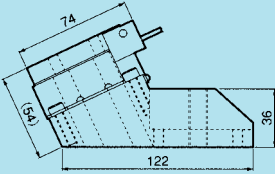
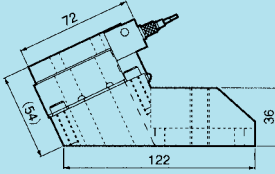
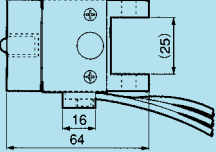
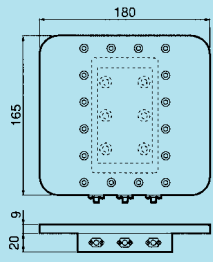
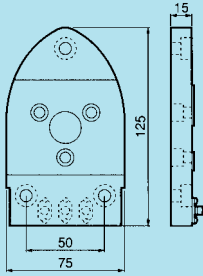
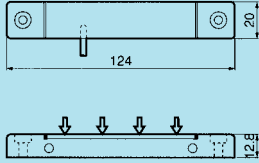
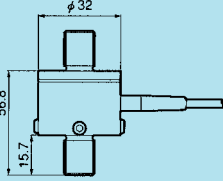


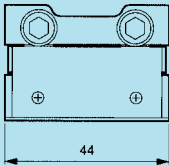
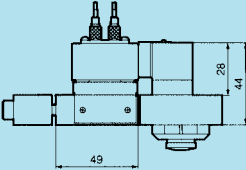
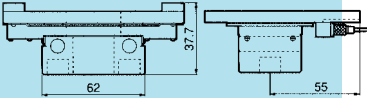
# Crash Test Sensors Applicable to Side Impact Dummy EUROSID-1

Mounted to the side impact dummy EUROSID-1, KYOWA strain-gage crash test sensors measure impact-initiated force to the cervix, scapulae, posterior, spine, abdomen, and pelvis etc. 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 abdomen and pubis

Description	Inferior Cervical 6-Component Force Transducer LSM-E-14KNS6	Inferior Cervical 3-Component Force Transducer LSM-C-12KNS3	Scapular 3-Component Force Transducer LSM-B-8KNS2R, L
			
<b>Detectable Variables</b>	Fx, Fy, Fz, Mx, My, Mz	Fy, Mx, Mz	Fx, Fy, Fz
<b>Rated Capacity (Reference Value)</b>	Fx: 12kN (1224kgf) Fy: 12kN (1224kgf) Fz: 14kN (1428kgf) Mx: 450N·m (45.89kgf·m) My: 450N·m (45.89kgf·m) Mz: 300N·m (30.59kgf·m)	Fy: ±12kN (±1.224tf) Mx: ±450N·m (±45.89kgf·m) Mz: ±450N·m (±45.89kgf·m) Allowable component force*: Fx: ±12kN (±1.224tf) Fz: ±14kN (±1.429tf) My: ±300N·m (±30.59kgf·m)	Fx: 8kN (825.8kgf) Fy: 4kN (407.9kgf) Fz: 4kN (407.9kgf)
<b>Safe Overload Rating</b>	120%	120%	120%
<b>Rated Output, Approx.</b>	Fx: 1.0mV/V Fy: 1.0mV/V Fz: 0.2mV/V Mx: 1.0mV/V My: 1.0mV/V Mz: 1.0mV/V	Fx: 0.7mV/V min. Mx: 0.7mV/V min. Mz: 0.7mV/V min.	Fx: 0.3mV/V Fy: 1.0mV/V Fz: 1.0mV/V
<b>Non-linearity</b>	±1%RO	±1%RO	±1%RO
<b>Hysteresis</b>	±1%RO	±1%RO	±1%RO
<b>Interference</b>	±5%RO (±7%RO with Fz)	±5%RO	±5%RO (±8%RO with Fx)
<b>Recommended Excitation Voltage</b>	1 to 4V ac or dc	1 to 5V ac or dc	1 to 4V ac or dc
<b>Safe Excitation Voltage</b>	6V ac or dc	10V ac or dc	6V ac or dc
<b>Input Resistance</b>	240Ω or 120Ω ±5%	120Ω to 350Ω ±10%	Fx: 120Ω ±10% Fy, Fz: 700Ω ±2% or 350Ω ±5%
<b>Output Resistance</b>	240Ω or 120Ω ±5%	120Ω or 350Ω ±10%	Fx: 120Ω ±10% Fy, Fz: 700Ω ±2% or 350Ω ±5%
<b>Insulation Resistance</b>	500MΩ min. (with 25Vdc applied)	500MΩ min. (with 25Vdc applied)	500MΩ min. (with 25Vdc applied)
<b>Compensated Temperature Range</b>	0 to 40°C	10 to 60°C (no dew condensing)	0 to 40°C
<b>Safe Temperature Range</b>	-20 to 70°C	5 to 70°C	-20 to 70°C
<b>Temperature Effect on Zero Balance</b>	±0.05%RO/°C (±0.1%RO/°C with Fz)	±0.2%RO/°C	±0.05%RO/°C
<b>Temperature Effect on Output</b>	±0.05%/°C	±0.2%/°C	±0.05%/°C
<b>Cables</b>	Six 4-conductor (0.08mm <sup>2</sup> ) vinyl shielded heat-resistant cables, 3.2mm dia. x approx. 7m long; connected directly to the internal circuit and terminated with Tajimi R05-PB5M connector plug	Three 4-conductor (0.05mm <sup>2</sup> ) vinyl shielded heat-resistant cables, 2.5mm dia. x approx. 5m long Connectors • Tajimi MR01-P4F at the sensor side • Tajimi R05-PB5M at the data acquisition side	Three 4-conductor (0.08mm <sup>2</sup> ) vinyl shielded heat-resistant cables, 3.2mm dia. x 5m long; connected directly to the internal circuit and terminated with Tajimi R05-PB5M connector plug
<b>Casing</b>		Metallic finish	
<b>Remarks</b>		* Reference values with respect to the strength • Coated, water-repellent design	Supply the clavicle to let us make secondary fabrication for mounting the transducer to it.

Description	<b>Posterior 3-Component Force Transducer LSM-C-10KNS1</b> 	<b>Pelvic 3-Component Force Transducer LSM-D-14KNS15</b> 	<b>Abdomnal Load Cell LCR-S-5KNS12</b> 	<b>Pubic Load Cell LCR-S-20KNS11</b> 
<b>Detectable Variables</b>	Fy, Mx, Mz	Fx, Fz, My	Load to the abdomen	Load to the pubis
<b>Rated Capacity (Reference Value)</b>	Fy: 10kN (1020kgf) Mx: 1kN·m (102.0kgf·m) Mz: 500N·m (50.99kgf·m)	Fx: 14kN (1428kgf) Fz: 14kN (1428kgf) My: 550N·m (56.08kgf·m)	5kN (509.9kgf)	20kN (2039kgf)
<b>Safe Overload Rating</b>	120%	120%	120%	120%
<b>Rated Output, Approx.</b>	Fx: 0.4mV/V Fz: 0.7mV/V My: 0.8mV/V	Fx: 0.9mV/V Fz: 0.9mV/V My: 1.7mV/V	1.8mV/V	1.0mV/V min.
<b>Non-linearity</b>	±1%RO	±1%RO	±1%RO	±0.5%RO
<b>Hysteresis</b>	±1%RO	±1%RO	±1%RO	±0.5%RO
<b>Interference</b>	±5%RO (±8%RO with Fy)	±5%RO	—	—
<b>Recom. Excitation Voltage</b>	1 to 4V ac or dc	1 to 4V ac or dc	1 to 4V ac or dc	1 to 8V ac or dc
<b>Safe Excitation Voltage</b>	6V ac or dc	6V ac or dc	6V ac or dc	12V ac or dc
<b>Input Resistance</b>	240Ω ±5% or 120Ω ±10%	120Ω ±10%	350Ω ±5%	350Ω ±5%
<b>Output Resistance</b>	240Ω ±5% or 120Ω ±10%	120Ω ±10%	350Ω ±5%	350Ω ±5%
<b>Insulation Resistance</b>	500MΩ min. (with 25Vdc applied)	500MΩ min. (with 25Vdc applied)	500MΩ min. (with 25Vdc applied)	500MΩ min. (with 25Vdc applied)
<b>Compensated Temp. Range</b>	0 to 40°C	0 to 40°C	0 to 40°C	0 to 40°C
<b>Safe Temp. Range</b>	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C
<b>Temp. Effect on Zero Bal.</b>	±0.05%RO/°C*	±0.05%RO/°C	±0.05%RO/°C	±0.05%RO/°C
<b>Temp. Effect on Output</b>	±0.05%/°C	±0.05%/°C	±0.05%/°C	±0.05%/°C
<b>Cables</b>	Three 4-conductor (0.05mm <sup>2</sup> ) vinyl shielded heat-resistant cables, 2.5mm dia. x 5m long Connectors • Tajimi MR01-P4F at the sensor side • Tajimi R05-PB5M at the data acquisition side	Three 4-conductor (0.05mm <sup>2</sup> ) vinyl shielded heat-resistant cable, 2.5mm dia. x 5m long Connectors • Tajimi MR01-P4F at the sensor side • Tajimi R05-PB5M at the data acquisition side	4-conductor (0.08mm <sup>2</sup> ) vinyl shielded heat-resistant cable, 3.2mm dia. x 5m long; connected directly to the internal circuit and terminated with R05-PB5M connector plug	4-conductor (0.08mm <sup>2</sup> ) vinyl shielded heat-resistant cable, 3.2mm dia. x 5m long; connected directly to the internal circuit and terminated with R05-PB5M connector plug
<b>Casing</b>			Metallic finish	Black oxide treated
<b>Remarks</b>	*±0.1%RO/°C with Fy			Conical spring washer for the load cell should be prepared by the user.

Description	<b>Rear Damper 3-Component Force Transducer LSM-C-8KNS2</b> 	<b>Front Damper 3-Component Force Transducer LSM-B-8KNS3</b> 	<b>Spinal 3-Component Force Transducer LSM-D-10KNS14</b> 
<b>Detectable Variables</b>	Fy, Mx, Mz	Fy, Fy, Fz	Fy, Mx, Mz
<b>Rated Capacity (Reference Value)</b>	Fy: ±8kN (±815.8kgf) Mx: ±300N·m (±30.59kgf·m) Mz: 300N·m (30.59kgf·m)	Fz: ±4kN (±407.9kgf) Fy: ±8kN (±815.8kgf) Fz: ±4kN (±407.9kgf)	Fx: ±10kN (±1.02tf) Mx: ±500N·m (±50.99kgf·m) Mz: 300N·m (±30.59kgf·m)
<b>Safe Overload Rating</b>	120%	120%	120%
<b>Allowable Moment (Reference with regard to strength)</b>		Mx, Mz: ±200N·m (±20.39kgf·m) My: ±100N·m (±10.20kgf·m)	My: ±300kN·m (±30.59kgf·m)
<b>Rated Output, Approx.</b>	Fy: 0.5mV/V min. Mx: 0.5mV/V min. Mz: 0.5mV/V min.	Fx: 1mV/V min. Fy: 1mV/V min. Fz: 1mV/V min.	Fx: 2mV/V Fy: 0.5mV/V Fz: 1.5mV/V
<b>Non-linearity</b>	±1%RO	±1%RO	±1%RO
<b>Hysteresis</b>	±1%RO	±1%RO	±1%RO
<b>Interference</b>	±7%RO	±7%RO	±7%RO (±8%RO with Fx)
<b>Recommended Excitation Voltage</b>	1 to 5V ac or dc	1 to 5V ac or dc	1 to 5V ac or dc
<b>Safe Excitation Voltage</b>	10V ac or dc	10V ac or dc	10V ac or dc
<b>Input Resistance</b>	120Ω to 350Ω ±10%	120Ω to 350Ω ±10%	120Ω to 350Ω ±10%
<b>Output Resistance</b>	120Ω to 350Ω ±10%	120Ω or 350Ω ±10%	120Ω to 350Ω ±10%
<b>Insulation Resistance</b>	500MΩ min. (with 25Vdc applied)	500MΩ min. (with 25Vdc applied)	500MΩ min. (with 25Vdc applied)
<b>Compensated Temperature Range</b>	10 to 60°C	10 to 60°C	10 to 60°C
<b>Safe Temperature Range</b>	5 to 70°C	5 to 70°C	5 to 70°C
<b>Temperature Effect on Zero Balance</b>	±0.2%RO/°C	±0.2%RO/°C	±0.2%RO/°C
<b>Temperature Effect on Output</b>	±0.2%/°C	±0.2%/°C	±0.2%/°C
<b>Cables</b>	Three 4-conductor (0.05mm <sup>2</sup> ) vinyl shielded heat-resistant cables, 2.5mm dia. x approx. 5m long; connected directly to the internal circuit and terminated with Tajimi R05-PB5M connector plug	Three 4-conductor (0.05mm <sup>2</sup> ) vinyl shielded heat-resistant cables, 2.5mm dia. x approx. 5m long <b>Connectors</b> • Tajimi MR01-P4F at the sensor side • Tajimi R05-PB5M at the data acquisition side	Three 4-conductor (0.05mm <sup>2</sup> ) vinyl shielded heat-resistant cables, 2.5mm dia. x 5m long <b>Connectors</b> • Tajimi MR01-P4F at the sensor side • Tajimi R05-PB5M at the data acquisition side
<b>Casing</b>	Metallic finish	Metallic finish	Metallic finish
<b>Remarks</b>	<ul style="list-style-type: none"> <li>Coated, water-repellent design</li> <li>Mounting box required</li> <li>Supply the damper to let us bore for mounting the transducer.</li> </ul>	<ul style="list-style-type: none"> <li>Coated, water-repellent design</li> <li>Supply the damper to let us fabricate for mounting the transducer.</li> </ul>	<ul style="list-style-type: none"> <li>Coated, water-repellent design</li> <li>Mounting box required</li> </ul>