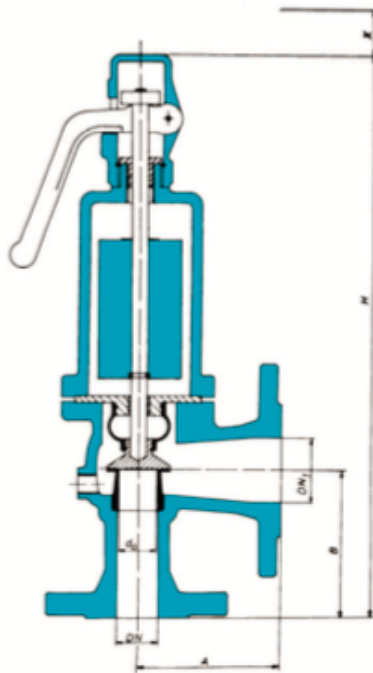


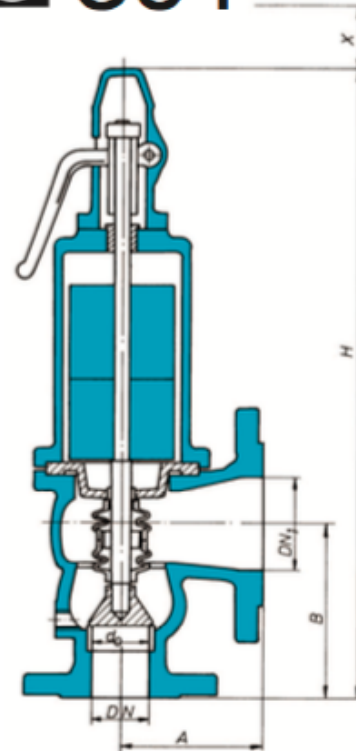
Säkerhetsventiler (Type 390 / 391 Diaphragm Closed Bonnet Safety Valve)

 **390**



Series 390
 nom. diam. 25 to 100

 **391**



Series 391
 nom. diam. 125 to 150

Product Overview

Maximum blow-off rate due to low flow losses. Special research led to the development of a simple construction of the flow passages leading to optimum efficiency and performance.

Series 390. Diaphragm High-Efficiency Safety Valve – These safety valves are for blowing-off saturated steam from pressure generators. Series 390 with closed bonnet, response overpressure: 0,5 bar. Nom. diam. 25 to 100. Lifiable valve head. Force is transmitted centrally at the valve head via ball.

Series 391. Diaphragm High-Efficiency Safety Valve – These safety valves are for blowing-off saturated steam from pressure generators. Series 391 with closed bonnet, response overpressures: 0,5 bar, nom. diam. 125 to 150. Weight loaded, diaphragm type, high-efficiency safety valve, angled, with highly elastic seal and metal backing in valve head.

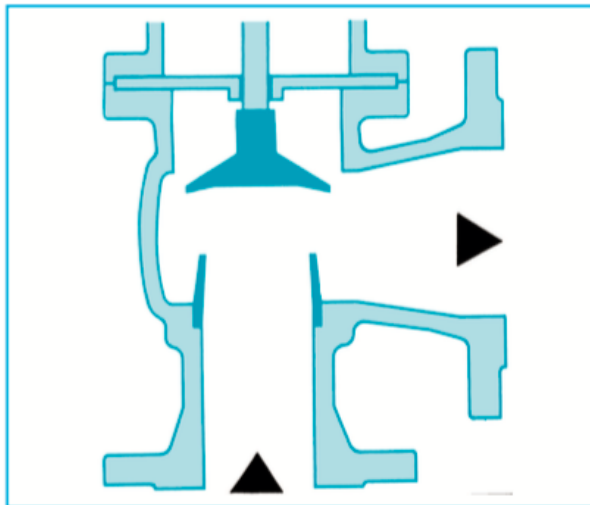
General Operation

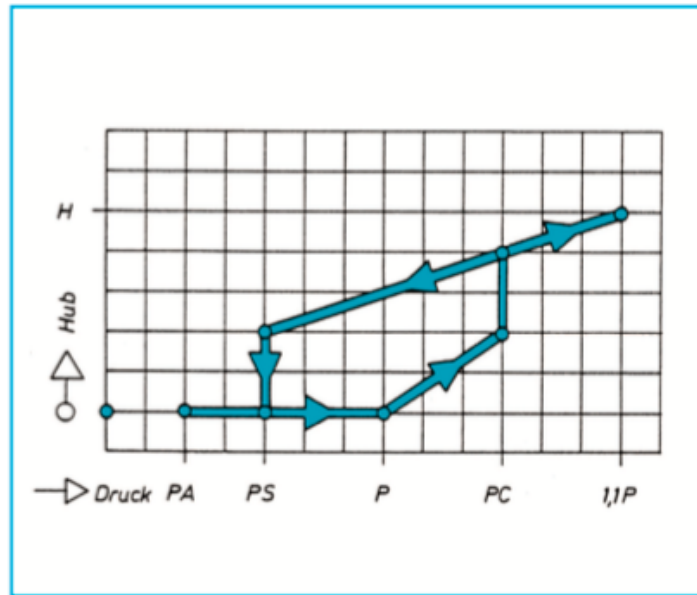
Valve design

The schematic on the left shows the simple and efficient construction of the THIES High-efficiency Safety Valve. At the inlet the incoming fluid is compressed slightly to compensate for any vortices and then discharges to the side through the gap between valve head and valve seat. The special design of the valve seat and valve head result in the high-efficiency operation as described below.

Operation

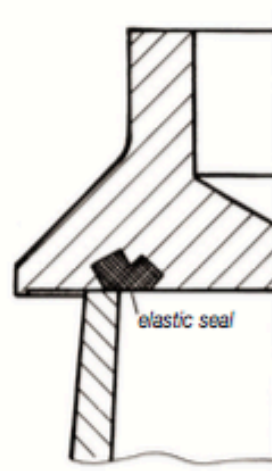
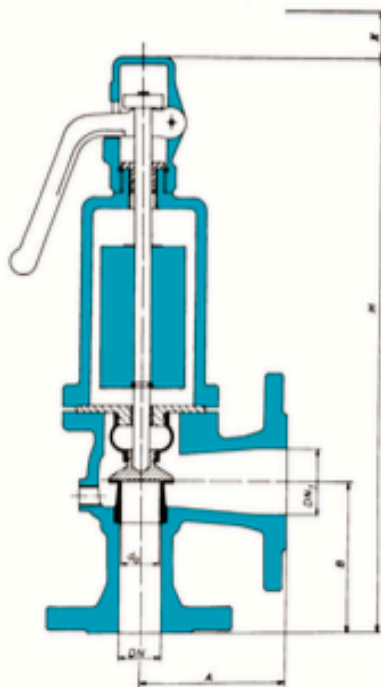
THIES High-efficiency Safety Valves start to open at response pressure P . Additional increases in pressure produce proportionate valve opening, until pressure P_C is reached. This produces instantaneous opening of the port's full cross section. At a pressure 10% in excess of the response pressure lift H is measured, on which the design value of the outflow is based. The valve closes again as the pressure drops. At closing pressure P_S the valve is fully shut. In order to ensure proper and reliable valve functioning the plant operating pressure should be P_A . The values of the rate of flow certified by the type approval mark issued by the German Technical Inspection Authority (Vd TÜV Essen) are determined by taking the lowest measured value for a particular series and subtracting a 10% safety margin.





 **390**

with closed bonnet



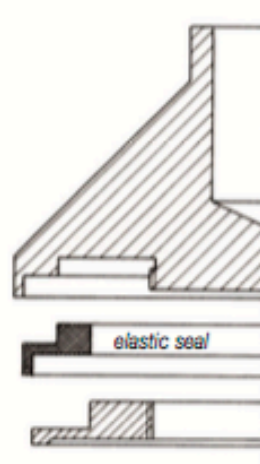
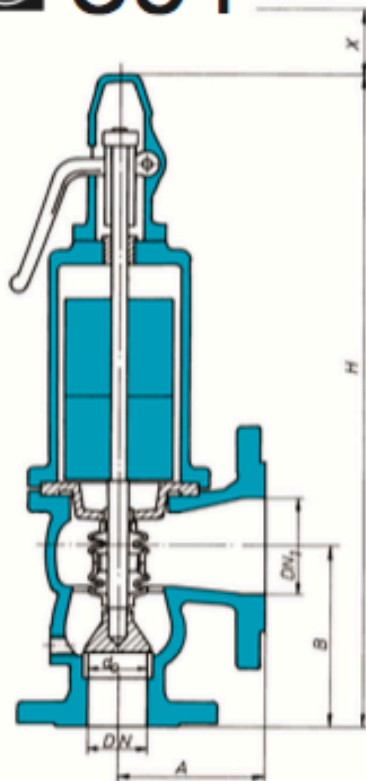
**response overpressure:
0,5 bar**

**Series 390
nom. diam. 25 to 100**



391

with closed bonnet



**response overpressure:
0,5 bar**

Series 391
nom. diam. 125 to 150

Diaphragm type High-efficiency Safety Valves

Application: These safety valves are for blowing-off saturated steam from pressure generators.

THIES-diaphragm high-efficiency safety valves meet the following German requirements: the AD Specification A 2 for „Safety Valves“, the Technical rules for steam boilers (TRD), the Safety Valve Code acc. to **DIN 4750 and 4751 Pt. 1.**

Response overpressure: 0,5 bar.

Proof marks for these valves, as follows, were issued by the official German Technical Inspection Authority (Vd TÜV Essen):

Series 390 (DN 25 to DN 100)
 TÜV · SV · ** - 368 · do · D · G · 0.5

Series 391 (DN 125 to DN 150)
 TÜV · SV · ** - 263 · do · D · G · 0.5

Constructions:

Weight loaded, diaphragm type, high-efficiency safety valve, angled, with highly elastic seal and metal backing in valve head.

Series 390/391 with closed bonnet

Liftable valve head. Force is transmitted centrally at the valve head via ball. Corrosion-resistant spindle guides ensure reliable and precise response of valve.

Flange connections:

Grey cast iron version: inlet and outlet as per
 DIN 2533 PN 16

Spheroidal graphite iron version and cast steel version:
 inlet as per DIN 2545 PN 40, outlet as per DIN 2543 PN 16

Materials:

Valve body GG 25, GGG 40.3, GS-C 25 or 1.4581
 Protective bonnet GG 25, GGG 40.3, GS-C 25 or 1.4408
 Valve seat Niro 1.4021/1.4301 or 1.4541
 Valve head Niro 1.4305 or 1.4571
 Spindle, polished Niro 1.4021 or 1.4571
 Guide bushes Niro 1.4301, Ms 58 or Rg 7
 Rubber diaphragm (max. 140°C) EPDM
 Load weight GG 20 or 1.4305

Models	Order Code No.		Example of Order:							
Series 390 of grey cast iron	PN 16 DN 25-100	390 GN	1 x 390 GN 25							
Series 391 of grey cast iron	PN 16 DN 125-150	391 GN	i. e. 1 THIES-diaphragm type high-efficiency safety valve, series 390							
Series 390 of spheroidal graphite iron	PN 40 DN 25-100	390 GGG	made of grey cast iron/Niro, nom. diam. 25/40, PN 16							
Series 390 of cast steel	PN 40 DN 25-100	390 SNC	response overpressure 0,5 bar.							
Series 390 of stainless steel	PN 40 DN 25- 50	390 EN								
Series 391 of spheroidal graphite iron	PN 40 DN 125-150	391 GGG								
Series 391 of cast steel	PN 40 DN 125-150	391 SNC								
Blow-off rates for saturated steam, response overpressure 0.1 to 0.5 bar										
DN	25	32	40	50	65	80	100	125	150	
DN ₁	40	50	65	80	100	125	150	200	250	
kg/h/kw - 0,5 bar	280/173	455/281	710/438	875/540	1590/981	2410/1488	3730/2302	5500/3395	7400/4568	
0,4 bar	240/148	310/191	605/373	760/469	1265/781	1930/1191	2980/1840	4917/3035	6525/4028	
0,3 bar	205/127	270/167	520/321	650/401	1085/670	1650/1019	2550/1574	4200/2593	5565/3435	
0,2 bar	165/102	215/133	420/259	525/324	875/540	1325/ 818	2050/1265	3376/2084	4466/2757	
0,1 bar	115/ 71	150/ 93	295/182	365/225	610/377	930/ 574	1435/ 886	2357/1455	3114/1922	
Dimensions and weights in mm and kg										
Length	A	100	110	115	120	140	160	180	200	225
Length	B	105	115	140	150	170	195	220	250	285
Overall height	H	480	500	610	625	710	735	860	980	1045
Seat diameter	do	23,5	30,0	37,9	46,5	60,0	74,0	92,0	123	148
Weight	kg	14,5	18	27,5	32	64	80	111	182	250
Clearance	x	90	90	150	150	150	150	200	260	260

As the cross sectional area of the inlet is designed to be approximately equal to that of the narrowest flow passage, a pressure drop in the feed line may affect the function of the safety valve. The feed line must be adapted to the maximum permissible pressure drop of 3% and, if necessary, enlarged appropriately. The safety valves are provided with a drain plug of size R 1/8" up to nominal diameter 50 mm and R 1/4" from nominal diameter 65 mm upwards. The dimensions and weights quoted are non-binding. Subject to design modifications.