

Automatic continuous desalting valve

For steam boilers Model 560 - A



EN



The conductivity electrode EC-1, the desalting controller RD-1 and the continuous desalting valve with servomotor allow the automatic desalting process of boiler water which eliminates:

- Organic matter and mineral salts in solution. (Calcium, magnesium, sodium, potassium, iron, bicarbonate ions, chlorides, sulphates, nitrates, ...etc.).
- Solid materials in suspension. (Sand, clay, metal residues, rock residues, organic matter, ...etc.).

The continuous bleeding process prevents:

- Damage caused by erosion and perforation, entailing the following high costs:
 - Direct: Replacement or repair of materials.
 - Indirect: Stoppages, product losses, ...etc.
- Danger of boiler explosion.

and reduces:

- Incrustations and sediments caused by precipitation of calcium and magnesium salts, which obstruct thermic transmission and which cause unnecessary and excessive fuel consumption.
- Foam formation caused by excessive saline concentration, with its corresponding drag. This combination of measuring comparison and control ensures minimum water loss and thus gives considerable energy savings

Conforms to the low voltage directive 73/23/CE version 93/68/CE.

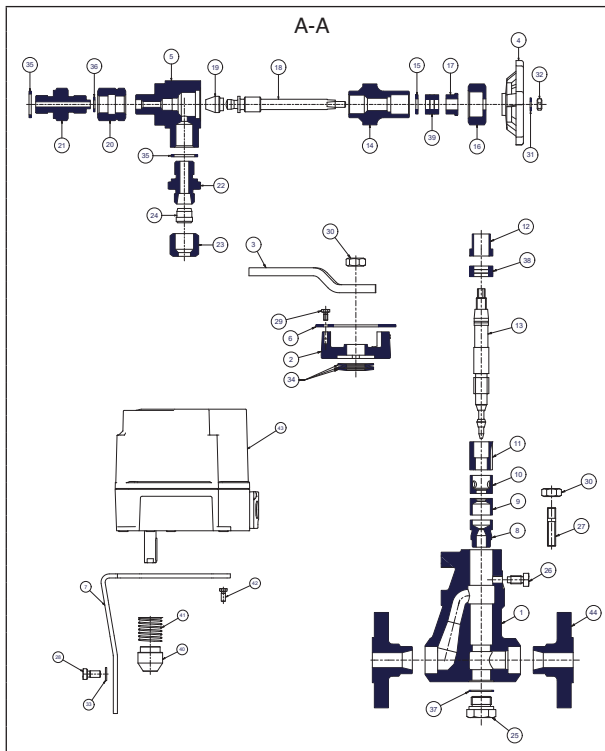
According to the electromagnetic compatibility directive 89/336/CE version 93/68/CE.

Specifications

— The unit consists of a Continuous desalting valve with servomotor, a Conductivity electrode EC-1 and Desalting controller RD-1 with or without assembly cupboard.

A Continuous desalting valve with servomotor

- 1 Faucet for taking samples: Makes process of analysing the salt concentration of boiler water easier. Possibility of guided connection for pipes with a \varnothing of 6/8 mm.
- 2 Reader plate: Allows bleeding positions to be seen clearly and concisely, even from some distance away.
- 3 Plug for draining the measuring nozzle.
- 4 Measuring nozzle: Acts as a valve, measuring and control organ. The water under pressure expands silently and gradually into it. Thus, dirt, incrustations and salt deposits are removed. Due to this gradual expansion, the system does not suffer erosion.
- 5 Servomotor mounted on the valve on an angle mounting. A synchronised reversable motor is used as a transmission element. Via gearing it adjusts the position of the regulation lever.



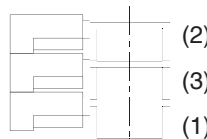
N°.	PIECE	PIECE	MATERIAL			
1	Body		Cast steel (EN-1.0619)			
2	Gland body		Nodular iron (EN-5.3106)			
3	Control lever		Cast iron (EN-1.0037)			
4	Flywheel		Aluminium (EN-AC-44200)			
5	Sample-taking faucet body		Stainless steel (EN-1.4008)			
6	Reader plate		Aluminium			
7	Lever lock		Carbon steel (EN-1.0037)			
8	Measuring nozzle seating		Stainless steel (EN-1.4028)			
9, 10	Measuring nozzle cap		Stainless steel (EN-1.4028)			
11	Measuring nozzle endless nut		Stainless steel (EN-1.4028)			
12, 17	Gland		Carbon steel (EN-1.1191)			
13	Measuring nozzle shaft		Stainless steel (EN-1.4028)			
14	Sample-taking faucet gland body		Carbon steel (EN-1.1191)			
15	Sample-taking faucet gland washer		Stainless steel (EN-1.4401)			
16	Gland nut		Carbon steel (EN-1.1191)			
18	Sample-taking faucet shaft		Stainless steel (EN-1.4401)			
19	Seal		Stainless steel (EN-1.4401)			
20	Sample-taking faucet connection nut		Carbon steel (EN-1.1191)			
21	Sample-taking faucet connection		Carbon steel (EN-1.1191)			
22	Adapter		Carbon steel (EN-1.0308)			
23	Adapter nut		Carbon steel (EN-1.0308)			
24	Cutting ring		Carbon steel (EN-1.0308)			
25	Draining plug		Carbon steel (EN-1.1191)			
26, 28, 43	Screw		Carbon steel (EN-1.1191)			
27	Stud		Carbon steel (EN-1.1181)			
29	Screw		Stainless steel (EN-1.4401)			
30	Nut		Carbon steel (EN-1.1141)			
31	Washer		Stainless steel (EN-1.4401)			
32	Nut		Stainless steel (EN-1.4401)			
33, 44	Washer		Carbon steel (EN-1.1141)			
34	Disc spring		Vanadium chrome steel (EN-1.8159)			
35, 36, 37	Joint		Copper			
38, 39	Seal		Graphite			
40	Coupling		Carbon steel (EN-1.1191)			
41	Spring		Stainless steel (EN-1.4310)			
42	Elastic gudgeon		Carbon steel (EN-1.1231)			
45	Servomotor		-			
46	Flanges		Carbon steel (EN-1.0460)			
		DN	15 to 25 (EN, ANSI)			
		PN	40			
OPERATING CONDITIONS	PRESSURE IN bar	40	35	32	28	
	MAXIMUM TEMPERATURE IN °C	120	200	250	300	

Operation

If the accepted conductivity value previously selected is exceeded the desalting controller RD-1, via indication from the conductivity electrode EC-1, operates the servomotor and opens the continuous desalting valve to the **OPEN** position. When the conductivity decreases the adjustment mechanism returns to the **SERVICE** position giving continuous economical desalting. When the "valve closed" switch is on the adjustment mechanism automatically puts the valve in the **CLOSED** position. These positions are fixed by the micro limit switches.

Adjustment of micro limit switches

The micro limit switches come ready adjusted from the factory:



Micro switch Position	Position of the lever on the indicator plate
(1) OPEN	35°
(2) CLOSED	0°
(3) SERVICE	8°

Using a screwdriver the positions of the micro switch can be readjusted. Turning the right to left decreases the purge position and turning it the left to right increases it.

Manual or automatic operation

To operate the valve manually:

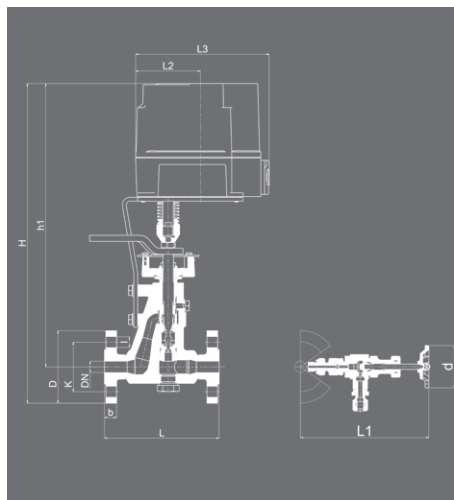
1. Disconnect the electrical current to the servo. Open the servomotor cover and remove the x1 connector.
2. Press coupling pin K1 (see page 3 Fig. 1 Mod. 560 Complementary technical instructions <http://vycindustrial.com/en/valves/bleeding-steam-boilers/>).
3. Move the adjustment lever to the desired position and release bolt K1.
4. Cover the cover.

Restoring automatic operation:

1. Place the regulating lever in the position between 0° and 35° on the nameplate of the valve using the bolt K1 (see page 3 Fig.1 Mod. 560 Complementary technical instructions <http://vycindustrial.com/en/valves/bleeding-steam-boilers/>).
2. Connect actuator connector X1.
3. Cover the cover.
4. Switch on power.

B Servomotor

Reversible Synchronous Motor, 10 VA Consumption.
 Gearbox with permanent lubrication.
 Voltage: 220 V CA -15% / +10%, 50...60 Hz ±6%
 Commuted micro limit switches: 6
 Adjustment time: 65 s / 90°
 Cell: Maximum load: 18 Nm
 Ambient temperature: 60 °C
 Protection: IP-66



	15			20			25		
CONNECTIONS	I- Flanges PN-40 EN-1092-1								
	II- Flanges class 150 lbs ASME/ANSI B 16.5								
	III- Flanges class 300 lbs ASME/ANSI B 16.5								
		I	II	III	I	II	III	I	II
H	419	416	419	424	421	429	429	426	434
h1	371			371			371		
L	150			150			160		
L1	167			167			167		
L2	85			85			85		
L3	175			175			175		
d	60			60			60		
D	95	90	95	105	100	115	115	110	125
K	65,00	60,30	66,70	75,00	69,90	82,60	85,00	79,40	88,90
I	14,00	15,90	15,90	14,00	15,90	19,10	14,00	15,90	19,10
b	16,00	11,20	14,30	18,00	12,70	15,90	18,00	14,30	17,50
DRILLS N°.	4			4			4		
WEIGHT IN kgs.	7,20	6,45	6,91	7,60	6,85	7,67	8,16	7,48	8,45
CODE 2102-560.	80241	802410	802413	83441	834410	834413	81041	810410	810413

Conductivity electrode. EC-1

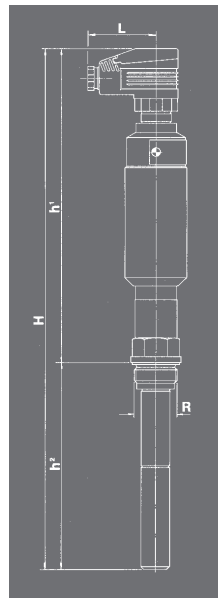


Connection: Whitworth gas-tight cylindrical male thread ISO 228/1 1978 (DIN-259) 1".
NPT thread ANSI-B2.1 via adapter. 1" F-GAS to 1" or 1 1/4" M-NPT.

Maximum operating temperature: 238°C.

Maximum operating pressure: 32 bar.

Protection: IP-65.



R	1"
H	419
h1	252
h2	167
L	53
WEIGHT IN kgs.	0,97
CODE	2102-560.7102

Electrode connection collector

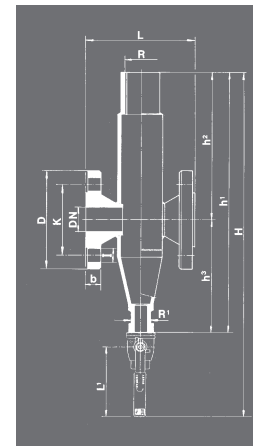
Nominal pressure: PN-40.

Allowable pressures and temperatures according to DIN-2401. Sheet 2.

Flange connection: DN-20 (EN-1092-1).

Electrode connection: Whitworth gas-tight cylindrical female thread ISO 228/1 1978 (DIN-259) 1".

DN	20
R	1"
H	390
h1	267
h2	157
h3	110
L	115
R1	1/2"
L1	100
D	105
K	75
I	14
b	18
DRILLS N°.	4
WEIGHT IN kgs.	3,33
CODE	2102-560.83442



We recommend adding a blowoff valve to the equipment, Mod. 999, 1/2" joined to the waste pipe for periodic release of sludge. As a minimum a 2 ÷ 3 second release must be performed every 8 hours.

Desalting controller. ARD-1. RD-1

Voltage: 220 V.A.C. ± 10% 50/60 Hz.

Electric consumption: Approximately 4,5 VA.

Relay contact: 250 V/4 A 750 VA.

Safety contact: Maximum 2A-Mitteltraeg.

Ambient temperature: -20 to + 70°C.

Regulator protection: IP - 00.

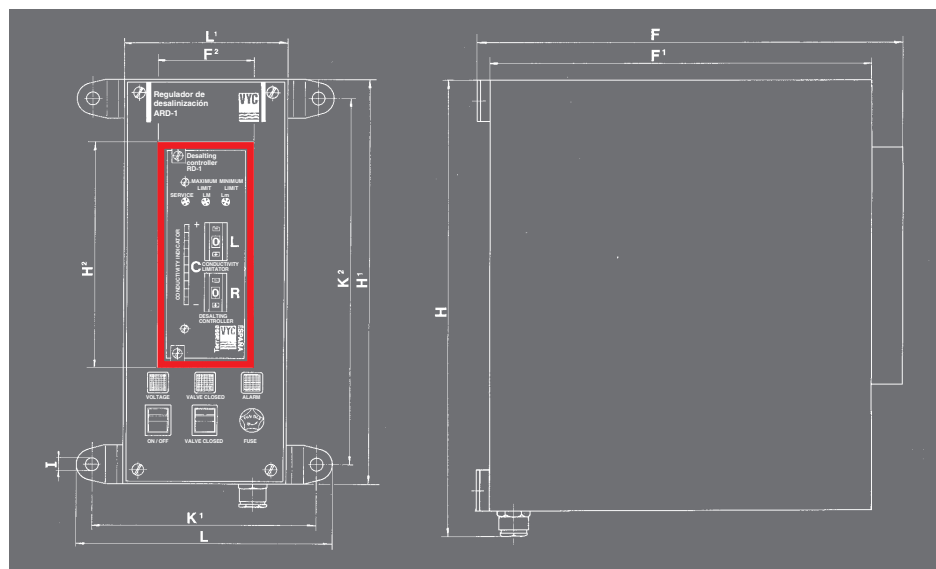
Regulator protection in assembly cupboard: IP - 50.

Regulation index: 2,5 to 20 mS.

Limit index: 40 to 75 mS.

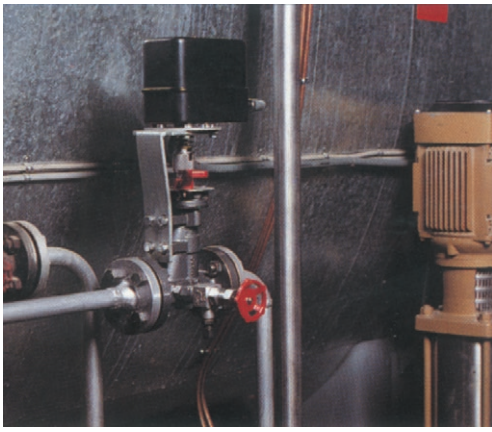
Desalting controller with assembly cupboard ARD-1.

Desalting controller without assembly cupboard RD-1.

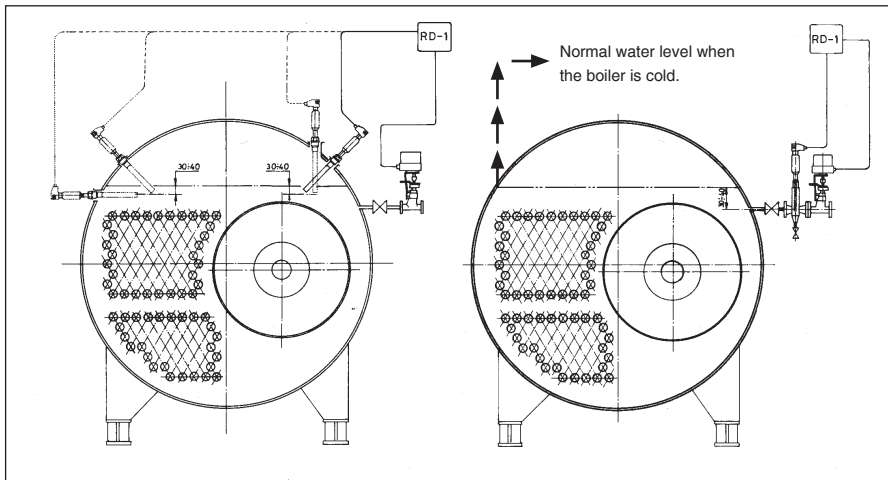


MODEL	ARD-1	RD-1
H	265	—
H ¹	250	—
H ²	—	137
F	245	—
F ¹	220	—
F ²	—	57
L	158	—
L ¹	100	—
K ¹	138	—
K ²	226	—
I	7,5	—
WEIGHT IN kgs.	2,50	0,93
CODE	0001	0002
2102-560.		

The desalting controller without assembly cupboard RD-1 is supplied in a 19" sub-rack according to DIN-41494.



Installation examples



Operation, efficiency and emptying

To establish the boiler's salinity, the quantity of salts extracted per unit of time must be equal to that of the water supply in this same period.

P = Amount of water extracted in the bleeding process (kg/h)
 R = Real steam production of the boiler (kg/h)
 S = Conductivity of the water supply (µS/cm).
 C = Desired conductivity inside the boiler (µS/cm).
 The effect is achieved when the salts are removed continuously and without movement in order to prevent uncontrolled water losses from the boiler.
 The amount of water extracted in the bleeding process:

$$P = \frac{R \cdot S}{C - S}$$

Example:
 $\Delta p = 15 \text{ bar}$
 $R = 800 \text{ kg/h}$
 $S = 800 \text{ µS/cm}$
 $C = 6200 \text{ µS/cm}$

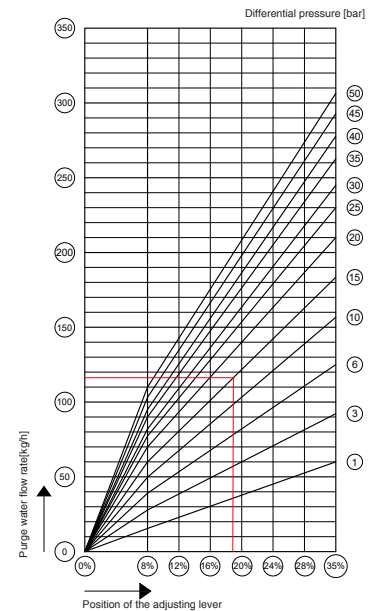
Amount of water extracted in the bleeding process: $P = 118 \text{ kg/h}$

Of these, between 5-10% by blowdown valve for bleeding dirt and sludge (Mod 260, 260-a or 460) and the remainder by means of continuous desalting valve (Mod 560 or 560-A).

Using the calibrated scale, the lever allows exact adjustment of the measuring nozzle. We shall set the lever at the position that allows us to remove a volume of water (P) at a differential pressure. Differential pressure = Working pressure - (Back pressure + Load losses). Continuous desalting is achieved with adjustment values of 0 to 35. The position "Direct bleeding" corresponds to the section of nozzle that is totally open and allows complete bleeding in a few seconds. In this case, the volume is approximately three times greater than that for 35 on the scale.

The combination of the Continuous desalting valve* and the Blowdown valve for bleeding dirt and sludge* is essential for optimizing the boiler's efficiency, and include its maximum security and availability. Neither of them can be replaced with others not designed for this specific application. Their moderate cost is depreciated in the short term.

* (See brochure for Models 560).
 • (See brochure for Models 260, 260-A and 460).



All graphs of purge flows in: <http://vycindustrial.com/en/valves/bleeding-steam-boilers/>

Mod.560 Complementary technical instructions