CALEFFI Hydronic Solutions

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DISCAL® air separator

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551- 5517 - NA551 Series

Installation, commissioning and servicing instructions

Function

The DISCAL® air separator is used to continuously remove the air contained in the hydronic circuits of heating and cooling systems. The air discharge capacity of these devices is very high. They are capable of removing automatically all the air present in the system down to micro-bubble level.

The circulation of fully de-aerated water enables the equipment to operate under optimum conditions, free from any noise, corrosion, localized overheating or mechanical damage. Micro-bubbles, fusing with each other, increase in volume (get larger) until they become large enough to rise to the top where they are automatically released.

This item is designed for use in closed hydronic systems. Do not use this item in plumbing applications. It does not meet the low-lead plumbing standards of U.S. and Canada.

Product range

551 series	DISCAL air separator for horizontal pipes, in brass compact with drain Sizes ¾" integral sweat; ¾" NPT female (A without service check valve, AC with service check)
551 series	DISCAL air separator for horizontal pipes, in brass with drain Sizes ¾" - 1" - 1 ¼" - 1 ½" - 2" NPT female; 1" - 1 ¼" - 1 ½" - 2" integral sweat (A without service check valve, AC with service check)
551 series	DISCAL air separator for horizontal pipes, in brass with drain Sizes 1" - 1 ¼" - 1 ½" - 2" press (A without service check valve, AC with service check)
5517 series	DISCAL air separator for horizontal or vertical pipes with rotating collar, in brass with drain. Sizes ¾" and 1" sweat union, press union and NPT male union
551 series	DISCAL air separator for horizontal pipes, in steel with flanged connections with drain Sizes 2" – 6" ANSI
NA551 series	DISCAL air separator for horizontal pipes, in steel with flanged connections with drain designed and built in accordance with Section VIII, Division 1 of the ASME Boiler and Pressure Vessel Code and tagged and registered with the National Board of Boiler and Pressure Vessel Inspector, with ASME U-stamp. Sizes 2" – 12" ANSI.

Scan to view

NA551 & 551 DISCAL®

Installation Tip

Technical specifications

Brass air separator

Materials	- body:	brass
	- internal element (compact and rotating collar versions):	304 stainless steel
	- internal element:	glass reinforced nylon PA66GF30
	- seal:	peroxide-cured EPDM
	- air vent float:	PP
	- air vent float linkages:	stainless steel
	- air vent float guide pin:	stainless steel

Performance

Suitable fluids:	water, glycol solution
Max. percentage of glycol:	50%
Max. working pressure:	150 psi (10 bar)
Temperature range:	32–250°F (0–120°C)
Air separation efficiency:	100% to micro-bubble level

Connections	- main:	
	compact series:	3/4" sweat; 3/4" NPT female
	horizontal:	3/4", 1", 1-1/4", 1-1/2" and 2" NPT female
		1", 1-1/4", 1-1/2" and 2"integral sweat
		1",1-1/4",1-1/2" and 2" integral press
	rotating collar version, 5517 series:	¾" and 1" sweat, press and NPT male union
	- lay length (press connection):	see page 4 and 5
	- drain:	1/2" NPT female
	5517 series:	1/2" straight female

Steel air separator

Materials	- body:	epoxy resin painted steel
	- internal element:	304 stainless steel
	- seal:	peroxide-cured EPDM
	- air vent float:	PP
	- air vent float linkages:	stainless steel
	- air vent float guide pin:	stainless steel

Performance

Suitable fluids:	water, glycol solution
Max. percentage of glycol:	50%
Max. working pressure:	sizes 2-6": 150 psi (10 bar); sizes 8-12": 200 psi (14 bar)
Temperature range:	32–270°F (0–132°C)
Air separation efficiency:	100% to micro-bubble level

Connections	- flanged:	2"– 12" ANSI B16.5 150 CLASS RF
	- drain pipe:	sizes 2 - 6 inch: 1" NPT male
		sizes 8 - 12 inch: 2" NPT male

Agency Approval

NA551 series is designed and built in accordance with Section VIII, Division 1 of the ASME Boiler and Pressure Vessel Code and tagged and registered with the National Board of Boiler and Pressure Vessel Inspector, and CRN registered (12" pending, contact Caleffi).

Working Pressure & Temperature Limits
(Solder Type Limits Per ASTM Std. B16.18-1979)

FLOW-CONTROL STYLE	TYPE OF SOLDER	MAXIMUM LIMITATIONS	
		PRESSURE PSI	TEMPERATURE °F
SWEAT	95-5 Tin-Antimony	150	250
	50-50 tin-Lead	125	150
	60-40 tin-Lead	75	250

SAFETY INSTRUCTION

This safety alert symbol will be used in this manual to draw attention to safety related instructions. When used, the safety alert symbol means.
ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED! FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN A SAFETY HAZARD.

WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

CAUTION: All work must be performed by qualified personnel trained in the proper application, installation, and maintenance of systems in accordance with all applicable codes and ordinances.

CAUTION: If the DISCAL valve is not installed, commissioned and maintained properly, according to the instructions contained in this manual, it may not operate correctly and may endanger the user.

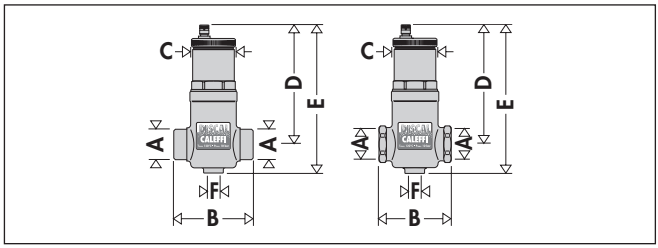
CAUTION: Make sure that all the connecting pipework is water tight.

CAUTION: When making the water connections, make sure that the pipework connecting the DISCAL is not mechanically over-stressed. Over time this could cause breakages, with consequent water losses which, in turn, could cause harm to property and/or people.

CAUTION: Water temperatures higher than 100°F (38°C) can be dangerous. During the installation, commissioning and maintenance of the DISCAL valve, take the necessary precautions to ensure that such temperatures do not endanger people.

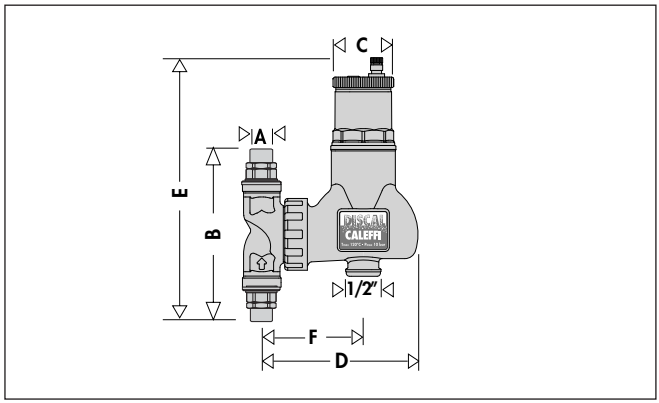
Leave this manual for the user

Dimensions



Code	A	B	C	D	E	F	Wt (lb)
551003A*	¾" NPT	3 1/16"	2 3/16"	5 3/8"	6 7/8"	½"	2.0
551022A*	¾" SWT	3 1/16"	2 3/16"	5 3/8"	6 7/8"	½"	2.0

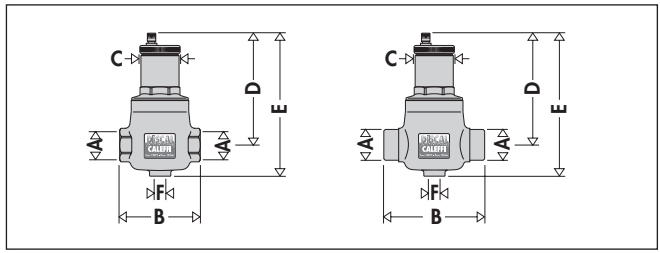
**Add suffix C to sweat and NPT code number when ordering the brass DISCAL to ship with expansion tank service check valve, code 561402A.*



Code	A	B	C	D	E	F	Wt (lb)
551705A	¾" NPT	5 1/8"	2 3/16"	5 3/8"	9 1/4"	3 1/2"	4.9
551765A	¾" press	6 3/8"	2 3/16"	5 3/8"	9 3/4"	3 1/2"	4.9
551795A	¾" SWT	6"	2 3/16"	5 3/8"	9 3/16"	3 1/2"	4.9
551706A	1" NPT	6 3/4"	2 3/16"	5 3/8"	9 3/4"	3 1/2"	4.9
551766A	1" press	6 3/4"	2 3/16"	5 3/8"	9 3/4"	3 1/2"	4.9
551796A	1" SWT	7"	2 3/16"	5 3/8"	9 3/4"	3 1/2"	4.9
551716*	--	3 3/4"	2 3/16"	5 3/8"	9 1/4"	3 1/2"	4.4

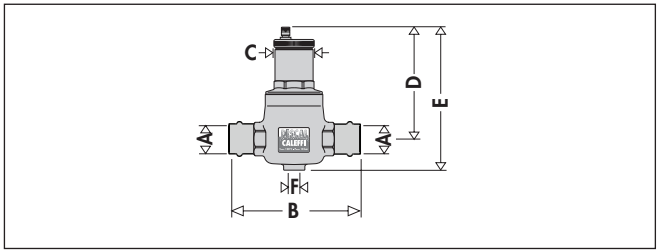
**Body only, no end connection fittings. Source separately, see Caleffi catalog for end connection code numbers.*

Code	A	Lay length
551765A	¾" press	4 5/8"
551766A	1" press	4 3/4"



Code	A	B	C	D	E	F	Wt (lb)
551005A*	¾" NPT	4 5⁄16"	2 3⁄16"	5 3⁄4"	7 1⁄2"	½"	3.7
551006A*	1" NPT	4 5⁄16"	2 3⁄16"	5 3⁄4"	7 1⁄2"	½"	3.7
551007A*	1¼" NPT	4 7⁄8"	2 3⁄16"	6 9⁄16"	8 1⁄4"	½"	4.9
551008A*	1½" NPT	4 7⁄8"	2 3⁄16"	6 9⁄16"	8 1⁄4"	½"	4.9
551009A*	2" NPT	5 1⁄8"	2 3⁄16"	6 9⁄16"	8 1⁄4"	½"	5.5
551028A*	1" SWT	5 1⁄16"	2 3⁄16"	5 3⁄4"	7 1⁄2"	½"	3.7
551035A*	1¼" SWT	5 3⁄16"	2 3⁄16"	6 5⁄16"	8 1⁄4"	½"	3.7
551041A*	1½" SWT	5 3⁄4"	2 3⁄16"	6 9⁄16"	8 1⁄4"	½"	4.9
551054A*	2" SWT	6 1⁄8"	2 3⁄16"	6 9⁄16"	8 1⁄4"	½"	5.5

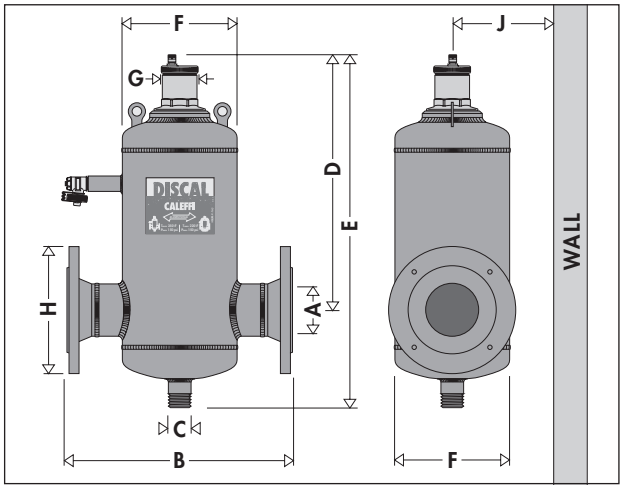
**Add suffix C to sweat, NPT and press (below) code numbers when ordering the brass DISCAL to ship with expansion tank service check valve, code 561402A.*



Code	A	B	C	D	E	F	Wt (lb)
551066A*	1" press	6 3⁄16"	2 3⁄16"	5 3⁄4"	7 1⁄2"	½"	3.8
551067A*	1¼" press	7 7⁄16"	2 3⁄16"	5 3⁄4"	7 1⁄2"	½"	5.0
551068A*	1½" press	8"	2 3⁄16"	6 9⁄16"	8 1⁄4"	½"	5.1
551069A*	2" press	8 1⁄2"	2 3⁄16"	6 9⁄16"	8 1⁄4"	½"	5.5

Code	A	Lay length
551066A*	1" press	4 ½"
551067A*	1¼" press	5 ⅛"
551068A*	1½" press	5 ¼"
551069A*	2" press	5 ½"

Dimensions

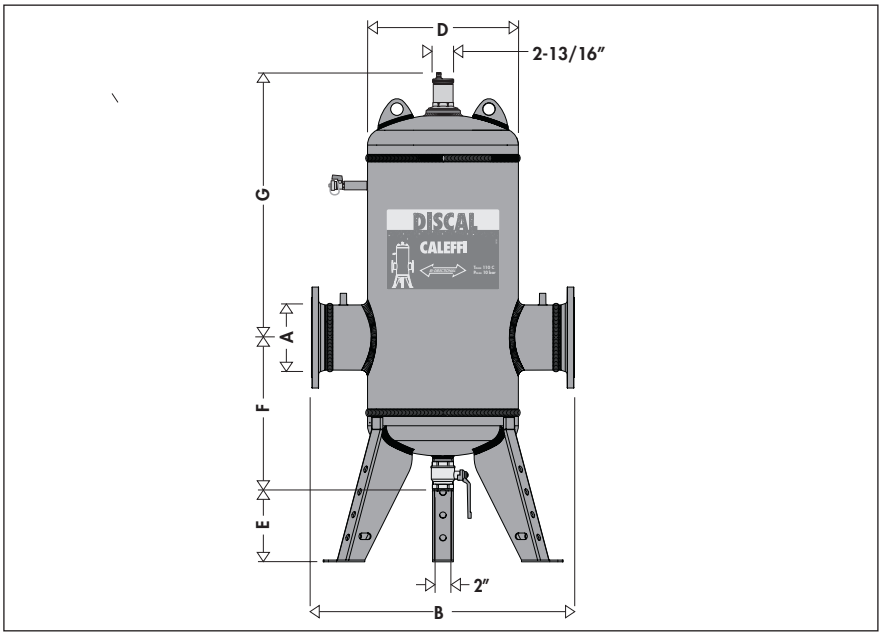


Code	A	B	C	D	E	F	G	H	J†	Wt (lb)
****551**050A	2"	13¾"	1"	14¾"	19 15⁄16"	6⅝"	2 13⁄16"	6"	6 5⁄16"	34
****551**060A	2½"	13¾"	1"	14¾"	19 15⁄16"	6⅝"	2 13⁄16"	7"	6 5⁄16"	35
****551**080A	3"	18⅜"	1"	17⅛"	23 7⁄16"	8⅝"	2 13⁄16"	7½"	7 5⁄16"	62
****551**100A	4"	18½"	1"	17⅛"	23 7⁄16"	8⅝"	2 13⁄16"	9"	7 5⁄16"	67
NA551120A	5"	25"	1"	21 7⁄16"	30½"	12¾"	2 13⁄16"	10"	9⅜"	106
NA551150A	6"	25"	1"	21 7⁄16"	30½"	12¾"	2 13⁄16"	10"	9⅜"	117

Size	2"	2 ½"	3"	4"	5"	6"
Cap. (gal)	1.8	1.8	4.8	4.8	13.7	13.7

***Add prefix NA to flanged code number when ordering ASME tagged and registered with the National Board of boiler and Pressure Vessel Inspector and CRN registered.*

†This dimension allows for a minimum of 3" wall clearance to accommodate insulation if used.

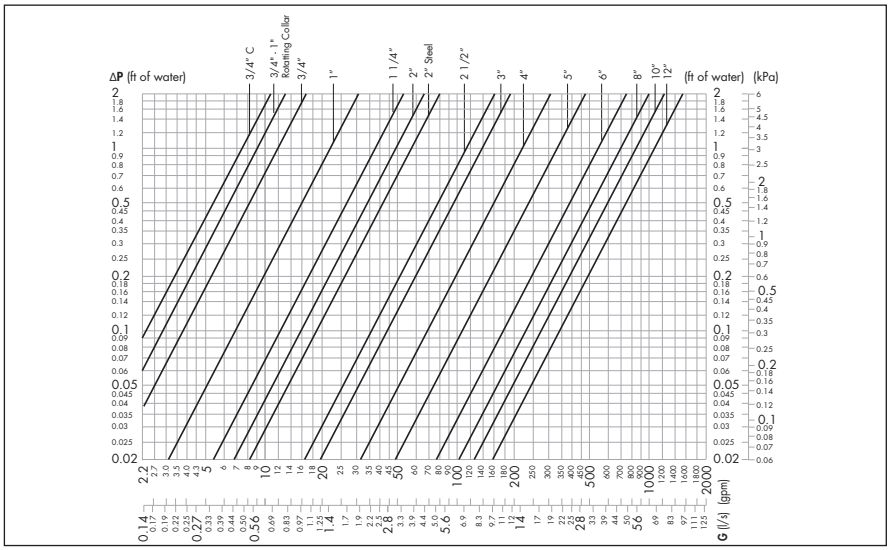


Code	A	B	D	E	F	G	Cap. (gal)	Wt (lb)
NA551200A	8"	35 7/16"	20"	8 1/2"	20"	32 1/2"	56	335
NA551250A	10"	41 3/4"	26"	8 1/2"	22 5/8"	38 1/4"	110	617
NA551300A	12"	46 1/2"	30"	8 1/2"	25 3/8"	43 3/8"	169	871

These models are ASME tagged and registered with the National Board of Boiler and Pressure Vessel Inspector and CRN registered (12" pending, consult Caleffi).

NOTE: Drawings may not reflect the actual size of the separators.

Hydraulic characteristics



ft of water x .433 = psi

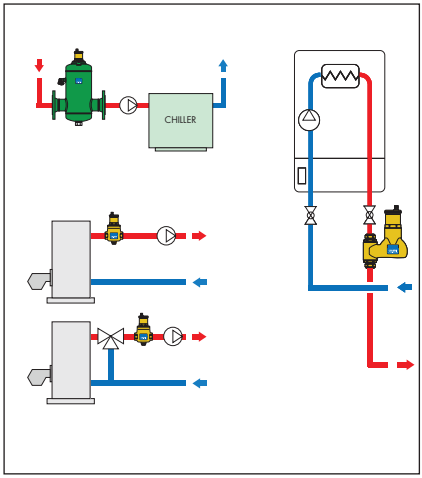
		Flow capacity — brass						
	Size	**¾" C/R**	**¾"**	**1"R**	**1"**	**1¼"**	**1½"**	**2"**
4.0 f/s	GPM	6	6	10	10	15	22	39
	l/s	0.4	0.4	0.6	0.6	1.0	1.4	2.5
	Cv	12/14	19	14	32	56	73	81

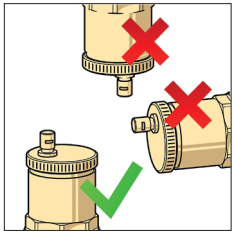
R: 5517 series rotating collar version.
C: Compact version.

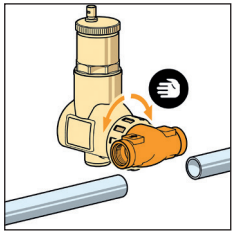
		Flow capacity — steel								
	Size	**2"**	**2 ½"**	**3"**	**4"**	**5"**	**6"**	**8"**	**10"**	**12"**
4.0 f/s	GPM	39	60	90	160	245	355	625	980	1,410
	l/s	2.5	3.8	5.7	10	15.5	22.4	40.0	62.0	89.0
10.0 f/s	GPM	100	155	220	400	615	880	1,570	2,450	3,530
	l/s	6.3	9.8	14	25.2	38.8	55.5	99.0	154.5	222.7
	Cv	87	174	208	324	520	832	1,109	1,387	1,664

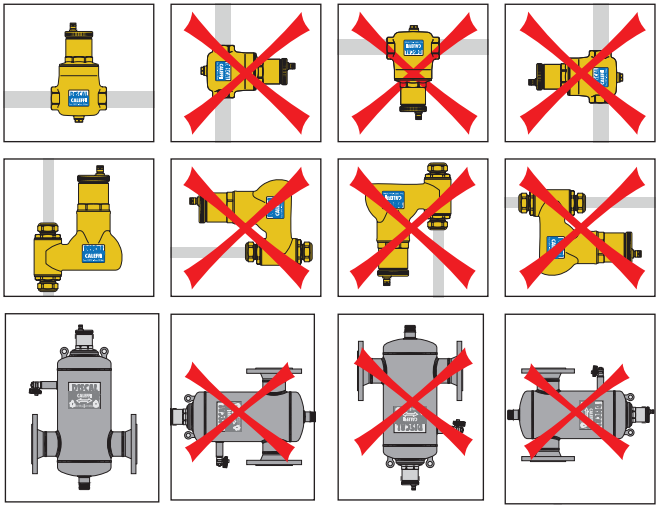
Installation

DISCAL units may be used in heating or cooling systems to ensure the progressive removal of air which is continuously formed. The units should preferably be installed after the boiler and on the pump suction side, as these are the points where the formation of micro-bubbles is greatest. DISCAL air separators for horizontal pipes must be installed vertically. Flow direction of the DISCAL air separator is bidirectional (flow in either direction is permitted), except for the 5517 series rotating collar version. For the 5517 series, the correct flow direction is shown by an arrow on the T-fitting. Turn the T-fitting by hand to correctly orient it to install in either horizontal or vertical piping. In installation conditions where inspection is not possible, it is recommended that the venting valve cap is replaced by a Caleffi Code R59681 hygroscopic safety vent. The standard replacement cap code is 59119.









Construction details

DISCAL air separators are designed to allow maintenance and cleaning without having to remove the valve body from the piping. All DISCAL air separators come standard with a bottom connection for installing a drain valve. All internal air release control components are fully accessible in all the models.

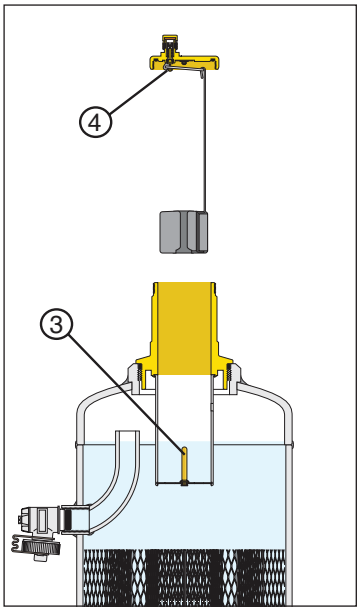
The automatic air vent, located at the top of the units, has a long chamber for the movement of the float. This feature prevents any debris present in the water from reaching the sealing seat. A stainless steel float guide pin (3) prevents the float from sticking due to accumulating residue in the flowing fluids, even when the DISCAL air separator is not installed perfectly vertical.

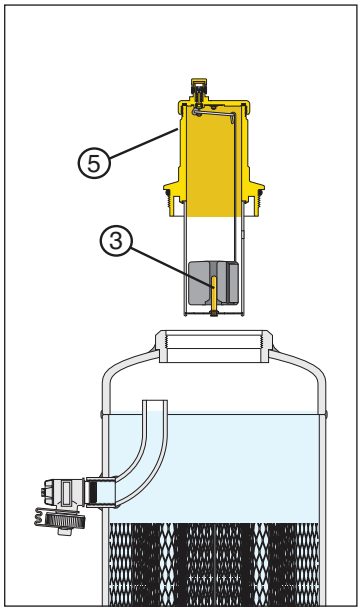
59756 59829

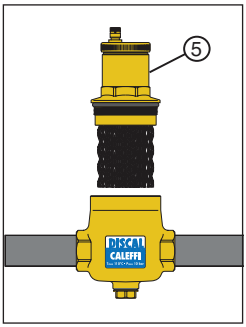
A replacement air vent assembly for the DISCAL brass 551 series (except rotating collar and compact versions) is code 59829; for the DISCAL steel 551 and NA551 series is code 59756.The moving parts that control air venting are accessed simply by removing the upper cover (4). Replacement cap and float assembly for all versions of the brass DISCAL 551 and 5517series is code F39807.

When cleaning, simply unscrew the portion of the body containing the automatic air vent (5). For the rotating collar and compact models, the element can be removed by removing the upper cover (4). There is no need to remove the air vent body for these models.

F39807



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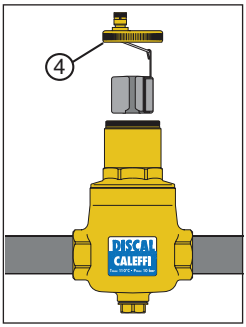
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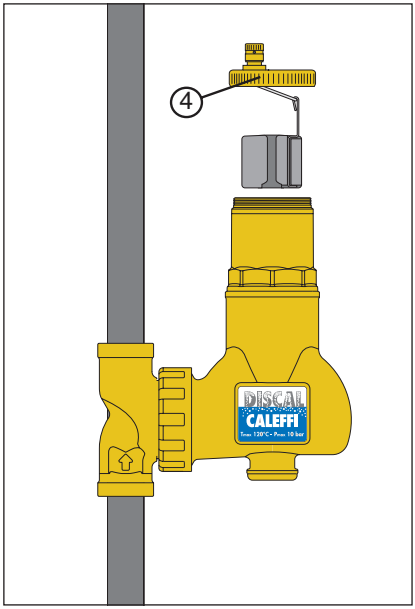
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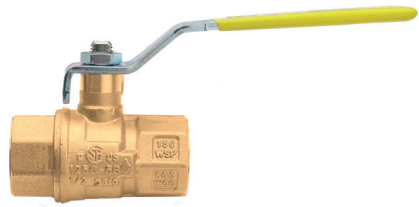
Accessories

Item	Code	Description
	561402A	Check valve for expansion tanks. 1/2" NPT connections.
	R59681	Hydroscopic safety vent cap.
	562100	Small anti-vacuum vent cap.
	59119	Replacement DISCAL air vent cap.

Insulation shells for brass DISCAL series for horizontal pipes. These are not designed for the compact or 517 series rotating collar DISCAL.

Code	Size
CBN551005	For ¾" and 1"
CBN551007	For 1¼" and 1½"
CBN551009	For 2"

Optional drain valves, separator sizes 2" - 6", code NA39753 (1" NPT female with T handle); separator sizes 8" -12", code NA59600 (2" NPT female with lever).



CALEFFI
Hydronic Solutions

Caleffi North America, Inc.
3883 West Milwaukee Road
Milwaukee, WI 53208
T: 414.238.2360 F: 414.238.2366