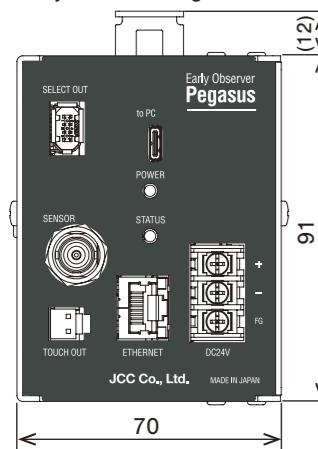
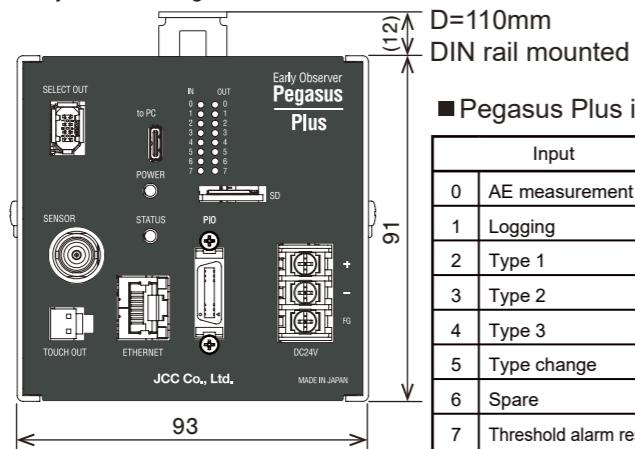


■ External dimensions

Early Observer Pegasus



Early Observer Pegasus Plus



Unit: mm

D=110mm  
DIN rail mounted

■ Pegasus Plus input/output signals

Input	Output
0 AE measurement	0 AE measurement answerback
1 Logging	1 Logging answerback
2 Type 1	2 Type answerback 1
3 Type 2	3 Type answerback 2
4 Type 3	4 Type answerback 3
5 Type change	5 Threshold alarm 1
6 Spare	6 Threshold alarm 2
7 Threshold alarm reset	7 Device normally working

■ General/performance specifications

Item	Pegasus	Pegasus Plus
Sampling frequency	10MHz	
Frequency filter	HPF	20, 30, 50, 80, 100, 150, 200, 240 [kHz] (-12dB/oct)
	LPF	80, 100, 180, 200, 360, 400, 600, 1,000 [kHz] (-12dB/oct)
Amplification factor	(0 dB), 10, 20, 30, 40, 50 [dB] (within ±3 dB). When 0 dB is selected, the maximum value of Amplitude is 1,000 (measured data is for reference only).	
Applicable AE sensor	FAEN-S60(W), FAEN-S150(W), FAEN-S300(W)	
AE sensor connector	BNC	
Edge processing time	1, 10, 20, 50, 100, 500, 1,000, 2,000, 5,000, 10,000, 20,000 [ms]	
Logging time	1 to 20 s (logging timer can be set in 0.1 s increments) / Continuous	
PIO (input/output)	—	Input: 8 points, output: 8 points (compatible with sink and source logics)
Communication method	Ethernet 100BASE-TX (UDP or TCP/IP switchable)	
Communication format	Binary data	
USB communication	USB 2.0 compliant, Full Speed (12 Mbps), virtual COM port	
Internal storage device	eMMC for storing various setting data (IP address, gain, etc.)	
External storage device	—	microSD card (for storing measurement data)
Operating environmental conditions	Temperature	-10 to +55°C
	Humidity	20 to 80% (condensation conditions should be avoided.)
Storage environmental conditions	Temperature	-20 to +75°C
	Humidity	20 to 80% (condensation conditions should be avoided.)
Applicable standards	CE mark obtained schedule	
Power voltage	12 to 24 VDC (5 W max.)	
Measurements	Amplitude-MAX	[mV]: the maximum amplitude value during edge processing time
	Energy	[dBs]: an energy value during edge processing time
	RMS	[mV]: a rms value during edge processing time
	COUNT	[points]: the number of 0V occurrence or threshold intersections during edge processing time
Mass	Approx. 500 g	Approx. 600 g
Dimensions (D x W x H)	110 x 70 x 91 [mm], excluding protruding parts	110 x 93 x 91 [mm], excluding protrusion
Ambient conditions	Conforming to RoHS Directive	

\*This product is a sensing system adopting the AE sensor as a key technology, which does not guarantee machine failure sign diagnosis result or quality control.

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\* As of January 2025 The specifications may be changed without notice.

# Early Observer Pegasus

## Tool wear & breakage monitoring

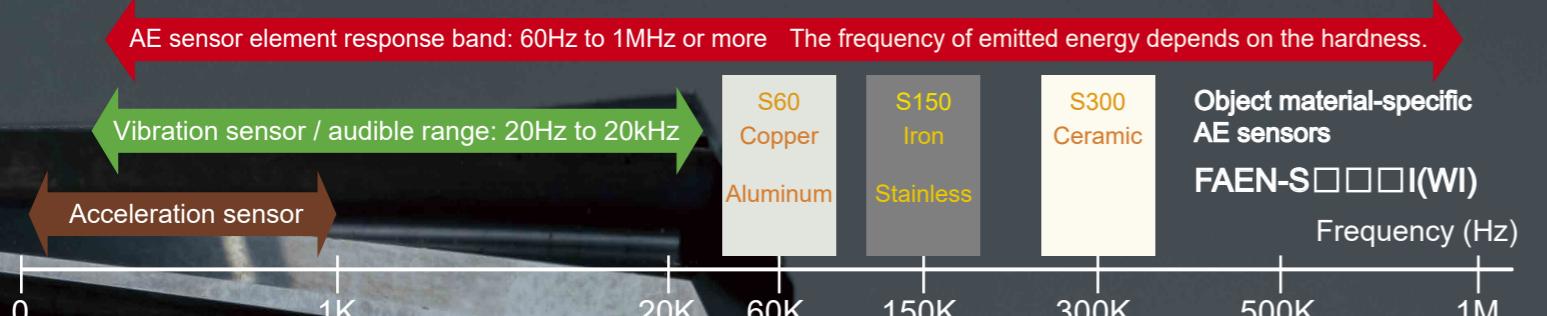
- Micro tool breakage detection (minimum tool diameter  $\phi$  0.05)
- Tool breakage detection
- Tool wear monitoring
- Honing stone condition monitoring



JCC Co., Ltd.

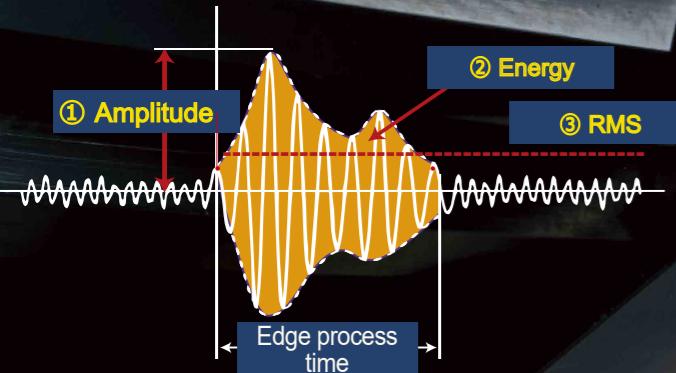
# Measuring the energy generated by workpiece-tool contact

Visualization of workpiece-tool contact condition made possible by monitoring high frequencies above the human audible range.  
System that does not require FFT analysis constructed from our original AE sensor and parameterization technology.  
Unprecedented sensing performance and usability realized.



Early Observer monitors the plastic deformation of target by "AE sensor for each target substance".

## The AE sensor signal parametrization technology

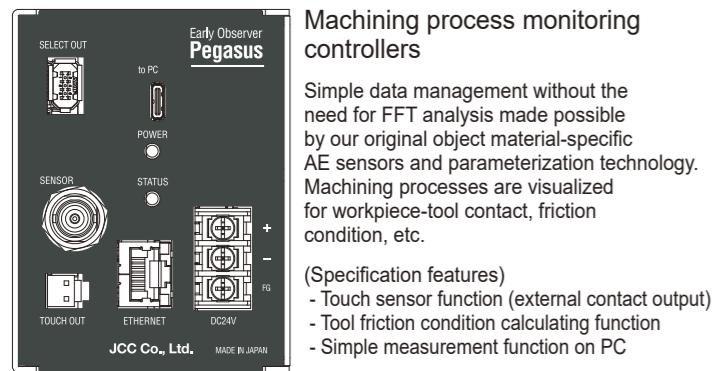


- ① Amplitude  
The maximum amplitude value of AE waveform (voltage from 0V to maximum displacement) = having a correlation to crack propagation.
- ② Energy  
Integral value of AE waveform within duration = having a correlation to crack area.
- ③ RMS (effective value)  
Effective value of AE signal obtained for every Edge process time unit = having a correlation to friction coefficient

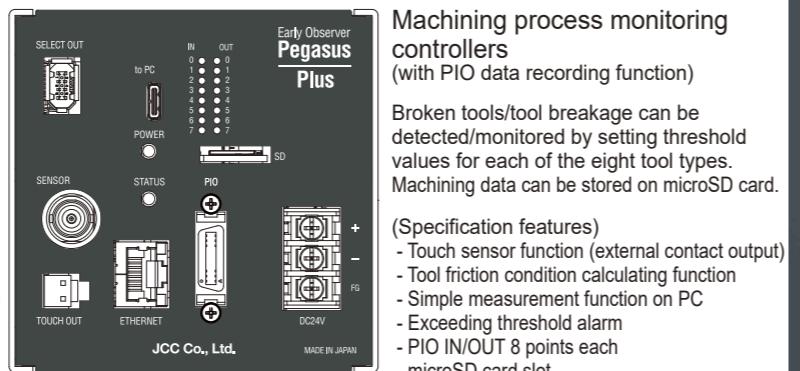
\* Edge process time = Time unit for edge processing the sensor sensing 10MHz measurement data  
\* Response speed = 0.1μs → Amplitude parameter reflects 0.3μs signal.

## Machining process monitoring controllers/sensors

### Early Observer Pegasus



### Early Observer Pegasus Plus



### AE sensor

(standard sensor)



(common specifications)  
- Resonance frequency: 60kHz/150kHz/300kHz ±20%  
- Operating temperature: -20 to 80°C  
- Ø20 x 26.5mm (excluding protruded part)

(waterproof sensor)



- Ø22 x 30mm (excluding protruded part)  
- Equipped with environmentally resistant robot cable (5m)  
- Waterproof and protective structure IP67

### Extension cable for AE sensor

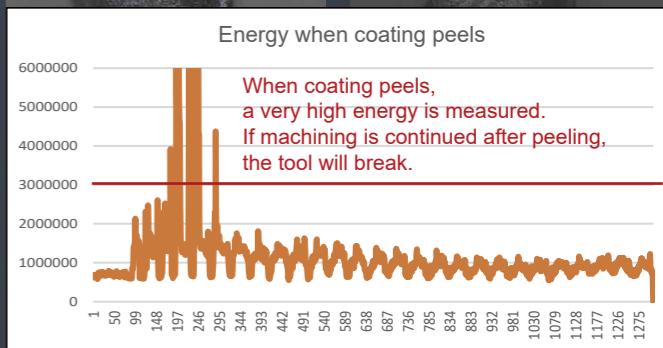
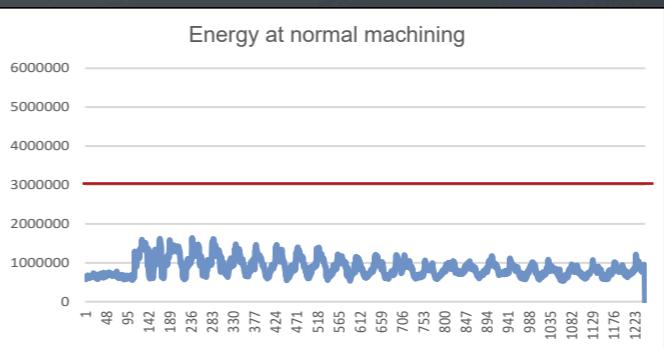
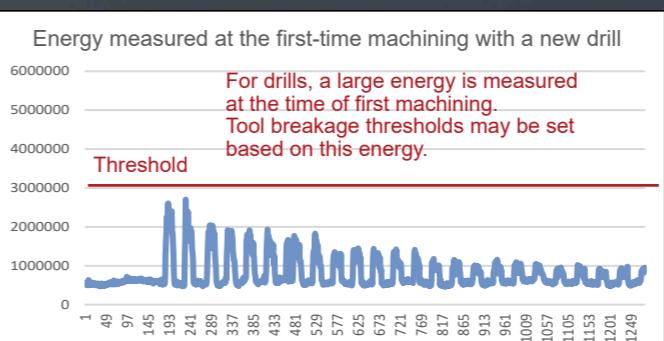
Item	Standard cable	Environmentally resistant robot cable
External diameter	Ø5	Ø4
Ambient operating temperature	-20 to 60°C	-253 to 200°C
Flex resistance	Not available	Available
Acid resistance	Not available	Available
Alkali resistance	Not available	Available
Sheath	Vinyl chloride	Fluorinated ethylene propylene

\* The maximum cable length of the system is 20m.

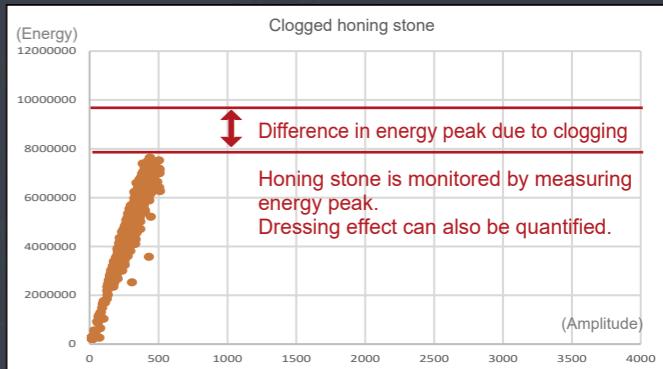
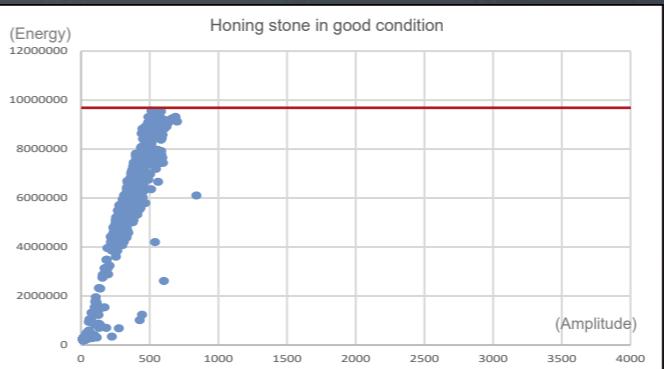
\* To extend the cable, use the waterproof relay connector set (OP).

# Cases for visualization and real-time monitoring of machining condition

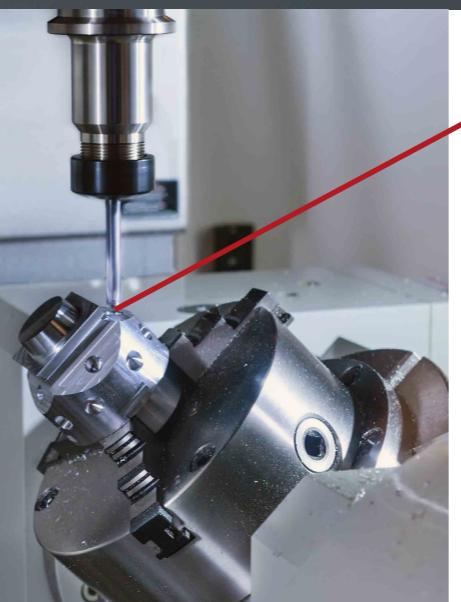
## Micro drill tip coating peeling detection (for Ø0.2 diamond-coated drill)



## Honing stone condition monitoring



# Advanced features of Early Observer Pegasus



## Touch sensor function (minimum tool diameter Ø 0.05)

This function detects workpiece-tool contact and outputs the result at a response time of 2 ms.  
Tool setter installation is unnecessary for finishing/additional machining. Significant reduction is realized in length measurement takt time.

## Measurement data calculation function

This function calculates and outputs data measured at 0.1 μs. Effective for visualization of machining process and tool condition monitoring.

- Amplitude = maximum value and average value.
- Energy/RMS = maximum value and summed value.

## Threshold alarm (Pegasus Plus)

You can set a threshold value arbitrarily to generate an alarm signal. Amplitude or energy can be set for each of two alarm thresholds.