

HEMA

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MASCHINEN- UND
APPARATESCHUTZ GMBH

VIEWING SYSTEMS

MACHINE SAFETY WINDOWS

SPIN WINDOWS

LED LIGHTING SYSTEMS

WE ARE THERE FOR YOU WORLDWIDE



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CATALOGUE PROTECTION SYSTEMS



- Bellows
- Roof Cover
- Backwall Systems
- Telescopic Steel Covers
- Roller Covers
- Spiral Springs

CATALOGUE CLAMPING AND BRAKING SYSTEMS

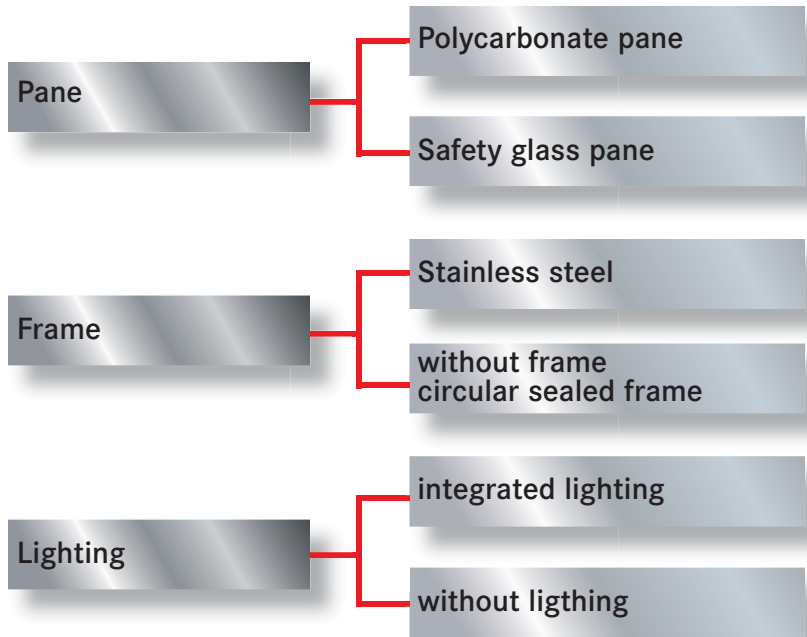


- RotoClamp
- DiskClamp
- LinClamp
- MClamp
- PClamp

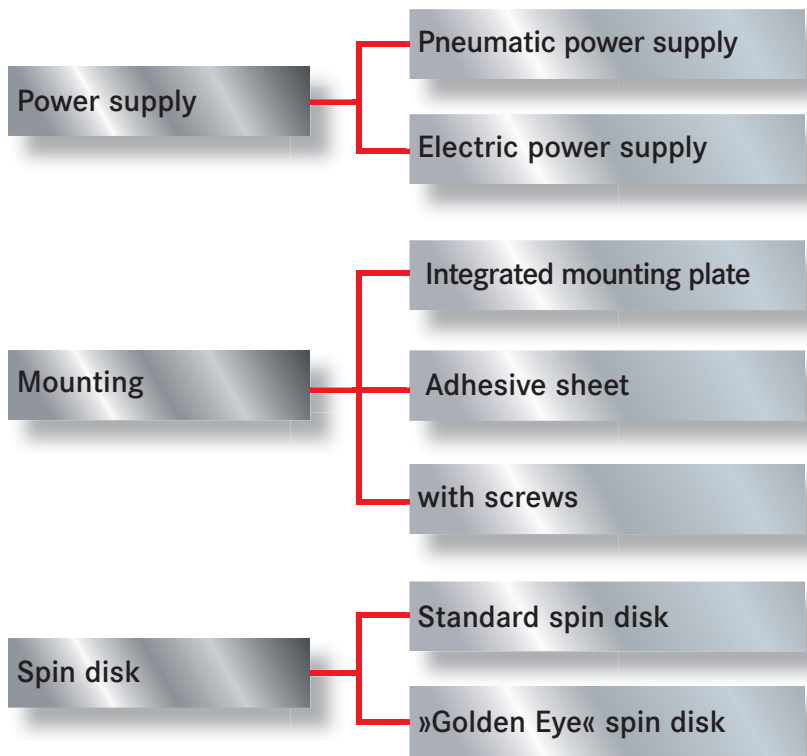
MODULAR CONCEPT

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MACHINE SAFETY WINDOWS



VISIPOINT® SPIN WINDOWS



MACHINE SAFETY WINDOWS

Safety glass is a restraining protective device on machining centres. It prevents tools, machined parts and broken particles from being ejected out of the machine's working space and protects people from injuries.

Industrial accident statistics show that workers are still the frequent victims of flying objects ejected by machine tools. Viewing panes in machining centres, ideally combined with a spin window system, provide a good view for the operator and transparency of the manufacturing process.

Viewing panes within the trajectory path of parts must exhibit adequate strength. According to the latest empirical tests polycarbonate is the material best suited for safety glass owing to its high energy absorption.

The restraining capacity of a polycarbonate pane of 8 mm thickness is about the same as of a 3 mm St 12.03 sheet.

Application	Protection against
Turning	<ul style="list-style-type: none"> ■ broken chuck components ■ broken tools ■ machine parts
Milling	<ul style="list-style-type: none"> ■ hot chips ■ broken tools ■ machine parts
Grinding	<ul style="list-style-type: none"> ■ Pieces of broken grinding disks

Application areas of safety windows

A disadvantage of polycarbonate is its sensitivity to scratching and it will be damaged by the impact of hot chips and sparks.

Furthermore it has low resistance to the effects of coolants, grease and oil and will embrittle as a result. This can reduce the restraining capacity within just a few years.

The safety glass provided by HEMA is encapsulated and sealed for permanent and efficient protection against these external influences.

Any safety glass showing damage from external mechanical impact, for example cracks, deep scratches or deterioration resulting from exposure to chemicals, must be replaced if it is to continue functioning properly.

At present there are three technical standards for metal cutting tools: DIN EN 23125 (for lathes), DIN EN 13128 and DIN EN 12417 (for milling machines and machining centres). These standards form the basis of our safety glass and spin window systems. You may determine the relevant safety classification and the corresponding minimum thickness of the polycarbonate from the tables on the following pages. The influential factors are the mass of the tool and of the machined part and the speed of rotation.



Machine safety window with stainless steel frame, including mounted VISIPORT® with »Golden Eye« spin disk

The restraining capacity of safety glass depends not only on the thickness of the polycarbonate but also on the sheet metal design of its enclosure. Clamps or bonding or an adequate frame is the best solution for the mounting.

The joints should be well covered to prevent the screen from being pushed through the frame when impacted by parts.



Machine safety window, standard design

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IMPACT TEST

Safety glass is a restraining protective device on machining centres. As part of tests on their restraining ability a range of HEMA polycarbonate panes with and without integrated VISIPOINT® mounting plate were tested at the IWF of TU Berlin.



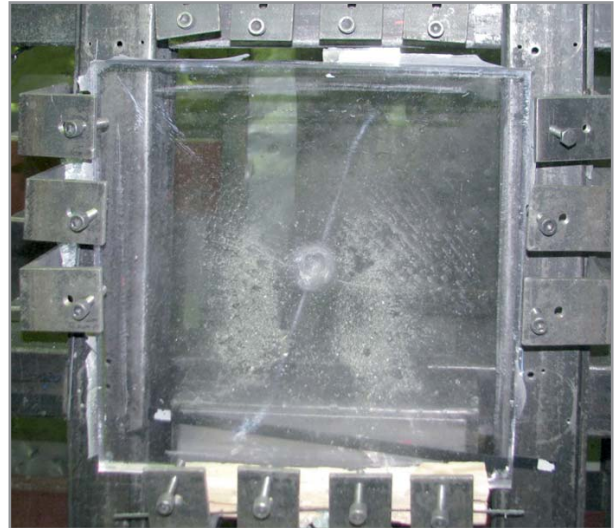
Fixing of pane

For the impact test according to DIN EN 23125, resistance class C3, for example, panes with 10 mm tempered safety glass and 15 mm polycarbonate were tested with and without supporting mountig plate for VISIPOINT®.

Testing

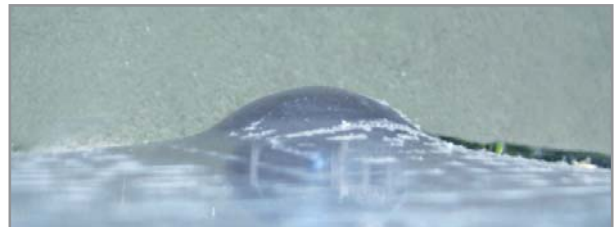
Polycarbonate panes are fixed within a frame and impacted with a 2.5 kg projectile.

The speed of the projectile is adjusted at the cannon's pressure, the speed is measured with a double laser light barrier.



Fixed polycarbonate pane after impact test

Test No	Test object	Projectile speed v [m/s]	Projectile energy E [Nm]	Result, note
1	4e	80	8000	passed
2	4b	80	8000	passed
3	4c	80	8000	passed
4	4f	80	8000	passed



Ident of polycarbonate pane after impact test



Panorama view of test laboratory at the IWF of TU Berlin. In the foreground acceleration pipe with projectile (enlarged).

MACHINE SAFETY WINDOWS

Material / classification	A1	A2	A3	B1	B2	B3	C1	C2	C3
Mass of projectile in kg	0.625	0.625	0.625	1.25	1.25	1.25	2.50	2.50	2,50
Kinetic energy in joule	320	781	2000	1562	2480	4000	3124	4960	8000
PC 6 mm	■			■					
PC 8 mm	■	■		■	■		■		
PC 10 mm	■	■	■	■	■		■	■	
PC 12 mm	■	■	■	■	■	■	■	■	
PC 15 mm	■	■	■	■	■	■	■	■	■
PC 19 mm laminated	■	■	■	■	■	■	■	■	■

Impact tests according to DIN EN 23125 at test pattern 500 x 500 mm
 ■ Available combination (without guarantee)

Parameter for calculation of safety classification and thickness of polycarbonate panes for turning centres according DIN EN 23125

Diameter of rotation	Maximum outer diameter of the clamping jaw at the machine
Rotational speed of the spindle	Maximum speed of the machine according to the manufacturer
Mass of clamping jaw	Mass of one clamping jaw (classification according to proposed standard)

max. diameter of clamping jaw (mm)	circumferential speed v (m/s)	Projectile dim. D x a (mm x mm)	Projectile mass m (kg)	Impact speed v (m/s), up to	Impact energy (Nm), up to	safety classification*	Minimum thickness of PC (mm)
up to 130	25	30 x 19	0.625	32	320	A1	6
	40			781	A2	6	
	63			2.000	A3	8	
130 to 250	40	40 x 25	1.250	50	1,562	B1	6
	50			2,480	B2	8	
	63			4,000	B3	12	
> 250	40	50 x 30	2.500	50	3,124	C1	8
	50			4,960	C2	10	
	63			8,000	C3	15	

*A1 to C3 = Classification according DIN EN 23125; PK 1 to 5 = classification according to VDW

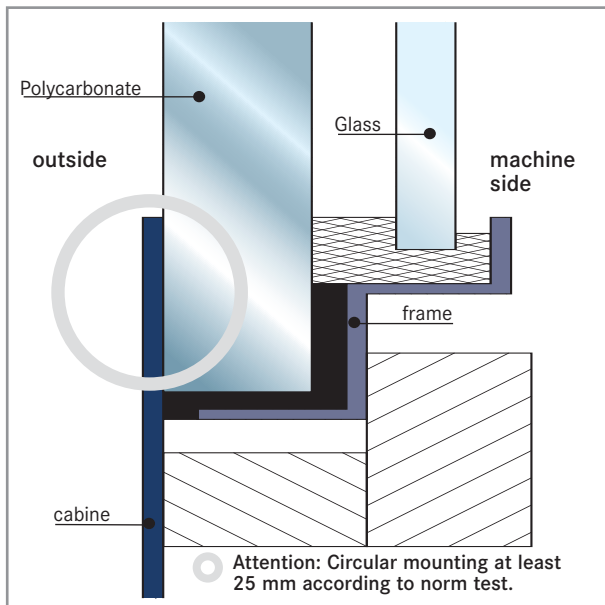
MACHINE SAFETY WINDOWS

Calculation of safety classification and required polycarbonate thickness for milling machines DIN EN 12417

Diameter of rotation	maximum outer diameter of the cutting tool unit at the machine concerned
Rotation speed of spindle	maximum speed of the machine according to the manufacturer
Mass of cutting tool	mass of cutting tool, defined for 100 g according to proposed standard

Required Data for calculation of impact energy and impact speed

Projectile mass m (kg) m (kg)	impact speed vt (m/s), up to	impact energy (Nm), up to	Minimal thickness of Polycarbonate (mm)
0.100	85	361	4
0.100	100	500	6
0.100	120	720	8
0.100	145	1.063	10
0.100	150	1.125	12
0.100	170	1.445	15
0.100	>170	>1.445	19



Design of safety glass window

Polycarbonate panes only with safety foil

When exposed these polycarbonate panes may lose their safety restraining properties partly or completely after only a few months of use.

This was impressively demonstrated by tests at the BIA Institute. Systematic research showed that polycarbonate panes splashed with coolant possess a retaining potential of only 60% after nine months of exposure.

According to our definition safety glass may be considered exposed as long as it is not completely encapsulated by an additional glass layer or a special foil. This encapsulation and sealing can be verified only by specialised companies.

In spite of the lower safety classification requirements of milling/drilling machine manufacturers and polycarbonate pane thicknesses less than 6 mm customers still use these panes.

Although the pane thickness corresponds to the machine's safety classification these panes are unprotected, i.e. not encapsulated or sealed.

Polycarbonate panes for machines should be protected against chemical attacks if they are to provide reliable protection over the long term.

A special focus of attention is the safety risks posed by safety windows that has found testimony over recent years.

The replacement of unprotected polycarbonate panes is recommended by VDMA (association of German machine and plant manufacturers) after only two years of use.

The safety glass fulfils the applicable recommendations of VDMA for an assured A1 to C3 safety classification. It is non-aging and resistant to oil, coolants, and heavy impacts.

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MACHINE SAFETY WINDOWS

The increasing imports of machining centres from low-cost countries always mean a safety risk, and the legal requirements are not always being met by these products.

Safe operation can be achieved though when these low cost machines are retrofitted in accordance with the required European safety standards.

Recommendation for replacement of panes

According to the recommendations of the German Berufsgenossenschaft BIA (Accident Prevention & Insurance Association), the Werkzeugmaschinenverband VDW, and the IWF/TU Berlin, Fachgebiet Werkzeugmaschinen und Fertigungstechnik, we recommend that protective panes are replaced after 5 years of use.

All buyers of new or second-hand machine tools must be informed of polycarbonate deterioration (e.g. in the manual). It is also recommended to mark the installation date of the polycarbonate pane on the pane itself. Replacing and servicing protection panes must observe all of the instructions from the manufacturer.

We recommend replacing the pane immediately when there is:

- deformation and/or cracks from impacts
- damage to the sealing
- infiltration of cooling fluid
- damage or destruction to the protection pane (or the scratch-resistant protection film) on the operator or machine side

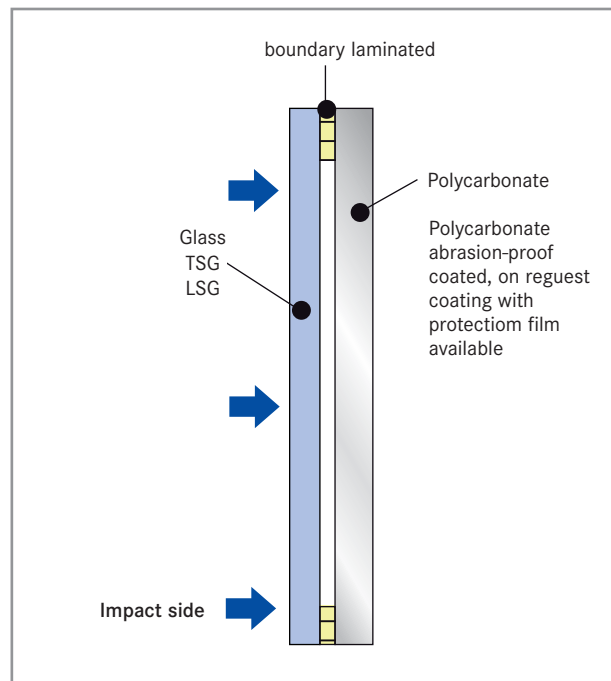
HEMA safety windows

- Only certified quality panes of polycarbonate are used with an efficient surface coating providing protection against chemicals, abrasion and scratching, film on option
- Polycarbonate panes from renowned manufactures
- Polycarbonate panes can be provided with any of the usual thicknesses. The basic versions range from 5 to 15 mm in thickness.
- PC panes are protected on the machine side by an additional single or multiple layer safety glass pane.
- The design may consist of polycarbonate with abrasion-proof coating and glass depending on customer requirements.
- Splinter proof laminated glass with a low risk of injury and for shorter cleaning and machine downtimes.
- The edges of the panes are completely sealed and resistant to coolants. In addition they can be fitted with stainless steel frame for optimal mounting.
- The panes and their components are tested by the IWF institute in Berlin according to DIN EN 23125, restraint categories A1 to C3, and to safety standards CEN/TC 143/WG3
- The customer receives a 5-year warranty on the encapsulated and sealed safety pane (according to our warranty conditions).

- The integration of modern spin window solutions such as VISIPORT® is possible without any safety risk or additional mounting work.

Design of machine safety windows

»HEMA WINDOW« machine safety windows are suitable for most applications. They can be produced with optional graduation, protection films, steel frames. Also the integration of LED lighting is possible (see page 74).



Design of machine safety window

The thickness of polycarbonate and the design of the multilayer machine safety window is based on the individual requirements and safety classifications. The HEMA charge number system assures traceability and convenient re-ordering.



Label inside window

VISIPOINT® SPIN WINDOWS

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CONTENT

VISIPOINT® Spin Windows are suitable for all types of CNC milling machines, lathes and machining centres, either retro-fitted or integrated at the factory.

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SAFETY WINDOWS
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The modular design facilitates installation and optimises maintenance for reduced costs.

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VISIPOINT® 220C2

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With their low weight and a generous visible surface, VISIPOINT® can be adapted optimally to your machines. Additional electronic safety features complete the perfect impression.

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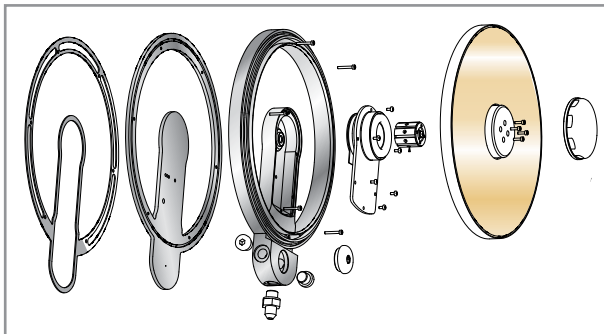
WORKPLACE
LIGHTING

Diagram of VISIPOINT®

Complete solutions - Safety Windows with mounted VISIPOINT® Spin Windows are also available. They are ready to mount without extra effort.

These systems can be preconfigured and then only have to be installed and connected. All systems meet the respective security requirements.

Advantages of VISIPOINT® Spin Windows

VISIPOINT® is synonymous with active safety precautions: Without VISIPOINT®, the operator can be tempted to bypass the safety circuit of the machine to see what is happening in the machine - potential danger with serious consequences!

With regard to product liability and safety regulations, take a look at the safety advantages of VISIPOINT® - it could pay off.



Direct view of the machining process

Installation and fixing

No hole has to be drilled in the machine cabin. The unit is either fastened on the bonded mounting plate or bonded directly to the window. The mounting plate allows fast replacement of the VISIPOINT® unit. VISIPOINT® can be installed vertically and up to 30° from the vertical. The flat construction enables the VISIPOINT® to be adapted to widely differing door and window designs. VISIPOINT® is also suitable for fastening to sliding doors with limited intermediate space. VISIPOINT® can be fixed in different ways:

- bonded
- screwed to safety window
- screwed directly to the integrated mounting plate

Bonding

The VISIPOINT® is mounted easily with a high-tech adhesive sheet (adhesive based on closed cellular acrylic foam). Simply remove the protective foil on the rear side of the VISIPOINT® and bond the VISIPOINT® to the desired position on the pane which should be cleaned thoroughly beforehand. The optimal setting time is 72 hours. To speed up installation we offer a special vacuum pump, which reduces the bonding time to 1-2 hours (95% bonding strength). Applying heat to the mounting frame can also help to reduce the bonding time. Afterwards it is very difficult to separate the VISIPOINT® from the surface it is bonded to, provided the surface had been cleaned adequately beforehand.



VISIPOINT® with high-tech adhesive sheet

VISIPOINT® SPIN WINDOWS

Screwed to safety window

In this case six holes are drilled through the polycarbonate pane (a process that degrades the pane's resistance). The holes are sealed from the machine's cabin side with an integrated o-ring. On the control side VISIPOINT® is fixed in place with a screwed clamping flange

Machine safety windows with integrated mounting plate

The easiest solution is to secure the VISIPOINT® to the mounting plate already integrated within the safety window. VISIPOINT® only has to be positioned and secured in place with the enclosed screws.



Machine safety window with integrated mounting plate

VISIPOINT® ventilation and airing

VISIPOINT® has a patented system with a separate flexible hose that supplies the required quantity of air for the interior ventilation of the VISIPOINT®.

The flexible hose protects the wire harness between the VISIPOINT® and the connecting box. Air circulation is important. Ventilation should always be assured.

Power supply

VISIPOINT® is available with two different drives types. VISIPOINT® 220C2 is equipped with an electrical drive, DiscAir 180 Turbo with a pneumatic drive.

Coolant

VISIPOINT® functions best with water based coolants and mineral oils; other oils on request.

For oil emulsion coolants we recommend the specially coated »Golden Eye« spin disk.

»Golden Eye« special disk

Machining aluminium or magnesium generates chips which condense like a film on the pane and the spin disk. This problem leads to obscured vision after only a short time. For these applications we recommend fitting the VISIPOINT® with the »Golden Eye« spin disk.

Its special coating gives the disk a gold coloured tint. This coating underwent exhaustive testing for 18 months under severe conditions in the mechanical production facilities at Boeing in Seattle.

VISIPOINT® models 180.B5, 220.B5 and 220C2 with electric drive can be retrofitted or fitted directly with the »Golden Eye« spin disk when ordered.

The Disc Air 180 Turbo is fitted as standard with a »Golden Eye« coated spin disk.

Product quality

All VISIPOINT® models come with a twelve month warranty ex works. Wearing parts are excluded. Many components are made of high-grade aluminium.

The ball bearings are lubricated for life and can be replaced. The flexible metal connecting hose or the tube system is temperature resistant up to 300°C.

The electronic components were developed specifically for the VISIPOINT®.

Ambient influences are excluded by the optimum installation position and sealing.

All parts and components of the VISIPOINT® are tested for material quality and life endurance.

Model	VISIPOINT® 220C2	VISIPOINT® DiscAir 180 Turbo
Required voltage	24V (± 1V), min. 5A continuous load	-
Required air pressure	-	5.3 - 5.8 bar
Speed	2.235 rpm	4000 rpm (at 5.5 Bar)
Air consumption	-	38 l/min
Noise level	-	79 dB (without housing, at a distance of 3 m)
Diagonal dimension/total dimension	253 mm / 299 mm	201,7 / 236,2 mm
Viewing area	215 mm	175 mm
Weight	2.1 kg	0.7 kg
Height	32.5 mm / 43 mm	29.6 mm / 44.9 mm
Thickness of disk	3 mm	2 mm
Golden-Eye disk	optional	standard

VISIPOINT® 220C2

VISIPOINT® 220C2

- Spinning disk mounted in the machine side, providing a clear view of the process through its high rotary speed (> 2,235 rpm)
- Integrated, protected electronic control unit providing protection against reverse and overvoltage, thermo circuit protecting against overheating (150°C)
- Driven by integrated brushless DC motor; power supply
- Fulfils CE standards for low tension voltage
- low weight, only about 2.1 kg
- built-in chip protection with specially designed base and disc ring
- Balanced rotating disc made of hardened glass 3 mm thick
- Optional plasma coated »Golden Eye« version

Connection

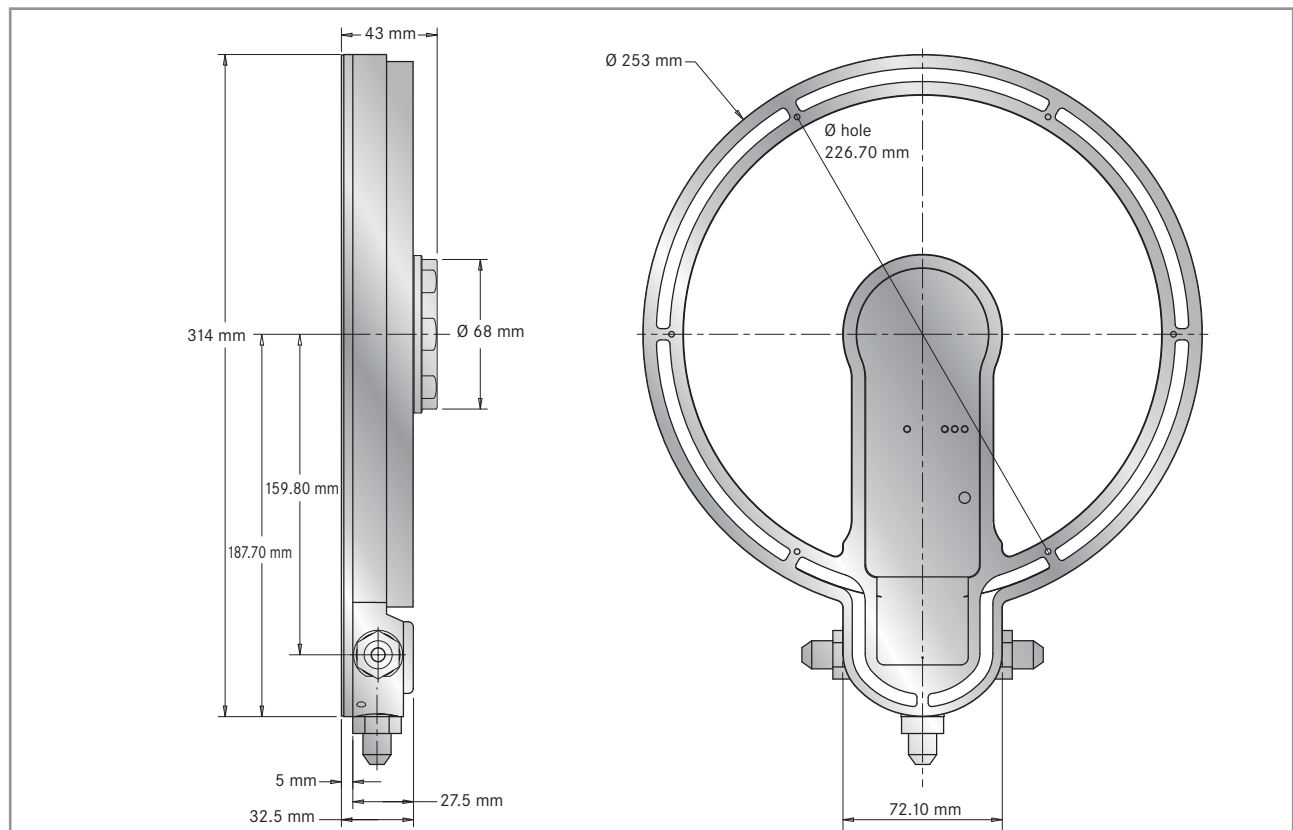
The VISIPOINT® 220C2 provides a three-way connection on its base plate:

- Connection fitting for FLEX metal hose
- FESTO fast connection fitting for FESTO tubes 8 x 1.25 mm
- EO fitting for Ø 8, 10 or 12 mm metal pipes
- Connection fitting EH-PG09 for plastic cable tube EW-PA-M12/P9



Variations of VISIPOINT® 220C2

FDX	Basic model, direct screw coupling on polycarbonate panes
FMX	Basic model, with VHB adhesive tape on basic device
FVX	Basic model, VHB adhesive tape on extra mounting plate for easy replacement
HM	Basic model, separate terminal box, VHB adhesive tape on basic device
HV	Basic model with terminal box and VHB adhesive tape on separate mounting plate for easy replacement



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VISIPOINT® DISCAIR 180 TURBO

VISIPOINT® DiscAir 180 Turbo

- Spin disk located on the machine side, providing clear view of machining through its high rotating speed (> 4000 rpm)
- Driven by purified compressed air, no electrical connection required
- Suitable for use with intermittent coolant spraying
- Rotor mounted on precision ball bearing
- Balanced rotating disc made of hardened glass 2 mm thick
- Plasma coated »Golden Eye« disk as standard
- Air hose connected at plug-in socket
- Patented high efficient turbine ring
- Air consumption 38 l/min

Connection

The DiscAir model is driven with compressed air available at almost every machine or at every workshop: simply connect the VISIPOINT® DiscAir to the compressed air supply - without costly electric wiring.

It is secured in place on the machine pane with simple fasteners, similarly to the electric VISIPOINT®.

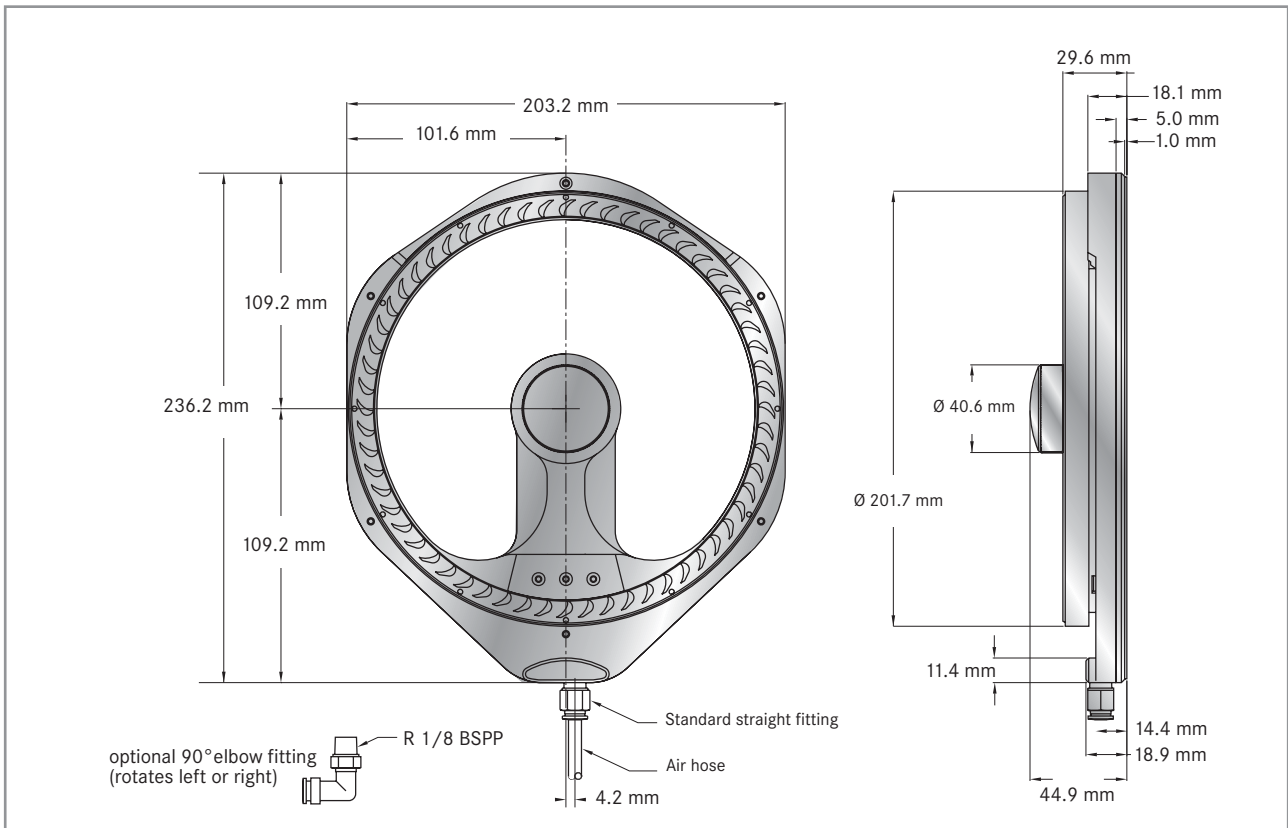
Due to its design and drive the DiscAir model generates more noise than the extremely low noise electrical VISIPOINT® Model. Owing to its optimised air circulation system and high precision manufacturing process the DiscAir model is nevertheless quite and fulfils the legal directives.



So there is very little difference to the machine's own noise levels when the cabin door is closed.

The air outlet has been designed to provide additional protection against the intrusion of coolant and chips.

The VISIPOINT® DiscAir model rounds off the VISIPOINT® line and represents an excellent price to performance ratio. It enables every CNC machine operator to adopt the spin window technology at a price considerably lower than that of electrical models.



HE-TRACK-ALPHA LED MACHINE LIGHTING

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HE-TRACK-LED, diffuse lighting for glare-free working

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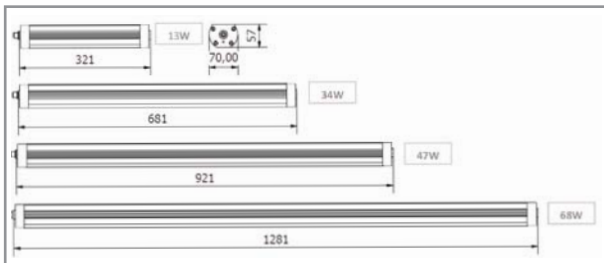
INTEGRATED
LIGHTING

HE-TRACK-ALPHA LED Machine light

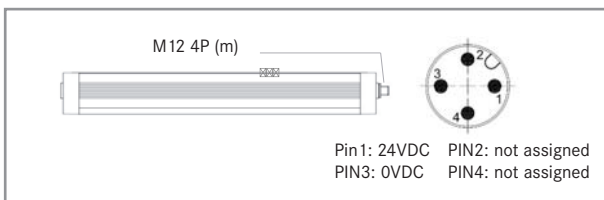
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HE-TRACK-ALPHA Dimensions



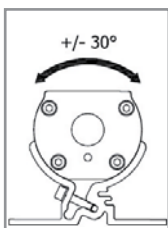
The HETRACK-ALPHA LED machine lamps are designed for small and mid sized machine tools.

The housing is of robust, silver anodised aluminium. The 5 mm thick, hardened safety pane presents a matt surface for diffuse, dazzle free lighting.

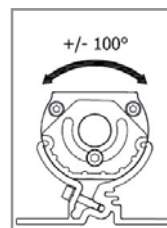
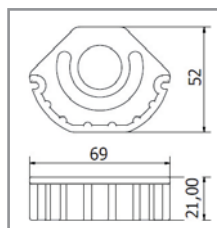
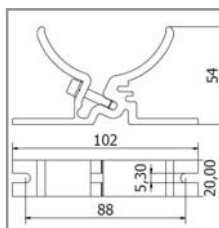
The lamps can be fitted with optional mounting plates for both horizontal and vertical installations. The lamps are impact resistant, impervious to vibrations, and can also operate in environments with coolants and lubricants.

In addition, the HETRACK-ALPHA LED machine lamps are extremely low maintenance. This LED technology exhibits a long service life of 50,000 operating hours, so the lamp is virtually replacement free, eliminating the cost for new parts and repairs.

- Flexible machine lamp
- Adjustable lighting angle
- Direct 24 V connector without additional components
- Resistant to many coolants and lubricants



Backside mounting ALPHA.CLIP



Sidewise mounting ALPHA.CLIP and ALPHA.ADP

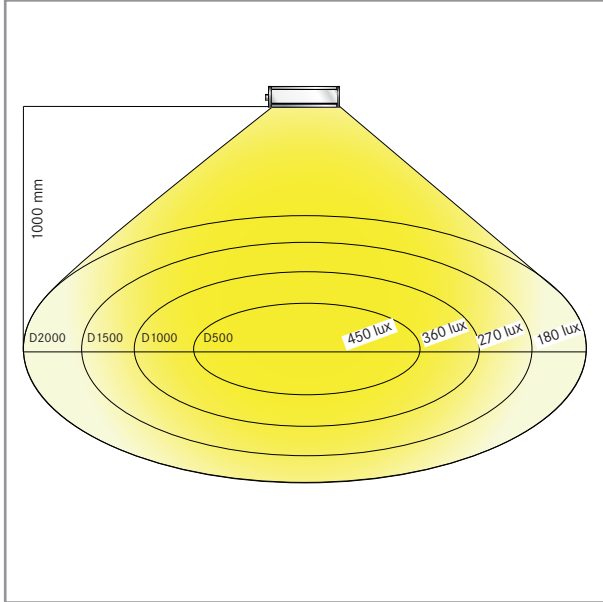


Version	Power supply	LED no	Operating voltage	Light temperature	Lens	Mounting
HE-TRACKLED 24	24 VDC	36	13 W / 0.60 A	5000K	120°	external
HE-TRACKLED 48	24 VDC	90	34 W / 1.50 A	5000K	120°	external
HE-TRACKLED 72	24 VDC	126	47 W / 2.10 A	5000K	120°	external
HE-TRACKLED 96	24 VDC	180	68 W / 3.00 A	5000K	120°	external

Delivered with cable lengths of 1.5m, cable ends of bare wires.

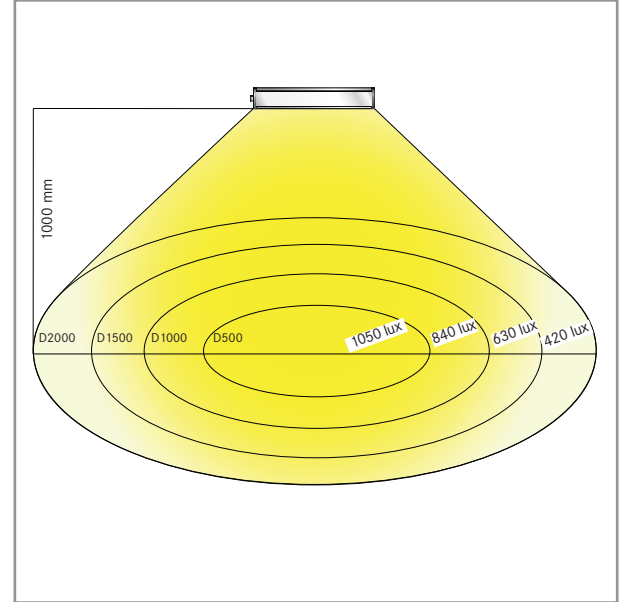
ILLUMINATION DISTRIBUTION CHARTS

HE-TRACK-ALPHA 2.50



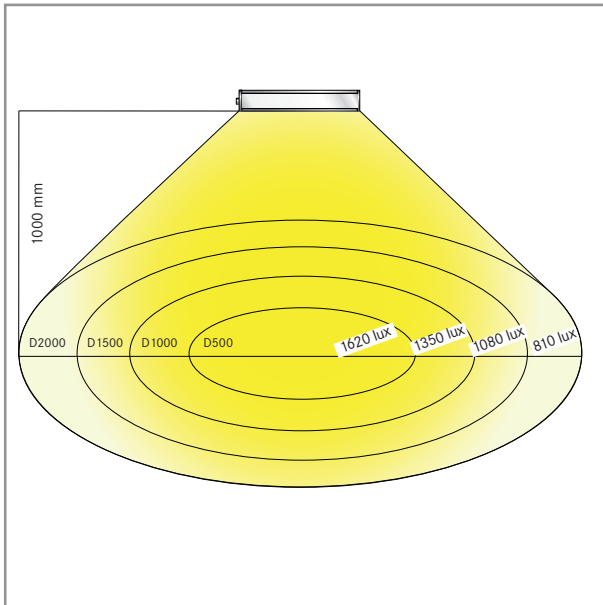
Lens	120°
Current	13 W / 0.6 A
Lighting systems	HE-TRACK ALPHA 2.50

HE-TRACK-ALPHA 5.50



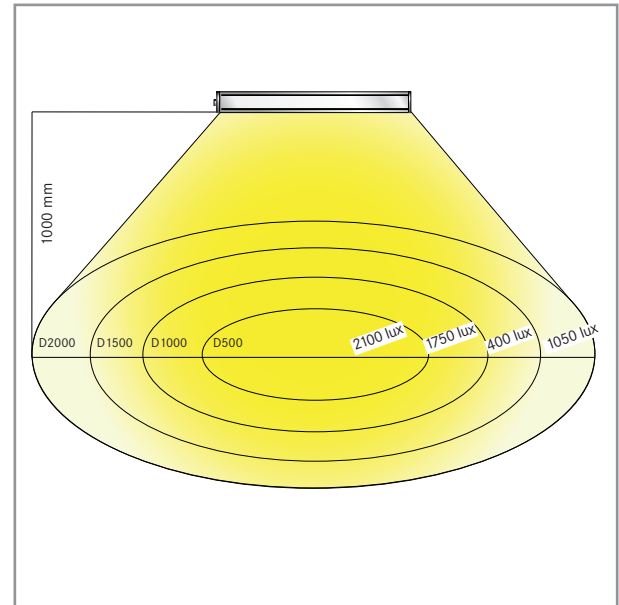
Lens	120°
Current	34 W / 1.5 A
Lighting systems	HE-TRACK ALPHA 5.50

HE-TRACK-ALPHA 7.50



Lens	120°
Current	47 W / 2.1 A
Lighting systems	HE-TRACK ALPHA 7.50

HE-TRACK-ALPHA 10.50



Lens	120°
Current	68 W / 3 A
Lighting systems	HE-TRACK ALPHA 10.50

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HE-TCITY MACHINE LIGHTING

03

CONTENT

Like the HETLED Series, also HE-TCITY is perfect for the permanent illumination of machine interiors. HE-TCITY is available in four sizes: 6 W, 12 W, 18 W, and 24 W. The HE-TCITY housing is made of aluminium encased in borosilicate glass. All HE-TCITY versions fulfil the protective requirements for IP 68.

04

SAFETY WINDOWS
SPIN WINDOWS

Machine inner lighting HE-TCITY with mounting

The encapsulated design is an effective barrier against foreign particles and moisture for a maintained high quality of lighting. The LEDs are designed for a long service life and high light quality, reducing maintenance work and energy costs to a considerable degree.

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INTEGRATED
LIGHTING

22

SPOT FITTING
LIGHTING

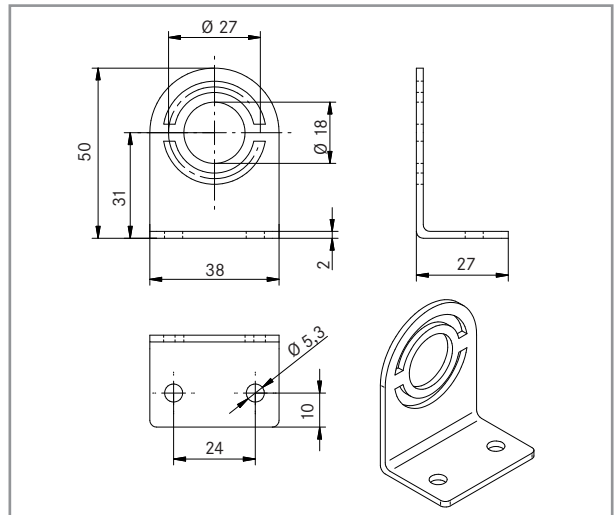
Advantages of using HE-TCITY lamps

- Compact measurements with maximum illumination
- Robust design for demanding applications
- 120° lighting angle
- Direct 24 V connector, integrated adapter
- Innovative fastening modes for maximised installation convenience
- Resistant to most coolants and lubricants
- High IP 68 rating
- LED technology for up to 50,000 hours of operation

24

WORKPLACE
LIGHTING

Machine inner lighting HE-TCITY



Holder to screw for HE-TCITY and HE-TLED

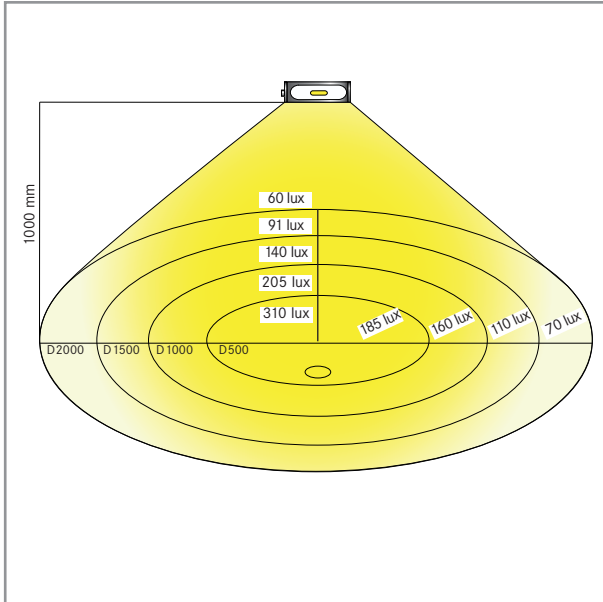


	HE-TCITY6	HE-TCITY12	HE-TCITY18	HE-TCITY24
Current 700 mA	6 W	12 W	-	-
Current 1,400 mA	-	-	18 W	24 W
Operating voltage	24 VDC	24 VDC	24 VDC	24 VDC
IEC marking	III	III	III	III
Cable length standard	1.5 m	1.5 m	1.5 m	1.5 m
LED life cycle	ca. 50,000 h	ca. 50,000 h	ca. 50,000 h	ca. 50,000 h
Number of LEDs	1	2	3	4
Light temperature	5000 K Ra65	5000 K Ra65	5000 K Ra65	5000 K Ra65
Lens	120°	120°	120°	120°
Dimensions (mm)	Ø 38x202	Ø 38x372	Ø 38x542	Ø 38x712
Fasteners	Holder / Clips	Holder / Clips	Holder / Clips	Holder / Clips
Colour	Aluminium/Glass	Aluminium/Glass	Aluminium/Glass	Aluminium/Glass
IP Class	IP68	IP68	IP68	IP68

Delivery with cable lengths 1.5m, 24 Vdc cable ends of bare wires.

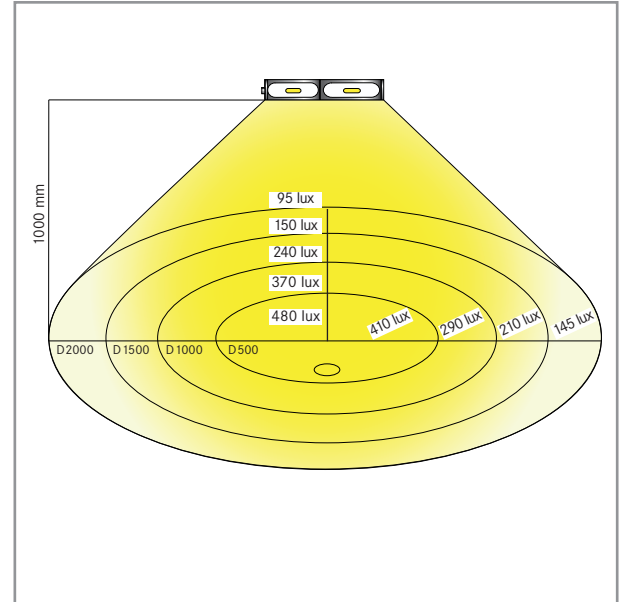
ILLUMINATION DISTRIBUTION CHARTS

HE-TCITY6



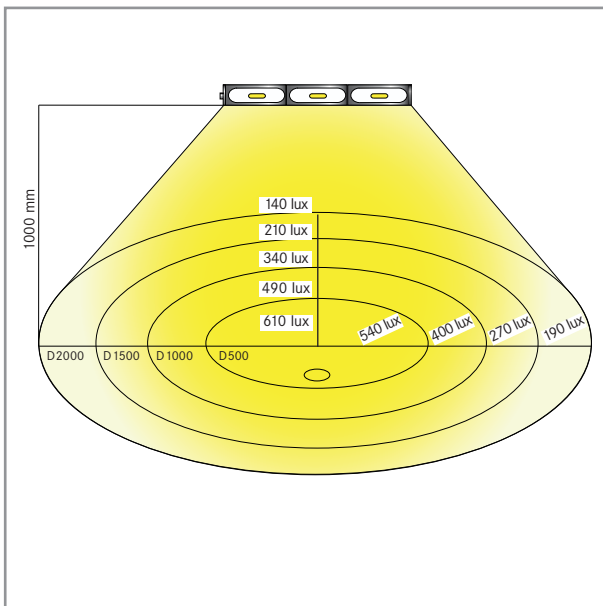
Lens	120°
Current	24V/700 mA
Lighting systems	HE-TCITY.6

HE-TCITY12



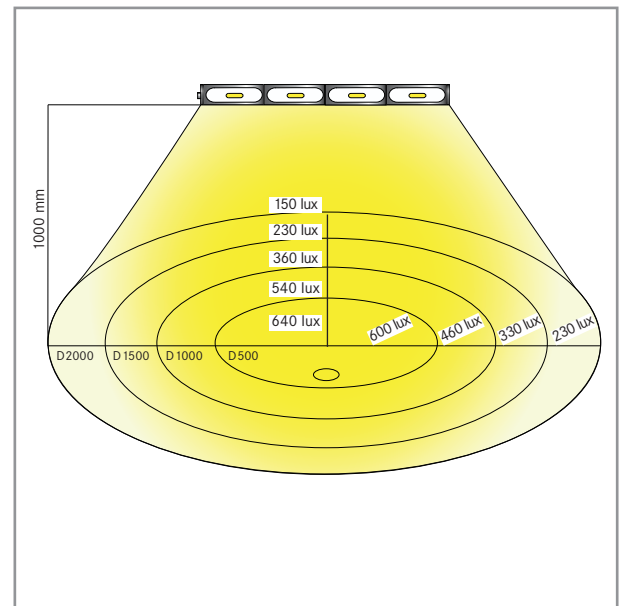
Lens	120°
Current	24V/700 mA
Lighting systems	HE-TCITY.12

HE-TCITY18



Lens	120°
Current	24V/1400 mA
Lighting systems	HE-TCITY.18

HE-TCITY24



Lens	120°
Current	24V/1400 mA
Lighting systems	HE-TCITY.24

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»SECRET MTL/MTLG« LED LIGHTING RAIL

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SPIN WINDOWS

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MACHINE
LIGHTING

HEMA »SECRET MTL« and »SECRET MTLG« LED lighting rail

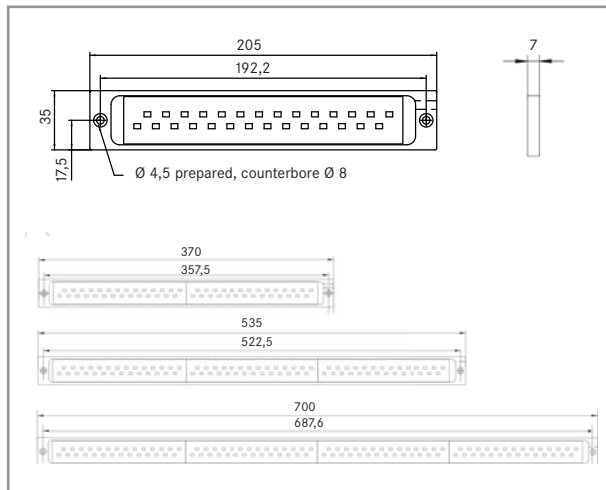
21

INTEGRATED
LIGHTING

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SPOT FITTING
LIGHTING

24

WORKPLACE
LIGHTING

The HEMA LED model range »SECRET MTL« is an innovative 24 VDC LED lighting for demanding and imperceptibly applications.

The LED lighting rails are compact and extremely flat and will put your machine or industrial site into proper light. Due to the compact dimensions of the »SECRET MTL« the lighting rail can be integrated almost invisible into the machine. The »SECRET MTL« is also perfect suitable for retrofit of machines.

Thanks to the excellent light efficiency at a wide angle the »SECRET MTL« provides both, a complete integrable machine and industrial light.

The also available »SECRET MTLG« type is additionally equipped with a cover plate of tempered glass.

Advantage »SECRET MTL« LED Lighting rail

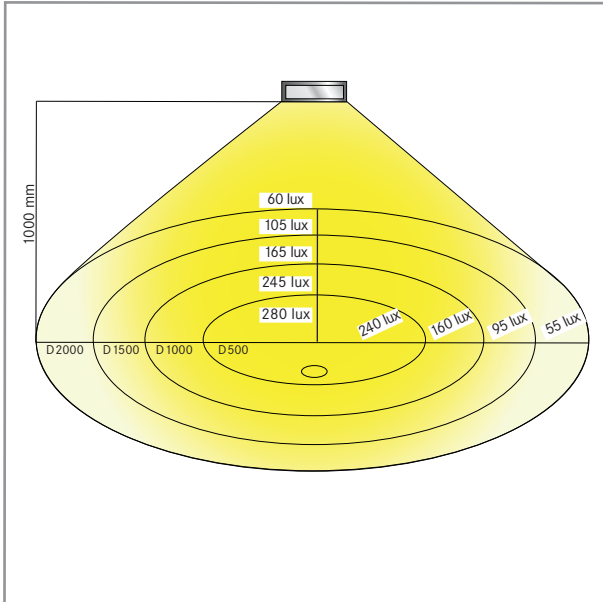
- Power supply 24V
- Connection via M12 plug
- Extremely slimline housing
- shock and vibration proof sealed in PUR backfill
- Anodized aluminium housing
- IP Rating IP69K

Type	SECRET MTL.6	SECRET MTL.12	SECRET MTL.18	SECRET MTL.24	SECRET MTL.36	SECRET MTL.48
Dimensions extern LxBxH	205x35x7mm	370x35x7mm	535x35x7mm	700x35x7mm	1030x35x7mm	1360x35x7mm
Power Supply	24V	24V	24V	24V	24V	24V
Operating voltage	5W	10W	15W	20W	30W	40W
Current	210mA	420mA	630mA	840mA	1260mA	1680mA
Number LED rails	1	2	3	4	6	8
Material	Alu anod./ PUR backfill	Alu anod./ PUR backfill	Alu anod./ PUR backfill	Alu anod./ PUR backfill	Alu anod./ PUR backfill	Alu anod./ PUR backfill
Lens	ca. 120°	ca. 120°	ca. 120°	ca. 120°	ca. 120°	ca. 120°
Light temperature	5700K	5700K	5700K	5700K	5700K	5700K
IP Rating	IP69K	IP69K	IP69K	IP69K	IP69K	IP69K
Connection	M12	M12	M12	M12	M12	M12
Connection cable length	PUR 3000mm	PUR 3000mm	PUR 3000mm	PUR 3000mm	PUR 3000mm	PUR 3000mm

Please see also our information on **HEMA Window** machine protection windows with integrated »SECRET MTL« LED Lighting rail - two systems that match.

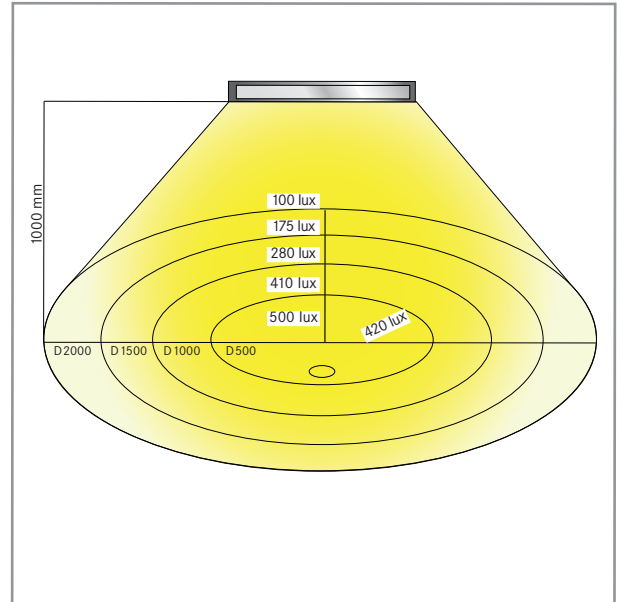
ILLUMINATION DISTRIBUTION CHARTS

HE-SECRET MTL.6



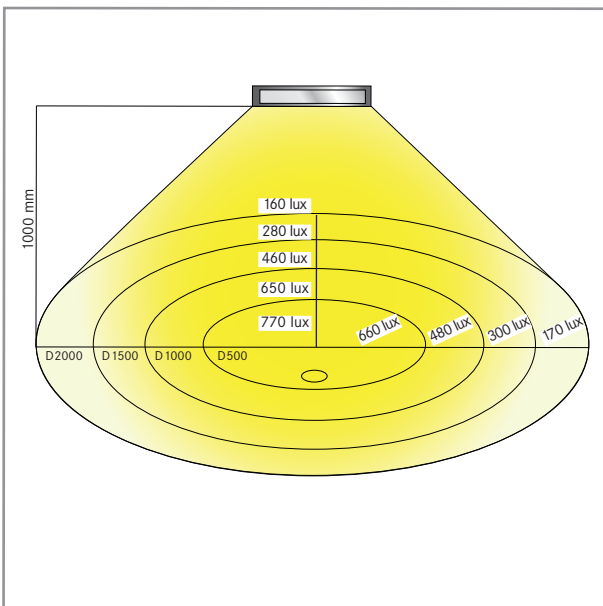
Lens	ca.120°
Current	24V/210mA
Lighting systems	HE-SECRET MTL.6

HE-SECRET MTL.12



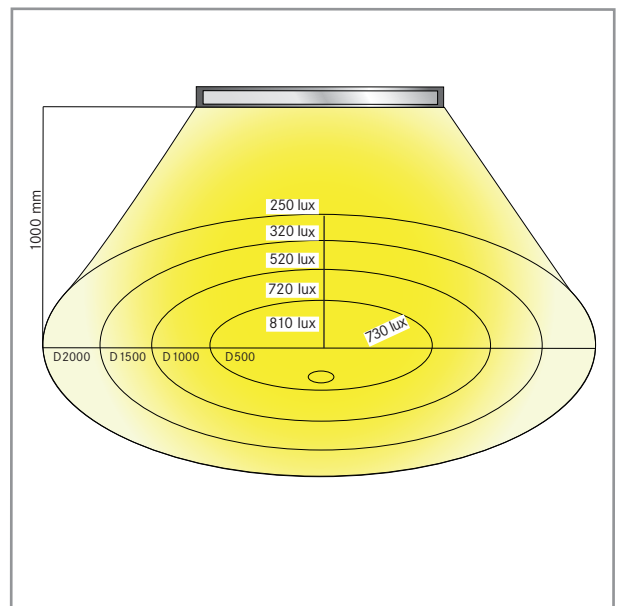
Lens	ca. 120°
Current	24V/420mA
Lighting systems	HE-SECRET MTL.12

HE-SECRET MTL.18



Lens	ca.120°
Current	24V/630mA
Lighting systems	HE-SECRET MTL.18

HE-SECRET MTL.24



Lens	ca.120°
Current	24V/840mA
Lighting systems	HE-SECRET MTL.24

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»SECRET FLOOD« LED LIGHTING

03

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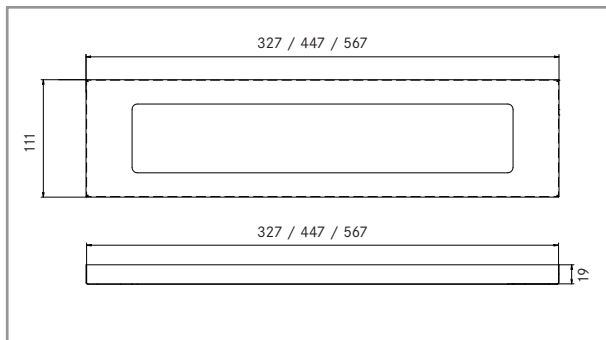
SAFETY WINDOWS
SPIN WINDOWS

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MACHINE
LIGHTING

HEMA »SECRET FLOOD« LED lights

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INTEGRATED
LIGHTING

HEMA »SECRET FLOOD« dimensions. type with glass

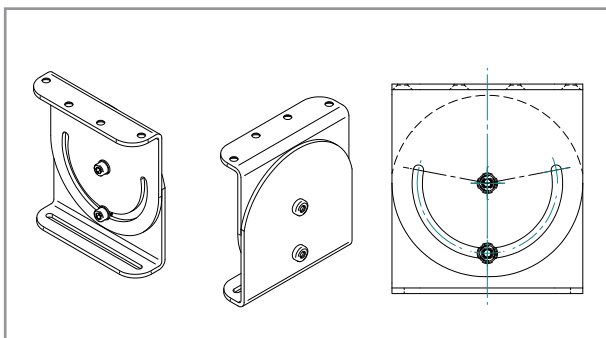
22

SPOT FITTING
LIGHTING

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WORKPLACE
LIGHTING

HEMA »SECRET FLOOD« without glass



HEMA »SECRET FLOOD« mounting

The HEMA LED light »SECRET FLOOD« is an enhancement of the successful »SECRET MTL« model range. The 24 VDC LED lighting stands for a new generation with excellent light efficiency at a wide angle. The »SECRET FLOOD« LED lights with their compact measurements and robust design is not only the perfect illumination for all sizes of machine tools and industrial applications. Thanks to its small dimensions the »SECRET FLOOD« can easily be integrated within the machines

The »SECRET FLOOD« is mounted into an anodized aluminium housing, shock and vibration proof sealed in PUR backfill and resistant to most coolants and lubricants.

Thanks to the tempered safety glass the »SECRET FLOOD« withstands the impact of swarf; in any case the glass is exchangeable. The »SECRET FLOOD« is based on a modular concept, available as a built-in or external version, with optical micro prism or different safety glasses.

An LED has a max life of 50,000 hours, reducing maintenance work to a considerable degree. This long life and high lighting quality also help to reduce maintenance and energy consumption. With its excellent light efficiency at a wide angle the »SECRET FLOOD« fits seamless to the SECRET range of lights.

Advantages of »SECRET FLOOD«

- Power supply 24V
- Connection via M12 plug
- Mounting sidewise or backwise
- Extremely slim housing - only 20 mm
- shock and vibration proof sealed in PUR backfill
- Anodized aluminium housing
- IP Rating 68/69K
- different models

CE IP68
IP69K

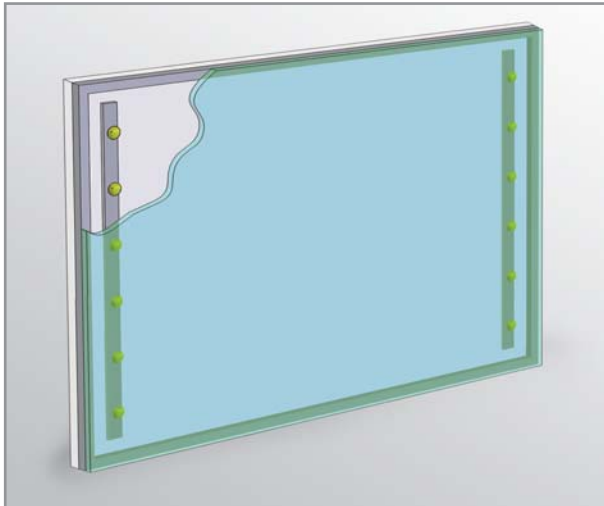


	SECRET FLOOD.33	FLOOD.49	FLOOD.65
Power supply	24 Vdc	24 Vdc	24 Vdc
Current	1.35 A	21.0 A	2.7 A
Operating voltage	33 W	49 W	65 W
Light temperature	6500 K	6500 K	6500 K
CRI	80	80	80
Lens	120°	120°	120°
Number LED	72	108	144

MACHINE SAFETY WINDOW WITH INTEGRATED LIGHTING

Machine safety windows permit safe viewing of machining operations inside the machine tool. Most often there is a need for additional lighting.

Depending on available space and position, conventional lights can become dulled by accumulation of swarf and contamination by coolant.



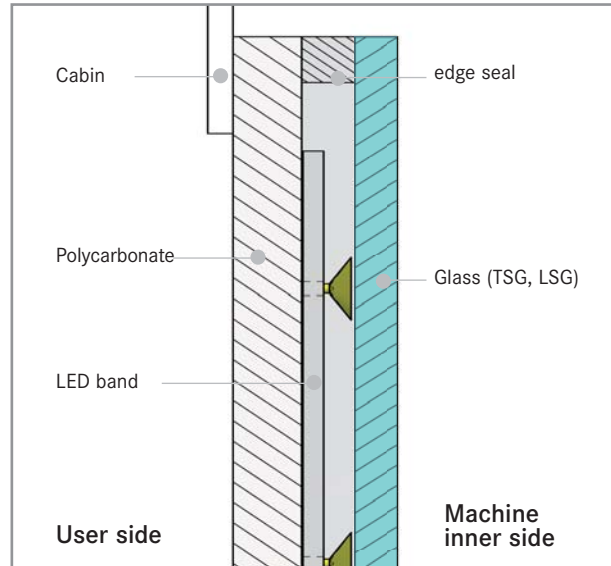
Machine safety window with LED lighting

The optimum solution combines a clear view into the machine with suitable lighting. This solution is available in the form of illuminated HEMA Windows - the integration of LED technology in a machine safety window. These illuminated safety windows combine the advantages of two established systems in one compact solution.

The variable position of the LED lighting rails - vertical or horizontal - enables a flexible fitting to requirements of



Machine safety window with LED lighting



Layout of the safety window with integrated lighting

the machine interior. Problems of swarf and coolant contamination of internally mounted lamps will be eliminated.

The well proven perimeter seal design ensures the LED's and internal surfaces are protected from ingress of contamination and moisture.

The advantages of HEMA windows with integrated lighting:

- Compact system solution
- Flexible illumination of the machine interior
- Tried and tested LED technology
- Elimination of lamp contamination
- Power supply from the mains or the machine
- Retrofit option on machines

Types

Power supply	24 VDC
Current	210mA, 420mA, 630mA, 840mA, 1260mA, 1680mA
Operating voltage	5W, 10W, 15W, 20W, 30W, 40W
Lens	ca. 120°
Light temperature	5700 K
Connection	M12

Due to the complex plug-in system the LED modules can be reused when the machine window is damaged. Our service will be happy to advise you.

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SPOT LIGHTING

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CONTENT

These recessed spot lamps are a compact LED lighting system for space saving solutions. The lamp head is of anodised aluminium in the standard colour black, with other colours available on request.

The spot lamps must be fitted in a recess matching their diameters and secured with a screw.

04

SAFETY WINDOWS
SPIN WINDOWS

The advantages of the HE-P LED spot lamps:

- Fitted in the machine housing for space saving solutions
- No projecting edges where swarf, etc., can collect
- Lighting angles 8°, 25°, 40°
- Resistant to most coolants and lubricants
- Variable number of LEDs: 1, 3, or 6 LEDs per head

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MACHINE
LIGHTING

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INTEGRATED
LIGHTING

Type HE-P6 with 6 LEDs

22

SPOT FITTING
LIGHTING

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WORKPLACE
LIGHTING

Type	HE-P1	HE-P3	HE-P6
No of LEDs	1	3	6
LED life	50,000 h	50,000 h	50,000 h
Brightness/Lens	diffuse / 8°, 25°, 40°	diffuse / 8°, 25°, 40°	diffuse / 8°, 25°, 40°
Light temperature	5000 K	5000 K	5000 K
Dimensions	A = 40mm B = 31.5mm C = 30mm	A = 70mm B = 53mm C = 61mm	A = 70mm B = 53mm C = 61mm
Fasteners	groove nut	groove nut	groove nut
IP rating	IP 67	IP 67	IP 67
Colour	black, other colours on request	black, other colours on request	black, other colours on request

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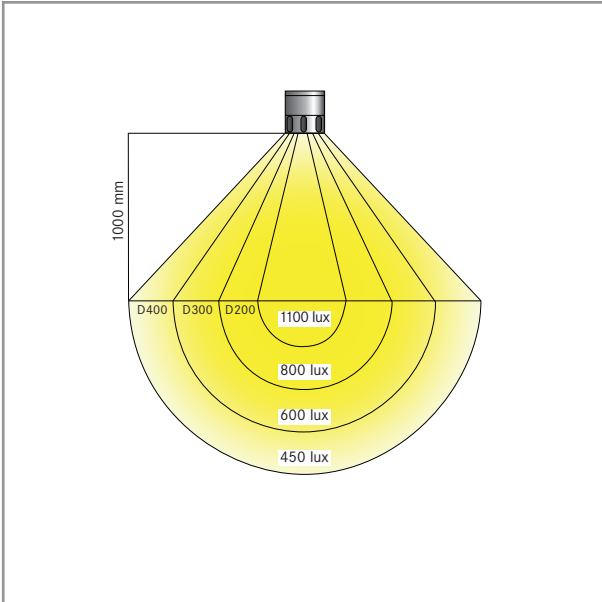
Electrical properties

Lamp type	HE-P1	HE-P3	HE-P6
Operating voltage	12-24 VDC/230 VAC	12-24 VDC/230 VAC	12-24 VDC/230 VAC
Current 700 mA	3 W	9 W	18 W
IEC marking	III	III	III

HEMA also supplies an adapter matching the ordered illuminant type. Solely the operating voltage must be specified on the order (see table above). Delivered with cable lengths from 1.5 to 6 m. 230 Vac cables fitted with two-pin plug, 12-24 Vdc cable ends of bare wires.

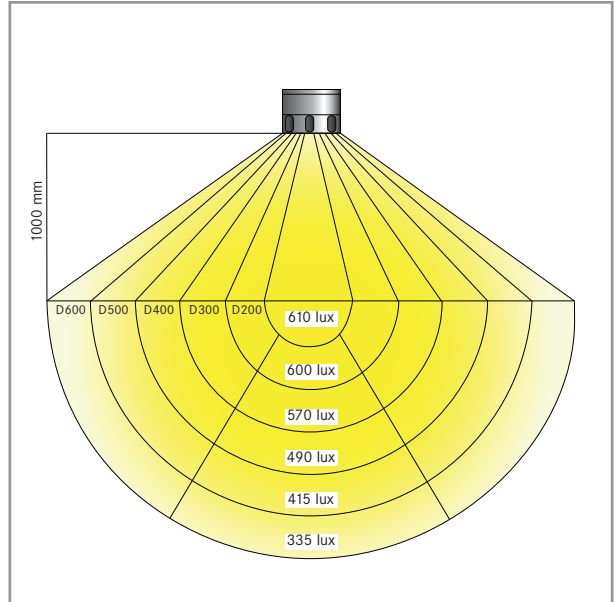
ILLUMINATION DISTRIBUTION CHARTS

HE-P1



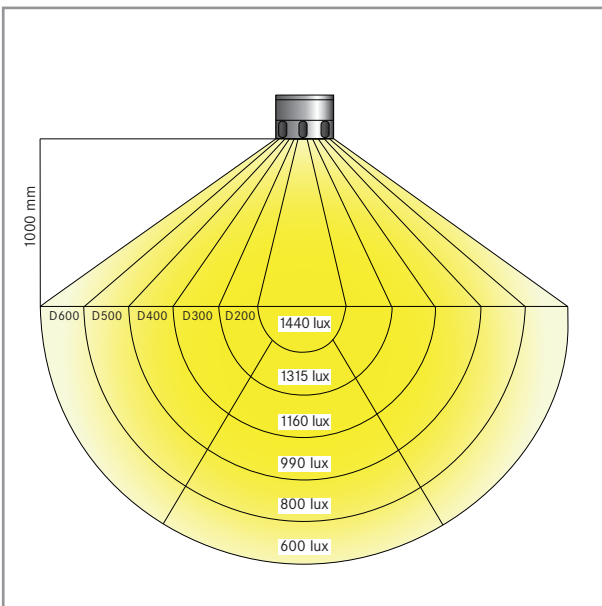
Lens	40°
Current	700 mA / 3W
Lighting systems	HE-P1

HE-P3



Lens	40°
Current	700 mA / 9W
Lighting systems	HE-P3

HE-P6



Lens	40°
Current	700 mA / 18W
Lighting systems	HE-P6

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WORKPLACE LIGHTING

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CONTENT

The optimal lighting at the workplace or inside the machine not only raises safety, but also enhances well being and counteracts work fatigue.

The decisive factor here is the choice of light source. Lamps fitted with modern LED technology emit an optimal and unvarying level of neutral colour light that does not flicker or contain UV or IR components.

04

SAFETY WINDOWS
SPIN WINDOWS

HE-BC - short lamp arm with ball joint

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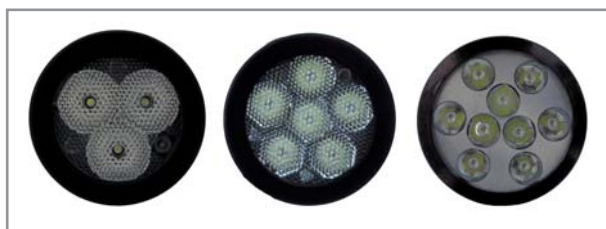
The temperature near the lamp is constantly low, which is important for maintenance work. Unlike halogen or neon lamps, this does not have a filament and so makes work possible even under difficult conditions.

The average life of the LEDs is 50,000 hours, equivalent to six years of continuous duty. Compared with the conventional filament bulb, this reduces operating costs by 50%, without replacements or maintenance work. A 700 mA LED consumes 3 W.

There are three housing variants available for installation at the workplace, all with the ON/OFF switch directly on the lamp head:

- HE-BC - short lamp arm with ball joint
- HE-BF - long lamp arm, flexible
- HE-BL - long lamp arm, rigid

All lamp types have an anodised aluminium head and are secured with screws through their base.



Lamp head with 3, 6, and 9 LEDs



HE-BF - long lamp arm, flexible

The ON/OFF switch is placed directly on the lamp head. The lamp base can be screwed in position at the workplace or inside the machine. Alternative fasteners are a clip foot and magnetic base for more flexible solutions.

For the perfect illumination and brightness control, every one of these lamp types can be fitted with three, six, or nine LEDs and with an 8°, 25°, or 40° lens.



HE-BL - long lamp arm, rigid

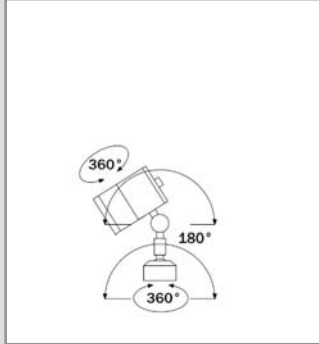
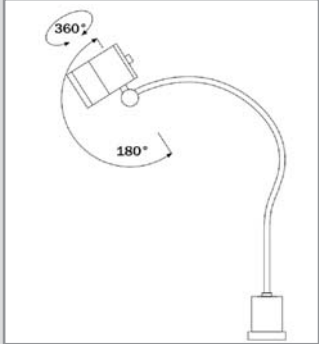
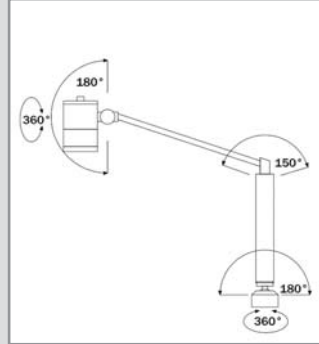
CE



IP65



WORKPLACE LIGHTING

Type	HE-BC	HE-BF	HE-BL
No. of LEDs	3 / 6 / 9	3 / 6 / 9	3 / 6 / 9
LED life	50,000 h	50,000 h	50,000 h
Brightness/lens	diffuse / 8°, 25°, 40°	diffuse / 8°, 25°, 40°	diffuse / 8°, 25°, 40°
Light temperature	5000° K	5000° K	5000° K
Reflector Ø mm	64x86 (3/6 LED), 90x101 (9 LED)	64x86 (3/6 LED), 90x101 (9 LED)	64x86 (3/6 LED), 90x101 (9 LED)
Basic dimensions	60x60 mm, H 36 mm	80 x 63 mm, H 102 mm	60x60 mm, H 36 mm
Lamp arm	-	Ø15 mm x L 700 mm, flexible	top Ø12 x L420 mm bottom 35 x 35 x 240 mm
Fasteners	4 screws	4 screws	4 screws
Switches	single pole, ON/OFF	single pole, ON/OFF	single pole, ON/OFF
Plug-in transformer	integrated in lamp head	integrated in lamp head	integrated in lamp head
IP rating	IP 65	IP 65	IP 65
Colour	black, other colours on request	black, other colours on request	black, other colours on request
Adjustable angle			

Electrical properties

Lampentyp	HE-BC/HE-BF/HE-BL - 3 LED	HE-BC/HE-BF/HE-BL - 6 LED	HE-BC, HE-BF, HE-BL- 9 LED
Operating voltage	12-24 VDC/230 VAC	12-24 VDC/230 VAC	230 VAC
Current 350 mA	-	-	9 W
Current 500 mA	6 W	12 W	-
IEC marking	III	III	III

HEMA also supplies an adapter matching the ordered illuminant type. Solely the operating voltage must be specified on the order (see table above). Cable length 1.5 m. 12-24 Vdc cable ends of bare wires, 230 Vac cables fitted with two-pin plug on option.

ILLUMINATION DISTRIBUTION CHARTS

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INTEGRATED
LIGHTING

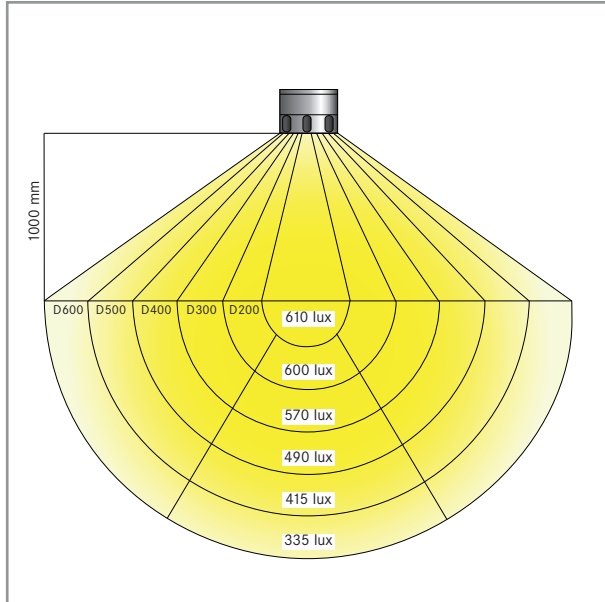
22

SPOT FITTING
LIGHTING

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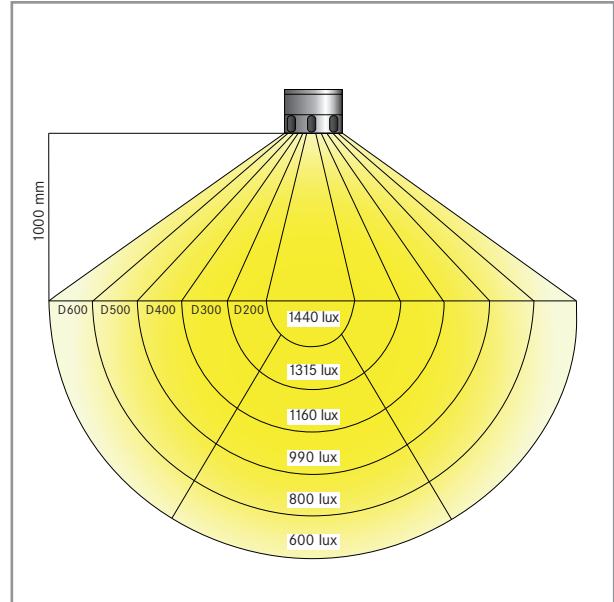
WORKPLACE
LIGHTING

HE-BC3, HE-BF3, HE-BL3



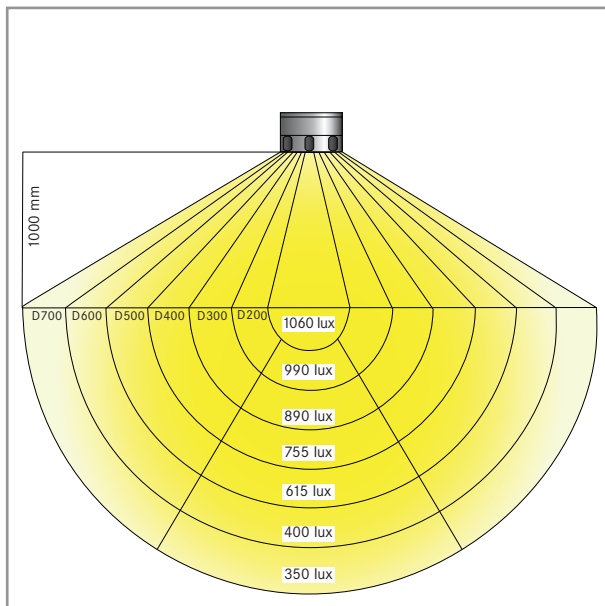
Lens	40°
Current	500 mA / 6W
Lighting systems	HE-BC3, HE-BF3, HE-BL3

HE-BC6, HE-BF6, HE-BL6



Lens	40°
Current	500 mA / 12W
Lighting systems	HE-BC6, HE-BF6, HE-BL6

HE-BC9, HE-BF9, HE-BL9



Lens	40°
Current	350 mA / 9W
Lighting systems	HE-BC9, HE-BF9, HE-BL9

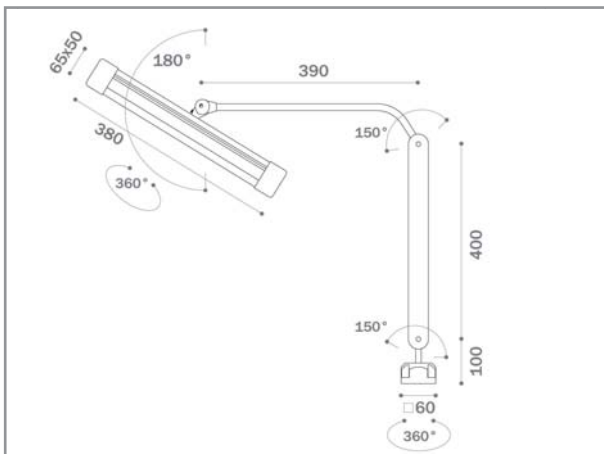
WORKPLACE LIGHTING HE-JOB-BRLED

The HE-JOB-BRLED is an adjustable workplace lamp featuring the latest LED technology. Thanks to the highly flexible jointed arm, lighting at the workplace can be set with ease to the optimal effect.

The lamp head of aluminium complies with protection class IP 65, and the entire unit IP 40. The ON/OFF switch is fitted directly on the lamp head for ease of use.

The advantages of the HE-JOB-BRLED workplace lamps:

- Jointed arm for great flexibility
- ON/OFF switch fitted directly on the lamp head
- Integrated ballast
- Optional dimmer



HE-JOB-BRLED Dimensions

	HE-JOB-BRLED
Operating voltage	230 VAC
IEC marking	II
Cabel length	1.5 m
LED life	50 000 h
No of LEDs	24
Light temperatur	5000 K
Fasteners	4 drilled holes or optional mounting devices (optional component parts)
Colour	Aluminium
Protection class	IP40 lamp IP65 lamp head



HE-JOB-BRLED Workplace lighting for benches



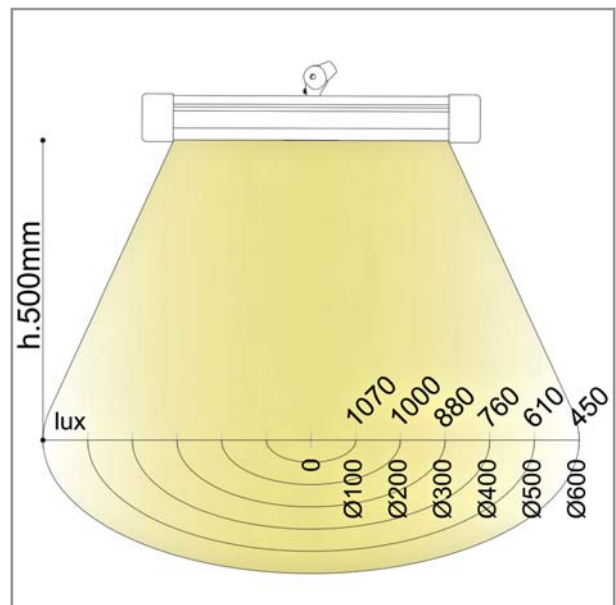
Optional mounting



ON/OFF switch on lamp head

ILLUMINATION DISTRIBUTION CHART

HE-JOB-BRLED





Our range of service



Protection systems



Clamping and braking systems



Machine safety windows
Spin windows
LED Lighting systems



Service, logistics and maintenance

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