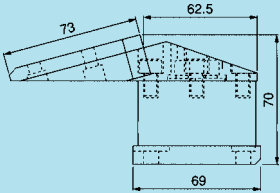
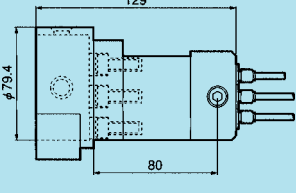
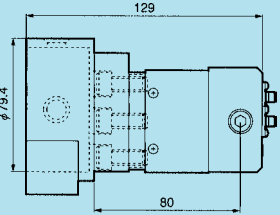
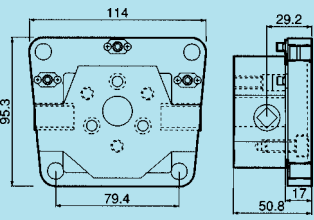
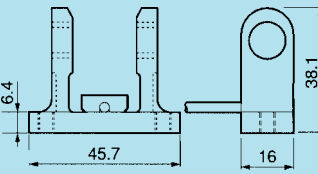
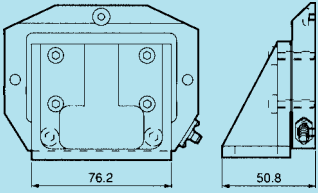


Crash Test Sensors Applicable to Side Impact Dummy SID

Mounted to the side impact dummy SID, KYOWA strain-gage crash test sensors measure impact-initiated force to the thorax, spine, costae, and pelvis to obtain the following variables in these sites:

- Fx: Shear force in front-rear direction
- Fy: Shear force in up-down direction
- Fz: Axial force in up-down direction
- Mx: Moment in left-right direction
- My: Moment in front-rear direction
- Mz: Angular moment
- Impact-initiated loads to the damper

Description	Superior Thoracic 6-Component Force Transducer LSM-E-10KNS7	Inferior Thoracic 6-Component Force Transducer LSM-E-18KNS8	Inferior Thoracic 3-Component Force Transducer LSM-D-18KNS12
			
Detectable Variables	Fx, Fy, Fz, Mx, My, Mz	Fx, Fy, Fz, Mx, My, Mz	Fx, Fz, Mx
Rated Capacity (Reference Value)	Fx: 10kN (1020kgf) Fy: 10kN (1020kgf) Fz: 10kN (1020kgf) Mx: 200N·m (20.39kgf·m) My: 200N·m (20.39kgf·m) Mz: 200N·m (20.39kgf·m)	Fx: 15kN (1530kgf) Fy: 15kN (1530kgf) Fz: 18kN (1835kgf) Mx: 300N·m (30.59kgf·m) My: 300N·m (30.59kgf·m) Mz: 300N·m (30.59kgf·m)	Fx: 15kN (1530kgf) Fz: 18kN (1835kgf) Mx: 300N·m (30.59kgf·m)
Safe Overload Rating	120%	120%	120%
Rated Output, Approx.	Fx: 1.0mV/V Fy: 1.0mV/V Fz: 0.2mV/V Mx: 0.3mV/V My: 0.3mV/V Mz: 0.5mV/V	Fx: 1.5mV/V Fy: 1.5mV/V Fz: 0.3mV/V Mx: 0.5mV/V My: 0.5mV/V Mz: 0.5mV/V	Fx: 1.5mV/V Fz: 0.3mV/V Mx: 0.5mV/V
Non-linearity	±1%RO	±1%RO	±1%RO
Hysteresis	±1%RO	±1%RO	±1%RO
Interference	±5%RO (±7%RO with Fz)	±5%RO (±7%RO with Fz)	±5%RO
Recommended Excitation Voltage	1 to 4V ac or dc	1 to 4V ac or dc	1 to 4V ac or dc
Safe Excitation Voltage	6V ac or dc	6V ac or dc	6V ac or dc
Input Resistance	480Ω or 240Ω ±5%	480Ω or 240Ω ±5%	350Ω ±5%
Output Resistance	480Ω or 240Ω ±5%	480Ω or 240Ω ±5%	350Ω ±5%
Insulation Resistance	500MΩ min.(with 25Vdc applied)	500MΩ min.(with 25Vdc applied)	500MΩ min.(with 25Vdc applied)
Compensated Temperature Range	0 to 40°C	0 to 40°C	0 to 40°C
Safe Temperature Range	-20 to 70°C	-20 to 70°C	-20 to 70°C
Temperature Effect on Zero Balance	±0.05%RO/°C (±0.1%RO/°C with Fz)	±0.05%RO/°C (±0.1%RO/°C with Fz)	±0.05%RO/°C
Temperature Effect on Output	±0.05%/°C	±0.05%/°C	±0.05%/°C
Cables	1) Four Teflon coated cables, 0.14mm ² x approx. 0.5m long 2) Six 4-conductor (0.08mm ²) vinyl shielded heat-resistant cables, 3.2mm dia. x 4.5m These two types of cables will be connected each other to provide a total length of approx. 5m. Connectors • Cannon MIKM6-1-7P at the sensor side (4 pcs.) • Tajimi R05-PB5M at the data acquisition side (6 pcs.)	1) Four Teflon coated cables, 0.14mm ² x approx. 0.5m long 2) Six 4-conductor (0.08mm ²) vinyl shielded heat-resistant cables, 3.2mm dia. x 4.5m These two types of cables will be connected each other to provide a total length of approx. 5m. Connectors • Cannon MIKM6-1-7P at the sensor side (4 pcs.) • Tajimi R05-PB5M at the data acquisition side (6 pcs.)	Three 4-conductor (0.05mm ²) vinyl shielded heat-resistant cables, 2.5mm dia. x 5m long Connectors • Tajimi MRO1-P4F at the sensor side • Tajimi R05-PB5M at the data acquisition side
Remarks		Supply the thoracic spine ass'y to let us secondary fabrication for mounting the transducer to it.	

Description	Pelvic 3-Component Force Transducer LSM-D-15KNS13 	Damper-tip Mounting Load Cell LCR-2-15KNS9 	Damper-base Mounting Load Cell LCR-S-10KNS10 
Detectable Variables	Fx, Fz, Mx	Load to damper tip	Load to damper base
Rated Capacity (Reference Value)	Fx: 10kN (1020kgf) Fz: 15kN (1530kgf) Mx: 300N·m (30.59kgf·m)	15kN (1530kgf)	10kN (1020kgf)
Safe Overload Rating	120%	120%	150%
Rated Output, Approx.	Fx: 0.7mV/V Fz: 0.8mV/V Mx: 0.5mV/V	1mV/V	1mV/V min.
Non-linearity	±1%RO	±2%RO	±1%RO
Hysteresis	±1%RO	±2%RO	±1%RO
Interference	±5%RO	—	—
Recommended Excitation Voltage	1 to 4V ac or dc	1 to 2V ac or dc	1 to 4V ac or dc
Safe Excitation Voltage	6V ac or dc	10V ac or dc	6V ac or dc
Input Resistance	240Ω ±5%	175Ω ±5%	240Ω ±5%
Output Resistance	240Ω ±5%	175Ω ±5%	240Ω ±5%
Insulation Resistance	500MΩ min. (with 25Vdc applied)	500MΩ min. (with 25Vdc applied)	500MΩ min. (with 25Vdc applied)
Compensated Temperature Range	0 to 40°C	10 to 50°C	0 to 40°C
Safe Temperature Range	-20 to 70°C	0 to 60°C	-20 to 70°C
Temperature Effect on Zero Balance	±0.05%RO/°C	±0.1%RO/°C	±0.05%RO/°C
Temperature Effect on Output	±0.05%/°C	±0.1%/°C	±0.05%/°C
Cable	Three 4-conductor (0.05mm ²) vinyl shielded heat-resistant cables, 2.5mm dia. x 5m long, Connectors <ul style="list-style-type: none"> • Tajimi MRO1-P4F at the sensor side • Tajimi R05-PB5M at the data acquisition side 	4-conductor (0.08mm ²) vinyl shielded heat-resistant cable, 3.2mm dia. x approx. 5m long; connected directly to the internal circuit and terminated with Tajimi R05-PB5M connector plug	4-conductor (0.05mm ²) vinyl shielded heat-resistant cable, 2.5mm dia. x 5m long Connectors <ul style="list-style-type: none"> • Tajimi MR01-P4F at the sensor side • Tajimi R05-PB5M at the data acquisition side
Remarks		Casing: Metallic finish, made of alloy steel	Dedicated support angle for the load cell will be provided.