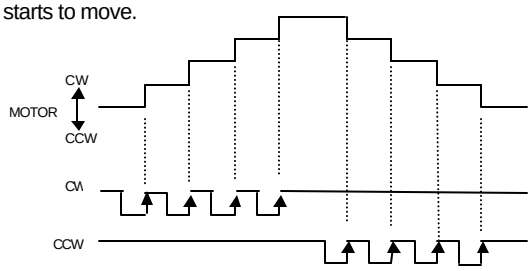
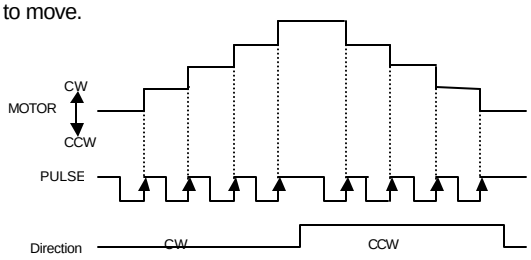
IMS20 Series Driver

2 Phase Stepping Driver Units

- A compact package matching most existing motors
- 100~120Vac Single Phase Power Input
- Opto-isolated inputs and outputs
- Auto-current down feature
- Half Step/Full Step setting selection

1. Specifications

Model	**IMS 20-210**
Drive Methods	Bi-polar ; constant current chopper driver
Power Requirement	Single Phase 100 ~ 120 Vac ± 10% 50 / 60 Hz
Power Consumption	240 VA or less
Output Current	2.0 Amp per phase
Resolution	Full Step : 1.8º , Half Step : 0.9º
Function	Auto-current down, Auto-current OFF, Motor Current OFF input, Excitation timing output, Overheat output
Input Signals	CW (or Pulse) input , CCW (or Direction) input, CO (Current OFF) input Opto Isolated Input resistance : 390 Ω Input current : 8mA P10mA Signal voltage H : 4P5V L : 0P0.5V
CW / CCW (preferred pulse type)	In Bi-Clock mode Clockwise direction pulses applied to the CW input. Counter clockwise direction pulses applied to the CCW input. Rising edge of input pulse starts to move. Timing chart of Bi-Clock signal 
Pulse / Direction	In Pulse / Direction mode Stepping pulses applied to the Pulse input. Direction logic signal applied to the CW/CCW input. Rising edge of input starts to move. Timing chart of Pulse/Direction signal [L] Level : CW [H] Level : CCW 
Output Signal	MONI (or Excitation timing) output , HEAT (Overheat) output Opto Isolated Open collector output : Max 25V 10mA or less
Excitation Timing Output (MONI)	This MONI output is activated when the driver is at origin (step zero) in the excitation sequence. Full Step : one pulse output at every 10 steps Half Step : one pulse output at every 20 steps

Dielectric Strength	No abnormality detected after the application of the below voltage among each terminal for one minute in normal temperature and humidity : Power input terminal – PE terminal : 1.5KV (60Hz) Power input terminal – Signal I/O teminal : 3.0KV (60Hz)
Insulation Resistance	100M ohms or higher with DC500V applied in normal temperature and humidity. • Power input terminal – PE terminal • Power input terminal – signal input terminal
Operating Environment	Temperature : 0P+40°C No freezing Humidity : less than 80% No condensation
Storage Environment	Temperature : -10P+60°C No freezing Humidity : less than 80% No condensation
Operating Height	Less than 1,000m from sea level
Atmosphere	In the room without corrosive gas, inflammable gas or dust, without splashing water or oil.
Weight	550 g

2. Applicable Motor Range

Type	Motor Size (NEMA)	Motor Model	Max. Holding Torque (kgcm)	Rotor Inertia (gcm^2)	Step Angle Half/Full	Phase Current (Amps)	Voltage (Vdc)	Phase Resistance (Ohms)	Motor Weight (kg)
STANDARD (PS Series)	17	PS 443-01A (B)	1.1	17	1.8º/0.9º	0.95	4.0	4.2	0.20
		PS 444-02A (B)	1.6	25	1.8º/0.9º	0.80	6.0	7.5	0.22
		PS 445-01A (B)	2.2	36	1.8º/0.9º	1.20	4.0	3.3	0.26
	23	PS 464-01A (B)	2.9	60	1.8º/0.9º	1.10	4.0	3.6	0.34
		PS 466-01A (B)	6.0	125	1.8º/0.9º	1.20	6.0	5.0	0.55
		PS 468-21A (B)	9.0	220	1.8º/0.9º	1.50	5.4	3.6	0.85
		PS 4610-01A (B)	10.8	350	1.8º/0.9º	1.88	6.0	3.2	1.40
	34	PS 496-02A (B)	12.5	560	1.8º/0.9º	1.25	5.5	4.4	1.45
		PS 499-02A (B)	22.0	1100	1.8º/0.9º	2.00	6.0	3.0	2.16
		PS 4913-02A (B)	35.0	1800	1.8º/0.9º	1.80	12.0	6.7	3.60
		PS 496M-02A (B)	12.5	560	0.9º/0.45º	1.25	5.5	4.4	1.45
		PS 499M-02A (B)	22.0	1100	0.9º/0.45º	2.00	6.0	3.0	2.60
		PS 4913M-02A (B)	35.0	1800	0.9º/0.45º	1.80	12.0	6.7	3.60
HI-TORQUE (PF Series)	17	PF 445-01 A (B)	3.2	68	1.8º/0.9º	1.2	4.0	3.3	0.35
	23	PF 464-02A (B)	4.3	120	1.8º/0.9º	2.0	2.8	1.4	0.47
		PF 466-02A (B)	8.5	280	1.8º/0.9º	2.0	3.6	1.8	0.70
		PF 468-02A (B)	13.5	480	1.8º/0.9º	2.0	4.5	2.25	1.00
	34	PF 496-01A (B)	20.0	1400	1.8º/0.9º	2.0	4.4	2.2	1.75
		PF 499-01A (B)	44.0	2700	1.8º/0.9º	2.0	6.4	3.2	2.80
		PF 4913-01A (B)	66.0	4000	1.8º/0.9º	2.0	7.6	3.8	3.93

Note : Motor model ending with A - single shaft Motor model ending with B - double shaft

Motor Electrical Specifications

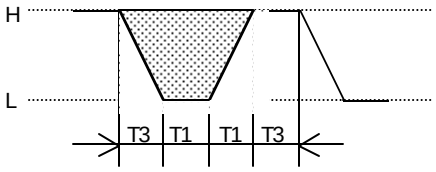
Dielectric Strength	No abnormality detected after the application of 0.5KV at 50 Hz between motor windings and frame for dureation of one minute
Insulation Resistance	100 Mohms or better with 500V potential applied between motor windings and frame at normal ambient temperature and humidity
Insulation Class	Class B
Operating Environment Temperature	0ºC ~ + 40ºC

Motor Mechanical Specifications

Shaft Radial Play	NEMA 17 motor	0.0006 in. (max) at 15.87 oz. force 0.015mm (max) at 450g
	NEMA 23/34 motor	0.0008 in. (max) at 15.87 oz. force 0.020mm (max) at 450g
Shaft Axial Play	NEMA 17 motor	0.0008 in. (max) at 15.87 oz. force 0.020mm (max) at 450g
	NEMA 23/34 motor	0.00031 in. (max) at 15.87 oz. force 0.080mm (max) at 450g
Shaft Runout		0.0005 T.I.R. (inches) (at shaft end)
Step Angle Accuracy		± 5% (max)
Bearing Type		ABEC 5P Deep Groove Permanently Sealed & Lubricated

3. Signal Input Waveform

3-1. Input Signal Waveform



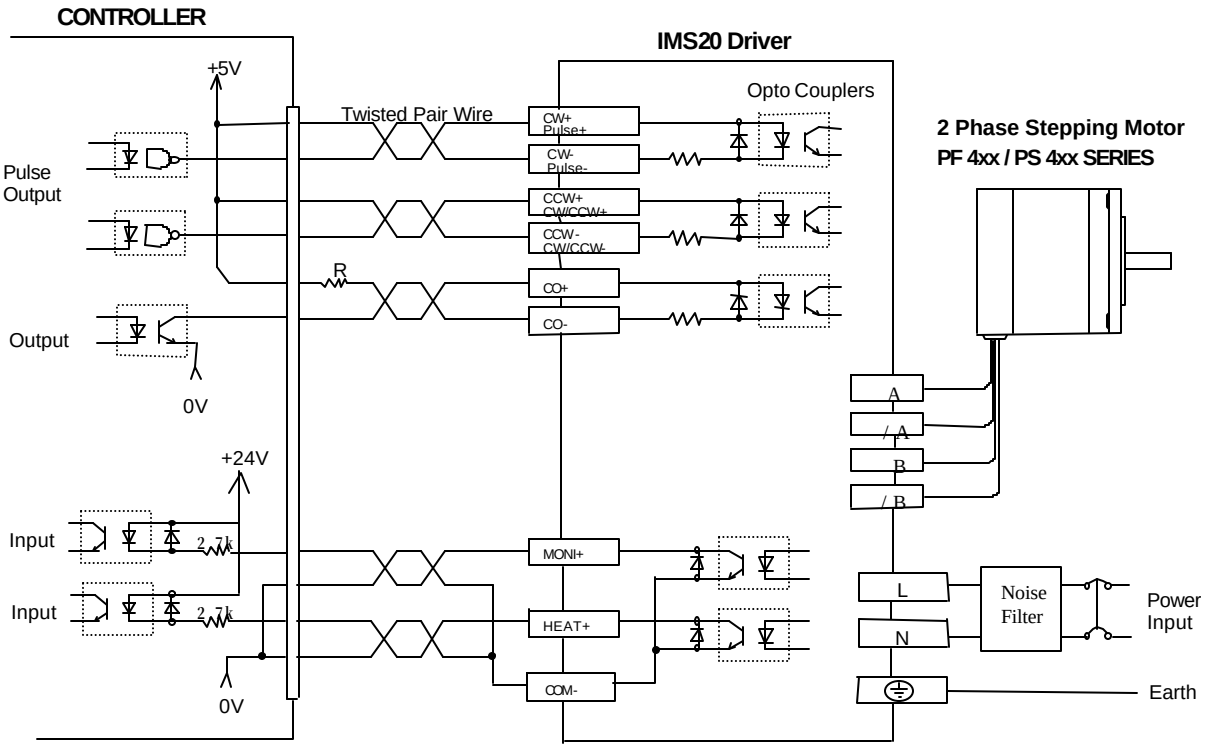
T1 > 10µsec
T2 > 30µsec
T3 < 2 µsec

Shaded area shows "ON" of photo coupler at input circuit.
The rising edge activates the motor.

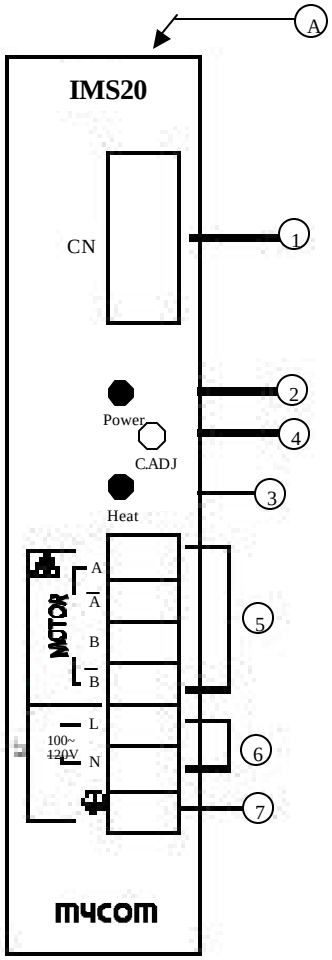
4. Automatic Current Down

This driver is equipped with the auto-current down function where the motor current is reduced at stand still status. This reduces the motor heat build up when not running.
The factory setting at 50% of the motor running current set at C.ADJ. The function is activated 250 msec after the motor stops. ie. pulse input changes from H to L.

5. Connection Diagram



*(If controller outputs are DC24V, a resistor of value R = 1.2kΩ 1/2W is to be connected in series to the signals.
Not necessary if the outputs are DC5V.)



A Adjustable parameters (located at top of driver)

SW1 : 1P/2P select (OFF:1P, ON:2P)
SW2 : Full/Half step select (OFF:Full, ON:Half)
VR4 (CC.ADJ) : Motor Standstill Current Cut-Off adjustment
When motor is not running, motor current is reduced to this setting (20%~90%). Turning clockwise increases motor standing current, and vice versa. Factory setting at 50%. This function is activated 200ms after motor stops. This feature can be disabled by keeping CW input terminal in ON (conducting) state.

1 CN input/output connector (9 pin D-Sub connector)

2 Power Indicator LED

3 Overheat Indicator LED

4 C.ADJ (Motor Running Current setting)

Each driver is pre-adjusted for the applicable motor included with a package. This adjustment **should not be changed** unless a lower current level setting is absolutely needed in order to reduce motor torque and motor/driver heat generation.

5 Motor Lead terminals (Motor power outputs)

Connect motor leads to these terminals as follows :

Terminal	PS44x	PS46x / 49x	PF44x	PF46x	PF49x
A	Red	Red	Red	Black	Red
/A	White	Red/White	Blue	Green	Blue
B	Yellow	Green	Green	Red	Green
/B	Blue	Green/White	Black	Blue	Black
NC	Brown	Black	White	Yellow	White
NC	Brown	White	Yellow	White	Yellow

* NC : no connection, tape and isolate individually

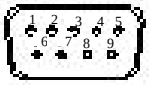
6 AC Power Input Terminal

Connect Single phase 100V-120Vac 50/60Hz supply to these terminals. Use AWG18 (0.75mm^2) or larger leads for connection.

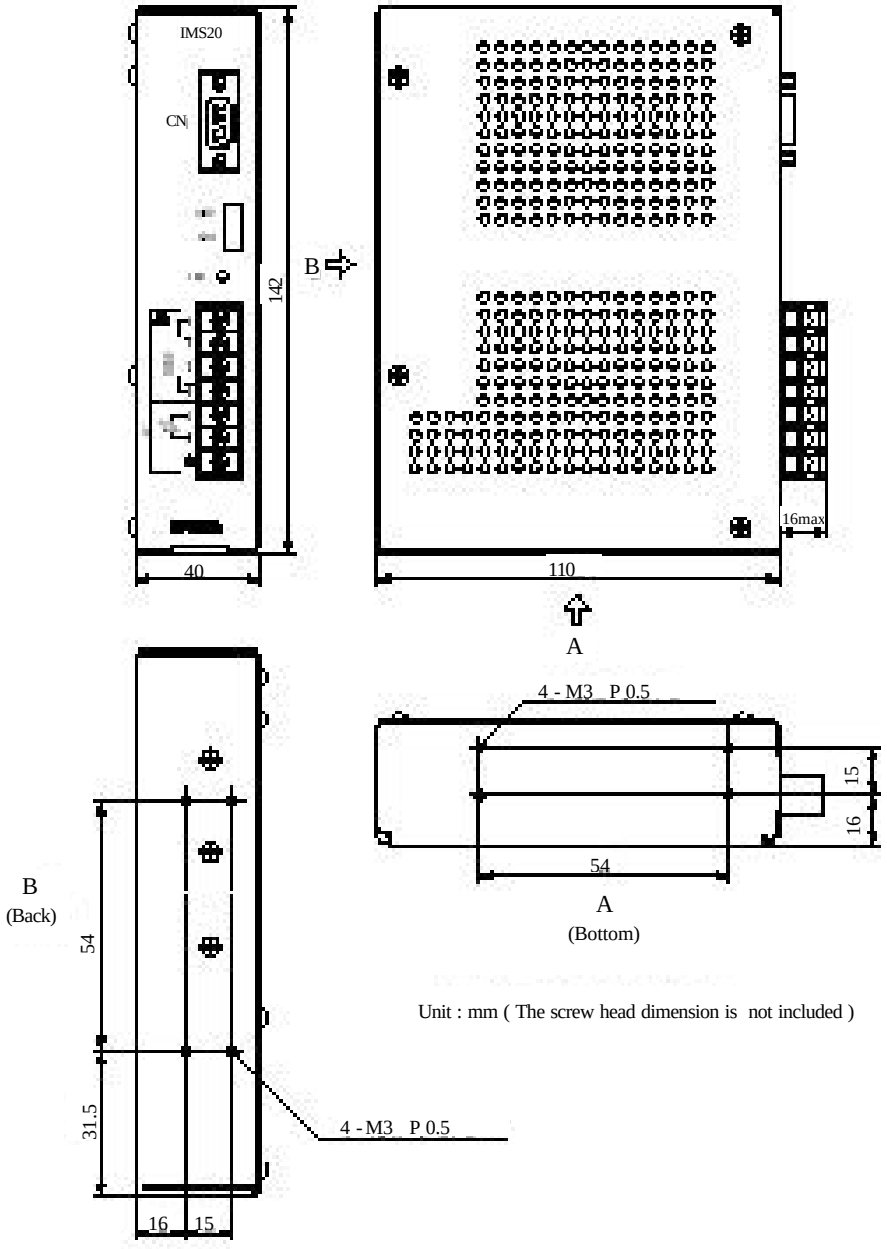
7 Frame Ground (PE)

Connect to system ground point. Use AWG18 (0.75mm^2) or larger leads for connection.

CN Driver Signal connection ::-

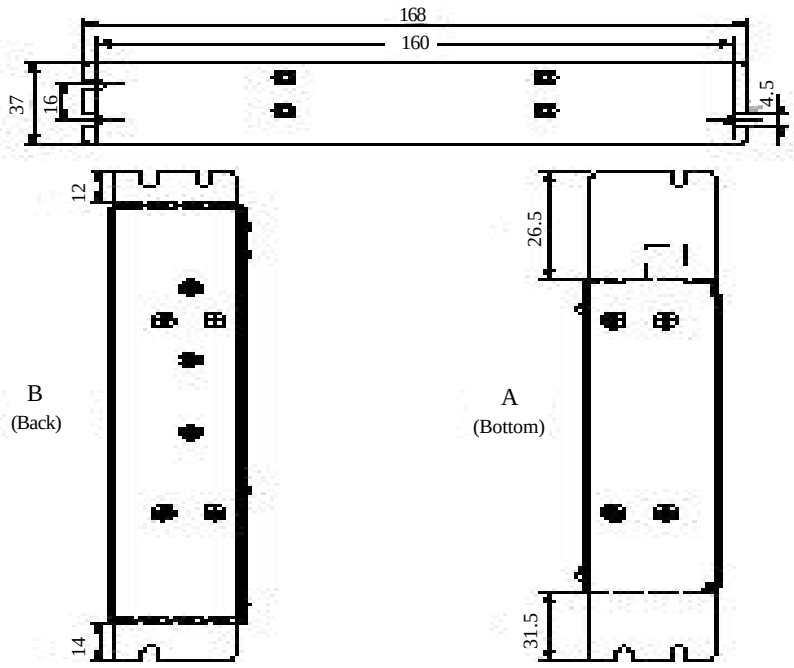


Pin No.	Driver Signal	Description
1	CW+ (Pulse)	CW pulse input terminal (SW1 set to ON) This opto-isolated terminal accepts CW pulse train from an indexer Step / Pulse input terminal (SW1 set to OFF) This opto-isolated terminal accepts motor step pulses from an indexer.
2	CW-	
3	CCW+ (CW/CCw)	CCW pulse input terminal (SW1 set to ON) This opto-isolated terminal accepts CCW pulse train from an indexer Direction input terminal (SW1 set to OFF) This opto-isolated terminal accepts CW/CCW direction input.
4	CCW-	
5	CO+	Motor current shutoff input terminal (CO) The driver's output current can be turned off by this input. The motor will not run while this input is ON.
6	CO-	
7	MONI	Excitation timing output terminal. This is an open collector output which turns on once per every 8 pulses received by the driver in the FULL step mode (SW2 OFF), and 16 pulses received by the driver in the HALF step mode (SW2 ON).
8	HEAT	Overheat Output terminal This is an open collector output which turns on when the onboard temperature sensor detects the driver's heat sink temperature to
9	COM	Common for HEAT and MONI output.



Unit : mm (The screw head dimension is not included)

Mounting Brackets (Optional)



Distributor

MYCOM, Inc.

12, S.Shimobano, Saga Hirosawa, Ukyo,
Kyoto 616, Japan

Tel : (81) 75-882-3601 Fax : (81) 75-880-6531
Email : support@mycom-japan.co.jp

MYCOM Technology (S) Pte Ltd

No 1 Sims Lane, #05-05 One Sims Lane
Singapore 387355

Tel : (065) 6743-4476 Fax : (065) 6743-4576
Email : sales@mycommts.com.sg