

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Safety Valve for Pressure Vessel

with type designation(s)
Series 810 (Gas) and 820 (Steam, gases), Series 820 (liquids)

Issued to

Leser GmbH & Co. KG
Hamburg, Germany

is found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.7 Pressure equipment
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV GL class programme DNVGL-CP-0186 – Type approval – Valves

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Type:	K. factor:
Series 810 (Gas) and 820 (Steam, gases)	0.820
Series 820 (liquids)	0.689

Issued at **Hamburg** on **2019-04-03**

This Certificate is valid until **2024-03-31**.

DNV GL local station: **Hamburg CMC**

for **DNV GL**

Approval Engineer: **Hagen Markus**

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Olaf Drews
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Product description

Pilot operated pressure relief valve (POSV) consisting of main valve and attached pilot valve in the versions of "Pop Action" and "Modulate Action".

Design standard ASME Sec. VIII Div.1 or AD2000.

Series	810	820
Type	811X.XXXX	821X.XXXX
Pilot control type	Pop Action	Modulate Action
Application	Gas	Steam, gases und liquids

Materials

Valve design - up to 426 bar

Cast steel

Main valve - Body, Flanges	
Material designation	Standard
1.4408 / CF8M	DIN EN 10213 / SA-351
1.0619 / WCB/WCC	DIN EN 10213 / SA-216
1.0619 / WCB/WCC/LCC/LCB	DIN EN 10213 / SA-216 / SA-352
1.4552 / CF8C	DIN EN 10213 / SA-351
1.4469	DIN EN 10213
1.4470 / CD3MN	DIN EN 10213 / SA-351
1.4581 / CF10M	

Steel round bars

Main valve	
Top plate, piston guide, nozzle, fitting, tube, pilot tube	
Pilot	
Body, Bonnet, Cap	
Material designation	Standard
1.0460 / SA-105	DIN EN 10273 / DIN EN 10222
1.4404 / 316L	DIN EN 10272 / SB-182 / SA-479
1.4571 / 316Ti	
1.4462 / S31803/F51	
1.4501 / S32760/F55	
1.4507 / S32550 / F61	
1.4529 / N08367	
1.4539	
1.4410	
1.4466	
2.4602 / N06022	DIN EN 10028-7 / SB-462 / SB-546
2.4617	DIN EN 10222-3
2.4819 / N10276	DIN EN 17744 / SB-462 / SB-546
2.4610 / N06455	
2.4856 / N06625	
P250GH	DIN EN 10222-2
2.4360 / N04400	DIN EN 17744 / SB-164

Valve design - up to 426 bar (continuation)

Bolts	
Material designation	Standard
A4-70	DIN EN ISO 3506-1/-2
Grade B8M Cl. 1	ASME SA-193
Grade 8M	ASME SA-194
Grade B7M	ASME SA-193
Grade 2HM	ASME SA-194

Valve design - up to 500 bar
Cast steel

Main valve body	
Material designation	Standard
1.4408 / CF8M	DIN EN 10213 / SA-351
1.0619 / WCB / WCC	DIN EN 10213 / SA-216
1.0619 / WCB / WCC / LCC / LCB	DIN EN 10213 / SA-216 / SA-352
1.4552 / CF8C	DIN EN 10213 / SA-351
1.4469	DIN EN 10213
1.4470 / CD3MN	DIN EN 10213 / SA-351
1.4581 / CF10M	

Top plate	
Material designation	Standard
1.0460 / SA-105	DIN EN 10273 / DIN EN 10222
1.4404 / 316L	DIN EN 10272 / SA-182 / SA-479
1.4501 / S32760 / F55	

Nozzle	
- welding end for TECHLOK Butt Weld Hub - API 6A 69MPa x 300/600 Connection (not welded)	
Material designation	Standard
1.4501	DIN EN 10272

Inlet Connection TECHLOK Butt Weld Hub 6 in 23 (welded to welding end of nozzle)	
Material designation	Standard
A182-F55	ASME Sec. II SA-182

Bolts	
Material designation	Standard
SA-193, Grade B8M Cl. 1	ASME Sec. II SA-193
Nuts	
Material designation	Standard
SA-194, Grade 8M	ASME Sec. II SA-194

O-ring materials	
Material designation	Standard
CR, EPDM, FFKM, FKM, NBR	Leser - LDeS 3027.01

Requirements depending on pipe classes and application

The requirements on the safety relief valve design, material grades and certificates of pressurised parts as well as the scope and requirements of production testing depends on the application and pipe class. Reference is made to the following DNVGL Rules:

DNV GL Pt. 2	Ch. 1	Sec. 2 (Approval of material manufacturers)
DNV GL Pt. 2	Ch. 2	Sec. 8 – 5 Castings for boilers, pressure vessels and piping systems
		Sec. 8 – 6 Ferritic steel castings for low temperature service
		Sec. 8 – 7 Stainless steel castings
DNV GL Pt. 4	Ch. 6	Sec. 1 – Table 1 (pipe classes)
		Sec. 1 – Table 4 (certification requirements)
		Sec. 2 – Table 3 (material certificates acc. to pipe classes)

In addition, for steam and pressure vessels application

DNV GL Pt. 4	Ch. 7	Sec. 1 - General Requirements
		Sec. 2 - Materials
		Sec. 2 - Table 3 (material certificates acc. to pipe classes)
		Sec. 3 - Thermal-oil installations
		Sec. 5 – 2 Safety Valves (steam boilers)
		Sec. 7 – Manufacture, workmanship and testing

In addition for weldings

DNV GL Pt. 4	Ch. 6	Sec. 10 - Welding
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Application/Limitation

The pilot operated pressure relief valve of series 810 and 820 are type approved for the use in piping systems and pressure vessels containing Air, Steam, Non-flammable gases and liquids.

Nominal Size		Seat diameter (mm)	Set pressure (bar gauge)		Nominal Pressure Inlet	Nominal Pressure Outlet
Inlet x Outlet DN _E x DN _A	Nominal pipe size	d _o	Min.	Max.		
25 x 50	1" x 2"	11, 14.7, 18.4, 23	1	426 ¹	PN10 up to PN400 150# up to 2500#	PN 10 up to PN63 150# up to 600#
40 x 50	1.5" x 2"	11, 14.7, 18.4, 29				
40 x 80	1.5" x 3"	23.6, 29.4, 35.7				
50 x 80	2" x 3"	23.6, 29.4, 38, 48		256		
80 x 100	3" x 4"	38, 45, 56, 75				
100 x 150	4" x 6"	56, 63, 69, 83, 95				
150 x 200	6" x 8"	110, 133, 142		102		
200 x 250	8" x 10"	168, 180				

Notes

¹ Size 2" x 3"

Orifice H is approved up to 500 bar nominal pressure with either one of the special inlet connections:

1. TECHLOK butt weld Hub 3in23 (welded nozzle design)
2. API6A 69MPa x 300 / 600 (non - welded nozzle design)

Service temperature range

The design temperature of the safety valves is limited by the selected O-ring materials used in the pilot valve or main valve seat as follows:

Soft seal ¹	Minimum	Maximum
CR	-30°C	100°C
EPDM	-40°C	150°C
FFKM	0°C	240°C
FKM	-50°C	200°C
NBR	-25°C	100°C

Notes

¹ Reference LESER specification no. LDeS 3027.01

For design temperatures below 0°C, steel castings for valve body are to be Charpy-V tested at 5°C below design temperature or -20°C whichever is lower. Refer to DNV GL Rule Pt.2, Ch.2 Metallic materials

Sizing of pressure relief valves

Certified Value, K. factors

Valve type	Steam, Gases	Liquids
821 (ASME)	0,82	0,689
811 (ASME)	0,82	--
821 (AD2000)	0,82	0,69
811 (AD2000)	0,82	--

Sizing of the valves according to LESER "High Efficiency – Extended Catalog, Section Capacities".

For steam boiler and pressure vessel application the requirements of DNV GL Pt.4, Ch.7, Sec.5 are to be observed.

Type Approval documentation

Type tests carried out

Capacity and performance testing in acc. with ASME Sec. VIII, VdTÜV SV100 and EN ISO 4126-4.

Production testing and Certification

Each relief valve shall be subjected to production testing according to LESER Global Standard LGS 0209. Appropriate DNV GL product certificate to be issued, if required by the Rules.

References:

Machinery piping systems	Pt.4, Ch.6, Section 1 – Table 4
Boiler safety valve	Pt.4, Ch.7, Section 1 – Table 8

Marking of product

For traceability to this type approval certificate each valve is to be provided with a name plate with at least the following data:

Job Id: **262.1-023168-3**
Certificate No: **TAP00001TD**

Scope	Example
Manufacturer's name or trade mark	LESER
Type designation	8213.1280
Serial no.:	12345678
TÜV-SV	15-1126
Production date month/year	04/19

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the Type Approval are complied with. For further details refer to DNVGL-CP-0338, Sec.4.

End of certificate