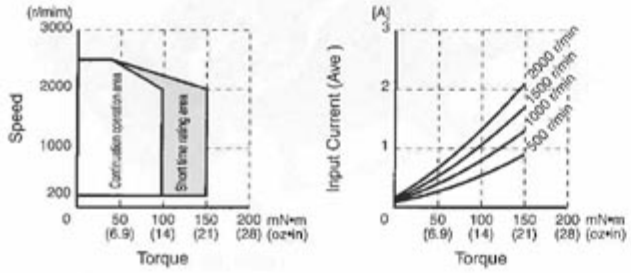
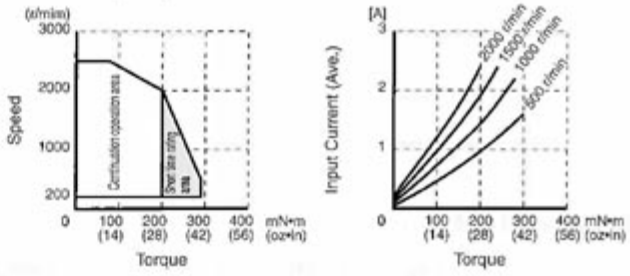
■Torque Speed/Current (TYP.) Characteristics

FH6S(PF)20H-D3+FHD620HD3

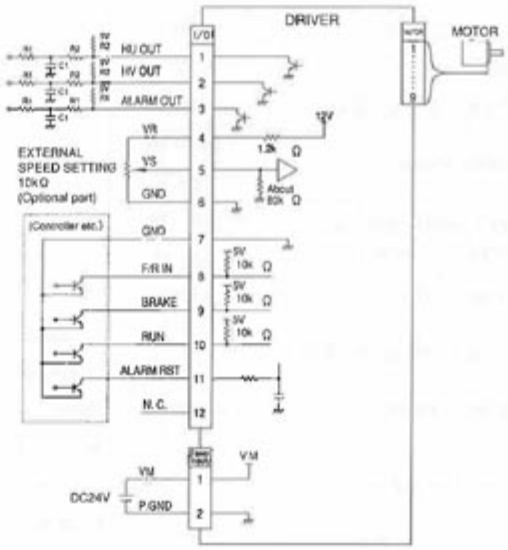


FH6S(PE)40H-D3+FHD640HD3



■Input & output terminals and wiring diagram

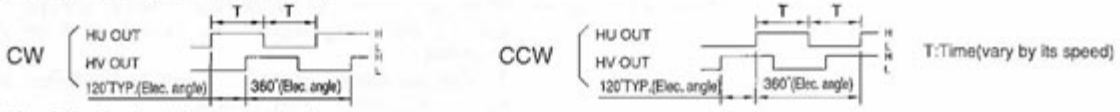
Item	Pin No.	Read Wire Color	Symbol	Input or Output	Function	Standard • Condition
Power supply	1	Red	VM	Input	Power supply positive for driver	DC24 V±10%
	2	Black	P.GND	–	Power supply GND for driver	
I/O	1	Brown	HU OUT	Output	7 Pulse/Revolution ※1	H: Open collector DC30V MAX. L: 0~0.8 V, 10 mA MAX.
	2	Red	HV OUT	Output		
	3	Orange	ALARM OUT	Output	H: Normal operation L: Alarm output	
	4	Yellow	VR	Output	Power supply positive for external speed setter	
	5	Green	VS	Input	Speed setting signal positive	0~10 V
	6	Blue	GND	–	Speed setting signal GND	
	7	Purple	GND	–	GND for I/O Signal	
	8	Gray	F/R IN	Input	H: CCW L: CW (Viewed from motor output shaft side)	H: Open collector L: 0~0.8 V
	9	White	BRAKE ※2	Input	H: BRAKE Deactivated L: BRAKE activated	
	10	Black	RUN	Input	H: Stop L: Start	
	11	Brown	ALARM RST ※3	Input	H: Normal operation L: Reset	
	12	Red	N.C.	–	Not used	Must be operated in the open state.



Part name	Recommended value
R1	4.7KΩ
R2	1KΩ
C1	0.01μF

*1 "HU OUT" signal and "HV OUT" signal are shown below.

Motor rotation (viewed from motor output shaft side)



※2 • Brake specification: Short brake between terminals
• "BRAKE has priority over "RUN".
• During rotation direction switching operation, "BRAKE" terminal voltage may reduce due to internal processing.

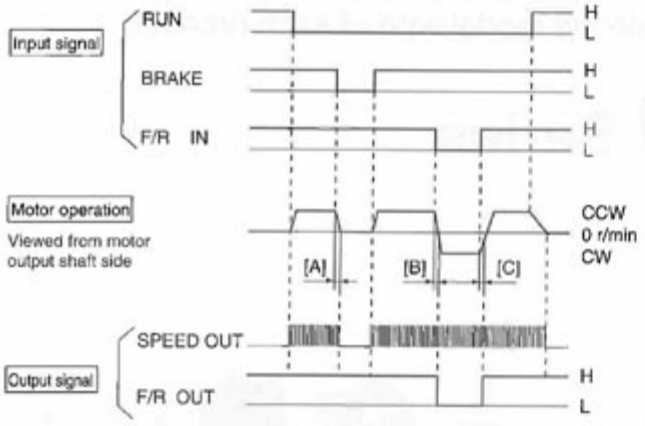
※3 In case of "L", the overload protection function is canceled. If overload operation is performed in this state, the motor may burn out.

■Protection

Protection function	Protection		Alarm Release
	Setting	Operation	
Overload Protection	When the load exceeds the rated torque for more than 5 seconds, the driver will cause the motor to stop and "ALARM" will output "L".	Motor is stepped and "ALARM" outputs "L"	Cool down the driver fully, and input "L" into "ALARM RST" until "ALARM OUT" changes to "H". Or disconnect power supply for more than 1 minute.

Do not use this function to determine whether or not the load exceeds the rated torque. Please make sure to check the load is lower than the rated torque before use. When the overload protection function is canceled ("ALARM RST" is in the "L" state) and temperature rises rapidly due to motor restraint, the motor may burn out. Make sure to set "ALARM RST" to "H" before operating the motor.

■Control sequence



[Notes for BRAKE Operation & Rotation change]
(1) Do not change (period [A] left) the "F/R IN" signal while the "BRAKE" is activated. "F/R IN" signal should be changed after "BRAKE" is deactivated.
(2) During the direction of rotation changing (period [B] & [C] left), you need the brake to operate, let it operate only when the both direction of rotation setting signal ("F/R IN") and direction monitor signal ("F/R OUT") is the same,
(3) When actual motor speed is higher than the setting (by signal input value of "VS"), any switching of the "F/R IN" and "BRAKE" ("H→"L") must not be made.
(4) During the brake is operating, set the "RUN" signal at "L" all the time.
WARNING:
In case of different way of use from (1), (2), (3) and (4), (1), (2), and (4) may be the cause of the incorrect operation and (3) may be the cause of the fire or the breakdown.
Electrical shock: By the load condition, the terminal voltage (VM) is raised up to 30 VDC, during switching BRAKE and/or Rotation direction.
(Braking Operation: At higher speed: reverse rotation brake first, then short circuit brake. But at slower speed: short circuit brake only.)
[Notes on "F/R OUT"] (20,40W only)
During the motor is in stop, the "F/R OUT" is held at the same signal as previously outputting. This means ; if the motor stopped once, but the rotation reversed by Cogging torque or by the Load, then the "F/R OUT" is held at reversed signal. Also note that "F/R OUT" signal will delay by 0~5pulses of "SPEED OUT" from the motor rotation switched.

■Speed setting

Fig.1 Speed setting by external speed setter

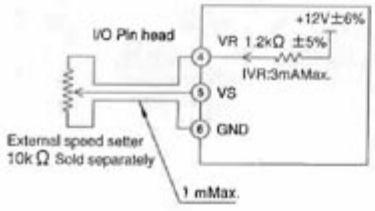
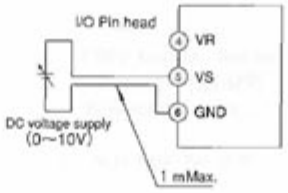
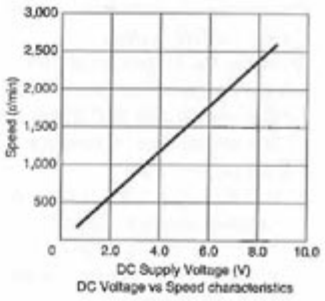


Fig.2 Speed setting by external voltage supply



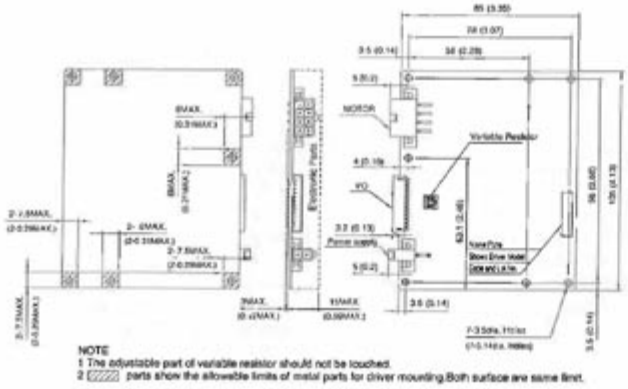


DC Voltage vs Speed characteristics

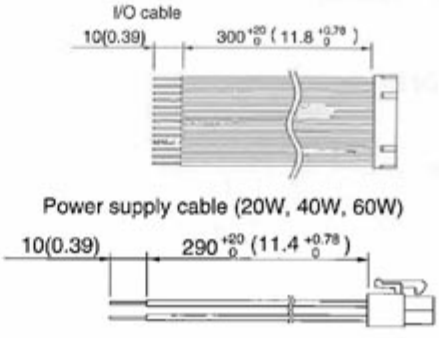
Item	Setting Method
Speed setting by external speed setter (Optional Part)	Connect as shown in Fig.1 and set by external speed setter. Use variable resistor 10[KΩ] as an external speed setter.
Speed setting by external voltage supply	Connect as shown in Fig.2 and set speed by external voltage supply.

By these function, it is possible to set a speed at outside of Speed control range. But it must be out of our product warranty.

■Driver outline Unit: mm (inch)



■Accessory Unit: mm (inch)



■Connector model code

Item	Pin head model code on drive	Connector model code on cable		Maker
		Housing	Contact (chained)	
I/O connection	53325-1210	51090-1200	50212-8000	MOLEX
Power supply connection	5566-02A	5557-02R	5556T	
Motor connection	5569-08A1	5557-08R	5556T	