Product datasheet: PD20

RHINO-FI

Insulated Folding Doors

Rhino DOORS

THE STRENGTH TO PROTECT

Rhino-FI Insulated Folding Doors

Flexible large opening multi leaf access door, typically used for vehicular access. Standard door is fully insulated, options for fully glazed versions

Configurations: Side-hung bi-folding door with any combination of 1, 2 or 3 leaves folding to one or both sides.

Performance: Panel U-Value 0.4W/m²/°C
Acoustic: R_w25dB overall for door BS EN 13241-1: (no wicket door)

- Op forces: pass
- Air Permeability: Class 2
- Water Pen: Class 2
- Durability: pass

Maximum Opening size: 4500x7000mm (w x h) maximum, (electric) or 5700x3000mm (manual).

Door Panels: 52mm for leaf height up to 6000mm high, for leaf heights >6000mm, 62mm thick. Cold rolled galvanised steel internal frame 1.6 to 2mm thick, and 0.7 to 0.9mm thick skins, CFC-free polyurethane foam core.

Guides: Top track is 4mm pressed galvanised steel. No bottom track.

Operation: Manual, semi-automatic or fully automatic electric operation.

Optional extras: Fully glazed
Vision panels
Wicket door
SEW variant for taller openings with cut-outs (2+2 bi-fold only)

Finishes: 'Colorcoat' sheets from a range of standard colours

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Detailed Rhino-FI product datasheet (Fully Glazed)

	Manual door	Electric door
Type of Door	Side hung bi-folding door available with any combination of 1, 2 or 3 leaves folding to the left, right or both sides, i.e., 2+2, 3+1, 3+3 etc. Leaves mount on the inside of the opening and fold inwards at 90°. Refer to pad drawings listed below, and table 1 for details and dimensions of individual configuration.	Side hung fast acting bi-folding door available with 2 leaves folding to the left, right or both sides, 2+0, 0+2 or 2+2. Leaves mount on the inside of the opening and fold inwards at 90°. Refer to pad drawings listed below, and table 1 for details and dimensions of individual configurations:

leaf configuration		manual	electric	max. width (mm)	max. height (mm)	subject to max. door area (m²)
2+0 0+2		√	√	2350	6000	13.75
2+2		√	√	4750	6000(1)	27.5
				max. width (mm) for odd leaf configurations		
				up to 3000mm high	up to 4000mm high	up to 4800mm high
3+0 0+3		√	X	2850	2700	2550
2+1 1+2		√	X	3450	3000	2550
3+1 1+3		√	X	3800	3600	3400
3+2 2+3		√	X	4800	4500	4250
3+3		√	X	5000(1)	5000	5000

Rhino-FI door size configuration chart
(table 1)

Note (1) – Sizes. Maximum width of 5700mm, and maximum height of 6000mm are subject to the maximum size rules set out in table 1 above. Taller doors up to 7000mm high subject to wind loading.

	Rhino-FI standard details	
	Manual door	**Electric door**
Technical Details	Max width 5700mm(1) Max height 6000mm(1) Leaf thickness 60mm Panel U-value TBA. Side room required 200mm Headroom required 150mm Weight 25kg/m^2 to 40kg/m^2 (subject to glazing material)	Max width 5000mm(1) Max height 6000mm(1) Leaf thickness 60mm Panel U-value TBA. Side room required 225mm Headroom required 150mm Weight 25kg/m^2 to 40kg/m^2 (subject to glazing material) Power supply 230V, 50Hz, single phase Opening speed 7 seconds
Performance	Performance in accordance with BS EN 13241-1:2003 (based on original door tested Aug'05) • Forces for Manual Operation – Pass • Operating Forces – Pass • Watertightness – Class 2 (50pa) • Air Permeability – Class 2 • Durability of Performance – Pass (110,000 continuous cycles in 60 days) • Life expectancy – more than 25 years • Wind pressure – Class 5(2)	
Panel Construction	Panels are constructed from 80 x 60 x 2mm thick cold rolled galvanised dovetail box section stiles and rails with pressed-in 20mm rebate. Intermediate transoms to match. 5mm thick internal local reinforcement for hardware. Sections are seam welded and linished smooth prior to powder coating.	
Seals	Flexible rubber seals are fitted to all edges of the door, and between door leaves. All seals are purpose-designed EPDM extrusions, which press into, and blend seamlessly with the door panels. Each seal provides full finger trap safeguarding, and excellent protection against weather, dust and sand.	
Top Track and Pendants	The top track is a 70 x 70 x 3 galvanised steel top-hung track mounted back to the surround frame with 6mm pressed steel brackets. Top rollers are 4-wheel pendant trollies with steel bearing wheels running on steel shafts mounted within black aluminium extrusions.	
Jamb Hinges	The weight of each door half is supported by two pairs of jamb hinges. Each pair of hinges is manufactured to a low tolerance from laser cut, fabricated, and machined bright steel. An M24 vertical adjustment screw, 16mm hinge pin, and an Igus bush complete the assembly, and provide simple, accurate setting during installation, and a low-maintenance, heavy-duty, low-friction component.	
Intermediate Hinges	Apex hinge pairs are machined from solid aluminium extrusions, fitted with sealed for life Igus bushes and 16mmØ stainless steel hinge pins. A concealed peg ensures that the hinge pins cannot be removed from the outside. Hinges are finished in black polyester powder coat to RAL 9005(M).	
Finish	Door frames and glazing beads are degreased, abraded, powder coat primed and polyester powder coated in a full range of RAL classic colours. All hinges and drop bolt sleeves are black polyester powder coated in RAL 9005(M).	

Note (2) – Wind Pressure. Wind pressure capacities are based on panel strengths derived from calculations. Calculations given are for standard leaf construction with each leaf supported at all four corners. Greater wind pressures can be with additional reinforcement. For further advice on wind pressures please consult the manufacturer.

	Rhino-FI standard details and available options	
	Manual door	**Electric door**
Vision Panels	Option 1 Window units SAN double-glazed units (3~18~3) with RS UV (scratch and UV resistant) sheet outside, PMMA UV sheet inside. Glazing units are maximum 15000mm high.(3). Units are fixed with steel glazing beads and internal and external EPDM glazing gaskets. Option 2 Window units are double glazed (4~16~4), argon filled, low E toughened glass. Glazing units are maximum 2000mm high. Units are fixed with steel glazing beads and internal and external EPDM glazing gaskets.	
Wicket Door	Standard - None fitted. Option 1 Lever furniture. Wicket door opens outwards. Hardware comprises a mortise sash lock, 70mm profile Rondo stainless steel lever handles, external Europrofile cylinder with internal thumb turn, 1½ pairs of stainless steel butt hinges. 110mm high threshold. Option 2 Emergency escape furniture. Wicket door opens outwards. Hardware comprises a mortise sash lock, internal Dorma panic touch bar, external override cylinder and finger latch, 1½ pairs stainless steel butt-hinges. 110mm high threshold.	
Locking / Handles	Standard A drop bolt and a black thermoplastic easy-grip pull handle are fitted internally between each pair of leaves. (to leading leaf of 2+0, 2+2 leaf doors only). A bottom guide pin engages in a cast aluminium floor shoe fitted to the threshold, holding the leading edge(s) firm. A black thermoplastic easy-grip pull handle is fitted internally. Option 1 A top and bottom espagnolette shoot bolt operated via an internal, non-lockable lever handle is fitted in lieu of a drop bolt and pull handle.	Standard A black thermoplastic easy-grip pull handle is fitted internally between each pair of leaves. An electro hydraulic lock within the drive motor automatically holds the door in the closed position. A small lever fitted at high level to the motor body disengages the drive, and allows the door to be opened manually. A bottom guide pin engages with a cast aluminium floor shoe fitted to the threshold, and holds the leading edge firm. A black thermoplastic easy-grip pull handle is fitted internally. Option 1 A lever operated floor bolt is fitted internally between pairs of leaves and is electrically interlocked.
Threshold Plate	Standard A 140 x 10mm thick extruded aluminium plate with 30° chamfered edges and anti-slip grooves fixes directly to the floor to form a water bar, presents a level surface for the door to seal against, minimises bottom seal wear as the door folds, and provides a solid location point for floor bolts. Option 1 No threshold supplied.(4)	

Note (3) – Due to the hydroscopic nature of the SAN sheets, used in 'Option 1' Vision Panels, moisture condensation and possible water accumulation may develop within double glazed units during certain atmospheric conditions. These effects should reverse during a change of weather conditions; however, water leakage through the window unit will not occur.

Note (4) – Threshold Plate. It is recommended that a threshold plate is installed. By not installing a threshold plate, the effectiveness of the bottom seals may be reduced, and wear of bottom seals may be expedited.

	Rhino-FI standard details and available options	
	Manual door	**Electric door**
Odd Leaf Hardware	Standard (active leaf to 3+0, 2+1, 3+1, 3+2, 3+3 leaf configurations only). The active leaf is designed as a full height pass door. Hardware comprises a mortise sash lock, pair of 70mm profile Rondo stainless steel lever handles, external Europrofile cylinder and internal thumb turn. (passive leaf to 3+1, 3+3 leaf doors only). A top and bottom espagnolette shoot bolt operated via an internal, non-lockable lever handle is fitted. Option 1. (active leaf to 3+0, 2+1, 3+1, 3+2, 3+3 leaf configurations only). A drop bolt and black thermoplastic easy-grip pull handle are fitted internally. Option 2. (active leaf to 3+0, 2+1, 3+1, 3+2 and 3+3 leaf configurations only). A top and bottom espagnolette shoot bolt operated via an internal, non-lockable lever handle is fitted.	Not applicable
Surround Frame	Standard Supplied by others.(5) Option 1. Rear mounted frame - 150 x 75 x 10 RSA (angle) goalpost frame for fixing to the back of an opening. Painted in 100µDFT Leighs Epigrip C400 zinc phosphate primer and 75µDFT Leighs Resistex C137 acrylic urethane semi-gloss black. Supplied with suitable anchor fixings. Option 2. Between wall frame - 200 x 100 x 5 RHS (box) goalpost frame for fixing between walls. Painted in 100µDFT Leighs Epigrip C400 zinc phosphate primer and 75µDFT Leighs Resistex C137 acrylic urethane semi-gloss black. Supplied with suitable anchor bolt fixings.	

Note (5) – Surround Frame. A flush steel goalpost surround frame should be provided in order to install a Rhino door. The minimum thickness of material to be 5mm, and the width of the internal surface to be minimum 150mm. (See SWT series pad drawings for further information)

	Rhino-FI standard details and available options (electric doors only)
Drive System	Standard A FAAC 560 electro-hydraulic motor is mounted internally at the top of each leading edge leaf. A FAAC E145 control panel with 12 function logics, and advanced programming for finer tuning, controls both door halves. A push button unit with Run and Captive Stop buttons is supplied. A manual release arm is fitted to each motor at high-level to enable manual operation of the door. Option 1 A FAAC 560 electro-hydraulic motor is mounted internally at the top of each leading edge leaf. A FAAC E145 control panel with 12 function logics, and advanced programming for finer tuning, controls both door halves. A push button unit with Run and Captive Stop buttons is supplied. A low-level manual release lever is fitted on the inside face of the door to enable instant manual operation of the door.
Control Logic	Standard Control board factory set to Logic "C" Deadman - continuous push to open, continuous push to close. Option 1 - Control board factory set to Logic "E" Semi-automatic - Single push to open, Single push to close. Stop button stops, and holds doors. (7) Option 2 – Control board factory set to Logic "S" Automatic – Single push to open, automatic closing after pre-set pause time (default 60 seconds). Stop button stops, and holds doors.(7)
Safety Features	Safety Edges A full height opto-electronic safety edge is mounted within each leading edge seal of the door. An impact on the edge during closing will automatically stop and re-open the door. Safety edges are continuously monitored so the door cannot close automatically in the event of damage or failure of the edge. Opening Safety Sensors (included as standard on all doors) Infrared presence detection sensors are fitted to the inside face of the trailing edge leaf to each door half to prevent the door impacting / crushing a person or object during movement. An active infrared detector is fitted externally above the centre of the opening to prevent the door impacting / crushing a person or object during movement. In the event of any detection during door movement, the door half will stop. Photocells A FAAC XP15W send / receive photocell is fitted across the opening. The receiver unit is fitted with a long-life battery to avoid hard wiring. Photocells can be fitted for closing safety, opening safety, or a combination of opening and closing. If a closing safety beam is broken during the closing cycle, the door will automatically stop and re-open. If an opening safety beam is broken during the opening cycle, the door will automatically stop. Traffic Lights A red and green 24V DC LED traffic light unit is fitted. The unit is sized 370mm x 190mm with 24 LEDs to each light, and is intended to be mounted directly on the inside face of the door or onto a traffic light post. Sequence of operation is Red light on when door closed or part closed, Green light on when door fully open. A pair of 24Vdc limit switches is supplied to monitor the fully open position. Photocell / Traffic Light Posts A pair of 100x100 RHS right angle steel posts are fitted on the inside of the bunched door leaves to mount an internal photocell and / or traffic lights. Posts are painted yellow for maximum visibility.

	Rhino-FI standard details and available options (electric doors only)
Additional Controls	Push Button – Additional Run/Captive stop push button unit. Key switch – Sprung return key switch in separate enclosure for operation of the door by keyholders only. For internal or external use.. Digi-key – Bewator K42 stainless steel code lock for operation of the door by authorised persons only. For internal or external use. Radio Control – 868MHz radio control system for remote operation of the door from a vehicle or control room. FAAC Plug-in radio receiver supplied with 1 twin channel transmitter. Additional transmitters available for multi-user systems. Movement Sensor – A Falcon radar movement sensor is mounted at high level, which will open the door on detection of approaching traffic, or close the door on detection of retreating traffic. Using microwave technology, the sensor is adjustable so as to ignore pedestrians, or parallel traffic. *Please note: maximum opening height is 5m for microwave sensors.*
Note (6) – Control logic. In accordance with BS EN 12453:2001, a safety edge and photocell, or safety edge must be installed for semi-automatic (Option 1) or automatic closing (Option 2).	

Detailed Rhino-FI product datasheet (insulated)

	Manual door	Electric door
Type of Door	Side hung bi-folding door available with any combination of 1, 2 or 3 leaves folding to the left, right or both sides, i.e., 2+2, 3+1, 3+3 etc. Leaves mount on the inside of the opening and fold inwards at 90°. Refer to pad drawings listed below, and table 1 for details and dimensions of individual configurations:	Side hung fast acting bi-folding door available with 2 leaves folding to the left, right or both sides, 2+0, 0+2 or 2+2. Leaves mount on the inside of the opening and fold inwards at 90°. Refer to pad drawings listed below, and table 1 for details and dimensions of individual configurations:

leaf configuration		manual	electric	max. width (mm)	max. height (mm)	subject to max. door area (m²)
2+0 0+2		√	√	2350	6000	12
2+2		√	√	4750	6000(1)	24
				max. width (mm) for odd leaf configurations		
				up to 3000mm high	up to 4000mm high	up to 4800mm high
3+0 0+3		√	X	2850	2700	2550
2+1 1+2		√	X	3450	3000	2550
3+1 1+3		√	X	3800	3600	3400
3+2 2+3		√	X	4800	4500	4250
3+3		√	X	5700(1)	5400	5100

Rhino-FI door size configuration chart
(table 1)

Note (1) – Sizes. Maximum width of 5700mm, and maximum height of 6000mm are subject to the maximum size rules set out in table 1 above.

	Rhino-FI standard details	
	Manually door	**Electrical door**
Technical Details	Max width 5700mm(1) Max height 6000mm(1) Panel thickness 52mm Panel U-value 0.40 W/m²/°C. Side room required 200mm Headroom required 150mm Weight 20kg/m²	Max width 4750mm(1) Max height 6000mm(1) Panel thickness 52mm Panel U-value 0.40 W/m²/°C. Side room required 225mm Headroom required 150mm Weight 20kg/m² Power supply 230V, 50Hz, single phase Opening speed 7 seconds
Performance	Performance in accordance with BS EN 13241-1:2003 (based on door tested Aug'05) • Forces for Manual Operation – Pass • Operating Forces – Pass • Watertightness – Class 2 (50pa) • Air Permeability – Class 2 • Durability of Performance – Pass (110,000 continuous cycles in 60 days) • Life expectancy – more than 20 years • Wind pressure(2) - 0.7kN/m² (6m high door), 1.1kN/m² (5m high door), 1.7kN/m² (4m high door), 3.1kN/m² (3m high door). Acoustic performance of the panel – Average weighted SRI, RW Index tested at 29dB. Overall door 25dB (based on test result as University of Salford March '03)	
Panel Construction	Panels are constructed from 1.6mm thick cold rolled galvanised dovetail channel frames with 5mm thick local reinforcement for hardware. The frame is covered on both sides with 0.7mm thick galvanised steel sheets and pressure injected with CFC-free polyurethane foam to form an extremely strong, rigid, flat panel.	
Seals	Flexible rubber seals are fitted to all edges of the door, and between door leaves. All seals are purpose-designed EPDM extrusions, which press into, and blend seamlessly with the door panels. Each seal provides full finger trap safeguarding, and excellent protection against weather, dust and sand.	
Top Track and Guide Rollers	The top guide track is a galvanised steel channel mounted back to the surround frame with 6mm pressed steel brackets. Top guide rollers are nylon guide wheels running on steel shafts mounted within black aluminium extrusions. Doors fitted with >40% area of glazing to be fitted with 4-wheel pendant trollies and support track in lieu of top guide rollers and guide track.	
Jamb Hinges	The weight of each door half is supported by two pairs of jamb hinges. Each pair of hinges is manufactured to a low tolerance from laser cut, fabricated, and machined bright steel. An M24 vertical adjustment screw, 16mm hinge pin, and an Igus bush complete the assembly, and provide simple, accurate setting during installation, and a low-maintenance, heavy-duty, low-friction component.	
Intermediate Hinges	Apex hinge pairs are machined from solid aluminium extrusions, fitted with sealed for life Igus bushes and 16mmØ stainless steel hinge pins. A concealed peg ensures that the hinge pins cannot be removed from the outside. Hinges are finished in black polyester powder coat to RAL 9005(M).	

Note (2) – Wind Pressure. Wind pressure capacities are based on panel strengths derived from physical tests carried out in the factory. Calculations given are for standard panel construction with 0.65mm skins, without cut-outs for windows, and with each panel supported at all four corners. Greater wind pressures can be withstood using thicker door skins, and with additional panel reinforcement. For further advice on wind pressures please consult the manufacturer.

	Rhino-FI standard details and available options	
	Manually door	**Electrical door**
Finish	Standard Outside face - choice of 8 stock colours: Colorcoat® LG Plastisol in Poppy Red, Solent Blue, Ocean Blue(3), Olive Green(3), Goosewing Grey, Merlin Grey(3) and White, or Colorcoat® Prisma in Silver Metallic. Inside face – Colorcoat® LG Plastisol in White. All hinges and drop bolt sleeves are black polyester powder coated in RAL 9005(M) Option 1 Outside faces of panels are polyester powder coated in a choice of 40 stock RAL colours. Inside face in LG Plastisol in White. All hinges and drop bolt sleeves are black polyester powder coated in RAL 9005(M). Option 2 Inside and outside faces of panels are polyester powder coated in a choice of 40 stock RAL colours(3). All hinges and drop bolt sleeves are black polyester powder coated in RAL 9005(M).	
Vision Panels	Standard - None fitted. Option 1 Black thermoplastic 'snap-lock' window with integral double-glazed units (2.5~15~2.5) SAN RS UV (scratch and UV resistant) outside, PMMA UV inside. Overall frame size 770mm x 430mm. (4) Option 2 Thermally broken aluminium window frame with one-piece inner liner tray. Window units are double glazed (4~20~4), argon filled, low E toughened glass. Frames are polyester powder coated in matt black to RAL 9005(M), fully sealed, and available in a choice of frame sizes as follows: 400mm x 600mm, 600mm x 600mm, 400mm x 1200mm, 600mm x 1200mm.	
Wicket Door	Standard - None fitted. Option 1 Lever furniture. Wicket door opens outwards. Hardware comprises a Briton 5520 mortise sash lock, 25mm low-profile anodised aluminium lever handles, external Europrofile cylinder with internal thumb turn, 1½ pairs of stainless steel butt hinges and a hidden door limiting stay. 85mm high step with 40mm wide aluminium threshold strip. Option 2 Emergency escape furniture. Wicket door opens outwards. Hardware comprises a Briton 379 panic bar, external override cylinder and finger latch, 1½ pairs stainless steel butt-hinges and a hidden overhead door limiting stay. 85mm high step with 40mm wide aluminium threshold strip.	
Locking / Handles	Standard A drop bolt and a black thermoplastic easy-grip pull handle are fitted internally between each pair of leaves. (to leading leaf of 2+0, 2+2 leaf doors only). A bottom guide pin engages in a cast aluminium floor shoe fitted to the threshold, holding the leading edge(s) firm. A black thermoplastic easy-grip pull handle is fitted internally. Option 1 A top and bottom espagnolette shoot bolt operated via an internal, non-lockable lever handle is fitted in lieu of a drop bolt and pull handle.	Standard A black thermoplastic easy-grip pull handle is fitted internally between each pair of leaves. An electro hydraulic lock within the drive motor automatically holds the door in the closed position. A small lever fitted at high level to the motor body disengages the drive, and allows the door to be opened manually. A bottom guide pin engages with a cast aluminium floor shoe fitted to the threshold, and holds the leading edge firm. A black thermoplastic easy-grip pull handle is fitted internally. Option 1 A lever operated floor bolt is fitted internally between pairs of leaves and is electrically interlocked.

Note (3) – Dark colours. It is recommended that any door panel, which is exposed to direct sun, i.e., East, South or West elevations, should be finished in a lighter colour. The insulation properties of the panel are so good that, if darker colours are used, the surface temperature of the panel can become unbearably hot, and the outer skin may occasionally bubble or ripple due to tiny air pockets within the panel. Taller panels may temporarily bow slightly until the temperature falls. This phenomenon is purely aesthetic and does not affect the structural integrity of the door. For further advice on colour selection please consult the manufacturer.

Note (4) – Due to the hydroscopic nature of the SAN sheets, used in 'Option 1' Vision Panels, moisture condensation and possible water accumulation may develop within double glazed units during certain atmospheric conditions. These effects should reverse during a change of weather conditions; however, water leakage through the window unit will not occur.

	Rhino-FI standard details and available options	
	Manual door	**Electrical door**
Odd Leaf Hardware	Standard (active leaf to 3+0, 2+1, 3+1, 3+2, 3+3 leaf configurations only). The active leaf is designed as a full height pass door. Hardware comprises a Briton 5520 mortise sash lock, pair of black Hewi lever handles, external Europrofile cylinder and internal thumb turn. (passive leaf to 3+1, 3+3 leaf doors only). A top and bottom espagnolette shoot bolt operated via an internal, non-lockable lever handle is fitted. Option 1. (active leaf to 3+0, 2+1, 3+1, 3+2, 3+3 leaf configurations only). A drop bolt and black thermoplastic easy-grip pull handle are fitted internally. Option 2. (active leaf to 3+0, 2+1, 3+1, 3+2 and 3+3 leaf configurations only). A top and bottom espagnolette shoot bolt operated via an internal, non-lockable lever handle is fitted.	Not applicable
Threshold Plate	Standard A 140 x 10mm thick extruded aluminium plate with 30° chamfered edges and anti-slip grooves fixes directly to the floor to form a water bar, presents a level surface for the door to seal against, minimises bottom seal wear as the door folds, and provides a solid location point for floor bolts. Option 1 No threshold supplied.(5)	
Surround Frame	Standard Supplied by others.(6) Option 1. Rear mounted frame - 150 x 75 x 10 RSA (angle) goalpost frame for fixing to the back of an opening. Painted in 100µDFT Leighs Epigrip C400 zinc phosphate primer and 75µDFT Leighs Resistex C137 acrylic urethane semi-gloss black. Supplied with suitable anchor fixings. Option 2. Between wall frame - 200 x 100 x 5 RHS (box) goalpost frame for fixing between walls. Painted in 100µDFT Leighs Epigrip C400 zinc phosphate primer and 75µDFT Leighs Resistex C137 acrylic urethane semi-gloss black. Supplied with suitable anchor bolt fixings.	

Note (5) – Threshold Plate. It is recommended that a threshold plate is installed. By not installing a threshold plate, the effectiveness of the bottom seals may be reduced, and wear of bottom seals may be expedited.

Note (6) – Surround Frame. A flush steel goalpost surround frame should be provided in order to install a Rhino door. The minimum thickness of material to be 5mm, and the width of the internal surface to be minimum 150mm. (See SWT series pad drawings for further information)

	Rhino-FI standard details and available options (electric doors only)
Drive System	Standard A FAAC 560 electro-hydraulic motor is mounted internally at the top of each leading edge leaf. A FAAC E145 control panel with 12 function logics, and advanced programming for finer tuning, controls both door halves. A push button unit with Run and Captive Stop buttons is supplied. A manual release arm is fitted to each motor at high-level to enable manual operation of the door. Option 1 A FAAC 560 electro-hydraulic motor is mounted internally at the top of each leading edge leaf. A FAAC E145 control panel with 12 function logics, and advanced programming for finer tuning, controls both door halves. A push button unit with Run and Captive Stop buttons is supplied. A low-level manual release lever is fitted on the inside face of the door to enable instant manual operation of the door.
Control Logic	Standard Control board factory set to Logic "C" Deadman - continuous push to open, continuous push to close. Option 1 - Control board factory set to Logic "E" Semi-automatic - Single push to open, Single push to close. Stop button stops, and holds doors. (7) Option 2 – Control board factory set to Logic "S" Automatic – Single push to open, automatic closing after pre-set pause time (default 60 seconds). Stop button stops, and holds doors.(7)
Safety Features	Safety Edges (7) A full height opto-electronic safety edge is mounted within each leading edge seal of the door. An impact on the edge during closing will automatically stop and re-open the door. Safety edges are continuously monitored so the door cannot close automatically in the event of damage or failure of the edge. Opening Safety Sensors (included as standard with Control Logic 1 or 2) Infrared presence detection sensors are fitted to the inside face of the trailing edge leaf to each door half to prevent the door impacting / crushing a person or object during movement. An active infrared detector is fitted externally above the centre of the opening to prevent the door impacting / crushing a person or object during movement. In the event of any detection during door movement, the door half will stop. Photocells A FAAC XP15W send / receive photocell is fitted across the opening. The receiver unit is fitted with a long-life battery to avoid hard wiring. Photocells can be fitted for closing safety, opening safety, or a combination of opening and closing. If a closing safety beam is broken during the closing cycle, the door will automatically stop and re-open. If an opening safety beam is broken during the opening cycle, the door will automatically stop. Traffic Lights A red and green 24V DC LED traffic light unit is fitted. The unit is sized 370mm x 190mm with 24 LEDs to each light, and is intended to be mounted directly on the inside face of the door or onto a traffic light post. Sequence of operation is Red light on when door closed or part closed, Green light on when door fully open. A pair of 24Vdc limit switches is supplied to monitor the fully open position. Photocell / Traffic Light Posts A pair of 100x100 RHS right angle steel posts are fitted on the inside of the bunched door leaves to mount an internal photocell and / or traffic lights. Posts are painted yellow for maximum visibility.

Note (7) – Control logic. In accordance with BS EN 12453:2001, a safety edge must be installed for semi-automatic (Option 1) or automatic closing (Option 2).

	Rhino-FI standard details and available options (electric doors only)
Additional Controls	Push Button – Additional Run/Captive stop push button unit. Keyswitch – Sprung return keyswitch in separate enclosure for operation of the door by keyholders only. For internal or external use. Digi-key – Bewator K42 stainless steel code lock for operation of the door by authorised persons only. For internal or external use. Radio Control – 868MHz radio control system for remote operation of the door from a vehicle or control room. FAAC Plug-in radio receiver supplied with 1 twin channel transmitter. Additional transmitters available for multi-user systems. Movement Sensor – A Falcon radar movement sensor is mounted at high level, which will open the door on detection approaching traffic, or close the door on detection of retreating traffic. Using microwave technology, the sensor is adjustable so as to ignore pedestrians, or parallel traffic. *Please note: maximum opening height is 5m for microwave sensors.*

Detail Rhino-FI Product datasheet (SEW Variant)

Rhino-FI SEW bi-folding doors

Technical details	Max width 5000mm Max height 7000mm (subject to max 32.5m^2 opening) Panel thickness 62mm Door U-value 1.1W/m^2/°C. (1) Side room required 290 mm to 310 mm Headroom required 450mm Weight 30kg/m^2 Power supply 415V, 3P+N, 16A Opening speed 8 seconds.
Performance	Performance in accordance with BS EN 13241-1:2003 (note these figures are based on a door (not SEW variant) tested in Aug'05) • Forces for Manual Operation – Pass • Watertightness – Class 2 (50pa) • Air Permeability – Class 2 • Life expectancy – more than 20 years • Wind pressure (2) - 1.1kN/m^2 (6m high door), 0.9kN/m^2 (6.5m high door). Acoustic performance of the panel – Average weighted SRI, RW Index tested at 29dB. Overall door 25dB (1)

Standard details

Type of door	Side hung bi-folding door with two leaves folding to each side. Leaves are mounted onto the inside face of the opening and fold inwards at 90°.(3)
Finish	Standard (4) Outside face finished in a choice of 6 stock colours: Colorcoat® LG Plastisol in White (00-E-55), Goosewing Grey (10-A-05), Honesty (10-C-31), Aztec Yellow (10-E-55), Mushroom (10-B-19) or Colorcoat® Prisma in Silver Metallic (RAL 9006). Inside face in Colorcoat® LG Plastisol in White (00-E-55).
Locking and handles	An electro mechanical lock within the drive motor automatically holds the door in the closed position. A stainless steel bottom guide pin engages with a yellow cast-aluminium floor shoe fitted to the threshold, and holds the leading edges in place. A black thermoplastic easy-grip pull handle is fitted internally to each door leaf for manual operation of the door.

Note (1) – U-value and acoustic figures based on a 4,000 mm (W) x 6,000 mm (H) door without windows or wicket doors, and without taking into account inevitable apertures for railway tracks and OLE cut-outs generally associated with doors for rail projects.

Note (2) – Wind pressure capacities are based on panel strengths calculated from physical tests carried out in our works. Calculations given are for standard panel construction with 0.65mm skins, without cut-outs for windows, and with each panel supported at all four corners. Greater wind pressures can be withstood using thicker door skins, and with additional panel reinforcement. For further advice on wind pressures please consult Jewers Doors.

Note (3) – Outward opening doors are available on request, subject to the geography of the site and must be designed with an external track / drive canopy and external mag-locking posts to secure the doors leaves open in windy conditions.

Note (4) – It is recommended that any door panel, which is exposed to significant direct sunlight, should be finished in a light colour. The insulation properties of the panel are so good that, if dark colours are used, the surface temperature of the panel can become unbearably hot, and the panel surface may ripple slightly, or taller panels may temporarily bow, until the temperature falls. This does not however affect the structural integrity of the door. For further advice on colour selection please consult the manufacturer.

Threshold	A 140 x 10mm thick extruded aluminium plate with 30° chamfered edges is fixed directly to the floor with M6 x 75 Thunderbolts. The plate forms a water bar, presents a level surface for the door to seal against, minimises bottom seal wear as the door folds, and provides a solid location point for floor bolts. Threshold plates are profiled between rail tracks as required.
Surround frame	A flush steel goalpost surround frame should be provided in order to install a Rhino door. The minimum thickness of material to be 6mm, and the width of the internal surface to be minimum 150mm. In addition a 300mm x 300mm motor mounting plate is required above the door at the centre of the opening. (6)
Drive system	An SEW S Series helical-worm gear motor with lockable manual brake release operates both door halves simultaneously. Motor power is 0.55kW or 0.75kW generating an output torque of up to 2400Nm. The drive unit is mounted above the top track at the centre of the opening. Minimum Ø40mm drive arms connected between the drive 'propeller' and the jamb hinges control the movement of the door. Manual operation is via a low-level aluminium lever handle operating a cable to release the clutch and allow instant manual movement of the door. Re-engaging the lever handle re-engages the drive. The manual release is interlocked to prevent electric operation of the door whilst disengaged.
Operational controls	A CSL control board with variable speed inverter drive and programmable logic control (PLC) with 42 I/O's programmed via an intuitive HMI touch screen. The steel cabinet is sized 500 mm W x 600 mm H, is IP66 rated and is lockable. Open, Close and Emergency stop buttons and Fault Reset button are mounted on the lid. The board provides variable speed opening and closing, slow-down on opening and closing, door-status displays, inputs for safety edges, photocells, storm bolts, wicket door and the manual release handle, and outputs for traffic lights or an AV alarm. Several spare 24V DC input and output are also provided as standard for integration with external HVAC, Fire, Vehicle Wash Plant, Building Management or Depot Protection systems. Doors will be set to Deadman (continuous push) to open and close unless additional safety features are installed.
Panel construction	Panels are constructed from 2mm thick cold rolled galvanised dovetail channel frames with mitred and spot-welded joints and 5mm thick local reinforcement for hardware. The frame is covered on both sides with minimum 0.65mm thick steel sheets and pressure injected with 50kg/m^3 CFC-free polyurethane foam to form an extremely strong, rigid, flat panel without mechanical fixings. Panel thickness is 62mm.
Seals	Flexible rubber seals are fitted to all edges of the door, and between door leaves. All seals are purpose-designed EPDM extrusions, which press into, and blend seamlessly with the door panels. Each seal provides full finger trap safeguarding, and excellent protection against weather, dust and sand.
Top track and gear	Top tracks are 4 mm thick pressed galvanised steel supported with purpose designed hot-dipped galvanised steel track brackets for fixing back to the head steel. 4-wheel pendant trollies with Ø50 mm sealed bearing wheels and Ø16 mm shafts guide the doors at the head. Pendants are mounted in 80 mm x 120 mm machined and bushed extruded aluminium brackets. Pendants are vertically adjustable.

Jamb hinges	Each door half is hung on three pairs of jamb hinges. Each pair of hinges is manufactured to a low tolerance from laser cut, fabricated, and machined bright steel. Hinges are fitted with min Ø16mm to Ø30mm hinge pins (subject to door size) and Igus bushes. Bottom hinges are fitted with vertical adjustment screws, providing simple and accurate setting during installation. Hinges are finished in black polyester powder coat to RAL 9005(M).
Intermediate hinges	Apex hinge pairs are 120 mm x 120 mm and machined from solid aluminium extrusions, fitted with sealed for life Igus bushes and Ø16mm stainless steel hinge pins. A concealed pin ensures that the hinge pins cannot be removed from the outside. Hinges are finished in black polyester powder coat to RAL 9005(M).

Note (6) – The door frame and drive mounting bracket must be structurally designed to withstand the torque produced by the drive unit during door movement. The output torque of the drive unit will be up to 2400Nm and the torque generated in each top hinge will be up to 1,500Nm, hence the steels need to be designed to accommodate this torque.

	Optional architectural / mechanical items
Finish	Option 1 Outside faces of panels are polyester powder coated in a choice of 13 RAL colours; 1001, 1002, 1013, 1016, 1018, 6018, 6019, 7032, 7035, 9001, 9002, 9006 or 9010. Inside face in LG Plastisol in White. All hinges and drop bolt sleeves are black polyester powder coated in RAL 9005(M). Option 2 Inside and outside faces of panels are polyester powder coated in a choice of 13 stock RAL colours listed in Option 1 above. All hinges and drop bolt sleeves are black polyester powder coated in RAL 9005(M).
Vision panels	Aluminium window frame with one-piece inner liner tray. Window units are double glazed (4~20~4), argon filled, low E toughened glass. Frames are polyester powder coated in matt black to RAL 9005(M), fully sealed, and available in a choice of frame sizes as follows: 400mm x 600mm 600mm x 600mm 400mm x 1200mm 600mm x 1200mm
Wicket door	Option 1 Standard lever furniture. Wicket door opens outwards. Hardware comprises a Briton 5520 mortise sash lock, 25mm low-profile anodised aluminium lever handles, external Europrofile cylinder with internal thumb turn, 1½ pairs of stainless steel butt hinges and a hidden door limiting stay. 85mm high step with 40mm wide aluminium threshold strip. Option 2 Emergency escape furniture. Wicket door opens outwards. Hardware comprises a Briton 379 panic bar, external override cylinder and finger latch, 1½ pairs stainless steel butt-hinges and a hidden overhead door limiting stay. 85mm high step with 40mm wide aluminium threshold strip.
Locking	Option 1 A lever operated floor bolt is fitted internally between pairs of leaves and is electrically interlocked to prevent electric operation with the bolts engaged. The bolt comprises a 240 mm x 70 mm steel case with cast aluminium lever handle which throws a 30 mm x 10 mm steel bar into a stainless steel socket on the threshold. Floor bolt is finished in BZP. Option 2 An automatic solenoid floor bolt is fitted internally between pairs of leaves. The bolt size is Ø20mm with a 50mm stroke and engages automatically into a floor socket as the door closes. The bolt comprises a 335 mm x 60 mm x 55mm black powder coated steel case. Optional cylinder for manual operation.
Surround Frame	Standard Supplied by others.(6) Option 1. Rear mounted frame - 150 x 75 x 10 RSA (angle) goalpost frame for fixing to the back of an opening. Painted in 100µDFT Leighs Epigrip C400 zinc phosphate primer and 75µDFT Leighs Resistex C137 acrylic urethane semi-gloss to match the door leaves. Supplied with suitable anchor fixings and 300 mm W x 350 mm H motor mounting plate. Option 2. Between wall frame - 200 x 100 x 5 RHS (box) goalpost frame for fixing between walls. Painted in 100µDFT Leighs Epigrip C400 zinc phosphate primer and 75µDFT Leighs Resistex C137 acrylic urethane semi-gloss to match the door leaves. Supplied with suitable anchor bolt fixings and 300mm W x 300 mm H gusseted motor mounting plate.

	Optional control & safety equipment
Safety equipment	<u>Safety Edges</u> A pair of full-height Category 3 opto-electronic safety edges are fitted to the leading edges the door. Each edge comprises a send and receive transmitter mounted within the top and bottom of the leading edge seal. An impact on either edge during closing will automatically stop and re-open the door. Safety edges are continuously monitored so the door cannot close automatically in the event of damage to, or failure of the edge. <u>Opening Safety Sensors (included as standard with Control Logic 1 or 2)</u> Infrared presence detection sensors are fitted to the inside face of the trailing edge leaf to each door half to prevent the door impacting / crushing a person or object during movement. An active infrared detector is fitted externally above the centre of the opening to prevent the door impacting / crushing a person or object during movement. In the event of any detection during door movement, the door half will stop. <u>Photocells</u> Photocells comprise a transmitter and a receiver, which sends a beam between the two. Photocells can be fitted for closing safety, opening safety, or a combination of opening and closing. If a closing safety beam is broken during the closing cycle, the door will automatically stop and re-open. If an opening safety beam is broken during the opening cycle, the door will automatically stop. <u>Traffic Lights</u> Red and green 230VAC LED traffic lights each sized 150mm diameter mounted in a black casing and supplied with a fixing bracket. Sequence of operation is Red light on when door closed or part closed, Green light on when door fully open. <u>Photocell / Traffic Light Posts</u> A pair of 100x100 RHS right angle steel posts are fitted on the inside of the bunched door leaves to mount an internal photocell and / or traffic lights. Posts are painted yellow for maximum visibility.
Operational controls	<u>Control Option 1</u> Semi-automatic - Single push to open, Single push to close. Stop button stops doors. <u>Control Option 2</u> Fully-automatic – Single push to open, automatic closing after pre-set pause time (default 60 seconds). Stop button stops, and holds doors. <u>Push Button</u> Additional Open / Close / Stop push button unit. <u>Key switch</u> A sprung return key switch in a separate enclosure for operation of the door by keyholders only. For internal or external use. <u>Digi-key</u> – Bewator K42 stainless steel code lock for operation of the door by authorised persons only. For internal or external use. Alternative control systems, i.e., photocells, light curtains or motion sensors are available subject to design.

Other items (for Rail doors)	OLE cut-out A cut-out is factory prepared at high level within the centre door panels to allow an OLE cable to pass though the closed door. Typically the cut-out is sized between 300 mm x 300 mm to 750 mm x 750 mm, and can be either be central or offset by maximum 300mm from centre. Rubber in-fill matting The OLE cut-out to be lined with 5mm thick electrical safety matting mounted in a black PTFE frame all dielectrically tested to 40kVA. Note the rubber to be cut around the contact wire following installation and adjustment. Earth bonding cables Braided wire earth cables are mounted between door panels and back to the door frame. Cable rating is designed for 25kVA.