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Spring loaded High-efficiency Safety Valves

Application:
As safety valves for steam, gases and hot water in pressure vessels and steam boilers.

Range of use:		
	EN-GJL-250	up to 300°C
	EN-GJS-400-18-LT	up to 350°C
	1.0619	up to 400°C
	1.4581	up to 550°C

Proof marks for the valves, as follows, were issued by the official German Technical Inspection Authority (VdTÜV):

For overpressure sets from 1.0 up to 3.5 bar for nominal diameters 25 to 100 mm:
TÜV · SV · **-335 · do · D/G · 0,61 · p
For overpressure sets from 2.5 up to 3.5 bar for nom. diam. 20 mm:
TÜV · SV · **-335 · do · D/G · 0,68 · p
For overpressure sets above 3.5 up to 20 bar for nom. diam. 20 to 80 mm:
TÜV · SV · **-336 · do · D/G · 0,69 · p
For overpressure sets above 20 up to 30 bar for nom. diam. 25 to 50 mm:
TÜV · SV · **-336 · do · D/G · 0,65 · p
For overpressure sets above 3.5 up to 18 bar for nom. diam. 100 mm:
TÜV · SV · **-335 · do · D/G · 0,66 · p
For overpressure sets 1 bar for nom. diam. 125 mm:
TÜV · SV · **-776 · do · D/G · 0,53 · p
For overpressure sets 1 bar for nom. diam. 150 mm:
TÜV · SV · **-776 · do · D/G · 0,45 · p

THIES High-efficiency Safety Valves meet the following German requirements: Pressure Vessel Safety Regulations, AD Specification A 2 for "Safety Valves", the technical rules for steam boilers (TRD) and the Safety Valves Code.

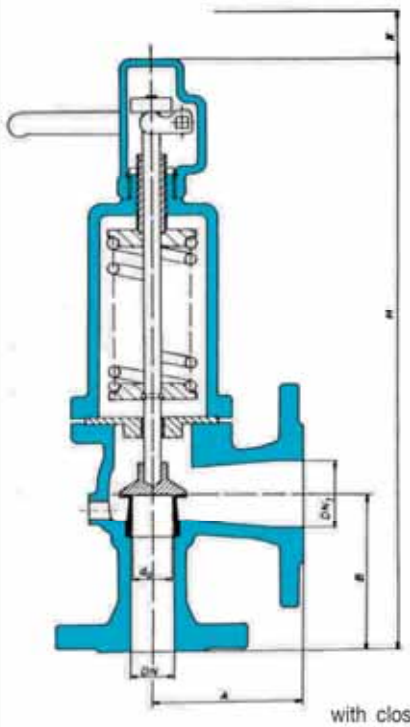
Construction:
THIES spring loaded high-efficiency safety valve, angled.
Series 356 gastight version
Series 357 version with closed bonnet
Liftable valve head. Force is transmitted centrally at the valve head via ball. Corrosion-resistant spindle guides ensure reliable and precise response of the valve.

Flange connections:
Grey cast iron version: inlet and outlet as per DIN 2533 PN 16
Spheroidal graphite iron version, cast steel version and stainless steel version: inlet as per DIN 2545 PN 40
outlet as per DIN 2543 PN 16

Materials

Valve body	EN-GJL-250, EN-GJS-400-18-LT, 1.0619 or 1.4581
Protective bonnet	EN-GJL-250, EN-GJS-400-18-LT, 1.0619 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
Spring	Niro 1.4310, DIN 17223 C or 50 CrV 4
Bolts	CK 35, 1.4401, 24CrMo 5/5.6

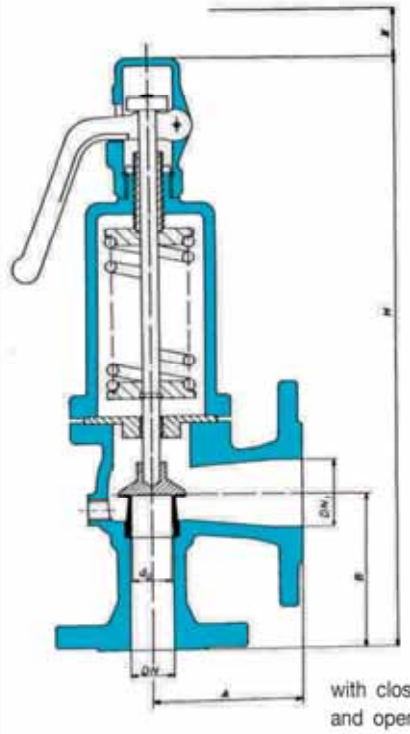
356 Gastight model



with closed protective bonnet and gastight lift housing
DN 125 and DN 150 not shown

x = Pressure change in range of fitted spring
x_1 = Pressure change requiring spring replacement

357 Closed bonnet



with closed protective bonnet and open lift housing
DN 125 and DN 150 not shown

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356 + 357

Models and dimensions

Models and dimensions	Order Code No.
Series 356 of grey cast iron	PN 16 300°C 356 GN
Series 357 of grey cast iron	PN 16 300°C 357 GN
Series 356 of spheroidal graphite iron	PN 40 350°C 356 GGG up to 20 bar
Series 356 of spheroidal graphite iron	PN 40 350°C 356 GH over 20 bar
Series 357 of spheroidal graphite iron	PN 40 350°C 357 GGG up to 20 bar
Series 357 of spheroidal graphite iron	PN 40 350°C 357 GH over 20 bar
Series 356 of cast steel	PN 40 400°C 356 SNC up to 20 bar
Series 356 of cast steel	PN 40 400°C 356 SH over 20 bar
Series 357 of cast steel	PN 40 400°C 357 SNC up to 20 bar
Series 357 of cast steel	PN 40 400°C 357 SH over 20 bar
Series 356 of stainless steel	PN 40 550°C 356 EN

Special Versions	
Flexible gasket, max. 140°C [1]	A
Free from nonferrous metals	O
High temperature spring 50 CrV 4 [2]	W

[1] Not required for steam [2] Contained in GGG and SNC as standard

Example of order:
1 x 357 SNC 32 — 4 bar:
i.e. 1 THIES high-efficiency safety valve, series 357 made of cast steel, nom. diam. 32/50, PN 40/16. Usable up to 400° C, response overpressure 4 bar.

Dimensions and weights in mm and kg

Nom. diam. DN		20	25	32	40	50	65	80	100	125	150
Nom. diam. DN1		32	40	50	65	80	100	125	150	200	250
Length	A	100	100	110	115	120	140	160	180	200	225
Length	B	100	105	115	140	150	170	195	220	250	285
Overall height	H	385	395	410	580	600	710	735	860	980	1045
Seat diameter	do	19,1	23,5	30,0	37,9	46,5	60,0	74,0	92,0	123	148
Weight	kg	10	12	15	24	26	46	50	72	100	133
Clearance	x	50	50	50	55	55	70	70	70	70	70
Clearance	x1	90	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 ¼" up to nom. diam. 50 mm and R ⅜" from nom. diam. 65 mm upwards.
The dimensions and weights quoted are non-binding. Subject to design modifications.

Performance Table

The values quoted apply to the response overpressure.

Saturated steam in kg/h at response overpressure p
Air in Nm³/h at 0°C and 760 Torr
at response overpressure p

This gives an additional safety margin of 10% compared with the actual outflow. According to the German Safety Valve Code and AD Specification A 2, it is not permissible to calculate the outflow at response pressure + 10% extra pressure. The flow rates in heavy type are the figures for which the valve's type approval was issued.

DN	20		25		32		40		50		65		80		100		125		150		DN
p bar	Steam	Air	Steam	Air	Steam	Air	Steam	Air	Steam	Air	Steam	Air	Steam	Air	Steam	Air	Steam	Air	Steam	Air	p bar
1	205	251	286	344	463	556	738	887	1111	1335	1851	2223	2815	3381	4351	5226	6845	8214	8429	10115	1
1,5	260	315	355	430	574	695	916	1109	1379	1669	2296	2779	3493	4227	5399	6533					1,5
2	311	377	425	516	686	834	1112	1330	1648	2003	2744	3334	4173	5072	6450	7839					2
2,5	359	441	491	602	794	973	1267	1552	1907	2336	3176	3890	4830	5917	7466	9146					2,5
3	408	503	559	688	903	1111	1441	1774	2168	2670	3610	4446	5492	6762	8488	10452					3
3,5	466	573	711	875	1149	1414	1833	2257	2759	3398	4594	5657	6988	8606	10016	12334					3,5
4	515	637	786	973	1269	1572	2026	2508	3050	3776	5078	6268	7724	9562	11070	13705					4
4,5	563	701	860	1070	1389	1729	2217	2759	3338	4153	5557	6915	8453	10518	12115	15075					4,5
5	614	764	938	1167	1516	1886	2419	3010	3641	4531	6062	7543	9221	11474	13216	16446					5
5,5	662	828	1011	1264	1633	2043	2607	3261	3924	4908	6533	8172	9938	12430	14243	17816					5,5
6	713	892	1089	1362	1759	2200	2807	3511	4226	5286	7036	8800	10702	13386	15340	19186					6
6,5	762	956	1163	1459	1880	2357	3000	3762	4516	5663	7519	9429	11437	14343	16392	20557					6,5
7	811	1019	1238	1556	2000	2514	3192	4013	4805	6041	8000	10058	12168	15299	17441	21928					7
7,5	861	1083	1315	1653	2125	2672	3391	4264	5105	6418	8500	10686	12929	16255	18532	23298					7,5
8	910	1147	1389	1751	2244	2829	3582	4515	5392	6796	8977	11315	13654	17211	19571	24668					8
8,5	958	1210	1462	1848	2363	2986	3771	4765	5677	7174	9451	11943	14376	18167	20606	26039					8,5
9	1008	1274	1539	1945	2487	3143	3970	5016	5975	7551	9949	12572	15133	19123	21689	27409					9
9,5	1056	1338	1612	2042	2605	3300	4157	5267	6258	7929	10420	13201	15849	20080	22716	28780					9,5
10	1103	1401	1685	2140	2722	3457	4344	5518	6540	8306	10888	13829	16562	21036	23738	30151					10
11	1204	1529	1838	2334	2969	3772	4739	6020	7134	9061	11878	15086	18067	22948	25897	32892					11
12	1301	1656	1986	2529	3209	4086	5121	6521	7709	9816	12835	16344	19523	24860	27983	35633					12
13	1397	1784	2133	2723	3447	4400	5501	7023	8281	10572	13788	17601	20972	26773	30060	38374					13
14	1497	1911	2285	2918	3693	4715	5894	7524	8873	11327	14772	18858	22470	28685	32206	41115					14
15	1597	2038	2438	3112	3939	5029	6287	8026	9464	12082	15757	20115	23968	30597	34354	43856					15
16	1692	2166	2584	3307	4175	5343	6663	8528	10030	12837	16700	21372	25402	32510	36409	46596					16
17	1787	2293	2729	3501	4409	5657	7038	9029	10594	13592	17638	22630	26829	34422	38454	49338					17
18	1887	2421	2880	3696	4654	5972	7428	9531	11182	14347	18617	23887	28319	36335	40590	52079					18
19	1986	2548	3032	3890	4899	6286	7819	10033	11771	15102	19507	25144	29810	38247	42727	54820					19
20	2075	2675	3168	4084	5119	6600	8169	10534	12297	15857	20474	26401	31144	40159	44638	57561					20
21			3162	4079	5150	6644	8217	10600	12370	15957											21
22			3305	4263	5389	6952	8591	11082	12932	16682											22
23			3449	4449	5619	7249	8964	11564	13494	17407											23
24			3593	4635	5853	7550	9338	12046	14056	18132											24
25			3736	4819	6087	7852	9711	12527	14619	18859											25
26			3880	5005	6321	8154	10085	13010	15181	19583											26
27			4024	5191	6555	8456	10458	13491	15743	20308											27
28			4168	5377	6789	8758	10832	13973	16305	21033											28
29			4311	5561	7023	9060	11205	14454	16868	21760											29
30			4455	5747	7257	9361	11579	14937	17430	22484											30