Liquid drainer
ANSI150 / 300

- with flanges (Fig. 665....1)
- with screwed sockets (Fig. 665....2)
- with socket weld ends (Fig. 665....3)
- with butt weld ends (Fig. 665....4)

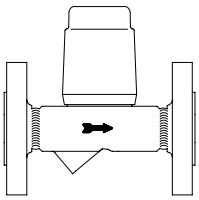


Fig. 665....1

Forged steel
Fig. 665 Page 2

Condensate discharge temperature limiter
ANSI150 / 300

- with flanges (Fig. 645/647....1)
- with screwed sockets (Fig. 645/647....2)
- with socket weld ends (Fig. 645/647....3)
- with butt weld ends (Fig. 645/647....4)

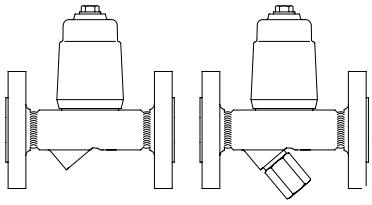


Fig. 647....1

Forged steel
Fig. 645/647 (Y) Page 4

Return temperature limiter
ANSI150 / 300

- with flanges (Fig. 650....1)
- with screwed sockets (Fig. 650....2)
- with socket weld ends (Fig. 650....3)
- with butt weld ends (Fig. 650....4)

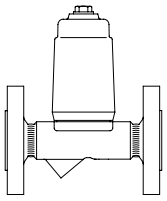


Fig. 650....1

Forged steel
Fig. 650 Page 6

Automatic air vent for liquid systems
ANSI150 / 300

- with flanges (Fig. 656....1)
- with screwed sockets (Fig. 656....2)
- with socket weld ends (Fig. 656....3)
- with butt weld ends (Fig. 656....4)

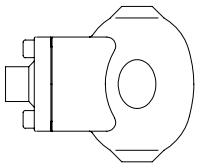


Fig. 656....1

Cast steel
Stainless steel
Fig. 656 Page 10

Liquid drainer (Forged steel)

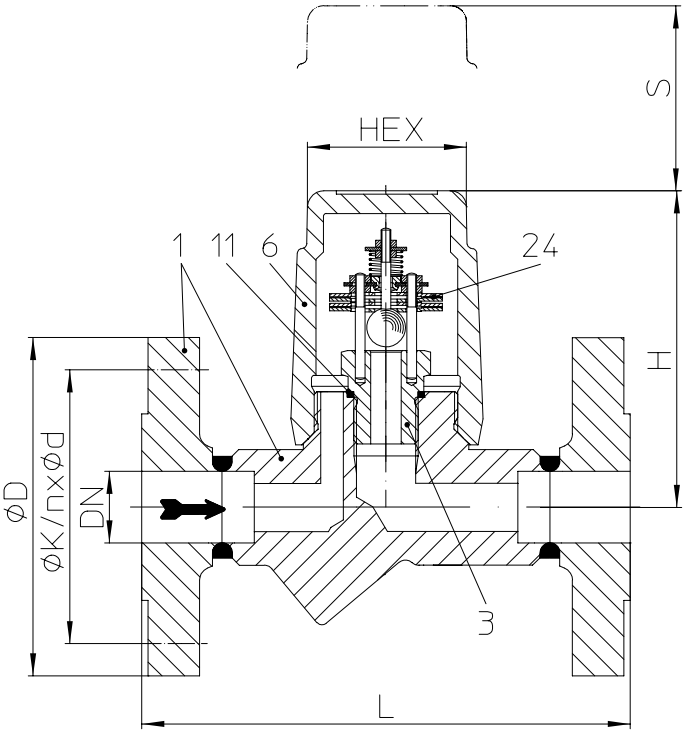


Fig. 665....1 with flanges

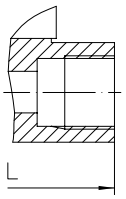


Fig. 665....2
with screwed sockets

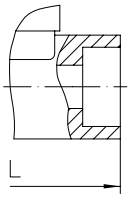


Fig. 665....3
with socket weld ends

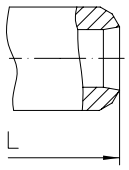


Fig. 665....4
with butt weld ends

Figure	Nominal pressure	Material	NPS	Operating pressure PS	Inlet temperature TS	Allow. differential pressure ΔPMX
42.665	ANSI150	SA105	1/2" - 1"	13 barg	225 °C	1,5 bar
				5,5 barg	427 °C	
45.665	ANSI300	SA105	1/2" - 1"	32 barg	411 °C	
				28 barg	427 °C	
SA182F321 on request.						
DIN/EN-Constructions refer to data sheet CONA®Components						

Types of connection	Other types of connection on request.
• Flanges 1	acc. to ASME B16.5
• Screwed sockets 2	NPT thread acc. to ANSI B1.20.1 or Rp thread acc. to DIN EN 10226-1
• Socket weld ends 3	acc. to ASME B16.11
• Butt weld ends 4	ASME B16.25 (Note restriction on operating pressure / inlet temperature depending to design!)

Features
• Automatic condensate-discharge during start-up and shut down
• On unpressurized system the liquid drainer will be opened by a compression spring inside of the controller
• On factory setting the liquid drainer will be closed at a differential pressure of ≥1,5 bar. Other factory settings between 0,5 bar and 2 bar possible.
• Bimetallic elements will achieve that the closing pressure is constant
• Installation in any position (if a frost resistant execution is required please inquire)

Selection criteria		**Example for order data**
Closing pressure	Material	For the condensate discharge from a steam pipe, Δp = 1,5 bar, max. Flow 700 kg/h, with flanges, ANSI150, NPS 1"
Nominal diameter / pressure	Place of service	**=> Liquid drainer, Fig. 665, ANSI150, NPS 1", SA105, Face-to-face dimension 160 mm, with flanges**
Type of connection		

Types of connection		Flanges			Screwed sockets Socket weld ends			Butt weld ends		
NPS		1/2"	3/4"	1"	1/2"	3/4"	1"	1/2"	3/4"	1"
Face-to-face acc. to data sheet resp. customer request										
L	(mm)	150	150	160	95	95	95	250	250	250
Dimensions										.Standard-flange dimensions refer to page 12.
H	(mm)	98	98	103	98	98	103	98	98	103
H1	(mm)	62	62	55	62	62	55	62	62	55
S	(mm)	70	70	70	70	70	70	70	70	70
S1	(mm)	30	30	30	30	30	30	30	30	30
HEX	(mm)	50	50	50	50	50	50	50	50	50
Weights										
Fig. 665 (approx.)	(kg)	3,2	3,7	4,2	1,7	1,6	2,1	2,2	2,3	2,4

Parts

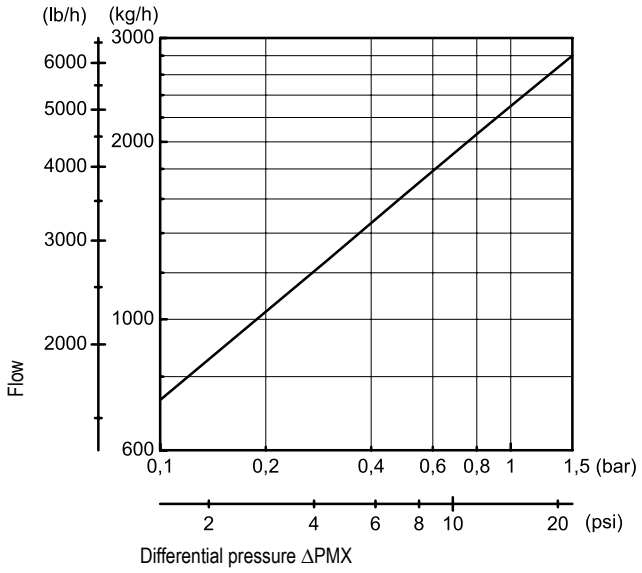
Pos.	Sp.p.	Description	Fig. 42./45.665
1		Body	SA105
6		Cover / Cap	SA105
11	x	Sealing ring	SA240Gr.316Ti
24	x	Controller, cpl.	TB 102 / 85 (corrosion resistant bimetal)
		└ Spare parts	

Information / restriction of technical rules need to be observed!

Resistance and fitness must be verified (contact manufacturer for information, refer to Product overview and Resistance list).

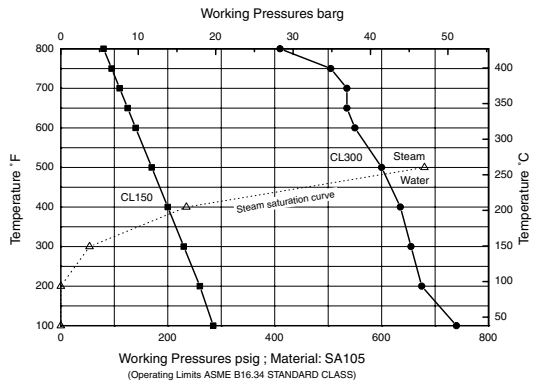
Operating and installation instructions can be downloaded at www.ari-armaturen.com.

Capacity chart



The capacity chart shows the maximum flow quantities of cold condensate at about 20°C.

Pressure-Temperature-Diagram



Condensate discharge temperature limiter (Forged steel)

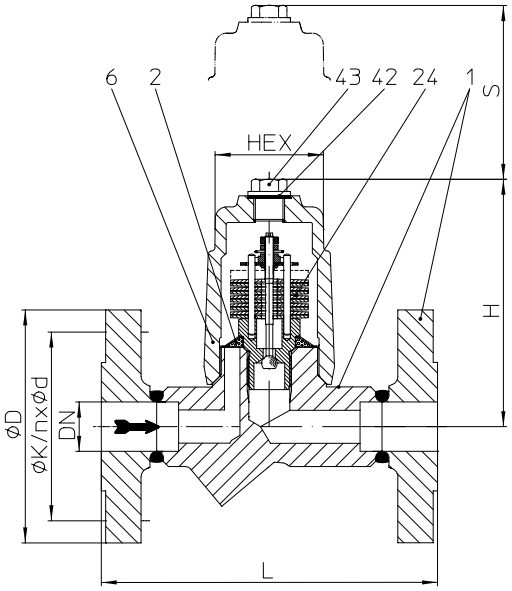


Fig. 645....1 with flanges

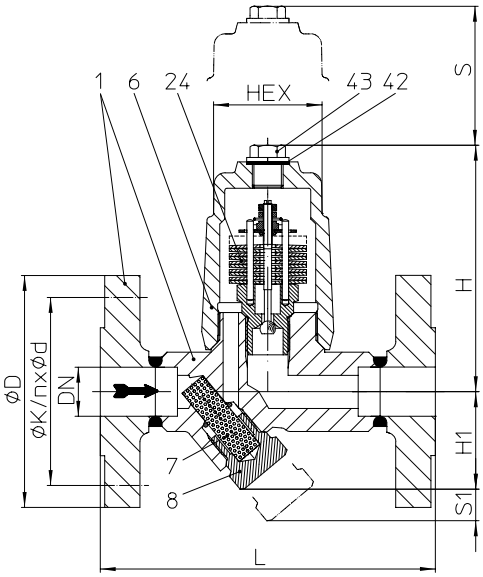


Fig. 647.... with flanges

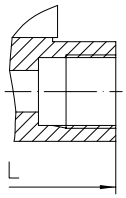


Fig. 645/647....2
with screwed sockets

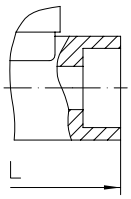


Fig. 645/647....3
with socket weld ends

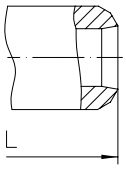


Fig. 645/647....4
with butt weld ends

Figure	Nominal pressure	Material	NPS	Operating pressure PS	Inlet temperature TS	allowable differential pressure ΔPMX	for controller
42.645 42.647 (Y)	ANSI150	SA105	1/2" - 1"	13 barg	225 °C	32 bar	R32
				5,5 barg	427 °C		
45.645 45.647 (Y)	ANSI300	SA105	1/2" - 1"	32 barg	411 °C	32 bar	R32
				28 barg	427 °C		
For ANSI versions refer to data sheet CONA®Components-ANSI							

Types of connection — Other types of connection on request.

- Flanges ....1 _____ acc. to ASME B16.5
- Screwed sockets ....2 ___ NPT thread acc. to ANSI B1.20.1 or Rp thread acc. to DIN EN 10226-1
- Socket weld ends ....3 ___ acc. to ASME B16.11
- Butt weld ends ....4 _____ ASME B16.25 (Note restriction on operating pressure / inlet temperature depending to design!)

Features

- Steam trap for the discharge of condensate without re-evaporation at adjustable condensate temperatures (temperature range from 60°C up to 140°C)
- With corrosion- and waterhammer resistant bimetallic controller
- Automatic air-venting during start-up and operation of the installation
- Installation in any position, except cap upside down
- Integrated non return protection
- With inside strainer - Fig. 645 / with outside strainer - Fig. 647 (Y)
- Subcooling of condensate is continuously adjustable (observe the operation instructions)
- The exchange of the controller is possible without disturbing the pipe connections
- For the utilization in warm water and hot water plants

Options — (Design refer to page 5)

- with blow down valve, cpl. (Pos. 46)
- with thermometer insert (Pos. 47 and 48) (only with inside strainer)

Selection criteria

- Inlet pressure
- Back pressure
- Quantity of condensate
- Nominal diameter / pressure
- Type of connection
- Material
- Options

Example for order data

For the condensate discharge from a steam pipe, Operating pressure P1 = 4 bar(g), max. Flow 50 kg/h, Opening temperature 80°C, with flanges, ANSI300, NPS 1"

=> Condensate discharge temperature limiter, Fig. 647, ANSI300, NPS 1", SA105, **Face-to-face dimension 160 mm, with flanges, with thermometer.**

Types of connection		Flanges			Screwed sockets Socket weld ends			Butt weld ends		
NPS		**1/2"**	**3/4"**	**1"**	**1/2"**	**3/4"**	**1"**	**1/2"**	**3/4"**	**1"**
Face-to-face acc. to data sheet resp. customer request										
L	(mm)	150	150	160	95	95	95	250	250	250
Dimensions										.Standard-flange dimensions refer to page 12.
H	(mm)	112	112	121	112	112	121	112	112	121
H1	(mm)	65	65	58	65	65	58	65	65	58
S	(mm)	80	80	80	80	80	80	80	80	80
S1	(mm)	30	30	30	30	30	30	30	30	30
HEX	(mm)	50	50	50	50	50	50	50	50	50
Weights										
(approx.)	(kg)	3,6	4,3	5,6	2	2,4	2,4	2,2	2	2

Parts

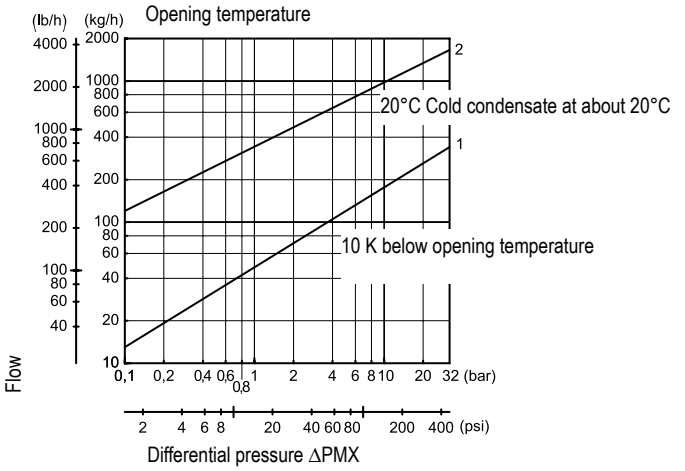
Pos.	Sp.p.	Description	Fig. 42.645 / 45.645	Fig. 42.647 / 45.647
1		Body	SA105	
2	x	Strainer	SA240Gr.304	--
6		Cap	SA105	
7	x	Strainer	--	SA240Gr.304
8		Strainer plug	--	SA276Gr.321
24	x	Controller, cpl.	TB 102 / 85 (corrosion resistant bimetal)	
42	x	Sealing ring	SA240Gr.316Ti	
43	x	Screw plug	SA276Gr.321	
46		Blow down valve, cpl.	SA276Gr.321	
47	x	Thermometer adapter	SA276Gr.321	
48	x	Thermometer	Stainless steel	
		└ Spare parts		

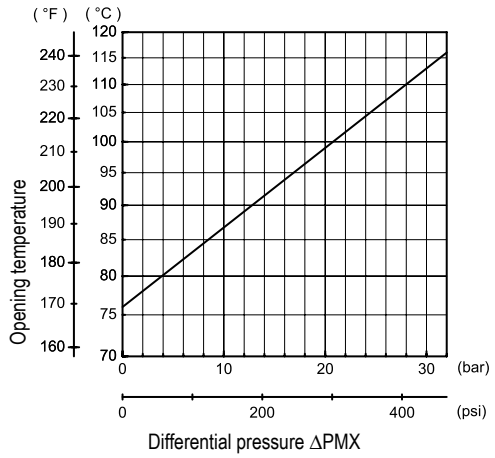
Information / restriction of technical rules need to be observed!

Resistance and fitness must be verified (contact manufacturer for information, refer to Product overview and Resistance list).

Operating and installation instructions can be downloaded at www.ari-armaturen.com.

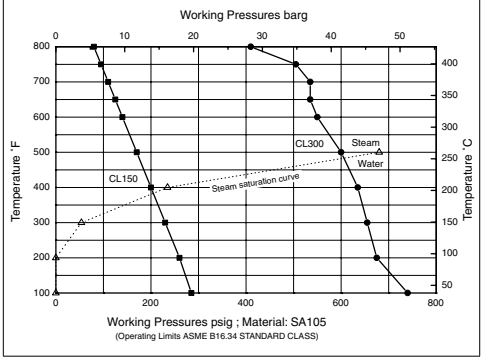
Capacity chart



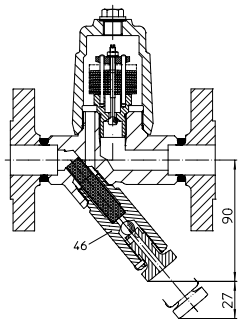


The capacity chart shows the maximum flow quantities of cold condensate at about 20°C and condensate at 10K below the opening temperature based on the factory setting.

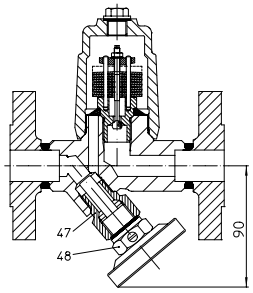
Pressure-Temperature-Diagram



Options



Outside strainer with blow down valve



Thermometer insert with adapter
(Indicating range: 0°C up to 160°C) standard,
(up to 250°C on request)

Return temperature limiter (Forged steel)

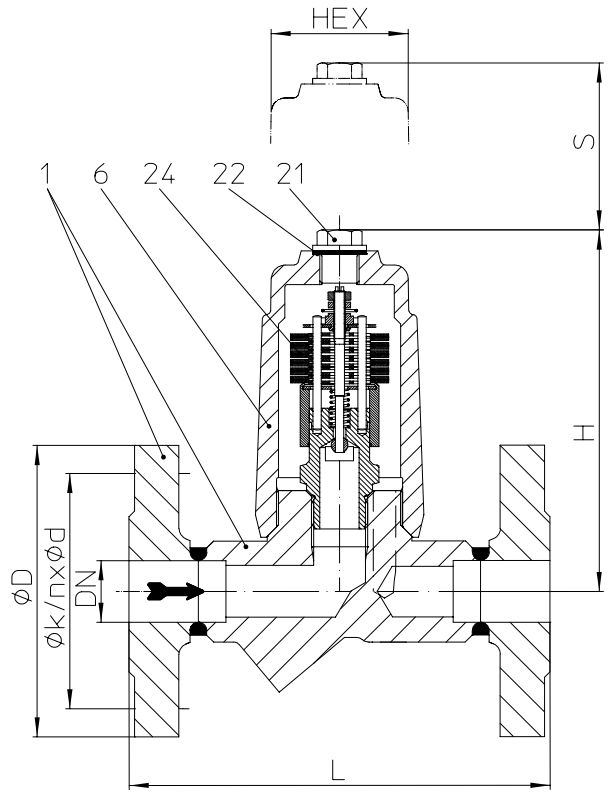


Fig. 650....1 with flanges

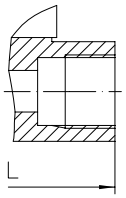


Fig. 650....2
with screwed sockets

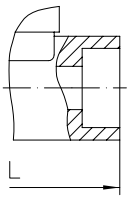


Fig. 650....3
with socket weld ends

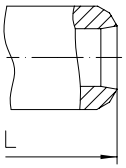


Fig. 650....4
with butt weld ends

Figure	Nominal pressure	Material	NPS	Operating pressure PS	Inlet temperature TS	allowable differential pressure ΔPMX	for controller
42.650	ANSI150	SA105	1/2" - 1"	14,5 barg	180 °C	6 bar	R22
45.650	ANSI300	SA105	1/2" - 1"	22 barg	180 °C		
For ANSI versions refer to data sheet CONA®Components-ANSI							

Types of connection — Other types of connection on request.

- Flanges ....1 _____ acc. to ASME B16.5
- Screwed sockets ....2 ___ NPT thread acc. to ANSI B1.20.1 or Rp thread acc. to DIN EN 10226-1
- Socket weld ends ....3 ___ acc. to ASME B16.11
- Butt weld ends ....4 _____ ASME B16.25 (Note restriction on operating pressure / inlet temperature depending to design!)

Features

- Liquid return temperature limiter is applied for the return of hot water or other suitable liquids in heating systems.
  Temperature guided but operating from the pressure, it is providing a consumption oriented supply of hot water to heating systems.
  Energy saving by using reduced flow return temperatures.
- With corrosion- and waterhammer resistant bimetallic controller
- The controller has a stroke-limitation at 130 °C thus even in case of an incorrect setting the function is performed
- Scope range of closing temperature from: 60° to 130 °C
- The exchange of the controller is possible without disturbing the pipe connections
- Optimized design for quick installation
- Maintenance simplified due to screwed cap without sealing
- Installation: horizontal installation position is preferred, inclined installation position of the screwed cap is possible

Options — (Design refer to page 7)

- with thermometer insert (Pos. 47 and 48)
- with external adjustment device (pos. 44) and extended setting range, with factory setting at 180°C

Selection criteria

- Closing pressure
- Operating pressure
- Back pressure/Differential pressure
- Flow quantity
- Upstream temperature
- Required closing temperature
- Nominal diameter / pressure
- Type of connection
- Material

Example for order data

Return temperature limitation for a pipe tracing system.. Inlet pressure 4bar(ü), Schließtemperatur 90°C, Flanschanschluss, ANSI300, NPS 1/2", SA105, Face-to-face dimension 150 mm.

=> Return temperature limiter, Fig. 650, ANSI300, NPS 1/2", SA105, Face-to-face dimension 150 mm, T=90°C, Flanschanschluss

Types of connection		Flanges			Screwed sockets Socket weld ends			Butt weld ends		
NPS		1/2"	3/4"	1"	1/2"	3/4"	1"	1/2"	3/4"	1"
Face-to-face acc. to data sheet resp. customer request										
L	(mm)	150	150	160	95	95	95	250	250	250
Dimensions										.Standard-flange dimensions refer to page 12.
H	(mm)	130	130	130	130	130	135	130	130	130
H1	(mm)	152	152	152	152	152	152	152	152	152
S	(mm)	90	90	90	90	90	90	90	90	90
S1	(mm)	90	90	90	90	90	90	90	90	90
HEX	(mm)	50	50	50	50	50	50	50	50	50
Weights										
(approx.)	(kg)	3,4	4,0	4,4	2,1	2,0	2,5	2,6	2,7	2,8

Parts

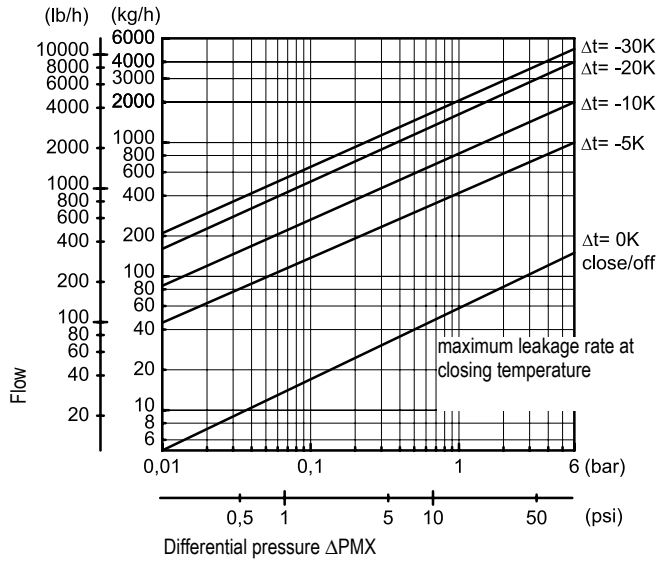
Pos.	Sp.p.	Description	Fig. 42.650 / 45.650
1		Body	SA105
6		Cap	SA105
21		Screw plug	SA276Gr.321
22	x	Sealing ring	SA240Gr.316Ti
24	x	Controller, cpl.	TB 102 / 85 (corrosion resistant bimetal)
47	x	Thermometer adapter	SA276Gr.321
48	x	Thermometer	Stainless steel
	└ Spare parts		

Information / restriction of technical rules need to be observed!

Resistance and fitness must be verified (contact manufacturer for information, refer to Product overview and Resistance list).

Operating and installation instructions can be downloaded at www.ari-armaturen.com.

Capacity chart



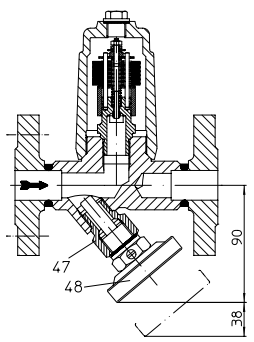
The capacity chart shows the maximum capacity at factory setting (90°C).

The water-temperature determines the degree of opening of the controller. The lower temperature of the water the higher the flow quantity.

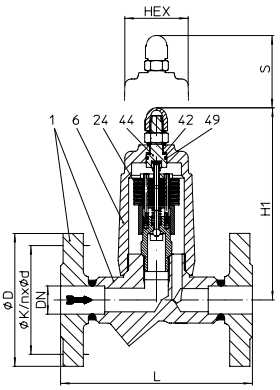
Change of the factory setting

After opening the cap in pressureless mode, an adjustment of the closing temperature can be done. A half turn of the screw clockwise results in an increase of temperature by about 10K.

Options



Thermometer insert with adapter
(Indicating range: 0°C up to 160°C) standard,
(up to 250°C on request)



External adjustment

Return temperature limiter (Forged steel)

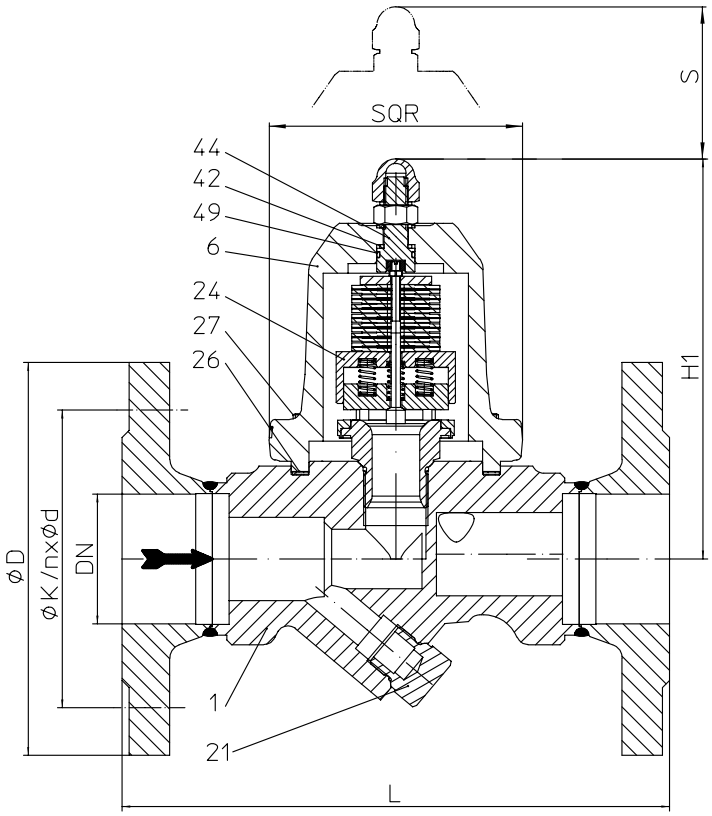


Fig. 650....1 with flanges

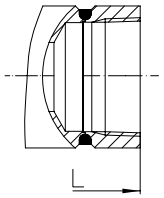


Fig. 650....2
with screwed sockets

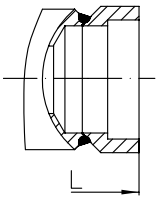


Fig. 650....3
with socket weld ends

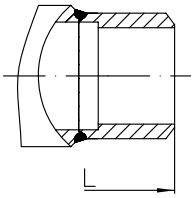


Fig. 650....4
with butt weld ends

Figure	Nominal pressure	Material	NPS	Operating pressure PS	Inlet temperature TS	allowable differential pressure ΔPMX	for controller
42.650	ANSI150	SA105	1 1/2" - 2"	14,5 barg	180 °C	6 bar	R22
45.650	ANSI300	SA105	1 1/2" - 2"	22 barg	180 °C		
For ANSI versions refer to data sheet CONA®Components-ANSI							

Types of connection — Other types of connection on request.

- Flanges ....1 _____ acc. to ASME B16.5
- Screwed sockets ....2 ___ NPT thread acc. to ANSI B1.20.1 or Rp thread acc. to DIN EN 10226-1
- Socket weld ends ....3 ___ acc. to ASME B16.11
- Butt weld ends ....4 _____ ASME B16.25 (Note restriction on operating pressure / inlet temperature depending to design!)

Features

- Liquid return temperature limiter is applied for the return of hot water or other suitable liquids in heating systems.
  Temperature guided but operating from the pressure, it is providing a consumption oriented supply of hot water to heating systems.
  Energy saving by using reduced flow return temperatures.
- With corrosion- and waterhammer resistant bimetallic controller
- Scope range of closing temperature from up to 180 °C
- With external adjustment device (pos. 44) and extended setting range
- With factory setting 90°C
- The exchange of the controller is possible without disturbing the pipe connections
- Installation: horizontal installation position is preferred, inclined installation position of the screwed cap is possible

Options — (Design refer to page 9)

- with thermometer insert (Pos. 47 and 48)

Selection criteria		Example for order data
• Closing pressure	• Required closing temperature	Return temperature limitation for a pipe tracing system.. Inlet pressure 4bar(ü), closing temperature 90°C, flange connection, ANSI300, NPS 1 1/2", SA105, Face-to-face dimension 230mm.
• Operating pressure	• Nominal diameter / pressure	**=> Return temperature limiter, Fig. 650, ANSI300, NPS 1 1/2", SA105, Face-to-face dimension 230 mm, T=90°C, flange connection**
• Back pressure/Differential pressure	• Type of connection	
• Flow quantity	• Material	
• Upstream temperature		

Types of connection		Flanges		Screwed sockets [1] Socket weld ends		Butt weld ends	
NPS		1 1/2"	2"	1 1/2"	2"	1 1/2"	2"
Face-to-face acc. to data sheet resp. customer request							
L	(mm)	230	230	130 / 160 [1]	210	250	250
Dimensions							.Standard-flange dimensions refer to page 12.
H1	(mm)	168	168	168	168	168	168
S	(mm)	100	100	100	100	100	100
SQR	(mm)	110	110	110	110	110	110
Weights							
(approx.)	(kg)	11,3	12,1	8	8	8,9	9,8

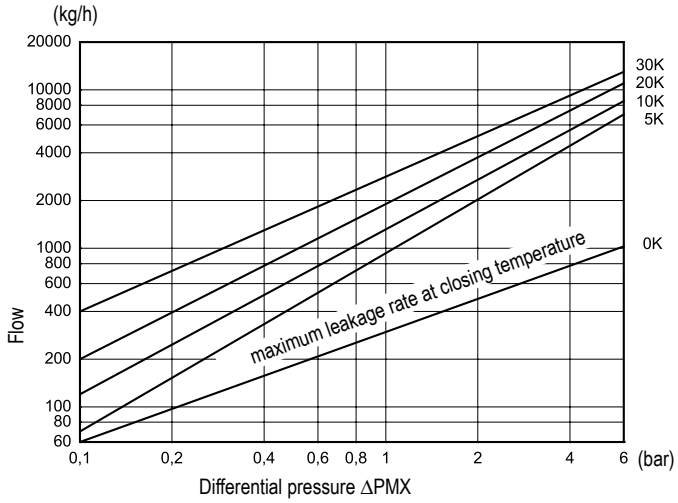
Parts			
Pos.	**Sp.p.**	**Description**	**Fig. 42.650 / 45.650**
1		Body	SA105
6		Cover	SA105
21		Screw plug	SA276Gr.321
22	x	Sealing ring	SA240Gr.316Ti
24	x	Controller, cpl.	TB 102 / 85 (corrosion resistant bimetal)
26	x	Gasket	Graphite
27		Cheese head screw	SA193-B16
42	x	Sealing ring	Cu
44		Cylinder screw HSE (Manual adjustment device)	AISI303
47	x	Thermometer adapter	SA276Gr.321
48	x	Thermometer	Stainless steel
49	x	O-ring	FPM 80
	└ Spare parts		

Information / restriction of technical rules need to be observed!

Resistance and fitness must be verified (contact manufacturer for information, refer to Product overview and Resistance list).

Operating and installation instructions can be downloaded at www.ari-armaturen.com.

Capacity chart



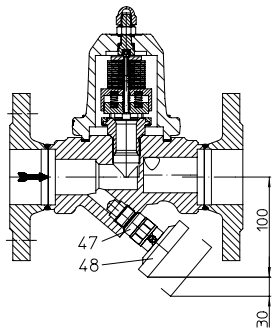
The capacity chart shows the maximum capacity at factory setting (90°C).

The water-temperature determines the degree of opening of the controller. The lower temperature of the water the higher the flow quantity.

Change of the factory setting

A half turn of the screw clockwise results in an increase of temperature by about 8K.

Options



Thermometer insert with adapter
(Indicating range: 0°C up to 160°C) standard, (up to 250°C on request)

Automatic air vent for liquid systems (Cast steel, Stainless steel)

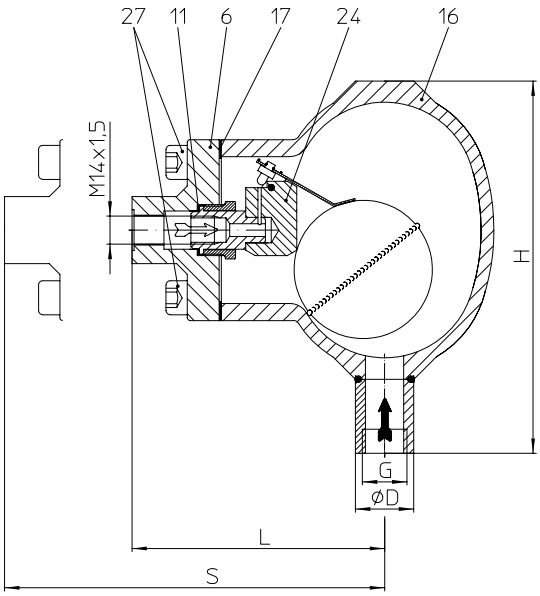


Fig. 656....2 (ANSI150) with screwed sockets

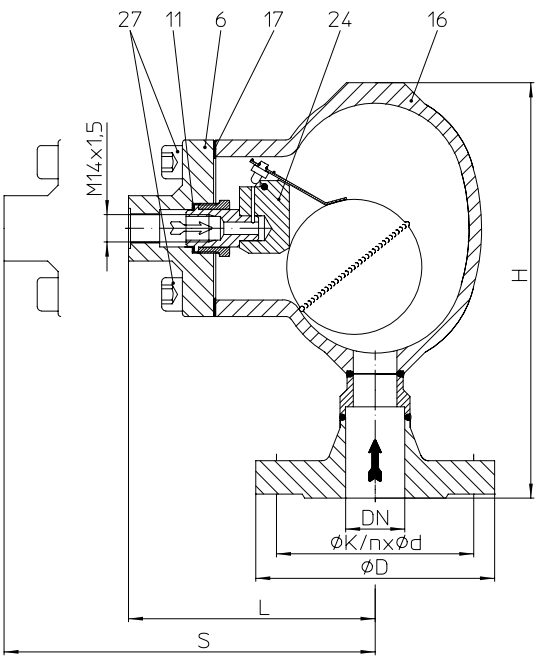


Fig. 656.... with flange

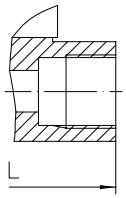


Fig. 656....2 (PN25)
with screwed sockets

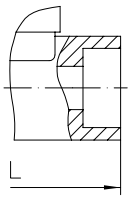


Fig. 656....3
with socket weld ends

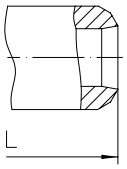


Fig. 656....4
with butt weld ends

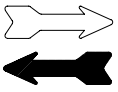


Figure	Nominal pressure	Material	NPS	Operating pressure PS	Inlet temperature TS	allowable differential pressure ΔPMX	for controller
32.656	ANSI150	SA216WCB	1/2" - 1"	19,7 barg	38 °C	19,7 bar	R21
				14 barg	196 °C		
35.656	ANSI300	SA216WCB	1/2" - 1"	21 barg	400 °C	21 bar	R21
52.656	ANSI150	SA351CF8	1/2" - 1"	19 barg	38 °C	19 bar	R21
				13,2 barg	193 °C		
55.656	ANSI300	SA351CF8	1/2" - 1"	21 barg	300 °C	21 bar	R21
DIN/EN-Constructions refer to data sheet CONA®Components							

Types of connection	Other types of connection on request.
Inlet:	• Flanges ....1 _____ acc. to ASME B16.5 • Screwed sockets ....2 ___ NPT thread acc. to ANSI B1.20.1 or Rp thread acc. to DIN EN 10226-1 • Socket weld ends ....3 ___ acc. to ASME B16.11 • Butt weld ends ....4 _____ ASME B16.25 (Note restriction on operating pressure / inlet temperature depending to design!)
Outlet:	• M14 x 1,5 DIN 13

Features
• Automatic air vents for liquid systems
• Hood with flanged cover
• The exchange of the controller is possible without disturbing the pipe connections
• Installation: above the point being vented, inlet always at the bottom

Options	(Design refer to page 11)
• Drip pipe (Pos. 54) with Union M14x1,5 for Pipe-ø 8 mm (Pos. 53)	

Selection criteria		**Example for order data**
• Operating pressure	• Nominal diameter / pressure	Automatic air vents for liquid systems, PS = 21 barg, TS = 400°C, flange connection, ANSI300, NPS 1", Hood Cast steel / Cover Forged steel
• Back pressure/Differential pressure	• Type of connection	**=> Automatic air vent for liquid systems, Fig. 656, PN25, DN25, 1.0460/1.0619, Face-to-face dimension 119 mm, R21, flange connection**
• Operating temperature	• Material	
• Flow quantity		

Types of connection		Flanges			Screwed sockets Socket weld ends			Butt weld ends		
NPS		1/2"	3/4"	1"	1/2"	3/4"	1"	1/2"	3/4"	1"
Face-to-face acc. to data sheet resp. customer request										
L	(mm)	119	119	119	119	119	119	119	119	119
Dimensions										.Standard-flange dimensions refer to page 12.
H	(mm)	196	197	200	140 [1] / 175	175	186	175	175	186
S	(mm)	238	238	238	238	238	238	238	238	238
										[1] Screwed sockets: L = 140 mm
Weights										
(approx.)	(kg)	4,8	5,3	5,6	4,3	4,4	4,4	4,3	4,4	4,4

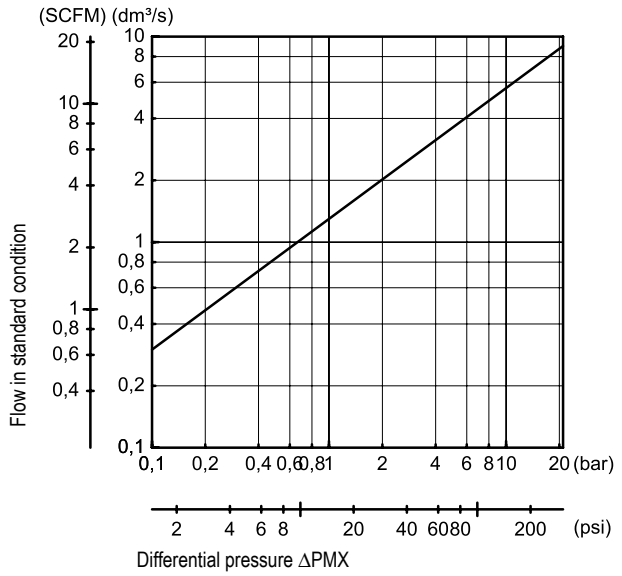
Parts						
Pos.	**Sp.p.**	**Description**	**Fig. 32.656**	**Fig. 35.656**	**Fig. 52.656**	**Fig. 55.656**
6		Cover	SA105		SA182F321	
11	x	Sealing ring	SA240Gr.316Ti			
16		Hood	SA216WCB		SA351CF8	
17	x	Gasket	Pure graphite CrNi laminated with graphite			
24	x	Controller, cpl.	SA240Gr.304			
27		Cheese head screw	SA193Gr.B16 (with metric screw-thread)			
53	x	Union for drip pipe	SA182F316Ti			
54	x	Drip pipe	SA240Gr.304			
		└ Spare parts				

Information / restriction of technical rules need to be observed!

Resistance and fitness must be verified (contact manufacturer for information, refer to Product overview and Resistance list).

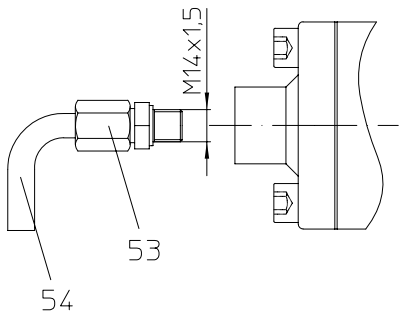
Operating and installation instructions can be downloaded at www.ari-armaturen.com.

Capacity chart



The diagram shows the maximum discharge of air at standard condition.

Options



Drip pipe (angle) with union joint

Informations about pipe welding

Welding groove acc. to ASME B16.25

The material used for ARI valves with butt weld ends are:

SA216WCB
SA105
A 576 Grade 1020
SA351CF8M
SA182F321

Due to our experience, we recommend to apply an electric welding process.

Because of the different material compositions and wall thickness of the steam traps and the pipe gas welding shall not be applied. Quenching cracks and coarse grain structure may develop.

On bimetallic steam traps face-to-face of 95 mm or less, the bimetallic controller has to be disassembled prior to welding. After the traps have cooled down to the ambient temperature the bimetallic controller shall be fitted again into the body.

Steam traps with socket-weld ends shall only be welded by arc welding (welding process 111 acc. to DIN EN 24063).

If during the time of warranty others than the manufacturer or by the manufacturer authorized persons are interfering in the product and/or the setting, the right of claim for warranty will lapse!

Standard-flange dimensions acc. to ASME B16.5

NPS			1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"
ANSI150	ØD	(mm)	89	99	108	117	127	153	178	191	229	254	279	343
	ØK	(mm)	60	70	79	78	98	121	140	152	191	216	241	298
	n x Ød	(mm)	4 x 16	4 x 16	4 x 16	4 x 16	4 x 16	4 x 19	4 x 19	4 x 19	8 x 19	8 x 22	8 x 22	8 x 22
ANSI300	ØD	(mm)	95	117	124	133	155	165	191	210	254	279	318	381
	ØK	(mm)	66.5	82.5	89	99	114	127	149	168	200	235	270	330
	n x Ød	(mm)	4 x 16	4 x 19	4 x 19	4 x 19	4 x 22	8 x 19	8 x 22	8 x 22	8 x 22	8 x 22	12 x 22	12 x 25

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