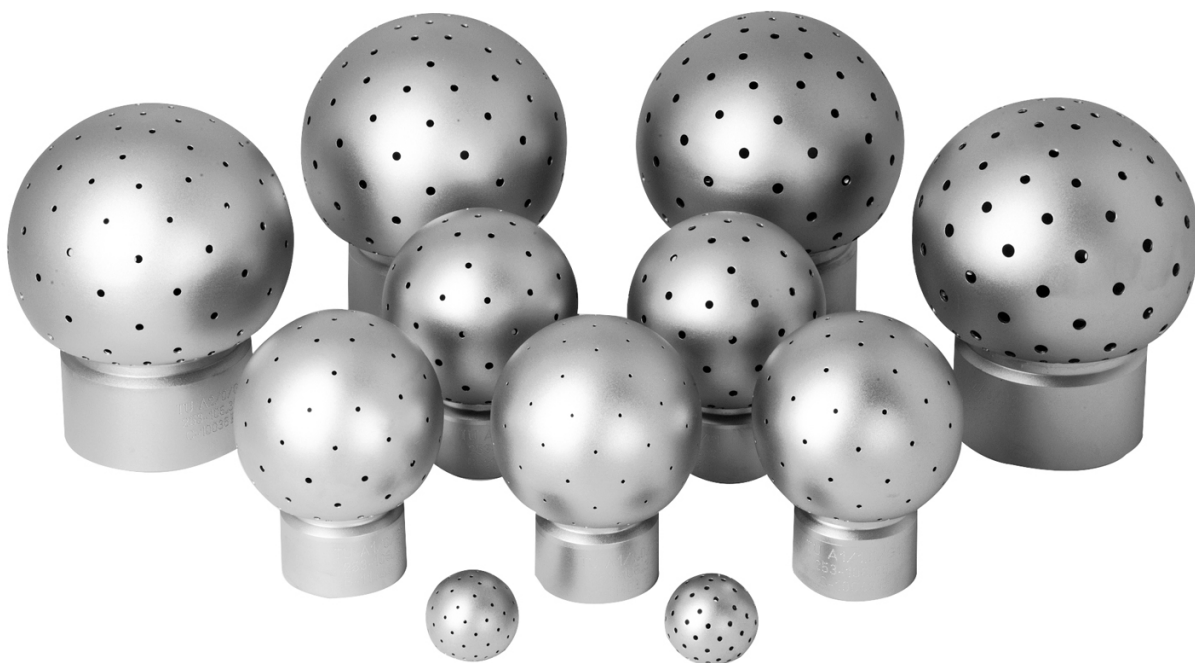




GEA Cleaning Technology

Spray ball

QRC (Translation from the original language)
430BAL008784EN_4

1 Technical data

Technical data	
Working pressure	1 - 2.5 bar
Cleaning diameter	max. 8 m
Operating temperature	max. 95 °C (203 °F)
Material spray ball	1.4404(316L), 1.4435 (316L), 1.4539, 2.4602 (Alloy 22)
Material clip/R-clip	1.4310, 1.4401, 2.4610
Surface finish	Matt polished, outside Ra< 0.8 µm e-polished, outside Ra< 0.5 µm
3A-compliant versions available	1.4404/316L, Ra 0.8 µm, fastening with R-clip and welded connection



Hint!

For 3A-compliant spray balls with welded connection the installation instructions must be observed.

Safety

- The spray ball is intended for the cleaning of tanks and vessels. Using the device for any other purpose is considered contrary to its designated use.
- The installation, operating and maintenance personnel must observe the national and locally applicable health and safety regulations and have sufficient qualification for the execution of their tasks. All safety precautions listed in the instruction manual must be observed.
- When the cleaner is switched on, the danger zones must be free.
- Suitable security measures ensure that the cleaner can never be operated outside the tank and that no persons can stay in the tank during operation.
- Before the visual inspection, the cleaner must be switched off and secured against being switched back on.
- Observe the safety data sheets supplied by the detergent manufacturers. The cleaner must only be operated with such cleaning detergents and used in such mediums against which all materials used are sufficiently resistant.
- The user must ensure a loss-proof lead connection into the tank.

Table 1: Flow rate														
Type	Spray angle	Cleaning diameter (m)	Flow rate during fastening											
			R-Clip fastening (m³/h)						Thread and welded connection (m³/h)					
			1 bar	1.5 bar	1.8 bar	2 bar	2.2 bar	2.5 bar	1 bar	1.5 bar	1.8 bar	2 bar	2.2 bar	2.5 bar
A 05	360°	1 – 2	5.1	6.2	6.8	7.2	7.6	8.1	4.7	5.8	6.3	6.6	7	7.4
A 05/1,0	360°	0.8 – 1	2.8	3.4	3.8	4	4.2	4.4	2.4	2.9	3.2	3.4	3.6	3.8
A 1/1,0	360°	1.5 – 2	3	3.7	4	4.2	4.4	4.7	2.5	3.1	3.4	3.5	3.7	4
A 1/1,5	360°	1.8 – 3	7	8.6	9.4	9.9	10.4	11.1	6.5	8	8.7	9.2	9.6	10.3
A 1	360°	2 – 3	9.8	12	13.1	13.9	14.5	15.5	9.4	11.5	12.6	13.3	13.9	14.9
A 1-1	360°	2.5 – 3.5	12.8	15.7	17.2	18.1	19	20.2	12.3	15.1	16.5	17.4	18.2	19.4
A 1-2	360°	3 – 4	15.3	18.7	20.5	21.6	22.6	24.1	14.8	18.1	19.9	20.9	22	23.4
A 2	360°	3.5 – 5	21.9	26.8	29.4	31	32.5	34.6	20.9	25.6	28	29.6	31	33
A 2-1	360°	4 – 6	28.4	34.8	38.2	40.2	42.2	45	27.3	33.4	36.6	38.6	40.5	43.2
A 2-2	360°	5 – 7	35.6	43.6	47.8	50.3	52.8	56.3	34.6	42.4	46.4	48.9	51.3	54.7
A 2-3	360°	6 – 8	40.9	50.1	54.9	57.8	60.7	64.7	39.9	48.9	53.5	56.4	59.2	63.1
B 05	192°	1 – 2	3	3.7	4	4.2	4.4	4.7	2.5	3.1	3.4	3.5	3.7	4
B 1	192°	2 – 3	9.5	11.6	12.7	13.4	14.1	15	9	11	12.1	12.7	13.3	14.2
B 2	194°	3.5 – 5	22.4	27.4	30.1	31.7	33.2	35.4	21.4	26.2	28.7	30.3	31.7	33.8
B 2-3	194°	6 – 8	42.2	51.7	56.6	59.7	62.6	66.7	41.2	50.5	55.3	58.3	61.1	65.1
G 05	232°	1 – 2	4.7	5.8	6.3	6.6	7	7.4	4.2	5.1	5.6	5.9	6.2	6.6
G 1	206°	2 – 3	9.2	11.3	12.3	13	13.6	14.5	8.7	10.7	11.7	12.3	12.9	13.8
G 1-1	206°	2.5 – 3.5	11.2	13.7	15	15.8	16.6	17.7	10.7	13.1	14.4	15.1	15.9	16.9
G 1-2	206°	3 – 4	14.5	17.8	19.5	20.5	21.5	22.9	14	17.1	18.8	19.8	20.8	22.1
G 2	246°	3.5 – 5	20.1	24.6	27	28.4	29.8	31.8	19.1	23.4	25.6	27	28.3	30.2
G 2-1	246°	4 – 6	26.8	32.8	36	37.9	39.8	42.4	25.8	31.6	34.6	36.5	38.3	40.8
G 2-2	246°	5 – 7	34.7	42.5	46.6	49.1	51.5	54.9	33.7	41.3	45.2	47.7	50	53.3
G 2-3	246°	6 – 8	41	50.2	55	58	60.8	64.8	40	49	53.7	56.6	59.3	63.2
L 1	188°	2.5 – 3	8.6	10.5	11.5	12.2	12.8	13.6	8.1	9.9	10.9	11.5	12	12.8
LA 1/1.0	360°	1.5 – 2.5	5.5	6.7	7.4	7.8	8.2	8.7	-	-	-	-	-	-
LA 1/1.5	360°	2.5 – 3	11	13.5	14.8	15.6	16.3	17.4	10.5	12.9	14.1	14.8	15.6	16.6



Hint!

The flow rate with electro-polished spray balls can be 15 - 20 % higher than the flow rate indicated in the table.



Hint!

For use in Ex-protected areas, the maximum permissible flow rates as well as all instructions on page 5 must be observed.

Practical advice for the design of spray balls:

- The operating pressure is between 1 - 2.5 bar pressure at the inlet of the spray ball.
- The following formula applies to the conversion of flow rates at pressures other than those specified in the table: $Q_2 = Q_1 \times \sqrt{\frac{P_2}{P_1}}$

As reference value for the correct design of spray balls, a flow rate of 1.8 - 3 m³/h (30 - 50 l/min) per meter of tank circumference is recommended.

2 Assembly and installation



Hint!

For the specification of spray ball type, mounting depth and mounting distance, the tank dimensions, tank version and tank use must be taken into account.

Mounting with clip or R-clip

The spray balls with a clip or R-clip connection have an annular gap between the sleeve and pipe outer diameter to clean the insertion pipe.

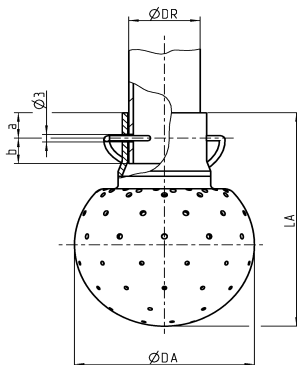
Welded connection

In order to be 3A-compliant, the spray balls with welded connection must be controllable and accessible when welded in. Contaminations in the ball must be detected and removed. The cleaning lance must not be too long and the user must have the possibility to check and clean. The weld assembly must conform to 3A Standard 78 - in latest revision.

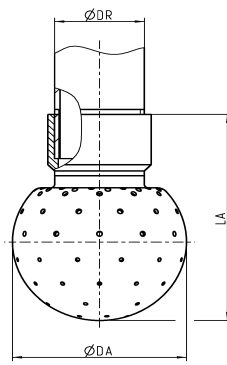
See 3A Standards 78 - Appendix 10, Figure 1 and 00 - , E.4.2.1.

Connection type	DR	Type	DA (mm)	LA (mm)	a (mm)	b (mm)	PL (mm)
Clip mounting according to DIN EN 10357 Series A (old DIN 11850); DIN 11860 Series A; DIN 11866 series A	DN 10 (12 mm)	Type 05	28	46.6	10	8	-
	DN 10 (13 mm)	Type 05	28	46.6	10	8	-
	DN 25 (29 mm)	Type 1	64	84	10	10	-
	DN 50 (53 mm)	Type 2	93	113.5	10	20	-
Clip mounting according to Inch OD DIN 10357 series D; DIN 11860/11866 series C; ASME-BPE 2014	½" (12.7 mm)	Type 05	28	46.6	8	8	-
	1" (25.4 mm)	Type 1	64	84	10	10	-
	2" (50.8 mm)	Type 2	93	113.5	10	20	-
Threaded connection according to DIN ISO 228-1	G 1¼"	Type 05	28	24.5	-	-	-
	G 1"	Type 1	68	84	-	-	-
	G 2"	Type 2	93	113.5	-	-	-
Clip mounting according to DIN EN 10357 series C (ISO 1127)	13.5 mm	Type 05	28	46.6	10	8	-
	33.7 mm	Type 1	68	84	6	10	-
Mounting with R-clip according to DIN 10357 series D; ASME-BPE 2014	1" (25.4 mm)	Type 1	68	84	10	8	78
	1½" (38.1 mm)	Type 1	68	92	5.5	10	101
	2" (50.8 mm)	Type 2	93	113.5	10	20	117
Welded connection according to Inch OD DIN 10357 Series D; DIN 11860/11866 Series C; ASME-BPE 2014	1" (25.4 mm)	Type 1	68	79	-	-	-
	1½" (38.1 mm)	Type 1	68	79	-	-	-
	2" (50.8 mm)	Type 2	93	98.5	-	-	-

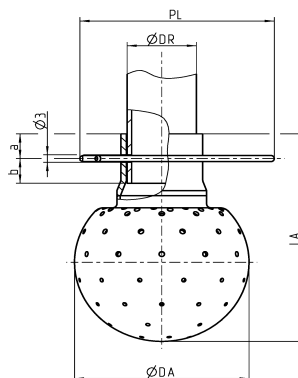
Clip connection



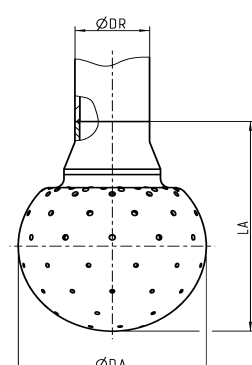
Threaded connection



Connection with R-Clip



Welded connection



ATEX

The following instructions apply for operation in potentially explosive atmosphere.

Safety notes

- The cleaners must be filled unpressurised with cleaning liquid. A sudden start can lead to damage and thus to an ignition source. Pressure surges are to be avoided.
- The maximum operating conditions must be observed and monitored. There is the risk of excessive generation of charge.
- During cleaning, liquids must be discharged from the tank so that no electrostatic charges form in the liquid which could potentially accumulate. During cleaning, do not add any liquids in the container.
- On starting the tank or container cleaning, there must be atmospheric conditions on the inside.
- The cleaner must be regularly checked for damage and function, taking into account the operating conditions. GEA recommends a visual inspection before/after every cleaning process.

Selection of the cleaning parameters according to TRGS 727:2016

For the information, GEA Tuchenhausen GmbH assumes no responsibility. If there is a risk of explosion due to the use of cleaners, all current ATEX relevant standards and regulations must always be applied.



Hint!

The accumulation of liquid in the container during cleaning should be avoided.



Hint!

Low-conductivity liquids such as hydrocarbons become less charged during spraying than water as they contain only a low concentration of dissociated ions.

Cleaning with water jets with pressures of up to 12 bar

When cleaning with water jets up to 12 bar and with up to 20 nozzles, no dangerous charges are to be expected as long as the liquid flow rate does not exceed 7 l/s and the tank volume does not exceed 10 m³.

Clean with solvents of low and medium conductivity from pressures up to 12 bar

If cleaning liquids of low and medium conductivity, e.g. organic solvents, are used, the proportion of a second phase, e.g. water or solid, may not exceed 1%.

Cleaning agents may only be run in a closed circuit if the impurities are kept below 1%.



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