



## Krantz displacement ventilation installed at the most modern police indoor firing range of Europe

### Reference project

#### Braamkamp Police Training Centre, Hamburg

- Client: IMPF Hamburgische Immobilienmanagement Gesellschaft mbH, Hamburg
- Consulting engineers: Heinze Stockfisch Grabis & Partner GmbH, Hamburg
- Building costs: about € 30 millions
- Mechanical contractor: Caverion Deutschland GmbH, Hamburg
- Year of construction: 2009 – 2011



**Special air distribution walls, make Krantz Components, type VA-RSA, have been installed in the indoor firing ranges to generate a low-turbulence displacement flow.**

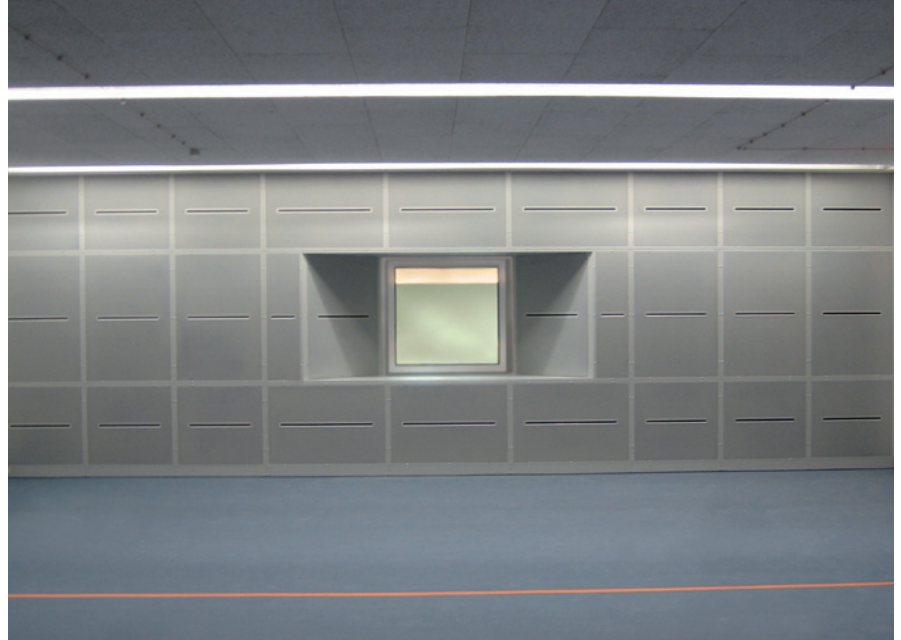
**Krantz Components is a leading manufacturer of individual air distribution systems and cooling/heating systems for commercial and industrial applications. High-quality clean-room systems complement our range of products.**

In the building project of the police training centre Braamkamp in Hamburg, Krantz Components has installed a total of nine air distribution walls (type VA-RSA) in the indoor firing ranges that differ in size, which generate a low-turbulence displacement flow. This type of air distribution makes sure that the pollutants released when shooting with firearms are displaced in the direction of the extraction system at the bullet trap by using the piston principle. Consequently the surrounding area of the shooter has a high air quality and is free of gun powder rests as well as of hazardous substances.

- Number: 9 air distribution walls (type VA-RSA)
- Dimensions (W x H):
  - 3 walls of 6 000 x 3 000 mm
  - 1 wall of 8 500 x 3 000 mm
  - 5 walls of 9 500 x 3 000 mm
- Supply air volume flow rate: 5 944 l/s – 9 444 l/s [21 400 m<sup>3</sup>/h – 34 000 m<sup>3</sup>/h]
- Air volume flow rate: about 306 l/s – 333 l/s [1 100 – 1 200 m<sup>3</sup>/h] per m<sup>2</sup> air discharge surface
- Installation of induction outlets for stabilization of the air jet
- Integration of windows into the air distribution wall
- Extraction system at the bullet trap

### Our advantages at a glance:

- Breathing area of the shooter free of hazardous substances
- High thermal comfort because of draught-free air supply
- Air distribution without influence on ballistics
- Easy and quick assembly (modular system)
- Integration of windows and doors for the supervision of the shooters
- Powder coating with free choice of colour
- Engineer support for layout and concept
- Proof of function during commissioning if desired



Police indoor firing range in Hamburg-Alsterdorf (Braamkamp)

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## The most modern police indoor firing range of Europe

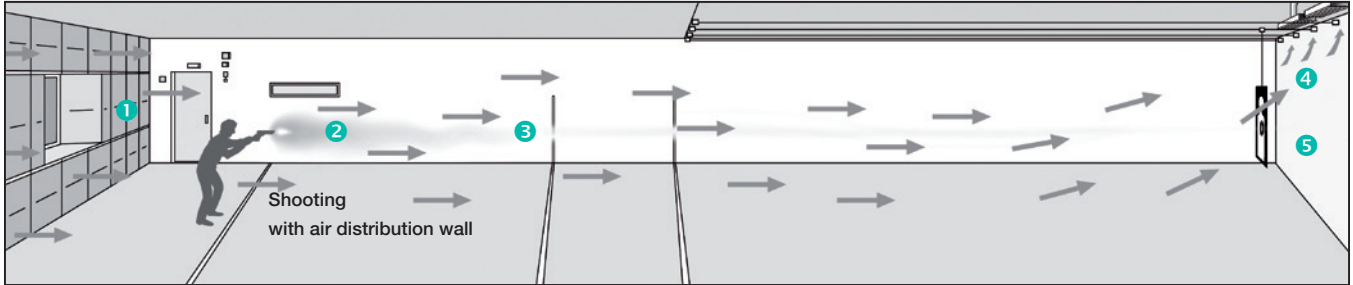
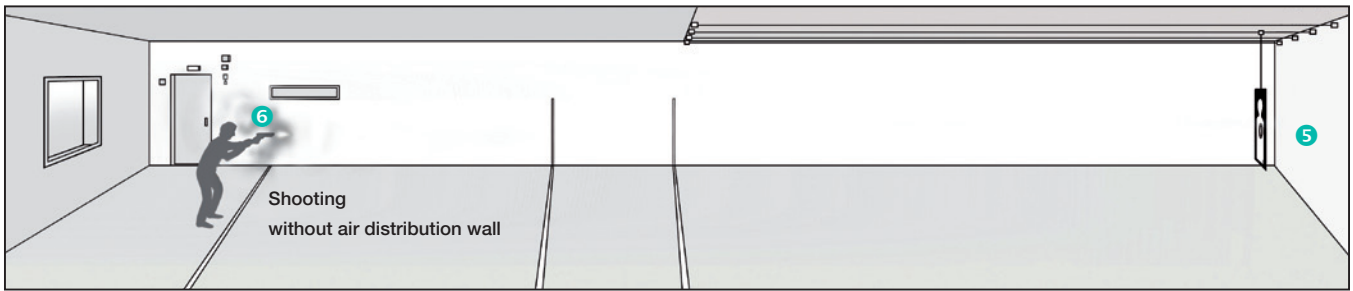
In June 2011 the most modern police indoor firing range of Europe was put officially into operation in Hamburg-Alsterdorf (Braamkamp).

A good 8 500 armed police officers from Hamburg are practicing ever since in the new firing range equipped with state-of-the-art technology.

Over an area of approximately 5 000 m<sup>2</sup> the officers are trained on firearms in a realistic way. In the police training centre at Braamkamp, Hamburg, the police officers are shooting at three-dimensional, moving targets and remote-controlled robots. To achieve a realistic scenario, the most different lighting, blinding and sound effects are installed. Altogether nine firing ranges were installed on two underground floors; five of them are specially designed for firing with lead-free ammunition.

Air conditioning and ventilation systems have been carried out by Caverion Deutschland GmbH, Hamburg.

The firing ranges were equipped with displacement outlets type VA-RSA, make Krantz Components. The air distribution walls were perfectly tailored to the individual architectural conditions.



## We protect shooters

Using the principle of displacement ventilation, installed in indoor firing ranges, the supply air is discharged through the entire wall surface behind the shooter. The special construction of the air distribution walls guarantees an even air flow. Built-in induction outlets support this effect and provide optimal displacement ventilation throughout the complete cross-section of the room. The windows for supervision are integrated with embrasures that are splayed out so that the visual field of the supervisor is not limited.

The value of the mean air velocity across the indoor firing range remains at a steady velocity of 0.33 m/s. Especially the firing ranges in Hamburg were designed for the possibility to adapt the volume flow rates and air velocities depending on the different internal loads.

Thanks to the special air distribution, the airborne pollutants that are released when shooting with firearms are displaced without any residues in the direction of the extraction system at the bullet trap by using the piston principle. Thus the adhesion of gun powder rests as well as health hazard of the shooters are avoided effectively. High air quality is generated in the area surrounding the shooter.

Krantz Components delivers all necessary parts like e.g. profiles and panels, sheet metal profiles for connection to sidewalls, floor and ceiling as well as fastening material. All parts are prepared to enable the customer to assemble the entire air distribution wall on site without great effort.

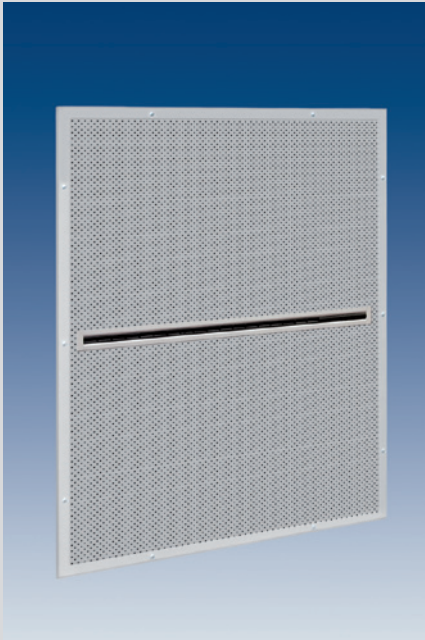
All visible elements will be painted in the required colour with a robust powder coating.

By request our experts will provide support for the design of the air distribution wall for your indoor firing range.

After the completion of the indoor firing range the performance can be proved by visualization with smoke (artificial fog) as well as by measurements of room air velocities and flow direction.

### Key

- ① Air distribution wall
- ② Displacement of airborne pollutants
- ③ Displacement ventilation (piston principle)
- ④ Extraction system at the top or lateral
- ⑤ Bullet trap
- ⑥ Airborne pollutants



Displacement outlet – ceiling element VA-RSA



Alternative design of an indoor firing range with air distribution ceiling and wall in Meiningen

## References

National	Supply air volume flow rate
Meiningen AFTP Police Force	2 861 l/s [10 300 m <sup>3</sup> /h]
Lübeck Local Authority Centre	2 861 l/s [10 300 m <sup>3</sup> /h]
Delmenhorst Police Force	4 583 l/s [16 500 m <sup>3</sup> /h]
Hamburg Police Force (9 indoor firing ranges)	up to 9 444 l/s [34 000 m <sup>3</sup> /h]
Hattingen Police Force	4 070 l/s [14 650 m <sup>3</sup> /h]
Selm Police Force	5 944 l/s [21 400 m <sup>3</sup> /h]
Nürthingen Police Station	3 375 l/s [12 150 m <sup>3</sup> /h]
RSA Nagold	4 250 l/s [15 300 m <sup>3</sup> /h]
Indoor Firing Range SG Tell, Uttenreuth	3 500 l/s [12 600 m <sup>3</sup> /h]
Schloss & Gut Liebenberg (castle & estate) (4 indoor firing ranges: 25 m-, 50 m-, 100 m and a shooting cinema)	7 625 l/s [27 450 m <sup>3</sup> /h]

International		Supply air volume flow rate
Victoria Police Station	Australia	11 111 l/s [40 000 m <sup>3</sup> /h]
Paris 12 <sup>th</sup> district, Police Station	France	4 167 l/s [15 000 m <sup>3</sup> /h]
Auchel Indoor Firing Range	France	3 375 l/s [12 150 m <sup>3</sup> /h]
Monterau Indoor Firing Range	France	9 722 l/s [35 000 m <sup>3</sup> /h]
Pyretherm Indoor Firing Range	France	8 333 l/s [30 000 m <sup>3</sup> /h]
A7 Gebouwenkomplex	Netherlands	6 500 l/s [23 400 m <sup>3</sup> /h]
Borne Police Force	Netherlands	6 639 l/s [23 900 m <sup>3</sup> /h]
Aargau Gun Firing Range	Switzerland	3 167 l/s [11 400 m <sup>3</sup> /h]
Teufen Indoor Firing Range	Switzerland	8 333 l/s [30 000 m <sup>3</sup> /h]

For further information about displacement ventilation for indoor firing ranges please click [here!](#)

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