MEMS Tilt Angle Sensor

ESC3000Z Series

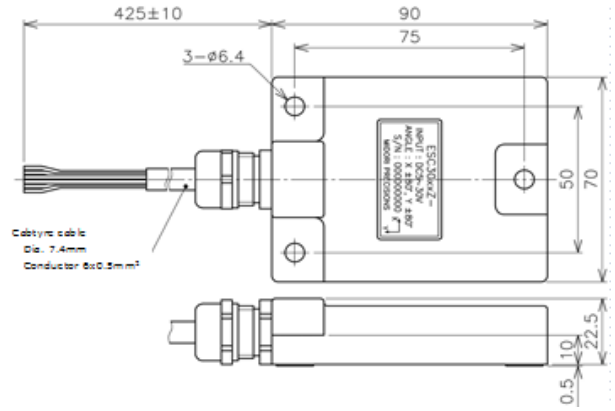
ESC-Series industrial inclinometers are high performance sensors used MEMS accelerometer to determine inclination in X and Y axes with excellent precision. Using Aluminum Die-Cast housing, the versions offer mechanical

- Dual Axis Measurement : up to ±80°
- High accuracy : Absolute Linearity <±0.5%FS
- Various Data Output : Voltage, Current, Serial RS-485

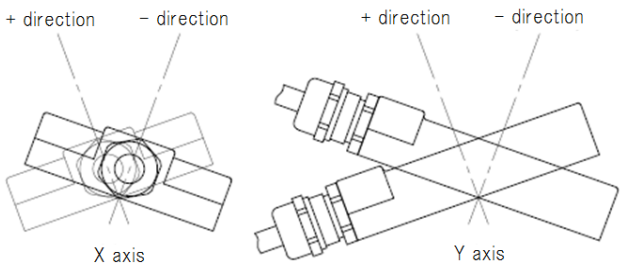
*Requesting other serial interface such as SAE J1939 & CANopen, please contact us.

- Stable measurement under vibration
- Programmable Parameters : Inclination range, Baud Rate, Data

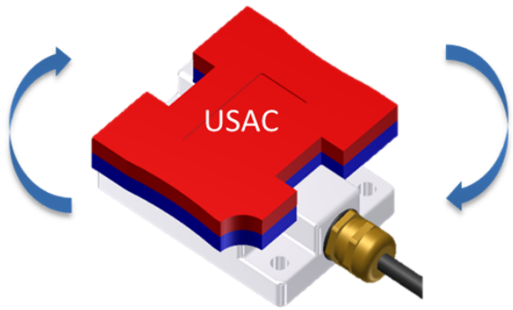
【Dimension】 [mm]



【Tilt Angle Direction】



【Easy Resetting Function for Index Point(0°) 】



Touch USAC 3 times each 180° CW rotation to ESC3000Z.

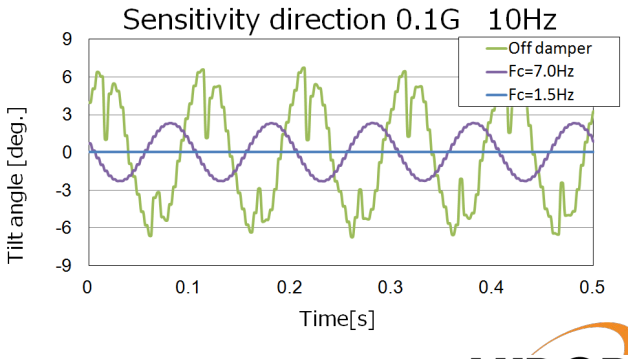
Only 5 seconds to reset index point (0°)
using User-Settable Adjustment Card. (USAC)

(1) Please touch ESC 3 times with USAC.
(2) Then current position (±5° max./horizontality) will be changed to index point.

Any electrical connections do not needed.

*Note: USAC is optional item.

【Programmable Digital Damping Control Function】



ESC3000Z serues implements the digital filter that would remove external noise to give the user a choice of certain filter factor from 16 available settings.
Existing inclinometers have to be add extra electrical low-pass filter or mechanical damping structure.
ESC30xxZ apply digital filter. It makes wider choice of cut-off frequency and easy to design frequency response.

Note: Frequency response is set before shipping.

Programmable function will be option.

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【Serial communication Function】

This series has RS485 interface as standard function. Using RS485 serial interface command, the following functions will be able to be used.

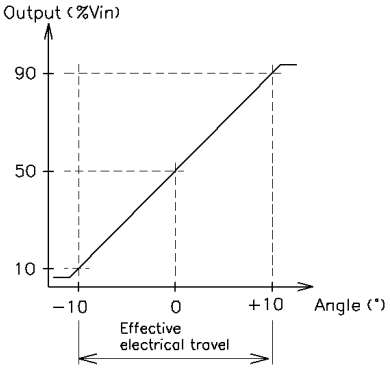
1. Retrieving of electrical angle position.
2. Retrieving of Serial number.
3. Teach-in setting of index (0°) point. (Option)
4. Changing of elecreial analog angle range. (Option)
5. Changing damper seting. (Option)
6. Changing baud rate. (Option)
7. Changing output cycle of serial data. (Option)

【Specifications】

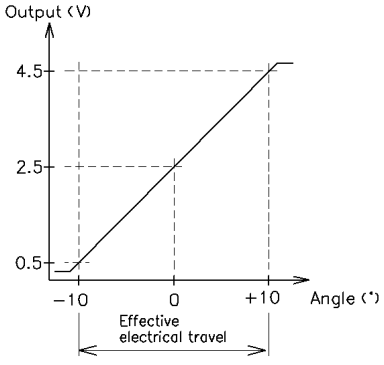
	Voltage Ratio	Voltage	Current	Serial (RS-485)
Electrical Angle	±10°、±20°、±30°、±45°、±60°、±80° Separate choice of X and Y axes (Option) Angle resetting function by RS-485 command is available (Option)			±80°
Absolute Linearity	±0.5%FS			±0.1°(～±10°) ±0.2°(～±30°) ±0.5°(～±80°)
Input Voltage	DC 5±0.25V	DC 8～30V	DC 24±4V	-
Current Consumption	75mA max.			
Output Range	10～90%Vin	0.5～4.5V	4～20mA	-
Output Resolution	12bit equivalent			-
Damper Control	・Time constant against input step : 443ms (Standard) ・Selectable 16 steps during 70ms~900ms (Option) ・Damper resetting function by RS-485 command is available (Option)			
Temp. Characteristics	0° position : ±0.5°　(-30°C ~ 85°C deviation from 25°C)			
Mass	300g approx.			
Cable	6 cores Cabtyre Cable, Outer diameter: dia. 7.4mm, Core: 0.5mm2			
EMS	ISO11452　corresponding ±1% output shifting at 10MHz~1GHz 100V/m (Ratio, Current, Serial) /　50V/m (Voltage)			
EMI	CISPR25 3rd.edit　CLASS1 corresponding			
Operating Temp. Range	-30～85℃			
ESD	±12kV			
Vibration	70m/s2, 5～200Hz/10min.　2 hours			
Shock	1000m/s2, Half sine wave 6ms			
IP Grade	IP67			
Index point Teach-in	Index point(±5° max./horizontality) Teach-in setting. (Option)			

【Output Characteristics】

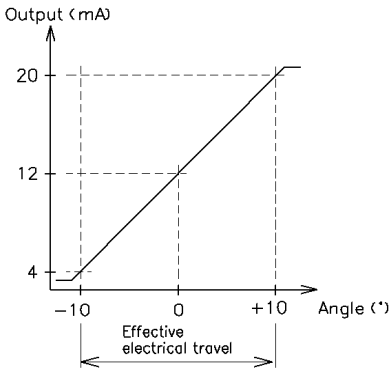
Voltage Ratio



Voltage



Current



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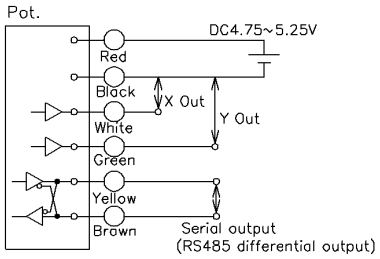
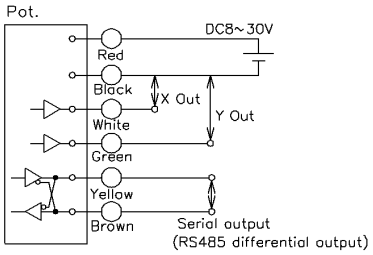
【Schematic】



・Red,black,white,green,yellow, and brown indicate harness colors.



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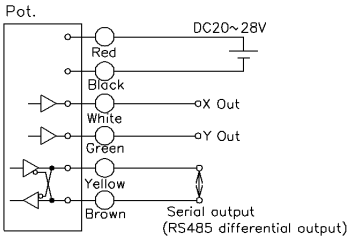

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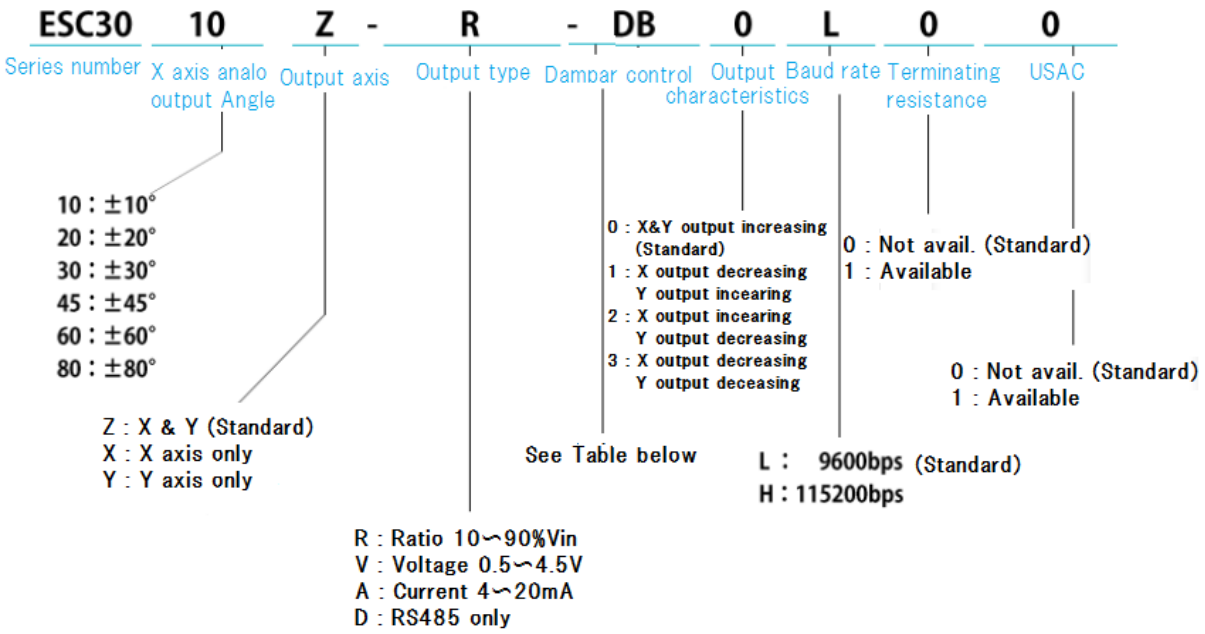
【Temperature Characteristics】

By our unique technology. ESC3000Z series is individually conpensented temperature characteristics each unit. ESC3000Z series realized stable temperature characteristics.

【ESC3000Z Series Model Number Designation】



Cut-off frequency and Time constant against Damper time constant are shown the below table.
It is possible to choose the best Damper time constant by operating speed and vibration condition.

Part No.	Level	Cut-off frequency	Time constant
D0	0	11.2Hz	120ms
D1	1	9.27Hz	150ms
D2	2	7.65Hz	160ms
D3	3	6.32Hz	170ms
D4	4	5.21Hz	190ms
D5	5	4.30Hz	220ms
D6	6	3.55Hz	250ms
D7	7	2.93Hz	290ms
D8	8	2.42Hz	330ms
D9	9	2.00Hz	360ms
DA	10	1.65Hz	420ms
DB	11	1.36Hz	500ms(Standard)
DC	12	1.21Hz	590ms
DD	13	0.92Hz	700ms
DE	14	0.76Hz	810ms
DF	15	0.62Hz	970ms

【Handling Instruction】

- Hall-IC sensor is impossible to measure resistance value as a variable resistor.
- Use this sensor in the place where is protected from ESD.
- Under acceleration 12m/s2 or Vibration Min.3000Hz, angle may not measured accurately.
- In certain temperature environment, output at 0° may be shifed by aging effect.

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