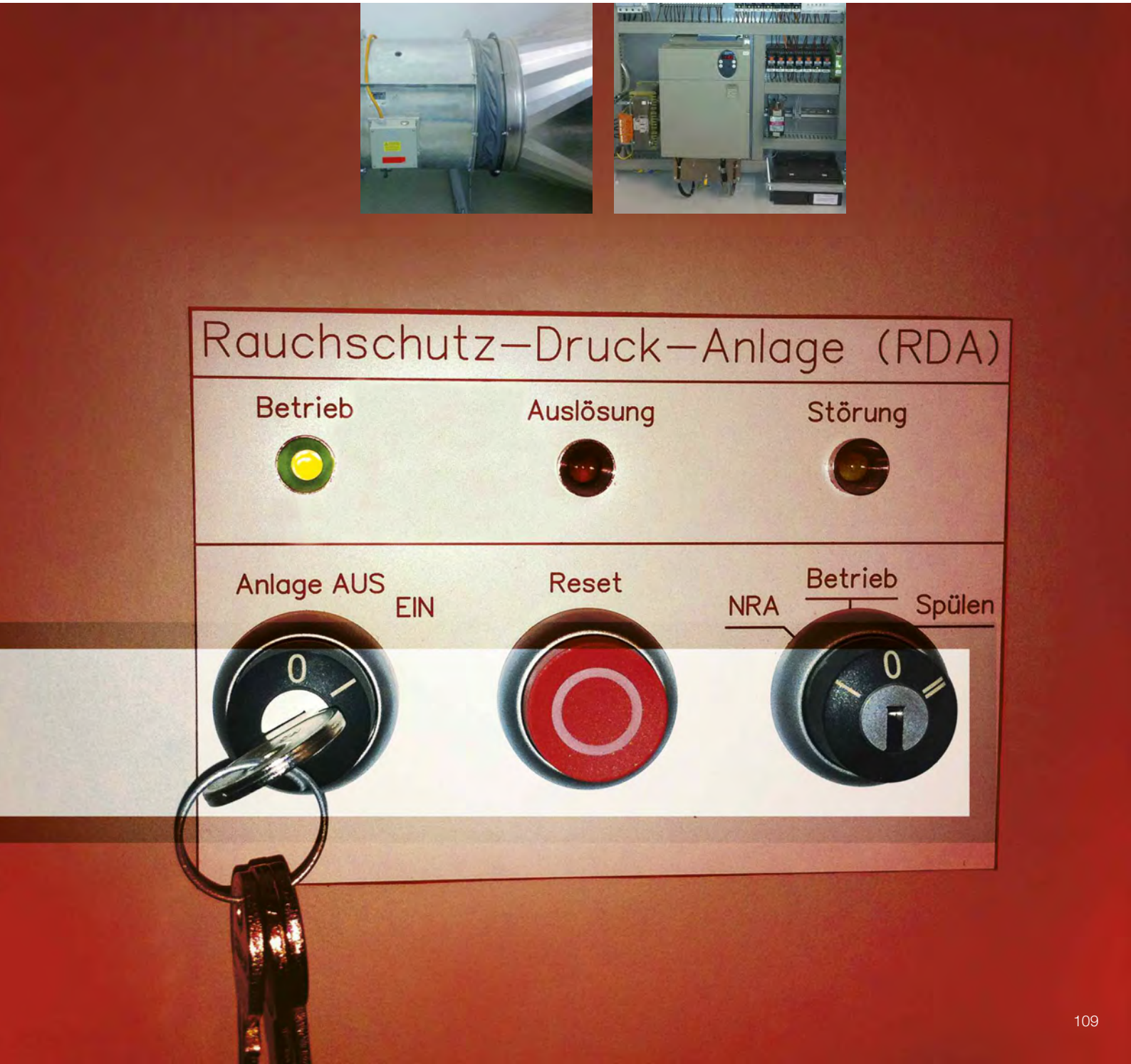
Smoke protection pressure- and stairway scavenging air systems guarantee smoke control in staircases, air-locks, fireman lifts and ante-rooms in case of fire. This enables the use of escape routes for people in the building and thus the safe exit of the building.

A smoke protection pressure system (RDA) generates a specified differential pressure between escape routes and adjacent building areas using a supply air fan. Whenever escaping persons open the doors, which lead into the smoke controlled escape route, a flow of fresh air originates from the supply air fan immediately. This prevents the smoke from entering the escape route.

Lifesaving protection of escape routes through smoke protection pressure systems.

Even with opened doors, the smoke spreading is effectively prevented, so that the escape routes can be used without restrictions.
In addition to the smoke control of escape routes, the RDA also cares for a significant reduction in building damages caused by smoke. The added smoke-free access for the firefighters to the fire floor allows a fast and effective fire fighting.

Stairway scavenging air systems (TSA) provides ventilation of the entire stairwell by using a fan. The dilution and discharge of smoke thus generated reduce the smoke gas concentration and increase the chances for a quick and successful self rescue for the people in the building significantly.



Regulations and approval

DIN EN 12101-6 contains detailed explanations and specifications to smoke protection pressure systems (RDA). Additional requirements for smoke discharge, dilution of smoke and smoke control systems are included in the VDMA standard sheet 24188. Furthermore, the legal building guideline of the specific state building code respectively the high-rise building regulations are to be taken into account.
In the planning phase the RDA has to be coordinated with the architect, the creator of the fire protection concept and the responsible approval authority. After the installation and adjustment an acceptance inspection by an expert is carried out. With handover of the system equipment the operator receives a training onsite. The functional safety in case of emergency is ensured by the annual maintenance and regular inspections.

Type of system

The VDMA 24188 standard sheet distinguishes five types of smoke control systems:
1) Natural smoke extraction
2) Scavenging air system without controlled pressure maintenance.
3) Scavenging air system with controlled pressure maintenance without guaranteed release in the storey.
4) Smoke protection pressure system with guaranteed release in the storey.
5) Smoke protection pressure system with guaranteed release in the storey and redundant operating mode and emergency power supply.

Depending on the escape route situation and building height the right system type is defined on the basis of flowcharts for standard cases.

Release of the system

Smoke protection pressure systems are put into operation automatically by smoke detectors. Per door, which leads to the escape route one smoke detector each is to be provided. In anterooms the smoke detector has to be installed in front of their entrance door. Addionally at least one push-button detector must be installed in the access area. The release also can be made by the fire alarm system of the building.

Scavenging of the stairwell

Directly after the release the RDA starts with scavending the stairwell. For the supply air discharge an opening surface of at least 1 m² is made in the stairwell head – e.g. by a RDA controlled light dome. Possibly penetrated smoke gases are so already diluted in the initial phase by the RDA and discharged from the stairwell.
If exclusively a scavenging of the stairwell is requested a planning of a stairway scavenging air system (TSA) is useful. This supplies the stairwell with an air flow volume of more than 10 000 m³/h through which penetrated fire gases are diluted and discharged via the open dome light.

Overpressure build-up

After the initial scavenging a controlled overpressure must be build up between the stairwell and the fireman floor in order to ensure a smoke-free area. For this a defined air flow volume enters the stairwell by using a fan. For an equal air supply in the stairwell of high buildings, a supply air duct with air outlet grille must be provided in every third storey. Pressure sensors permanetly measure the differential pressure in the stairwell. The RDA-control provides automatically the stabilization of the differential pressure in the stairwell and a door-opening force of less than 100 N (measured on the door handle) by means of a speed control.
With the doors closed in the stairwell the differential pressure between stairwell and adjacent unit is at least 15 Pa. This differential pressure prevents penetrating from smoke into the stairwell through gaps around the door.

Flow of air through doors

If escaping people open the doors, thus a pressure balance occurs immediately between the escape route and area on fire. In order that still no smoke can penetrate into the stairwell, fresh air must flow through the open door within the shortest time. For this fresh air is moved via supply air fan through the open door in direction of the area on fire. To achieve the required air flow velocity through doors a controlled discharge opening (e.g. window with servo motor, shaft) in the unit affected by the fire must be created, which is controlled by the RDA-control. The air flow velocity to be maintained through the door depends on the expected smoke gas temperature and the corresponding protection targets:
– Self rescue of persons ≥ 0,75 m/s
– Firefighting support ≥ 2 m/s

Fireman lifts

Smoke protection pressure systems prevent through the build-up of a controlled overpressure the penetration of smoke gases in the elevator shaft of fireman lifts. In the fireman floor a louvered damper with a cross section of approx. 0,4 m² is opened by the RDA-control, so that a connection is made between elevator shaft and anteroom through which the supply air can flow out of the elevator shaft into the anteroom. If the door of the anteroom is opened in the case of fire, fresh air immediately flows through this with a velocity of at least 0,75 m/s. Therefore the complete fireman lift and its anterooms are held smoke-free by the RDA.

Estimation of the air flow rate

The layout of the right fan takes place in two steps via the determination of the necessary design air flow rate:
1) Air leakage rate
The air leakage rate is to be injected after the release consistently into the stairwell to be able to build up the necessary overpressure. Leakages by which the overpressure escapes into the stairwell are e.g., door gaps and leaking connections between windows and the brickwork. Since the determination of the leakages is often very difficult, leakages not taken into account are compensated by the inclusion of a factor of 1.5.
2) Air flow rate to ensure the required door-flow velocity
Depending on door size and flow velocity the required flow volume is determined.

The final design air flow rate results from the sum of the above mentioned two air flow rates plus a deviation limit of 15 % for flow losses. The supply air fan is laid out on the basis of this design air flow rate as well as the object-specific pressure losses.

Estimation of a complete RDA based on the example of the system on page 7, figure 1.

1. Air leakage rate in the stairwell:

T30 RS doors	
Front door	550 m³/h
Window	50 m³/h
External walls	
Internal walls	
Stairwell ceiling	350 m³/h
4x Overflow valves	100 m³/h
Σ Air leakage rates	**1 050 m³/h**
+ Safety factor for undetected leak paths	· 1,5
	1 575 m³/h
+ Discharge via light dome	3 000 m³/h
Total air leakage rate	**4 575 m³/h**

2. Air flow rate for door flow:
1x open door in safety stairwell, without necessary corridor (k = 1,8)

$$\dot{V}_L = k \cdot b \cdot h^{1,5}$$

= **24 650 m³/h**

3. Design air flow rate:

	4 575 m³/h
	+ 24 650 m³/h
	29 225 m³/h
+ Safety factor for flow loss (+15 %)	
	= **33 609 m³/h**

...which means: **RDA 35**

Helios Ventilation Systems

As a leading manufacturer of fans and ventilation systems Helios offers a wide range of products and fulfils in finest gradations all requirements on air flow rate and pressure. In the RDA and TSA service packages Helios medium pressure axial fans are used whose air flow rates are matched perfectly to smoke protection pressure- and stairway scavenging air systems. Modular designed system packages allow the individual adaptation to the project and thereby increase the planning flexibility and plant safety.

Helios Service

Helios offers a variety of services for the planning, implementation, start-up and approval of smoke protection pressure systems. Please contact us.

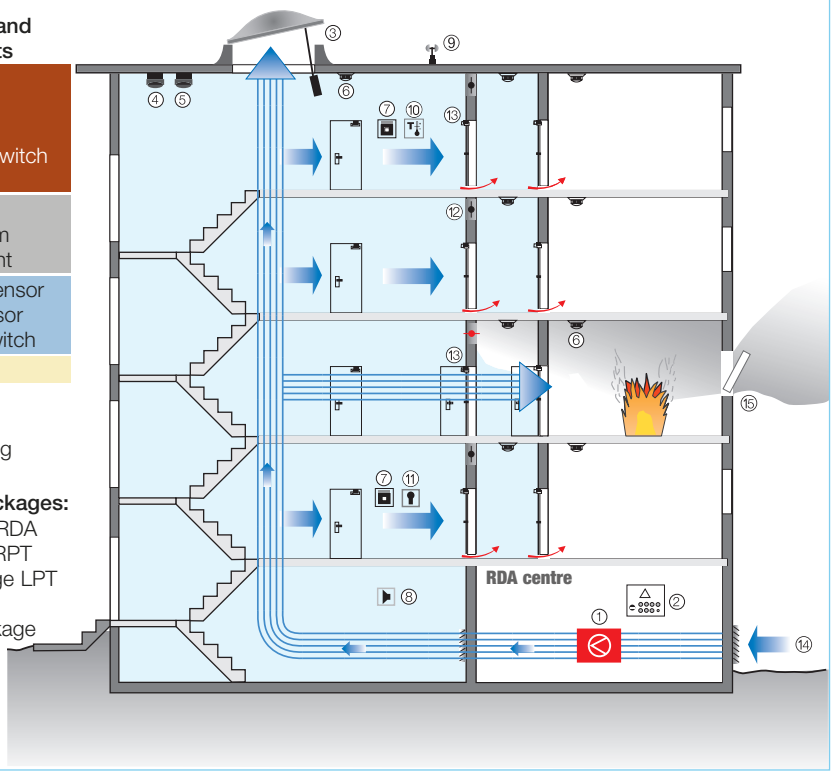
■ Overpressure ventilating of stairsways – Smoke protection pressure system (RDA)

Fig. 1

□ **RDA-packages and their components**

① Supply air fan
② RDA-control
③ Light dome
④ Safety pressure switch
⑤ Pressure sensor
⑥ Smoke detector
⑦ Push button alarm
⑧ Siren/Flashing light
⑨ Wind- and rain sensor
⑩ Temperature sensor
⑪ Ventilation key switch
⑫ Overflow valve
⑬ Door closer
⑭ Supply air intake
⑮ Discharge opening

Legend – RDA-packages:
- Service package RDA
- Smoke package RPT
- Ventilation package LPT
- Accessories
- Redundancy package RDP: ① and ②



■ **Smoke protection pressure system**

□ **Operating mode RDA**

If smoke is detected in a unit the Helios RDA is released immediately and the stairwell is supplied through the supply air fan ① with fresh air. Through the opened light dome ③ in the stairwell head a constant flow through the stairwell takes place with fresh air to dilute and discharge possibly entered smoke gases. In addition, an overpressure builds up in the stairwell, which prevents penetrating of smoke and thus ensures the smoke control of the escape routes. At the same time the RDA-control ② sends a signal to a servo motor, which opens a controlled discharge opening in the fireman floor. After the air has passed through the escape route and the opened door at a prescribed speed, it escapes through the controlled discharge opening to the outside. Fire gases are thereby held back also by a door opening ⑮, a smoke entry in the stairwell is effectively prevented.

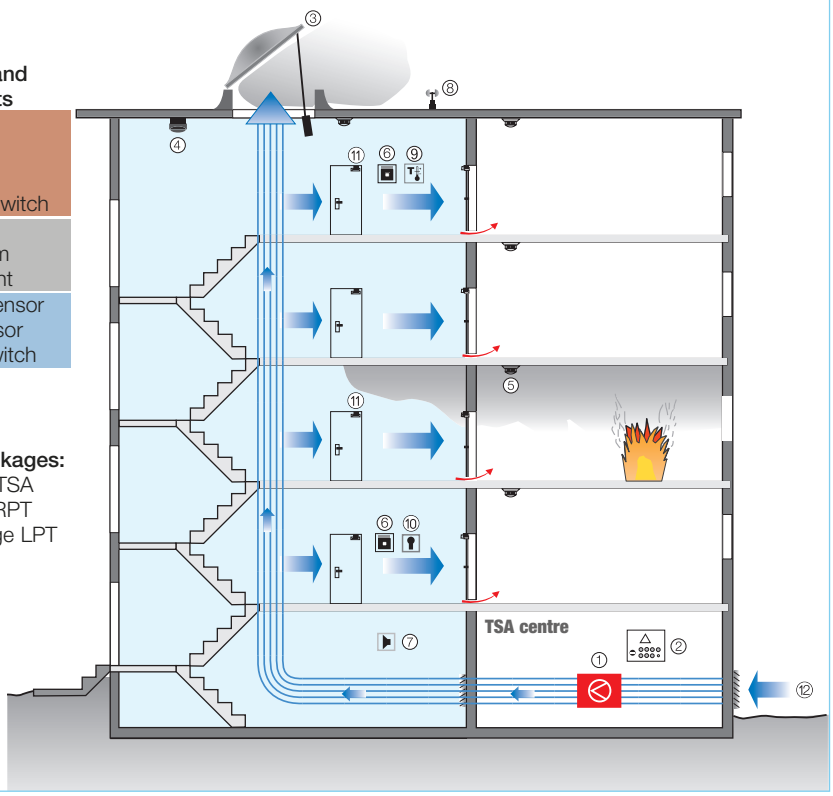
■ Scavenging of stairways - Stairway scavenging air system (TSA)

Fig. 2

□ **TSA-packages and their components**

① Supply air fan
② TSA-control
③ Light dome
④ Safeta pressure switch
⑤ Smoke detector
⑥ Push button alarm
⑦ Siren/Flashing light
⑧ Wind- and rain sensor
⑨ Temperature sensor
⑩ Ventilation key switch
⑪ Door closer
⑫ Supply air intake

Legend – TSA-packages:
- Service package TSA
- Smoke package RPT
- Ventilation package LPT



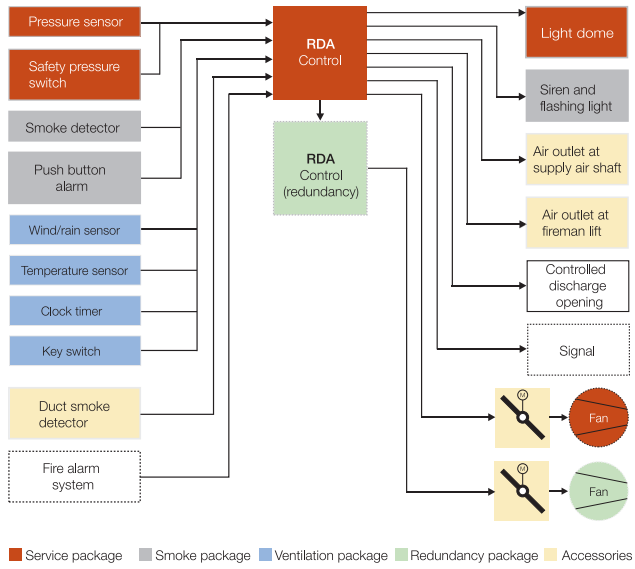
■ **Stairway scavenging air system**

□ **Operating mode TSA**

If units are endangered by smoke the Helios TSA will be released e.g. by a smoke detector ⑤. After the immediate, complete opening of the light dome ③ in the stairwell head fresh air is transported into the stairwell via the supply air fan ①. The fresh air flows through the whole stairwell, dilutes at the same time the penetrated smoke gases and discharges them through the opened light dome ③ into the atmosphere. A constant air flow rate of about 10 000 m³ / h ensures significant reduction of smoke gas concentration in the scavenged stairwell.

RDA service package

System sketch RDA



Helios protection pressure systems RDA provide in the case of fire through overpressure build-up for the safe smoke control of stairwells, air locks, fireman lifts and their anterooms.
The complete RDA product range of Helios is made up of pre-configured packages with components coordinated on each other.
The modular system allows:

- ☐ **The individual expansion and adaptation to almost all structural conditions and project requirements.**
- ☐ **A trouble-free planning, installation and start-up as well as a safe operation.**

■ Description

■ Smoke protection pressure system with diffential pressure regulation

By using a specially configured frequency inverter in combination with a powerful medium pressure axial fan and an innovative control technology, the Helios RDA meets all building regulations and normative requirements on the differential pressure regulation.

■ Scope of delivery/ Packages

The RDA scope of service is modularly structured in packages with coordinated components, which can be ordered individually:

■ Service package RDA

Contains the following as a basis of each RDA, in all objects required components:

- Medium pressure axial fan AMD. According to the table below in four sizes, depending on the required supply air flow volume.
- Light dome, colour white, RAL 9010. With 24 V spindle drive and heat-insulated 300 mm GFP-skylight base.
- Control cabinet with complete RDA control, including frequency inverter. Expandable with multiple functions using pre-configured modules, see table on right side.
- Safety pressure switch and pressure sensor for the differential pressure regulation.

■ Smoke package RPT

Includes the system elements, which are necessary for the alerting and activation of the system. (Description see next page).

■ Ventilation package LPT

For an ideal, demand-driven ventilation (Description see next page).

■ Redundancy package RDP

To fulfill the requirement of two independently operating fans and separate controls (Description see next page).

■ Start-up

Complete adjustment and start-up of the smoke protection pressure system. Including service-, smoke- and if necessary ventilation- and redundancy package. On request support of the acceptance procedure.

RDA-IB Ref. No. 4966

☐ Note

As standard, the RDA control is powered by the battery integrated in the control cabinet during a power failure for at least 72 hours. During this time the light dome can be opened in case of fire for natural smoke extraction.

RDA Service package includes		a) Supply air fan, 3-phase motor, IP 55				b) Control cabinet	c) Light dome							
Type	Ref. No.	Air flow volume (max.)	Type	Motor power (nominal)	Voltage	Current at full load	Cabinet dimensions[1]	Nominal dimensions	Lift	A effective	**Smoke package**		**Ventilation package**		**Redundancy package**	
		m^3/h	400 V, 50 Hz	kW	V	A	mm	mm	mm	m^2	**Type**	Ref. No.	**Type**	Ref. No.	**Type**	Ref. No.
RDA 20	4996	20 000	AMD 560/2	7,5	400/690	13,9	800x1000x300	1200x1200	500	1	**RPT**	4987	**LPT**	4986	**RDP 20**	4988
RDA 25	4997	25 000	AMD 710/4	5,5	400/690	10,9	800x1000x300	1200x1200	500	1	**RPT**	4987	**LPT**	4986	**RDP 25**	4989
RDA 35	4998	35 000	AMD 800/4	11	400/690	21,0	800x1000x300	1500x1500	500	1,3	**RPT**	4987	**LPT**	4986	**RDP 35**	4990
RDA 65	4999	65 000	AMD 900/4	30	400/690	54,4	1000x1200x300	1500x1500	500	1,3	**RPT**	4987	**LPT**	4986	**RDP 65**	4991

Accessories for RDA..

Type	Volume control damper with 24 Volt servomotor			Volume control damper with guard for supply air duct		Volume control damper with guard for fireman lift*		Bell mouth with guard		Automatic back draughtt shutter		Extension duct		Flanged fexible connector		Anti vibration mounts **SDD** Comp./**SDZ**	
	Type	mm	Ref. No.	**Type**	Ref. No.	**Type**	Ref. No.	**Type**	No.	**Type**	No.	**Type**	No.	**Type**	No.	**Type**	Ref. No.
RDA 20	**JK 130/60**	1300x600	4975	**JKG 70/50**	4979	**JKG 80/50***	4974	**ASD-SGD 560**	1421	**RVS 560**	2599	**VR 560**	1409	**STS 560**	1226	**../..2**	1453/1455
RDA 25	**JK 140/60**	1400x600	4976	**JKG 70/50**	4979	**JKG 80/50***	4974	**ASD-SGD 710**	1423	**RVS 710**	2601	**VR 710**	1411	**STS 710**	1229	**../..2**	1453/1455
RDA 35	**JK 150/80**	1500x800	4977	**JKG 70/50**	4979	**JKG 80/50***	4974	**ASD-SGD 800**	1424	**RVS 800**	2602	**VR 800**	1412	**STS 800**	1233	**..3/..3**	1367/1366
RDA 65	**JK 160/140**	1600x1400	4978	**JKG 70/50**	4979	**JKG 80/50***	4974	**ASD-SGD 900**	1309	**RVS 900**	2603	**VR 900**	1311	**STS 900**	1234	**..3/..7**	1367/1929

* The fireman lift is a separate fire section. The installation of the damper JKG 80/50 must be coordinated in advance with the approval authorities or the fire protection planner.
[1] When using the redundancy package, cabinet dimension on request.

System packages

Smoke package

RPT Ref.No. 4987

Contains the following components (1 piece each):
- Smoke detector,
- Push button alarm,
- Combined unit with siren and flashing light.

The package components are also available individually as accessories, see description right column.

Ventilation package

LPT Ref.No. 4986

Extends the RDA function to the demand-driven ventilation mode (summer): With open dome light, the fan runs on low speed. Content of the package for activation of the ventilation mode (1 piece each):
- Key switch
- Temperature sensor
- Timer
- Wind- and rain sensor, stops the ventilation in bad weather and closes the dome light.

Redundancy package

RDP 20	Ref.No. 4988
RDP 25	Ref.No. 4989
RDP 35	Ref.No. 4990
RDP 65	Ref.No. 4991

Completes the RDA for appropriate building regulations requirements to a complete system with two independently operating supply air fans and separate power parts. Content of package (1 piece each):
- Medium pressure axial fan AMD. According to accompanying table in four sizes (depending on the required supply air rate).
- Power part integrated in control cabinet from service package.

Smoke package

Ventilation package

Redundancy package

Accessories

Smoke detector

RMR Ref.No. 4984

Smoke detector for the automatic activation of the system in case of smoke detection. Simple installation by bayonet lock und local test option.

Voltage	8-30 V DC
Standby current	50 µA
Dimensions mm	Ø 105 x H 58

Push button alarm

DKM Ref.No. 4985

Push button alarm for the manual activation of the system. Easy replaceable glass pane in the lockable casing.

Voltage	24V DC
Colour	RAL 2011
Dimensions mm	W 123 x H 123 x D 40

Siren/Flashing light

BLH Ref.No. 4983

Combined unit with xenon flashing light and volume-adjustable siren. Protected in impact resistant poymer casing, for ceiling and wall mounting.

Voltage	18-30 V DC
Rated current	170 mA
Sound level	ca. 110 dB
Dimensions mm	Ø 93 x H 120

Duct smoke detector

RMK Ref.No. 4982

Duct smoke detector for early detection of smoke gases in the supply air intake.

Voltage	12/24 V DC
Standby current	120 µA
Dimensions mm	W 370 x H 128 x D 64

Overflow valve

ÜV 200 Ref.No. 4981

Overflow valve DN 200 for pressure balance between the pessurized stairwell and its adjoining air locks.

Pressure adjustment range	15-50 Pa
Required wall thickness	min. 210 mm
Diameter mm	Ø 200

Volume control damper with guard

JKG 70/50 Ref.No. 4979

with 24V servo motor and safety guard for the supply air shaft.

Dimensions mm W 700 x H 500 x D 120

JKG 80/50* Ref.No. 4974

with 24V servo motor and safety guard for fireman's lift shaft

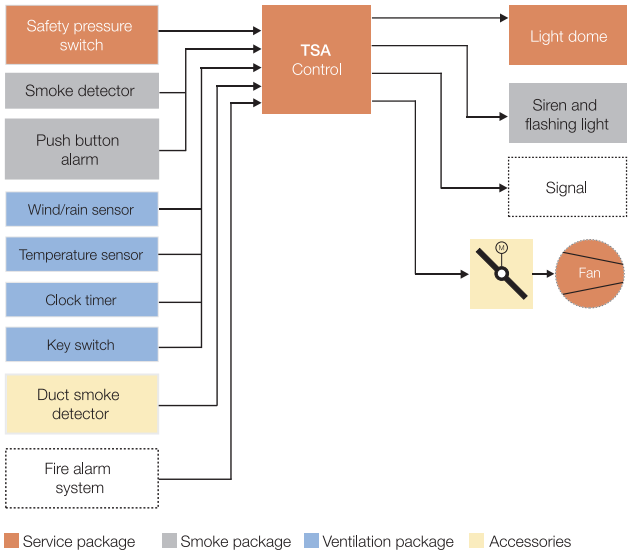
Dimension mm W 800 x H 500 x D 120

Connection options to RDA controls		
Type	Quantity	Description
RMR	10 x	Smoke detector
RMK	1 x	Duct smoke sensor
AMD..	1 x	Medium pressure axial fan
DDR	1 x	Pressure sensor
BLH	1 x	Siren/Flashing light
DKM	10 x	Push button alarm
JKG..	2 x	Volume control damper with 24 V servomotor
LK..	1 x	Light dome with 24V spindle drive
DDB	1 x	Safety pressure switch
LPT	1 x	Ventilation package

Extension moduls for RDA controls (for integration in control cabinet)		
Type	Ref.No.	Description
EM 1	4968	for 5 additional supply air dampers with 24V
EM 2	4969	for 20 additional smoke detectors RMR
EM 3	4970	for 10 additional push button alarm DKM
EM 4	4971	Additional output 24V DC, max. 4A (e.g. window in stairwell)
EM 5	4972	For the control of up to 20 free-swinging door closers
EM 6	4973	Selective damper control 24V (each floor)
EM 7	4940	Selective detector analysis (each floor)

TSA Service package

System sketch TSA



Helios stairway scavencing air systems TSA provide in case of fire by discharge for a significant dilution of the smoke gas concentration in stairwells, air locks, fireman lifts and their anterooms and and thereby increase the chances of a quick and successful self-rescue.
The complete TSA product range of Helios is made up of preconfigured packages with components coordinated on each other and includes additionally low noise system solutions.
The modular system allows:
- ☐ **The individual expansion and adaptation to almost all structural conditions and project requirements.**
- ☐ **A trouble-free planning, installation and start-up as well as a safe operation.**

■ Description

■ Stairway scavenging air system TSA

The TSA supplies the stairwell in case of fire with a supply air flow volume of at least 10 000 m³/h. Thus the entered smoke gases are diluted and discharged through the open skylight in the stairwell head.

■ Scope of delivery/ Packages

The TSA scope of service is modularly structured in packages with coordinated components, which can be ordered individually:

■ Service package TSA

Contains the following as a basis of each RDA, in all objects required components
- – High perfomance medium pressure axial fan AMD with a supply air flow volume of at least 10 000 m³/h for air scavenging of the stairwell.
- – Light dome, colour white, RAL 9010. With 24 V spindle drive and heat-insulated 300 mm GFP-skylight base.
- – Control cabinet with complete TSA control. Expandable with multiple functions using preconfigured modules, see table on right side.
- – Safety pressure switch to shut off the supply air fan at too high differential pressure.

☐ Altogether four service packages are available
- – Standard version TSA as well as silent version TSAS with lower sound power level.
- – Both types are optionally available as „L"-version with two-stage fan. This allows in combination with the ventilation package LPT an economic, demand-driven ventilation.

☐ Ventilation function

Using appropriate control cabinet equipment and additional ventilation packages the TSA service packages "L" allow the manual and automatic stairwell ventilation, e.g. at high temperatures in summer.

■ Smoke package RPT

Includes the system elements, which are necessary for the alerting and activation of the system (Description see next page).

■ Ventilation package LPT

For an ideal, demand-driven ventilation of TSA-L and TSAS-L (Description see next page).

■ Start-up

Complete adjustment and start-up of the stairway scavenging air system. Including service-, smoke- and ventilation package. On request support of the acceptance procedure.

TSA-IB Ref.No. 4967

TSA Service package includes			a) Supply air fan				b) Control cabinet	c) Light dome					
Type	Ref. No.	Air flow volume (min.)	Type	Motor power (nominal)	Voltage	Current at full load	Cabinet dimensions	Nominal dimensions	Lift	A effective	**Smoke package**		**Ventilation package** for TSA-L and TSAS-L	
		m³/h		kW	V	A	mm	mm	mm	m²	**Type**	Ref.No.	**Type**	Ref.No.
TSA	4992	10 000	AMD 450/2	3,0	230/400	5,86	600x600x210	1200x1200	500	1	**RPT**	4987	—	—
TSA-L	4993	10 000	AMD 450/4/2	0,8/3,1	400	2,11/6,27	600x600x210	1200x1200	500	1	**RPT**	4987	**LPT**	4986
TSAS	4994	10 000	AMD 560/4	2,2	230/400	4,64	600x600x210	1200x1200	500	1	**RPT**	4987	—	—
TSAS-L	4995	10 000	AMD 560/8/4	0,65/2,4	400	2,68/4,97	600x600x210	1200x1200	500	1	**RPT**	4987	**LPT**	4986

Accessories for TSA..												
Type	Volume control damper with 24 Volt servomotor			Bell mouth with guard		Automatic back draught shutter		Extension duct		Flanged flexible connector		Anti vibration mounts **SDD** Comp./**SDZ** Susp.	
	Type	mm	Ref.No.	**Type**	Ref.No.	**Type**	Ref.No.	**Type**	Ref.No.	**Type**	Ref.No.	**Type**	Ref.No.
TSA	**JK 70/50**	700x500	4965	**ASD-SGD 450**	1419	**RVS 450**	2597	**VR 450**	1407	**STS 450**	1224	**..2/..2**	1453/1455
TSA-L	**JK 70/50**	700x500	4965	**ASD-SGD 450**	1419	**RVS 450**	2597	**VR 450**	1407	**STS 450**	1224	**..2/..2**	1453/1455
TSAS	**JK 70/50**	700x500	4965	**ASD-SGD 560**	1421	**RVS 560**	2599	**VR 560**	1409	**STS 560**	1226	**..3/..3**	1367/1366
TSAS-L	**JK 70/50**	700x500	4965	**ASD-SGD 560**	1421	**RVS 560**	2599	**VR 560**	1409	**STS 560**	1226	**..3/..7**	1367/1929

System packages

Smoke package

RPT Ref.No. 4987

Contains the following components (1 piece each):
- Smoke detector,
- Push button alarm,
- Combined unit with siren and flashing light.

The package components are also available individually as accessories, see description right column.

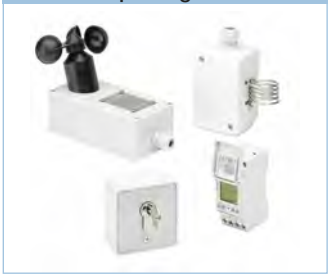
Smoke package

Ventilation package

LPT Ref.No. 4986

Extends the RDA function to the demand-driven ventilation mode (summer): With open dome light, the fan runs on low speed. Content of the package for activation of the ventilation mode (1 piece each):
- Key switch
- Temperature sensor
- Timer
- Wind- and rain sensor, stops the ventilation in bad weather and closes the dome light.

Ventilation package



Note

As standard, the RDA control is powered by the battery integrated in the control cabinet during a power failure for at least 72 hours. During this time the light dome can be opened in case of fire for natural smoke extraction.

Accessories

Smoke detector

RMR Ref.No. 4984

Smoke detector for the automatic activation of the system in case of smoke detection. Simple installation by bayonet lock und local test option.

Voltage	8-30 V DC
Standby current	50 µA
Dimensions mm	Ø 105 x H 58

Push button alarm

DKM Ref.No. 4985

Push button alarm for the manual activation of the system. Easy replaceable glass pane in the lockable casing.

Voltage	24V DC
Colour	RAL 2011
Dimensions mm	W 123 x H 123 x D 40

Siren/Flashing light

BLH Ref.No. 4983

Combined unit with xenon flashing light and volume-adjustable siren. Protected in impact resistant poymer casing, for ceiling and wall mounting.

Voltage	18-30 V DC
Rated current	170 mA
Sound level	ca. 110 dB
Dimensions mm	Ø 93 x H 120

Duct smoke detector

RMK Ref.No. 4982

Duct smoke detector for early detection of smoke gases in the supply air intake.

Voltage	12/24 V DC
Standby current	120 µA
Dimensions mm	W 370 x H 128 x D 64

Connection options to TSA controls

Type	Quantity	Description
RMR	10 x	Smoke detector
RMK	1 x	Duct smoke detector
AMD..	1 x	Medium pressure axial fan
BLH	1 x	Siren/Flashing light
DKM	10 x	Push button alarm
JKG..	2 x	Volume control damper with 24 V servomotor
LK..	1 x	Light dome with 24 V spindle drive
DDB	1 x	Safety pressure switch
LPT	1 x	Ventilation package

Extension moduls for TSA controls (for integration in control cabinet)

Type	Ref.No.	Description
EM 1	4968	for 5 additional supply air dampers with 24V
EM 2	4969	for 20 additional smoke detectors RMR
EM 3	4970	for 10 additional push button alarm DKM
EM 4	4971	Additional output 24V DC, max. 4A (e.g. window in stairwell)
EM 5	4972	for the control of up to 20 free-swinging door closers