optrel®

Better welding - automatically

swiss made

Your health and efficiency determine the requirements of our solutions and products.

We all know what it feels like when pressure on the company is continually increasing due to ever-changing economic factors. More and more parts have to be produced with the same size of workforce but in an ever-shorter amount of time. A drop in quality is out of the question. Welders have to perform a variety of welding processes, some of which can be very complex, and so require welding equipment optimised for maximum protection, comfort and efficiency.

optrel AG, a swiss technology expert, is a specialised supplier of welder protection systems, which focus on ensuring the safety, health and efficiency of welders. For decades, optrel has been a synonym for welding helmets with automatic darkening filters.

Offering both active and passive protection products, optrel knows how to satisfy welders' needs with innovative and comfortable products.

Depending on the welding process, surroundings and intensity of work, the welder has different protection needs. optrel provides the optimum, individual solution for every welder.

Innovation, reliability and a never-ending quest for quality, maximum performance and absolute safety are the main pillars of the optrel corporate philosophy which is applied to every product.

Optimum protection, adapted to the welding process in hand, plays a key role in ensuring the welder's health and safety. Put your trust in the very highest Swiss quality! Put your trust in optrel!

expert

expert

Welding is part of your everyday work and the quality of your work leaves no room for compromise. You need protective equipment that satisfies the very highest efficiency, safety and comfort requirements. Welcome to the expert range from optrel. This product range is built on decades of experience and a zero-compromise approach to quality. The expert range combines the very latest technologies with the greatest possible user comfort. Experience the difference for yourself.

pro

pro

Welding is just one of many tasks you have to perform and is limited to a small number of applications. You are a regular welder even if you don't weld every day. Even though you don't use your welding helmet regularly, you still want the safety and efficiency of a high-quality, active helmet. We have developed the pro range for people just like you. It's reduced to the essential elements but maximised for use.

basic

basic

The basic range offers passive welder protection products in various versions and materials. The handshields and helmets offer reliable protection to people who only rarely perform welding work, work in very tight spaces or perform special applications.

Contents

Why welders need protection

Most welders see buying and wearing protective products as a necessary evil. Despite this attitude, protection is essential as welding involves various risks that you can see but also some that you can't. The American Bureau of Labor Statistics estimates that there are 365 000 welding accidents a year in the US. However, it is very easy to protect yourself against these risks so long as you know what they are:

Ears

Ears require particular protection against UV and IR radiation due to their thin layers of skin.
In addition, ear protection products should be worn for certain welding procedures.

Eyes

Bright, intensive light automatically triggers the body's natural defence mechanism: the eyes are covered by the eyelids. Because this mechanism is obstructive during welding but also because open eyes can lead to tired and red eyes, the intensity of the welding arc must be lessened. In active welding protection products, this function is taken on by liquid crystal displays or dark glass. The welder is still able to view the weld object, but the intensity is diminished. Another great risk is presented by UV and IR radiation. The fact that the radiation cannot be detected by the naked eye lures many a welder into a false sense of security. Due to its intensity, even the briefest moment of exposure is enough to irritate the eyes and to seriously damage them in the long term. To be sure that the eyes are protected, a UV and IR filter that reliably and permanently reflects the radiation is required. In all optrel welder protection systems, a great deal of importance is attached to the permanent filtration of this radiation.

Respiratory tracts

Depending on the welding process and material, fine particles, smoke or poisonous vapours and gases may be released. In the short term, these substances usually lead to headaches, nausea and coughing. Without you noticing it, these can then result in serious illnesses and long-term damage. An analysis of the materials , additives and welding processes used in the working environment concerned should help you to find the right protection. Blower filter units with gas and /or particle filters or systems with a central air supply can be use to minimise the risks of respiratory problems.

Skin and body

Burns and injuries caused by flying hot particles account for 70% of the most commonly caused accidents among welders, according to the aforementioned study by the American Bureau of Labor Statistics. UV and IR radiation also cause dangerous burns which can eventually result in skin cancer. Just a few minutes of exposure are enough to cause skin irritation and for this reason, optrel AG pays particular attention to adequately protecting the entire head and offers various accessories for protecting the neck, chest and back of the head.

Hands and feet

As already mentioned, welding generates hot particles and flux chippings which may cause burns to exposed parts of the body. In some working environments the welder may need to be protected from falling parts whilst adequate foot and hand protection is normally seen as essential to the welders' safety. Despite all the risks, the welder should feel safe at work and most importantly be able to perform his demanding work without having to concentrate on other matters. Thanks to state-of-the-art technology and research, optrel is able to offer welders optimum and reliable protection without restricting their freedom of movement.

Certification

Using a welding protective helmet, fresh air systemor handshield can minimise risks to the welder's eyes, face and respiratory tracts. But certification and choosing the right product are essential. You can only reliably prevent a risk that you are not aware of if you ensure the right quality and most importantly the continuity of the production processes. The various certification symbols provide information about how the product is tested once and/or periodically for safety.

CE

All personal protective equipment used in Europe must hold CE certification. The term personal protective equipment (PPE) includes welding helmets, handshields and breathing protection systems. This certification confirms compliance with the specified minimum statutory requirements laid down in the directive governing personal protective equipment (Directive 89/686/EEC).

Certificates bearing the words «EC type approval» enable a product to be labelled with the CE symbol in Europe. This confirms that the manufacturer has satisfied the above directive. Once tested, the product offers unlimited use.

ECS

Labels stating «DIN tested» and «DIN-tested safety» or «ECS tested» and «ECS-tested safety» confirm that a product has been tested in line with DIN standards. Unlike the case with the CE symbol, manufacturers using one of these symbols are voluntarily subject to regular monitoring of their internal quality system, measurement equipment and end products and therefore ensure a consistently high-quality product. Products with certificates bearing the words «test notice» are entitled to feature the symbols shown on the left.

Outside Europe, optrel AG generally has its products tested in line with the following standards:

AS and NZS

Australian/New Zealand Standard (AS/NZS) The so-called Australian Standardsmark Licence entitles a product to bear the corresponding test symbol and is similar to DIN. Once this certificate has been gained, products are again subject to periodical, usually annual, auditing by the Australian SAI Global certification body.

ANSI

ANSI (American National Standards Institute) standards provide for self-certification by the manufacturers of protection products. This means that the manufacturer himself checks that his products comply with the relevant standards and approves satisfaction of the standard's requirements for third parties. Conformation of compliance with these standards by an independent test institute is also possible for greater product confidence.

GOST-R

GOST-R, Russian certification The GOST-R certificate is similar to European CE certification and allows products to be sold in Russia.

A brief description of welding helmets

Delay, sensitivity and arc detection are terms often used in the welding protective helmet sector and are important to understand before attempting to select the right helmet. Please read the following section covering some of the most important functions before you consider choosing the welding helmet that meets your requirements:

Active welding helmets vs. passive welding helmets

The term «active welding helmet» includes all welding helmets which automatically respond to a flash during all electric welding and which automatically darken thanks to the use of LCDs. When not welding, the welder can see the object he is working on through the darkening filter. As soon as he strikes the arc, his vision darkens and he is protected from intensive rays. Passive products contain permanently coloured glass as their viewing windows. Once welding is complete, they are raised or removed so that the welder can see the object he is working on and his surroundings.

Components of a welding helmet

ADF – Automatic Darkening Filter

The ADF, or automatic darkening filter, consists of liquid crystal displays (LCDs), electronic components, solar cells/batteries, sensors and a UV/IR filter. This is the part of the helmet that automatically darkens when a welding arc is struck. optrel provides a wide range of ADFs with various features and shade protection options.

During certification, the quality of an ADF is assessed in line with the European standard. The following four criteria are graded in order to provide the welder with an indication of quality: optical class, scattered light, homogeneity and dependence on angle of vision. All ratings must be stated on the darkening filter: 1 is the highest rating and 3 the lowest.

1 LCD - liquid crystal display

LCDs form part of the ADF. Amongst other things they contain liquid crystals which allow for automatic darkening of the filter. The arrangement of the liquid crystals is controlled by electric pulses. Different arrangements allow the liquid crystals to respond in different ways to the light intensity.

2 UV/IR filter

A filter is used to reliably reflect optical radiation in the UV and IR range. The filter is permanently fitted in the ADF and offers permanent protection regardless of whether the darkening filter is in the dark or light state.

3 Inside cover lens

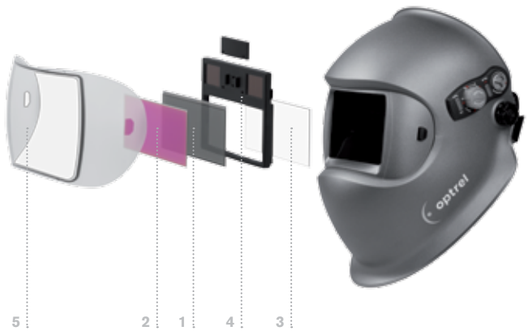
An inside cover lens is used to protect the back of the ADF from dust and other dirt. This thin plastic lens is a wearing part and canbe replaced when it becomes dirty and discoloured.

4 Sensors

The sensors fitted in the ADF detect when an arc is struck. When this happens, the sensors transmit a signal to the electronics which then activate the LCDs.

5 Front cover lens

The front cover lens is fitted on the helmet in front of the darkening filter. It prevents weld spatter from reaching and damaging the darkening filter. The front cover lens has to be replaced regularly depending on the welding process and dirt levels experienced.



Functions for maximum protection, comfort and efficiency

1. Sensor slide/setting the detection angle

We all know what it feels like when the sensor detection angle causes an automatic helmet to respond to the arc of a neighbouring welder. optrel has the perfect solution. Its patented sensor slide allows the detection angle to be reduced from 120° to 60° to prevent the ADF from responding to welding nearby.

2. Seeing true colours

Specially coated filters which enable the welding object to be viewed better are used in selected expert products. This kind of filter optimises colour detection such that the welder is able to view colours in the surrounding area in an almost true form. This allows the welder to easily read red LEDs on the welding device without having to raise his helmet, thereby improving efficiency and safety.

3. Sensitivity function/control

If several welders are working in a room or in close proximity to one another, sometimes the ADF responds too soon or not at all to the flash because the preset sensor sensitivity is not right for the working environment conditions. Continuously variable sensitivity control allows the sensor sensitivity to be adapted to the surroundings and workplace. This function can also be used if welding at low amperages and the ADF is not therefore darkening.

4. Delay function/opening delay

We all know how uncomfortable your eyes are when a material continues to glow after welding. If the helmet quickly switches from dark to light after a long period of welding, the welder can be briefly dazzled. The welder can use the delay function to delay the ADF from opening, thereby greatly improving operating comfort.

5. Shade level

The shade level specifies how much the ADF darkens. A shade level is selected according to the welding process and amperage. The shade level also depends on the welder's eyes and age. optrel is the first manufacturer anywhere in the world to offer a product which can automatically detect the shade level required (see page 15). This function translates into a real efficiency gain when welding at alternating power intensities.

6. Grinding mode

If a helmet has this function, it means that the ADF can be fixed in the light state for the duration of the grinding process. This prevents the filter from darkening due to flashes when grinding.

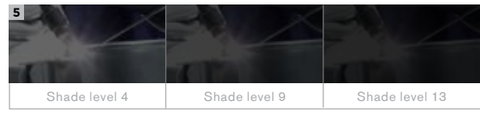
1

2

3

4

5



6

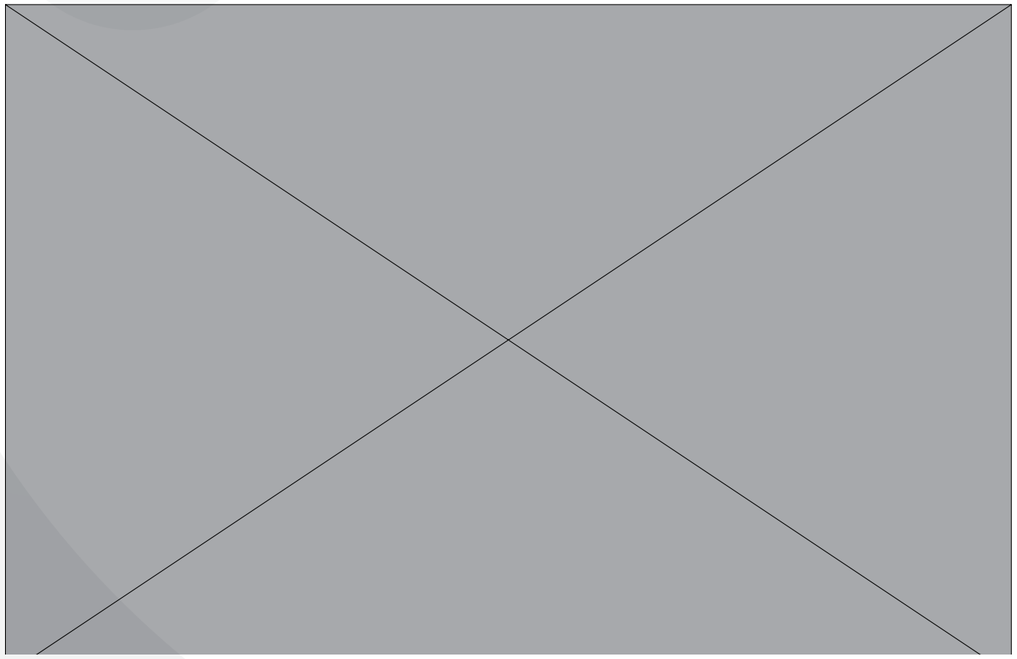
Help with selecting the right helmet

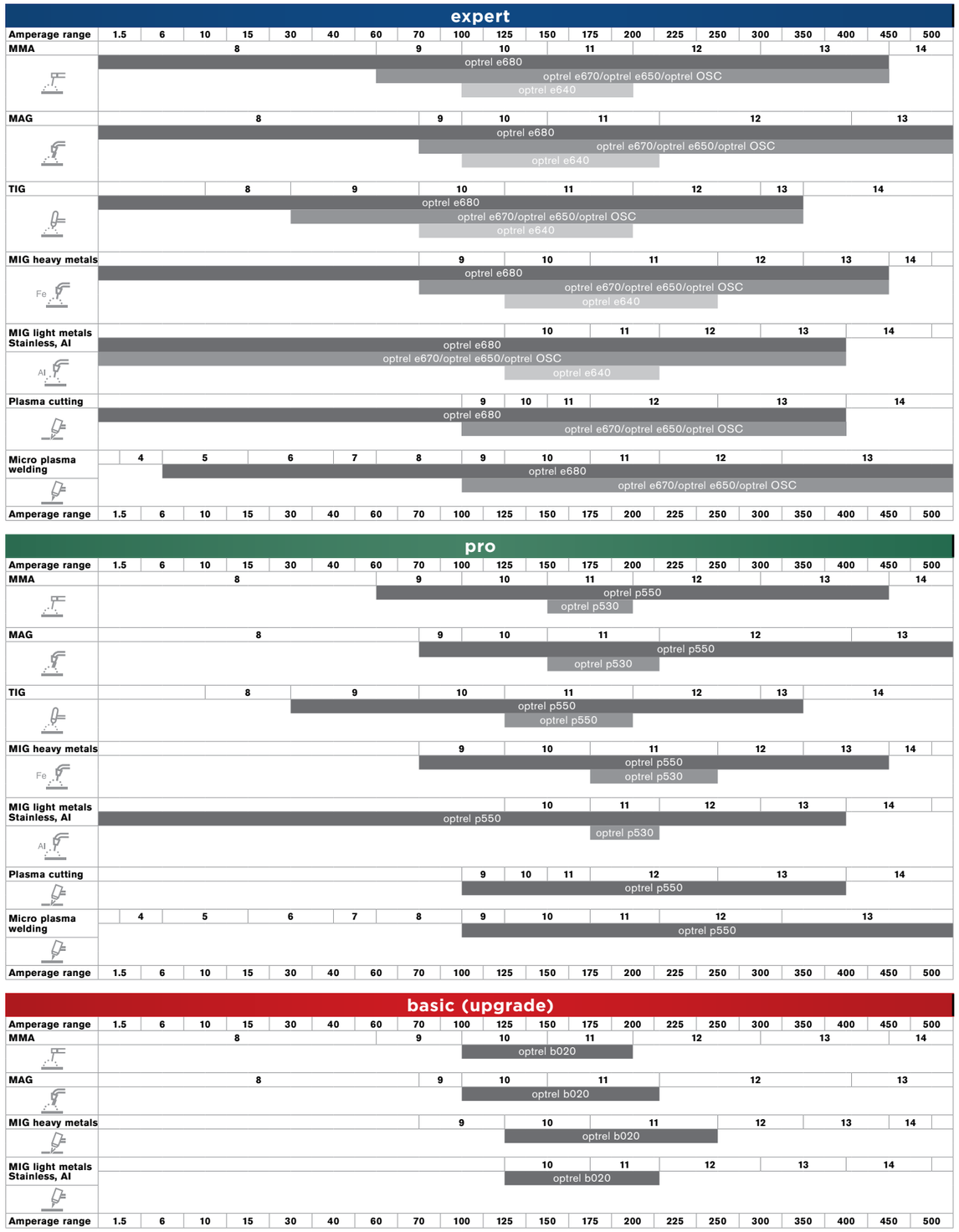
Various factors affect the correct choice of appropriate protection. It is not only greatly determined by the welding method and amperage. The workplace conditions, in terms of gas, smoke and particle levels and the average duration of welding also need taking into account. Welding experts who spend several hours a day welding and use a range of different welding methods may for example have much greater demands of their protection equipment than people who only weld occasionally or rarely.

You can use the table below to see which product range is most suitable for your ventilation, average duration of welding and space requirements.

Once you have established the appropriate product range, consult the table on page 11 for the shade level recommended by the EN 169 standard for your amperage and application. The various bars indicate which helmet may be appropriate. You can then evaluate functions such as sensitivity, delay and grind in the detailed helmet descriptions on the following pages.

Requirement	expert	pro	basic
Ventilation system	✓		
Welding performed daily	✓		
Welding performed regularly	✓	✓	
Welding performed occasionally	✓	✓	✓
Welding performed rarely or in special applications	✓	✓	✓





Recommended areas of use for expert and pro

All arc-based welding methods* and gas welding. Not suitable for laser welding.

* Arc-based welding methods: electrode welding (stick welding, SMAW)/MIG/MAG (inert-gas-metal-arc welding, GMAW)/GMAW high-performance welding/flux-cored self shielded arc welding/WIG welding (TIG, GTAW)/plasma welding/micro plasma welding/plasma cutting

optrel® expert

The expert helmet shell:
a new completely level of comfort and performance

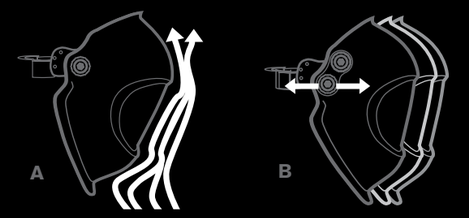
The expert helmet shells from optrel don't just offer a timeless design, but also maximum comfort and performance. The precise work undertaken to develop this range has paid off; the helmet shell has been used with great success for a number of years. Hundreds of thousands of welders the world over swear by it - day after day.

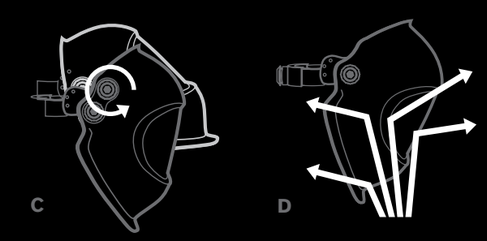
Thanks to its smoke- and particle-deflecting design, this helmet shell produced in line with the very latest ergonomic and fluidic findings, can also be used for overhead welding tasks. Specially developed metallic paints reflect heat and reduce the temperature inside the helmet by up to 15%. You can see that we leave no stone unturned in our efforts to simplify your work.

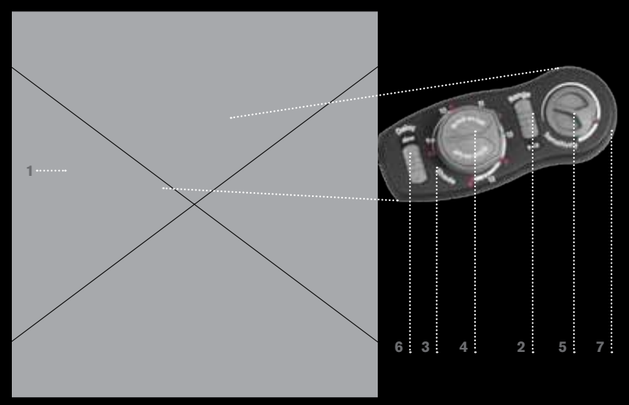
In the future, breathing protection systems will have an important, strategic role to play in individual protection. Each expert helmet shell can be combined with an optrel breathing protection system.
By experts for experts.

High levels of comfort

- → Ergonomic design with optimum balance for minimum strain on the neck and nape of the neck
- → High-quality, heat-resistant material
- → Heat-reflective paint for pleasant temperatures inside the helmet
- → Curved edges to deflect weld smoke (A)
- → Convex front cover lens with extremely long life and a sealing profile to prevent gas, smoke, dust and particles from penetrating
- → The headband has a telescopic mechanism so that the helmet can be individually adjusted to ensure an optimum field of vision (B)
- → Tilt adjustment to control distance between helmet and chin (C)
- → Extended protection area to protect the neck and ears (D)







1. Adjustable sensor slide to change the detection angle for ambient light from 120° to 60°
2. Shade level ranges DIN 5–9 or DIN 9–13 (optrel e680) or automatic/manual mode (optrel e670)
3. Fine adjustment of shade levels
4. Grinding mode for deactivating the filter for flicker-free grinding
5. Sensitivity controller to adapt sensor sensitivity to the surroundings and the welder's own needs
6. Opening delay to adjust the time between switching from dark back to light to suit the application and the welder's own needs
7. 2 CR2032 batteries (on rear)

For outstanding performance day after day
optrel e680

The optrel e680 helmet was designed especially for welding experts with varying job requirements and a need for an extensive range of individual adjustment options. It is the only helmet to allow the wearer to select between DIN 5 to DIN 13 shade levels and can be used with a very wide range of welding methods and amperages without any restrictions.

The true colour filter gives the welder a superlative, full-detail view of the weld object and all machine displays. Red LEDs on the welding machine can be read without the user having to remove his helmet.
It's not just in the areas of comfort and safety that the optrel e680 offers an unsurpassed level of perfection but in terms of its additional functions too.

Functions for outstanding performance

Shade level	2 ranges: 4/5–9 and 4/9–13
Control unit outside the helmet	Yes
Comfortable headband	Yes
Ability to adapt the detection angle	Yes (60° or 120°)
Sensitivity control	Yes
Opening delay	Yes
Grinding mode	Yes (shade level 4)
Overhead welding	Yes
Colour true filter	Yes
Can be retrofitted with optrel breathing protection system	Yes
Hard hat can also be worn	Yes

Other features

Size of darkening filter/field of vision	90 x 110 x 7 mm/50 x 100 mm
Eye protection	Maximum UV and IR protection with every shade level setting
Classification according to EN379	1/1/1/2
Classification according to EN175	B (120m/s impact resistance)
Time taken to switch from light to dark	0.180 ms at room temperature 0.120 ms at 55 °C
Time taken to switch from dark to light	Slow: 0.35 – 0.6 s Fast: 0.1 – 0.35 s
Energy supply	Solar cells and batteries, no need to switch on and off
Battery life	Around 2500 hours (operation)
Working temperature	–10 °C to +70 °C
Total weight	490 g
Recommended areas of use	See page 11
Guarantee	2 years (not including batteries)
Certificates	CE, ECS, ANSI, AS/NZS, GOST-R

Designation	Article no.
dark blue*	1006.110
snow white*	1006.120
titan*	1006.130
cosmic green*	1006.160
shiny ruby*	1006.170
medium blue*	1006.180
black unpainted*	1006.190
Darkening filter	5012.400

*Spare helmet shell on request

Version with hard hat adapter	
dark blue	1006.150
snow white	1006.152
titan	1006.153
cosmic green	1006.154
shiny ruby	1006.155
medium blue	1006.156
black unpainted	1006.157

The ultimate in efficiency
optrel e670

The modern welder needs protective equipment optimised for maximum performance and efficiency. In order to allow welders to work with as few interruptions as possible, welding machine manufacturers are increasingly adding remote control to their welding torches. But how does this affect the welder who needs to control his shade level? If the welder has to manually adapt his shade level, the process will be interrupted once more. If he leaves the shade level setting unchanged, comfort levels plummet – e670 is the perfect solution.

Unique sensor technology allowsthe darkening filter to automaticallyselect the shade level and continually adapts this to the relevant application and arc intensity during welding. Fine adjustment also allows the welder to adapt the automatically selected shade level to his personal eyesight sensitivity. All of which means the welding process isn't interrupted at all. Maximum efficiency and comfort are guaranteed.

Functions for maximum efficiency

Shade level	4/9 <13
Automatic shade level detection	Yes (automatic/manual)
Control unit outside the helmet	Yes
Comfortable headband	Yes
Ability to adapt the detection angle	Yes (60° or 120°)
Sensitivity control	Yes
Opening delay	Yes
Grinding mode	Yes (shade level 4)
Overhead welding	Yes
Colour true filter	Yes
Can be retrofitted with optrel breathing protection system	Yes
Hard hat can also be worn	Yes

Other features

Size of darkening filter/field of vision	90 x 110 x 7 mm/50 x 100 mm
Eye protection	Maximum UV & IR protection with every shade level setting
Classification according to EN379	1/1/1/2
Classification according to EN175	B (120m/s impact resistance)
Time taken to switch from light to dark	0.180 ms at room temperature 0.120 ms at 55 °C
Time taken to switch from dark to light	Slow: 0.35 – 0.6 s Fast: 0.1 – 0.35 s
Energy supply	Solar cells and batteries, no need to switch on and off
Battery life	Around 2500 hours (operation)
Working temperature	–10 °C to +70 °C
Total weight	490 g
Recommended areas of use	See page 11
Guarantee	2 years (not including batteries)
Certificates	CE, ECS, ANSI, AS/NZS, GOST-R

Designation	Article no.
cosmic green*	1006.210
dark blue*	1006.290
snow white*	1006.260
titan*	1006.230
shiny ruby*	1006.270
medium blue*	1006.280
black unpainted*	1006.200
Darkening filter	5012.420

*Spare helmet shell on request

Version with hard hat adapter	
dark blue	1006.254
snow white	1006.252
titan	1006.253
cosmic green	1006.250
shiny ruby	1006.255
medium blue	1006.256
black unpainted	1006.257

Comfortable and high-performance
optrel e650

Comfort and individual scope for adaptation, a large viewing area and consistent quality make the optrel e650 an optimum working tool for most welding methods. In addition to the infinitely variable shade level (can be set between levels 9–13), the helmet offers a continuously variable sensitivity control and opening delay function. All functions can be selected and adjusted from outside the helmet and therefore guarantee maximum comfort and efficiency.

Functions for everyday comfort

Shade level	4/9-13
Control unit outside the helmet	Yes
Comfortable headband	Yes
Ability to adapt the detection angle	Yes (60° or 120°)
Sensitivity control	Yes
Opening delay	Yes
Grinding mode	Yes (shade level 4)
Overhead welding	Yes
Colour true filter	No
Can be retrofitted with optrel breathing protection system	Yes
Hard hat can also be worn	Yes

Other features

Size of darkening filter/field of vision	90 x 110 x 7 mm /50 x 100 mm
Eye protection	Maximum UV and IR protection with every shade level setting
Classification according to EN379	1/1/1/2
Classification according to EN175	B (120m/s impact resistance)
Time taken to switch from light to dark	0.180 ms at room temperature 0.120 ms at 55 °C
Time taken to switch from dark to light	Slow: 0.35 – 0.6 s Fast: 0.1 – 0.35 s
Energy supply	Solar cells and batteries, no need to switch on and off
Battery life	Around 2500 hours (operation)
Working temperature	–10 °C to +70 °C
Total weight	490 g
Recommended areas of use	See page 11
Guarantee	2 years (not including batteries)
Certificates	CE, ECS, ANSI, AS/NZS, GOST-R

Designation	Article no.
shiny ruby*	1006.310
dark blue*	1006.390
snow white*	1006.360
titan*	1006.330
cosmic green*	1006.340
medium blue*	1006.380
black unpainted*	1006.300
Darkening filter	5012.440

*Spare helmet shell on request

Version with hard hat adapter

dark blue	1006.354
snow white	1006.352
titan	1006.353
cosmic green	1006.357
shiny ruby	1006.355
medium blue	1006.356
black unpainted	1006.350

The entry-level expert helmet
optrel e640

Thanks to the extremely high quality filter and use of the expert helmet shell, the welder benefits the standard DIN 10 and DIN 11 function plus comfort and protection benefits.
The welder can adjust the shade level to suit his requirements using the slide switch on the rear of the filter. It can be set to either DIN 10 or DIN 11. The detection angle for ambient light can also be adjusted using the sensor bar.

Functions for everyday comfort and performance

Shade level	4/10-11
Control unit outside the helmet	No
Comfortable headband	Yes
Ability to adapt the detection angle	Yes (60° or 120°)
Sensitivity control	No
Opening delay	No
Grinding mode	No
Overhead welding	Yes
Colour true filter	No
Can be retrofitted with optrel breathing protection system	Yes
Hard hat can also be worn	Yes

Other features

Size of darkening filter/field of vision	90 x 110 x 7 mm /38 x 98 mm
Eye protection	Maximum UV & IR protection with every shade level setting
Classification according to EN379	1/1/1/2
Classification according to EN175	B (120m/s impact resistance)
Time taken to switch from light to dark	0.4 ms at room temperature 0.1 ms at 55 °C
Time taken to switch from dark to light	0.2 – 0.3 s
Energy supply	Solar cells and batteries, no need to switch on and off
Working temperature	–10 °C to +70 °C
Total weight	460 g
Recommended areas of use	See page 11
Guarantee	2 years
Certificates	CE, ECS, ANSI, AS/NZS, GOST-R

Designation	Article no.
medium blue*	1006.480
dark blue*	1006.490
snow white*	1006.460
titan*	1006.430
cosmic green*	1006.440
shiny ruby*	1006.470
black unpainted*	1006.400
Darkening filter	5012.460

*Spare helmet shell on request

Version with hard hat adapter

dark blue	1006.454
snow white	1006.452
titan	1006.453
cosmic green	1006.457
shiny ruby	1006.455
medium blue	1006.456
black unpainted	1006.450

Evidence of decades of experience
optrel OSC

The optrel OSC has been around for a good 20 years and remains very popular amongst our loyal clientele.
The simple, yet ingenious shape of the OSC combined with the fact that the wearer can adjust the DIN 9–13 filter using the continuously variable control from outside the helmet still today offers a very high level of protection and comfort.

Functions for everyday comfort

Shade level	4/9–13
Control unit outside the helmet	Yes
Comfortable headband	No
Ability to adapt the detection angle	Yes (60° or 120°)
Sensitivity control	No
Opening delay	Yes
Grinding mode	No
Overhead welding	No
Colour true filter	No
Can be retrofitted with optrel breathing protection system	No
Hard hat can also be worn	No

Other features

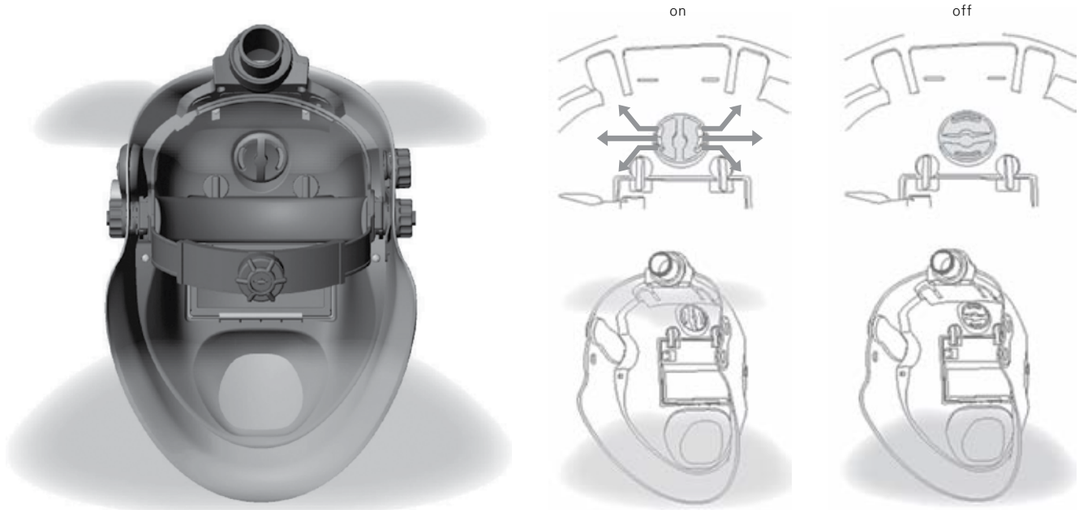
Size of darkening filter/field of vision	90 x 110 x 7 mm/38 x 98 mm
Eye protection	Maximum UV and IR protection with every shade level setting
Classification according to EN379	1/1/1/3
Classification according to EN175	S (45m/s impact resistance)
Time taken to switch from light to dark	0.4 ms at room temperature 0.1 ms at 55 °C
Time taken to switch from dark to light	Fast 0.1 – 0.35 s Slow: 0.35 – 0.6 s
Energy supply	Solar cells and batteries, no need to switch on and off
Working temperature	–10 °C to +70 °C
Total weight	490 g
Recommended areas of use	See page 11
Guarantee	2 years
Certificates	CE, DIN, ANSI, AS/NZS, GOST-R

Designation	Article no.
OSC black unpainted*	1000.053
Darkening filter	5012.046

*Spare helmet shell on request

Breathing protection with a pleasant cooling effect
optrel papr expert

Welders are put under a lot of stress during their work. The production of smoke, dust, vapour and gas is unavoidable during welding and other related work. These can pass via the larynx, wind pipes and bronchial system to the finest of bronchioles and alveoli which may result in a variety of respiratory diseases or even lung cancer. The breathing protection solutions from optrel's expert range reliably protect against these dangers. A particle filtration system and a combined particle and gas filtration unit eliminate these dangers without restricting welder comfort. All optrel blower units are designed to be combined with the optrel e600 helmet shell. Thanks to a special inner mask to regulate airflow, the welder is permanently protected from harmful substances and at the same time benefits from a pleasant cooling effect. Maximum protection and comfort are guaranteed.



If the welder uses the adjustment mechanism to select the «off» position, 100% of airflow is directed towards his mouth. If the «on» position is selected, 20% of the air is directed towards his forehead and 80% towards his mouth. This produces a cooling effect without the welder's eyes being irritated by an annoying airflow.

All optrel blower units consist of a fan with a rechargeable battery which draws in ambient air through a fine filter and supplies the helmet with clean, fresh air. The units are fitted with both a visual and acoustic alarm which warns the welder if the filter is not in place or is blocked or if the battery voltage drops. A soft and flame-retardant face seal is used to adapt the unit to the face, for optimum comfort and for excellent sealing properties. Like the face seal, the belt is made from flame-retardant material and thanks to lumbar support always offers the perfect fit.

Protective and safe

- The intelligent electronics of the optrel e1100 ensure a constant airflow of at least 150 l/min, regardless of the battery charge and level of filter dirt, and ensure constant overpressure in the helmet. This reliably prevents harmful substances from entering the helmet. The airflowof the optrel e2100 can be manually controlled in three stages: 140 l/min, 160 l/min or 180 l/min.
- Maximum safety is guaranteed by an acoustic and visible signal. The alarm indicates when the filter is blocked and issues a signal if the battery level becomes critical.
- The short coupling on the helmet reduces the risk of it getting caught. The air hose is protected by a flame-retardant protective sleeve.

No entry for smoke, particles and dust
optrel e1100

optrel e1100 was developed especially for professional welders and offers ideal protection from the weld smoke, flying particles and dust which are released during welding and associated work. The filter used in this unit is a special, fine mesh filter for ideally filtering particles. optrel e1100 is supplied along with all helmets in the optrel e600 range.

Features

Nominal protection factor	TH2P classification (Europe) In accordance with BGR190, can be used for up to 20 times the workplace limit value
Blower unit	Speed of airflow: at least 150 l/min, controlled
Material	Polyamide (PA-GF)
Blower	High-quality, ball bearing-mounted fan motor
Fusing	Electronic fuse
Noise level	Max. 70 dB(A)
Alarm signals	Acoustic and visual alarms when battery charge and airflow are low and filter is not fitted or is blocked
Battery (standard)	Li-Ion, 4400 mAh, weight: 420 g
Battery life	Typically 11h (standard) / 16h (longlife)
Charge time	7 hours for the standard battery
Filter	1 x TH3P type for TH2P system
Hose	Length: 1160 mm, weight: 185 g
Weight	1205 g (blower including filter and belt)
Dimensions	(L x W x H): 249 x 213 x 87 mm
Guarantee	2 years (not including battery)
Certificates	CE, AS/NZS, GOST-R

Designation	Article no.
e1100 with e680 dark blue	4240.003
e1100 with e670 cosmic green	4270.000
e1100 with e650 black unpainted	4280.000
e1100 with e640 black unpainted	4260.001

Spare parts and accessories

Designation	Article no.	Unit/box
Upgrade kit e680 dark blue – e1100 without filter	4242.003	1 pc
Upgrade kit e670 cosmic green – e1100 without filter	4262.001	1 pc
Upgrade kit e650 black unpainted – e1100 without filter	4262.000	1 pc
Upgrade kit e640 black unpainted – e1100 without filter	4282.000	1 pc
e1100 blower	4251.000	1 pc
Textile belt with rear section	4155.002	1 pc
Textile belt without rear section	4155.030	1 pc

Designation	Article no.	Unit/box
Leather belt	4155.004	1 pc
Air hose	4155.021	1 pc
Air hose & protective sleeve	4155.022	1 pc
Protective sleeve	4155.003	1 pc
Charger	4255.001	1 pc
TH3P filter for TH2P system	4088.000	1 pc
Standard battery	4255.006	1 pc
Longlife battery	4255.007	1 pc
Airflow gauge	4155.000	1 pc
Storage box	4074.001	1 pc
Face seal	4160.000	1 pc
Leather neck and head protection for PAPR welding helmets	4028.031	1 pc

Protection from gases, vapours and particles
optrel e2100

The optrel e2100 offers optimum protection from gases, vapours and particles. The various combination filters allow the welder to tailor the helmet precisely to his needs. The standard range contains three filter types, each of which offer the highest possible protection from various gases.

Features

Nominal protection factor	TH2P classification
Blower unit	Min. speed of airflow 140/160/180 l/min, controlled
Material	Polyamide (PA-6)
Fan	High-quality, brushless fan motor
Fusing	Electronic fuse
Noise level	55 – 61 dB(A)
Alarm signals	Acoustic and visual alarms when battery charge and airflow are low
Battery (standard)	NiMH, 4500 mAh, weight: 570 g
Battery life	Typically 10–11 hours with TH2P R SL filters
Battery charge time	10 hours
Filter	TH2P particle, gas or combined filter
Dimensions	(L x W x H): 208 x 150 x 132 mm
Weight	950 g (blower unit including belt)
Guarantee	1 year (not including battery)
Certificates	CE

Designation	Article no.
e2100 with e680 dark blue (not including filters)	4341.000

Spare parts and accessories

Designation	Article no.	Unit/box
TH2P R SL filter	4088.030	3 pcs
TH2A2P SL filter	4088.031	3 pcs
TH2A2B2E2SXPSL Ozone filter	4088.032	3 pcs
Standard battery	4355.006	1 pc
e2100 charger	4355.005	1 pc
Textile belt with rear section	4355.030	1 pc
Hose (without protective sleeve)	4355.021	1 pc
Protective sleeve	4155.003	1 pc
e2100 blower	4351.000	1 pc
Upgrade kit e680 – e2100 without darkening filter	4342.000	1 pc
Transport box	4074.001	1 pc
Face seal	4160.000	1 pc
Leather neck and head protection for PAPR welding helmets	4028.031	1 pc

Spare parts and accessories for the expert range

Accessories for blower units and expert helmets

Designation	Article no.	Unit/box
Industrial helmet adapter CONNECT Basic	5011.100	1 pc
Industrial helmet adapter CONNECT PAPR for e680/e670/e650 dark blue	4230.000	1 pc
Industrial helmet adapter CONNECT PAPR for e640 black unpainted	4231.000	1 pc
Leather bib	4028.015	1 pc
Leather head and neck protection	4028.016	1 pc
Leather head and neck protection for PAPR welding helmets	4028.031	1 pc

Front cover lenses and inside cover lenses

Designation	Article no.	Unit/box
Front cover lens for e600 helmets	5000.210	2 pcs
Front cover lens for e600 helmets	5000.212	5 pcs
Front cover lens OSC	5000.105	10 pcs
Inside cover lens for e680, e670 and e650	5000.001	5 pcs
Inside cover lens for e640 and OSC	5000.300	5 pcs

Other spare parts

Designation	Article no.	Unit/box
Headband	5003.250	1 pc
Sweatband	5004.073	2 pcs
Repair kit 1 e600 range**	5003.500	1 pc
Repair kit 2 e600 range**	5003.501	1 pc
Potentiometer rotary button for OSC	5000.862	10 pcs
Front lens frame for OSC	5000.490	10 pcs

* Not suitable for optrel e600 helmets combined with fresh air systems

** **Repair kit 1**: 1 potentiometer button, 1 satellite back section, 1 sensitivity button
Repair kit 2: 2 clips, 2 screws

Accessories for e680, e670 and e650

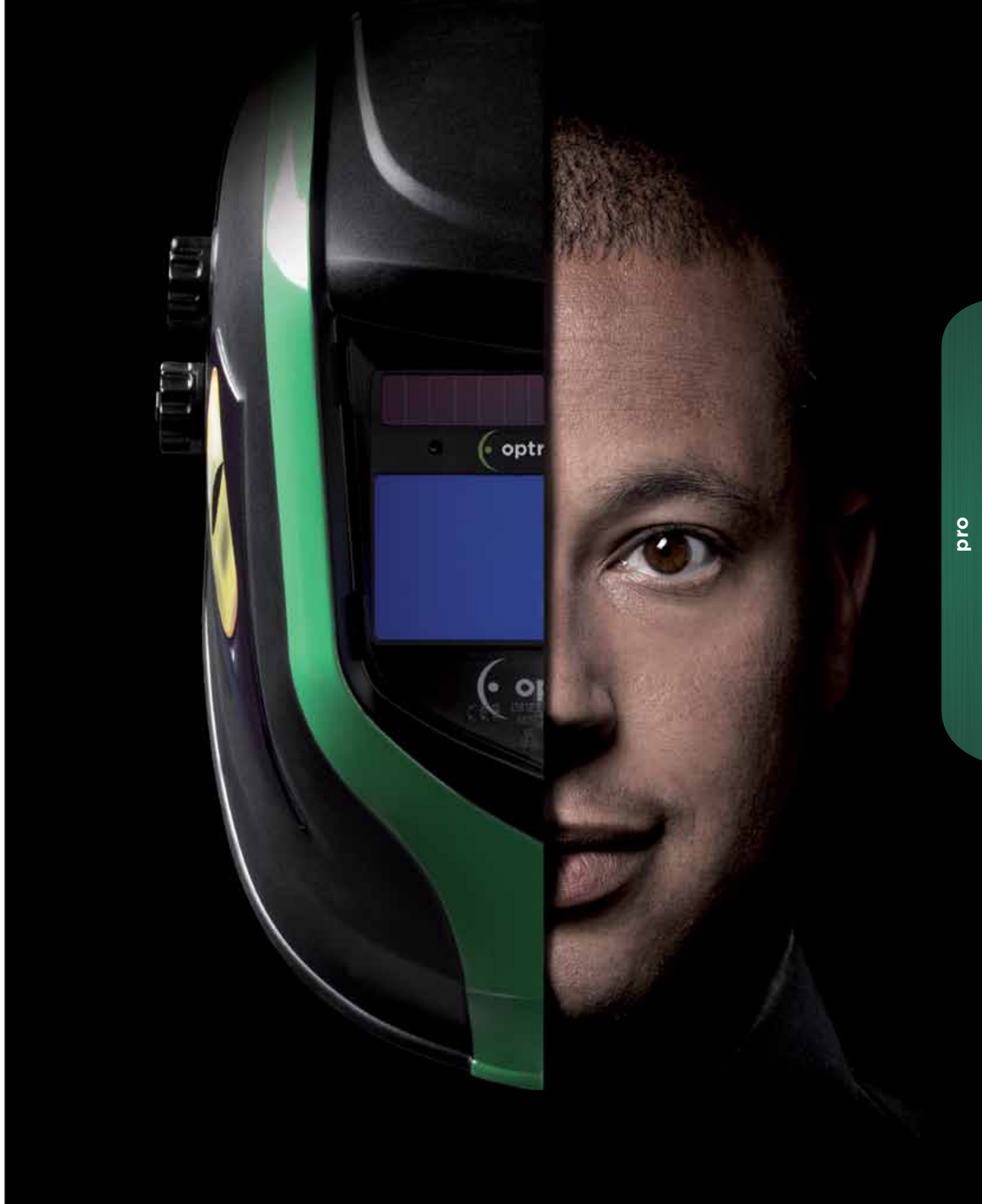
Designation	Article no.	Unit/box
Dioptrine 1.00	5000.050	1 pc
Dioptrine 1.50	5000.051	1 pc
Dioptrine 2.00	5000.052	1 pc
Dioptrine 2.50	5000.053	1 pc
Inside cover lens blue +1 shade level	5000.011	5 pcs
Inside cover lens light green +1.5 shade levels	5000.012	5 pcs
Inside cover lens dark green 2 shade levels	5000.013	5 pcs

Accessories for e640 and OSC

Designation	Article no.	Unit/box
Dioptrine 1.00	5000.500	1 pc
Dioptrine 1.50	5000.600	1 pc
Dioptrine 2.00	5000.700	1 pc
Dioptrine 2.50	5000.800	1 pc
Inside cover lens blue + 1 shade level	5000.450	5 pcs
Inside cover lens light green + 1.5 shade levels	5000.400	5 pcs
Inside cover lens dark green + 2 shade levels	5000.350	5 pcs

CONNECT Basic

optrel® pro



As individual as you are

Welders can give helmets from the pro range a touch of individuality. They are perfect for welders who don't undertake a large range of tasks or work at great intensity but who still want the safety and efficiency of a high-quality, active welding helmet.

Making each day a little more colourful and interesting

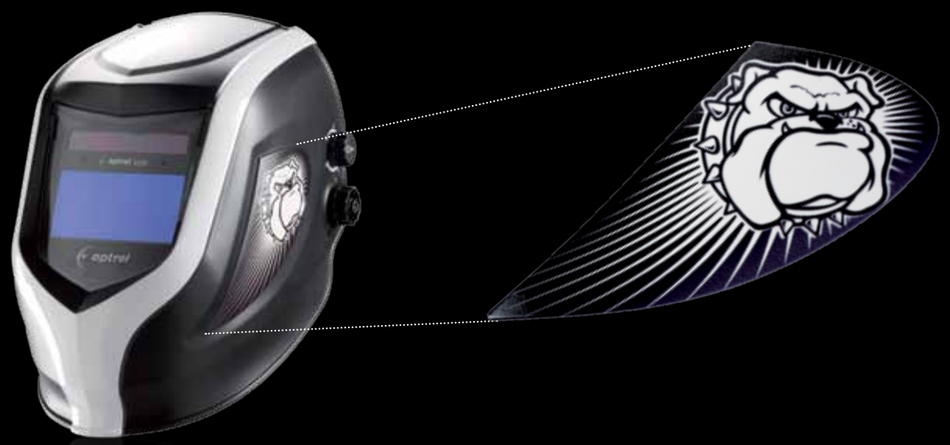
The p500 range from optrel is a totally new helmet concept. The new helmets of the pro range allow welders to add a very personal touch to their helmet. All colour optrel p500 helmets are supplied with a pair of interchangeable side covers. optrel can provide a range of side covers for you to design your helmet to reflect your taste.

Cheeky yet functional: optrel's new helmet shell.

Modern and attractive, ergonomic and light. The famous optrel headband and the shell shape optimise weight distribution and minimise strain on the wearer's neck and nape of the neck.

Benefits and features

- → The sensitivity of the sensors can be adapted to the welding process and operating environment.
- → The optimised front cover lens offers reliable protection from splash and weld smoke.
- → Thanks to the adjustable opening delay, the welder can select the time for switching from dark to light.
- → The enlarged LCD gives the optrel p500 range a comfortable field of vision.
- → Together with the optimised weight distribution and comfortable, adjustable headband, the helmet is incredibly comfortable.



optrel pro range

The pro range from optrel is a selection of helmets perfect for common welding methods. The good quality of the ADF combined with the optrel p500 helmet shell guarantee a long life and good standard for welders. The popular optrel headband and scope for adding the patented hard hat adapter also ensure that this range offers great comfort and protection. Thanks to the newly developed side cover concept, the welder can change the way his helmet looks time and again.

For the allrounder
optrel p550

Functions for occasional welding

Shade level	4/9-13
Control unit outside the helmet	Yes
Comfortable headband	Yes
Ability to adapt the detection angle	No
Sensitivity control	Yes
Opening delay	Yes
Grinding mode	No
Overhead welding	No
Colour true filter	No
Can be retrofitted with optrel breathing protection system	No
Hard hat can also be worn	Yes

Other features

Size of darkening filter/field of vision	90 x 110 x 7 mm /50 x 100 mm
Eye protection	Maximum UV and IR protection with every shade level setting
Classification according to EN379	1/2/1/2
Classification according to EN175	B (120m/s impact resistance)
Time taken to switch from light to dark	0.220 ms at room temperature 0.165 ms at 55 °C
Time taken to switch from dark to light	0.25 – 0.7 s, continuously variable selection
Energy supply	Solar cells and batteries, no need to switch on and off
Working temperature	–10 °C to +70 °C
Total weight with/without side covers	520 g/495 g
Recommended areas of use	See page 11
Guarantee	2 years (not including batteries)
Certificates	CE, ECS, ANSI, GOST-R

Designation	Article no.
black unpainted* (without side covers)	1007.000
black-green*	1007.010
black-white*	1007.020
white-black*	1007.030
Darkening filter	5012.700

*Spare helmet shell on request

Version with hard hat adapter

black unpainted (without side covers)	1007.001

For constant welding
optrel p530

Functions for occasional welding

Shade level	4/11
Control unit outside the helmet	No
Comfortable headband	Yes
Ability to adapt the detection angle	No
Sensitivity control	Yes
Opening delay	Yes
Grinding mode	No
Overhead welding	No
Colour true filter	No
Can be retrofitted with optrel breathing protection system	No
Hard hat can also be worn	Yes

Other features

Size of darkening filter/field of vision	90 x 110 x 7 mm/50 x 100 mm
Eye protection	Maximum UV and IR protection with every shade level setting
Classification according to EN379	1/2/1/2
Classification according to EN175	B (120m/s impact resistance)
Time taken to switch from light to dark	0.220 ms at room temperature 0.165 ms at 55 °C
Time taken to switch from dark to light	0.25 – 0,7 s continuously variable
Energy supply	Solar cells and batteries, no need to switch on and off
Working temperature	–10 °C to +70 °C
Total weight with/without side covers	510 g/485 g
Recommended areas of use	See page 11
Guarantee	2 years (not including batteries)
Certificates	CE, ECS, ANSI, GOST-R

Designation	Article no.
black unpainted* (without side covers)	1007.100
black-green*	1007.110
black-white*	1007.120
white-black	1007.130
Darkening filter	5012.750

*Spare helmet shell on request

optrel p505

Shade level	11 (ex factory)
Comfortable headband	Yes
Overhead welding	No
Can be retrofitted with optrel breathing protection system	No
Hard hat can also be worn	Yes

Other features

Field of vision	90 x 110 mm
Eye protection	Maximum UV and IR protection with optrel passive glasses
Classification according to EN166	1 (optical class)
Classification according to EN175	B (120m/s impact resistance)
Working temperature	-40°C to +130°C
Total weight	485 g
Recommended areas of use	All arc-based welding methods. Not suitable for laser welding.
Guarantee	2 years
Certificates	CE, ECS, ANSI, GOST-R

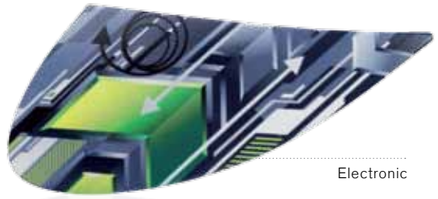
Designation	Article no.
black unpainted* (without side covers)	1007.500
Passive filter DIN 11 90 x 110 mm (25)	3800251

*Spare helmet shell on request

optrel p500 side covers

The colour helmet versions of the optrel p500 range can be individually adjusted by the welder - or employer. The interchangeable side covers allow the user to change the helmet design without any effort. Whether you want to adapt the helmet to your personal taste, express your mood, customise the helmet for improved recognition or give the employer space for important information: everything is possible. Select side covers from the standard range or get advice on individual solutions.

Reptile



Electronic

Tribal

Tiger

Skull white

Bulldog

Mirror

Boxes of side covers

Designation	Article no.	Unit/box
«Reptile» side covers	5002.500	10 pairs/box
«Electronic» side covers	5002.510	10 pairs/box
«Tiger» side covers	5002.520	10 pairs/box
«Tribal» side covers	5002.530	10 pairs/box
«Skull white» side covers	5002.540	10 pairs/box
«Bulldog» side covers	5002.550	10 pairs/box
«Mirror» side covers	5002.560	10 pairs/box

Spare parts and accessories for the pro range

Front cover lenses and inside cover lenses

Designation	Article no.	Unit/box
Front cover lens for p500 range	5000.250	5 pcs
Inside cover lens for p550/p530	5000.001	5 pcs
Inside cover lens for p505	5000.255	25 pcs

Other spare parts

Designation	Article no.	Unit/box
Potentiometer rotary button for p550	5000.862	10 pcs
Headband	5003.250	1 pc
Sweatband	5004.073	2 pcs
Retaining spring for p505	5002.210	10 pcs

Accessories

Designation	Article no.	Unit/box
Industrial helmet adapter CONNECT Basic	5011.100	1 pc
Leather bib	4028.015	1 pc
Leather head and neck protection	4028.016	1 pc
Dioptrine 1.00	5000.050	1 pc
Dioptrine 1.50	5000.051	1 pc
Dioptrine 2.00	5000.052	1 pc
Dioptrine 2.50	5000.053	1 pc
Inside cover lens blue +1 shade level	5000.011	5 pcs
Inside cover lens light green +1.5 shade levels	5000.012	5 pcs
Inside cover lens dark green +2 shade levels	5000.013	5 pcs

optrel® basic

Modern and compact design for sense of freedom

The passive products from optrel AG have also been redesigned to take account of the stringent requirements of welders. The styling chosen offers a new dimension in comfort to tradesmen who only rarely undertake welding work and welders who work in tight spaces or perform special applications.

All optrel basic products offer reliable protection from chips, UV and IR rays and hot metal splash. Every welder is sure to find a product to fully meet his needs from the various product ranges available from optrel AG.

Benefits and features

- → Modern and ergonomic shape
- → Good temperature and resistance properties
- → Low weight

optrel b100 range

The optrel b100 range is made from high-quality thermoplastic. This material boosts the modern and ergonomic shape with good temperature and resistance properties. optrel b100 products are recommended mainly for tradesmen who don't weld on a regular basis but still want reliable protection for their eyes and face. The products are suited to use up to around 100 °C.

optrel b110

Welding shield including front cover lens and a DIN 11 glass filter. Available with six country-specific adapters. Low weight.

Designation	Article no.	Unit/box
b110 105 x 50 mm/2" x 41/4"	1005.000	10 pcs
b110 90 x 110 mm	1005.001	10 pcs
b110 31/4" x 41/4"	1005.002	10 pcs
b110 55 x 110 mm	1005.003	10 pcs
b110 60 x 110 mm	1005.004	10 pcs
b110 75 x 98 mm	1005.005	10 pcs

optrel b120

Welding helmet including front cover lens, headband and a DIN 11 glass filter. Available with six country-specific adapters. Low weight.

Designation	Article no.	Unit/box
b120 105 x 50 mm/2" x 41/4"	1005.010	10 pcs
b120 90 x 110 mm	1005.011	10 pcs
b120 31/4" x 41/4"	1005.012	10 pcs
b120 55 x 110 mm	1005.013	10 pcs
b120 60 x 110 mm	1005.014	10 pcs
b120 75 x 98 mm	1005.015	10 pcs

optrel b130

Welding helmet with quiet-closing flip-up including front cover lens, headband and a DIN 11 glass filter. Extra large viewing window when folded up. Low weight.

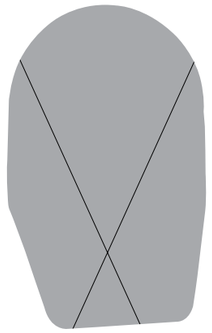
Designation	Article no.	Unit/box
b130 105 x 50 mm/2" x 41/4"	1005.020	10 pcs

optrel b200 range

The optrel b200 product range is made from a very resistant glass fibre compound. The erratically arranged fibres along with the plastic used reliably deflect weld splash and are self-extinguishing. These products are characterised by their great resistance to temperatures of up to around 400 °C and their robust design.

optrel b210

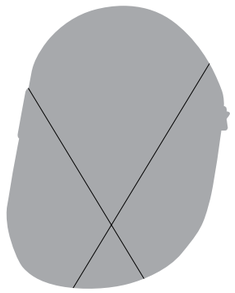
Welding shield including front cover lens and a DIN 11 glass filter. The special glass sliding mechanism allows the b210x to be quickly changed from dark to light, providing clear sight through the DIN 11 filter.



Designation	Article no.	Unit/box
b210 105 x 50mm/2" x 41/4"	3037000	10 pcs
b210 90 x 110mm	3800014	10 pcs
b210 31/4" x 41/4"	3800015	10 pcs
b210x 105 x 50mm/2" x 41/4"	3021402	10 pcs

optrel b220

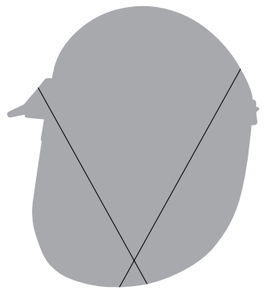
Welding helmet including front cover lens, headband and a DIN 11 filter.



Designation	Article no.	Unit/box
b220 105 x 50mm/2" x 41/4"	3800227	10 pcs
b220 90 x 110mm	3890008	10 pcs
b220 31/4" x 41/4"	3800029	10 pcs

optrel b230

Welding helmet with flip-up including front cover lens, headband and a DIN 11 filter.



Designation	Article no.	Unit/box
b230 105 x 50 mm/2" x 41/4"	3810351	5 pcs

optrel b300 range

Just like the products in the optrel b300 range, optrel b200 products are reinforced through use of a glass fibre mat. This produces a totally resistant material which reliably defects weld splash and high temperatures up to around 400 °C. A compact glass fibre layer and a modern panel thickness make the optrel b300 range very light.

optrel b310

Welding shield including front cover lens and a DIN 11 glass filter.

Designation	Article no.	Unit/box
b310 105 x 50 mm/2" x 41/4"	1005.030	10 pcs

optrel b320

Welding helmet including front cover lens, headband and a DIN 11 glass filter.

Designation	Article no.	Unit/box
b320 105 x 50 mm/2" x 41/4"	1005.040	10 pcs

optrel b330

Welding helmet with flip-up including front cover lens, headband and a DIN 11 glass filter. Extra large field of vision when folded up.

Designation	Article no.	Unit/box
b330 105 x 50 mm/2" x 41/4"	1005.050	10 pcs

optrel b400 & b500 range

Leather hoods with a passive welding filter are indispensable for welders who have to work in tight spaces.
If welding work is required in recesses or 3D constructions, leather hoods are often the only possible form of protection.

optrel b420 & b430

Leather helmet or flip-up with a DIN 11 glass filter and flexible headband. Split leather.

Designation	Article no.	Unit/box
b420 (helmet) 105 x 50 mm	3800079	1 pc
b430 (flip-up) 105 x 50 mm	3800289	1 pc

optrel b520 & b530

Leather helmet or flip-up with a DIN 11 glass filter and flexible headband. Solid leather.

Designation	Article no.	Unit/box
b520 (helmet) 105 x 50 mm	3800071	1 pc
b530 (flip-up) 105 x 50 mm	3800070	1 pc

optrel b600

Helmet or flip-up with a DIN 11 glass filter.

Designation	Article no.	Unit/box
b620 (helmet) 105 x 50 mm	3890001	10 pcs
b630 (flip-up) 105 x 50 mm	3890004	10 pcs

Spare parts for optrel b600

Designation	Article no.	Unit/box
Adapter 105 x 50 mm b620	5002.062	1 pc
Flip-up adapter b630	5002.080	1 pc
Front cover lens 105 x 50 mm b600 range	5000.223	5 pcs
Inside cover lens 105 x 50 mm b600 range	5000.300	5 pcs
Inner safety cover lens b630	5000.370	5 pcs
Retaining spring for b600 range	5002.067	5 pcs
Headband for b600	5003.250	1 pc
Sweatband for b600	5004.073	2 pcs

optrel upgrade darkening filters

The b020 allows customers with passive protection products to upgrade to active protection without having to change their helmet or shield.. The optrel b020 darkening filter can then be used in place of the passive glass.

optrel b020 (darkening filter with solar cells)

Designation	Article no.	Unit/box	Energy supply	Shade level	Filter size
b020 Nordic	5012.199	1 pc	Solar cells	DIN 3/10	110 x 60 x 5 mm
b020	5012.202	1 pc	Solar cells	DIN 3/10	108 x 51 x 5 mm
b020	5012.300	1 pc	Solar cells	DIN 3/11	108 x 51 x 5 mm

optrel passive glasses

Designation	Window size	Shade level	Article no.	Unit/box
Passive glass	105 x 50 mm/108 x 51 mm	DIN 8	3000008	100 pcs
Passive glass	90 x 110 mm	DIN 8	3800248	25 pcs
Passive glass	105 x 50 mm/108 x 51 mm	DIN 9	3000009	100 pcs
Passive glass	90 x 110 mm	DIN 9	3800249	25 pcs
Passive glass	105 x 50 mm/108 x 51 mm	DIN 10	3000010	100 pcs
Passive glass	90 x 110 mm	DIN 10	3800250	25 pcs
Passive glass	105 x 50 mm/108 x 51 mm	DIN 11	3000011	100 pcs
Passive glass	90 x 110 mm	DIN 11	3800251	25 pcs
Passive glass	105 x 50 mm/108 x 51 mm	DIN 12	3000012	100 pcs
Passive glass	90 x 110 mm	DIN 12	3800252	25 pcs
Passive glass	105 x 50 mm/108 x 51 mm	DIN 13	3000013	100 pcs
Passive glass	90 x 110 mm	DIN 13	3800253	25 pcs

optrel front cover lenses

Designation	Window size	Article no.	Unit/box
Scratch- and heat-resistant front cover lens	105 x 50 mm	3000022	200 pcs
Scratch- and heat-resistant front cover lens	110 x 90 mm	3800261	200 pcs
Scratch- and heat-resistant front cover lens	106 x 32 mm	3800262	200 pcs
Scratch- and heat-resistant front cover lens	110 x 60 mm	3800266	200 pcs

Other spare parts

Designation	Article no.	Unit/box
Headband for b100, b300	5003.260	1 pc
Headband for b200 standard	3021300	5 pcs
Headband for b200 comfort	3800452	5 pcs
Sweatband for b100, b200, b300	3800756	5 pcs

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