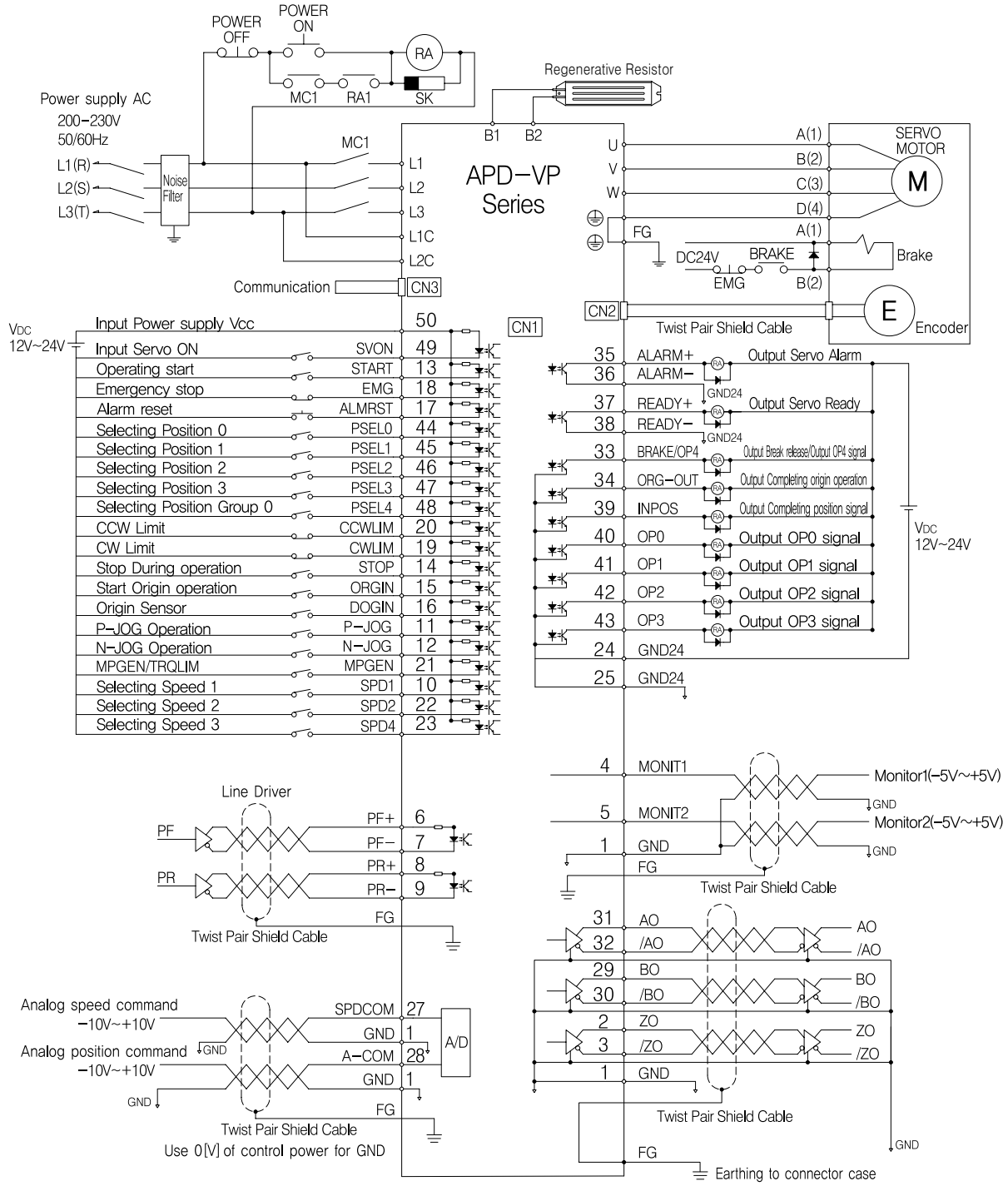
Connection Diagrams for Controller Embedded Type Servo Drive

APD-VP Series : Linear Coordinates Position Operation Type (VP-1)



Note 1) 400W and lower size of Drive don't have control power terminals(L1C, L2C)
2) When Single-phase power supply(AC200-230V) is use, Connect L1 and L2 terminals but, in this case the output may be lower than the rating. (the use of single-phase AC 220-230V for 500W and lower drive is acceptable)
3)Take care of diode direction, Mis-connecting of Diode direction cab be reason of drive output signal problem
4) Emergency Stop, CWLIM, and CCWLIM terminals are in Contacts B for safety
5) To prevent Electric shock and Noise, FG terminal of servo drive must be connected to FG terminal of Control panel
6) Shield cable is connected to plate in the connector
7) Please refer our APD-VP operating manual for detailed information.

APD-VP Series : Rotary Coordinates Position Operation Type (VP-2)



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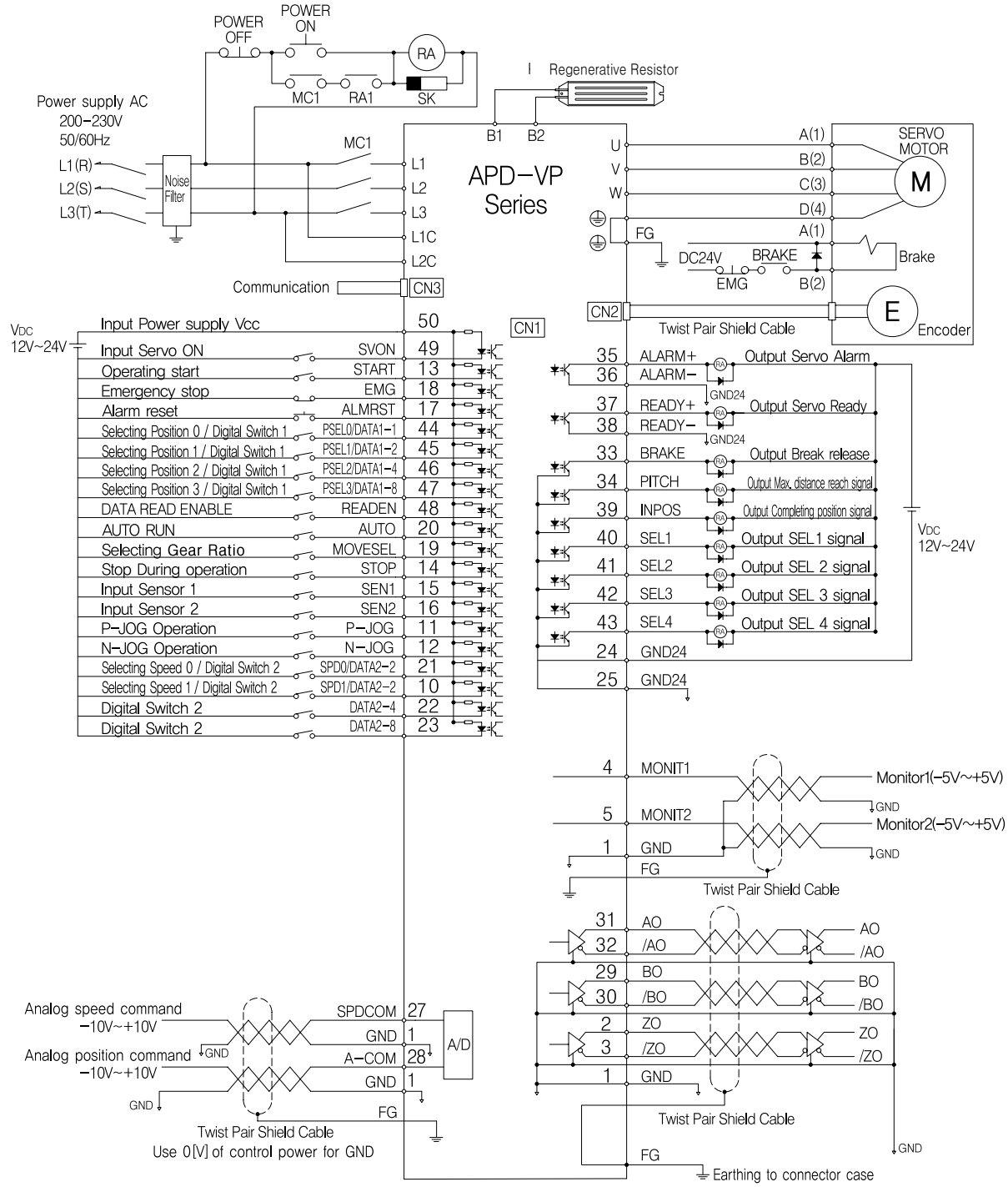
4) Emergency Stop, CWLIM, and CCWLIM terminals are in Contacts B for safety
5) To prevent Electric shock and Noise, FG terminal of servo drive must be connected to FG terminal of Control panel
6) Shield cable is connected to plate in the connector
7) Please refer our APD-VP operating manual for detailed information.

APD-VP Series : Position Operation Type After Feeder and Sensor (VP-3)



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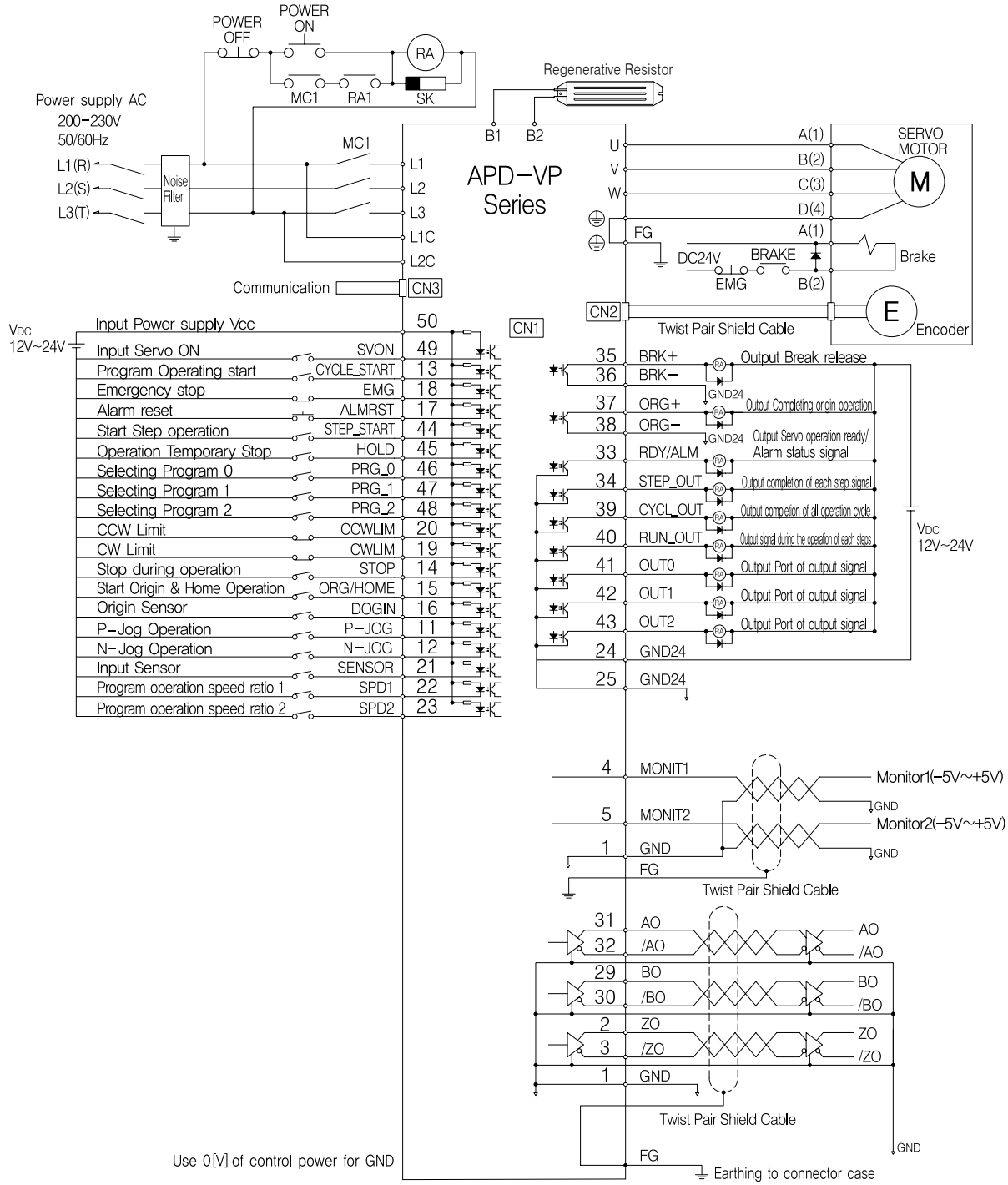
APD-VP Series : Program Operation Type (VP-5)



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6) Shield cable is connected to plate in the connector
7) Please refer our APD-VP operating manual for detailed information.

VK Servo Drive Characteristics

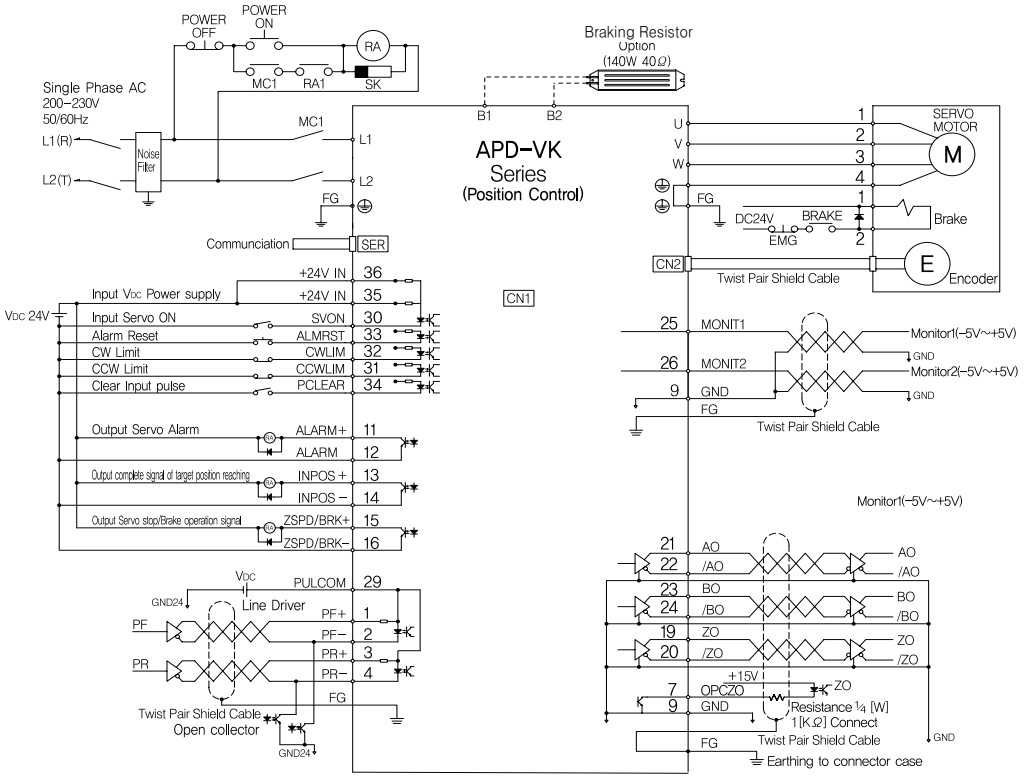
Model (APD-VK)		VKR5N	VK01N	VK02N	VK04N	VK08N
Power supply (★Note)		Single phase AC200-230[V] +10%-15%, 50/60[Hz]				
Applicable Motor	Voltage Type	3 phase sine wave PWM driven AC Servo Motor				
	Rated Current[A]	1.2	1.65	1.65	2.9	3.9
	Max. Current[A]	3.6	4.95	4.95	8.7	11.7
Encoder Type		Standard : Incremental 5V, Line Driver, 15Pin, 2500[P/R] (but, SA Series motor is Incremental 5V, Line Driver, 15Pin, 2048[P/R]) Option : Incremental 5V, Line Driver, 9Pin, 2500[P/R] (but, SA Series motor is Incremental 5V, Line Driver, 9Pin, 2048[P/R])				
Position control Type	Input Frequency	Line Driver 500[kpps], Open collector 200[kpps]				
	Input Pulse Type	A+B Phase, Forward/reverse Pulse , Direction +Pulse[Line Driver, Open Collector]				
	Input Pulse	5[V] Line Driver, 24[V] Open Collector				
Speed Control Type	Range of Speed Control	1:10,000				
	Accel/Decel Time	Linear or "s" shape Accel /Decel, 0- 10,000[ms], 1[ms] Units can be set separately				
	Inside command Speed	DC -10[V]~+10[V](CCW in(-) voltage), 3 Different Speed Setting				
Setting	Communication	Standard : RS232c, Option : RS485 Max. 16 Axis				
	Option	Handy Loder, Touch Loder				
Embedded Function	Generative Braking	Standard Embedded[Operated at Servo Alarm or Servo OFF]				
	Regenerative Braking	Option			Standard	
	Electronic Gear Ratio	99,999/99,999 Times of Command Pulse is Possible				
	Feedback Pulse Dividing	From 1 to 16, Selecting Division is possible / Line driver A/B/Z Phase, Open Collector Z Phase Output				
	Contacts Logic	Selecting A/B contact(Input/Output Contacts) function				
Monitor	Digital Display	Built in 7 - Segments (1 Digits)				
	Analog Output	DC 5[V] ~ +5[V], 2 Channels [Speed , Torque, etc]				
Protect Function	Items Displayed	Over current, Overload, Overvoltage, Voltage shortage, Over speed, Wrong wiring, Encoder problem, position following problem				
	Memory Capacity	Can save memory The alarm upto 20 times including the current alarm occurred				
Ambient Environment	Temperature	0~50[℃]				
	Humidity	Less than 90[%] (Avoid Condensation)				
	Atmosphere	Indoor, No corrosive gas, Inflammable gas and fluid, Oil mist, or dust				

VK Servo Drive Specification of Power circuit

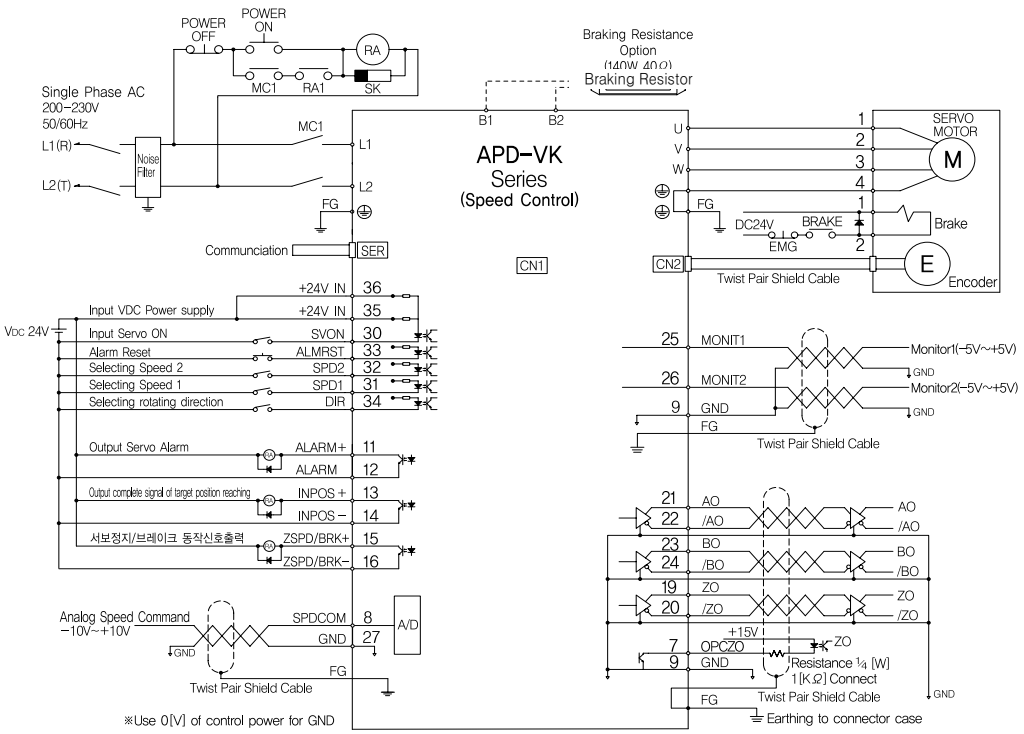
Model (APD-VK)	VKR5N	VK01N	VK02N	VK04N	VK08N
MCCB	ABS336M [8A]				
Noise Filter	NFZ410SM				
MC	GMC-9[11A] or Equivalent				
Cable	AWG16(1.25SQ)				
Power input Terminal for Drive	AMP 1-178128-3(Case), 175218(Pin)				
Input Terminal for Braking Resistance	AMP 1-178128-2(Case), 175218(Pin)				
Power input Terminal for Motor	AMP 1-178128-4(Case), 175218(Pin)				
Braking Resistance	-			30[W] 50[ohm]	

APD-VK Series Wiring

Position operation mode Type(APD-VK□□-P)



Speed operation Mode Type(APD-VK□□-S)



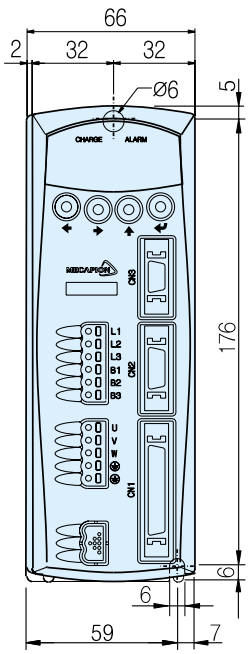
Note1) ⊐XC Wiring Marker must be used Twist Pair Shield Cable to prevent any malfunction
Note2) Use external DC 24[V] power supply There is any 24Vdc power supply in the servo drive.

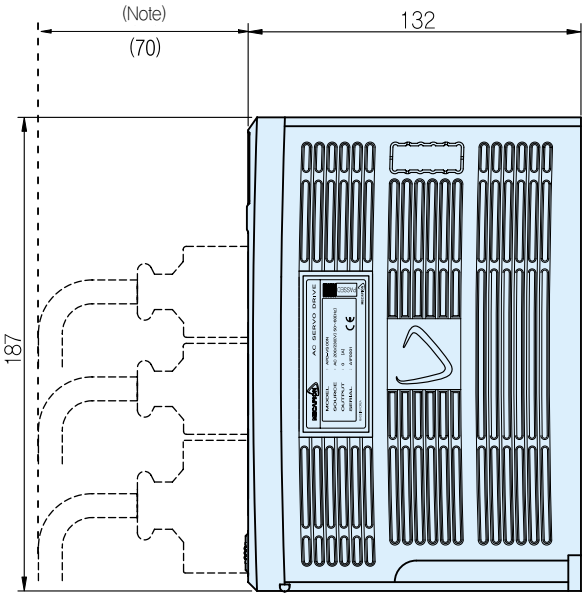
Servo Drive Dimension

200W and Below

APD I VS/VPR5N, VS/VP01N, VS/VP02N

Weight : 1.2[kg]



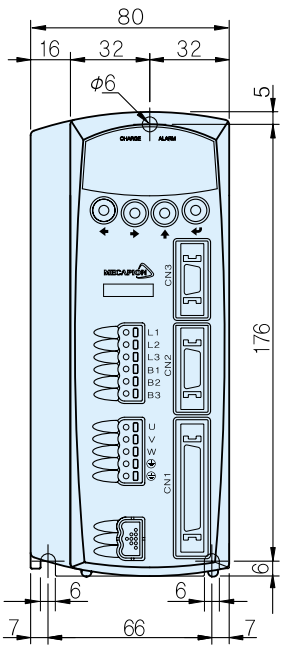


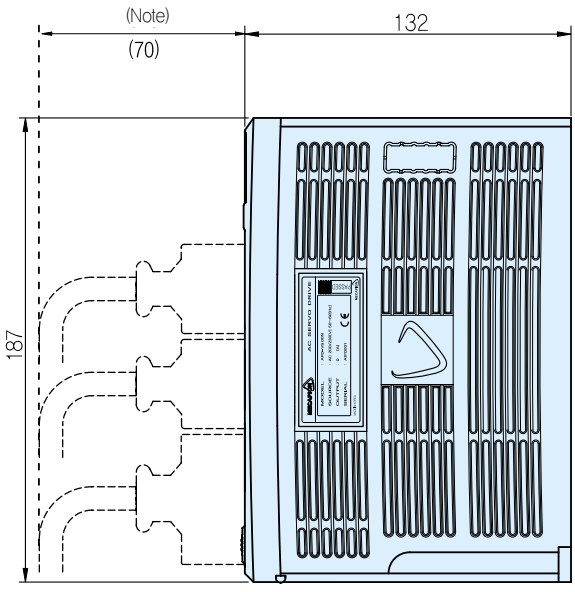
Note) Indicate the dimension which connector is attached.

400W

APD I VS/VP04N

Weight : 1.5[kg]



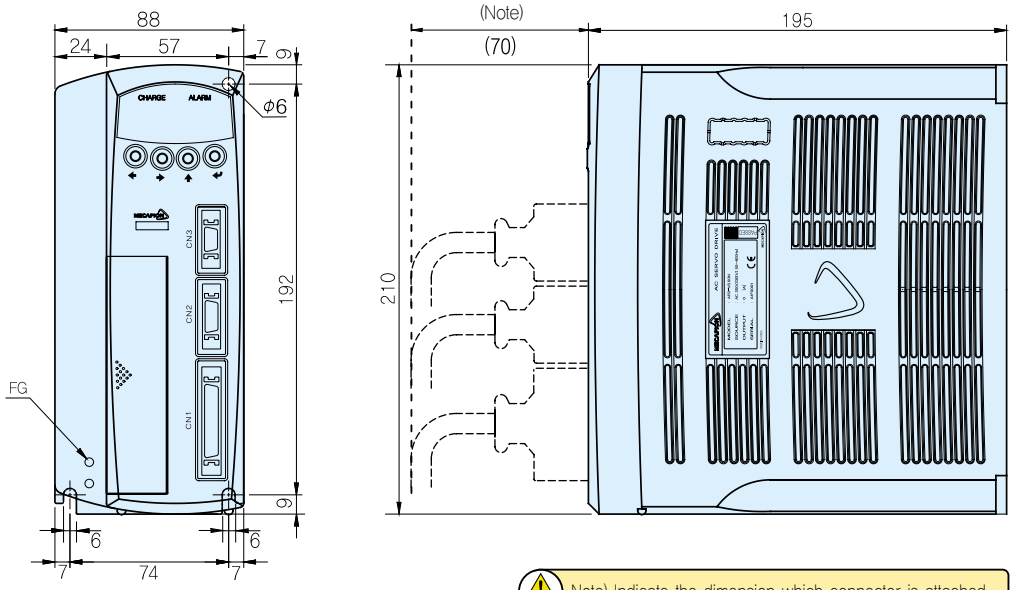


Note) Indicate the dimension which connector is attached.

500W ~ 1KW

APD I VS/VP05N, VS/VP10N

Weight : 2.5[kg]



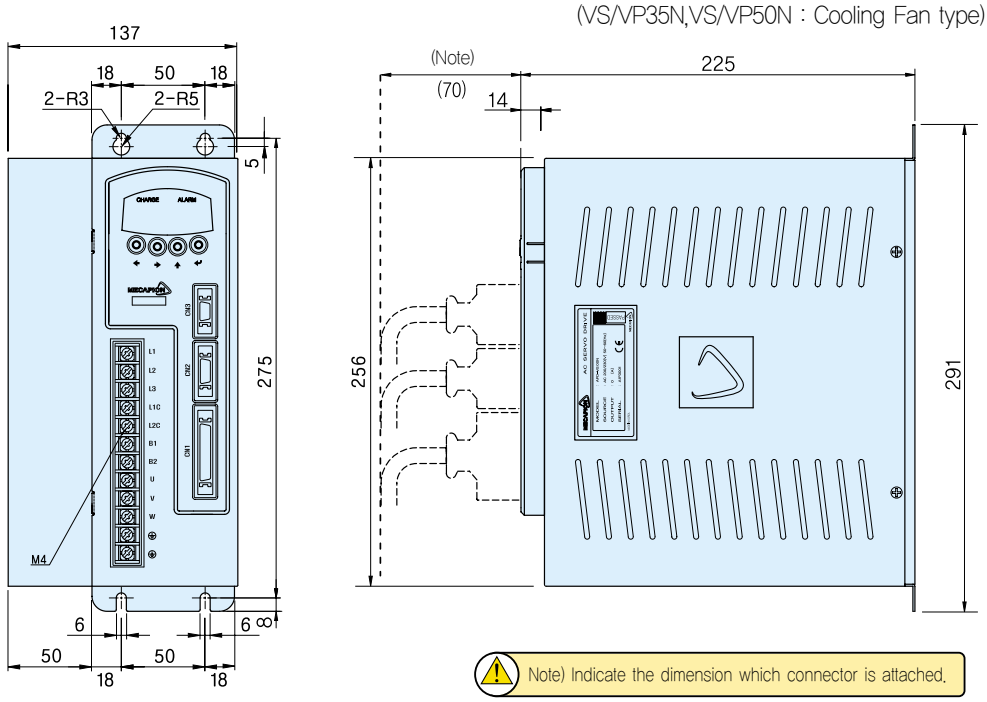
Note) Indicate the dimension which connector is attached.

1.5kW~5kW

APD I VS/VP15N, VS/VP20N, VS/VP35N, VS/VP50N

Weight : 7.2[kg]

(VS/VP35N,VS/VP50N : Cooling Fan type)



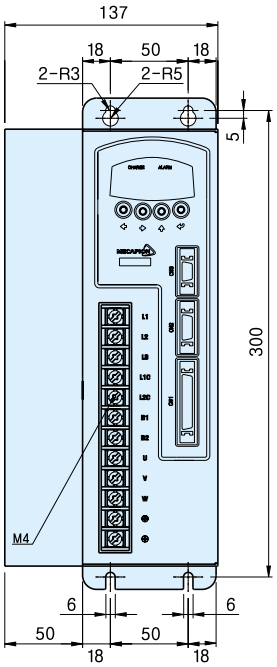
Note) Indicate the dimension which connector is attached.

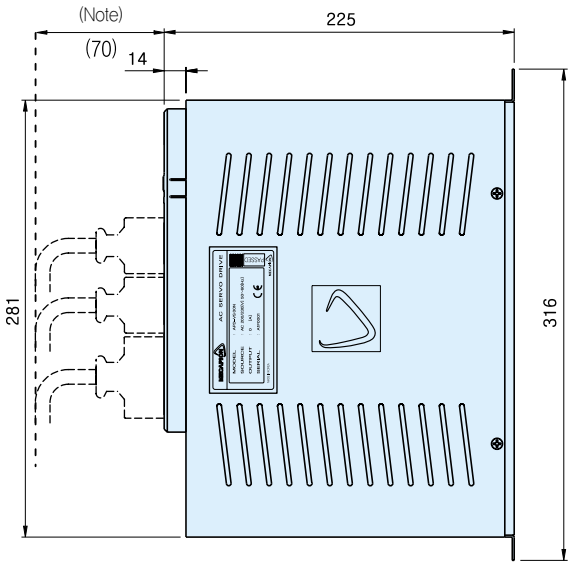
7.5kW

APD I VS/VP75N

Weight : 8[kg]

(Cooling Fan type)





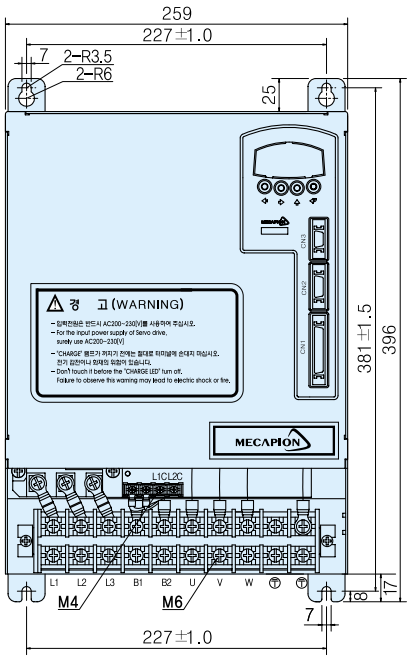
Note) Indicate the dimension which connector is attached.

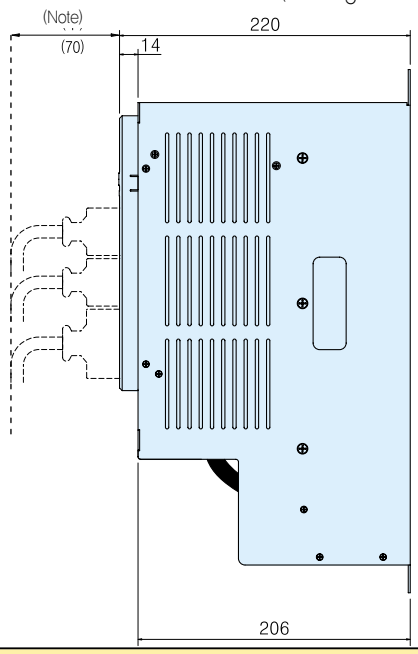
11kW

APD I VS/VP110N

Weight : 12[kg]

(Cooling Fan type)



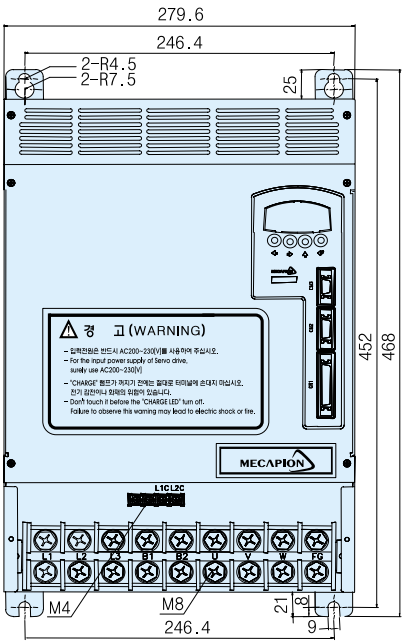


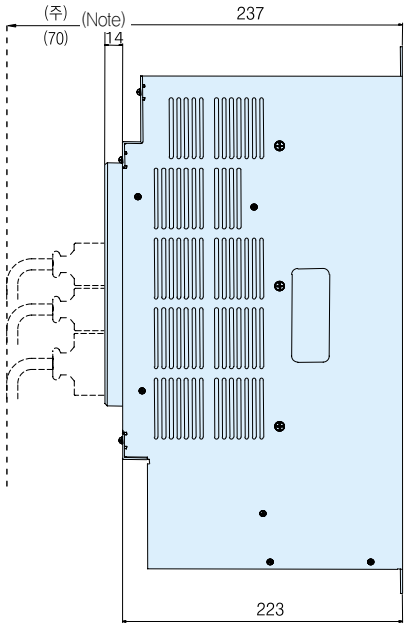
Note) Indicate the dimension which connector is attached.

15kW

APD I VS/VP150N

Weight : 15[kg]
(Cooling Fan type)



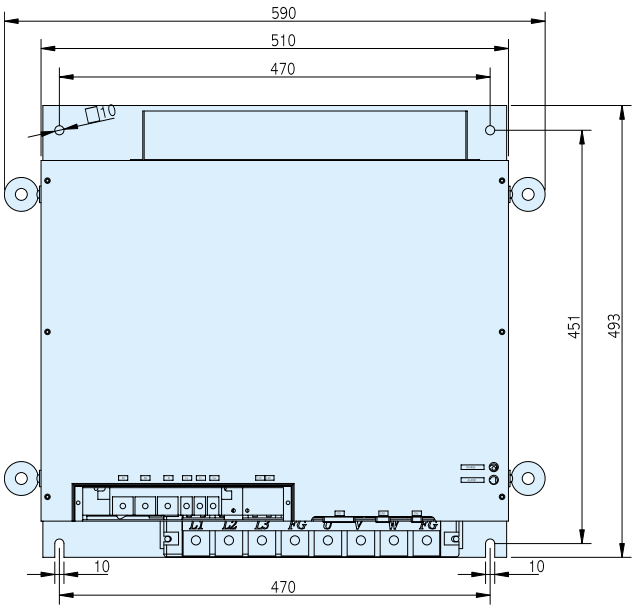


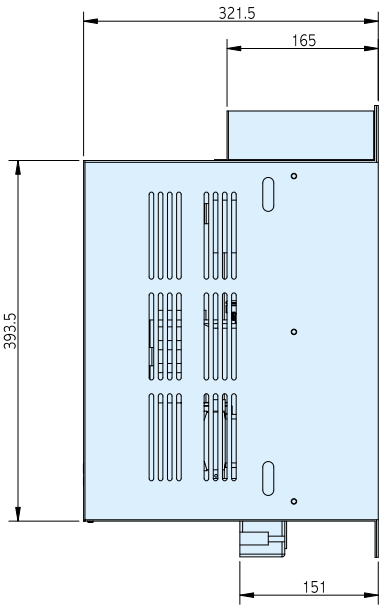
⚠ Note) Indicate the dimension which connector is attached.

22kW, 30kW, 37kW

APD I VS/VP220N, 300N, 370N

Weight : 22[kw]⇨54[kg]
30,37[kw]⇨56[kg]
(Cooling Fan type)





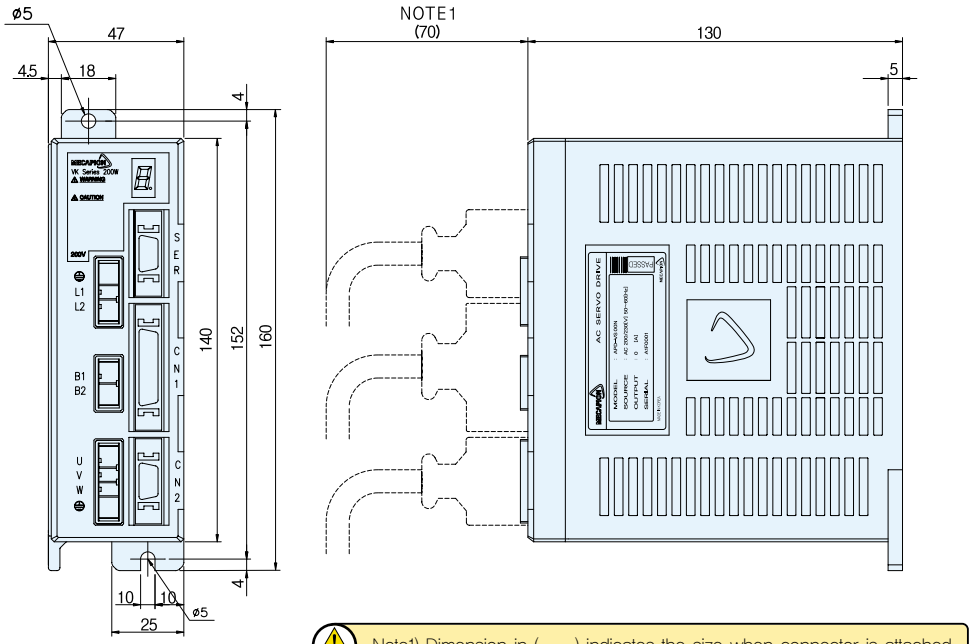
⚠ Note) Indicate the dimension which connector is attached.

APD-VK Drive Dimensions

50W, 100W, 200W

APD | VKR5N/VK01N/VK02N

Weight : 0.7[kg]

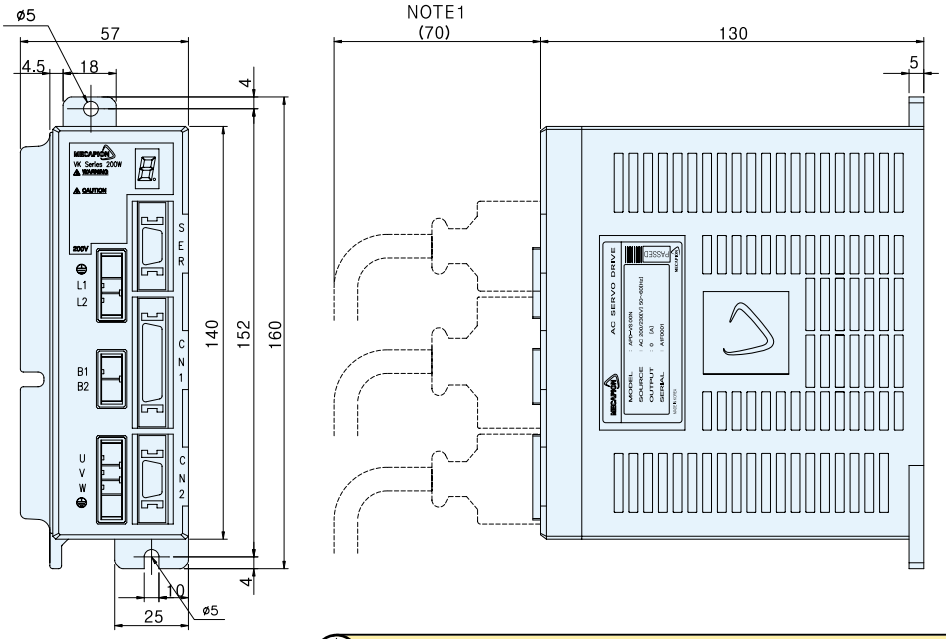


Note1) Dimension in ( ) indicates the size when connector is attached.

400W, 800W

APD | VK04N/VK08N

Weight : 0.9[kg]



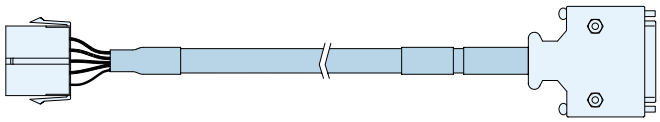
Note1) Dimension in ( ) indicates the size when connector is attached.

Options(Cable)

Incremental Encoder Cable

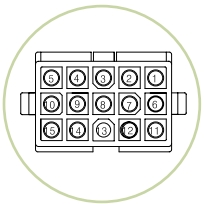
Model (★Note1) : APC - ☐☐ ☐ ☐S
Applicable Motor : All models of APM-SA Series, APM-SB Series, APM-SC Series, APM-HB Series
Applicable Drive : APD-VS/VP Series

Motor Side Connector



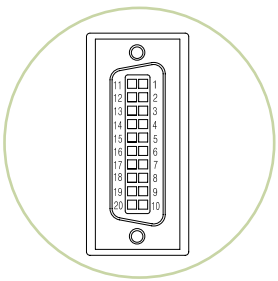
Drive Side Connector(CN2)

1. **Motor Side Connector**
   CAP (15 Position) : 172163-1(Made by AMP)
   SOCKET : 170361-1(Made by AMP)
2. **Drive Side Connector(CN2)**
   CASE : 10320-52A0-008(Made by 3M)
   CONNECTOR : 10120-3000VE(Made by 3M)
3. **Cable**
   7Px0.2SQ(AWG24)



AMP 172163-1 CAP
(15 Circuits)

PIN NO.	Encoder signal	PIN NO.	Encoder signal
1	A	9	V
2	$\overline{A}$	10	$\overline{V}$
3	B	11	W
4	$\overline{B}$	12	$\overline{W}$
5	Z	13	+5V
6	$\overline{Z}$	14	0V
7	U	15	SHIELD
8	$\overline{U}$		

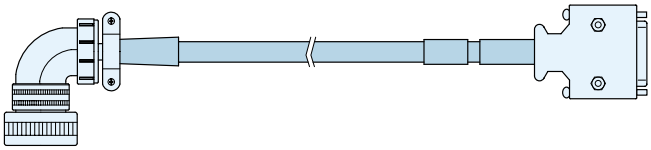


3M 10320-52A0-008
(15 Circuits)

PIN NO.	Encoder signal	PIN NO.	Encoder signal
1	W	11	$\overline{Z}$
2	$\overline{W}$	12	SHIELD
3	V	13	$\overline{B}$
4	$\overline{V}$	14	Z
5	U	15	$\overline{A}$
6	$\overline{U}$	16	B
7	–	17	–
8	–	18	A
9	0V	19	+5V
10	–	20	–

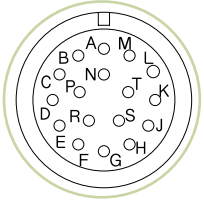
Model (★Note1) : APC-☐☐ ☐ ☐S
Applicable Motor : All models of APM-SE Series, APM-SF Series, APM-SG Series, APM-HE Series
Applicable Drive : APD-VS/VP Series

Motor Side Connector



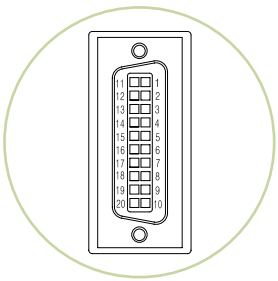
Drive Side Connector(CN2)

1. **Motor Side Connector**(MS:Military Standard)
   PLUG : MS3108B(MS3106B) 20-29S
2. **Drive Side Connector(CN2)**
   CASE : 10320-52A0-008(Made by 3M)
   CONNECTOR : 10120-3000VE(Made by 3M)
3. **Cable**
   7Px0.2SQ(AWG24)



MS3108B20-29S
(15Circuits)

PIN NO.	Encoder signal	PIN NO.	Encoder signal
A	A	M	V
B	$\overline{A}$	N	$\overline{V}$
C	B	P	W
D	$\overline{B}$	R	$\overline{W}$
E	Z	H	+5V
F	$\overline{Z}$	G	0V
K	U	J	SHIELD
L	$\overline{U}$		



3M 10320-52A0-008
(15 Circuits)

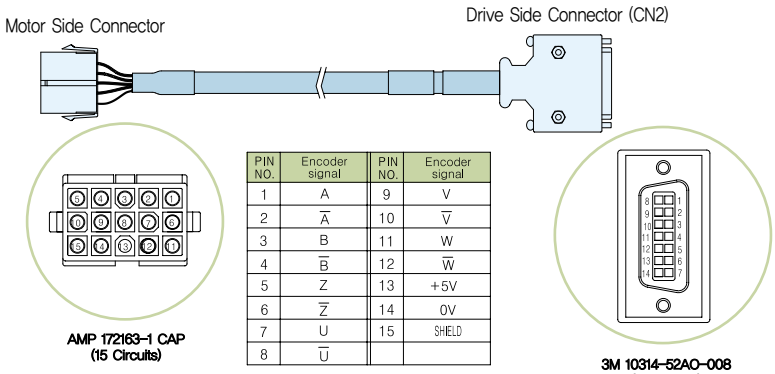
PIN NO.	Encoder signal	PIN NO.	Encoder signal
1	W	11	$\overline{Z}$
2	$\overline{W}$	12	SHIELD
3	V	13	$\overline{B}$
4	$\overline{V}$	14	Z
5	U	15	$\overline{A}$
6	$\overline{U}$	16	B
7	–	17	–
8	–	18	A
9	0V	19	+5V
10	–	20	–

Note1) ☐☐☐ of model indicates the kind and length of cable, and notation is as below

Standard Cable Length (m)	3	5	10	20
Robotic Cable	F03	F05	F10	F20
General Cable	N03	N05	N10	N20

Incrernental Encoder Cable(15Line)

Model (★Note1) : APC - E□□□VK15 Applicable Drive : APD-VK Series
Applicable Motor : APM-SA Series, APM-SB Series, APM-SC Series



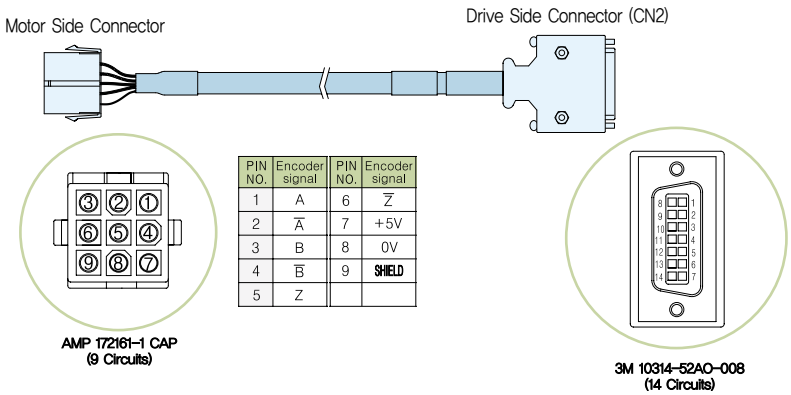
PIN NO.	Encoder signal	PIN NO.	Encoder signal
1	A	9	V
2	$\overline{A}$	10	$\overline{V}$
3	B	11	W
4	$\overline{B}$	12	$\overline{W}$
5	Z	13	+5V
6	$\overline{Z}$	14	0V
7	U	15	SHIELD
8	$\overline{U}$		

PIN NO.	Encoder signal	PIN NO.	Encoder signal
1	0V	8	+5V
2	$\overline{B}$	9	$\overline{A}$
3	B	10	A
4	$\overline{Z}$	11	$\overline{U}$
5	Z	12	U
6	$\overline{V}$	13	$\overline{W}$
7	V	14	W
CASE	SHIELD		

1. **Motor Side Connector**
   CAP (15 Position) : 172163-1(Made by AMP)
   SOCKET : 170361-1(Made by AMP)
2. **Drive Side Connector(CN2)**
   CASE : 10314-52A0-008(Made by 3M)
   CONNECTOR : 10114-3000VE(Made by 3M)
3. **Cable** : 7Px0.2SQ(AWG24)

Incrernental Encoder Cable(9Line)

Model (★Note1) : APC - E□□□VK9 Applicable Drive : APD-VK Series
Applicable Motor : APM-SA Series, APM-SB Series, APM-SC Series



PIN NO.	Encoder signal	PIN NO.	Encoder signal
1	A	6	$\overline{Z}$
2	$\overline{A}$	7	+5V
3	B	8	0V
4	$\overline{B}$	9	SHIELD
5	Z		

PIN NO.	Encoder signal	PIN NO.	Encoder signal
1	0V	8	+5V
2	$\overline{B}$	9	$\overline{A}$
3	B	10	A
4	$\overline{Z}$	11	–
5	Z	12	–
6	–	13	–
7	–	14	–
case	SHIELD		

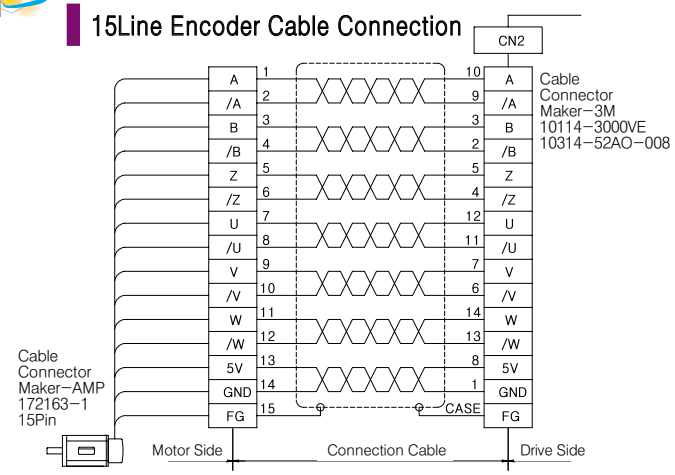
1. **Motor Side Connector**
   CAP (9 Position) : 172161-1(Made by AMP)
   SOCKET : 170361-1(Made by AMP)
2. **Drive Side Connector(CN2)**
   CASE : 10314-52A0-008(Made by 3M)
   CONNECTOR : 10114-3000VE(Made by 3M)
3. **Cable** : 4Px0.2SQ(AWG24)

Note1) □□□ of model indicates the kind and length of cable, and notation is as below

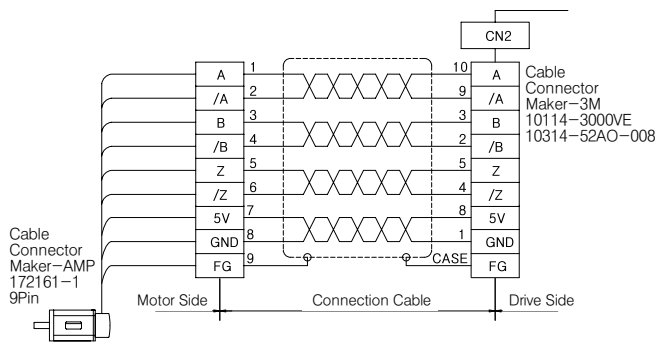
Standard Cable Length (m)	3	5	10	20
Robotic Cable	F03	F05	F10	F20
General Cable	N03	N05	N10	N20

VK Encoder Cable Connection

15Line Encoder Cable Connection



9Line Encoder Cable Connection



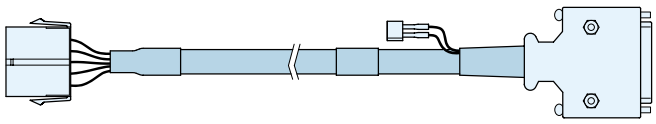
Note1) ☒☒☒ Wiring Marker must be used Twist Pair Shield Cable to prevent any malfunction

Absolute Encoder Cable

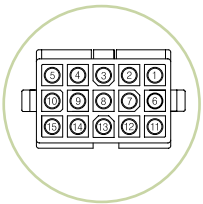
Model (★Note1) : APC-ED □ AA
Applicable Motor : All models of APM-SB Series, APM-SC Series
Applicable Drive : APD-VS/VP Series

Motor Side Connector

Drive Side Connector (CN2)

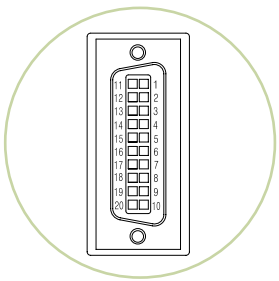


1. **Motor Side Connector**
   CAP (15 Position) : 172163-1(Made by AMP)
   SOCKET : 170361-1(Made by AMP)
2. **Drive Side Connector(CN2)**
   CASE : 10320-52A0-008(Made by 3M)
   CONNECTOR : 10120-3000VE(Made by 3M)
3. **Cable**
   7Px0.2SQ(AWG24)
4. **BATTERY CONNECTOR**
   5267-02A(Made by MOLEX)



AMP 172163-1 CAP
(15Circuits)

Pin No.	Encoder Phase	Pin No.	Encoder Phase
1	A	9	BATTERY
2	$\overline{A}$	10	BATTERY 0V
3	B	11	RX
4	$\overline{B}$	12	$\overline{RX}$
5	Z	13	+5V
6	$\overline{Z}$	14	0V
7	CLR	15	SHELD
8	FG		



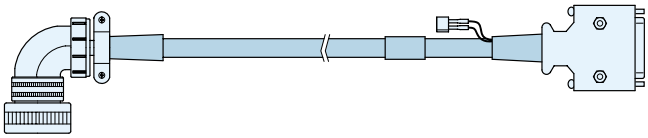
3M 10320-52A0-008
(15 Circuits)

Pin No.	Encoder Phase	Pin No.	Encoder Phase
1	RX	11	$\overline{Z}$
2	$\overline{RX}$	12	SHELD,FG
3	—	13	$\overline{B}$
4	—	14	Z
5	—	15	$\overline{A}$
6	—	16	B
7	—	17	—
8	—	18	A
9	0V	19	+5V
10	—	20	CLR

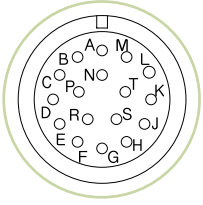
Model (★Note1) : APC-ED □ BA
Applicable Motor : All models of APM-SE Series, APM-SF Series, APM-SG Series
Applicable Drive : APD-VS/VP Series

Motor Side Connector

Drive Side Connector (CN2)

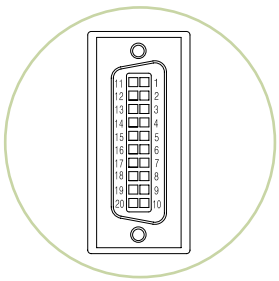


1. **Motor Side Connector (MS : Military Standard)**
   PLUG : MS3108B(3106B)20-29S
2. **Drive Side Connector(CN2)**
   CASE : 10320-52A0-008(Made by 3M)
   CONNECTOR : 10120-3000VE(Made by 3M)
3. **Cable**
   7Px0.2SQ(AWG24)
4. **BATTERY CONNECTOR**
   5267-02A(Made by MOLEX)



MS3108B20-29S
(15Circuits)

Pin No.	Encoder Phase	Pin No.	Encoder Phase
A	A	M	CLR
B	$\overline{A}$	N	FG
C	B	P	RX
D	$\overline{B}$	R	$\overline{RX}$
E	Z	H	+5V
F	$\overline{Z}$	G	0V
K	BATTERY	J	SHIELD
L	BATTERY 0V		



3M 10320-52A0-008
(15 Circuits)

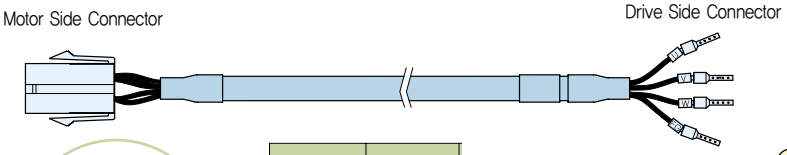
Pin No.	Encoder Phase	Pin No.	Encoder Phase
1	RX	11	$\overline{Z}$
2	$\overline{RX}$	12	SHELD,FG
3	—	13	$\overline{B}$
4	—	14	Z
5	—	15	$\overline{A}$
6	—	16	B
7	—	17	—
8	—	18	A
9	0V	19	+5V
10	—	20	CLR

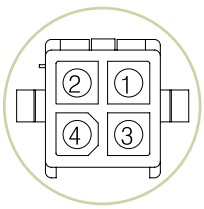
Note1) □□□ of model indicates the kind and length of cable, and notation is as below

Standard Cable Length (m)	3	5	10	20
Robotic Cable	F03	F05	F10	F20
General Cable	N03	N05	N10	N20

Power cable

Model (★Note1) : APC – PO □ □ DS Applicable Drive : APD-VS/VP Series
Applicable Motor : All models of APM-SA Series, APM-SB Series, APM-HB Series / APM-SC04A, SC06A, SC03D, SC05D



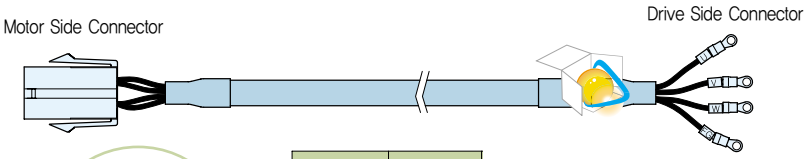


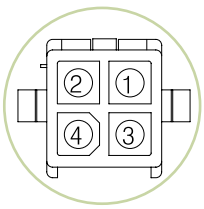
AMP 172159-1 CAP
(4Circuits)

Pin No.	Phase
1	U
2	V
3	W
4	Ground

1. **Motor Side Connector**
   CAP (4 Position) : 172159-1(Made by AMP)
   SOCKET : 170362-1(Made by AMP)
2. **Drive Side Connector (U,V,W,FG)**
   PIN : UA-F1512(Made by Suh-il Electronic)
   Compressor : UA-510A
   (Made by Suh-il Electronic)
3. **Cable**
   4Cx0.75SQ(AWG20)

Model (★Note1) : APC – PO □ □ DS Applicable Drive : APD-VS/VP Series
Applicable Motor : APM-SC08A, SC10A, SC06D, SC07D



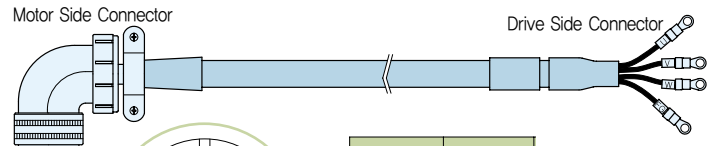


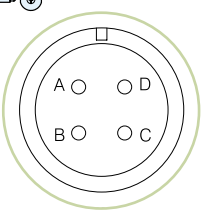
AMP 172159-1 CAP
(4Circuits)

Pin No.	Phase
1	U
2	V
3	W
4	Ground

1. **Motor Side Connector**
   CAP (4 Position) : 172159-1(Made by AMP)
   SOCKET : 170362-1(Made by AMP)
2. **Drive Side Connector(U,V,W,FG)**
   Connection terminals : 1.25×3(KET GP110012)
3. **Cable**
   4C×0.75SQ(AWG18)

Model (★Note1) : APC – PO □ □ ES Applicable Drive : APD-VS/VP Series
Applicable Motor : All models of APM-SE Series, APM-HE Series





MS3108B20-4S
(4Circuits)

Pin No.	Phase
A	U
B	V
C	W
D	Ground

1. **Motor Side Connector(MS:Military Standard)**
   PLUG : MS3108B(MS3106B)20-4S
2. **Drive Side Connector (U,V,W,FG)**
   Connection terminals : 2.5x4(KET GP110721)
3. **Cable**
   4Cx2.0SQ(AWG14)

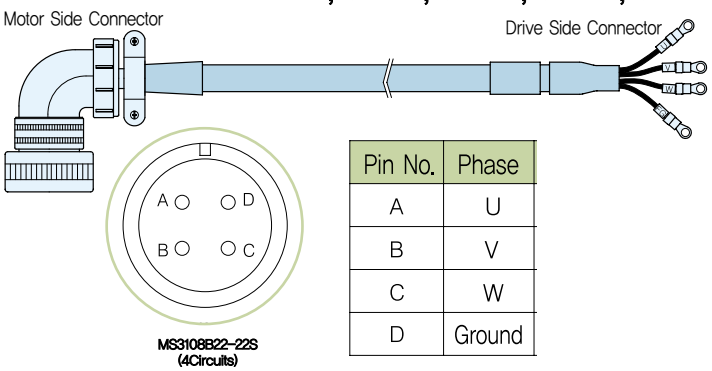
Note) For drive side connector of APM-SE03M Series cable, UA-F1512 pin is to be applied

Note1) □□□ of model indicates the kind and length of cable, and notation is as below

Standard Cable Length (m)	3	5	10	20
Robotic Cable	F03	F05	F10	F20
General Cable	N03	N05	N10	N20

Power cable

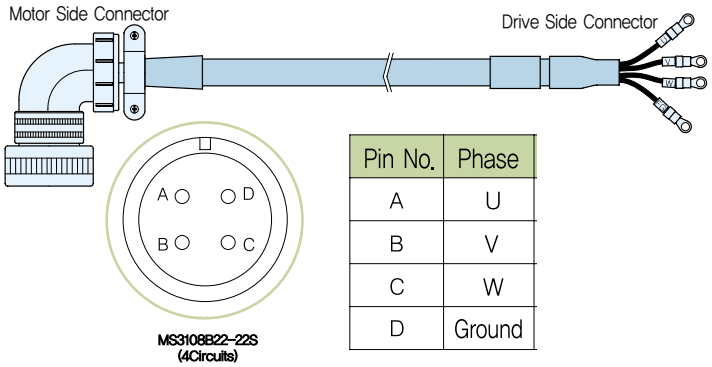
Model (★Note1) : APC-PS□ □ ES Applicable Drive : APD-VS/VP Series
Applicable Motor : APM-SF30A, SF22D, SF35D, SF20G, SF30G, SF12M, SF20M, SF30M
SG22D, SG35D, SG20G, SG30G, SG12M, SG20M, SG30M



Pin No.	Phase
A	U
B	V
C	W
D	Ground

1. **Motor Side Connector(MS:Military Standard)**
   PLUG : MS3108B(MS3106B)22-22S
2. **Drive Side Connector(U,V,W,FG)**
   Connection terminals : 3.5x5(KET GP110028)
3. **Cable**
   4Cx3.5SQ(AWG12)

Model (★Note1) : APC-PS□ □ GS Applicable Drive : APD-VS/VP Series
Applicable Motor : APM-SF50A, SF55D, SF75D, SF44G, SF60G, SF75G, SF44M
SG55D, SG75D, SG44G, SG60G, SG44M



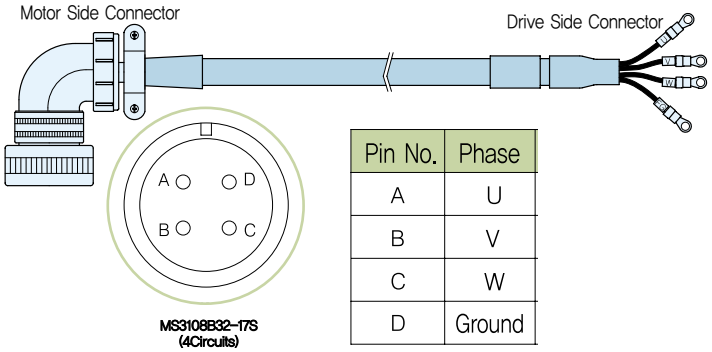
Pin No.	Phase
A	U
B	V
C	W
D	Ground

1. **Motor Side Connector(MS:Military Standard)**
   PLUG : MS3108B(MS3106B)22-22S
2. **Drive Side Connector(U,V,W,FG)**
   Connection terminals : 5.5x5(KET GP110028)
3. **Cable**
   4Cx5.0SQ(AWG10)

Model (★Note1,2) : APC-PS□ □ BS Applicable Drive : APD-VS/VP Series
Applicable Motor : APM-SG110D, SG85G, SG60M

Model (★Note1,3) : APC-PS□ □ BS Applicable Drive : APD-VS/VP Series
Applicable Motor : SG110G, SG150G

★Note2



Pin No.	Phase
A	U
B	V
C	W
D	Ground

1. **Motor Side Connector(MS:Military Standard)**
   PLUG : MS3108B(MS3106B)32-17S
2. **Drive Side** Connector(U,V,W,FG)
   Connection terminals : 8.0x8(KET GP140841)
3. **Cable**
   4Cx8.0SQ(AWG8)

★Note3

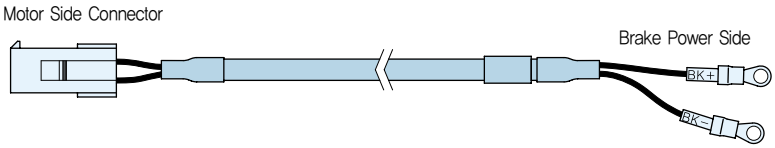
1. **Motor Side Connector(MS:Military Standard)**
   PLUG : MS3108B(MS3106B)32-17S
2. **Drive Side** Connector(U,V,W,FG)
   Connection terminals : 14x8(KET GP140841)
3. **Cable**
   4Cx22.0SQ(AWG6)

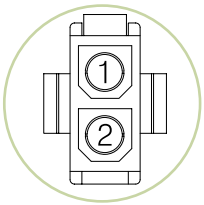
Note1) □□□ of model indicates the kind and length of cable, and notation is as below

Standard Cable Length (m)	3	5	10	20
Robotic Cable	F03	F05	F10	F20
General Cable	N03	N05	N10	N20

Brake cable

Model (★Note1) : APC-PC□ □ KB
Applicable Motor : All models of APM-SA Series, APM-SB Series, APM-SC Series
Applicable Drive : APD-VS/VP Series



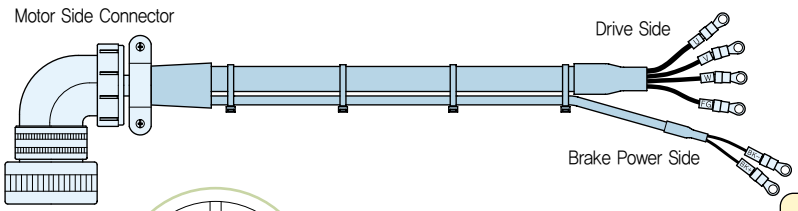


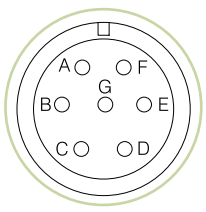
AMP 172157-1 CAP
(2Circuits)

Pin No.	Phase
1	BK+
2	BK-

1. Motor Side Connector
CAP (2 Position) : 172157-1(Made by AMP)
SOCKET : 170362-1(Made by AMP)
2. Brake Power Side
Connection terminals : 1.25×3(KET GP110012)
Cable : 2C×0.75SQ(AWG18)

Model (★Note1) : APC-PC□ □ MB
Applicable Motor : All models of APM-SE Series
Applicable Drive : APD-VS/VP Series





MS3108B20-15S
(6Circuits)

Pin No.	Phase
A	U
B	V
C	W
D	Ground
E	BK+
F	BK-

1. Motor Side Connector (MS:Military Standard)
PLUG : MS3108B(MS3106B)20-15S
2. Drive Side (U,V,W,FG)
Connection terminals : 2.5x4(KET GP110721)
Cable : 4Cx2.0SQ(AWG14)
3. Brake Power Side (+,-)
Connection terminals : 1.25x3(KET GP110012)
Cable : 2Cx0.75SQ(AWG18)

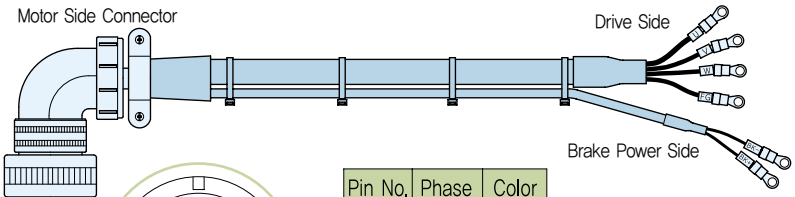
Note) For drive side connector of APM-SE03M Series cable, UA-F1512 pin is to be applied

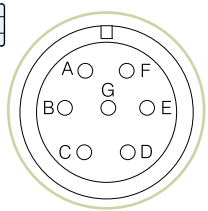
Note1) □□□ of model indicates the kind and length of cable, and notation is as below

Standard Cable Length (m)	3	5	10	20
Robotic Cable	F03	F05	F10	F20
General Cable	N03	N05	N10	N20

Brake cable

Model (★Note1) : APC-PC□ □ NB Applicable Drive : APD-VS/VP Series
Applicable Motor : APM-SF30A, SF22D, SF35D, SF20G, SF30G, SF12M, SF20M, SF30M



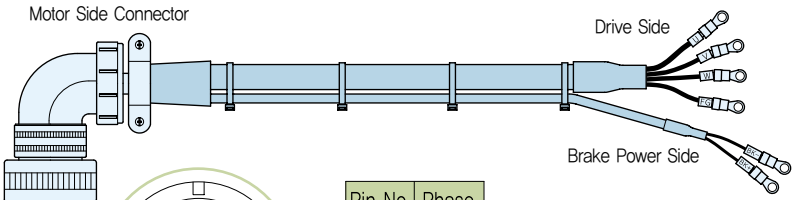


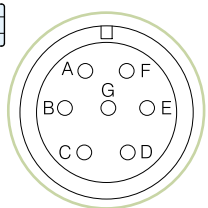
MS3108B24-10S
(6Circuits)

Pin No.	Phase	Color
A	U	Red
B	V	White
C	W	Black
D	Ground	Green
E	BK+	–
F	BK–	–

1. Motor Side Connector(MS:Military Standard)
   PLUG : MS3108B(MS3106B)24-10S
2. Drive Side (U,V,W,FG)
   Connection terminals : 3.5x5(KET GP110028)
   Cable : 4Cx3.5SQ(AWG12)
3. Brake Power Side (+,–)
   Connection terminals : 1.25x3(KET GP110012)
   Cable : 2Cx0.75SQ(AWG18)

Model (★Note1) : APC-PC□ □ PB Applicable Drive : APD-VS/VP Series
Applicable Motor : APM-SF50A, SF55D, SF75D, SF44G, SF60G, SF75G, SF44M



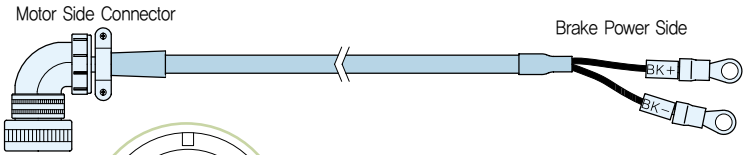


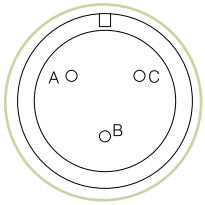
MS3108B24-10S
(6Circuits)

Pin No.	Phase
A	U
B	V
C	W
D	Ground
E	BK+
F	BK–

1. Motor Side Connector (MS:Military Standard)
   PLUG : MS3108B(MS3106B)24-10S
2. Drive Side (U,V,W,FG)
   Connection terminals : 3.5x5(KET GP110028)
   Cable : 4Cx5.5SQ(AWG10)
3. Brake power Side (+,–)
   Connection terminals : 1.25x3(KET GP110012)
   Cable : 2Cx0.75SQ(AWG18)

Model (★Note1) : APC-PC□ □ SB Applicable Drive : APD-VS/VP Series
Applicable Motor : All models of APM-SG Series





MS3108B14S-7S
(2Circuits)

Pin No.	Phase
A	BK+
B	BK–

1. Motor Side Connector
   PLUG : MS3108B(MS3106B)14S-7S
2. Brake Power Side (+, –)
   Connection terminals : 1.25×3(KET GP110012)
3. Cable
   2C×0.75SQ(AWG18)

Note1) □□□ of model indicates the kind and length of cable, and notation is as below

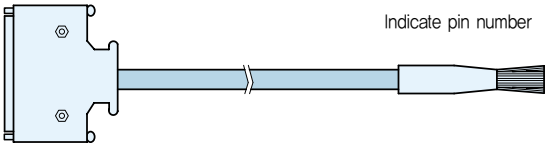
Standard Cable Length (m)	3	5	10	20
Robotic Cable	F03	F05	F10	F20
General Cable	N03	N05	N10	N20

For CN1 Cable

Model (★Note1) : APC-CN1□ A

Applicable Drive : All models of APD-VS/VP Series

Servo Drive CN1



1. Drive Side (CN1)
   Case : 10350-52A0-008(Made by 3M)
   Connector : 10150-3000VE(Made by 3M)
   Cable : UL20276 25Pair(AWG 28)
2. Cable can be changed without any notice.

〈Pin number〉

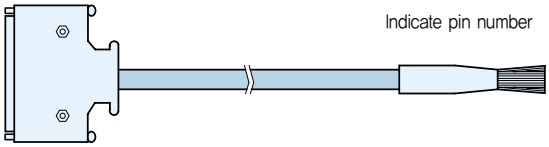
CN1	Color	CN1	Color	CN1	Color	CN1	Color	CN1	Color
1	Orange/Black 1P	11	Orange/Black 2P	21	Orange/Black 3P	31	Orange/Black 4P	41	Orange/Black 5P
2	Orange/Red 1P	12	Orange/Red 2P	22	Orange/Red 3P	32	Orange/Red 4P	42	Orange/Red 5P
3	Yellow/Black 1P	13	Yellow/Black 2P	23	Yellow/Black 3P	33	Yellow/Black 4P	43	Yellow/Black 5P
4	Yellow/Red 1P	14	Yellow/Red 2P	24	Yellow/Red 3P	34	Yellow/Red 4P	44	Yellow/Red 5P
5	White/Black 1P	15	White/Black 2P	25	White/Black 3P	35	White/Black 4P	45	White/Black 5P
6	White/Red 1P	16	White/Red 2P	26	White/Red 3P	36	White/Red 4P	46	White/Red 5P
7	Gray/Black 1P	17	Gray/Black 2P	27	Gray/Black 3P	37	Gray/Black 4P	47	Gray/Black 5P
8	Gray/Red 1P	18	Gray/Red 2P	28	Gray/Red 3P	38	Gray/Red 4P	48	Gray/Red 5P
9	Pink/Black 1P	19	Pink/Black 2P	29	Pink/Black 3P	39	Pink/Black 4P	49	Pink/Black 5P
10	Pink/Red 1P	20	Pink/Red 2P	30	Pink/Red 3P	40	Pink/Red 4P	50	Pink/Red 5P

For CN1 Cable

Model (★Note1) : APC-CN1□ ☑KA

Applicable Drive : All models of APD-VK Series

Servo Drive CN1



1. Drive Side (CN1)
   Case : 10336-52A0-008(Made by 3M)
   Connector : 10136-3000VE(Made by 3M)
   Cable : ROW-SB 0.1Cx36C(AWG 28)
2. Cable can be changed without any notice.

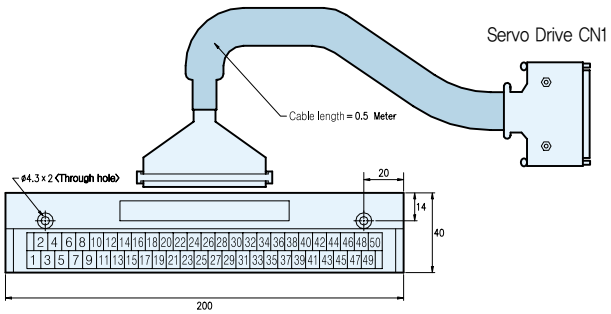
〈Pin number〉

CN1	Color	CN1	Color	CN1	Color	CN1	Color	CN1	Color
1	Orange/Black 1P	11	Orange/Black 2P	21	Orange/Black 3P	31	Orange/Black 4P		
2	Orange/Red 1P	12	Orange/Red 2P	22	Orange/Red 3P	32	Orange/Red 4P		
3	Yellow/Black 1P	13	Yellow/Black 2P	23	Yellow/Black 3P	33	Yellow/Black 4P		
4	Yellow/Red 1P	14	Yellow/Red 2P	24	Yellow/Red 3P	34	Yellow/Red 4P		
5	White/Black 1P	15	White/Black 2P	25	White/Black 3P	35	White/Black 4P		
6	White/Red 1P	16	White/Red 2P	26	White/Red 3P	36	White/Red 4P		
7	Gray/Black 1P	17	Gray/Black 2P	27	Gray/Black 3P				
8	Gray/Red 1P	18	Gray/Red 2P	28	Gray/Red 3P				
9	Pink/Black 1P	19	Pink/Black 2P	29	Pink/Black 3P				
10	Pink/Red 1P	20	Pink/Red 2P	30	Pink/Red 3P				

Terminal Block for CN1

Model (★Note1) : APC-VSCN1T-□ □

Applicable Drive : All models of APD-VS/VP Series

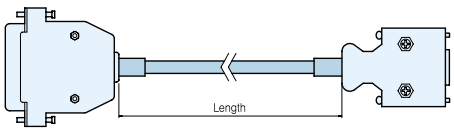


1. For APD-VS/VP
2. Standard cable Length : 0.5m
3. 1m, 2m also available

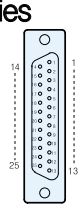
Servo Drive O/S Download Cable

Model (★Note1) : APC-CN3□ S

Applicable Drive : All models of APD-VS/VP/VK Series



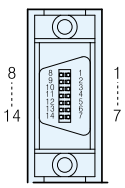
Standard Cable length : 2[m]



PC Parallel Port

Pin No.	Phase
15	Error
8	Data6
7	Data5
9	Data7
16	Init
18~25	GND
6	Data4
18~25	GND

Pin No.	Phase
1	DX0
2	FSRX
3	CLKRX
4	CLK
8	RESET
9	INT2/3
10	DR0
11	GND
Case	Shield



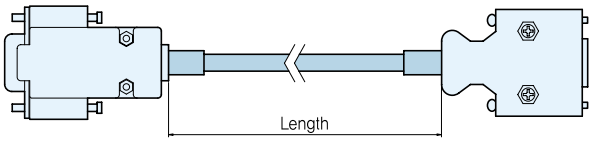
Servo Drive CN3

Note1) □□ of model indicates the length of cable, and notation is as below

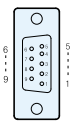
Standard Cable Length (m)	1	2	3	5
Marking	01	02	03	05

RS232 Communication Cable

Model (★Note1) : APC-CN3□ ☒
Applicable Drive : All models of APD-VS/VP/VK Series



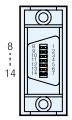
Standard Cable length : 2[m]



PC-Serial Port

Pin No.	Phase
2	RXD
3	TXD
5	GND

Pin No.	Phase
6	TXD
5	RXD
11or12	GND
Case	Shield



Servo Drive CN3

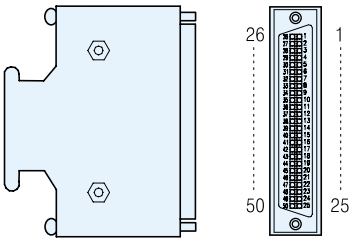
Note1) □□ of model indicates the length of cable, and notation is as below

Standard Cable Length (m)	1	2	3	5
Marking	01	02	03	05

Options (Connector)

CN1 Connector

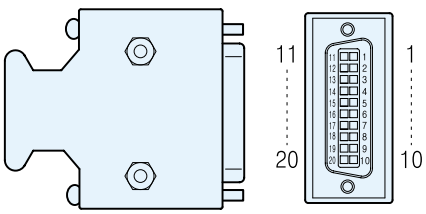
Model : APC-CN1NNA
Applicable Drive : All models of APD-VS/VP Series



1. Case : 10350-52A0-008(Made by 3M)
2. Connector : 10150-3000VE(Made by 3M)

CN2 Connector

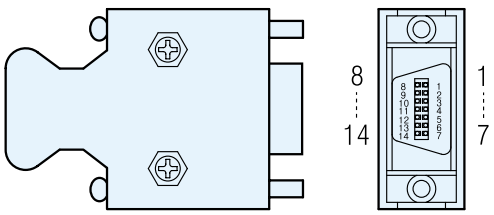
Model : APC-CN2NNA
Applicable Drive : All models of APD-VS/VP Series



1. Case : 10320-52A0-008(Made by 3M)
2. Connector : 10120-3000VE(Made by 3M)

CN3 Connector

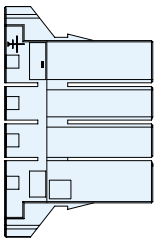
Model : APC-CN3NNA
Applicable Drive : All models of APD-VS/VP Series



1. Case : 10314-52A0-008(Made by 3M)
2. Connector : 10114-3000VE(Made by 3M)

Motor Power Connector 4Pin

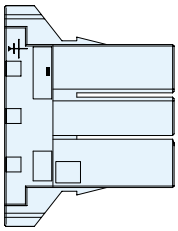
Model : APC-CNMPVKA
Applicable Drive : APD-VK Series



1) CASE : 1-178128-4(AMP)
2) CONNECTOR PIN 175218(AMP)

Drive Power Connector 3Pin

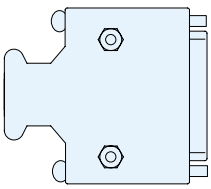
Model : APC-CNACVKA
Applicable Drive : APD-VK Series



1) CASE : 1-178128-3(AMP)
2) CONNECTOR PIN 175218(AMP)

CN1 Connector 36Pin

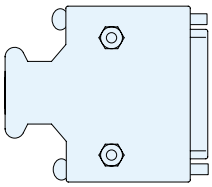
Model : APC-CN1VKA
Applicable Drive : APD-VK Series



1) CASE : 10336-52A0-008(3M)
2) CONNECTOR 10136-3000VE(3M)

SER/CN2 Connector

Model : APC-CN3NNA
Applicable Drive : APD-VK Series

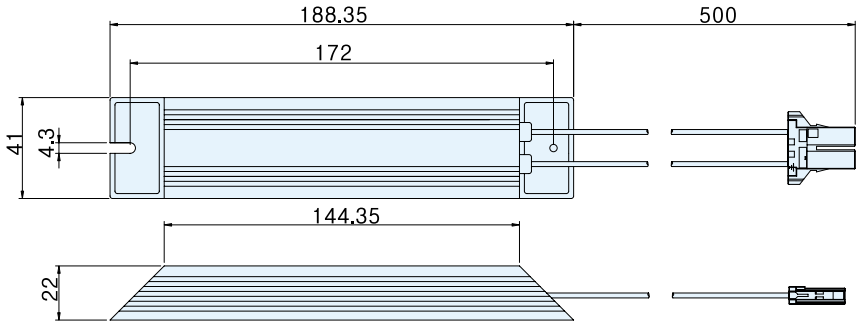


1) CASE : 10314-52A0-008(3M)
2) CONNECTOR 10114-3000VE(3M)

Options (Braking Resistor, Noise Filter) for VK Servo Drive

Braking Resistor

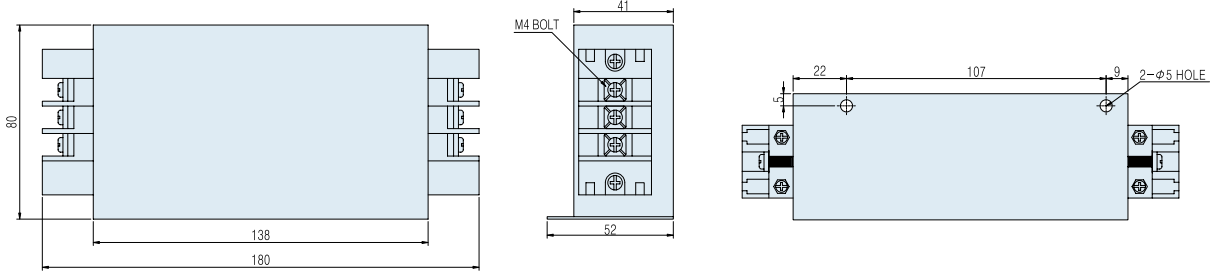
Model : APC-140R40VK
Applicable Drive : APD-VK Series



Noise Filter

Model : APC-RFY410
Applicable Drive : APD-VK Series

Part Name : RFY-410SM

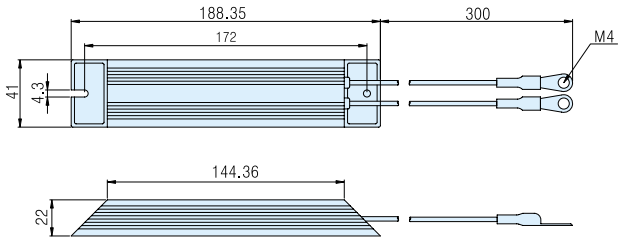


Options (Braking Resistor)

Braking Resistor

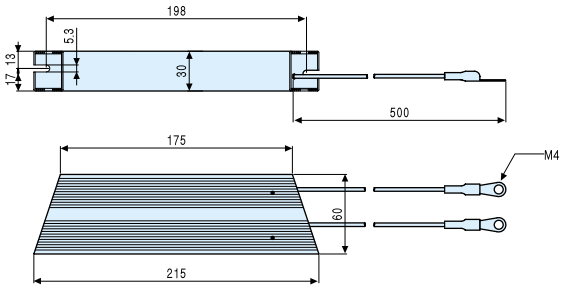
Model (★Note1) :APC-140R40
Applicable Drive : APD-VS/VP02, VS/VP04

Part Name : IRH 140W 40ohm)



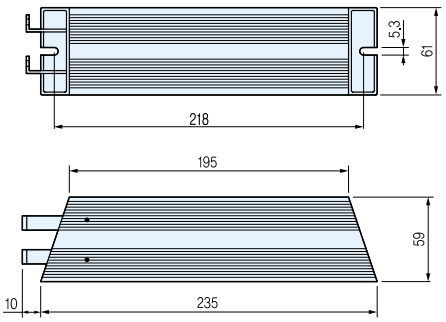
Model (★Note1) : APC-300R23
Applicable Drive : APD-VS/VP05, VS/VP10

Part Name : IRV 300W 23ohm)



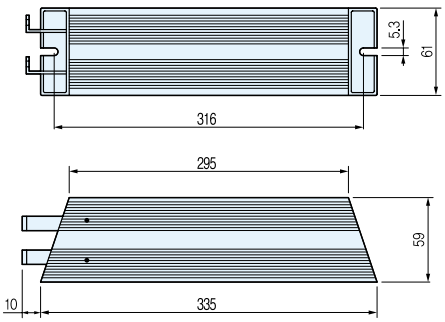
Model (★Note1) : APC-600R30
Applicable Drive : APD-VS/VP15(2P), VS/VP20(2P), VS/VP35(3P), APD-VS/VP50(3P), VS/VP75(3P), VS/VP110(4P)

Part Name : IRV 600S 30ohm)



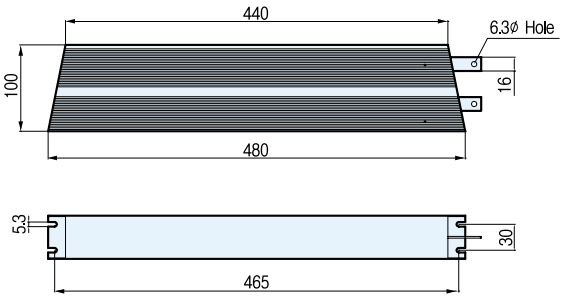
Model (★Note1) : APC-1000R6R5
Applicable Drive APD-VS/VP150(2P)

Part Name : IRV 600S 30ohm)



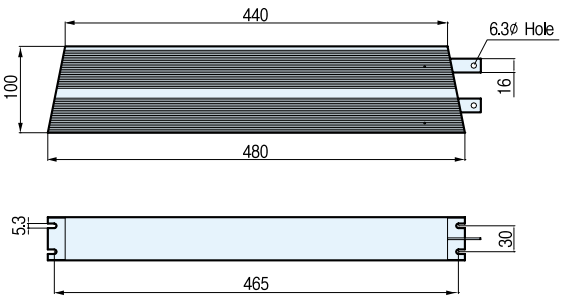
Model (★Note1) : APC-2400R2R4
Applicable Drive : APD-VS/VP220(1P)

Part Name : IRV 2400P 2.4ohm)



Model (★Note1) : APC-2400R3R2
Applicable Drive : APD-VS/VP300(2P), VS/VP370(2P)

Part Name : IRV 600S 30ohm)



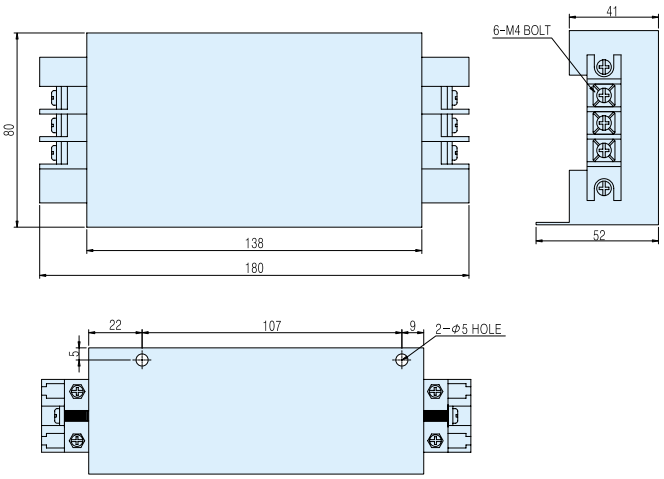
Note)Standard Braking Resistance for each drive capacity is provided as below table

Applicable Drive APD-VS/VP□□N	R5	01	02	04	05	10	15	20	35	50	75	110	150	220	300	370
Braking Resistance (Basically provided)	–		In 50[Ω] (50[W])		40[Ω] (140[W])		23[Ω] (300[W])		11.5[Ω] (300[W]×2P)			Option				

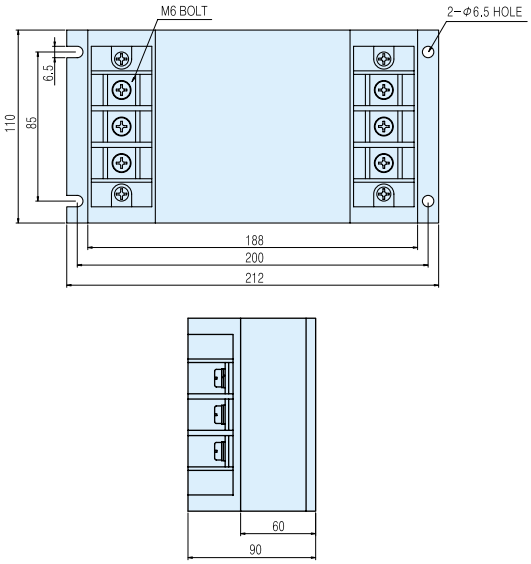
Options (Noise Filter)

Noise Filter

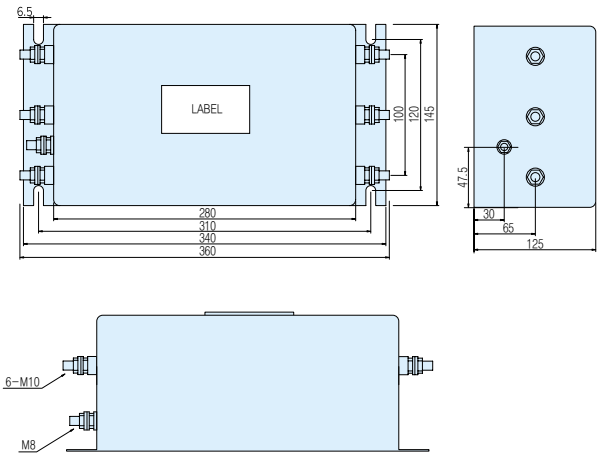
Model : APC-RFY410SM/415SM/420SM/430SM
Applicable Drive (★Note1)
Part Name : RFY-410SM/415SM/420SM/430SM)



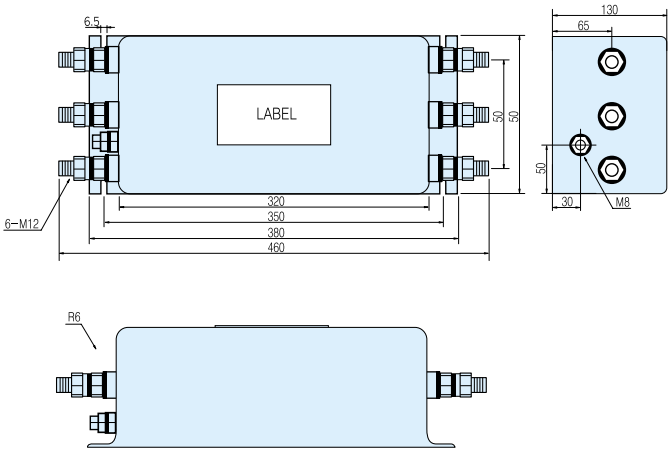
Model : APC-RFY4040SM/4050SM/4080SM
Applicable Drive (★Note1)
Part Name : RFY-4040SM/4050SM/4080SM)



Model : APC-RFY4150/4200
Applicable Drive (★Note1)
Part Name : RFY-4150/4200)



Model : APC-RFY4250
Applicable Drive (★Note1)
Part Name : RFY-4250)



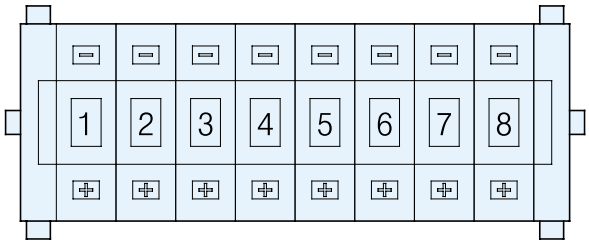
Note)Noise filter Model name for each applicable servo drive is as below table

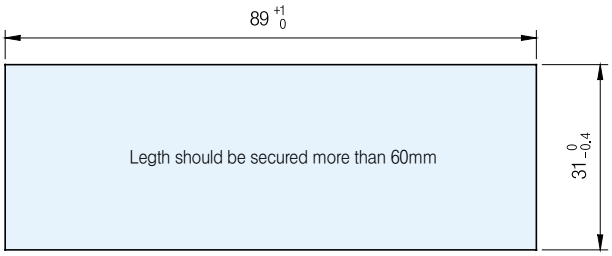
Applicable Drive APD-VS/VP□□N	R5	01	02	04	05	10	15	20	35	50	75	110	150	220	300	370
Noise Filter APC-RFY□□□□	410					415		420	430	4040		4050	4080	4150	4200	4250

Options (Setting machine / Indicator)

Digital Switch

Model : APC-VPDS08
Applicable Drive : All models of APD-VP Series



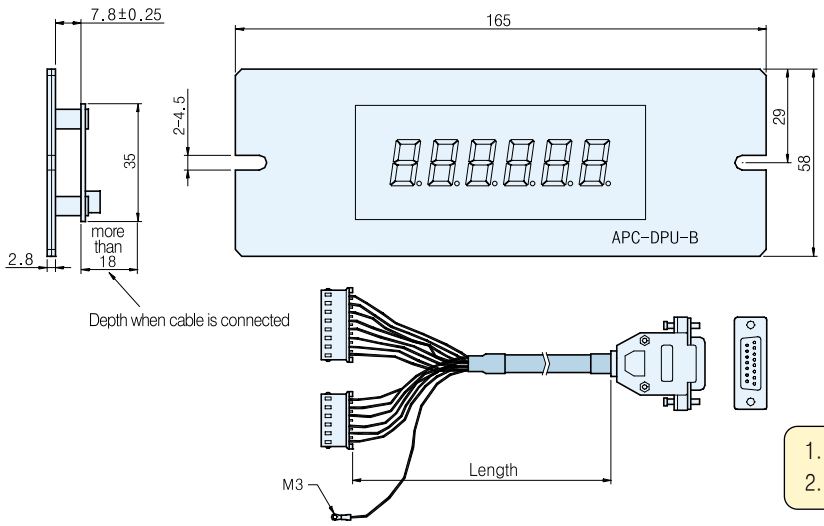


Processing dimensions

1. For Position/Speed setting of Controller-embedded Type(APD-VP)
2. Refer to the Manual of Controller-embedded Type(APD-VP) for wiring.
3. The Specification of Digital Switch can be changed (Standard 8 termianls)

Remote Display

Model (★Note1) : APC-DPU□ B
Applicable Drive : All models of APD-VS/VP Series



1. Cable length can be adjusted upon request
2. Place an order with Servo Drive (Remote Type)

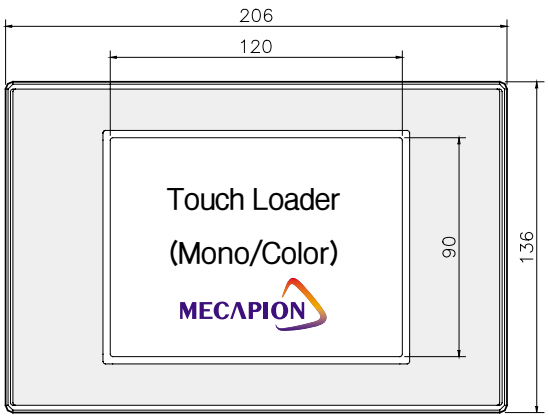
Note1) □□ of model indicates the length of cable, and the notation is as below

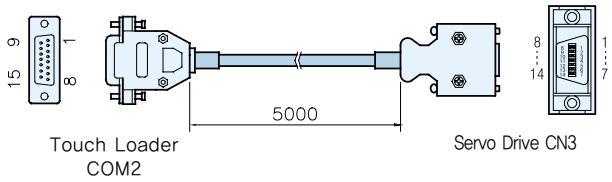
Standard Cable Length (m)	1	2	3	5
Marking	01	02	03	05

Options(Touch/Handy Loader)

Mono/Color Touch Loader

Model : Mono Touch Loader : APC-V□TS3MA, Color Touch Loader : APC-V□TS3SA
Applicable Drive : All models of APD-VS/VP/VK Series
Part Name : Mono:TOP3MA, Color:TOP3SA

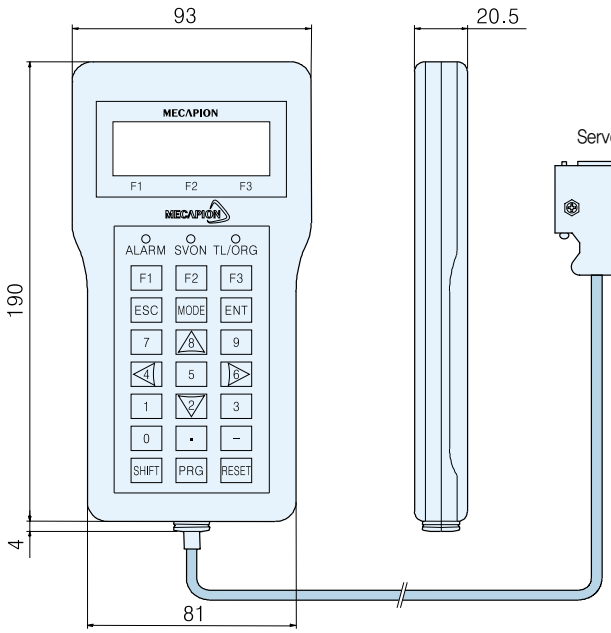


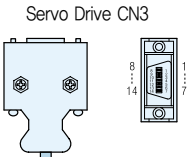


1. Touch Loader Input Voltage : DC 24V
2. Standard Cable length for COM2 : 5m
3. Option Cable(Separate Purchasing item)
   1) RS232 Communication cable for COM1 : APM-CN305T(length : 5m)
   2) Touch Loader OS Download Cable : APC-CN3TSC(LENGTH : 3m)
4. □ in model name indicates Servo drive type
   S : Standard Touch O/S installed in VS series
   P : Standard Touch O/S installed in VP series

Handy Loader

Model (★Note1) : Handy Loader : APC-HD1□ △1
Applicable Drive : All models of APC-VS/VP/VK Series





Pin No.	Color	Phase
1	Yellow, Orange	/PSEN
5	Blue	TXD
6	Green	RXD
11	Black, White	GND
14	Red, Pink	VCC

1. Handy Loader Input Voltage : DC 5[V]
2. The Length of standard Cable : 2[m]
   The length can be adjusted upon request.

Note1) □□ of molel indicates the length of cable, and the notation is as below.

Standard Cable Length (m)	2	3	4	5
Marking	20	30	40	50

Selection Table of Servo Capacity

1. General customer information

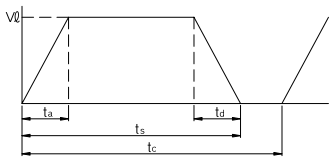
Date		Name		TEL	
Name of Product		The number of shaft		FAX	
Control Type	Standard Type(VS)	Speed, position, torque, speed/position, speed/torque, position/torque			
	Controller Type(VS)	Linear coordinates operation(x-y), Rotary coordinates operation(index, turret), Feeder operation, Position decision operation after sensor, 2 Step round operation(drill, automatic door), Pulse synchronized operation, PUSH-PULL operation(pressure, tensile control, press)			
	Compact Type(VK)	Postion mode, Speed mode			

2. Operation Cycle and Load Spec.

1. Operation cycle

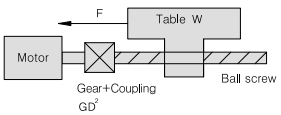
Position decision length L_s [sec]
Position decision time t_s [sec]
Transfer speed V_ℓ [m/min]

Operation period t_c [sec]
Acceleration time t_a [sec]
Deceleration time t_d [sec]



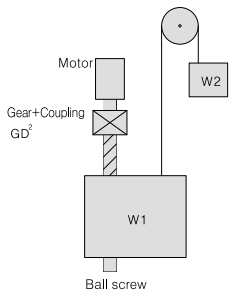
2. Ball screw(horizontal axis)

Load weight W [kg]
Impellent force F [kg]
Friction coefficient μ
Total efficiency η
Deceleration ratio R(Nm/N ℓ)
Gear+Coupling GD^2 [kg · cm^2]
Ball screw pitch P [mm]
Ball screw diameter D [mm]
Ball screw length L [mm]



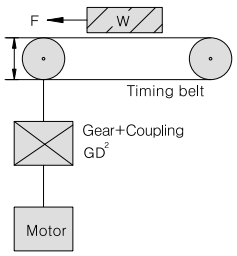
3. Ball screw(vertical axis)

Load weight W [kg]
Counter waiter W2 [kg]
Friction coefficient μ
Total efficiency η
Deceleration ratio R(Nm/N ℓ)
Gear+Coupling GD^2 [kg · cm^2]
Ball screw pitch P [mm]
Ball screw diameter D [mm]
Ball screw length L [mm]



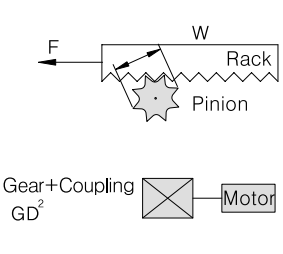
4. Timing belt

Load weight W [kg]
Impellent force F [kg]
Friction coefficient μ
Total efficiency η
Deceleration ratio R(Nm/N ℓ)
Gear+Coupling GD^2 [kg · cm^2]
Pulley GD^2 [kg · cm^2]
Pulley diameter D [mm]



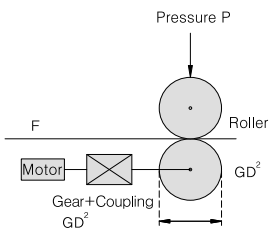
5. Rack pinion

Load weight W kg]
Impellent force F [kg]
Friction coefficient μ
Total efficiency η
Deceleration ratio R(Nm/N ℓ)
Gear+Coupling GD^2 [kg · cm^2]
Pinion diameter D [mm]
Pinion thickness t [mm]



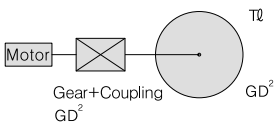
6. Roll feeder

Load GD^2 [kg · cm^2]
Tension F [kg]
Pressure P [kg]
Roll diameter D [mm]
Friction coefficient μ
Total efficiency η
Decleration ratio R(Nm/N ℓ)
Gear+Coupling GD^2 [kg · m^2]



7. Rotating body

Load GD^2 [kg · cm^2]
Load torque T_ℓ [kg · cm]
Total efficiency η
Decleration ratio R(Nm/N ℓ)
Gear+Coupling GD^2 kg · cm^2]



New Advanced Drive
VN series

Servo Motor Charasticstics

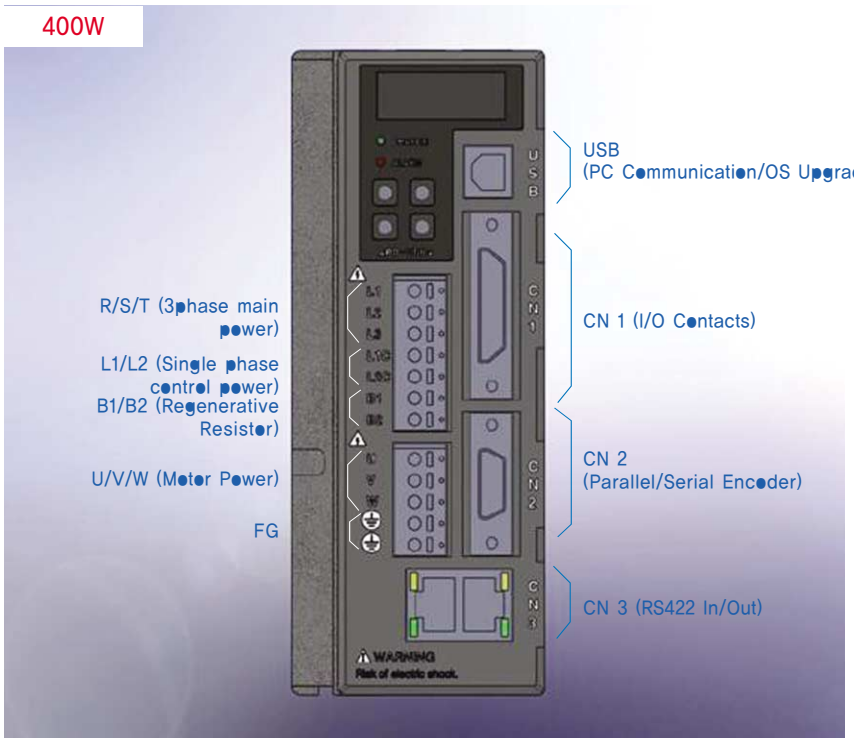
Servo Motor (APM-)		SB01A	SB02A	SB04A	SC04A	SC06A	SC03D	SC05D	SE03M
Servo Drive (APD-)		VN01	VN02	VN04	VN04	VN04	VN04	VN04	VN04
Rated Power (kW)		0.1	0.2	0.4	0.4	0.6	0.3	0.45	0.3
Torque [N.m]	Rated	0.318	0.637	1.273	1.273	1.91	1.432	2.149	2.865
	Max	0.955	1.910	3.820	3.82	5.730	4.297	6.446	8.594
Inertia [kg.m^{2}x10^{-4}]		0.144	0.182	0.321	0.674	1.092	0.674	1.092	6.659
Allowable Load Inertia Ratio		20 times of motor inertia			15 times		15 times		10 times
Speed [r/min]	Rated	3000					1500		1000
	Max	5000					3000		2000
Encoder		Serial INC 17~21 (bit)							
Operating environment		Vibration : Less than 24m/s^2, Operating Temp : 0~50[℃], Storage Temp : -20~80[℃]							

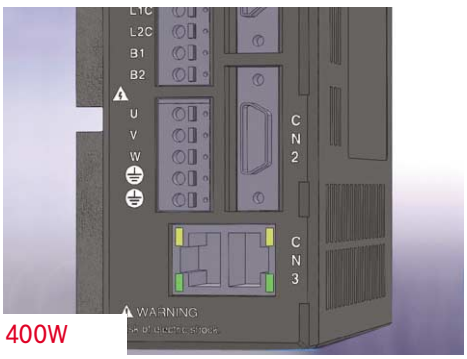
VN Servo Drive Spec

		VN01	VN02	VN04
Power Supply		3 phase AC 200~230V +10[%] - - 15[%], 50/60[Hz]		
Applicable motor	Voltage type	3 phase sine wave PWM driven AC Servo Motor		
	Rated Currnet[A]	1.4	1.65	3
	Max Current[A]	4.2	4.95	9
Detector Type		Incremental line drive 2000 ~ 10000[ppr] Serial line drive 17~21bit [BiSS type]		
Speed Control Mode	Speed control range	Max 1:5000		
	Frequency response	600[Hz] (For using Serial Encoder)		
	Speed command	DC -10[V] ~ +10[V](-voltage : Reverse Rotation), 3 digital speed commands		
	Acceleration/Deceration time	Linear 0~10,000[ms], S type acceleration/deceleration		
	Speed Variation ratio	± 0.01[%] or less [load variation 0~100%], ±0.1[%] or less [Temperature 25 ±10℃]		
Position Control Mode	Input frequency	Line drive : 500[kbps] Open collector : 400[kbps]		
	Input pulse	A+B phase, forward + reverse pulse, direction + pulse[Line driver, Open Collector)		
	Electronic gear ratio	Digital 4 speed, Available detail adjust		
Torque Control Mode	Torque command	DC -10[V] ~ +10[V] (- voltage : reverse)		
	Torque linearity	Less than 2[%]		
	Speed limit	DC 0[V] ~ +10[V], 3 digital speed commands		
Embeded Function	Generative Brake	Standard embedded [Operating on Servo ON or Servo OFF]		
	Regenerative Brake	Option		Embedded
	Loader	Embedded 7 segments [6 digits], CHARGE & ALARM Lamp		
	Monitor output	DC -5[V] ~ +5[V], 2Channels [Speed, Torque, Position etc]		
	Protect function	For the error and mistake of Input/UVW wiring, Encoder pulse setting, Overheat of power module, Over current, Over load and Over speed etc		
Ambient Environment	Temperature	0 ~ 50 [℃]		
	Humidity	Less than 90[%] (Avoid condensation)		
	Environment	Indoor, No corrosive gas, inflammable gas and Oil mist etc		

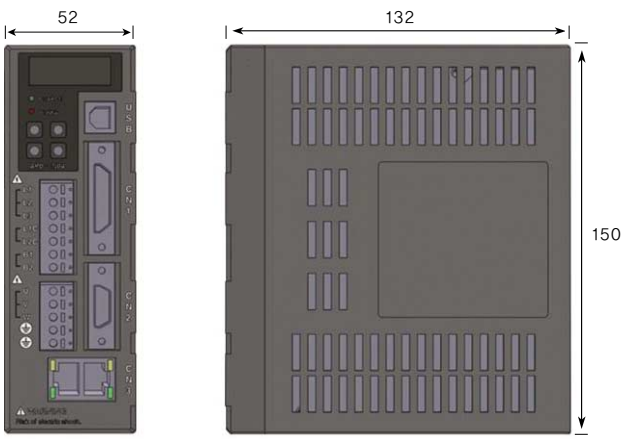
VN Series Designation

400W

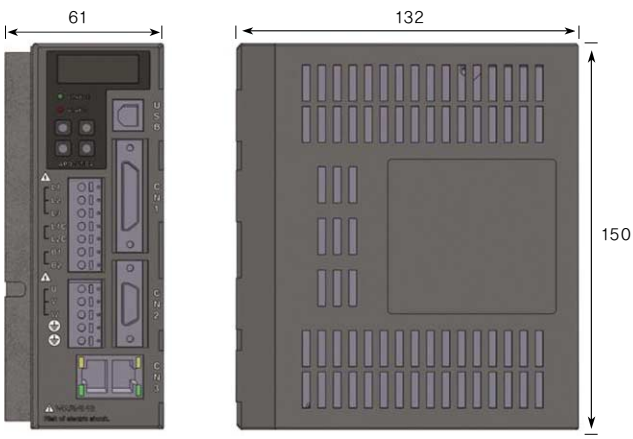




VN Series Dimension



On or Less than VN 200 [w] (Weight 0.8kg)



VN 400 [w] (Weight 1kg)

New Advanced Drive
VN series

Merit of VN Series

Compact
- Reduced 40% of size compare with VS series (400W)
- Improve space flexibility of control panel with minature design

Low Cost
- Reduced 7~10% of production cost from VS series (400W)

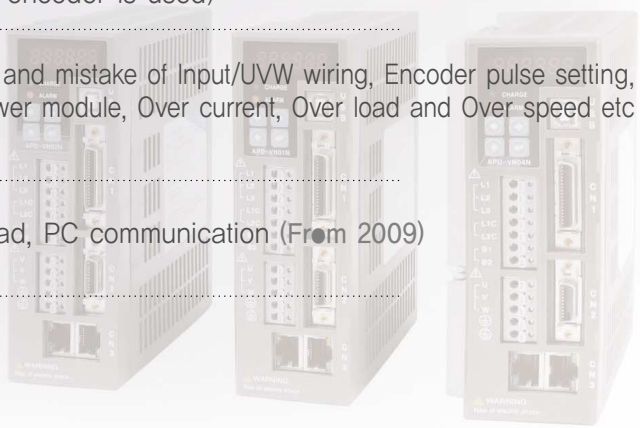
Serial Encoder Support
- 17 ~ 21 Bit serial encoder is available (From 2009)

Excellent Speed Reponse
- Fast response speed compare with VS series (When serial encoder is used)

Various Alram Function
- For the error and mistake of Input/UVW wiring, Encoder pulse setting, Overheat of power module, Over current, Over load and Over speed etc

USB Communication
- O/S download, PC communication (From 2009)

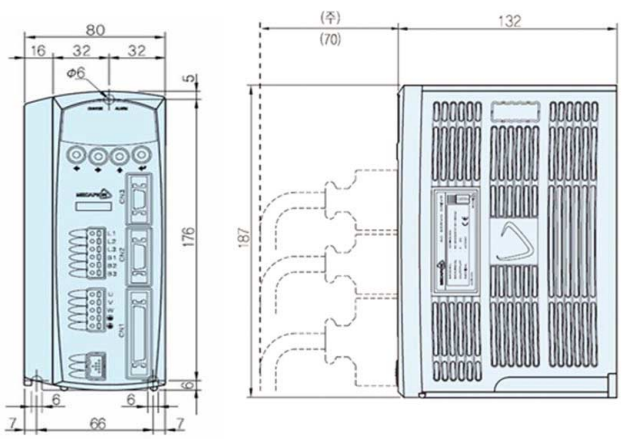
RS-422 Communication
- From 2009



VS / VN Drive Comparison
- Dimensions

VS Drive

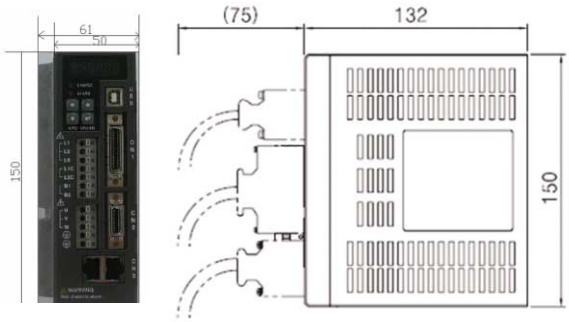
Mecapion VS Drive



[400W] WxLxH : 80X176X132 [mm]

VN Drive

Mecapion VN Drive



[400W] WxLxH : 61X150X132 [mm]

VS / VN Comparison

• Based on 400W drives

Article \ Drive		APD-VS04N	APD-VN04N
Pictures			
Power Supply		3 phase AC 200~230V +10[%] – – 15[%], 50/60[Hz]	
Applicable motor	Voltage type	3 phase sine wave PWM driven AC Servo Motor	
	Rated Currnet	3.2	3
	Max Current	9.6	9
Detector Type		Incremental Line Drive 2000~10000[ppr]	Incremental Line Drive 2000~10000[ppr] Serial Line Drive BiSS type 17~21bit Support
Speed Control Mode	Speed control range	Max 1 : 10,000	1 : 5,000
	Frequency response	Max 400[Hz]	Incremental : 400Hz, Serial : Over than 600Hz
	Speed command	7 digital speed commands	3 digital speed commands
	Acceleration/Deceration time	Linear 0~10,000[ms], S type acceleration/deceleration	
	Speed Variation ratio	± 0.01[%] or less [load variation 0~100%], ±0.1[%] or less [Temperature 25 ±10℃]	
Position Control Mode	Input frequency	Line Drive : 500[kbps] Open Collector : 400[kbps]	
	Input pulse	A+B phase, forward + reverse pulse, direction + pulse[Line driver, Open Collector)	
	Electronic gear ratio	Digital 4 speed, Precise adjustment function	
Torque Control Mode	Torque command	DC –10[V] ~ +10[V] (– voltage : reverse)	
	Torque linearity	Less than 2[%]	
	Speed limit	DC 0[V] ~ +10[V], 3 digital speed commands	
Ambient Environment	I/O Contact	Input: 14, Output: 6, Analogue Input: 2 Pulse line: 2, Monitor: 2	Input: 9, Output: 3, Analogue Input: 2, Pulse line: 2, Monitor: 2
	Feedback encoder from controller	1/1 ~ 1/16: 16 Steps divided output	Arbitrary divided output
	Communication	RS232	USB
	Drive Support	RS485	RS422

www.mecapion.com