

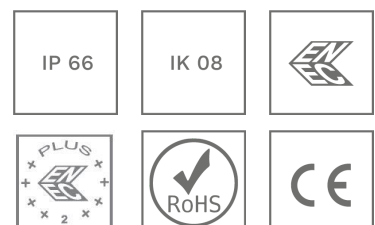
TAG



Powerful tunnel lighting solution

TAG takes advantage of the latest innovations to offer a compact, lightweight, easy-to-install, versatile and powerful tunnel lighting solution. With TAG, Schröder exploits the full potential of the latest digital technology to improve tunnel environments. The flat, compact and robust mechanical design of the TAG minimises mounting constraints and ensures that the optical units occupy little space in the tunnel ceiling. The TAG range is not only designed to reduce the investment. It is also optimised to provide state-of-the-art lighting that guarantees a safe and comfortable driving experience for motorists with significant energy and maintenance savings for tunnel operators.

TAG benefits from Schröder's long-standing expertise in tunnel lighting. This new range is fully compliant with the most stringent standards and can be managed by the Advanced Tunnel control System (ATS) from Schröder, to offer the highest savings while providing an optimal experience for drivers.



Concept

TAG is a range of low-profile LED optical units with separate drivers and controls for tunnel lighting. Its optimised design ensures that its LED light sources provide long-lasting performance in demanding underpasses and tunnel environments. With a lightweight body, a versatile mounting system and integrated quick-on connectors, TAG facilitates mounting operations with a real plug-and-play philosophy.

The range includes two sizes. TAG 1, the smaller version, is mainly designed for transition and interior zones for point lighting layouts while the powerful TAG 2 finds its typical application at the entrance zone. Both TAG 1 and TAG 2 combine the energy efficiency of LED technology with the photometric performance of the LensoFlex® concepts developed by Schröder.

TAG 2 is also available with the ReFlexo™ photometric engine for counter beam lighting (CBL) to optimise lighting levels on road and wall surfaces while providing high visual comfort.

The TAG range has been developed to enable constant dimming with an optimised power factor. Designed with two electronic circuits, each TAG luminaire can either be dimmed completely, partially or even have 50% of its LEDs switched off.

This possibility not only maximises energy savings. It also extends the lifetime of the complete installation and reduces the need for disruptive maintenance. TAG is part of Schröder's complete tunnel solution that includes robust luminaires, smart cabling with quick-on QPD connectors and advanced control systems to improve safety for drivers and to provide major operational benefits for tunnel managers.



The TAG range includes a new generation of IP 66 gear boxes.



TAG is equipped with quick-on QPD connectors.

Types of application

- TUNNELS & UNDERPASSES

Key advantages

- High-power LED solution to replace HID luminaires in the entrance and interior zones
- Available in two sizes and in various configurations to cover all tunnel lighting requirements
- Designed for long-lasting performance
- Compact, lightweight and easy to install
- Two electrical circuits for enhanced dimming possibilities, optimised power factor and longer lifespan
- Remote gear boxes for versatile mounting (up to 3 TAGs per gear box)
- Wide range of lighting distributions to suit numerous tunnel configurations



Depending on the configuration, up to 3 TAGs can be powered by the same gear box



TAG is delivered with a versatile mounting system.



LensoFlex®2

LensoFlex®2 is based upon the addition principle of photometric distribution. Each LED is associated with a specific PMMA lens that generates the complete photometric distribution of the luminaire. The number of LEDs in combination with the driving current determines the intensity level of the light distribution.

The proven LensoFlex®2 concept includes a glass protector to seal the LEDs and lenses into the luminaire body.



LensoFlex®3

LensoFlex®3 uses lenses made of mouldable and optical-grade silicon offering superior transparency and excellent photothermal stability. This withstands high driving currents and delivers maximised lumen output over time. As silicon offers a higher thermal resistance compared to PMMA, temperature is not as critical for LensoFlex®3 engines. This offers two distinct advantages; LensoFlex®3 ensures enhanced performance in warm climates and enables a high driving current to be used to increase the lumen output and a higher lm/kg ratio. It also does not suffer from yellowing over time.



ReFlexo™

Using metal reflectors with a superior reflective co-efficient, the ReFlexo™ photometric engine delivers high performance for specific applications such as counter beam lighting in tunnels or very extensive light distributions for sports or apron lighting.

Another key advantage of the ReFlexo™ is its' ability to direct all the light to the front of the luminaire, ensuring that no back light is emitted. This photometric engine guarantees glare free lighting for excellent visual comfort and the creation of ambiance.

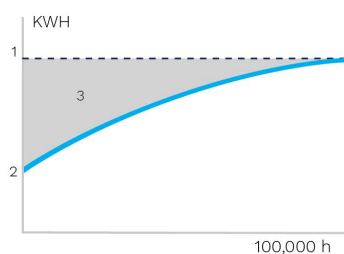




Constant Light Output (CLO)

This system compensates for the depreciation of luminous flux to avoid excess lighting at the beginning of the installation's service life. Luminous depreciation over time must be taken into account to ensure a predefined lighting level during the luminaire's useful life.

Without a CLO feature, this simply means increasing the initial power upon installation in order to make up for luminous depreciation. By precisely controlling the luminous flux, the energy needed to reach the required level can be maintained throughout the luminaire's life.



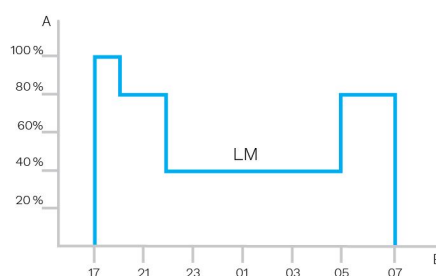
1. Standard lighting level | 2. LED lighting consumption with CLO | 3. Energy savings



Custom dimming profile

Intelligent luminaire drivers can be programmed with complex dimming profiles. Up to five combinations of time intervals and light levels are possible. This feature does not require any extra wiring.

The period between switching on and switching off is used to activate the preset dimming profile. The customised dimming system generates maximum energy savings while respecting the required lighting levels and uniformity throughout the night.



A. Performance | B. Time

Advanced Tunnel Solution (ATS)

The ATS (Advanced Tunnel Solution) is a control system that manages luminaire controllers (Lumgates) to deploy pre-defined lighting scenarios or to take charge of the lighting installation at any moment.

The ATS controller can operate as a standalone unit or can be linked to the main tunnel control system to interact with features not directly related to lighting (traffic management, ventilation, fire detection etc.).



Luminance meter (L20)

The luminance meter measures the luminance provided by natural light in the access zone from the safe stopping distance. It sends the data to the ATS control system that adjusts the lighting levels to avoid any visual adaptation problems.



Lumgate

The Lumgate is an RS485 closed-loop device connected to the luminaire drivers to control the light intensity and provide command/reporting features.

One Lumgate can control several luminaires.



Tunnel Control System (TCS)

The Tunnel Control System (TCS) is a gateway ensuring the connection/control of the multiple ATS controllers as well as the communication with the central management system of the tunnel infrastructure (SCADA) if applicable.



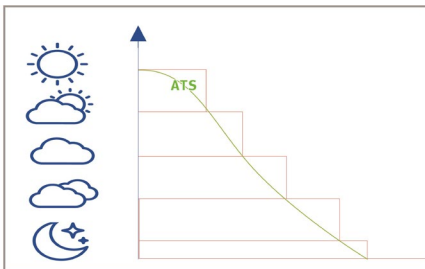


Jointly developed by Schröder and Phoenix Contact, the Advanced Tunnel Solution (ATS) has been designed to control every lighting point or clusters of luminaires to perfectly adapt the lighting level according to conditions in the

tunnel, to monitor the power consumption and to report the burning hours or any failure to facilitate maintenance. The system includes a self-commissioning feature and enables scenarios to be adapted remotely at any moment.

PRECISE AND CONTINUOUS DIMMING

ATS provides 25 different dimming levels to precisely adapt the lighting to the real needs. Without any over-lighting, the energy consumption is limited to what is absolutely necessary to ensure safe and comfortable driving conditions.



FLEXIBILITY

Flexible redundancy offers security on multi-level applications, not only for the lighting.

PLUG AND PLAY COMMISSIONING

The tunnel lighting study can be directly imported into the ATS control system.

This unique feature, in combination with the auto-addressing of the Lumigates, leads to an extremely short commissioning time once the fixtures have been installed.

Each luminaire or cluster of luminaires is attributed the precise dimming profile linked to its position and characteristics.

INTERACTION WITH THIRD PARTY SYSTEMS

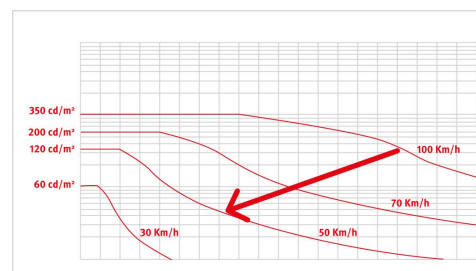
Every command or signal sent to or coming from a tunnel component (emergency exit, smoke extraction system, traffic management system...) can be used to trigger a responsive lighting scenario. All of the tunnel equipment can be controlled through the same bus command.

MAXIMISED SAFETY

The system enables the easy set-up of emergency and disaster management scenarios.

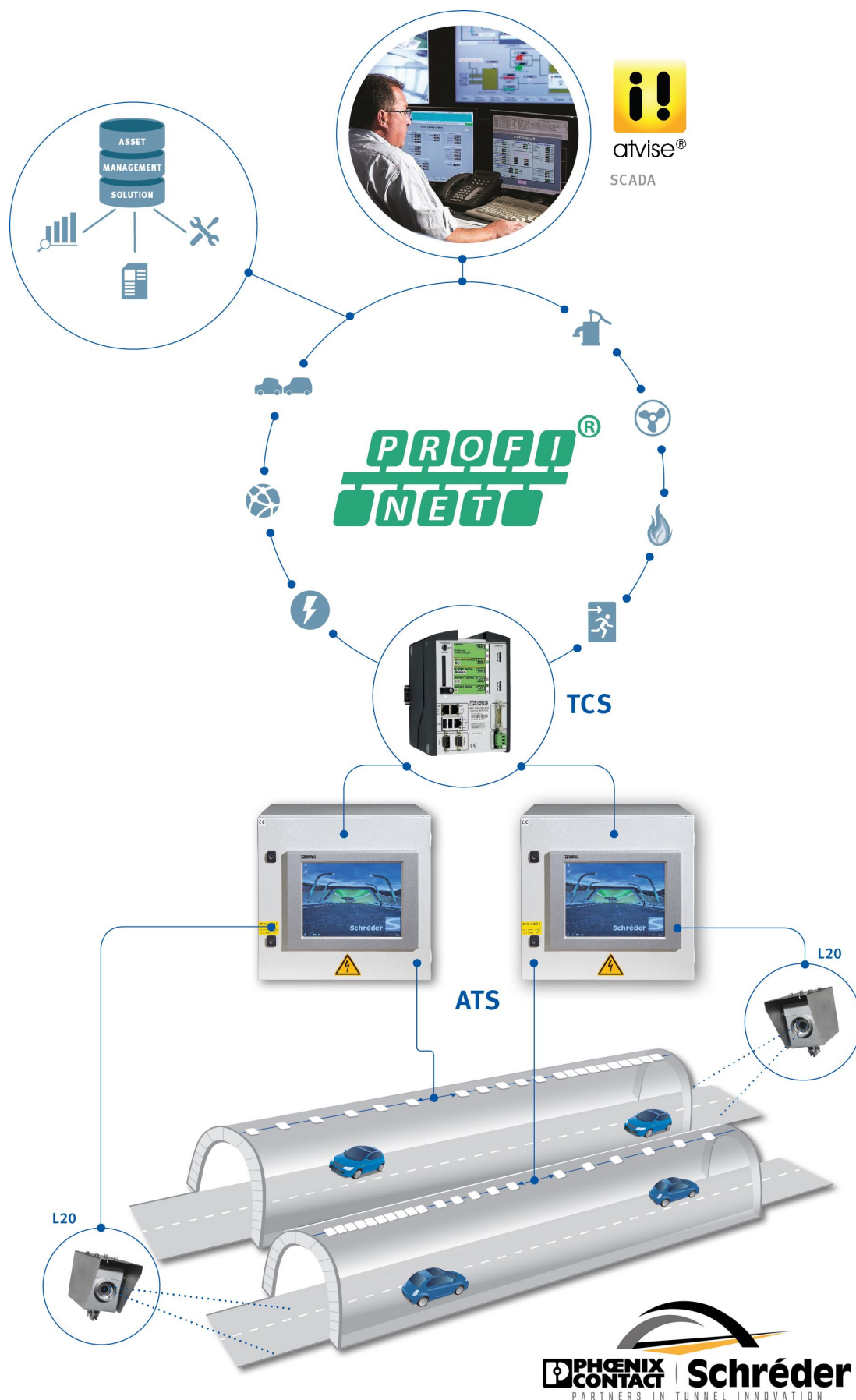
ADAPTIVE LIGHTING ACCORDING TO SPEED

The ATS can be linked to a traffic monitoring system to obtain data regarding speed or density to adapt the lighting level according to safety standards. This option further reduces energy consumption and increases the lifetime of the installation while ensuring the best driving conditions for motorists.



ADAPTIVE LIGHTING ACCORDING TO POLLUTION

Based on cleaning cycles, the ATS can take into account the depreciation of the flux due to dirt accumulation to continuously provide the requested lighting level in the tunnel. No more, no less. This feature offers additional energy savings while providing safety and comfort for users.



GENERAL INFORMATION

Recommended installation height	4m to 6m 13' to 20'
CE Mark	Yes
ENEC+ certified	Yes
ROHS compliant	Yes
Testing standard	LM 80 (all measurements in ISO17025 accredited laboratory)

HOUSING AND FINISH

Housing	Aluminium
Optic	PMMA
Protector	Tempered glass
Housing finish	Polyester powder coating
Standard colour(s)	RAL 7040 window grey
Tightness level	IP 66
Impact resistance	IK 08
Vibration test	Compliant with ANSI C 136-31 standard, 1.5G load

· IK may be different according to the size/configurations. Please consult us.

OPERATING CONDITIONS

Operating temperature range (Ta)	-25 °C up to +45 °C / -13 ° F up to 113 °F
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· Depending on the luminaire configuration. For more details, please contact us.

ELECTRICAL INFORMATION

Control protocol(s)	1-10V, DALI
Control options	Lumgate, Remote management
Associated control system(s)	Advanced Tunnel Solution (ATS)

· Electrical information given for the gear box

OPTICAL INFORMATION

LED colour temperature	4000K (Neutral White 740)
Colour rendering index (CRI)	>70 (Neutral White 740)

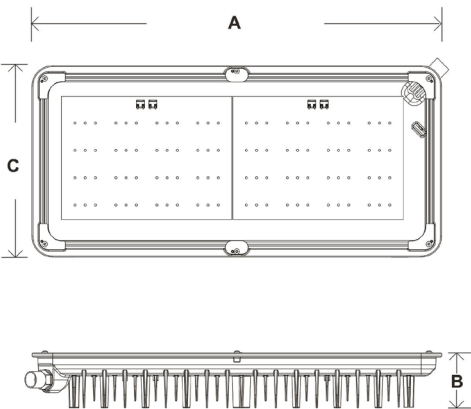
LIFETIME OF THE LEDS @ TQ 25°C

All configurations	100,000h - L90
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DIMENSIONS AND MOUNTING

AxBxC (mm inch)	TAG 1 - 350x80x280 13.8x3.1x11.0
	TAG 2 - 600x80x280 23.6x3.1x11.0
Weight (kg lbs)	TAG 1 - 4.3 9.5
	TAG 2 - 7.85 17.3
Mounting possibilities	Direct mounting on ceiling
	Direct mounting on cable tray

· Size and weight may be different according to the configuration, please consult us for more information.





			Luminaire output flux (lm) Neutral White 740		Power consumption (W)	Luminaire efficacy (lm/W)	
Luminaire	Number of LEDs	Current (mA)	Min	Max		Up to	Photometry
TAG 1	48	350	6600	7200	53	136	
	48	400	7500	8100	60	135	
	48	580	10400	11200	87	129	
	48	600	10700	11500	91	126	
	48	700	12100	13100	106	124	
	48	800	13500	14600	122	120	
	48	900	14800	15900	137	116	
	48	1000	15900	17200	152	113	
	64	350	8900	9600	69	145	
	64	400	10000	10800	79	137	
	64	500	12200	13200	98	138	
	64	600	14300	15400	118	131	
	64	700	16200	17500	138	130	
	64	800	18000	19400	159	122	
	64	900	19700	21300	182	117	
	64	1000	21300	23000	200	115	
	64	1050	22000	23800	207	115	

Tolerance on LED flux is $\pm 7\%$ and on total luminaire power $\pm 5\%$



			Luminaire output flux (lm) Neutral White 740		Power consumption (W)	Luminaire efficacy (lm/W)	
Luminaire	Number of LEDs	Current (mA)	Min	Max		Up to	Photometry
TAG 2	128	350	18000	19200	138	145	LENZO FLEX ²
	128	350	16000	16700	139	126	RE FLEXO [®]
	128	350	16500	20100	136	155	RE FLEXO [®] LENZO FLEX ³
	128	400	20300	21600	158	137	LENZO FLEX ²
	128	400	18000	18800	158	119	RE FLEXO [®]
	128	400	18600	22700	154	147	RE FLEXO [®] LENZO FLEX ³
	128	500	24500	26100	196	136	LENZO FLEX ²
	128	500	21700	22700	198	117	RE FLEXO [®]
	128	500	22700	27700	192	146	RE FLEXO [®] LENZO FLEX ³
	128	600	28700	30600	236	130	LENZO FLEX ²
	128	600	25100	26300	238	111	RE FLEXO [®]
	128	600	26600	32600	232	141	RE FLEXO [®] LENZO FLEX ³
	128	700	32500	34600	276	128	LENZO FLEX ²
	128	700	28300	29600	280	109	RE FLEXO [®]
	128	700	30300	37200	272	141	RE FLEXO [®] LENZO FLEX ³
	128	800	36100	38500	318	121	LENZO FLEX ²
	128	800	31200	32600	322	101	RE FLEXO [®]
	128	800	33800	41500	312	133	RE FLEXO [®] LENZO FLEX ³
	128	900	39500	42100	364	116	LENZO FLEX ²
	128	900	33800	35400	368	96	RE FLEXO [®]
	128	900	37000	45600	356	128	RE FLEXO [®] LENZO FLEX ³
	128	1000	42500	45400	400	114	LENZO FLEX ²
	128	1000	36200	37900	404	94	RE FLEXO [®]
	128	1000	40000	49500	392	126	RE FLEXO [®] LENZO FLEX ³
	128	1050	44000	46900	414	113	LENZO FLEX ²
	128	1050	37300	39000	418	93	RE FLEXO [®]
	128	1050	41400	51300	406	126	RE FLEXO [®] LENZO FLEX ³
	128	1100	42800	53100	426	125	RE FLEXO [®] LENZO FLEX ³
	128	1200	45400	56500	466	121	RE FLEXO [®] LENZO FLEX ³

Tolerance on LED flux is ± 7% and on total luminaire power ± 5 %

