

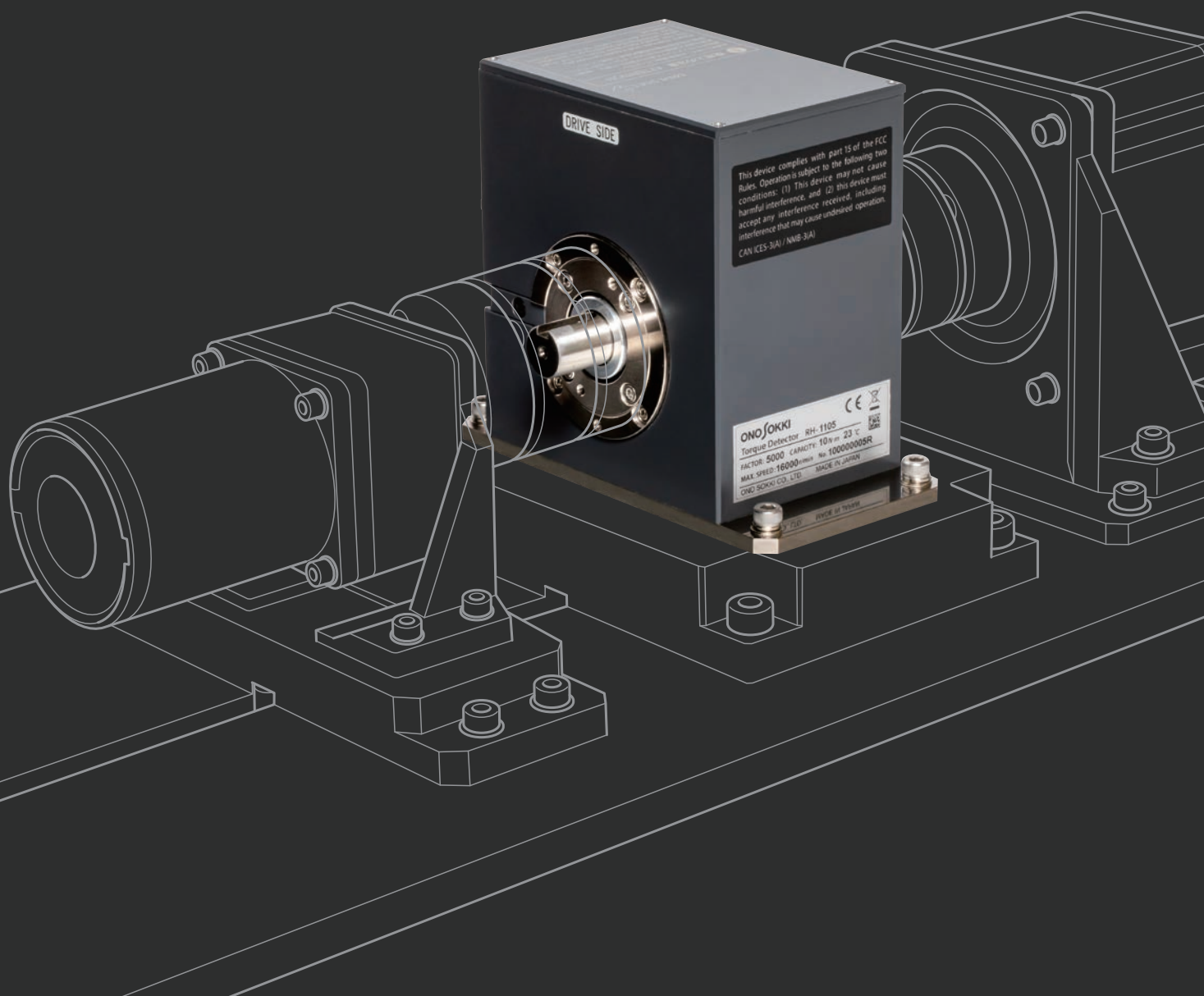
RH series

ONOSOKKI

Torque Detector

High speed rotation measurement
with high rigid, high response

The RH series makes torque measurement range wider
beyond expectation



Torque Detector RH series



Measures torque of various targets



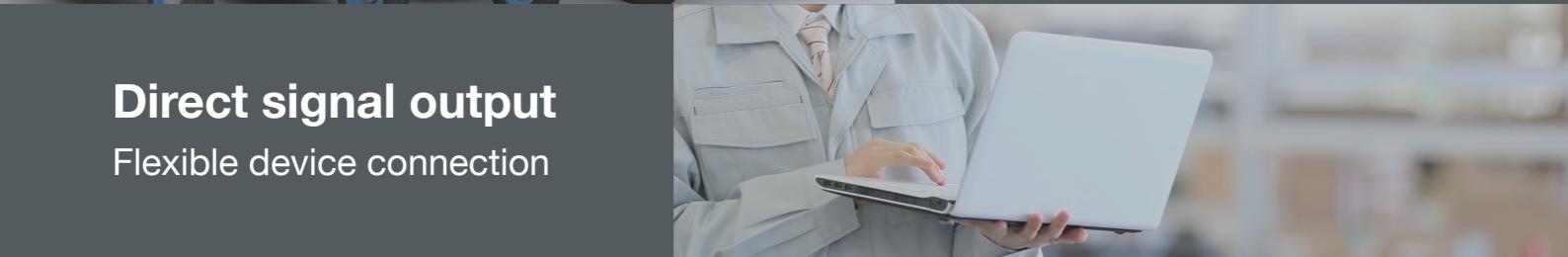
High Rigidity

Measures accurately the torque fluctuation



High speed torque measurement

Supports wide measurement range



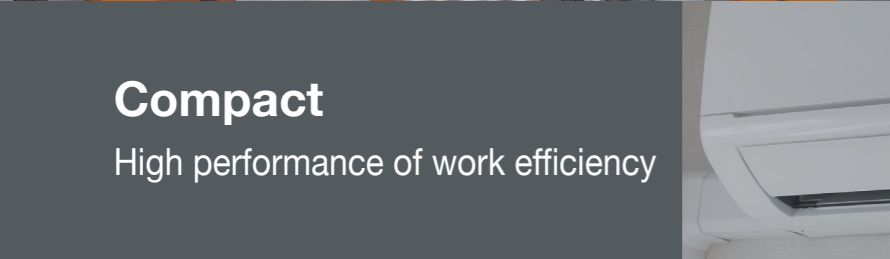
Direct signal output

Flexible device connection



High accuracy

Reliable performance evaluation



Compact

High performance of work efficiency

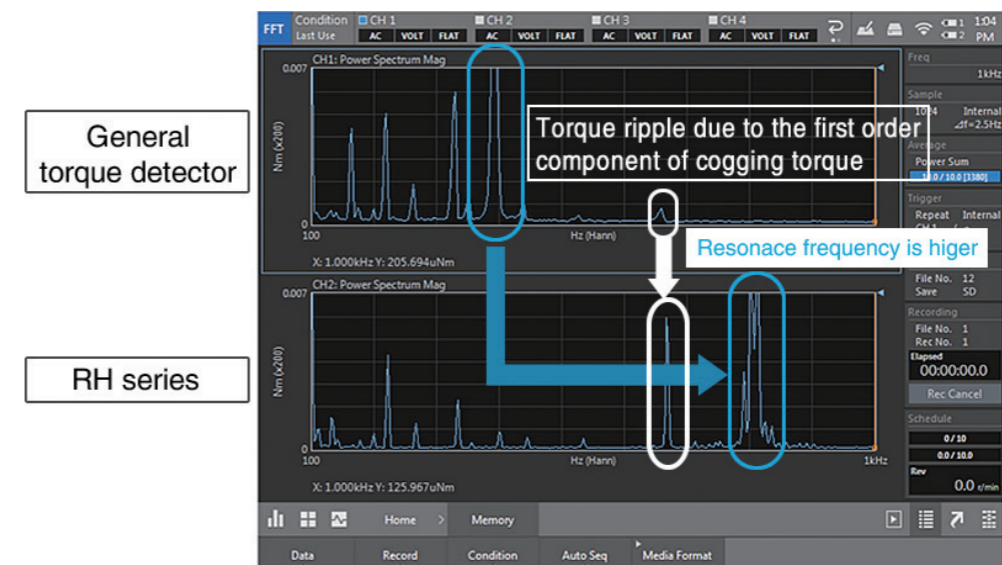
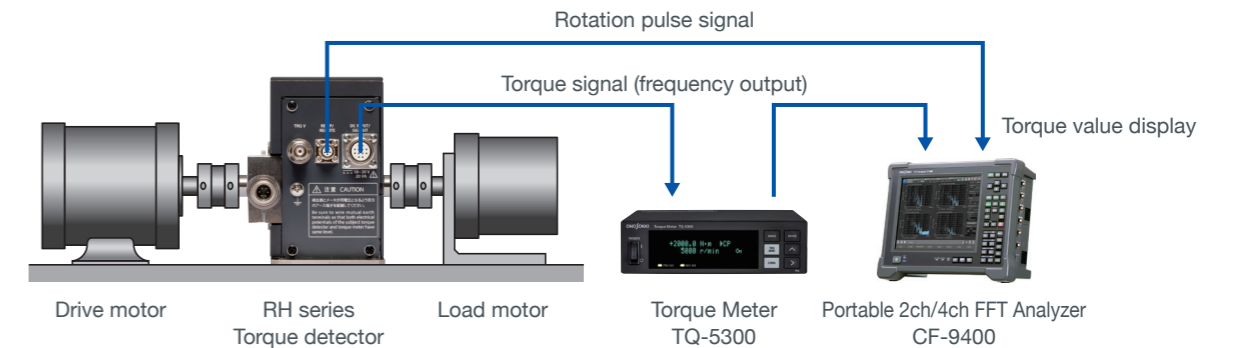
High Rigidity

Highly accurate detection of torque fluctuation with high response

As the shift to electrification of various products, the development of quieter and higher quality motors has been required. The RH series has achieved accurate detection of torque fluctuations with high rigidity*, and supports high-speed rotation. It helps the development of products with outstanding quietness by minimizing cogging torque and torque ripple that cause vibration and noise.

*4.5 times of torsional rigidity compared to the existing model.

Example of RH series cogging torque measurement (compared to a general torque detector)



The power spectrum above shows the measurement results of the cogging torque when using the RH series and a general torque detector.

The RH series has higher torsional rigidity than general torque detectors, so the resonance frequency of the device can be increased to perform torque measurement (here, the torque ripple due to the first order component of cogging torque) with higher accuracy. It enables to measure flat and higher frequency.

Torque Detector RH series

High speed torque measurement Up to 20,000 r/min

In motors of EV scooters and compressor for air conditioners, the demand for high-speed rotation has been increasing.

The RH series provides high-speed and stable measurement from low to high, up to 20,000 r/min (2.5 times faster than the existing model).

RH series (without rotation detection gear)



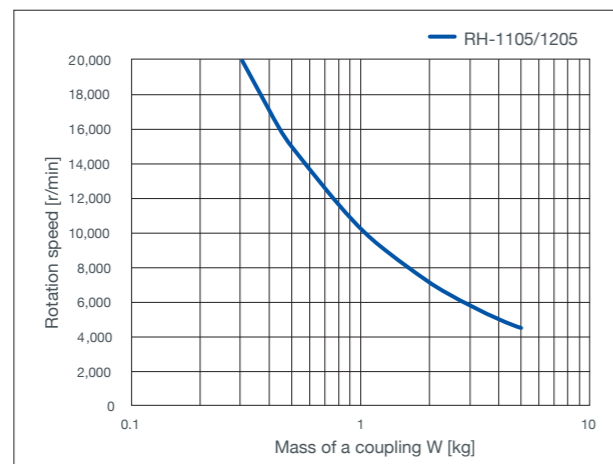
RH series (with rotation detection gear)



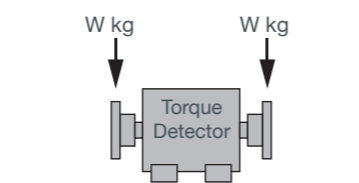
How to select a coupling

The mass of the coupling that can be attached to the detector depends on the max. rotation speed to be used.

Refer to the following graph for selecting the coupling. The thrust load should be about the mass of the coupling.



Rotation speed-Mass of a coupling

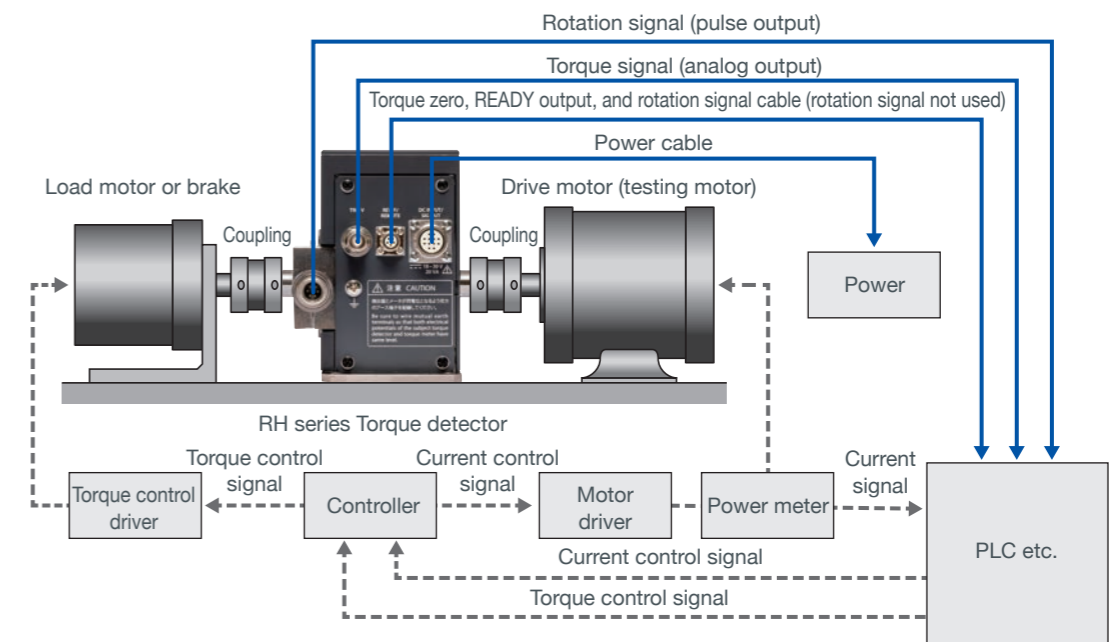


(W: Coupling mass at one shaft end)

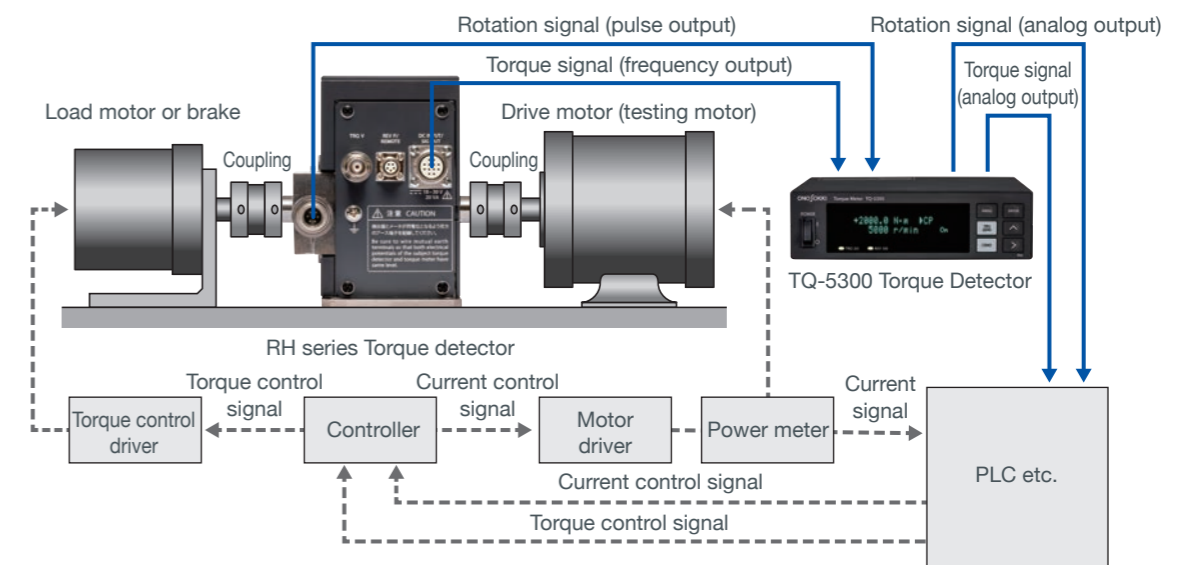
Direct signal output Selectable signal output destination

The RH series has selection of the output destination. It can be used as a stand-alone without a display unit or used with the TQ-5300 Torque meter which can read the torque value directly. The choice depends on your system.

Using the RH series Torque Detector alone



Using the RH series Torque Detector connecting with the TQ-5300 Torque meter



Torque Detector RH series

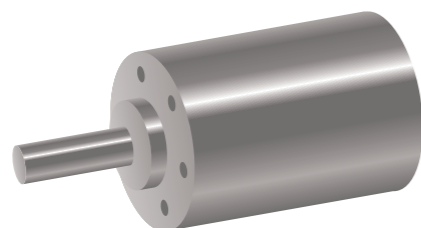
High accuracy Highly accurate performance evaluation tests

The RH series torque detectors have achieved highly accurate measurement with $\pm 0.05\%$ /FS of linearity including hysteresis (1/2 compared to the existing model).

Example

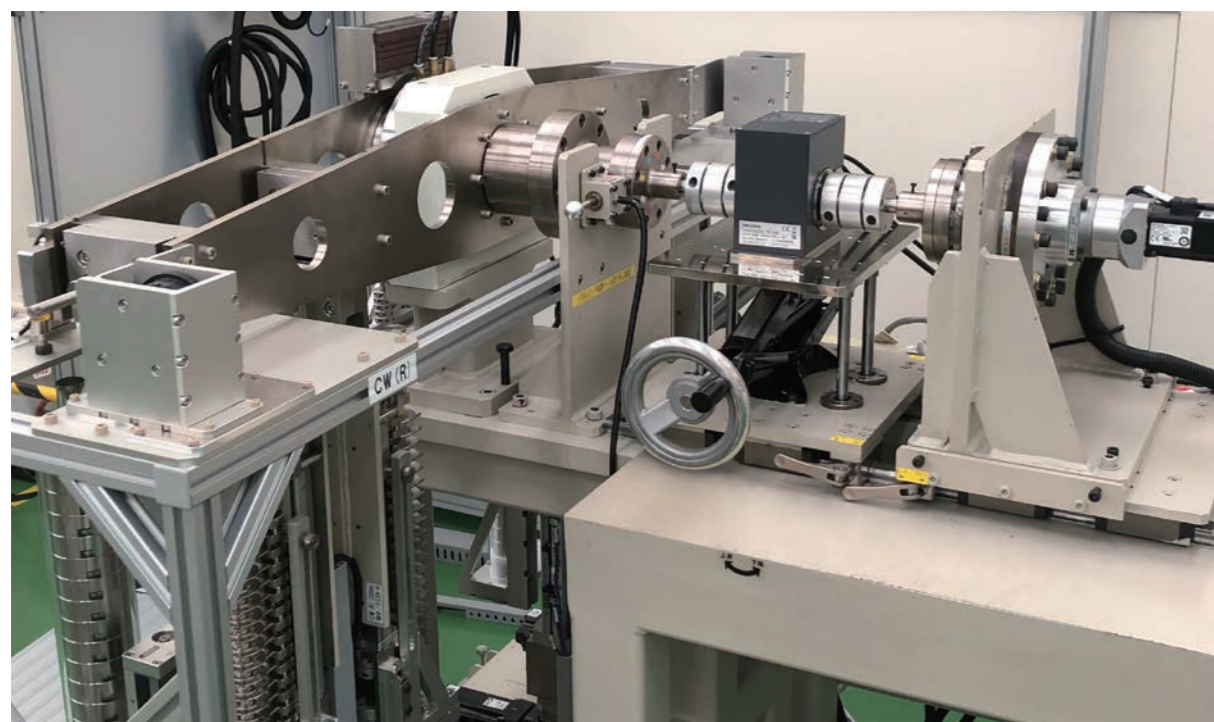
When a control accuracy of 1% is required for the torque capacity of an electric power steering motor (10 times higher accuracy for torque detector is required to meet the condition.)

Torque capacity of an electric power steering motor:	6 N·m
Required accuracy for motor	: 1 % = 0.06 N·m
Required accuracy for torque detector	: 0.1 % = 0.006 N·m
Accuracy of RH-1105 (rated torque 10 N·m)	: $\pm 0.05\%$ /FS = 0.005 N·m (<0.006 N·m)



Reliable calibration system (JCSS calibration)

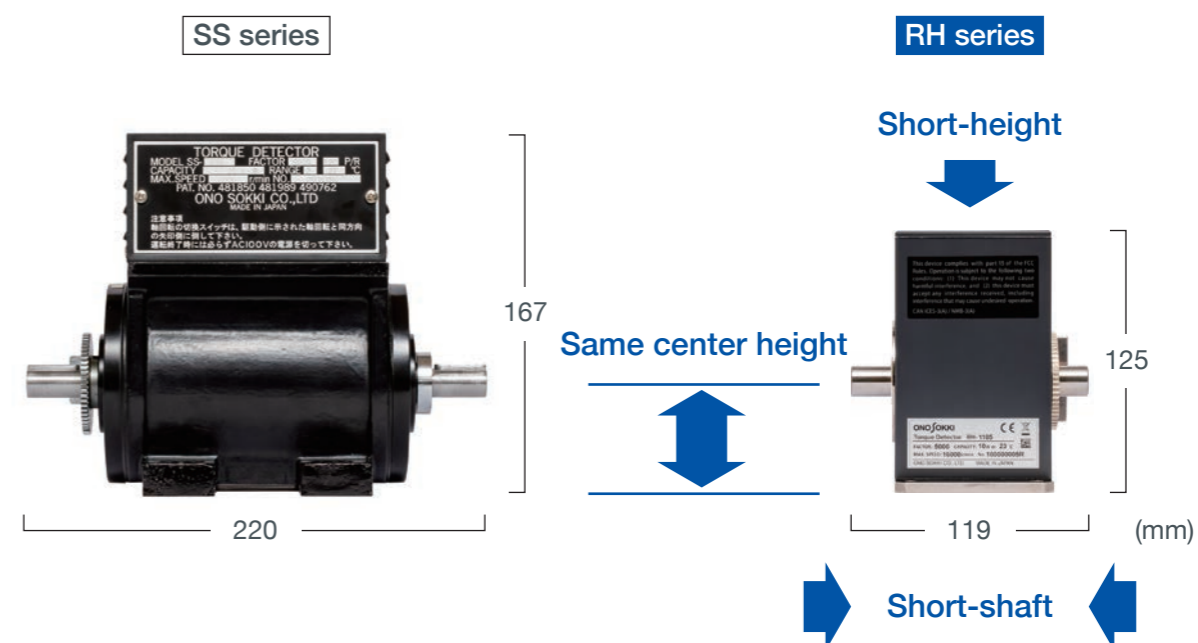
Ono Sokki provides reliable and high level calibration services for torque accuracy verification testing with the equipment that is compatible with JCSS calibration.



Compact Easy to handle

Compact, light weight, and having same center height as the existing model (SS series), replacing with RH series provides advantage of higher accuracy detection.

Comparison of appearance



SS series Torque Detector

- Shaft length: 220 mm
- Width (main unit): 117 mm
- Height: 167 mm
- Center height: 50 mm
- Weight: Approx. 5.5 kg

RH series Torque Detector

- Shaft length: 119 mm
- Width (main unit): 108 mm
- Height: 125 mm
- Center height: 50 mm
- Weight: Approx. 2 kg

Precautions

Torque detectors might have shaft damage, deformation, breakage and other troubles due to the following reasons. Please handle with special care.

- Poor centering of the device or radial load
- Overtorque
- Dust ingress, oil ingress, etc.

Torsion bar results in some amount of aging due to its material characteristics, that causes the static torque characteristic errors to change. To maintain the accuracy, please perform a calibration to adjust the factor at least once a year.

For a calibration, contact your nearest Ono Sokki sales office or the distributor where you purchased the torque detector.

Specifications

Measurement section		
Torque Detection	Rated torque	10 or 20 N·m
	Breakdown torque	400 % or more of rated torque
	Limit torque	200 % or more of rated torque
	Linearity	±0.05% / FS or less (screen display with TQ-5300 connected)
	Influence on temperature at zero point	±0.02% / FS/°C or less (screen display with TQ-5300 connected)
Rotation speed detection	Number of output pulses (standard)	4 P/R (detected with hall IC and magnet)
	Number of output pulses (optional RH-0501 rotation detection gear 60 P/R mounted)	60 P/R (optional MP-981 or MP-9820 used for rotation speed detection)
Output section		
Analog torque output	Output format	Voltage output 0 to ±10 V / F.S
	Analog conversion method	Cycle conversion method (converted to torque value at each cycle and then converted to analog voltage)
	Minimum allowable load	100 kΩ
	Linearity	±0.10 % / FS or less
	Zero point offset	0.05 V or less
	Connector	BNC (female)
Torque frequency output	Output format	Line driver output 10 kHz ±5 kHz
	Connector	R03-RB12F
Rotation speed pulse output	Output item	Hall IC pulse output on which waveform shaping is processed
	Output format	Open collector output with pull-up to +5 V by 330 Ω resistor
	Minimum allowable load	10 kΩ
Connector	R03-RB5F	
Interface section		
Torque zero input	Input item	Torque zero correction value acquisition start Contact input; Makes a torque at no-load zero automatically through external contact.
	Input signal	No-voltage contact input: Open voltage: 5.25 V or less Short-circuit current: 1 mA or less Voltage input: H level: +4 to +5.25 V L level: 0 to +1 V
	Connector	R03-RB5F
READY output	Output item	Contact output; Contact closes in the torque measurement state.
	Output format	Photo MOS relay
	Load voltage	DC30 V or less
	Load current	100 mA or less
	ON-resistance	10 Ω or less
Connector	R03-RB5F	

General specifications		
Power supply voltage	DC24 V (18 to 30 V)	
Power consumption	20 W or less	
Power input connector	R03-RB12F	
Operating temperature range	0 to +50 °C	
Operating humidity range	20 to 85 %, no dew condensation	
Storage temperature range	-10 to +60 °C	
Storage humidity range	20 to 85 %, no dew condensation	
CE marking	Low Voltage Directive (LDV)	2014/ 35/ EU standard EN61010-1
	EMC Directive	2014/ 30/ EU standard EN61326-1 Class A Group 1
	RoHS Directive	2011/ 65/ EU standard EN50581 · Four substances added by (EU) 2015/ 863
FCC	FCC Part 15 Subpart B Class A	
ICES	ICES-003 Issue7 + Amendment 1 Class A	
Safety	IEC61010-1 : Overvoltage category I, grounding protection class III, contamination level 2	
Torsional rigidity (design value)	10 N·m: 3.6 kN·m/rad 20 N·m: 6.9 kN·m/rad	
Inertia moment (design value)	10 N·m: 24.3×10 ⁻⁶ kg·m ² 20 N·m: 24.6×10 ⁻⁶ kg·m ²	
Allowable rotation speed (standard)	16,000 r/min	
Allowable rotation speed (with optional RH-0502 dynamic balance adjusted)	20,000 r/min	
Supplied items		
Instruction manual	—	
Inspection cart	—	
Key	2 pcs (drive side-1, load side-1)	

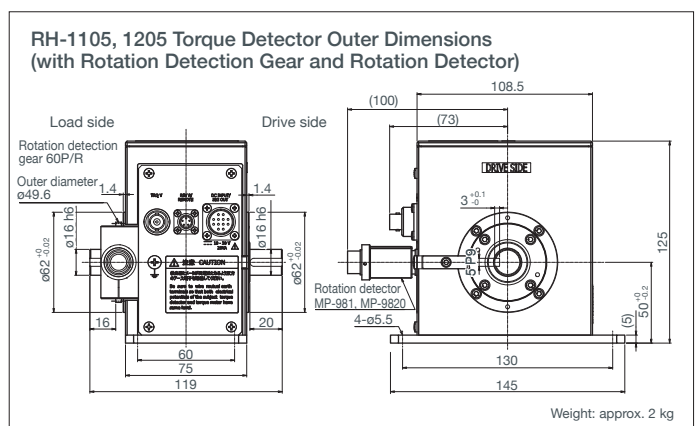
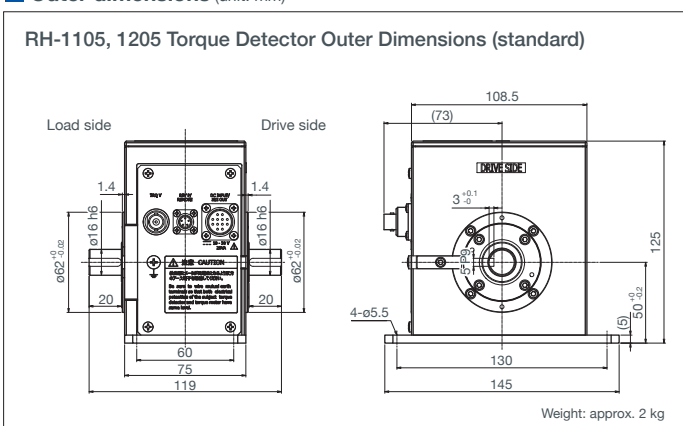
- (1) Recommend to perform zero torque correction before the start of measurement to measure accurately.
- (2) Use within the temperature and humidity range described in the specifications.
- (3) Store within the temperature and humidity range described in the specifications.

Options

Model	Name
RH-0105	Torque signal cable (5 m)
RH-0110	Torque signal cable (10 m)
RH-0205	Power cable (5m)
RH-0210	Power cable (10m)
RH-0305	Rotation signal cable (5m): for connecting RH series with TQ-5300 series
RH-0310	Rotation signal cable (10m): for connecting RH series with TQ-5300 series
MX-7105	Rotation signal cable (5m): for connecting MP-981/9820 with TM-3000 series
MX-7110	Rotation signal cable (10m): for connecting MP-981/9820 with TM-3000 series
MX-8105	Rotation signal cable (5m): for connecting MP-981/9820 with TQ-5300 series

Model	Name
MX-8110	Rotation signal cable (10m): for connecting MP-981/9820 with TQ-5300 series
RH-0405	Torque zero input cable (torque zero, READY output, and rotation signal cable) 5m
RH-0410	Torque zero input cable (torque zero, READY output, and rotation signal cable) 10m
RH-0501	Rotation detection gear 60 pulses
MP-981	Magneto-electric rotation detector
MP-9820	Magneto-electric rotation detector
RH-0502	Dynamic balance adjustment
MX-101	Signal cable (1.5m)
MX-105	Signal cable (5m)

Outer dimensions (unit: mm)



* For details about the TQ-5300 Torque Meter, refer to our website or the instruction manual.

ONOSOKKI

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* Outer appearance and specifications are subject to change without prior notice.
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