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Certificate for mobile hydrogen applications

**“Fuel system components for compressed hydrogen gas powered vehicles”
Gemäß CSA/ANSI HGV 3.1:22
H25 und H70**

date	28, may 2025
pages	2 pages
Name of applicant	JUMO GmbH & Co. KG
Address	Moritz-Juchheim-Strasse 1, 36039 Fulda, Deutschland
Manufacturer	JUMO GmbH & Co. KG
Address	Moritz-Juchheim-Straße 1, 36039 Fulda, Deutschland
Product brand, model and / or typ	JUMO temperature protection tubes 909710/12 (250bar) und 909710/13 (700bar) + type code TZ 1160 JUMO temperature probes 901020, 901030, 902020, 902030, 902040, 902044, 902050, 902810, 902815, 902820, 902915 (with type code TZ1160)

Tests by accredited laboratory KIWA Nederland B.V. HGV3.1 test report number P000343252HGV18 - Ext.:00 23.07.2024				
	test	chapter	requirement	result
1	hydrostatic strength	5.2	250% pressure load of NWP*	passed
2	leakage	5.3	Tightness at 2,5% of NWP* with H ²	passed
3	Exceeding ther permissible tightening torque	5.4	150% of nominal torque	passed
4	Operational strength (endurance test)	22.3.2	50.000 hydraulic cycles at RT 10%...100% NWP*; 40.000 gas cycles at RT 60%...100% NWP; 5% of cycles at 120°C at 75%...125% NWP; 5% of cycles at -40°C at 60%...100% NWP *nominal working pressure	passed



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5	Vibration resistance	5.13	acceration 1,5g sinusoidal frequenz 10...500Hz 10min	passed
6	Stress corrosion cracking resistance	5.14	ASTM B858 - 06	passed
7	Repeated assembly	22.3.3	tight	passed

Operation conditions for protection tubes		
Product group	909710/12 + TZ1160	909710/13 + TZ1160
Pressure class acc. HGV3.1	H25	H70
Working pressure	25 MPa (250 bar)	70 MPa (700 bar)
Temperature range	-40 °C ...120 °C	-40 °C ...120 °C
Installation length EL	≤ 100 mm	≤ 100 mm
Outer diameter AD	≤ 6,6 mm	≤ 8 mm
Process connection with stainless steel 316L	≥ G1/8 oder M10	≥ G1/4 oder M14

Operation conditions for temperature tubes		
Produktgruppe	901020, 901030, 902020, 902030, 902810, 902820, 902040, 902044, 902050, 902815, 902915 with type code TZ 1160	
	Pressure class depends on used protection tube	
Pressure class acc. HGV3.1	H25	H70
Working pressure	25 MPa (250 bar)	70 MPa (700 bar)
Temperature range	-40 °C ...120 °C	-40 °C ...120 °C
Installation length EL	≤ 100 mm	≤ 100 mm
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Process connection with stainless steel 316L	≥ G1/8 oder M10	≥ G1/4 oder M14

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Datum	Unterschrift
Fulda, 28.05.2025	Viola Thiessen 