



INTELLIGENT GLASS®

USER GUIDE

SWITCHABLE GLASS

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SWITCH ON TO INTELLIGENT GLASS

Established in 2004, Intelligent Glass are the UK’s longest serving switchable technology provider. Part of the Pro Display Group, our patented manufacturing processes allow us to offer the widest range of product on the market with industry leading clarity levels. This guide covers the installation steps, cleaning and aftercare and the technical specifications for our Switchable Glass.



SHIPPING

A full packaging and shipping service is available for UK and worldwide export.

All packaging is robust and designed to provide protection during transit. It is the responsibility of the recipient to offload deliveries, unless otherwise agreed. Please notify us prior to dispatch if the delivery address is restricted or this could result in additional shipping charges.

For UK shipments, we offer next-day or dedicated same-day deliveries whereas for overseas customers we can ship via Road, Air or Sea depending on your preference. Please note, overseas customers are responsible for customs and clearance. All non-UK shipments use DAP terms unless stated otherwise.

All consignments are insured to the full value of the goods. A quotation for packaging, shipping and insurance will be provided prior to dispatch.

RECEIVING

Before accepting the shipment from the carrier, the packaging should be inspected for shortages or damage. If shortages or damage is found, please could you make a note of this on the shipper's paperwork and notify us as soon as possible within 24 hours in order for us to make an insurance claim with the shipper.

UNPACKING

Switchable Glass panels are heavy and the crate should be placed on a level, even surface prior to commencing unpacking.

Warning: Glass panels are positioned upright in crates. Precautions should be taken to prevent panels tipping forward prior to removal of the front panel.



STORAGE

Care should be taken when the glass is being handled, in line with local recommended guidelines for the handling of glass panels. If the Switchable Glass is not being installed immediately after un-crating, care must be taken to protect the panels and store them in conditions where the relative humidity is less than 80% and a near constant temperature between -20°C and +50°C in order to prevent the formation of condensation on the glass.

INSTALLATION

The customer or installer should thoroughly inspect each piece of Switchable Glass prior to installation. Never attempt to install products which you consider to be incorrectly sized, damaged, scratched, abraded or deficient in any other way, in the first instance contact Intelligent Glass for an initial assessment.

Any attempt to install a deficient product will signify acceptance of its suitability and as such cannot not be replaced.

Adhere to all Switchable Glass installation guides. Never install Switchable Glass in pressure glazing systems that do not have a positive stop.

Switchable Glass should never be installed in situations where it may be subjected to loading or pressure or mechanical stress, for example installation into misaligned, damaged or warped framework or concentrated mechanical loads or actions.

Where laminated Switchable Glass is required for door applications, a framing system which supports the glass on all sides should be used.

Glazing to exterior and wet interior applications must be wet sealed in a suitable frame and impervious to moisture, with provision for the weeping of condensation that may form in the glazing system.

Electrical connections must be positioned and exit at the top of any installation in wet environment applications and must be completely sealed so as to be impervious to moisture ingress.

A qualified professional must ensure switchable products are installed in the appropriate zones/positions within bathrooms and areas of moisture.

We only recommend the use of Dow Corning AS7096N, as a sealant. This can be supplied by Intelligent Glass.

Ensure all glazing gasket joints are cut and sealed in accordance with the relevant manufacturer's instructions to provide a watertight seal wherever joints are made.

All glass pieces must be supported by two setting blocks. The blocks should have a Shore A Durometer hardness of 85 +/- 5 and be silicone compatible. The preferred location for setting blocks is at quarter points. The electrical connections should not be used to support the glass.

Great care should be taken when installing fixings and fittings to the glass. Metal parts should never have direct contact with the surface of the glass or the film and fittings attached by threaded fixings should be tightened to a maximum torque of 1Nm. (To avoid the risk of mechanical threaded fixing becoming loose over time the use of a high quality thread adhesive in line with the manufacturer's instructions should be considered).

Unexplained breakages can occur even after all precautions for glass handling, storage and protection has been observed. This is beyond the control of the manufacturer and as such is not warrantable. Breakages of this nature can include but are not limited to:

- Thermal stress
- Glazing system pressures
- Accidental damage during installation
- Excessive wind Loading

GLAZING

Prior to commencing installation, examine all and make good any unsatisfactory conditions relating to the glazing system, stops, gaskets, channels, rebates which may impair the successful and safe installation of Switchable Glass.

Internal Applications

Dry Glazing: This is the recommended interior glazing method.

Butt Joint Glazing: can be used in internal applications we recommend the use of Dow Corning AS7096N for “seamless glazing” effects, alternatively the use of clear dry plastic jointing trims may be placed between abutted glass panels (The use of polished edge glass is recommended).

Wet Glazing: If a sealant is required use only Dow Corning AS7096N, which can be supplied upon request.

External Applications

Wet Glazing: Pre-shimmed Glazing tapes and Dow Corning AS7096N are required to create a seal impervious to moisture, with provision for the weeping of condensation that may form in the glazing system.

Framing Systems and Design

Switchable Glass is suitable for glazing to a wide range of steel, timber, aluminium and UPVC systems. Frame edge clearance and face clearances may be used although a minimum bite edge (each side) of 10mm for Switchable Single Glazing and Laminate Glazing and 23mm for Switchable Glazed Units.

Inadequate clearance for the edges can cause damage due to glass-to-frame contact. A minimum edge clearance of 3mm is recommended to reduce this possibility.

Glass larger than 0.6m² should be placed on four Shore A Durometer hardness of 85 +/- 5 and be silicone compatible. The preferred location for setting blocks is at quarter points.

The blocks should be 1.5mm narrower than the channel width. Lock Strip Gasket Systems can also require setting blocks. Refer to manufacturer for recommendations. Customer specified holes and cut-outs produced during the manufacturing process may cause the edge of the switchable element to discolour slightly and as such will require 4-6mm coverage by a trim, escutcheon or bezel.

Glass Protection

Pro Display cannot be held liable for damage caused by other parties. Once the glass has been installed it is the responsibility of the installer, main contractor or building owner to provide protection and cleaning.

ELECTRICAL INSTALLATION

Switchable Glass is an electrical component and should be provided for in the electrical layout including the provision of fused spurs, switches, cable management and electrical connection boxes. All installations must meet the requirements of local regulations and guidelines and be carried out by a qualified electrician.

Any metal framework close to or adjoining the wiring of the panel should be earthed. Switchable Film or glass must NEVER be installed in direct contact with a metal frame. If in doubt consult a qualified electrician prior to commencing any installation work.

Before installation commences busbars, connection leads and cables should be inspected to ensure the integrity of insulation.

Wherever possible it is recommended that the operation of Switchable Film or Glass is tested prior to commencement of installation.

Great care should be taken to ensure that exposed busbars, leads or cables do not come into contact with framework and any metal frames must be earthed and are totally sealed to prevent the ingress of moisture or water.

Switchable Glass / film products operate at 48-65V AC. The correct voltage must be applied to the product using Pro Display approved thermally protecting isolated transformers. Power levels exceeding the recommended voltage can cause irreversible damage and will not be covered under warranty.

Failure to use Pro Display transformers may result in irreparable damage to the Switchable Glass / acrylic or Film. (Data sheets can be supplied on request). This is not covered by the warranty, detailed on page 11.

Multiple Switchable Glass panels can be connected in parallel to a single transformer.



An RCD with an MCB, or an RCBO should be used along with a fused spur at the connection point for the Switchable Glass to provide local isolation.

Selecting the right one should be done in accordance with BS 7671:Requirements for Electrical Installations and will ensure that the device will not cause unwanted tripping due to high inrush currents generated by the transformer(s). The use of C-type or D-type breakers is recommended.

It is imperative that the manual switch or remote control is wired into the circuit on the mains voltage side of the transformer; failure to observe this requirement may lead to irreparable damage of the Switchable Glass panels.

Before turning on the power to a new installation the electrician must test the resistance reading between the frame and the busbar feed cables to ensure that the resistance is infinite. If this is not the case the short circuit should be found and insulated accordingly.

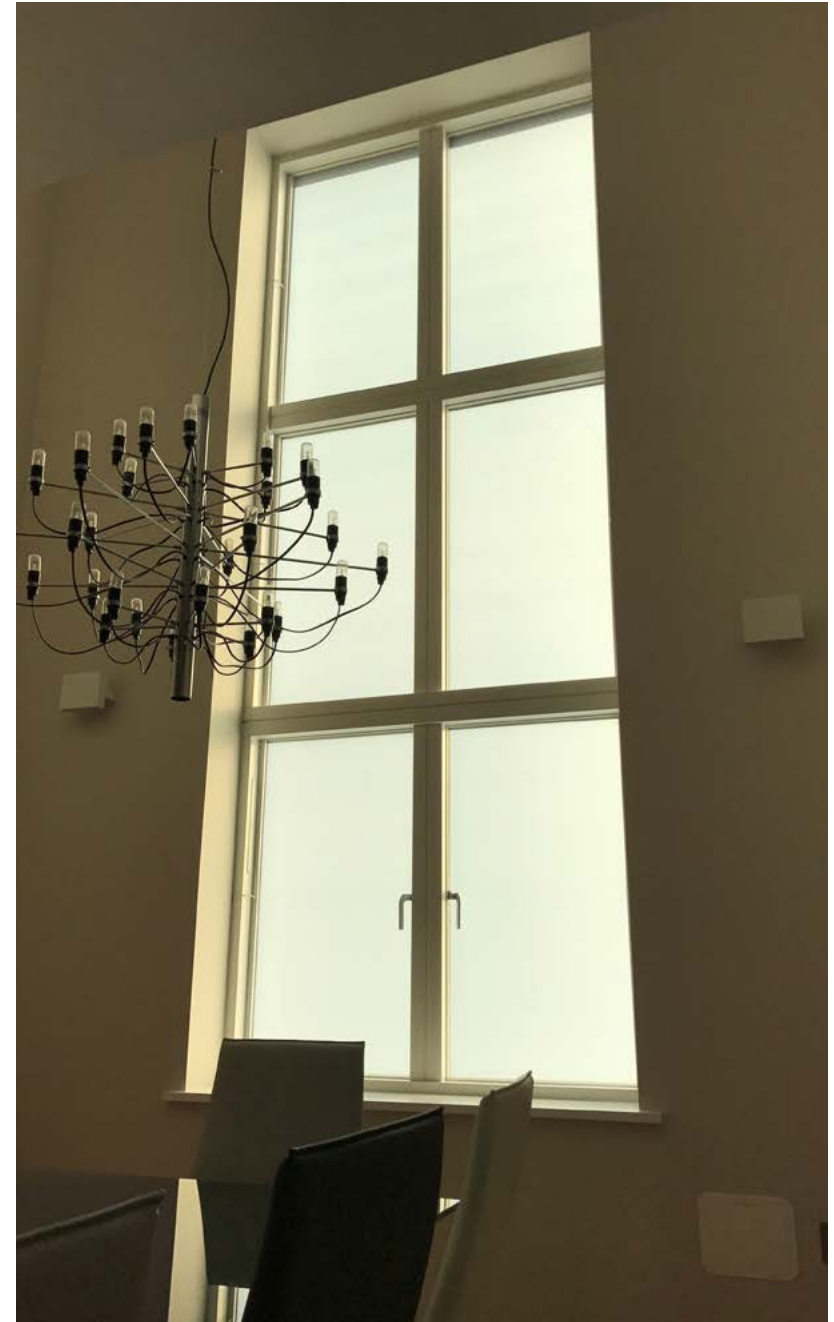
CLEANING & AFTERCARE

Once the glass is installed, the glazing contractor should make provisions to ensure that glass surfaces are protected from possible damage caused by the construction practices of other trades.

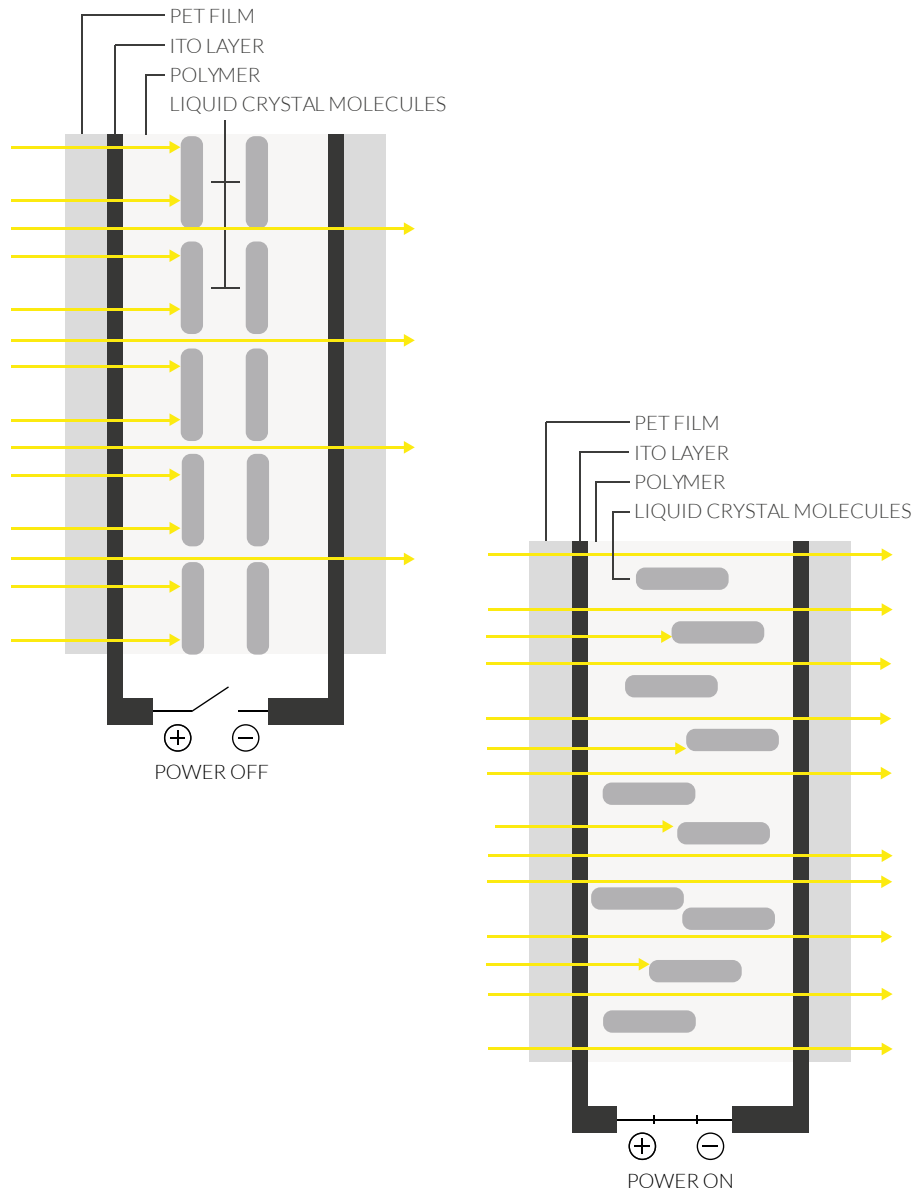
We recommend that Switchable Glass should be cleaned with IPA wipes which are available for purchase from Intelligent Glass. Toughened Switchable Glass requires special care during the initial cleaning and the construction period in order to prevent marking or damage caused by abrasive contaminants.

We recommend cleaning our Switchable Glass products with IPA wipes which are available for purchase from Intelligent Glass. Please ensure the electrical contacts are fully sealed so they are not exposed to water / moisture. Switchable Glass is an electrical product and to ensure longevity we recommend turning the glass off for at least 8 hours per day.

ANNUAL CHECKS: We recommend that the client should check that all wiring is in good condition, framing materials are free of any damage and that the transformer and switch are in good visible order. The areas adjoining the Switchable Glass including walls, ceilings and floors should be checked for structural integrity, excess humidity and temperature. Should any of these items appear unusual the client should immediately notify the original supplier / installer / contractor or Intelligent Glass.



SWITCHABLE GLASS SPECIFICATIONS



OPTICS	LIGHT TRANSMISSION	ON	>82%
		OFF	>65%
	HAZE	ON	<3%
		OFF	<95%
	UV BLOCK	ON/OFF	<98%
	VIEWING ANGLE	ON	>165°
ELECTRICAL	VOLTAGE	ON	AC 48 - 65V
	POWER CONSUMPTION	ON	5 W per m ²
	FREQUENCY	ON	AC 48 - 65V
	CURRENT	ON	0.1 A per m ²
	SWITCHING TIME	OFF>ON	45ms
		ON>OFF	200ms
ENVIRONMENT	OPERATING TEMPERATURE	ON/OFF	-20°C to +70°C
DURABILITY	LIFETIME		>80,000 hours
	TEST TIME		> 2 million switches
DIMENSIONS	MAXIMUM LENGTH		4 metres
	MAXIMUM WIDTH		1.8 metres

TRANSFORMER SPECIFICATIONS

50 W

DESCRIPTION	SPECIFICATION
DIMENSIONS	165 x 120 x 60mm
PRI WIRE	2 x 0.75mm ² , 0.9m cable
WEIGHT	1.96 kg
FULL LOADING POWER	50W (Max)
INPUT VOLTAGE	AC 220V ± 10%
FREQUENCY	50 Hz / 60 Hz
NO LOAD VOLTAGE	AC 60V ± 2%
FULL LOADING CURRENT	3.6A (Max)



200 W

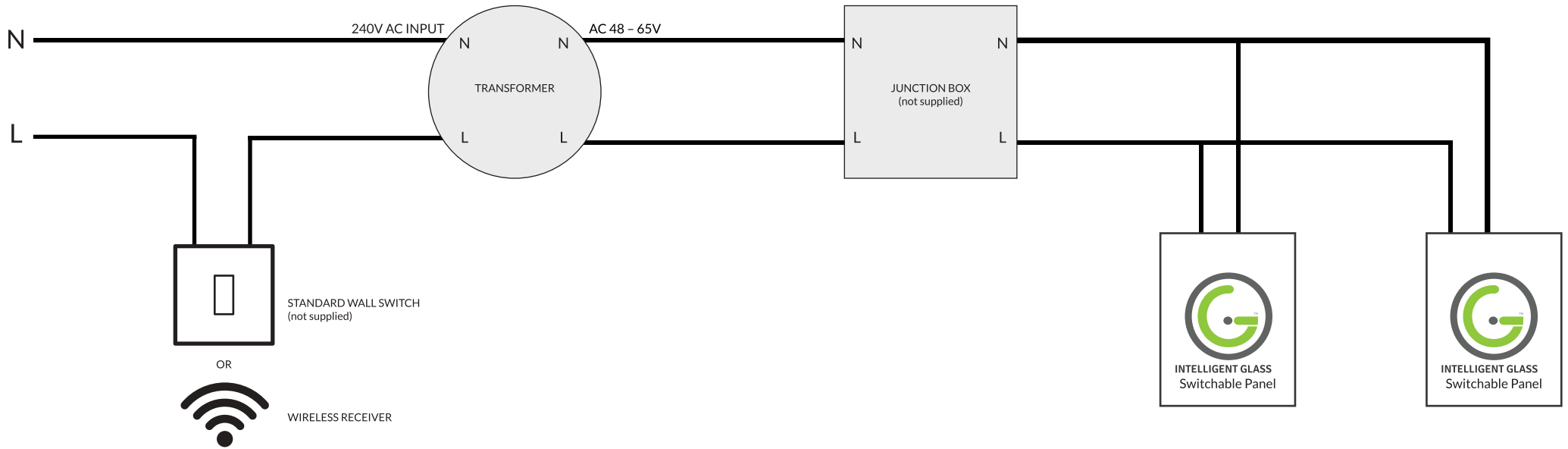
DESCRIPTION	SPECIFICATION
DIMENSIONS	195 x 125 x 80mm
PRI WIRE	2 x 0.75mm ² , 0.9m cable
WEIGHT	3.5 kg
FULL LOADING POWER	200W (Max)
INPUT VOLTAGE	AC 220V ± 10%
FREQUENCY	50 Hz / 60 Hz
NO LOAD VOLTAGE	AC 60V ± 2%
FULL LOADING CURRENT	3.6A (Max)



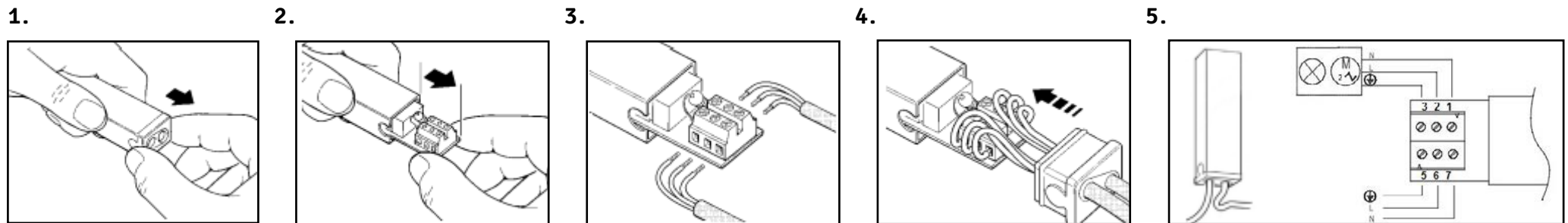
Both transformers are supplied with a UK 3-pin plug fitted.

WIRING DIAGRAMS

Switchable Glass & Film **Standard / Wireless** Wiring Diagram



Receiver Wiring Diagram



WARRANTY

Intelligent Glass warrants that switchable products should be free from defects assuming normal use and correct installation for a period of 2 years from the date of purchase. Defects include loss of switching where the electrical system has been wired correctly.

Haze: Switchable Film products are not as optically clear as standard glass. All switchable technologies have some degree of haze and this is not deemed as a fault.

Switching Time: Whilst the transition time from frosted to clear is usually less than 1 second, the transition time from clear to fully frosted can vary depending upon ambient temperature, length of time the film has been switched clear and age of the product. Such variability in transition is normal and not deemed as a fault.

Glass Quality: Glass used in the makeup of Switchable Film products conforms to the Visual Quality Standard as described by the UK Glass and Glazing Federation. Intelligent Glass is not responsible for the finish of the product when glass is supplied by the customer. Switchable products require the application surface to be as smooth as possible. If the substrate is of low quality, a high quality finish cannot be ensured.

Film Quality: There may be slight variations in the thickness of the liquid crystal over the surface area causing slight tint variation and is not deemed as a fault.

Tolerance: Switchable Glass dimensions have a tolerance of +/- 3mm.

UV Stability: All PDLC Switchable Glass technologies can discolour over a period of years if exposed to direct UV light. This is not deemed as a fault.

Glazed Units: The warranty for Switchable glazed units mounted in a timber frame is 12 months from installation date.

UV Stability: Switchable products are warranted for a period of 1 year from purchase against discolouration or damage caused through UV exposure.

To activate the warranty, send us clear images of the film being switched clear and frosted using our website form (which is linked from the “Activate Warranty” box on this page).

Your warranty will be activated upon receipt of these images.

All sales are subject to Pro Display TM Ltd terms & conditions.



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