

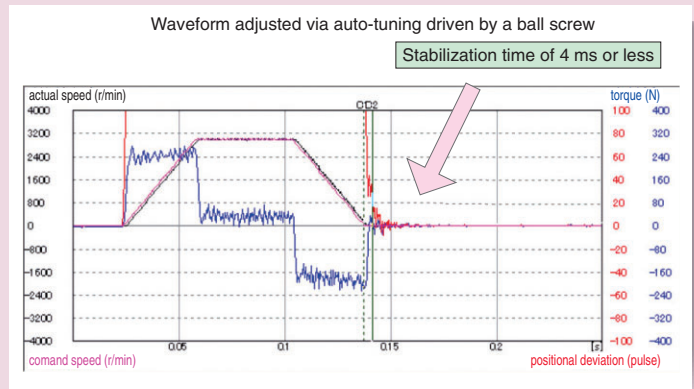
# Details of Features

Inherits high performance and advanced functioning

## 1. Further Adjustment-Free Operation

### High-functionality Real-Time Auto-Gain Tuning

- Corresponds to even variation of load inertia. Offers real automatic gain tuning to low and high stiffness machines with a combination of an adaptive filter.
- Supports the vertical axis application where the load torque is different in rotational direction.
- Prevents the machine from over-traveling during automatic gain tuning with software limit protective function.

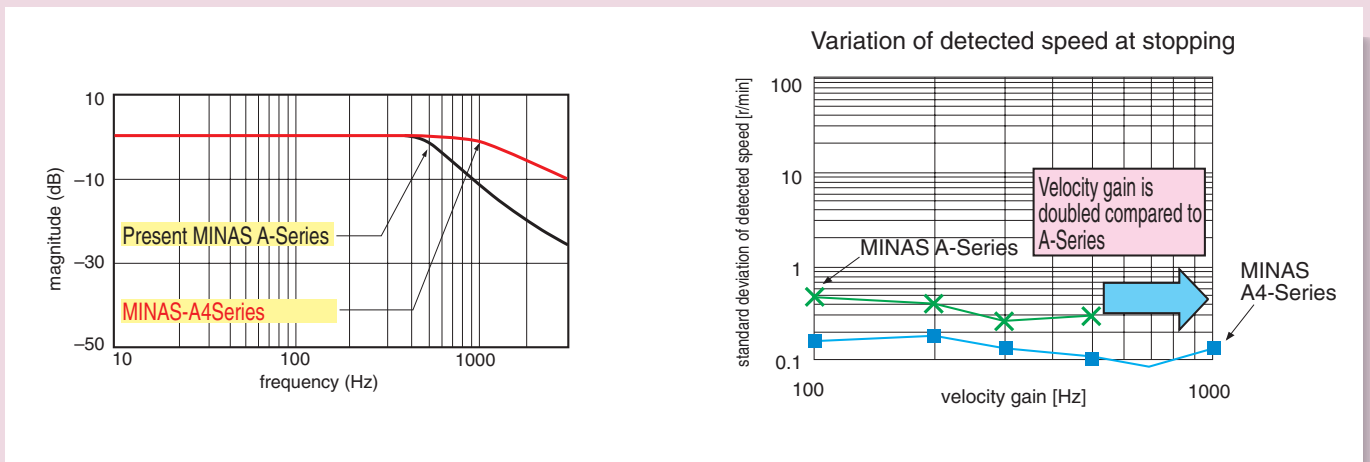


## 2. Further High-Speed and High-Response

### Velocity response (bandwidth) of 1kHz

- Implementation of Instantaneous Velocity Observer realizes a detection of motor speed with higher speed and higher resolution.

\*) In case of high stiffness machine



### High-functionality Real-Time Auto-Gain Tuning

- Supports the low stiffness machine of belt-driven and the high stiffness machine of short stroke ball screw driven, and enables to realize high-speed positioning with high-functionality real-time auto-gain tuning.

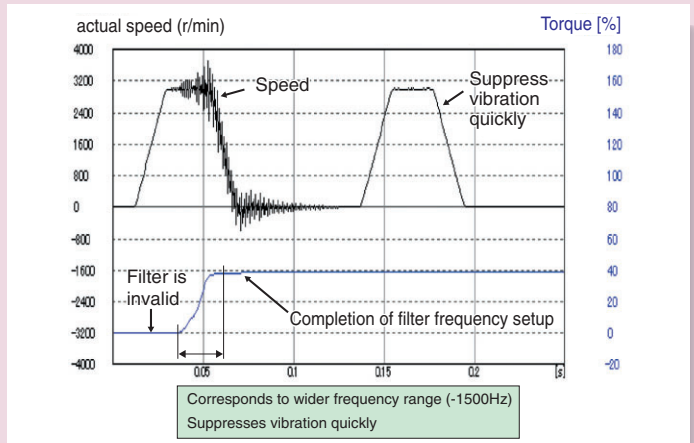
# 3. Further Reduction of Vibration

## Adaptive filter

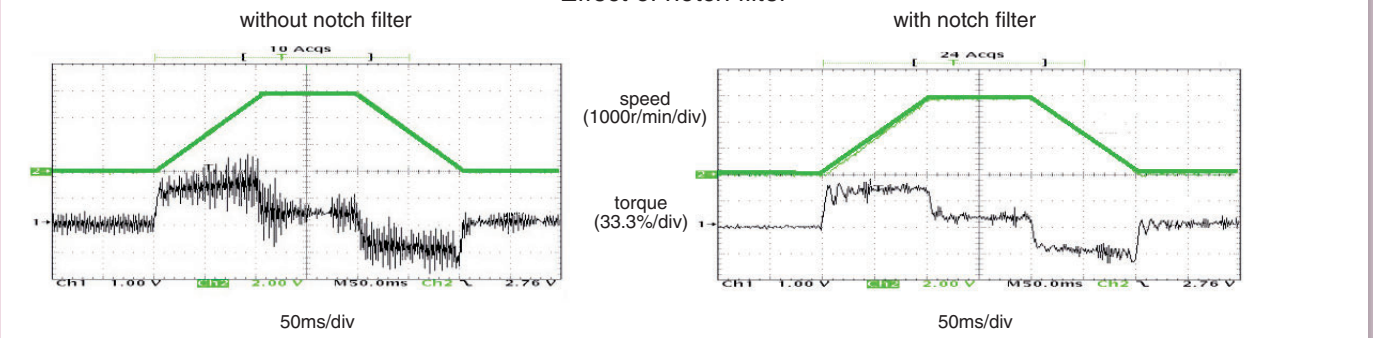
- Makes the notch filter frequency automatically follow the machine resonance frequency.
- Suppression of "Judder" noise of the machine can be expected which is caused by variation of the machines or resonance frequency due to aging.

## 2-channel notch filters

- 2-channel notch filters are equipped in the driver independent from adaptive filter.
- You can set up both frequency and width for each of 2 filters, and set up frequency in unit of 1Hz.
- Suppression of "Judder" noise of the machine which has multiple resonance points can be expected

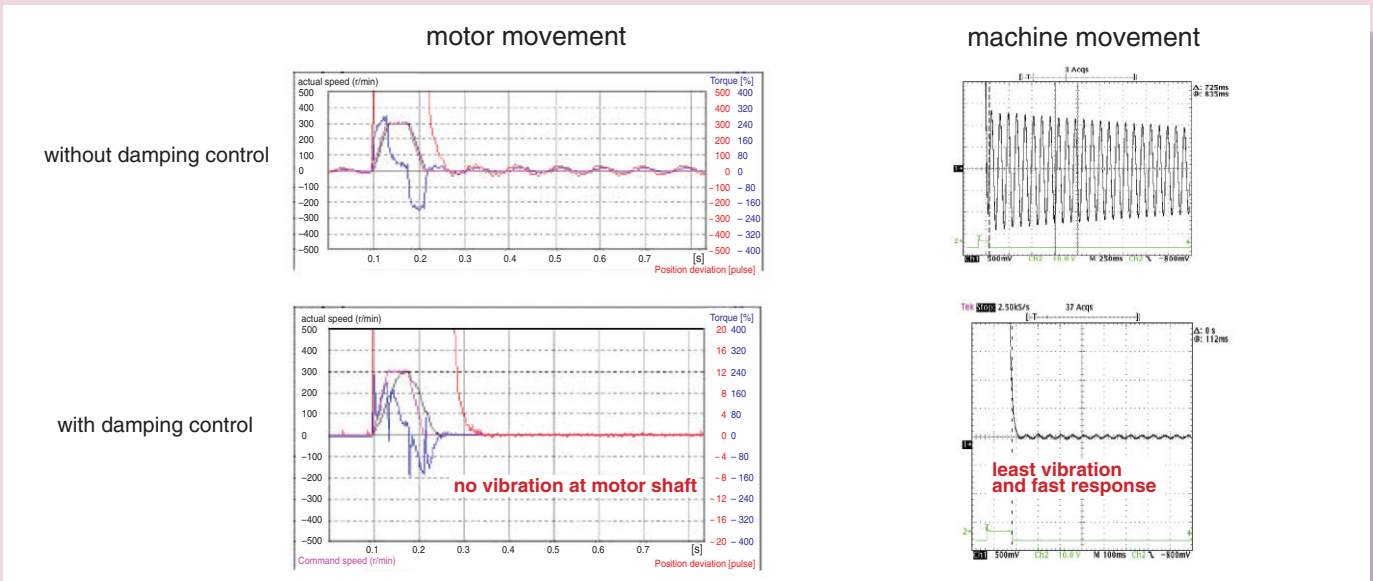


Effect of notch filter



## Damping control

- 2-channel damping filters are equipped in this driver. You can suppress vibration occurring at both starting and stopping in low stiffness machine, by manually setting up vibration frequency in 0.1Hz unit.
- You can also switch the vibration frequency set by 2-channel with rotating direction or with an external input to correspond to the variation of vibration frequency caused by the machine position.
- Easy setup with entry of only frequency and filter value. Improper setup values do not result in unstable operation



# 4. Further Flexibility and Multiplicity

## Dedicated Console (DV0P4420)

- Enables easy parameter setting/changing, control state monitoring, status/error log viewing, and parameter saving/loading.
- Makes it easy to move a target position, set a positioning point and perform teaching.
- Can select and display 16 types of operation data including motor rotational speed and torque in the monitor mode.

## Control Mode

- Makes it possible to select position control via the motor's internal encoder or fully-closed control based on an feedback scale.

## Analog Monitor Terminal

- "Motor rotational speed", "Command speed", "torque command" and "positional deviation" can be observed by oscilloscope through the analog monitor pin at the front panel of the driver.

## Trial run (JOG)

- Features the function for trial (JOG) run through console (option) without connecting to a host controller.
- You can shorten the machine setup time.

## Full-closed control (High precision positioning)

- Features the full-closed control of position and velocity, using the signals from feedback scale installed on the load side and high resolution encoder.

Note) Applicable feedback scales are as follows,

- Made by Mitsutoyo

	Resolution(μm)	Max. Speed*(m/s)
ABS AT573A Series	0.05	2
ABS ST771A Series	0.5	5
ABS ST773A Series	0.1	4
ABS ST771AL Series	0.5	5
ABS ST773AL Series	0.1	4

(\* The maximum speed depends on the driver performance.  
( It is limited by the machine configuration and system configuration. )

- Best suits to high precision machines.

## Inrush current suppressing function

- Inrush suppressing resistor is equipped in this driver, which prevents the circuit breaker shutdown of the power supply caused by inrush current at power-on.
- Prevents unintentional shutdown of the power supply circuit breaker in multi-axes application and does not give load to the power line.

## Regeneration discharging function

- Discharges the regenerative energy with resistor, which energy is generated while stopping the load with large moment of inertia, or use in up-down operation, and is returned to the driver from the motor.
- No regeneration discharge resistor is built-in to Frame A driver (MADDT1105P type.) and Frame B driver (MBDDT2210P type.), and we recommend you to connect optional regenerative resistor.
- Regenerative resistor is built-in to Frame C to F drivers, however, connection of the optional regenerative resistor bring you further regenerative capability.

## Built-in dynamic brake

- You can select the dynamic brake action which short the servo motor windings of U, V and W, at Servo-OFF, CW/CCW over-travel inhibition, power shutdown and trip.
- You can select the action sequence setup depending on the machine requirement.

## Setup support software

- With the setup support software, "PANATERM" via RS232 communication port, you can monitor the running status of the driver and set up parameters.

## Wave-form graphic function

- With the setup support software, "PANATERM", you can monitor the "Command speed", "Actual speed", "Torque", "Position deviation" and "Positioning complete signal".
- Helps you to analyze the machine and shorten the setup time  
\* Note) Refer to page "F2" for setup support software.

## Selectable Torque Limit Value

- A torque limit can be set for each rotational direction.
- According to the specification of the machine, a maximum torque can be set for each rotational direction as necessary.

## Built in sequence of bumping homing

- You can select 8 kind of homing mode.
  - Home sensor (based on the front end)
  - Home sensor + Z phase (based on the front end)
  - Home sensor + Z phase (based on the rear end)
  - Limit sensor
  - Limit sensor + Z phase
  - Z phase homing
  - Bumping homing
  - Data set

## SEMI F47 voltage sag immunity

- Features the function which complies to voltage sag immunity standard of SEMI F47 at no load or light load.
- Useful for semiconductor industry.

Notes)

- 1) Not applicable to single phase, 100V type.
- 2) Verify with the actual machine condition to F47, voltage sag immunity standard.

## Frequency analyzing function

- You can confirm the response frequency characteristics of total machine mechanism including the servo motor with the setup support software, "PANATERM"
- Helps you to analyze the machine and shorten the setup time  
\*Note) Refer to page "F2" for setup support software.

## Applicable overseas safety standards



Subject	Standard conformed	
Motor	IEC60034-1 IEC60034-5 UL1004 CSA22.2 No.100	Conforms to Low-Voltage Directives
	EN50178 UL508C CSA22.2 No.14	
Motor and driver	EN55011	Conforms to references by EMC Directives
	EN61000-6-2	
	IEC61000-4-2	
	IEC61000-4-3	
	IEC61000-4-4	
	IEC61000-4-5	
	IEC61000-4-6	
	IEC61000-4-11	Instantaneous Outage Immunity Test

IEC : International Electrotechnical Commission  
 EN : Europaischen Normen  
 EMC : Electromagnetic Compatibility  
 UL : Underwriters Laboratories  
 CSA : Canadian Standards Association

Pursuant to at the directive 2004/108/EC,article 9(2)

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