LIGHT FITTINGS
for Wind Power Stations.

SCHUCH – for 116 years
your competent and reliable partner.

SCHUCH

SCHUCH –
The expert for illumination since 1895

For more than 116 years …

… the illumination of commercial zones and industrial facilities has been our field of activity. We are the experts for solving ambitious and delicate situations of illumination. Worldwide we have achieved an excellent reputation in many special areas of application.

Our successful branch and client-specific solutions are basing on our profound know-how as well as on the great experience of our employees. You may rely on these people's high competence at any time. Our products keep the promises given by us even if there are extreme situations in the project such as very high or very low ambient temperatures.

That's why from the very beginning of the development of the wind power industry we have been a competent partner with regard to all questions relating to the illumination finally required.

Basing on individual requirements and in close coordination with the customers our engineers have designed efficient solutions as follows:

_ for the illumination of tower ladders, lift cages and platforms
_ for the illumination of gondolas, hubs and pitches
_ for very high and very low temperatures (-40°C up to +60°C)
_ for areas with vibrations or for offshore installations

These days out of quite a number of light fittings for mains and/or emergency operation (light fittings with internal battery set for ambient temperatures down to -40°C, too) you may select the type required for your project.
Each of all these types stands out due to its particular advantages.

As a matter of fact light fittings with an up-to-date LED technology are part of our range of products. Especially for application in climate zones with very low temperatures LED light fittings have got explicit advantages:

_ immediate full light output
_ no luminous flux decline
_ no reduction of service life

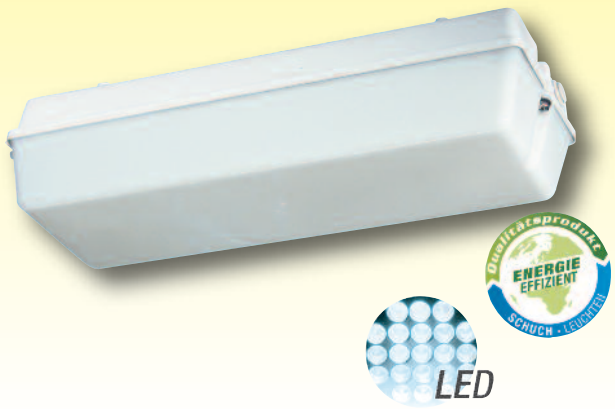
Efficient LED solutions with high illuminance are available for emergency illumination too. UL and CCC certifications are under way.

Internationally we are near to you almost all-around via a net of excellent sales partners.

In this pamphlet we would offer you a summery of the most important standard solutions. In case of any special requests for your particular case of application we would gladly look for the best solution together with your assistance.

Call on us to assist you!

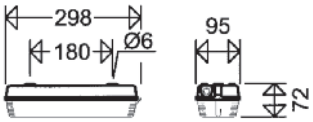
Compact Light Fittings for Wind Power Stations with Highpower LED for wide temperature range from -40°C up to +60°C 130/131 601 W LED T40/H60



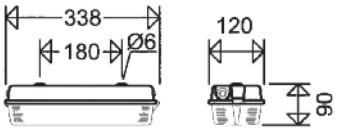
Application:
Illumination of hubs, towers, gondolas, lift cages and platforms (work places during maintenance and repair work). Application areas with low and high ambient temperatures. On- and offshore applications.

Design:
Housing: White polycarbonate.
Cover: Injected white opalescent polycarbonate. On one side there is a multiple hinge for swivelling and detaching the cover. Captive stainless steel bolt on the other side.
Reflector: Aluminium unpainted with suspension cord fixed to the housing.
Connection: 3-pole terminal.
Cable entry **130**: 1 plug M16 on the lokking side.
Cable entry **131**: 1 plug M20 each on both front sides.
Mounting: Two holes for ceiling mounting. Pressure discs and rubber washers included.
Electronic control gear: 230V, 50/60 Hz.
LED: 6 Highpower LED white, 1 W, 6,500K
Ambient temperature: -40°C up to +60°C
Attention: This light fitting is not suitable for permanent maintained operation.

130...

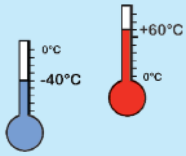


131...



Advantages of the LED version:

- up to 66% energy saving in comparison with an 18W compact fluorescent lamp
- low maintenance costs thanks to quite long maintenance intervals
- applicable at temperatures from -40°C up to +60°C
- instantly full light output at very low temperatures, too
- extremely long life of the LED (> 50,000 hours with < 30% decreased luminous flux, Ta=25°C)
- operating device of high ingress protection IP 66
- robust against vibrations and mechanical shocks
- easy to install and maintain thanks to a multiple-hinged detachable cover

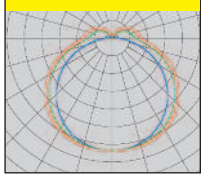


130/131 601 W LED T40/H60

IP65

Type	Article no.	Quantity LED	Power input	LED lm/W	Weight approx. kg
130 601 W LED T40/H60	13002 0036	6 x 1W	8,0 W	100	0,5
131 601 W LED T40/H60	13101 0103	6 x 1W	8,0 W	100	0,5

131 601. W LED



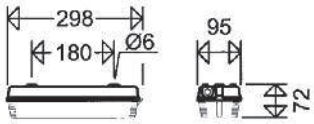
Further equipment

– **131... RR** for cable looping with 2 cable entries on one small end and 2 plugs M20. Thus, a typical through wiring system is not required.

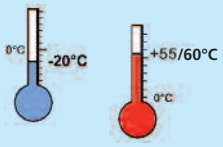
Vibration-proof Compact Light Fitting for Wind Power Stations - for ambient temperatures up to +55/60°C Series 130... RF

Application:
Illumination of towers, gondolas, hubs, lift cages and platforms. This fitting is especially suitable for areas with high ambient temperatures and for areas which are subject to vibrations. On- and offshore applications.

Design:
Housing: White polycarbonate.
Cover: Injected clear polycarbonate with internal prisms or opalescent white (W). On one side there is a multiple hinge for swivelling and detaching the cover. Captive stainless steel bolt on the other side.
Reflector: Sheet steel painted in white with suspension cord fixed to the housing. It carries the electrical components secured by stop nut.
Lampholder: With snap-in function
Connection: 3-pole terminal.
Cable entry: 1 plug M16 on the locking side.
Mounting: Two holes for ceiling mounting. Pressure discs and rubber washers included.
Admissible ambient temperature:
-20°C up to +55°C (1 x 11W)
-20°C up to +60°C (1 x 9W)



SCHUCH quality – Your advantage:



- robust and impact resistant design (completely made from PC)
- applicable at temperatures from -20°C up to +55/60°C
- vibration-proof and compact design, best suitable for application at the hub area
- Shock tested: RK 1.6 / 16A
- easy to install and maintain thanks to a multiple-hinged detachable cover

130 ... RF

IP65

TC-S	Type	Article no.	Lamps/Watt	Weight approx.kg
130 111...	130 111 RF[1)]	13000 0033	1 x TC-S 9 bis 11 W	0,7

1) Wiring: Uncomp.

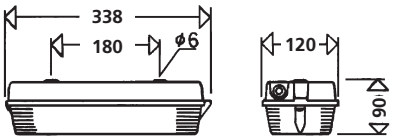
Further equipment

– injected white opalescent polycarbonate cover (W)
– 1 cable entry on the back of the housing
– cable looping system (RR)
with 2 cable entries on one side with 2 plugs M20. Thus, a typical through wiring system is not required.
– available for different voltages and frequencies
e.g. 120V/60Hz (for the 9W lamp only)

Compact Emergency Light Fitting for Wind Power Stations with Highpower LED
Series 131... W LED /. MA

Application:
Illumination of escape routes in towers, gondolas, hubs, lift cages and on platforms in mains and emergency operation (work places during maintenance and repair work). On- and offshore applications.

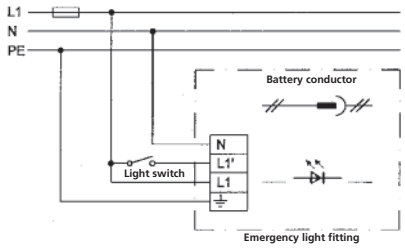
Mechanical Design:
Housing: White polycarbonate.
Cover: Injected opalescent white polycarbonate (W). Escape label to be ordered separately.
Locking system: On one side there is a multiple hinge for swivelling and detaching the cover, captive stainless steel bolt on the other side.
Reflector: Aluminium painted.
Connection: 4-pole terminal.
Mains voltage: 230 V, 50 Hz
LED: Highpower LED 1W white, 6,500K.
Cable entry: There is 1 plug M20 on each of the 2 front sides.
Mounting: Two holes for ceiling mounting. Pressure discs and rubber washers included.
Ambient temperature:
-5°C up to +30°C (maintained operation)
-5°C up to +40°C (standby operation)



Electrical Design:
NiMH battery mounted on the reflector. A constant trickle charge to the battery ensures readiness of operation at all times.
Electronic deep discharge protection
Recharging time: 24 hours acc. to EN 60598-2-22.
Automatic monitoring the emergency light fitting acc to EN 62034.
Indication of the test results by bicolour LED on the light fitting (.../MA).

Modes of operation:
Maintained operation: Switching over to battery operation when the mains fails.
Standby operation: Emergency operation will start when the mains fails.

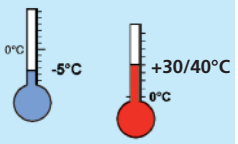
Wiring diagram: Maintained/standby operation



Commissioning: Connect battery conductor
Decommission: Disconnect battery conductor
Standby operation: Do not connect L1'

Advantages of the LED version:

- up to 71% energy saving in comparison with an 8W fluorescent lamp
- applicable at ambient temperatures from -5°C up to +30/40°C
- suitable for offshore-applications (salt spray test severity level 2)
- safety in emergency case - instant full light output also at low temperatures
- stable luminous flux in emergency operation independent of the ambient temperature
- reduced battery output
- low weight
- due to the long service life of the LED (> 50,000 hours) the operation is almost maintenance-free
- no costs for lamp replacement



131... LED/. MA

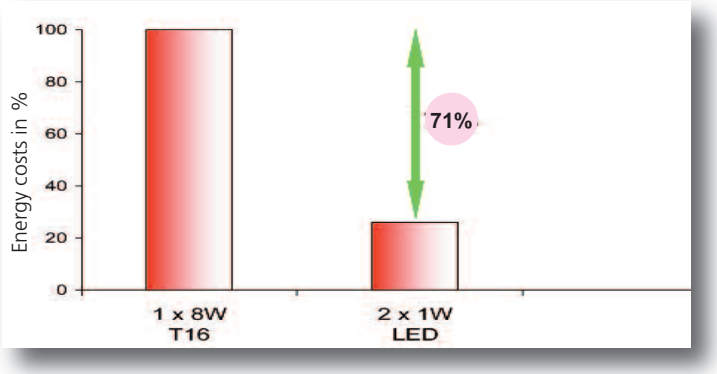
IP65

with battery set and automatic self-test system

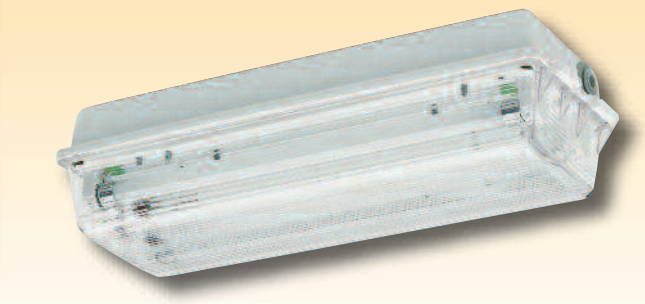
Type	Article no.	Quantity LED	Time of oper. (h)	Luminous flux factor %[1])	Power input
maintained operation					
131 201 W LED/1 MA	13112 0100	2 x 1 W	1	100	4W
131 201 W LED/3 MA	13112 0101	2 x 1 W	3	100	4W

1) ratio effective lum. flux of lamp to rated lum.flux

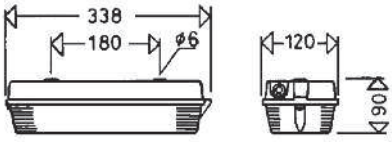
Energy cost saving
by application of LED series 131.....



Compact Emergency Light Fitting for Wind Power Stations
131 208 D3 / M2001 P3



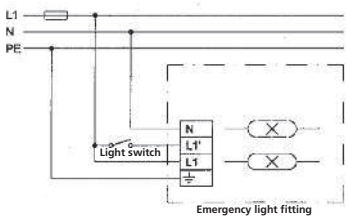
Application:
Illumination of escape routes in towers, gondolas, hubs, lift cages and on platforms in mains and emergency operation (work places during maintenance and repair work). On- and offshore applications.
Mechanical Design:
Housing: White polycarbonate.
Cover: Injected clear polycarbonate with internal prisms. On one side there is a multiple hinge for swivelling and detaching the cover, captive stainless steel bolt on the other side.
Reflector:
Sheet steel painted in white with suspension cord fixed to the housing. The electrical components are mounted on the reflector.
Connection: 4-pole terminal.
Cable entry: 2 plugs M20 on 1 front side for cable looping.
Mounting: Two holes for ceiling mounting. Pressure discs and rubber washers included.



Electrical Design:
NiCd battery, gastight. A constant trickle charge to the battery ensures readiness of operation at all times.
Visual functionality monitoring by green LED indicator.
Electronic deep discharge protection
Recharging time: 24 hours acc. to EN 60598-2-22

Modes of operation:
Light fitting in standby version (light switch: off). By turning the light switch on the light fitting starts maintained operation (1 lamp operating).
Attention: This light fitting is not suitable for permanent maintained operation.
In case of a mains failure battery operation will start. In this case the second lamp in the fitting will be the emergency lamp.
Mains voltage: 230V, 50Hz
Ambient temperature:
-5°C up to +30°C - maintained operation
-5°C up to +40°C - standby operation

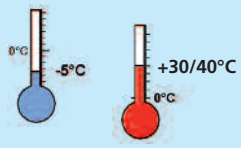
Wiring diagram: Maintained/standby operation



Commissioning:	Connect battery conductor
Decommission:	Disconnect battery conductor
Standby operation:	Central light switch off
Maintained operation:	Central light switch on

SCHUCH quality – Your advantage:

- robust and impact resistant (housing and cover made from PC)
- applicable at temperatures from -5°C up to +30/40°C
- shock tested: RK 1.0 / 10A
- very economic thanks to cable looping system on one side (a typical through wiring system is not required)
- easy to install and maintain thanks to a multiple-hinged detachable cover



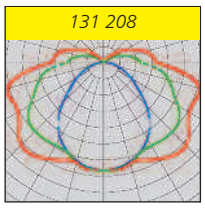
131 208 D3/M2001 P3

IP65

with battery set

T 16

Type	Article no.	Lamps/ Watt	Time of oper. (h)	Luminous flux factor %[2]	Power input
131 208 D3/M2001 P3[1]	13110 0102	2 x T16/8W	3	35	1, 8

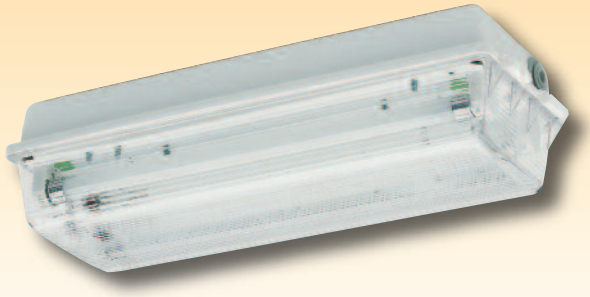


1) Wiring: uncomp. only
2) ratio effective lum. flux of lamp to rated lum.flux

Further equipment

– vibration-proof version (RF)
for application in areas subject to vibrations (e.g. hubs)

Vibration-proof Compact Emergency Light Fitting for Wind Power Stations
131 108/36 D3 RF

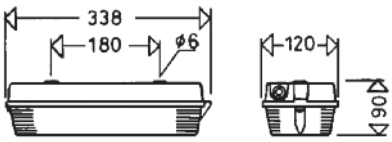


Application:
Illumination of escape routes in towers, gondolas, hubs, lift cages and on platforms (work places during maintenance and repair work). This fitting is especially suitable for areas which are subject to vibrations. On- and offshore applications.

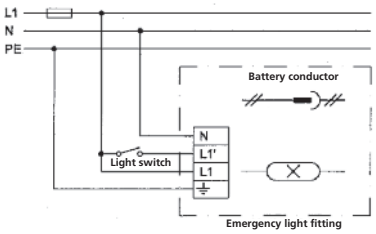
Mechanical Design:
Housing: White polycarbonate.
Cover: Injected clear polycarbonate with internal prisms; multiple hinge on one side for swivelling and detaching the cover; captive stainless steel bolt on the other side.
Reflector: Sheet steel painted in white with suspension cord fixed to the housing. The electrical components are mounted on the reflector secured by stop nut.
Connection: 4-pole terminal.
Cable entry: 1 plug M20 each on the front sides.
Mounting: Two holes for ceiling mounting. Pressure discs and rubber washers included.

Electrical Design:
NiCd battery, gastight. With mounting sheet instead of end caps, Battery plug with snap function, pole safe. A constant trickle charge to the battery ensures readiness of operation at all times.
Visual functionality monitoring by green LED indicator.
Electronic deep discharge protection.
Recharging time: 24 hours acc. to EN 60598-2-22.

Modes of operation:
Light fitting in standby version (light switch: off). By turning the light switch on the light fitting starts maintained operation (lamp operating). Battery operation will start in case of a mains failure.
Mains voltage: 230V, 50Hz
Ambient temperature:
-5°C up to +30°C - maintained operation
-5°C up to +40°C - standby operation

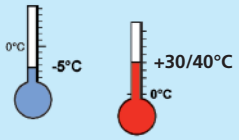


Wiring diagram: Maintained/standby operation



Commissioning:	Connect battery conductor
Decommission:	Disconnect battery conductor
Standby operation:	Central light switch off
Maintained operation:	Central light switch on

SCHUCH quality – Your advantage:



- robust housing with high mechanical impact resistant PC cover
- applicable at temperatures from -5°C up to +30/40°C
- suitable for offshore-applications (salt spray test severity level 2)
- vibration-proof and compact, best suitable for application in hub areas
- shock tested: RK 1.0 / 10A
- very economic due to low system capacity in mains operation (inverter with integrated ECG)
- easy to install and maintain thanks to a multiple-hinged detachable cover

131 108/36 D3 RF

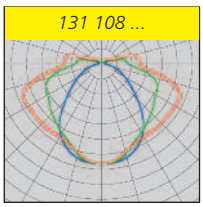
IP65

with battery set

T 16

Type	Article no.	Lamps/ Watt	Time of oper. (h)	Luminous flux factor %[2]	Power input
131 108/36 D3 RF[1]	13110 0099	1 x T16/8W	3	36	1, 8

1) electronic ballast
2) ratio effective lum. flux of lamp to rated lum.flux



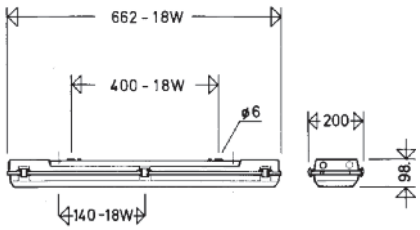
Further equipment

– **cable looping system (RR)**
with 2 cable entries on one side and 2 plugs M20.
Thus, a typical through wiring system is not required.

Light Fitting for Wind Power Stations with Highpower LED for wide temperature range from -40°C up to +45/60°C 164... LED T40/H.. PC

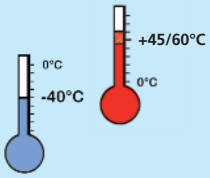
Application:
Illumination of towers, gondolas, lift cages and platforms (work places during maintenance and repair work). Application areas with low and high ambient temperatures. On- and offshore applications.

Design:
Housing: Glass fibre reinforced polyester resin. Foamed polyurethane gasket.
Cover: Clear pearled polycarbonate (**PC**).
Closure: Single piece plastic clips (**KK**).
Reflector: Aluminium painted in white with two suspension cords fixed to the housing, detachable. Electrical components mounted on the reflector. Quarter-turn locks for quick release and assembly.
Connection: 3-pole terminal.
Cable entry: Closed knock-outs on the front ends, 2 blanking plugs M20.
Mounting: Two holes. Rubber gaskets and U-washers included.
Electronic control gear:
230V, 50/60 Hz
LED: 6 Highpower LED white, 1W or 2W, 6,500K
Ambient temperatures:
-40°C up to +60°C - 164 **601** LED
-40°C up to +45°C - 164 **603** LED
Attention: This light fitting is not suitable for permanent maintained operation.



Advantages of the LED version:

- up to 66% energy saving in comparison with an 18W fluorescent lamp
- low maintenance costs thanks to quite long maintenance intervals
- applicable at temperatures from -40°C up to +45/60°C
- suitable for offshore-applications (salt spray test severity level 2)
- instant full light output also at very low temperatures
- extremely long operating life of the LED (> 50,000 hours with < 30% decreased luminous flux, Ta=25°C)
- robust against mechanical shocks and vibrations
- operating device of high ingress protection IP 66



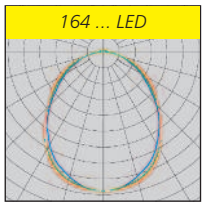
164 ... LED T40/H.. PC

IP65

LED

Type	Article no.	Quantity LED	Power input	LED lm/W	Weight approx. kg
164 601 LED T40/H60 PC	16402 0014	6 x 1W	8,0	100	2,2
with increased luminous flux					
164 603 LED T40/H45 PC	16402 0015	6 x 2W	16,0	80	2,2

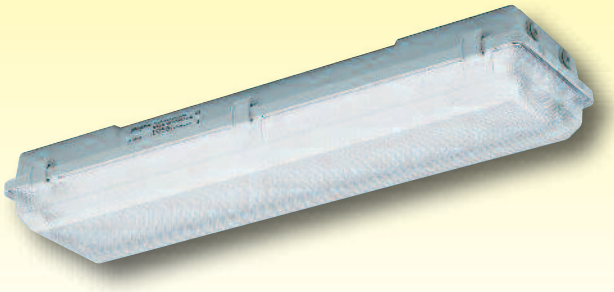
164 ... LED



Further equipment

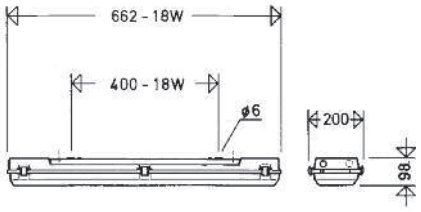
- for cable looping system (RR):
  2 cable entries on one side,
  2 cable glands M20 x 1,5 as well as 1 terminal for flexible conductors (no end sleeve) up to 5 x 4 mm². Thus, a typical through wiring system is not required.
- with stainless steel clips (**KE**)
- with threepart captive plastic clips (**series 162...**)

Light Fitting for Wind Power Stations for wide temperature range from -40°C up to +50°C 164 218 T40/H50 PC

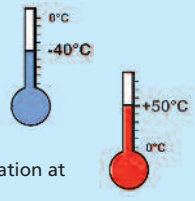


Application:
Illumination of towers, gondolas, lift cages and platforms (work places during maintenance and repair work).
Application areas with low and high ambient temperatures. On- and offshore applications.

Design:
Housing: Glass fibre reinforced polyester resin. Foamed polyurethane gasket.
Cover: Clear pearled polycarbonate (PC).
Closure: Single piece plastic clips (KK).
Reflector: White sheet steel with two suspension rubber cords. Electrical components mounted on the reflector.
Quarter-turn locks for quick release and assembly.
Heat-build-up tube: Ø38 mm for rising luminous flux in low temperature areas.
Starter: Polar starter for safe ingnition of the lamps in mains operation down to -40°C.
Connection: 3-pole terminal.
Cable entry: Closed knock-outs on the front ends, 2 blanking plugs M20.
Mounting: Two holes. Rubber gaskets and U-washers included.
Ambient temperature: -40°C up to +50°C



SCHUCH quality – Your advantage:



- robust housing with high mechanical impact resistant PC cover
  - reliable and safe sealing due to deep sealing groove and non-ageing, weather- and chemically resistant polyurethane gasket
- applicable at temperatures from -40°C up to +50°C
- suitable for offshore-applications (salt spray test severity level 2)
- optimized design - minimized decrease of luminous flux in mains operation at low temperatures
- easy to install and maintain
  - quarter-turn locks for quick releasing and remounting the reflector
  - spacious connection chamber for 5 x 4mm² max.
  - smooth 1-man-assembly (2-point suspension)

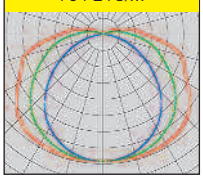
164 218 T40/H50 PC

IP65

	Type	Article no.	Lamps/ Watt	Weight approx. kg
T 26	164 218 T40/H50 PC[1)]	16401 0013	2 x T 26/18W	4,4

1) wiring: uncompensated

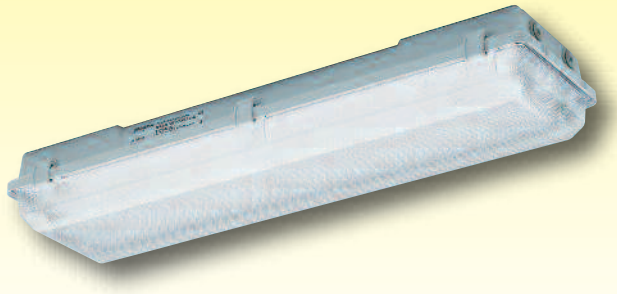
164 218/...



Further equipment

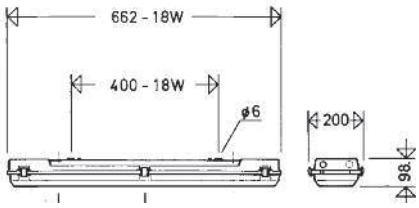
- cable looping system **(RR)**:
  2 cable entries on one side,
  2 cable glands M20 x 1,5 as well as 1 terminal for flexible conductors (no end sleeve)
  up to 5 x 4 mm². Thus, a typical through wiring system is not required.
- with stainless steel clips **(KE)**
- with threepart captive plastic clips (series **162...**)
- with stainless steel clips **(KE)**
- vibration-proof version **(RF)**
  for application in areas subject to vibrations (e.g.

Light Fitting for Wind Power Stations
164 218 PC

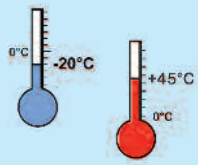


Application:
Illumination of towers, gondolas, lift cages and platforms (work places during maintenance and repair work). On- and offshore applications.

Design:
Housing: Glass fibre reinforced polyester resin. Foamed polyurethane gasket.
Cover: Clear pearled polycarbonate (PC).
Closure: Single piece plastic clips (KK).
Reflector: White sheet steel with two suspension rubber cords. Electrical components mounted on the reflector. Quarter-turn locks for quick release and assembly.
Connection: 3-pole terminal.
Cable entry: Closed knock-outs on the front ends, 2 blanking plugs M20.
Mounting: Two holes. Rubber gaskets and U-washers included.
Ambient temperature: -20°C up to +45°C. In vertical position: Section with starter at the bottom.



SCHUCH quality – Your advantage:



- robust housing with high mechanical impact resistant PC cover
  - reliable and safe sealing due to deep sealing groove and non-ageing weather- and chemically resistant polyurethane gasket
- applicable at temperatures from -20°C up to +45°C
- suitable for offshore-applications (salt spray test severity level 2)
- easy to install and maintain
  - quarter-turn locks for quick releasing and remounting the reflector
  - spacious connection chamber for 5 x 4mm² max.
  - smooth one-man assembly (2-point suspension)

164 218 PC

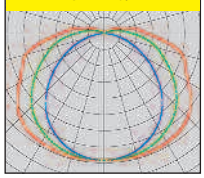
IP65

T 26

Type	Article no.	Lamps/ Watt	Weight approx. kg
164 218 PC[1)]	16400 0013	2 x T 26/18W	2,4

1) wiring: uncompensated

164 218/...



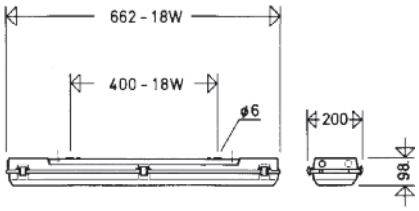
Further equipment

- cable looping system (RR):
  2 cable entries on one side
  2 cable glands M20 x 1,5 as well as 1 terminal for flexible conductors (no end sleeve) up to 5 x 4 mm². Thus, a typical through wiring system is not required.
- with three-part captive plastic clips (series 162...)
- with stainless steel clips (KE)
- for wide temperature range ,from -40°C up to +50°C (T40/H50)
- vibration-proof version (RF) for application in areas subject to vibrations (e.g. hubs)
- for different voltages and frequencies (e.g. 120V/60Hz)

LED/ Fluorescent Emergency Light Fitting for Wind Power Stations - Low temperature version – down to -40°C 164 218/2LED/1 T40 PC

Application:
Illumination of escape routes in towers, gondolas, hubs, lift cages and on platforms in mains and emergency operation (work places during maintenance and repair work). Application areas with low and high ambient temperatures. On- and offshore applications.

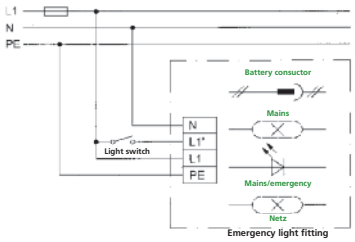
Design:
Housing: Glass fibre reinforced polyester resin. Foamed polyurethane gasket.
Cover: Clear pearled polycarbonate (**PC**).
Closure: Single piece plastic clips (**KK**).
Reflector: White sheet steel with two suspension rubber cords.
Electrical components mounted on the reflector. Quarter-turn locks for quick release and assembly.
Maintained operation: 2 X T26/18Watt fluorescent lamps. (**Version T40** with special feature in order to minimize luminous flux reduction at low ambient temperatures.)
Emergency operation: 2 Highpower –LED
Connection terminals: 4-pole terminal
Cable entries: Closed knock-outs on the front end, 2 blanking plugs M20.
Mounting system: Two holes, rubber gasket and U-washers included.



Electrical Design:
NiCd-battery: Gastight. A constant trickle charge to the battery ensures readiness of operation at all times.
Battery heating element with overload protection for safe operation down to -40°C (version T40)
Visual functionality monitoring by green LED indicator
Battery with voltage reversal protection
Electronic deep discharge protection
Recharging time:
24 hours acc. To EN 60598-2-22
Emergency Mode: 2 X 1Watt High-Power LED, white, 6.500K, 100lm/Watt
Battery backup: 1 hour (as well at -40°C ambient temperatures **version T40**)

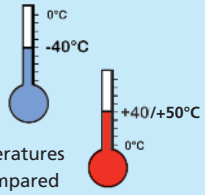
Modes of Operation:
Light fitting in standby version (light switch: off). By turning the light switch on the light fitting starts maintained operation (2x 18W lamp operating).
Battery operation will start in case of mains failure. Both fluorescent lamps will be switched off and 2x 1W LEDs will operate.
Mains voltage: 230V, 50Hz
Ambient temperature (**Version H50**):
-5°C up to +40°C - maintained
-5°C up to +50°C - standby
Ambient temperature (**Version T40**):
-40°C up to +40°C - maintained
-40°C up to +50°C - standby

Wiring diagram: Maintained/standby operation



Commissioning: Connect battery conductor
Decommissioning: Disconnect battery conductor
Standby wiring: Don't connect L1'
Maintained operation: Central light switch on

SCHUCH quality – Your advantage:



- robust housing with high mechanical impact resistant PC diffuser
- operational at ambient temperatures from -40°C to +40°C/+50°C (version T40)
- suitable for offshore-applications (salt spray test severity level 2)
- optimized design (version T40)
  - Minimal decrease of luminous flux within maintained mode at low temperatures
  - up to 20 times higher luminous flux of the LEDs in emergency mode – compared to a 18Watt fluorescent lamp
  - 1 hour battery back-up at -40°C
- immediate full lighting output at low temperatures
- constant luminous flux in emergency mode
- high availability due to extremely long life cycles of LEDs (≥ 50.000h with 30% decreased luminous flux, Ta=25°C)

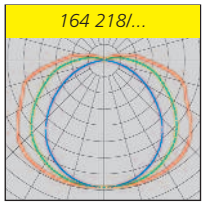
164 218/2LED/1 ... PC

IP65

with self-contained battery

T 26 + LED

164 218/...



Type	Article no.	Battery back-up	Lamps/ (mains)	LED (emergency)	Weight ca. kg
for high ambient temperatures from -5 to +50°C					
164 218/2LED/1 H50 PC[1)]	16414 0133	1h	2 x T 26/18W	2 x 1W	4,4
for wide range of ambient temperatures from -40°C to +40/50°C					
164 218/2LED/1 T40 PC[1)]	16414 0132	1h	2 x T 26/18W	2 x 1W	4,4

1) Schaltung induktiv

Further equipment

- cable looping system (**RR**):
  2 cable entries on one side,
  2 cable glands M20 x 1,5 as well as 1 terminal for flexible conductors (no end sleeve)
  up to 5 x 4 mm². Thus, a typical through wiring system is not required.
- with threepart captive plastic clips (series **162...**)
- with stainless steel clips (**KE**)
- vibration-proof version (**RF**)
  for application in areas subject to vibrations (e.g. hubs)

Emergency mode at low ambient temperatures. Unbeatable LEDs

The luminous flux of a **fluorescent lamp** is very much depending on the ambient temperature. It reaches its optimum at approximately +25°C. Luminous flux reduces down to 10% of the maximum at -20°C ambient temperature.

Fluorescent lamps must be kept warm for low temperature applications of such light fittings. Three methods are used as a technical solution:

- Usage of specially designed low-temperature fluorescents with integrated protection tube
- Standard fluorescents installed in a heat-build-up tube
- Heating of the entire light fitting

But there are obviously vital disadvantages using Fluorescent lamps in emergency mode applications

- Fluorescent lamps never achieve their 100% luminous flux despite heating
- Negative impact on the lamps temperature management because it will be operated on lower power consumption
- Luminous flux will be reduced furthermore if no auxiliary heating is provided

LEDs show completely different characteristics. Their luminous flux is almost unaffected by the ambient temperature.
It even slightly increases on lower temperatures.
Luminous flux gain will be 10% when operating a LED at -30°C instead of -25°C.

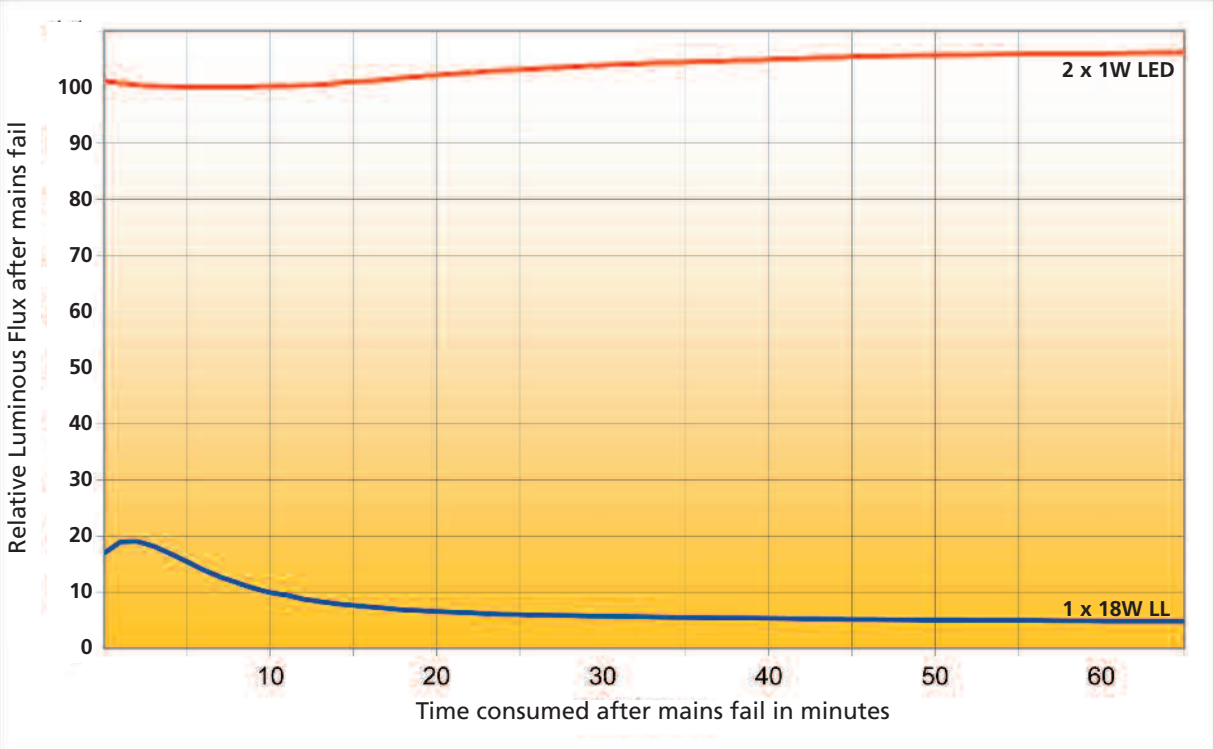
SCHUCH combines the LED advantages at low temperatures with the support of a heating element in their 164 218/2 LED/1 T40 PC light fitting.

The fitting will operate 2 X 18Watt fluorescent lamps in maintained mode. Supported by an internal heating element at low temperatures. This heating element ensures as well a safe battery recharge cycle.
Two High-Power LEDs will be activated in emergency mode and the 18Watt fluorescents will be switched off.
Luminous flux will be five times higher immediately after a mains fail compared to the usage of fluorescent lamps.
And will be almost ten times higher after 10 minutes in emergency mode (15 times after 20 minutes, 20 times after 1 hour)

LED has obviously an outstanding performance compared to fluorescent lamps when operated.

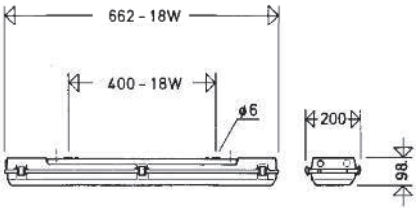
Up to 20 times higher luminous flux with LED in emergency mode

Comparison: 1 X18Watt T8-lamp against 2 X 1Watt LED at -40°C

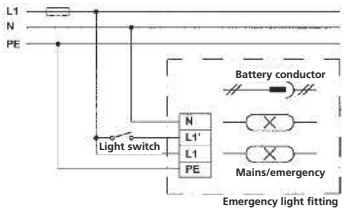


Emergency Light Fitting for Wind Power Stations with high luminous flux in emergency operation 164 218/60/1 PC

Application:
Illumination of escape routes in towers, gondolas, lift cages and on platforms in mains and emergency operation (work places during maintenance and repair work). On- and offshore applications.
Mechanical Design:
Housing: Glass fibre reinforced polyester resin. Foamed polyurethane gasket.
Cover: Clear pearled polycarbonate (PC).
Closure: Single piece plastic clips (KK).
Reflector: White sheet steel with two suspension rubber cords. Electrical components mounted on the reflector. Quarter-turn locks for quick release and assembly.
Connection: 4-pole terminal.
Cable entry: Closed knock-outs on the front end, 2 blanking plugs M20.
Mounting: Two fixing points. Rubber gaskets and U-washers included.



Wiring diagram: Maintained/standby operation

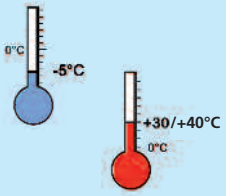


Commissioning: Connect battery conductor
Decommission: Disconnect battery conductor
Standby wiring: Don't connect L1'
Maintained operation: Central light switch on

Electrical Design:
NiCd battery, gastight. A constant trickle charge to the battery ensures readiness of operation at all times.
Visual functionality monitoring by green LED indicator.
Electronic deep discharge protection.
Recharging time: 24 hours acc. to EN 60598-2-22.
Modes of operation:
Light fitting in standby version (light switch: off). By turning the light switch on the fitting starts maintained operation (both lamps T26/18W operating). Automatic switch over to emergency mode when the mains fails. In this case 1 lamp will continue operating as safety lighting.
Mains voltage: 230V, 50Hz
Ambient temperature:
-5°C up to +30°C - maintained operation
-5°C up to +40°C - standby operation

SCHUCH quality – Your advantage:

- robust housing with high mechanical impact resistant PC cover
  - reliable and safe sealing due to deep sealing groove and non-ageing, weather- and chemically resistant polyurethane gasket
- applicable at temperatures from -5°C up to +30/+40°C
- suitable for offshore-applications (salt spray test severity level 2)
- high luminous flux in emergency operation, too (lum. flux factor: 60%)
- easy to install and maintain
  - quarter-turn locks for quick releasing and remounting the reflector
  - spacious connection chamber for 5 x 4mm² max.
  - smooth one-man assembly (2-point suspension)



164 218/60/1 PC

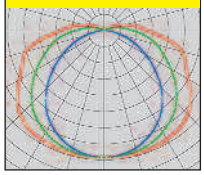
IP65

with battery set

T 26

Type	Article no.	Time of oper.(h)	Lamps/ Watt	Lum.flux factor[2]	Weight approx. kg
164 218/60/1 PC[1]	16410 0019	1h	2 x T 26/18W	60	4,7

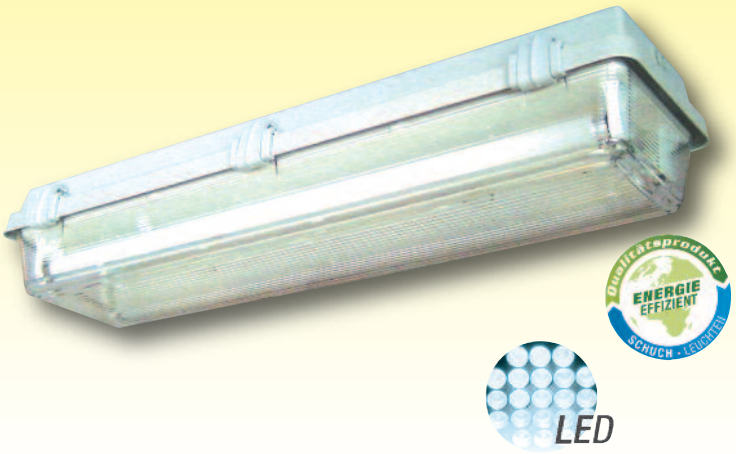
164 218/60/1



1) wiring: uncompensated only
2) ratio effective lamp lum. flux/rated lum. flux

Further equipment

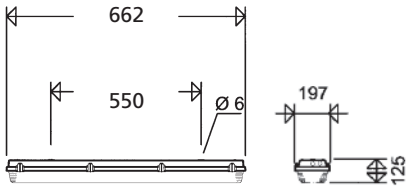
- for cable looping system:
  2 cable entries on one side, 2 glands M20 x 1,5 as well as 1 terminal for flexible conductors (no end sleeve) up to 5 x 4 mm². Thus, typical through wiring system not required.
- with stainless steel clips (**KE**)
- with three-part captive plastic clips (series 162...)
- with lower lum.flux factors and 3h emergency operation



Light Fitting for Wind Power Stations with Highpower LED for wide temperature range from -40°C up to +45/60°C 162... LED T40/H.. FPC

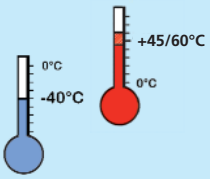
Application:
Illumination of towers, gondolas, lift cages and platforms (work places during maintenance and repair work). Application areas with low and high ambient temperatures. On- and offshore applications.

Design:
Housing: Glass fibre reinforced polyester resin. Foamed polyurethane gasket.
Cover: Polycarbonate frosted (**FPC**) .
Closure: Threepart captive plastic clips (**KK**).
Reflector: Aluminium painted in white, detachable. Electrical components are mounted on the reflector. Quarter-turn locks for quick release and assembly. Suspension cords.
Connection: 3-pole terminal.
Cable entry: 2 plugs M20.
Mounting: Two fixing points. Rubber gaskets and U-washers included.
Electronic control gear: 230V, 50/60 Hz
LED: 6 Highpower LED white, 1W or 2W, 6,500K
Ambient temperature:
-40°C up to +60°C - 162 601 LED
-40°C up to +45°C - 162 603 LED
Attention: This light fitting is not suitable for permanent maintained operation.
Options: See „Further equipment".



Advantages of the LED version:

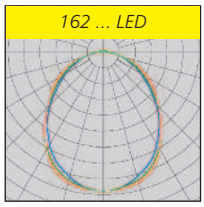
- up to 66% energy saving in comparison with an 18W fluorescent lamp
- low maintenance costs thanks to quite long maintenance intervals
- applicable at temperatures from -40°C up to +45/60°C
- suitable for offshore-applications (salt spray test severity level 2)
- instant full light output also at very low temperatures
- extremely long life of the LED (> 50,000 hours with < 30% decreased luminous flux, Ta=25°C)
- robust against mechanical shocks and vibrations
- operating device of high ingress protection IP 66



162 ... LED T40/H.. FPC

IP65

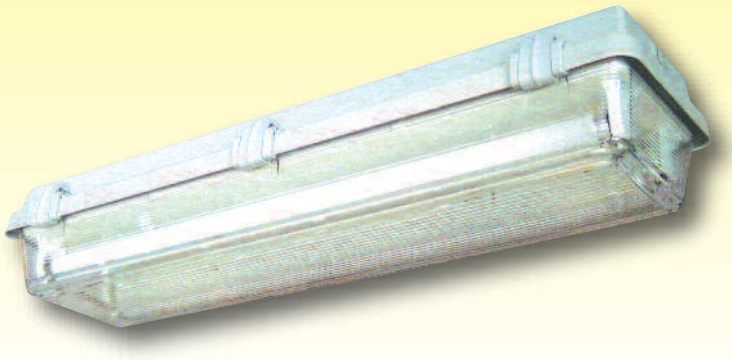
Type	Article no.	Quantity LED	Power input	LED lm/W	Weight approx. kg
162 601 LED T40/H60 FPC	16215 0101	6 x 1W	8,0	100	2,9
with increased luminous flux					
162 603 LED T40/H45 FPC	16215 0102	6 x 2W	16,0	80	2,9



Further equipment

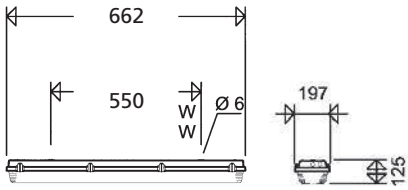
- cable looping system (RR):
  2 cable entries on one side
  2 cable glands M20 x 1,5 as well as 1 terminal for flexible conductors (no end sleeve) up to 5 x 4 mm². Thus, a typical through wiring system is not required.
- with stainless steel clips (**KE**)
- with stainless steel hinges (**SC**) on one long side

Light Fitting for Wind Power Stations
162 218/I/PC



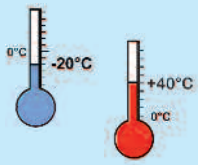
Application:
Illumination of towers, gondolas, lift cages and platforms (work places during maintenance and repair work). On- and offshore applications.

Design:
Housing: Glass fibre reinforced polyester resin. Foamed polyurethane gasket.
Cover: Injected clear polycarbonate (PC) with internal prisms.
Closure: Threepart captive plastic clips (KK).
Reflector: Sheet steel painted in white, detachable. Quarter-turn locks for quick release and assembly. Suspension cords.
Electrical components are mounted on the reflector.
Connection: 3-pole terminal.
Cable entry: 2 plugs M20.
Mounting: There are 2 fixing points. Rubber gaskets and U-washers included.
Ambient temperature: -20°C up to +40°C



SCHUCH quality – Your advantage:

- robust housing with high mechanical impact resistant PC cover
  - reliable and safe sealing due to deep sealing groove and non-ageing, weather- and chemically resistant polyurethane gasket
- applicable at temperatures from -20°C up to +40°C
- suitable for offshore-applications (salt spray test severity level 2)
- easy to install and maintain
  - quarter-turn locks for quick releasing and remounting the reflector
  - spacious connection chamber for 5 x 4mm² max.
  - smooth one-man assembly (2-point suspension)

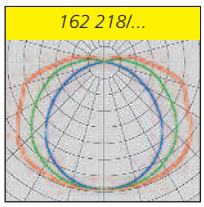


162 218/I/PC

IP65

T 26	Type	Article no.	Lamps/ Watt	Weight approx. kg
162 218/I/...	162 218/I/PC 1)	16200 0076	2 x T 26/18W	3,0

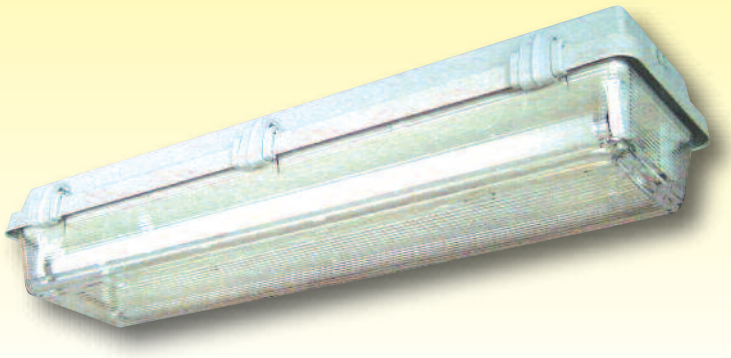
1) wiring uncompensated



Further equipment

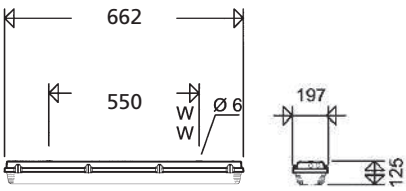
– cable looping system (RR):
2 cable entries on one side
2 cable glands M20 x 1,5 as well as 1 terminal for flexible conductors (no end sleeve) up to 5 x 4 mm². Thus, a typical through wiring system is not required.
– with stainless steel clips (KE)
– for wide temperature range from -40°C up to +50°C (T40/H50)
– for different voltages and frequencies

Light Fitting for Wind Power Stations for wide temperature range from -40°C up to +50°C 162 218 T40/H50 PC



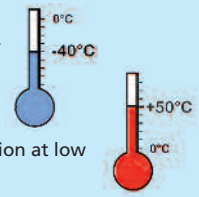
Application:
Illumination of towers, gondolas, lift cages and platforms (work places during maintenance and repair work).
Application areas with low and high ambient temperatures. On- and offshore applications.

Design:
Housing: Glass fibre reinforced polyester resin. Foamed polyurethane gasket.
Cover: Polycarbonate (PC) injected, clear with internal prisms.
Closure: Threepart captive plastic clips (KK).
Reflector: Sheet steel painted in white, detachable. Quarter-turn locks for quick release and assembly. Suspension cords. Electrical components are mounted on the reflector.
Heat-build-up tube: Ø38 mm for rising luminous flux in low temperature areas.
Starter: Polar starter for safe ingnition of the lamps in mains operation down to -40°C.
Connection: 3-pole terminal.
Cable entry: 2 plugs M20.
Mounting: There are 2 fixing points. Rubber gaskets and U-washers included.
Ambient temperature: -40°C up to +50°C



SCHUCH quality – Your advantage:

- robust housing with high mechanical impact resistant PC cover
  - reliable and safe sealing due to deep sealing groove and non-ageing, weather- and chemically resistant polyurethane gasket
- applicable at temperatures from -40°C up to +50°C
- suitable for offshore-applications (salt spray test severity level 2)
- optimized design - minimal decrease of luminous flux in mains operation at low temperatures
- easy to install and maintain
  - quarter-turn locks for quick releasing and remounting the reflector
  - spacious connection chamber for 5 x 4mm² max.
  - smooth one-man assembly (2-point suspension)

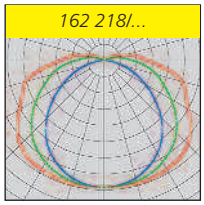


162 218 T40/H50 PC

IP65

	Type	Article no.	Lamps/ Watt	Weight approx. kg
T 26	162 218 T40/H50 PC[1)]	16202 0037	2 x T 26/18W	4,4

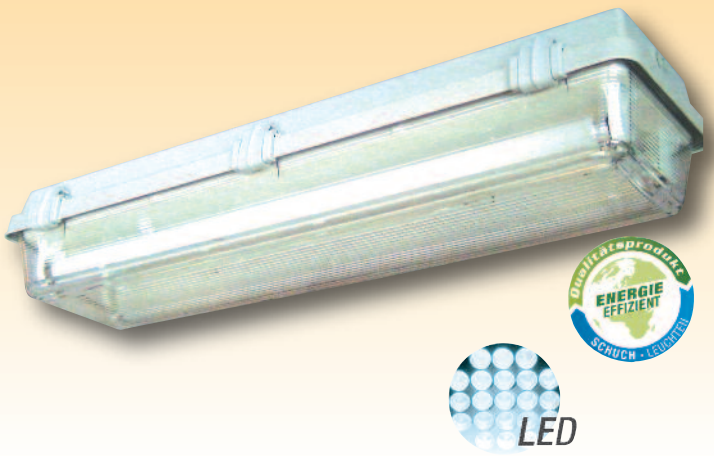
1) wiring: uncompensated



Further equipment:

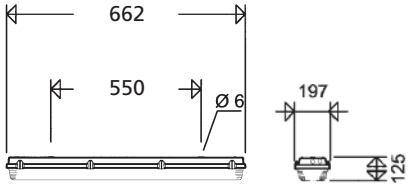
– **cable looping system (RR):**
2 cable entries on one side
2 cable glands M20 x 1,5 as well as 1 terminal for flexible conductors (no end sleeve) up to 5 x 4 mm². Thus, a typical through wiring system is not required.
– **with stainless steel clips (KE)**

Emergency Light Fitting for Wind Power Stations with Highpower LED and Fluorescent Tubes for wide temperature range of -40°C up to +40/50°C 162 218/2LED/1 ... FPC

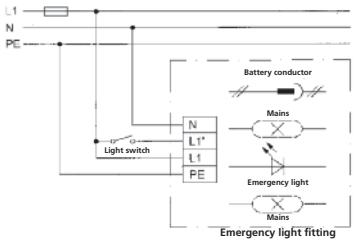


Application:
Illumination of escape routes in towers, gondolas, lift cages and on platforms in mains and emergency operation (work places during maintenance and repair work).Application at areas with low and high ambient temperatures. On- and off-shore applications.

Mechanical Design:
Housing: Glass fibre reinforced polyester resin. Foamed polyurethane gasket.
Cover: Polycarbonate frosted (**FPC**).
Closure: Threepart captive plastic clips (KK).
Reflector: White sheet steel, detachable. Electrical components mounted on the reflector. Quarter-turn locks for quick release and assembly. Suspension cords.
Mains operation: 2 x T26/18W (version T40 with special features in order to minimize luminous flux reduction at low temperatures)
Emergency operation: 2 Highpower LED
Connection: 4-pole terminal.
Cable entry: 2 blanking plugs M20.
Mounting: There are 2 fixing points. Rubber gaskets and U-washers included.



Wiring diagram: Maintained/standby operation

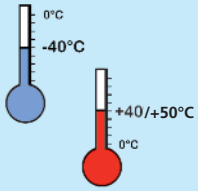


Commissioning: Connect battery conductor
Decommissioning: Disconnect battery conductor
Standby wiring: Don't connect L1'
Maintained operation: Central light switch on

Electrical Design:
NiCd battery, gastight with constant trickle charge ensuring readiness of operation at all times.
Battery heating element with overload protection for safe operation at an ambient temperature of down to -40°C (**version T40**).
Visual functionality monitoring of battery loading process by green LED indicator
Reverse battery protection
Electronic deep discharge protection
Recharging time: 24 hours acc. to EN 60598-2-22
Emergency operation: 2 x 1W Highpower LED white, 6,500K, 100 lm/W
Time of emergency operation: 1h (**version T40** – guaranteed at -40°C, too)

Modes of operation:
Light fitting in standby version (light switch: off). By switching the light on the fitting starts maintained operation (both lamps T26/18W operating). Automatic switch over into emergency mode when the mains fails. Both fluorescents will be switched off and 2x1W LED will operate.
Mains voltage: 230V, 50Hz
Ambient temperature: **Version H50**
-5°C up to +40°C - maintained operation
-5°C up to +50°C - standby operation
Ambient temperature: **Version T40**
-40°C up to +40°C - maintained operation
-40°C up to +50° - standby operation

SCHUCH quality – Your advantage:

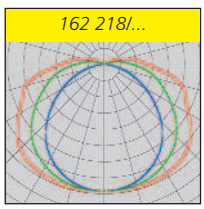


- robust housing with high mechanical impact resistant PC cover
- suitable for a temperature range from -40°C up to +40/+50°C (version T40)
- suitable for offshore-applications (salt spray test severity level 2)
- optimized design in version T40:
  - minimal decrease of luminous flux within mains operation at low temperatures
  - up to 20 times higher luminous flux of the LED version in emergency mode at low temperaturers compared to a 18W fluorescent tube
  - 1 hour battery back-up at -40°C
- immediate full lighting output at low temperatures
- constant luminous flux in emergency mode independent from ambient temperature
- high availability due to extremely long life cycles of the LED (>50,000h with <30% decreased luminous flux, Ta=25°C, according to OEM specification)

162 218/2LED/1 ... FPC

IP65

with battery set



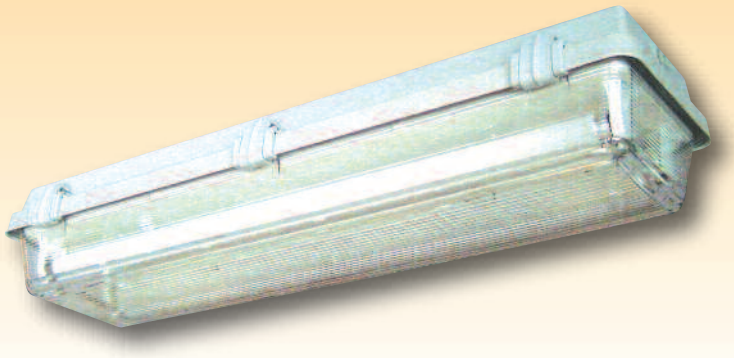
Type	Article no.	Time of oper.(h)	Lamps (mains)	LED (emergency)	Weight approx. kg
for high ambient temperatures from -5 up to +50°C					
162 218/2LED/1 H50 FPC[1)]	16218 0195	1h	2 x T 26/18W	2 x 1W	4,4
for wide temperature range from -40°C up to +40/50°C					
162 218/2LED/1 T40 FPC[1)]	16218 0196	1h	2 x T 26/18W	2 x 1W	4,4

1) wiring: uncompensated

Further equipment

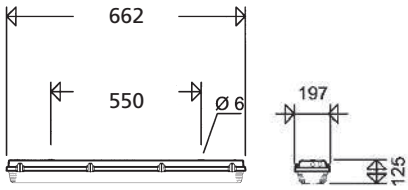
- cable looping system:
  2 cable entries on one side, 2 glands M20 x 1,5 as well as 1 terminal for flexible conductors (no end sleeve) up to 5 x 4 mm². Thus, typical through wiring system not required.
- with stainless steel clips (**KE**)
- with stainless steel hinges (**SC**) on one long side
- vibration-proof version (**RF**)
  for application in areas which may be subject to vibrations (e.g. hubs)

Emergency Light Fitting for Wind Power Stations with high luminous flux in emergency operation 162 218/I/60/1 PC



Application:
Illumination of escape routes in towers, gondolas, lift cages and on platforms in mains and emergency operation (work places during maintenance and repair work). On- and offshore applications.

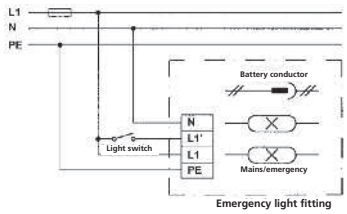
Mechanical Design:
Housing: Glass fibre reinforced polyester resin. Foamed polyurethane gasket.
Cover: Injected clear polycarbonate (PC) with internal prisms.
Closure: Threepart captive plastic clips (KK).
Reflector: White sheet steel, with suspension cords, detachable. Electrical components mounted on the reflector.
Quarter-turn locks for quick release and assembly.
Connection: 4-pole terminal.
Cable entry: 2 blanking plugs M20.
Mounting: There are 2 fixing points. Rubber gaskets and washers included.



Electrical Design:
NiCd battery, gastight. A constant trickle charge to the battery ensures readiness of operation at all times.
Visual functionality monitoring of battery loading process by green LED indicator.
Electronic deep discharge protection.
Recharging time: 24 hours acc. to EN 60598-2-22.

Modes of operation:
Light fitting in standby version (light switch: off). By turning the light on the fitting starts maintained operation (both lamps T26/18W operating). Automatic switch over to emergency mode when the mains fails. In this case 1 lamp will continue operating as safety lighting.
Mains voltage: 230V, 50Hz
Ambient temperature:
-5°C up to +30°C - maintained operation
-5°C up to +40°C - standby operation

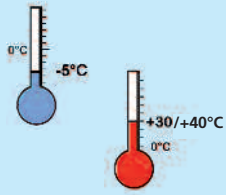
Wiring diagram: Maintained/standby operation



Commissioning: Connect battery conductor
Decommissioning: Disconnect battery conductor
Standby wiring: Don't connect L1'
Maintained operation: Central light switch on

SCHUCH quality – Your advantage:

- robust housing with high mechanical impact resistant PC cover
  – reliable and safe sealing due to deep sealing groove and non-ageing, weather- and chemically resistant polyurethane gasket
- applicable at temperatures from -5°C up to +30/+40°C
- suitable for offshore-applications (salt spray test severity level 2)
- high luminous flux in emergency operation, too (lum. flux factor: 60%)
- easy to install and maintain
  – quarter-turn locks for quick releasing and remounting the reflector
  – spacious connection chamber for 5 x 4mm² max.
  – smooth one-man assembly (2-point suspension)



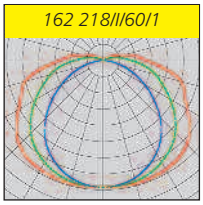
162 218/I/60/1 PC

IP65

with battery set

Type	Article no.	Time of oper.(h)	Lamps/ Watt	Lum.flux factor[2]	Weight approx. kg
T 26					
162 218/I/60/1 PC[1]	16210 0690	1h	2 x T 26/18W	60	4,2

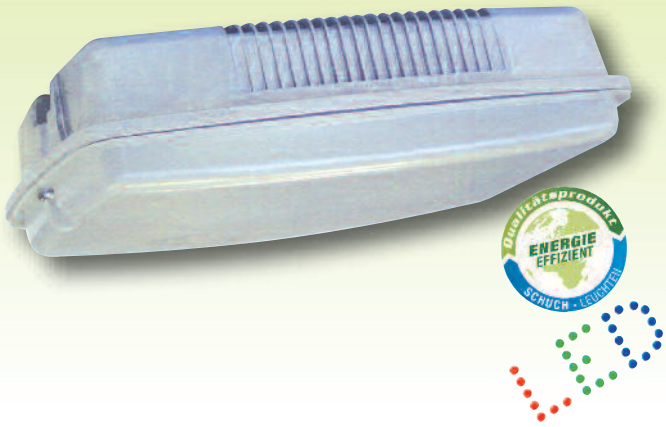
1) wiring: uncompensated
2) ratio effective lamp lum. flux/rated lum. flux



Further equipment

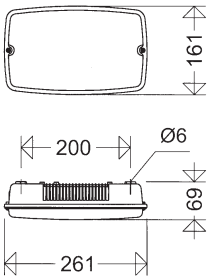
- cable looping system:
  2 cable entries on one side, 2 glands M20 x 1,5 as well as 1 terminal for flexible conductors (no end sleeve) up to 5 x 4 mm². Thus, typical through wiring system not required.
- with stainless steel clips (**KE**)
- with stainless steel hinges (**SC**) on one long side
- with lower luminous flux factors and 3h emergency operation
- for different voltages and frequencies

Compact Light Fitting for Wind Power Stations with Highpower LED for wide temperature range from -40°C up to +60°C Series 3611/... LED T40/H..



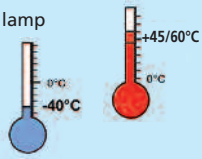
Application:
Illumination of hubs, towers, gondolas, lift cages and platforms (work places during maintenance and repair work). Application areas with low and high ambient temperatures.

Design:
Housing: Die-cast aluminium, natural finish. All operating components are located inside the housing, wired ready for connection.
Cover: PMMA opalescent, with inserted EPDM gasket.
Connection: 3-pole terminal.
Cable entry: 1 plug M20 on the front side.
Mounting: 2 mounting points serve for fixation. Gaskets and washers can be found inside the fitting..
Electronic control gear: 230V, 50/60 Hz.
LED: 6 Highpower LED white, 1 or 3W, 6,500K
Ambient temperature:
-40°C up to +60°C - 3611/**601** LED
-40°C up to +45°C - 3611/**603** LED



Advantages of the LED version:

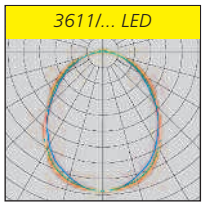
- up to **66%** energy saving in comparison with an 18W compact fluorescent lamp
- low maintenance costs thanks to quite long maintenance intervals
- applicable at temperatures from -40°C up to +45/60°C
- immediate full light output also at very low temperatures
- extremely long life of the LED (> 50,000 hours with < 30% decreased luminous flux, Ta=25°C)
- robust against vibrations and mechanical shocks
- operating device of high ingress protection IP 66



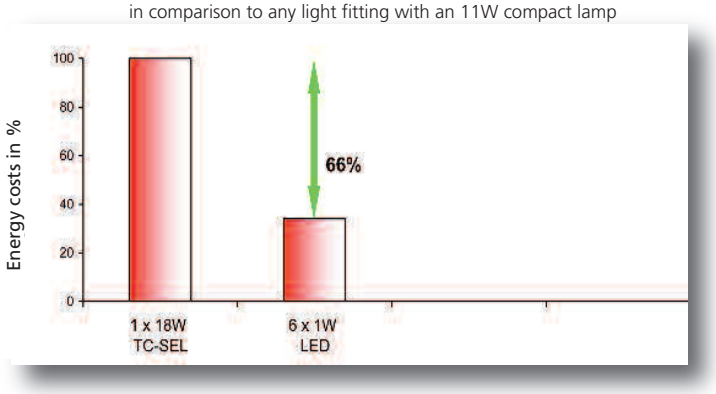
3611/... LED T40/H..

IP65

Type	Article no.	Quantity LED	Power input	LED lm/W	Weight approx. kg
3611/601 LED T40/H60	36110 0103	6 x 1W	8,0	100	1,0
with increased luminous flux					
3611/603 LED T40/H45	36110 0104	6 x 2,5W	16,0	80	1,0



Energy cost saving
by application of version 3611 601 W LED
in comparison to any light fitting with an 11W compact lamp



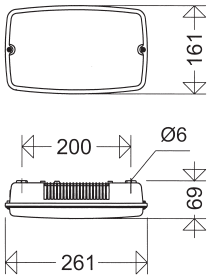
Further Equipment

– cable looping system (**RR**)

Kompakte Windkraftanlagen-Notleuchte mit Highpower-LED Baureihe 3611/201 LED/. MA RW

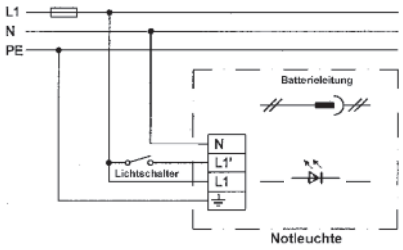
Einsatzbereiche:
Ausleuchtung der Rettungswege in Turm, Gondel, Nabe und auf Plattformen im Netz- und Notbetrieb (Arbeitsstätten bei Wartungs- und Reparaturarbeiten).

Ausführung mechanisch:
Gehäuse: Aluminium-Druckguss, weiß lackiert, alle Betriebsgeräte im Gehäuse integriert, anschlussfertig verdrahtet.
Glas: PMMA satiniert, eingelegte EPDM-Dichtung.
Anschlussklemme: 4-polig.
Anschlussspannung: 230 V, 50 Hz.
Kabeleinführung: Stirnseitig, 1 Verschlussstopfen M20.
Befestigung: 2 Befestigungspunkte, Gummidichtungen und U-Scheiben zur Abdichtung liegen bei.
Umgebungstemperatur:
-5°C bis +30°C (Dauerschaltung)
-5°C bis +40°C (bereitschaftsschaltung)
Optionen siehe „Weitere Ausführungen"



Ausführung elektrisch:
Eingebaute NiMH-Batterie, die durch ständige Erhaltungsladung betriebsbereit gehalten wird.
Überwachung: Automatische Überwachung der Notleuchte gemäß EN 62034. Anzeige der Prüfergebnisse per 2-farbiger LED an der Leuchte.
Elektronischer Tiefentladeschutz:
Wiederaufladezeit: 24h, gemäß EN 60598-2-22
LED: 2 x 1W Highpower-LED, integrierte Optik mit Batwingcharakteristik, 5.000K
Betriebsarten:
Dauerschaltung: Umschaltung auf Batteriebetrieb bei Netzausfall.
Bereitschaftsschaltung: Notlicht schaltet sich bei Netzausfall ein.

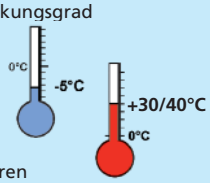
Schaltbild Dauer-/Bereitschaftsschaltung



Inbetriebnahme: Batterieleitung zusammenstecken
Außerbetriebnahme: Batterieleitung trennen
Bereitschaftsschaltung: L1' nicht anschließen

Vorteile der LED-Ausführung

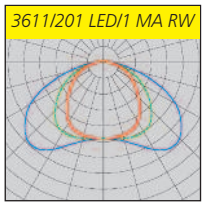
- niedrige Betriebskosten durch geringe Leistungsaufnahme und hohen Wirkungsgrad
- bis zu **71% Energieeinsparung** im Vergleich zu einer 8W Leuchtstofflampe
- einsetzbar im Temperaturbereich von -5°C bis +30/40°C
- extrem lange Lebensdauer der LED (≥ 50.000h, bei ≤ 30% Lichtstromrückgang, Ta = 25°C)
- niedrige Wartungskosten durch lange Wartungsintervalle
- Sicherheit im Notfall, sofort volle Lichtleistung, auch bei tiefen Temperaturen
- große Lichtpunktabstände bei der Ausleuchtung von Flucht- und Rettungswegen durch LED-integrierte Optik mit Batwingcharakteristik (**Ausführung ... RW**)
- bestens geeignet bei hoher Schalthäufigkeit
- robust gegen Vibrationen und Erschütterungen



3611/201 LED/. MA ..

IP65

mit Einzelbatterie und automatischer Selbstüberwachung



Type	Art. Nr.	Anzahl LED	Brenndauer h	Lichtstromfaktor[1]	Gewicht ca. kg
Flucht- und Rettungswegeleuchte[2]					
3611/201 LED/1 MA RW	36111 0003	2 x 1W	1	100	1,1
3611/201 LED/3 MA RW	36111 0004	2 x 1W	3	100	1,3

1) Verhältnis effektiver Lampenlichtstrom zum Nennlichtstrom

Weitere Ausführungen

– mit PC-Glas
– mit einseitiger Rein-Raus-Verdrahtung (**RR**)

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