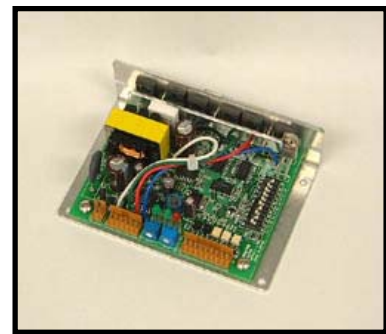


# INS200 Series NanoDrive Driver (\*\* CE Approved)

## 2 Phase DC Type NanoDrive Stepping Driver Units

- A compact package matching most existing motors
- 24Vdc Power Input
- Opto-isolated inputs and outputs
- Auto-current down feature
- Full Step/Half Step up to 200,000 ppr setting selection ( 16 selections )
- Achieve up to 0.0018° per pulse
- High accuracy even for fine resolution setting
- Minimum vibration at low speed



### 1. Specifications

Model	INS 200-030	INS 200-230
Drive Methods	Uni-polar , constant current chopper driver	
Power Requirement	DC 24V ~ 36V ± 10%	
Power Consumption	36W or less	60W or less
Output Current	0.8 Amp per phase max	2.0 Amp per phase max
Resolution	Basic Step:1.8° Division ratio: 1, 2, 2.5, 4, 5, 8, 10, 20, 25, 40, 50, 100, 200, 250, 500, 1000	
Function	Auto-current down, Motor Current OFF input, Excitation timing output	
Input Signals	CW ( or Pulse ) input , CCW ( or Direction ) input, CO ( Current OFF ) input Opto Isolated    Input resistance : 390 Ω    Input current : 8mA~10mA Signal voltage    H : 4~5V    L : 0~0.5V	
CW / CCW (preferred pulse type)	<p>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.</p> <p>Timing chart of Bi-Clock signal</p>	
Pulse / Direction	<p>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.</p> <p>Timing chart of Pulse/Direction signal</p> <p>[L] Level : CW [H] Level : CCW</p>	
CO Input	Motor free input. When 5V input supplied across terminal, motor is free.	
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.
Overheat output (HEAT)	This output is activated when the transistors in the driver exceeds 70 deg C.
Insulation Resistance	100Mohms or higher with DC500V applied in normal temperature and humidity. • Power input: Motor leads-chassis • Power input: Motor leads-signal I/O terminal
Operating Environment	Temperature : 0~+40°C No freezing Humidity : less than 80% No condensation
Storage Environment	Temperature : -10~+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.
Applicable Standard	EN60950
Accessories	Connector (JAE) , Housing: IL-2S-S3L, IL-6S-S3L, IL-9S-S3L, Contact: IL-C2-10000
Weight	240 g

## 2. Applicable Motor Range

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

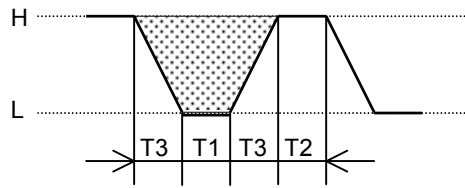
Dielectric Strength	No abnormality detected after the application of 0.5KV at 50 Hz between motor windings and frame for duration of one minute
Insulation Resistance	100 Mohms or better with 500V potential applied between motor windings and frame at normal ambient temperature and humidity
Insulation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

### 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



$T1 > 0.2\mu\text{sec}$   
 $T2 > 0.2\mu\text{sec}$   
 $T3 < 0.2\mu\text{sec}$

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

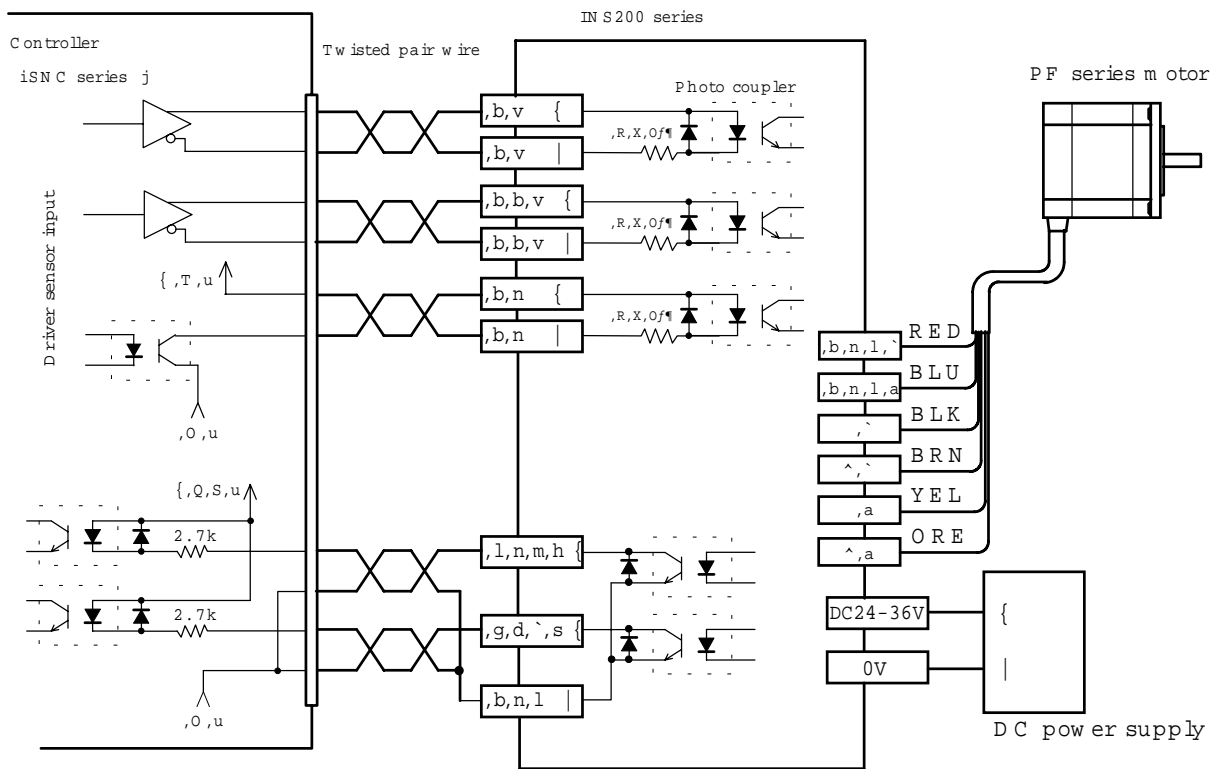
### 4. Automatic Current Down

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.

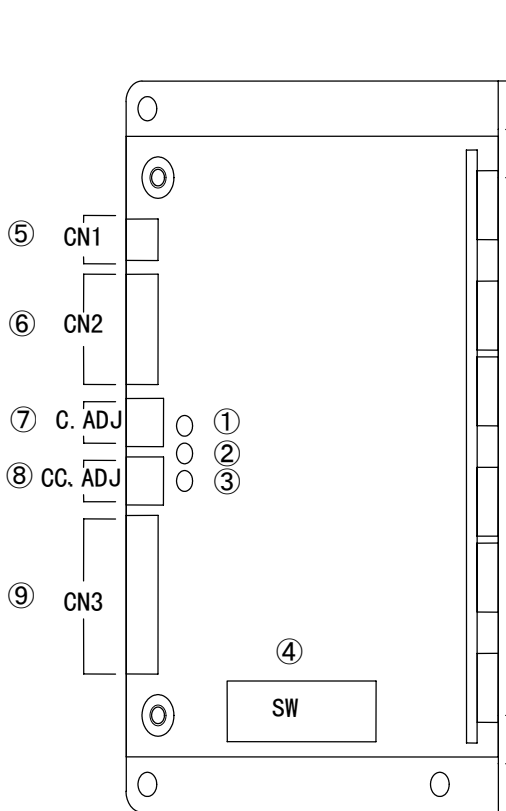
The factory setting at 50% of the motor running current set at C.ADJ. The function is activated 200 msec after the motor stops. i.e. pulse input changes from H to L.

This function can be deactivated via A.CD switch setting.

### 5. Connection Diagram



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



① **Power indicator LED (POWER)**

② **Excitation Home Indicator LED (MONI)**

This LED lights up when driver is at excitation home.

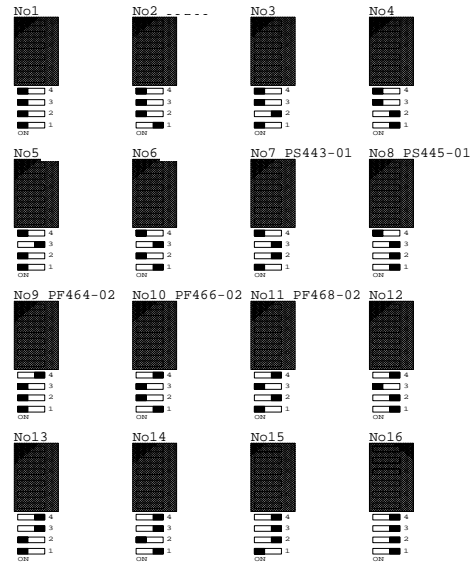
③ **Overheat Indicator LED**

This LED lights up when the temperature of internal heat sink exceeds 70 °C.

④ **Switch Settings**

This group of switch settings setup the functions of the driver.

SW # 1~4 : Motor type selection



⑤ **Power Input Connector (CN1)**

Connect DC24~36V supply to the driver.

Connector pin assignment	
1	DC 24V to 36 V
2	0V

⑥ **Motor Connector (CN2)**

Connect motor leads to these terminals as follows :

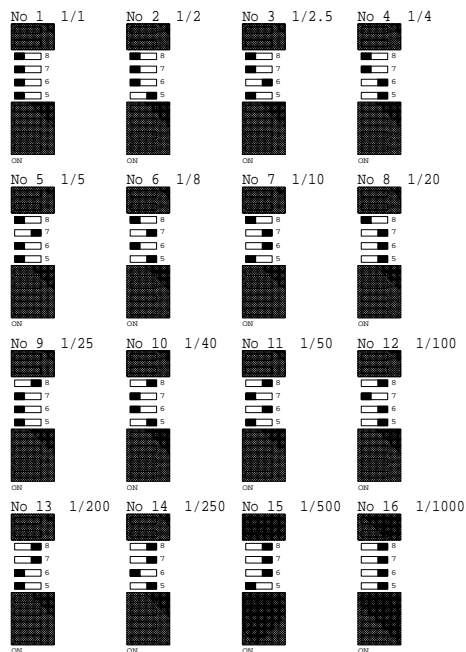
Pin No.	PS44x	PS46x/49x	PF44x	PF46x	PF49x	
1	COM A	Brn	Blk	Wht	Blk	Wht
2	COM B	Brn	Wht	Yel	Wht	Yellow
3	A	Red	Red	Red	Red	Red
4	/A	Wht	Red/Wht	Blue	Red/Wht	Blue
5	B	Yel	Grn	Grn	Grn	Green
6	/B	Blue	Grn/Wht	Blk	Grn/Wht	Black

\* NC : no connection, tape and isolate individually

⑦ **Motor Running Current Adjustment (C.ADJ)**

This adjust the motor running current. Correct setting must be made to ensure motor does not overdrive or underdrive.

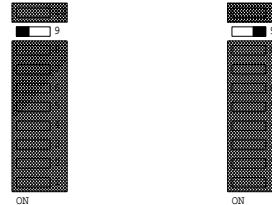
SW # 5~8 : Resolution selection



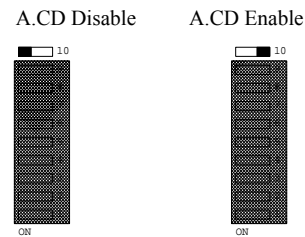
### ⑧ Motor Standstill Current Cut-Off Adjustment (CC.ADJ)

When motor is not running, motor current is reduced to this setting (45%~85% of running current for INS200-030, 30%~80% of running current for INS200-230). 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 or A.CD switch setting. When set above 50% for INS200-230, compulsive air cooling is required for driver.

SW # 9 : Pulse input type selection (1P / 2P )  
2 pulse type      1 pulse type



SW # 10 : Auto current down function enable/disable ( A.CD )



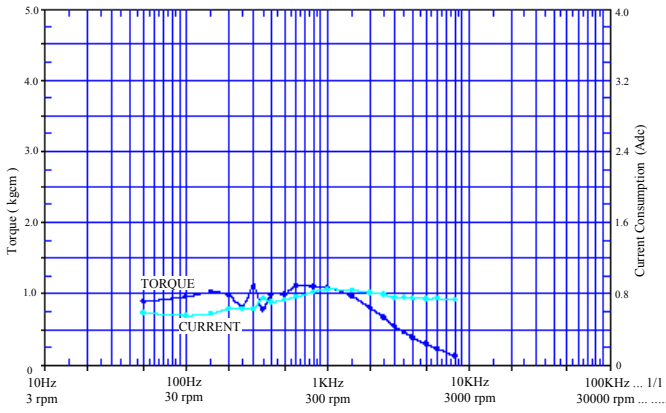
### ⑨ Signal I/O connector (CN3) :-

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
2	CW-	Step / Pulse input terminal ( SW1 set to OFF ) This opto-isolated terminal accepts motor step pulses from an indexer.
3	CCW+ (CW/CCW)	CCW pulse input terminal ( SW1 set to ON ) This opto-isolated terminal accepts CCW pulse train from an indexer
4	CCW-	Direction input terminal ( SW1 set to OFF ) This opto-isolated terminal accepts CW/CCW direction input.
5	CO+	Motor current shutoff input terminal (CO) The driver's output current can be turned off by this input.
6	CO-	The motor will not run while this input is ON.
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 exceed 70°C.
9	COM	Common for MONI and HEAT output.

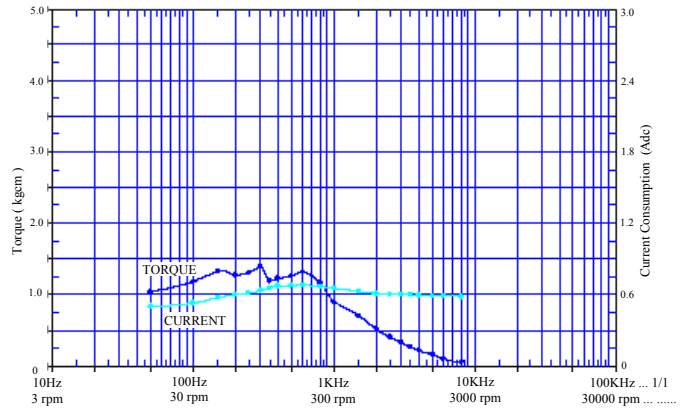
# 7. Performance Characteristics



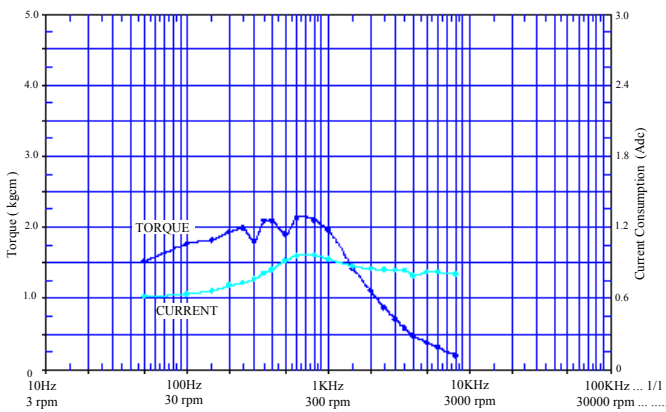
**INS200-030 + PS 443-01 (Full Step)**



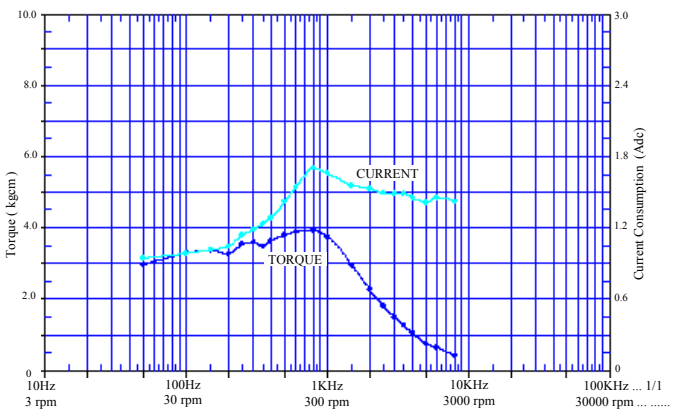
**INS200-030 + PS 444-02 (Full Step)**



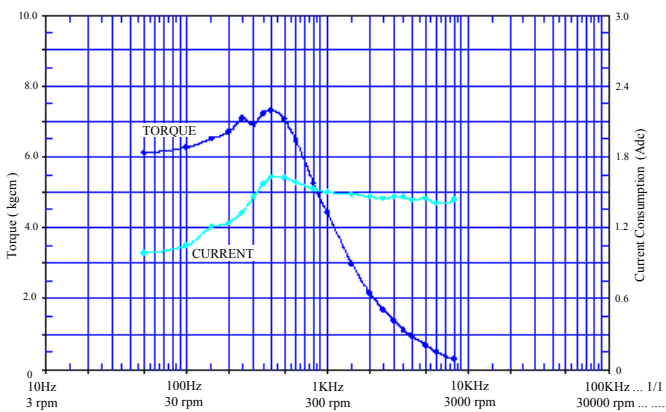
**INS200-030 + PS 445-01 (Full Step)**



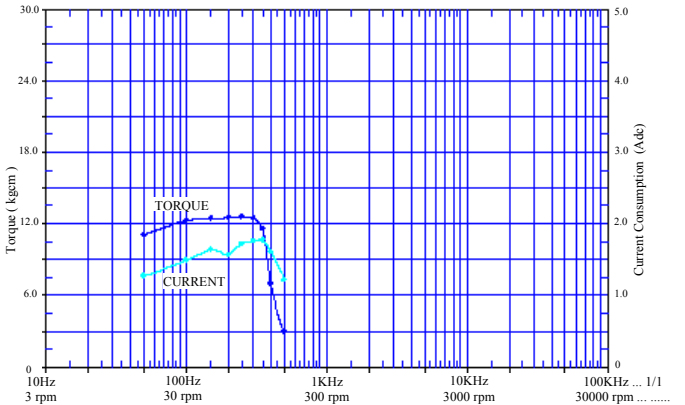
**INS200-230 + PF 464-02 (Full Step)**



**INS200-230 + PF 466-02 (Full Step)**

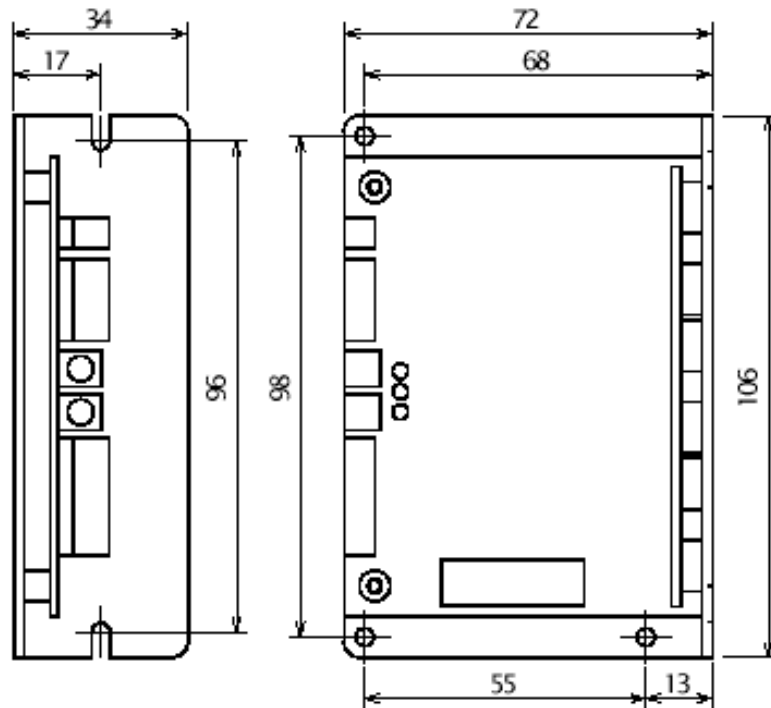


**INS200-230 + PF 468-02 (Full Step)**

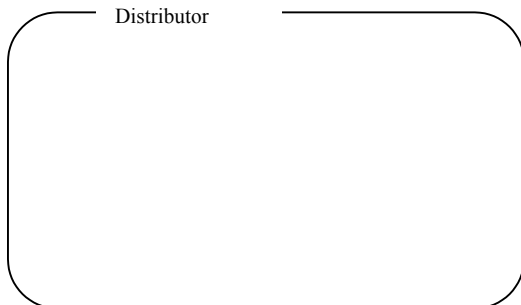


## 8. External Dimensions

**MYCOM**



All dimensions in mm. ( Screw head is not included )



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\*\* MYCOM reserves the right to revise the specifications, dimensions etc of the above product without obligation to notify any person of such revision or changes.