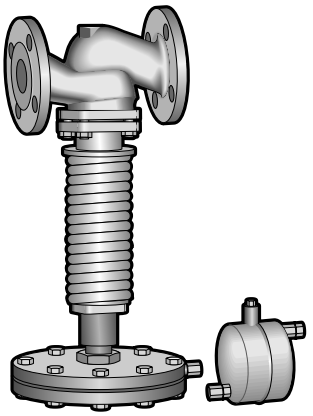
Reducing Valve
Steam

AT 4265

Dimension range	PN	Temperature range	Material
DN 15-100	40	max 300° C	Steel

Range of Application

For pressure reducing of steam
High pressure max. 25 bar(e)
Temperature max. 300^{0}C
Low pressure 0,15-13 bar (see table Low pressure range below)



AT 4265

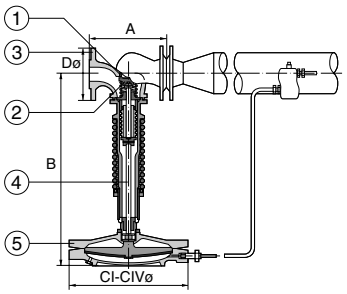
Quality Assurance

CE-marking
Fulfil PED 97/23/EC acc. to category IV group 1 and 2.

Material Specification

1	Body	steel	GS-C25
2	Seat	stainles steel	X20Cr13
3	Disc	stainless steel	X35CrMo17
4	Spindle	stainless steel	X12CrMoS17
5	Diaphragm chamber	cast iron	GG-20

Dimension and Weight



DN			15	20	25	32	40	50	65	80	100
A			130	150	160	180	200	230	290	310	350
B			440	440	440	445	445	540	540	610	650
D			95	105	115	140	150	165	185	200	235
Weight incl. diaphragm chamber	I	Q44,Q66	17	17	18	20	22	30	34	41	58
Diaphragm chamber	II	Q93,Q140	20	20	21	23	25	33	37	44	61
	III	Q 300	24	24	25	27	29	37	41	48	65
	IV	Q500	29	29	30	32	34	42	546	53	70
Diaphragm chamber diam. C	I	172									
	II	220									
	III	282									
	IV	340									

Measurements in mm, weight in kg.

Function and Design

The disc is relieved, which provides a constant low pressure even at varying high pressure.
The position of the disc is controlled by the low pressure that via the condensate vessel and the impulse line affects the diaphragm house. The valve is tight at zero consumption in intermittent operation.
The valve is single seated and self-acting without auxiliary control.

Marking

Manufacturer, DN, PN, material and flow arrow.
Diaphragm chamber is marked with I, II, III or IV.

Technical Information

Valve capacity saturated steam kg/h

P, over pressure	Valve DN								
bar (e)	15	20	25	32	40	50	65	80	100
0,5	51	68	90	118	186	300	460	800	1250
0,75	63	84	112	146	230	360	580	1000	1550
1	75	100	133	175	280	430	700	1200	1850
1,5	100	133	175	240	360	590	910	1600	2500
2	125	170	230	290	450	750	1160	2000	3050
2,5	150	200	260	350	550	880	1390	2400	3600
3	175	240	310	400	640	1010	1600	2700	4300
4	220	290	390	510	800	1300	2000	3400	5400
5	260	350	480	620	1000	1600	2500	4200	6500
6	330	440	580	760	1220	1930	3000	5100	8000
7	400	520	700	910	1430	2300	3600	6100	9500
8	450	600	800	1040	1670	2700	4100	7100	11000
9	500	670	880	1180	1800	2900	4600	7800	12000
10	560	750	980	1300	2000	3200	5100	8500	13600
12	680	900	1180	1540	2500	4000	6100	10500	18300
14	800	1050	1400	1850	2900	4700	7200	12600	19000
16	920	1230	1630	2150	3400	5500	8300	14600	22000
18	1040	1400	1860	2450	3600	6200	9500	16000	25000
21	1170	1540	2100	2700	4200	7000	10800	18500	28000
22	1330	1780	2350	3050	4900	7800	12200	21000	32000
24	1500	2000	2600	3400	5400	8700	13700	23600	36000
25	1600	2150	2800	3600	5700	9500	14500	26500	38000

Pipe capacity saturated steam kg/h

P over pressure	Pipe DN										
bar (e)	15	20	25	32	40	50	65	80	100	125	150
0,15	10	17	27	40	83	120	180	260	420	650	910
0,2	11	19	31	46	90	145	210	310	500	780	1100
0,3	13	23	35	55	112	165	240	360	560	880	1230
0,5	16	28	46	70	140	200	300	440	700	1100	1550
0,75	20	35	57	85	175	250	370	560	870	1380	1980
1	25	42	68	100	210	300	450	680	1040	1650	2400
1,5	32	55	90	140	280	400	590	880	1400	2200	3100
2	40	70	115	170	350	520	750	1120	1750	2800	3900
2,5	47	84	135	200	400	600	880	1310	2100	3300	4600
3	55	99	155	240	480	700	1020	1540	2400	3800	5300
4	70	123	195	300	600	890	1300	1900	3000	4800	6000
5	85	150	245	360	740	1080	1600	2400	3700	5800	8200
6	104	185	300	450	900	1340	1950	2900	4700	7200	10000
7	122	225	350	540	1100	1600	2400	3400	5500	8600	12200
8	140	250	400	600	1250	1800	2700	4000	6200	9900	14200
9	160	280	450	680	1380	2000	2290	4400	6900	10900	15500
10	180	320	500	750	1500	2300	3300	5000	7800	12000	17000
12	220	380	610	900	1850	2700	4000	6000	9200	14500	21000
14	260	450	720	1050	2300	3100	4700	7000	11000	17000	24500
16	300	520	830	1230	2600	3600	5500	8100	12600	20000	26000
18	340	590	940	1400	2900	4200	6200	9200	14000	23000	32000
21	380	670	1050	1580	3300	4800	7000	10300	16500	26000	36000
22	425	750	1180	1780	3700	5300	7800	11700	18500	29000	40000
24	475	840	1320	2000	4100	6000	8700	13200	21000	33000	46000
25	510	900	1400	2150	4400	6500	9200	14200	23000	36000	60000

Kvs value for calculating of safety valve

DN	15	20	25	32	40	50	65	80	100
K_{VS}	4,8	6,9	9,1	11,8	14,4	26,5	51,5	79,5	129,5

Dimensioning

At the reduction of superheated steam the given mass flow has to be multiplied first by the factor VH/VS:		
VH	=	specific volume of superheated steam
VS	=	specific volume of saturated steam

Dimensioning
The tables of capacity are used to dimensioning of:
Reducing valve
High pressure pipe line
Low pressure pipe line

Correction factor
Correction factors must also be used for certain pressure ratios as follows:
At following pressure ratios (bar a) must the requested capacity be multiplied by the correction factors.
(P2 låg+1)/(P1 hög+1) ≥ 0,7 gives correction factor = 1,25
(P2 låg+1)/(P1 hög+1) ≥ 0,8 gives correction factor = 1,6
(P2 låg+1)/(P1 hög+1) = 0,9 gives correction factor = 2,25
(P2 låg+1)/(P1 hög+1) < 0,7 no correction factor needs
P2 låg = low pressure bar (e)
P1 hög = high pressure bar (e)
Note that in the choice of smaller pipe dimensions the pressure drop will increase.

Example of dimensioning
Steam capacity: 5400 kg/h
High pressure: 25 bar
Low pressure: 7 bar

Reducing valve
Go to 25 bar in the column "P overpressure" of the valve capacity table which indicate the max. steam capacity the valve can be used for. Follow the horizontal line until you find a value equal or higher than 5400 kg/h. In this case it will be 5700 kg/h. Now go to the top and you will find the nominal valve diameter DN40.

High pressure pipeline
Go to 25 bar in the column "P overpressure" of the pipeline capacity table. Follow the horizontal line until you find a value equal or higher than 5400 kg/h. In this case it will be 6500 kg/h. Now go to the top and you will find the nominal pipe diameter DN50.

Low pressure pipeline
Do as above but go to 7 bar in the column "P overpressure" of the pipeline capacity table. Follow the horizontal line until you find a value equal or higher than 5400 kg/h. In this case it will be 5500 kg/h. Now go to the top and you will find the nominal pipe diameter DN100.

Results of dimensioning
Reducing valve DN 40
High pressure pipeline DN 50
Low pressure pipeline DN 100

It is possible to select a reducing valve, if estimated more practical, in the same DN as the high pressure pipeline. In this example a valve DN 50 can also be used.

Low Pressure range

Membran	I- Q 44[1]		I-Q 66		II- 93[1]		II-Q 140		III-Q 300		IV-Q 500		IV-Q 500	
DN	bar	Spring	bar	Spring	bar	Spring	bar	Spring	bar	Spring	bar	Spring	bar	Spring
15	8,3-13,0	605	5,6-8,2	605	3,9-5,5	605	1,7-3,8	605	1,0-1,6	605	0,5-0,99	605	0,15-0,49	603
20	8,3-13,0	605	5,6-8,2	605	3,9-5,5	605	1,7-3,8	605	1,0-1,6	605	0,5-0,99	605	0,15-0,49	603
25	8,3-13,0	605	5,6-8,2	605	3,9-5,5	605	1,7-3,8	605	1,0-1,6	605	0,5-0,99	605	0,15-0,49	603
32	8,3-13,0	605	5,6-8,2	605	3,9-5,5	605	1,7-3,8	605	1,0-1,6	605	0,5-0,99	605	0,15-0,49	603
40	8,3-13,0	605	5,6-8,2	605	3,9-5,5	605	1,7-3,8	605	1,0-1,6	605	0,5-0,99	605	0,15-0,49	603
50	8,6-13,0	614	7,0-8,5	614	4,3-6,9	615	2,0-4,2	615	1,0-1,9	615	0,5-0,99	615	0,15-0,49	613
65	8,6-13,0	614	7,0-8,5	614	4,3-6,9	615	2,0-4,2	615	1,0-1,9	615	0,5-0,99	615	0,15-0,49	613
80	-	-	9,0-13,0	623	5,1-8,9	624	2,0-5,0	624	1,0-1,9	624	0,46-0,99	624	0,15-0,45	622
100	-	-	-	-	6,1-13,0	634	2,0-6,0	634	1,0-1,9	634	0,46-0,99	634	0,15-0,45	632

[1] Membran chamber provided with insert rings.

Now are the size of valve, high pressure and low pressure pipeline determined and it is time to determine type of diaphragm chamber and spring in combination as follows:
Use table “Low pressure range” and go to DN 40 in column DN ,. Follow the line to right until you find a low pressure range where the requested low pressure, 7 bar, can be conformed and you will find low pressure range 5,6-8,2 and spring 605. Go to the top and you will find diaphragm chamber Q 66.
The low pressure is now adjustable within the low pressure range 5,6-8,2 bar.
If the condition of low pressure is changed with a low pressure outside the existing pressure range it is necessary to replace diaphragm chamber alternatively the spring or both.

Installation

1 Building in

To avoid pressure drop in the low pressure pipeline the reducing valve should be mounted as closed as possible to the consumption point and in horizontal position with the diaphragm chamber down wards and the diaphragm is hereby protected against hot steam during the water/condensate from the condensate vessel.

2 Impulse pipe

The condensate vessel is connected to the low pressure pipe ca 2 m after the valve and is connected via the impulse pipe with the membrane body. This to make the steamregain a calmer progress after the reducing valve and create a more stable low pres-sure. Both condensate vessel and membrane body have connections for connecting steel pipes (impulse pipe) with an external diameter of .10 mm.

3 Strainer

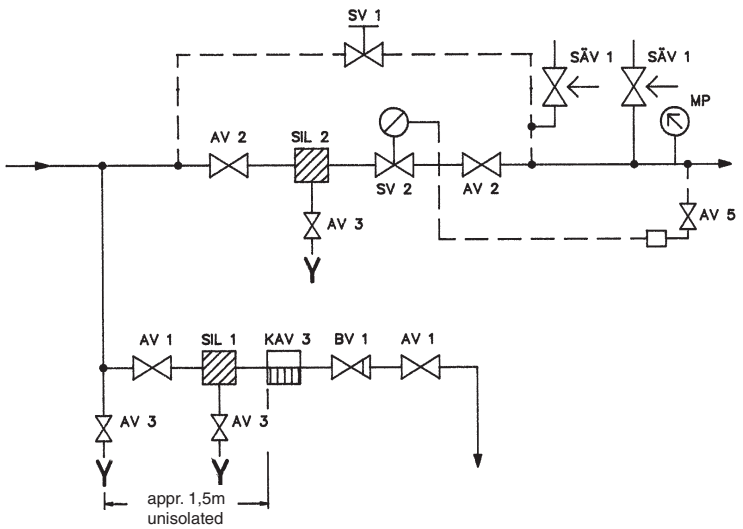
To prevent dirt in the steam from damaging seat and disc, the strainer should be mounted before the reducing valve. By that the costs for maintenance decrease

and the reliability increases.

4. Shut-off valve
At long times without any steam consumption, the shut-off valve before the reducing valve should be closed for reasons of security.

5 Safety valve
The low pressure pipe and connected equipment shall be protected by a safety valve. By dimensioning this valve, maximum steam flow is calculated acc. to the Kvs-value of the reducing valve.

Starting up and adjustment of low pressure
1. Fill the plug on the condensate vessel with water. Make sure that the diaphragm chamber is ventilated so that the space under the membrane body also is filled.
2. Loosen the spring by turning the spring plate anti-clockwise.
3. Make sure that the valve on the low pressure side is open.
4. Open the valve on the high pressure side slowly.
5. Tighten the spring by turning the spring plate clockwise until the pressure gauge shows the requested low pressure.



System fittings

		PN 40	PN 25
AV1	Shut-off valve	AT 1050	AT 1028
AV2	Shut-off valve	AT 1050	AT 1028
AV3	Shut-off valve	AT 3547HT	AT 3547HT
AV5	Shut-off valve	AT 1890	AT 1890
SV1	Balancing valvel (man)	AT 1340	AT 1320
SV2	Reucing valve	AT 4265	AT 4265
SÄV1	Safety valve	AT 4550	AT 4550
SIL1	Strainer	AT 4042	AT 4028
SIL2	Strainer	AT 4042	AT 4028
KAV3	Steam trap	AT 4440	
BV1	Check valve	AT 1174	
MP	Manometer kit	AT 1804	

How to order

Example: Reducing valve AT 4265 -40Q66-605 (low pressure range 5,6-8,2 bar)			
AT 4265	**-40**	**Q 66**	**-605**
Fig. no.	DN	Membrane	Spring