

FAAC Swing Gate Operator Selection Knowledge Handbook

Edition 1.1 Complete - All operators with integrated 400/400L geometry annex

Purpose. A searchable, AI-readable source for controlled FAAC and DAAB swing-gate operator screening and selection. This complete revision preserves all operator families and incorporates the expanded 400/400L geometry data as a dedicated chapter.

Geometry limitation. Final installation geometry may be generated only when the exact product path has a complete verified geometry record and passes body-envelope, bracket-feasibility, physical-stop, locking, duty and wind checks. Family-level data is not fabrication authority.

Control	Value
Revision	Edition 1.1 Complete
Date	5 August 2026
Scope	390, 392C, 400/400L, 402, 412, 413, 415/415L, 422, S418, S450H, 750, 770N, S800, S800H, S2500I and DAAB
Controllers	E034, E124S, E145S LC and EP105
Personal survey data	Excluded
Pricing	Excluded from suitability decisions

1. Selection sequence and authority

Step	Decision
1	Validate survey branch, units and per-leaf values.
2	Screen leaf length, leaf weight and application class.
3	Resolve exact product variant and body path.
4	Use exact geometry record; never interpolate blanks.
5	Run body-envelope and bracket-feasibility checks.
6	Resolve opening and closing physical stops separately.
7	Resolve locking direction and electric-lock threshold.
8	Apply duty and wind rules.
9	Assign the governed controller.
10	Rank technically valid candidates; consider price last.

Source hierarchy

- Confirmed internal rules and official comparison data govern explicit corrections.
- Current manufacturer manuals and current UK product data govern product construction.
- Technical annexes structure the evidence and retain partial status where source capture is incomplete.
- Unknown data is not inferred.

Status vocabulary

Status	Meaning
VERIFIED	Direct source support.
VERIFIED_WITH_CONDITIONS	Usable with listed checks.
PARTIAL_GEOMETRY	Some geometry exists, but final automatic output is restricted.
MANUAL_REVIEW	Human engineering or source review required.
HARD_FAIL	Absolute product, geometry or safety limit breached.
DATA_ERROR	Invalid input, matrix, controller or rule path.
EXCLUDED	Not selectable.

2. Survey input dictionary

No.	Measurement	Use
1	Nearest obstacle to gate when open	Operator body and sweep clearance
2	Post width	Mounting and structure
3	Post face to hinge centre	Plan geometry
4	Post surface to hinge centre	Alternative offset reference
5	Gate leaf length	Capacity, locking and wind
6	Hinge centre to front-bracket mounting surface	Front bracket plane
7	Gate leaf height	Exposed area
8	Bottom gap at hinge end	Slope and underground fit
9	Bottom gap at tip end	Slope and movement clearance

Use survey pages 1-3 for measurements 1-9. Do not use the gate-profile page to redefine them.

Mandatory technical fields

- Leaf count, active hinge arrangement, opening direction, handing and required angle.
- Leaf length, height and weight per leaf.
- Gate construction, effective wind solidity and wind exposure.
- Cycles per day and open-hold duty.
- Physical stops recorded separately for opening and closing.
- Supply voltage, mounting preference, existing/new installation and whether hinge geometry may change.

Normalisation

Input	Rule
Not Answered	Missing/inactive; never zero.
N/A	Explicit not applicable.
Bare number	Retain original; attach unit only when safe.
Double gate	Check each leaf; do not average.
Weight	Must be per leaf or explicitly total.
Stops = Open	Closing remains unresolved.

3. Global geometry, stop, locking and controller rules

- A and B originate at the true hinge centre. B is parallel to the closed gate; A is perpendicular to the gate surface.
- Mirror right-hand gates so B remains positive.
- Include half the operator body width in obstacle-side clearance.
- Bracket adaptation is allowed unless product-specific rules prohibit it.
- A valid geometry cell does not prove stops, locking, duty, wind or structural suitability.

Required failure wording. There isn't enough bracket length for the operator body to clear the inside post face according to the actual product dimensions

Controller allocation

System	Controller	Control
392C	Built-in E034	Do not assign E124S.
Other FAAC 24V swing systems	E124S	E024S prohibited.
Standard FAAC 230V swing systems	E145S LC only	E145S, E145 and E045S prohibited.
DAAB	EP105 / approved inverter path	Separate industrial path.

Stops and locking

- Encoder, limit switch, slowdown and hydraulic locking are not physical stops.
- Assess physical stops separately by direction.
- Assess locking direction and length threshold explicitly.
- Non-locking SB/SBS paths require external locking wherever positive holding is required.

4. Operator quick comparison

Family	Max leaf m	Lock threshold	Stops	Controller	Geometry
390 230/24	3.0	1.8	External	E145S LC / E124S	Partial graph
392C	2.5	2.0	Internal O/C	E034	Partial graph
400/400L	2.2-7.0	Variant	Variant/kit	E145S LC	Outward detailed
402	1.8/3.0	CBC/SBS	External O/C	E145S LC	2 references
412	1.8	Within limit	External conservative	E145S LC	2 references
413	2.5	1.8	Internal O/C	E145S LC/E124S	6 rows
415/415L	3/4	2.5/3	Assess	E145S LC/E124S	4 references
422	1.8/3 PED 1.2	Variant	External	E145S LC	Matrices partial
S418	2.7	2.3	Config.	E124S	6 rows
S450H	2/3	CBAC/SB	Manual arrangement	E124S	Exact column table
750	3.5	CBAC 1.8	External	E145S LC	Offset review
770N	3.5	2.0	External/kit	E145S LC/E124S	Graph partial
S800 230V	2/4	CBAC/SBW	Internal subject to limits	E145S LC	Draft partial
S800H 24V	2/4	CBAC/SBW	Internal O/C	E124S	Conditional
S2500I	2.5	2.0	Optional/external	E124S	Partial
DAAB	4/5.5/12	Project	Project	EP105	Engineering review

5. FAAC 390 230V and 24V

Field	Controlled value
Maximum leaf	3.0 m
Current lock threshold	Electric lock above 1.8 m
230V	280 W; 250 Nm max; S3 30%; E145S LC
24V	40 W; 200 Nm max; S3 100%; E124S
Dimensions	410 x 130 x 130 mm; 11.5 kg; IP44
Stops	External opening and closing

Geometry and selection controls

- Use the articulated-arm manufacturer graph; do not infer coordinates.
- Current 1.8 m UK lock threshold overrides older 2 m manual value.
- Further required: digitised graph, exact arm lengths and full swept envelope.

6. FAAC 392C

Field	Controlled value
Maximum leaf / weight	2.5 m / 350 kg
Lock threshold	Above 2 m
Opening	120 deg maximum
Torque / speed	300 Nm / 8.5 deg/s
Controller	Built-in E034
Stops	Standard internal opening and closing

Geometry and selection controls

- Plain 392 is the secondary operator without the board.
- Use product wind table and geometry graph.
- Further required: digitised graph, exact arm sweep and machine-readable wind cells.

7. FAAC 402

Field	Controlled value
CBC	1.8 m; closed-only locking
SBS	3.0 m; non-locking; electric lock
Duty	55 cycles per day
90 deg reference	A120 / B120 / L910
100 deg reference	A100 / B100 / L910
Controller	E145S LC
Stops	External opening and closing

Geometry and selection controls

- Any alternate A/B returns MANUAL_REVIEW.
- Wind-only uncertainty returns MANUAL_REVIEW, not rejection.
- Further required: full Rev B matrices and exact bracket drawings.

8. FAAC 412

Field	Controlled value
Path	Current 230V RH/LH
Maximum leaf	1.8 m
Duty	18 cycles/hour
90 deg	A145 / B145 / L892
110 deg	A125 / B125 / L892
Controller	E145S LC

Geometry and selection controls

- Handing viewed from inside.
- No interpolation between references.
- Further required: full Rev C geometry, stop proof, brackets and outward path.

9. FAAC 413

Field	Controlled value
Variants	230V, 230V LS, 24V, 24V LS
Maximum leaf / lock	2.5 m / 1.8 m
Duty	230V 30%; 24V continuous
Stops	Mechanical O/C on all variants
LS	Electrical limit switches only
Controllers	E145S LC / E124S

Geometry and selection controls

- Use exact stop-dependent configuration.
- Further required: bracket drawing and outward geometry.

10. FAAC 415 and 415L

Field	Controlled value
415	3.0 m; lock above 2.5 m
415L	4.0 m; lock above 3.0 m
415 90/110	A145/B145; A120/B135
415L 90/110	A195/B195; A170/B170
Controllers	E145S LC / E124S

Geometry and selection controls

- Published reference does not prove envelope clearance.
- Use preserved corner-hung 180 mm clearance validation.
- Further required: full Rev 3 tables, pivot-relative dimensions, brackets and outward data.

11. FAAC 422

Field	Controlled value
Standard	987 x 120 x 85 mm; 240 mm stroke
PED	827 x 120 x 85 mm; 160 mm stroke
Locking	CBC/CBCS closed; CBAC/CBACS both; SB/SBS none
Duty	Standard 55/hour partial; PED 70/hour partial
Controller	E145S LC
Stops	External default

Geometry and selection controls

- Standard and PED never mix.
- Exact populated S matrices only; blanks invalid.
- Further required: Rev C cell audit, bracket dimensions, outward matrices and wind method.

12. FAAC S418

Field	Controlled value
Maximum leaf / lock	2.7 m / 2.3 m
Angle	110 deg
Travel	350 mm with stops; 390 mm without
Force / duty	1800 N / continuous
Controller	E124S

Geometry and selection controls

- Six discrete stop-specific configurations only.
- No bracket modification, niche or side-wall recovery.
- Further required: final rendered-source audit and swept envelope.

13. FAAC S450H

Field	Controlled value
CBAC	2.0 m; hydraulic locking
SB	3.0 m; non-locking
Force / speed	5000 N / 2.5 cm/s with E124
Stroke	311 mm
Controller	E124S; encoder mandatory

Geometry and selection controls

- Use exact Rev G column-mounted B/D cell and bracket hole.
- Never cut bracket; UP marking upward.
- Side-wall path remains excluded.
- Further required: pivot-relative moving envelope.

14. FAAC 750

Field	Controlled value
Variants	CBAC 1.8 m; SB 2.5 m; SBS 3.5 m
Maximum weight	800 kg
Torque	543 Nm CBAC/SB; 272 Nm SBS
Stops	External opening and closing
Controller	E145S LC

Geometry and selection controls

- Axis alignment and drainage mandatory.
- Offset loses about 10% torque; Zone B extra reduction unquantified.
- Further required: quantified Zone B and complete shaft positions.

15. FAAC 770N

Field	Controlled value
Variants	230V and 24V
Leaf limits	3.5 m 110; 3 m 180; 2.5 m 140
Torque	330 Nm
Duty	230V 30%; 24V 100%
Controllers	E145S LC / E124S

Geometry and selection controls

- Use leaf-weight graph, not one universal weight.
- Internal stops incompatible with 180 kit.
- Further required: digitised weight graph and exact kit rules.

16. FAAC S800 ENC 230V

Field	Controlled value
Variants	100/180 CBAC and SBW
Leaf / weight	CBAC 2 m; SBW 4 m; 800 kg
Torque / speed	550 Nm / 7.8 deg/s
Controller	E145S LC
Stops	Integrated positive stops within envelope
Source	Rev DRAFT

Geometry and selection controls

- SBW requires electric lock.
- Zone B and shaft-position paths remain MANUAL_REVIEW.
- Further required: final manual, full offset data, duty/weight and digitised tables.

17. FAAC S800H ENC 24V

Field	Controlled value
Variants	100/180 CBAC and SBW
Leaf / weight	CBAC 2 m; SBW 4 m; 800 kg
Torque / speed	600 Nm / 8.2 deg/s on E124
Duty	Continuous at 55 C
Controller	E124S
Stops	Internal positive O/C

Geometry and selection controls

- Axis alignment and drainage mandatory.
- Further required: complete foundation and envelope validation.

18. FAAC S2500I

Field	Controlled value
Maximum leaf / lock	2.5 m / 2.0 m
Weight	250 kg subject to graph
Angle	165 deg
Pillars	100/120/150 mm square, 3-4 mm profile
Controller	E124S

Geometry and selection controls

- Dedicated hinge and anti-fall device required; no intermediate hinges.
- Further required: digitised weight/wind cells and exact stop configurations.

19. DAAB MT, MK2 and M10

Field	Controlled value
MT	3.5-4.0 m config.; 300 kg; 7-16 sec
MK2	5.5 m with lock / 3.5 without; 500 kg; 8-30 sec
M10	12 m; 1500 kg; 16-60 sec
Duty	Continuous
Controller	EP105; DB405; DB409 inverter interface

Geometry and selection controls

- Use for large, intensive, wind-affected, infilled, large-pillar or speed-critical gates as a candidate.
- Exact drive, ratio, arms, brackets, loads and drawings require project engineering.

20. FAAC 400 and 400L integrated geometry chapter

The complete detailed 400/400L annex follows this core handbook. The annex is part of Edition 1.1 Complete, not a separate replacement document.

Path	Body	Y	Overall	Width	Stroke	Min Z
400	Standard	75 mm	1020 mm	120 mm	270 mm	50 mm
400L	Long	100 mm	1265 mm	120 mm	390 mm	50 mm

- Standard and long geometry paths must never be substituted.
- Use exact outward S=0, 20 or 40 matrix cell.
- Blank cells are invalid.
- Apply 60 mm obstacle-side body allowance.
- Fully retract rod, then extend 5 mm for outward setup.
- Outward locking: CBA closed, CBC open, CBAC both, SB/SBS none.
- 400 SBS and SBS Long must not use operator-mounted physical stop kits.
- The appended annex contains all currently captured outward matrix records, wind chart assignments, tests and further requirements.

21. Geometry completeness and further-information register

Path	Status	Further required
390	PARTIAL	Digitised graph and arm sweep
392C	PARTIAL	Digitised graph, arm sweep and wind cells
400/400L outward	VERIFIED_WITH_CONDITIONS	Bracket component dimensions, sweep model, wind contours
400/400L inward	PARTIAL	All individual matrix cells
402	PARTIAL	Full matrices and brackets
412	PARTIAL	Full Rev C, stops and brackets
413	CONDITIONAL	Bracket dimensions and outward data
415/415L	PARTIAL	Full tables, envelope and brackets
422	PARTIAL	Rev C audit, brackets, outward and wind
S418	CONDITIONAL	Rendered audit and sweep
S450H column	CONDITIONAL	Swept envelope
750	PARTIAL/REVIEW	Zone B and shaft data
770N	PARTIAL	Digitised weight graph and kit rules
S800 230V	PARTIAL DRAFT	Final source and offset data
S800H 24V	CONDITIONAL	Foundation/envelope data
S2500I	PARTIAL	Digitised weight/wind/stop cells
DAAB	PROJECT REVIEW	Approved drawings and exact configuration

Cross-product evidence required before fabrication

- Rear and front bracket engineering drawings, pivot offsets, usable lengths, pin sizes, plate sizes and permitted modifications.
- Pivot-relative body dimensions including end caps, motors, cable exits and releases.
- Swept-envelope validation at closed, 25%, 50%, 75% and fully open positions.
- Machine-readable wind regions independently checked against source charts.
- Regression tests for valid cells, blanks, wrong body paths, footnotes, locks and stops.

22. AI output specification

Output field	Requirement
Product / variant	Exact path, voltage and body
Geometry	Method, matrix ID, S/A/B/D/Z/hole and angle
Envelope	Data used, minimum clearance and sweep status
Brackets	Modification need and whether numeric output is permitted
Stops	Opening and closing separately
Locking	Direction and external-lock condition
Duty / wind	Boundary, inputs and result
Controller	Governed board only
Status	VALID_WITH_CONDITIONS, MANUAL_REVIEW, HARD_FAIL or DATA_ERROR
Evidence	Rule IDs, source IDs and revision

If any required geometry or component dimension is absent, return MANUAL_REVIEW and state the exact missing information. Do not estimate fabrication dimensions.

23. Source and revision note

- Edition 1.1 Complete preserves all multi-operator content and appends the expanded 400/400L technical annex.
- The 400/400L annex identifies FAAC 400 installation manual 732871 Rev D (2023) as primary manufacturer authority and Version 11 as the highest available working baseline.
- Edition 1.1 does not claim the missing Version 13 master was reviewed.
- Personal details from the survey example are excluded.

2. Geometry decision contract

2.1 What an AI may output

Geometry evidence	Allowed output
Complete verified exact cell plus all physical checks	Exact A, B, S, angle, matrix ID, footnotes, body path and conditions.
Verified discrete reference only	The exact published reference, labelled VERIFIED_WITH_CONDITIONS.
Matrix range known but cells incomplete	Candidate path and MANUAL_REVIEW only.
Graph not digitised	Manual graph lookup required; no invented coordinate.
Bracket dimensions incomplete	No numeric cutting, extension or fabrication.
Swept-envelope model incomplete	Static clearance result only; final movement clearance MANUAL_REVIEW.
Blank matrix cell	HARD_FAIL geometry; never interpolate.

2.2 Required result fields

- Operator and exact variant; standard/long/voltage/locking path.
- Opening direction and handing.
- Geometry method and source revision.
- Exact matrix or discrete-reference identifier.
- S, A, B, D, Z and bracket hole where applicable.
- Required angle and supported maximum angle.
- Body-envelope data and minimum clearance.
- Bracket modification requirement and whether output is permitted.
- Opening and closing physical stop sources.
- Locking direction and external-lock requirement.
- Duty and wind outcomes.
- Final status, assumptions, warnings and source IDs.

2.3 Common physical checks

- Use the true hinge centre as the rotation centre.
- Include the obstacle-side half-body width beyond the nominal B geometry line.
- Check closed, intermediate and fully open positions where a swept model exists; otherwise return MANUAL_REVIEW for moving-body clearance.
- Check minimum Z, post-side clearance, body taper and remaining bracket length.
- Use the exact failure message when applicable: There isn't enough bracket length for the operator body to clear the inside post face according to the actual product dimensions.

3. Product screening summary

Family	Max leaf	Locking threshold	Geometry status	Controller
390	3.0 m	1.8 m	Articulated graph partial	230V E145S LC / 24V E124S
392C	2.5 m	2.0 m	Graph/manual lookup	Built-in E034
400/400L	2.2-7.0 variant	Variant-specific	Outward detailed; inward cells pending	E145S LC
402	1.8 CBC / 3 SBS	CBC closed / SBS none	Two inward references only	E145S LC
412	1.8 m	Self-locking within limit	Two inward references only	E145S LC
413	2.5 m	1.8 m	Six discrete rows	E145S LC / E124S
415/415L	3 / 4 m	2.5 / 3 m	Four inward references; envelope incomplete	E145S LC / E124S
422	3 m standard; 1.2 PED	Variant-specific	Six matrices embedded; audit pending	E145S LC
S418	2.7 m	2.3 m	Six discrete rows	E124S
S450H	2 CBAC / 3 SB	CBAC / SB none	Exact Rev G column table	E124S
750	3.5 m variant	1.8 CBAC	Coaxial + offset partial	E145S LC
770N	3.5 m	Above 2 m lock	Kit-dependent underground	E145S LC / E124S
S800 230V	2 CBAC / 4 SBW	CBAC / SBW lock	Draft source; Zone B review	E145S LC
S800H 24V	2 CBAC / 4 SBW	CBAC / SBW lock	Coaxial; internal positive stops	E124S
S2500I	2.5 m	2.0 m	Pillar configurations	E124S
DAAB	4 MT / 5.5 MK2 / 12 M10	Project-specific	Engineered drawings required	EP105

4. FAAC 400 and 400L controlled product data

Path	Y	Overall	Width	Half-width	Height	Stroke	Weight	Min Z
400 standard	75	1020	120	60	86	270	8.9 kg	50
400L long	100	1265	120	60	86	390	10.5 kg	50

4.1 Variant paths

Variant	Locking	Max leaf	Published duty	Stop-kit control
400 CBC/CBA/CBAC	CBC closed; CBA open; CBAC both	2.2 m	70/hour	Compatible only where exact kit approved
400 SB	None	4.0 m	70/hour	External lock where holding required
400 CBAC R	Both	2.2 m	80/hour	Rapid path
400 SBS	None	5.0 m internal selector limit	60/hour	Operator-mounted stop kit prohibited
400 CBAC L	Both	2.2 m	50/hour	Long body
400 SB L	None	4.0 m	50/hour	External lock where required
400 SBS L	None	7.0 m	50/hour	Operator-mounted stop kit prohibited

4.2 Matrix and physical-fit order

- Select standard or long body first.
- Select inward or outward direction.
- Select exact S matrix: 0, 20 or 40.
- Read only the exact populated A/B cell and its footnotes.
- Apply the 60 mm half-body obstacle allowance and the correct 1020 mm or 1265 mm body length.
- Apply minimum Z = 50 mm, taper and remaining-bracket checks.
- Apply physical stops, locking, duty and wind as separate layers.

Do not force A and B to be equal. Rank valid exact cells by practical fit, clearance margin, bracket adaptation and warnings.

5. FAAC 400 standard-body outward matrices

Use $Y = 75$ mm. Fully retract the rod, then extend by 5 mm before fixing the front bracket. OPEN bypass controls closing force; CLOSE bypass controls opening force. Footnote (1): closing electric lock required. Footnote (2): speed may be uneven at final movement.

5.1 S = 0

A / B	70	80	90	100	110	120	130	140	150	160
80	105 (1-2)	110 (1-2)	115 (1-2)	120 (1-2)	125 (1-2)	125 (1-2)	115 (1)	105 (1)	100 (1)	95 (1)
90	105 (2)	110 (2)	115 (2)	115 (2)	120 (2)	120	110	100	95	
100	105 (2)	105 (2)	110 (2)	115 (2)	120 (2)	110	105	95		
110	100 (2)	105 (2)	110 (2)	115 (2)	120 (2)	105				
120	100 (2)	105 (2)	110 (2)	110 (2)						
130	100 (2)									

5.2 S = 20

A / B	70	80	90	100	110	120	130	140	150
100	90 (1)	95 (1)	100 (1)	105 (1)	110 (1)	110 (1)	105 (1)	95 (1)	90 (1)
110	90	95	100	105	110	105	100	90	
120	90	95	100	105	110	100	95		
130	90	95	100	105	100	95	90		
140	90	95	100	105	95	90			
150	90	95							

5.3 S = 40

A / B	90	100	110	120	130
120	90	95	100	100	95
130	90	95	100	95	90
140	90	95	95	90	
150	90	95	90		
160	90	90			

6. FAAC 400L long-body outward matrices

Use Y = 100 mm, 1265 mm overall body and 390 mm stroke. Never substitute standard-body tables. Footnotes and outward setup are identical to the standard path unless a cell says otherwise.

6.1 Exact row records

For B80-160, values are ordered B = 80,90,100,110,120,130,140,150,160. For B170-240, values are ordered B = 170,180,190,200,210,220,230,240. For B170-230, values are ordered B = 170,180,190,200,210,220,230. “blank” is invalid.

Matrix / B range	A	Ordered angle values and footnotes
S0 B80-160	100	110(1-2),115(1-2),120(1-2),120(1-2),125(1-2),125(1-2),130(1-2),130(1-2),135(1-2)
S0 B80-160	110	110(1-2),110(1-2),115(1-2),120(1-2),120(1-2),125(1-2),130(1-2),130(1-2),135(1-2)
S0 B80-160	120	105(2),110(2),115(2),115(2),120(2),125(2),125(2),130(2),130(2)
S0 B80-160	130	105(2),110(2),110(2),115(2),120(2),120(2),125(2),125(2),130(2)
S0 B80-160	140	105(2),110(2),110(2),115(2),115(2),120(2),125(2),125(2),130(2)
S0 B80-160	150	105(2),110(2),110(2),115(2),115(2),120(2),120(2),125(2),125(2)
S0 B80-160	160	105(2),105(2),110(2),115(2),115(2),120(2),120(2),120(2),120
S0 B80-160	170	100(2),105(2),110(2),110(2),115(2),115(2),120(2),120(2),115
S0 B80-160	180	100(2),105(2),110(2),110(2),115(2),115(2),115(2),120(2),blank
S0 B80-160	190	100(2),105(2),105(2),blank,blank,blank,blank,blank,blank
S0 B170-240	100	140(1-2),135(1),125(1),115(1),110(1),105(1),100(1),95(1)
S0 B170-240	110	135(1-2),130(1),120(1),110(1),105(1),100(1),95(1),95(1)
S0 B170-240	120	135(2),120,115,105,100,100,95,90(1)
S0 B170-240	130	130(2),115,110,105,100,95,90,90(1)
S0 B170-240	140	120,110,105,100,95,90,90,blank
S0 B170-240	150	115,105,100,95,95,90,blank,blank
S0 B170-240	160	110,105,100,95,blank,blank,blank,blank
S0 B170-240	170	105,blank,blank,blank,blank,blank,blank,blank,blank
S20 B80-160	120	100(1),100(1),105(1),100(1),115(1),115(1),120(1),125(1),125(1)
S20 B80-160	130	95(1),100(1),105(1),110(1),110(1),115(1),120(1),120(1),125(1)
S20 B80-160	140	95,100,105,105,110,115,115,120,120
S20 B80-160	150	95,100,105,105,110,115,115,120,120
S20 B80-160	160	95,100,105,105,110,110,115,115,120
S20 B80-160	170	95,100,105,105,110,110,115,115,110
S20 B80-160	180	95,100,100,105,105,110,110,115,105
S20 B80-160	190	95,100,100,105,105,110,110,110,100
S20 B80-160	200	95,100,100,105,105,110,110,105,95
S20 B80-160	210	95,100,100,105,blank,blank,blank,blank,blank
S20 B170-240	120	125(1),120(1),115(1),105(1),105(1),100(1),95(1),90(1)
S20 B170-240	130	125(1),115(1),110(1),105(1),100(1),95(1),90(1),90(1)
S20 B170-240	140	120,110,105,100,95,95,90,blank
S20 B170-240	150	115,105,100,95,95,90,blank,blank

Matrix / B range	A	Ordered angle values and footnotes
S20 B170-240	160	110,105,100,95,90,blank,blank,blank
S20 B170-240	170	105,100,95,90,blank,blank,blank,blank
S20 B170-240	180	100,95,90,blank,blank,blank,blank,blank
S20 B170-240	190	95,90,90,blank,blank,blank,blank,blank
S20 B170-240	200	90,90,blank,blank,blank,blank,blank,blank
S40 B80-160	140	90(1),95(1),95(1),100(1),105(1),105(1),110(1),115(1),115(1)
S40 B80-160	150	90(1),90(1),90(1),100(1),105(1),105(1),110(1),110(1),115(1)
S40 B80-160	160	90,95,95,100,105,105,110,110,115
S40 B80-160	170	90,95,95,100,100,105,110,110,110
S40 B80-160	180	90,90,95,100,100,105,105,110,105
S40 B80-160	190	90,90,95,100,100,105,105,110,100
S40 B80-160	200	90,95,95,100,100,105,105,105,95
S40 B80-160	210	90,90,95,100,100,105,105,100,95
S40 B80-160	220	90,90,95,100,100,105,100,95,90
S40 B80-160	230	90,90,95,100,100,100,blank,blank,blank
S40 B170-230	140	120(1),110(1),105(1),100(1),95(1),95(1),90(1)
S40 B170-230	150	115(1),105(1),100(1),95(1),95(1),90(1),blank
S40 B170-230	160	110,105,100,95,90,blank,blank
S40 B170-230	170	105,100,95,90,blank,blank,blank
S40 B170-230	180	100,95,90,blank,blank,blank,blank
S40 B170-230	190	95,90,90,blank,blank,blank,blank
S40 B170-230	200	90,90,blank,blank,blank,blank,blank
S40 B170-230	210	90,blank,blank,blank,blank,blank,blank

7. FAAC 400/400L outward operation and locking

Control	Required rule
Rod setup	Fully retract, then extend 5 mm before fixing front bracket.
OPEN bypass	Controls closing force in outward operation.
CLOSE bypass	Controls opening force in outward operation.
CBA	Closed-position hydraulic locking outward.
CBC	Open-position hydraulic locking outward.
CBAC	Locks both directions.
SB / SBS	No hydraulic locking; add external lock wherever positive holding is required.
Footnote 1	Install a closing electric lock.
Footnote 2	Warn of possible uneven speed in final movement.
Blank cell	HARD_FAIL geometry.

7.1 Physical stops

- Physical opening and closing stops remain separate from hydraulic locking.
- External gate stops may be used where structurally suitable.
- An operator-mounted positive-stop accessory may be used only with exact verified compatibility.
- 400 SBS and 400 SBS Long must never be paired with operator-mounted physical stop kits. This does not prohibit suitable external gate stops.

7.2 Envelope rules

- Use 60 mm half-body allowance when the 120 mm width faces the obstacle.
- Use 1020 mm body length for 400 and 1265 mm for 400L.
- Minimum Z is 50 mm.
- The operator must taper toward the gate and must not sit parallel to it.
- Reduce B as far as practical before increasing A, while remaining in an exact populated matrix cell.
- Bracket adaptation is not itself a rejection; final fit and structural suitability must be demonstrated.

8. FAAC 400/400L wind controls

Chart	Exact variants	Axes
Table 7	400 CBC, 400 CBAC, 400 SB	Leaf 0.9-3.0 m; exposed area 1-12 m2
Table 8	400 CBAC L	Leaf 1.1-3.0 m; exposed area 1-12 m2
Table 9	400 SBS	Leaf 0.9-3.0 m; exposed area 1-12 m2
Table 10	400 SBS L	Leaf 1.1-3.0 m; exposed area 1-12 m2

- Select the chart by exact variant; never use the nearest chart.
- Require leaf length, exposed surface area and required wind condition.
- Do not invent a reduction factor for bars, mesh or perforation.
- Do not interpolate a blank region or optimistic contour boundary.
- Use the lower allowance for unresolved boundary points.
- Above the chart allowance is `HARD_FAIL` for that variant.
- Unknown exposed area or ambiguous lookup is `MANUAL_REVIEW`.
- Chart compliance does not replace structural assessment of posts, hinges, leaf and foundation.

Remaining wind task. The four contour images must be digitised into conservative machine-readable regions and independently checked before an AI may return an automatic numerical Beaufort result.

9. Geometry completeness register

Path	Status	Available	Further required
390	PARTIAL	Manual graph exists; not digitised.	Graph points, arm dimensions, swept envelope.
392C	PARTIAL	Manual graph and key clearances.	Digitised graph and full arm sweep.
400/400L outward	VERIFIED_WITH_CONDITIONS	Exact outward cells now included.	Bracket starting dimensions; swept-body model; wind contours.
400/400L inward	PARTIAL	Matrix scopes known.	All inward cells from Version 11 sections 11.3-11.8.
402	PARTIAL	Two discrete inward references.	Full Rev B tables and bracket drawings.
412	PARTIAL	Two discrete inward references.	Full Rev C geometry, stops and brackets.
413	VERIFIED_WITH_CONDITIONS	Six stop-dependent rows.	Bracket dimensions; outward table.
415/415L	PARTIAL	Four inward references.	Rev 3 tables; full bracket and envelope dimensions.
422	PARTIAL	Six matrices included in annex.	Cell audit against Rev C and bracket dimensions.
S418	VERIFIED_WITH_CONDITIONS	Six discrete configurations.	Rendered-source audit of ambiguous rows.
S450H column	VERIFIED_WITH_CONDITIONS	Exact Rev G B/D cell and hole.	Product envelope sweep; no bracket modification.
S450H side wall	EXCLUDED	Source table retained.	Governed selector rule would need explicit revision.
750 standard	PARTIAL	Coaxial installation manual.	Complete capacity/kit and foundation geometry dataset.
750 offset	MANUAL_REVIEW	Zone A/B guidance.	Quantified Zone B reduction and shaft dataset.
770N	PARTIAL	Kit-dependent underground data.	Digitise weight graph and kit constraints.
S800 ENC 230V	PARTIAL	Draft manual, wind and stops.	Final manual, Zone B/shaft evidence, exact weight/duty.
S800H 24V	VERIFIED_WITH_CONDITIONS	Coaxial 100/180 paths and positive stops.	Complete foundation and product-envelope checks.
S2500I	PARTIAL	Pillar/hinge rules and tables.	Digitise all wind/weight cells and stop configurations.
DAAB	MANUAL_REVIEW	Family and controller screening.	Project drawings, arm lengths, ratios, brackets, loads and approved configuration.

10. All further required information

10.1 Highest-priority geometry evidence

Priority	Required information	Why required
1	Complete 400/400L inward matrices from Version 11 sections 11.3-11.8 or Rev D rendered pages.	Enables exact inward lookup rather than ranges only.
2	Original rear/front bracket drawings for 400/400L, 402, 412, 413 and 415.	Required for numeric cut, extension, pin and plate output.
3	Digitised articulated-arm graphs for 390 and 392C.	Required for exact pivot and opening-angle lookup.
4	Full 422 Rev C cell audit.	Promotes embedded matrices from partial to verified.
5	Final S800 ENC 230V manual and approved Zone B/shaft figures.	Replaces draft placeholders and controls offset paths.
6	Digitised wind tables/charts for every product with a graph.	Required for automatic wind outcome.
7	Swept-envelope dimensions relative to pivot centres.	Required for collision checks throughout movement.
8	DAAB approved project-drawing package and selection rules.	Required before exact DAAB geometry can be automated.

10.2 Product dimensions still needed for fabrication

- Rear pivot to body start and body end.
- Rear fork usable length, internal width, pin diameter and pivot offset.
- Rear plate width, height, thickness, hole pattern and edge distances.
- Front clevis pin offset, bracket height, weld footprint and gate-face offset.
- End-cap, motor, cable-exit and release-device projections.
- Maximum permitted cut, extension and welding detail by product.
- Material grade, weld specification and structural design limits.

10.3 Survey fields still needed or must be strengthened

- Explicit inward/outward direction and left/right handing for each leaf.
- Units enforced on every numeric field.
- Gate weight explicitly per leaf.
- Gate thickness and exact hinge-axis coordinates.
- Obstacle geometry and wall location, not only a single nearest distance.
- Post material, usable mounting region and permission for fabrication/packing.
- Effective wind solidity or a governed method to derive it.
- Opening and closing physical stops recorded separately.
- Foundation space and drainage route for underground systems.

10.4 Promotion tests before final geometry output

- Independent cell-by-cell comparison of each digitised matrix against the source.
- Known valid and invalid cell regression tests, including blanks and footnotes.
- Corner-hung 415 validation using the preserved 180 mm clearance example.
- Static and swept-envelope tests at closed, 25%, 50%, 75% and open positions.
- Bracket feasibility tests using actual component dimensions.
- Locking-direction tests for inward and outward hydraulic paths.
- Stop-source tests independent of encoders and limit switches.
- Wind boundary tests using conservative contour interpretation.

11. Revised AI operating instruction

AI use rule. First screen products by leaf length, weight, duty, voltage, stops, locking and wind. Then calculate geometry only for a path marked VERIFIED_WITH_CONDITIONS or better and only when every required input is present. A product family summary is never sufficient authority for fabrication output.

11.1 Required status logic

Condition	Return
Complete exact matrix cell and all checks pass	VALID_WITH_CONDITIONS
Exact cell passes but swept envelope unavailable	MANUAL_REVIEW
Required point is a blank cell	HARD_FAIL
Cell inferred from adjacent values	DATA_ERROR
Wrong body, S matrix or direction used	DATA_ERROR / HARD_FAIL
Bracket dimensions absent	MANUAL_REVIEW; no fabrication output
Wind chart ambiguous	MANUAL_REVIEW or lower conservative allowance
Required lock or stop can be added	VALID_WITH_CONDITIONS with mandatory accessory
Required lock/stop cannot be provided	HARD_FAIL

11.2 Edition 1.1 source note

The new 400/400L data comes from the supplied FAAC 400 and 400L Technical Annex, which identifies FAAC 400 installation manual 732871 Rev D (2023) as the primary manufacturer source and Version 11 as the highest available working baseline. Edition 1.1 does not claim that the missing Version 13 master was reviewed.

12. QA and revision declaration

Check	Result
Edition 1 geometry limitation prominent	PASS
400/400L standard and long separated	PASS
400 standard outward matrices added	PASS
400L outward row records added	PASS
Blank cells explicitly invalid	PASS
Outward rod/bypass/locking rules added	PASS
SBS stop-kit prohibition retained	PASS
Wind chart mapping added	PASS
Further required information listed	PASS
Personal survey data excluded	PASS
Unsupported fabrication permitted	NO
Final filename	FAAC_Swing_Gate_Operator_Selection_Knowledge_Handbook_Edition_1_1.pdf

FAAC Swing Gate Operator Selection Knowledge Handbook

Edition 1.2 Complete - Source-evidence and AI-engine update

This update retains the full Edition 1.1 multi-operator handbook. It adds the complete 400/400L inward geometry source extract, formal engine execution controls from the S28 release-readiness workbook, the geometry-calculator question flow, agent architecture, and the latest controlled release status.

Release boundary. S28 records the selector as NOT ACCEPTED for unrestricted production and states DO NOT DEPLOY LIVE. Permitted use remains controlled internal review and manual-review paths until source, blocked-test, connected UAT, rollback and accountable acceptance gates are closed.

Revision item	Edition 1.2 treatment
400/400L inward matrices	Added as searchable controlled source extract.
Geometry variables	Adds S, Y and derived $E = S + Y$; A must exceed E for taper.
Engine sequence	Adds ordered run, validation, path, geometry and evidence stages.
Candidate outputs	Adds a formal minimum output contract.
750 offset	Adds U-profile placement/welding rule and outstanding Figure 4/5, Zone B and shaft evidence.
Release governance	Adds tested/blocked status and fail-closed production boundary.
Historic status reconciliation	Technical rules retained; obsolete blockers are not allowed to override later supplied manuals.

A. Geometry definitions and calculation controls

Variable	Controlled definition
A	Rear-bracket perpendicular offset from hinge centre.
B	Rear-bracket parallel offset from hinge centre.
D	Signed hinge-to-inside-post-face distance; positive in front, negative rear/corner hung.
S	Hinge centre to internal gate-leaf surface.
Y	Front-bracket pivot offset defined by product.
E	Derived front protrusion: $E = S + Y$.
Z	Effective usable rear-bracket length.

Taper rule. A must be greater than E so the rear of the operator sits farther from the gate than the front. The operator must taper toward the gate and must not sit parallel.

Geometry recovery order

- Do not jump to maximum A.
- Reduce B as far as physically mountable.
- Increase A only as required.
- Re-check open obstacle envelope, closed post envelope, taper and Z.
- Reject only when no exact product geometry survives or remaining bracket length cannot accommodate the body.

400/400L inward promotion

- The appended controlled source pages contain complete standard and long-body $S = 0, 20$ and 40 inward matrices.
- Blank cells remain invalid and must not be interpolated.
- Unusual values such as $86, 89$ and 127 degrees require direct source-page verification before production automation.
- Matrix completion does not enable automatic bracket cutting; component dimensions and swept envelope remain required.

B. Formal engine execution sequence

Step	Phase	Order	Scope	Action	Pass next
SEQ-001	RUN_INITIALISATION	10	RUN	Create immutable run identity and load controlled versions.	SEQ-002
SEQ-002	INPUT_VALIDATION	20	SURVEY	Validate survey keys, types, units, enumerations and required fields.	SEQ-003
SEQ-003	RECORD_EXPANSION	30	GATE	Validate gate count/type and create gate records.	SEQ-004
SEQ-004	RECORD_EXPANSION	40	LEAF	Create and validate separate leaf records.	SEQ-005
SEQ-005	CANDIDATE_GENERATION	50	LEAF	Retrieve current product and variant candidates in the correct application scope.	SEQ-006
SEQ-006	PATH_RESOLUTION	60	CANDIDATE	Resolve exact voltage, body/stroke, direction, linkage and angle path.	SEQ-007
SEQ-007	AUTHORITY_FILTER	70	CANDIDATE	Filter rules and evidence by lifecycle and applicability.	SEQ-008
SEQ-008	ABSOLUTE_LIMITS	80	CANDIDATE	Check verified leaf length, weight, angle and application limits.	SEQ-009
SEQ-009	GEOMETRY	90	CANDIDATE	Retrieve exact discrete geometry and validate mounting path.	SEQ-010
SEQ-010	PHYSICAL_ENVELOPE	100	CANDIDATE	Check rear bracket, body, half-width allowance and swept envelope.	SEQ-011
SEQ-011	FOUNDATION_TRANSIT	110	CANDIDATE	For underground paths, check foundation, drainage, axis, services, release access and transit.	SEQ-012
SEQ-012	PHYSICAL_STOPS	120	CANDIDATE	Assess opening and closing physical stops independently.	SEQ-013
SEQ-013	LOCKING	130	CANDIDATE	Assess locking direction, length threshold and external-lock requirement.	SEQ-014
SEQ-014	DUTY	140	CANDIDATE	Compare demand with the exact authorised duty period or class.	SEQ-015
SEQ-015	WIND	150	CANDIDATE	Apply only product-family-specific wind evidence.	SEQ-016
SEQ-016	CONTROLS	160	CANDIDATE	Validate voltage-specific controller, encoder and feedback path.	SEQ-017
SEQ-017	SAFETY	170	CANDIDATE	Record survey-stage safety constraints and required devices without claiming installation approval.	SEQ-018
SEQ-018	EVIDENCE_COMPLETENESS	180	CANDIDATE	Verify every numeric conclusion retains value, unit, datum, applicability and source.	SEQ-019
SEQ-019	S800_OVERRIDE	190	CANDIDATE	Apply S800 230V controlled offset treatment when applicable.	SEQ-020
SEQ-020	STATUS_AGGREGATION	200	CANDIDATE	Aggregate independent category outcomes using fixed precedence.	SEQ-021
SEQ-021	ACTION_ASSEMBLY	210	CANDIDATE	Assemble all conditions, mandatory accessories, missing evidence and review questions.	SEQ-022
SEQ-022	TECHNICAL_ELIGIBILITY	220	CANDIDATE	Set ranking eligibility from final technical status.	SEQ-023
SEQ-023	RANKING_INITIATION	230	LEAF	Start ranking only after all candidate statuses are final.	SEQ-024
SEQ-024	COST_GATE	240	LEAF	Confirm governed cost connection status.	SEQ-025
SEQ-025	OUTPUT_PUBLICATION	250	RUN	Publish technical and customer views with audit trail and limitations.	END

C. Candidate output and evidence contract

Output block	Required content
Run identity	Immutable survey/run ID and controlled data version.
Candidate identity	Exact product, variant, voltage, body/stroke, direction, linkage and angle path.
Absolute limits	Leaf length, weight, angle and application result.
Geometry	Exact record or matrix ID, S/A/B/D/Z/hole, maximum supported angle and footnotes.
Physical envelope	Half-width, obstacle, post, body, bracket and swept-envelope result.
Foundation/transit	Underground box, drainage, shaft, offset and vehicle-transit result where applicable.
Stops	Operator and external opening/closing stop sources separately.
Locking	Closed/open/both/none, threshold and electric-lock requirement.
Duty and wind	Inputs, source, boundary and result.
Controller	Governed controller only.
Evidence	Source lifecycle, verification status and blocked-data treatment.
Result	Status, reason codes, mandatory conditions and manual-review action.
Ranking	Only among technically surviving candidates; cost evaluated last when governed.

Fail-closed precedence

- A HARD_FAIL from any applicable technical gate eliminates the candidate.
- Blocked or unverified evidence cannot be silently promoted.
- A valid geometry never overrides product limits, collision, missing stops, incompatible locking, duty or wind.
- The orchestrator reconciles results but does not override technical constraint agents.

Agent architecture

Agent	Responsibility
Duty and Performance	Duty, usage, thermal/mechanical loading and reliability.
Safety and Compliance	Hazard mitigation, public access, mandatory safety equipment and veto of unsafe paths.
Orchestrator	Apply precedence, remove HARD_FAIL candidates and produce auditable primary/secondary recommendations.

D. S28 release status and permitted use

Decision field	Value	Basis / next action
S28 audit	COMPLETE	Rule, test, source, release-gate and integrity audit performed
Technical test remediation	SUBSTANTIALLY COMPLETE	225 tests tested; 4 exact cases remain blocked
Production release	NOT_ACCEPTED	Mandatory source, blocked-test, connected UAT, rollback and acceptance gates fail
Live deployment	DO NOT DEPLOY LIVE	Fail-closed release decision
Permitted use	CONTROLLED INTERNAL REVIEW / MANUAL-REVIEW PATHS	No unrestricted production selection
Cost	NOT_CONNECTED — EVALUATE LAST	No governed price source connected
Next action	S29 SOURCE-EVIDENCE AND BLOCKED-TEST CLOSURE	Prioritise S800 230V drawing, blocked tests, product source evidence, UAT and rollback

Release-gate implications

- 225 technical tests are recorded as tested; four exact cases remain blocked.
- Source verification still includes partial, conditional and unverified records.
- Connected UAT acceptance evidence is absent.
- Production rollback rehearsal/evidence is absent.
- No named accountable production acceptance is recorded.
- Cost remains not connected and must be evaluated last.

Handbook use. Edition 1.2 is suitable for controlled knowledge retrieval, screening, audit and manual-review support. It must not be presented as proof of unrestricted production release.

Historic source-control note

The uploaded file is named FAAC_Operator_Selector_Master_Backup_v13.docx, but the document body identifies itself as a Version 12 backup based on Version 11 and says no Version 13 source was reviewed. Edition 1.2 therefore cites it as a backup source extract, not as verified Version 13 authority.

E. 750 offset remediation and remaining evidence

Item	Controlled treatment
Figure 3	U-profile may be fitted on the side of the gate.
Figure 4	U-profile may be fitted below the gate.
Below-gate holes inaccessible	The profile may be welded to the gate.
Figure 5	Dimensions must always be observed.
Visible references	152-175 mm, 124 mm and (100 mm) retained as source values.
Zone A/B	Zone A preferred; Zone B remains MANUAL_REVIEW.
Unknowns	Exact Zone B torque reduction and full shaft-position data are not invented.

Further information still required

- Direct verification of unusual 400/400L inward matrix values against FAAC 400 manual 732871 Rev D.
- Exact bracket component drawings for numeric fabrication output.
- Digitised 390 and 392C geometry graphs and articulated-arm sweep.
- Cell-by-cell 422 Rev C matrix audit.
- Final S800 ENC 230V manual and controlled Zone B/shaft data.
- Machine-readable wind chart regions independently checked against source charts.
- Connected UAT, rollback rehearsal and named acceptance before production release.

No values invented. Missing evidence remains manual review, controlled exclusion or blocked-data status.

11. Embedded Geometry Matrices - FAAC 400 / 400L (Inward Opening)

11.1 Matrix interpretation rules

- These matrices are the authoritative geometry limits for the FAAC 400 / 400L family for inward-opening installations.
- Use the selected matrix to determine A->B or B->A directly.
- Each valid cell gives the maximum opening angle and any mandatory footnote(s).
- Blank / missing cells are invalid / unsupported geometry combinations.
- After selecting a valid cell, always apply the separate practical validation layer: body-envelope checks, post-side fit, Z / bracket fit, and stop and locking rules.

11.2 Footnotes used in the 400 / 400L matrices

- (1) a closing electric lock has to be installed
- (2) the speed of the leaf could be uneven during the final stage of movement
- (1-2) both conditions apply

11.3 Measurements 400 - Standard Body - S = 0

A \ B	80	90	100	110	120	130	140	150
80	110° (1-2)	115° (1-2)	120° (1-2)	120° (1-2)	125° (1-2)	115° (1)	105° (1)	100° (1)
90	105° (1-2)	110° (1-2)	115° (1-2)	120° (1-2)	120° (1-2)	110° (1)	100° (1)	95° (1)
100	105° (2)	110° (2)	115° (2)	120° (2)	110°	105°	95°	
110	105° (2)	110° (2)	115° (2)	115° (2)	105°	100°	95°	
120	105° (2)	105° (2)	110° (2)	105°	100°	95°		
130	100° (2)	105° (2)	110° (2)	100°	95°	90°		
140	100° (2)	105° (2)	100°	95°	90°			
150	100° (2)	100°	90°	85°	85°			
160	100° (2)	90°	85°					

Blank cells are invalid / unsupported geometries.

11.4 Measurements 400 - Standard Body - S = 20

A \ B	80	90	100	110	120	130	140	150
100	95° (1)	100° (1)	105° (1)	110° (1)	110° (1)	105° (1)	95° (1)	95° (1)
110	95° (1)	100° (1)	105° (1)	110° (1)	105° (1)	100° (1)	95° (1)	95° (1)
120	95°	100°	100°	105°	100°	95°	90°	
130	95°	95°	100°	100°	95°	90°	85°	
140	95°	100°	100°	95°	90°	86°		
150	95°	95°	95°	85°	85°			
160	95°	95°	85°					

Blank cells are invalid / unsupported geometries.

11.5 Measurements 400 - Standard Body - S = 40

A \ B	100	110	120	130	140	150
120			100° (1)	95° (1)	90° (1)	85° (1)
130			95° (1)	90° (1)	85° (1)	
140		95°	90°	85°		
150		90°	85°			
160	85°	85°				

Blank cells are invalid / unsupported geometries.

11.6 Measurements 400L - Long Body - S = 0

Complete manufacturer matrix from FAAC manual 732871 Rev. D, page 14. Values are maximum opening angles in degrees. Blank cells are invalid and must not be interpolated.

S = 0, B = 80 to 150 mm

A / B	80	90	100	110	120	130	140	150
100	105 (1-2)	110 (1-2)	115 (1-2)	115 (1-2)	120 (1-2)	125 (1-2)	125 (1-2)	130 (1-2)
110	105 (1-2)	110 (1-2)	115 (1-2)	115 (1-2)	120 (1-2)	120 (1-2)	125 (1-2)	130 (1-2)
120	100 (1-2)	110 (1-2)	110 (1-2)	115 (1-2)	120 (1-2)	120 (1-2)	125 (1-2)	125 (1-2)
130	100 (2)	105 (2)	110 (2)	115 (2)	115 (2)	120 (2)	120 (2)	125 (2)
140	100 (2)	105 (2)	110 (2)	110 (2)	115 (2)	120 (2)	120 (2)	125 (2)
150	100 (2)	105 (2)	105 (2)	110 (2)	115 (2)	115 (2)	120 (2)	120 (2)
160	100 (2)	105 (2)	105 (2)	110 (2)	115 (2)	115 (2)	120 (2)	120 (2)
170	100 (2)	100 (2)	105 (2)	110 (2)	110 (2)	115 (2)	115 (2)	120 (2)
180	100 (2)	100 (2)	105 (2)	105 (2)	110 (2)	110 (2)	115 (2)	115 (2)
190	100 (2)	100 (2)	105 (2)	105 (2)	110 (2)	110 (2)	115 (2)	105
200	100 (2)	100 (2)	100 (2)	105 (2)	110 (2)	110 (2)	110 (2)	100
210	100 (2)	100 (2)	100 (2)	105 (2)	105 (2)	110 (2)	100	95
220	95 (2)	100 (2)	100 (2)	105 (2)	105 (2)	100	95	90
230	100 (2)	100 (2)	100 (2)	100 (2)	105 (2)	95	90	85
240	95 (2)	100 (2)	100 (2)	105 (2)	95	90	85	85
250	100 (2)	100 (2)	100 (2)	95	90	85		
260	95 (2)	100 (2)	95	90	85			
270	95 (2)	95 (2)	85	85				

S = 0, B = 160 to 220 mm

A / B	160	170	180	190	200	210	220
100	135 (1-2)	135 (1-2)	135 (1-2)	120 (1)	115 (1)	110 (1)	105 (1)
110	130 (1-2)	135 (1-2)	130 (1)	120 (1)	110 (1)	105 (1)	100 (1)
120	130 (1-2)	130 (1-2)	120 (1)	115 (1)	110 (1)	105 (1)	100 (1)
130	125 (2)	130 (2)	115	110	105	100	
140	125 (2)	120	110	105	100	100	
150	125 (2)	115	105	100	100	95	
160	120 (2)	110	100	100	95		
170	110 (2)	100	100	95	90		
180	105	100	95	90			
190	100	95	90	90			
200	95	90	90				
210	90	85	85				
220	85	85					
230	85						

Footnotes: (1) a closing electric lock has to be installed; (2) leaf speed could be uneven during the final stage of movement; (1-2) both conditions apply.

11.7 Measurements 400L - Long Body - S = 20

Complete manufacturer matrix from FAAC manual 732871 Rev. D, page 14. Values are maximum opening angles in degrees. Blank cells are invalid and must not be interpolated.

S = 20, B = 80 to 150 mm

A / B	80	90	100	110	120	130	140	150
120	95 (1)	100 (1)	105 (1)	105 (1)	110 (1)	115 (1)	115 (1)	120 (1-2)
130	95 (1)	100 (1)	100 (1)	105 (1)	110 (1)	110 (1-2)	115 (1-2)	120 (1-2)
140	95 (1)	100 (1)	100 (1)	105 (1)	110 (1)	110 (1)	115 (1-2)	115 (1-2)
150	95	95	100 (2)	105	105	110 (2)	110 (2)	115 (2)
160	95	95 (2)	100 (2)	100	105 (2)	110 (2)	110	115 (2)
170	95 (2)	95	100	105 (2)	105 (2)	110 (2)	110 (2)	110 (2)
180	95 (2)	95	100 (2)	100 (2)	105	105 (2)	110 (2)	110 (2)
190	95 (2)	95 (2)	100 (2)	100 (2)	105 (2)	105 (2)	110 (2)	105
200	90 (2)	95 (2)	100 (2)	100 (2)	100 (2)	105 (2)	110 (2)	100
210	90 (2)	95 (2)	100 (2)	100 (2)	100 (2)	105 (2)	100	95
220	90 (2)	95 (2)	95 (2)	100 (2)	100 (2)	105 (2)	95	90
230	90 (2)	95 (2)	95 (2)	100 (2)	100 (2)	95	90	85
240	90 (2)	95 (2)	95 (2)	100 (2)	95	90	85	85
250	90 (2)	95 (2)	95 (2)	95 (2)	90	85		
260	90 (2)	95 (2)	95 (2)	90	85			
270	90 (2)	95 (2)	90	85				

S = 20, B = 160 to 230 mm

A / B	160	170	180	190	200	210	220	230
120	120 (1-2)	127 (1-2)	125 (1)	115 (1)	110 (1)	105 (1)	100 (1)	95 (1)
130	120 (1-2)	125 (1-2)	115 (1-2)	110 (1)	105 (1)	100 (1)	95 (1)	95 (1)
140	120 (1-2)	120 (1-2)	110 (1)	105	100 (1)	95 (1)	95 (1)	
150	120 (2)	115	105	100	100	95	90	
160	115 (2)	110	100	100	95	90		
170	110	105	100	95	90	90		
180	105	100	95	90	90			
190	100	95	90	90	85			
200	95	90	90	85				
210	90	85	85	85				
220	85	85						
230	85							

Footnotes: (1) a closing electric lock has to be installed; (2) leaf speed could be uneven during the final stage of movement; (1-2) both conditions apply.

11.8 Measurements 400L - Long Body - S = 40

Complete manufacturer matrix from FAAC manual 732871 Rev. D, page 14. Values are maximum opening angles in degrees. Blank cells are invalid and must not be interpolated.

S = 40, B = 90 to 160 mm

A / B	90	100	110	120	130	140	150	160
140	90 (1)	95 (1)	100 (1)	100 (1)	105 (1)	105 (1)	110 (1)	115 (1)
150	90 (1)	95 (1)	95 (1)	100 (1)	105 (1)	105 (1)	110 (1)	110 (1)
160	90 (1)	90 (1)	95 (1)	100 (1)	100 (1)	105 (1)	110 (1)	110 (1)
170	90	90	95	100	100	105	105	110

A / B	90	100	110	120	130	140	150	160
180	90	90	95	100	100	105	105	105
190	90	90	95	100	100	105	105	100
200	90	90	95	100	100	105	100	95
210	90	90	95	95	100	100	95	90
220	90	90	95	95	100	95	90	85
230	90	90	95	95	95	90	89	85
240	90	90	95	95	90	85	85	
250	90	90	95	90	85			
260	90	90	90	85				
270	90	90	85					

S = 40, B = 170 to 230 mm

A / B	170	180	190	200	210	220	230
140	115 (1)	110 (1)	105 (1)	100 (1)	95 (1)	95 (1)	90 (1)
150	115 (1)	105 (1)	100 (1)	95 (1)	95 (1)	90 (1)	90 (1)
160	110 (1)	100 (1)	100 (1)	95 (1)	90 (1)	90 (1)	85 (1)
170	105	100	95	90	90	85	
180	100	95	90	90	85	85	
190	95	90	90	85	85		
200	90	90	85	85			
210	90	85	85				
220	85						

Footnotes: (1) a closing electric lock has to be installed; (2) leaf speed could be uneven during the final stage of movement; (1-2) both conditions apply.

12. Geometry Calculation Tool - Required Question Flow and Decision Logic

12.1 Purpose of the tool

The geometry calculation tool must guide the user through the minimum set of questions needed to identify which operators are out of scope, identify valid candidates, determine the easiest practical A / B solution, determine the practical rear-bracket position, state whether the rear bracket should remain standard, be cut down, or be extended, apply the separate stop and locking rules, and explain clearly why any operator was rejected or retained.

The tool must not invent geometry for operators whose tables or full model rules are not yet embedded in this document.

12.2 Current calculation scope

- At the current stage of this document, the calculation tool may perform full geometry calculations only for the following operators and variants:
For the FAAC 400 and 400L inward-opening paths, complete S = 0, 20 and 40 matrices are embedded from manual 732871 Rev. D. Outward-opening 400/400L data is available from the same manual but remains implementation-pending.
- FAAC 400 standard body

- FAAC 400L long body
- FAAC 422 standard body
- FAAC 422 PED / short operator

All other straight-arm operators must remain in manual review / pending geometry mode until their geometry rules are embedded.

12.3 Questions the tool must ask

The tool must ask questions in a structured order so that impossible operators are filtered out early.

Stage 1 - Basic project scope

1. Is the gate inward opening or outward opening? If outward opening and the operator has no outward-opening rules embedded, mark the operator as out of scope.
2. Is the leaf standard or pedestrian / narrow leaf?
3. Required maximum opening angle?
4. Is the gate single leaf or double leaf?
5. Which side is hinged? (left / right). Handing must be handled by mirroring only; B remains positive.

Stage 2 - Gate and hinge geometry inputs

6. Distance from hinge centre to inside face of the post / pier (D).
7. Available width on the mounting face of the post for the rear bracket.
8. Gate thickness.
9. Gate internal face / mounting surface details needed to derive front-bracket relationship.
10. Whether the hinge is centre-hung, inset, or rear-hung / corner-hung.

Stage 3 - Open-position obstacle and clearance inputs

11. Is there a wall / obstacle / return in the open position?
12. What is the clearance from the open gate face to that obstacle?
13. Are there any post-side structural restrictions in the closed position?

Stage 4 - Non-geometry selection inputs

14. Is physical stop provision already present on the gate?
15. If not, may external stops be added?
16. Is a locking operator required, and if so in which direction(s)?
17. Gate leaf length.
18. If the operator is hydraulic, which locking behaviour is acceptable?
19. Is smoother motion a strong preference, or is a valid but less ideal geometry acceptable?
 - 19A. For S450H, is the gate a shorter open-bar design with low wind loading? Record leaf length, height, infill/open area and exposure.
 - 19B. For S450H, is a suitable external closed gate stop present or capable of being added?

Stage 5 - Product / family filtering inputs

20. Which operator families are being considered?
 - 20A. For S450H, record D, required opening angle and whether a directly verified Rev. G bracket-hole configuration exists. Do not ask for or calculate a fabricated B value.
21. If 400 family is selected, which body length is being considered?
22. If 422 family is selected, is this a standard leaf or pedestrian leaf?

12.4 Early exclusion logic

- Exclude immediately if the required opening direction is outside the embedded scope, the operator family has no embedded geometry for the requested mode, the requested opening angle cannot appear in any available table for that operator, the operator body cannot satisfy the universal taper rule, stop or locking requirements make the operator incompatible, or SBS variants are being paired with physical stop kits.

- Reject any variant where the required locking direction is not available and an external electric lock is not permitted or cannot be added.
- Reject any variant where physical stopping is required but neither operator-provided physical stops nor external physical gate stops are available.
- Reject any 400 SBS / 400 SBS Long selection if the stop strategy depends on a physical stop kit.
- Keep in manual-review mode if the operator is in scope generally but its geometry tables are not yet embedded.

For S450H, require an external electric lock above 2 m. Treat longer, boarded, substantially infilled or wind-exposed S450H gates as MANUAL_REVIEW. Do not rely solely on the internal closed-position stop outside the approved shorter open-bar low-wind application.

12.5 Geometry calculation logic for matrix-driven operators

23. Select the correct operator family and body type.
24. Select the correct S table.
25. Search the matrix for cells that meet or exceed the required opening angle.
26. Exclude any matrix cells that are physically impossible once obstacle-side body envelope, post-side body envelope, taper-rule compliance, and Z feasibility are applied.
27. Of the remaining valid cells, rank them by practicality.

12.6 Practical ranking logic - choosing the best A and B

- Prefer the geometry that makes the rear bracket easiest to fit on the post.
- Prefer the geometry that minimises required bracket adaptation.
- Prefer the geometry that preserves a smooth motion profile.
- Prefer a geometry with fewer warnings / footnotes.
- Prefer a geometry that leaves more physical margin on both the open side and post side.
- Do not force equal A and B.
- Try to keep B as low as practical while still making the geometry physically mountable.
- Increase A only as needed to achieve clearance and preserve the taper rule.
- Reject only if no valid matrix cell survives physical checking.

12.7 Rear-bracket position output rules

- For each retained operator, output the chosen operator family / variant, chosen table and S condition, chosen A, chosen B, resulting maximum opening angle, any footnotes / warnings, whether an electric lock is required, whether speed may be uneven in the final stage, rear-bracket pivot position relative to the hinge, rear-bracket pivot position relative to the post corner / mounting face where possible, whether the bracket remains standard, must be cut, or must be extended, and if adapted, by how much.
- Each result must explicitly state operator-provided physical stop capability as included, optional, or none.
- Each result must explicitly state external physical gate stops from site data as yes, no, or unknown.
- Each result must explicitly state final stop availability as open, close, both, or none.
- Each result must explicitly state locking class as closed only, open only, both, or none.
- Each result must explicitly state whether an external electric lock is required, optional, or not required.

12.8 Bracket cut / extension logic

28. Start with the product's available rear bracket length (Z).
29. Compare the required rear-pivot geometry with the usable bracket length.
30. If the standard bracket length is too long, calculate the amount to cut.
31. If the standard bracket is too short but extension is allowed, calculate the extension required.
32. If the required cut would leave too little bracket length for the operator body to physically exist, reject using the mandatory message.

There isn't enough bracket length for the operator body to clear the inside post face according to the actual product dimensions

The tool must never reject an operator merely because the bracket needs adapting.

12.9 Required operator-by-operator outputs

- Rejected: exact reason for rejection and whether rejection was due to geometry table limits, body-envelope failure, locking incompatibility, stop incompatibility, or bracket infeasibility.
- Retained but with warning: selected geometry, all footnotes, all physical cautions, any lock or stop requirement.
- Best practical option: selected A and B, selected S table, bracket position, bracket modification requirement, and why this option is the easiest practical fit.

12.10 Future implementation note

This section defines the logic for a future interactive geometry calculator. The calculator may later be implemented as a structured question flow, a spreadsheet, a Power App, or a coded tool. Regardless of implementation method, the logic above is authoritative and must be followed.

End of current consolidated ruleset

13. Agent-Based Decision Architecture (Authoritative)

13.1 Duty & Performance Agent

Purpose: Determines whether an operator is operationally suitable over time for the declared usage.

Scope: assesses duty cycle, usage class, thermal and mechanical loading; enforces manufacturer duty limits and variant suitability; issues HARD_FAIL where longevity or reliability cannot be assured.

Outputs: VALID / VALID_WITH_CONDITIONS / HARD_FAIL with explicit justification and mandatory conditions.

13.2 Safety & Compliance Agent

Purpose: Determines whether an installation can be made compliant with applicable safety standards and legal obligations.

Scope: evaluates hazard mitigation feasibility and public access implications; determines mandatory safety equipment and operational restrictions; holds absolute veto authority for unsafe or non-compliant scenarios.

Outputs: VALID / VALID_WITH_CONDITIONS / HARD_FAIL with enforceable compliance requirements.

13.3 Orchestrator Agent

Purpose: Sole decision authority that reconciles all constraint agents and produces the final outcome.

Responsibilities: applies strict precedence order: Safety, Geometry, Stops & Locking, Duty; eliminates any operator with a HARD_FAIL from any agent; selects primary and secondary recommendations from remaining candidates; outputs a defensible, auditable final decision.

The orchestrator must not perform technical analysis or override any constraint agent.

FAAC Swing Gate Operator Selection Knowledge Handbook

Edition 1.3 Complete - Public-source evidence closure update

Scope. This update uses FAAC Help, FAAC global support and FAAC UK public sources to identify current English manuals, replace obsolete source-status statements, add accessory manuals and separate facts that are confirmed online from evidence that still requires page-level extraction.

Authority rule. Confirmed internal selector controls remain authoritative where deliberately stricter. Public manuals may reveal a manufacturer-supported option, but the option is not activated automatically when it conflicts with a governed selector rule.

Website	Role
https://www.faac.help/en	Current manuals, products, revision history and document links.
https://www.faac.biz/support/manuals-and-certificates	Consolidated global manual collections for swing gates, boards, accessories and certificates.
https://www.faac.co.uk/	UK product positioning, technical sheets and current UK application limits.

A. Current manual revision register

Family	Current English record	Handbook action	Status
400	400_732871_RevD	Current; existing source remains valid.	CONFIRMED
390	390_732669_RevD	Current; existing source remains valid.	CONFIRMED
392/392C	392_392C_532879_RevB	Replaces Rev A source status; technical delta audit required.	SOURCE UPGRADE
402	402_732143_RevB	Current; use for full geometry/bracket capture.	CONFIRMED
412	412_732238_RevC	Current; use for full geometry/bracket capture.	CONFIRMED
415	415_00058I0457_Rev3	Current; use to complete partial 415/415L path.	SOURCE UPGRADE
422	422_732870_RevC	Current; direct matrix cell audit required.	CONFIRMED
S418	S418_00058I0806_Rev3	Current; direct table audit required.	CONFIRMED
770N	770N_732615_RevB	Current; existing main source remains valid.	CONFIRMED
S800 ENC	S800_ENC_532116_RevB	Current final manual exists; replaces draft-only source status.	SOURCE UPGRADE
S800 supporting box	S800H_S700H_Supporting_Box_732550_RevD	New foundation/drainage source.	NEW SOURCE
S2500I	S2500I_532323_RevD	Replaces Rev A; technical delta audit required.	SOURCE UPGRADE
S2500I hinge	S2500I_HINGE_532324_RevB	New dedicated hinge source.	NEW SOURCE

Public source URLs

- 400: <https://www.faac.help/en/documents/400>
- 390: <https://www.faac.help/en/documents/390>
- 392/392C: <https://www.faac.help/en/documents/392-392c>
- 402: <https://www.faac.help/en/documents/402>
- 412: <https://www.faac.help/en/documents/412>
- 415: <https://www.faac.help/en/documents/415>
- 422: <https://www.faac.help/en/documents/422>
- S418: <https://www.faac.help/en/documents/s418>
- 770N: <https://www.faac.help/en/documents/770n>
- S800 ENC: <https://www.faac.help/en/documents/s800-enc>
- S800 foundation box: <https://www.faac.help/en/documents/s800-foundation-box>
- S2500I: <https://www.faac.help/en/documents/s2500i>
- S2500I hinge: <https://www.faac.help/en/documents/s2500i-hinge>

B. Gaps closed or reduced

Gap	New evidence	Revised treatment
S800 230V source marked draft	FAAC Help identifies S800_ENC_532116_RevB as current.	Remove “draft is current” statement. Keep technical fields conditional until Rev B pages are extracted and compared.
392C based on Rev A	FAAC Help identifies 392_392C_532879_RevB as current.	Retain E034 rule and Rev A values as prior evidence; perform Rev B delta audit before promotion.
S2500I based on Rev A	FAAC Help identifies S2500I_532323_RevD and hinge RevB.	Upgrade source register and revalidate geometry, wind, stops, pillars and hinge requirements.
415 partial source	Current Rev3 record identified.	Use Rev3 as the primary completion source for geometry and brackets.
770N supporting detail scattered	Foundation box, encoder, quick guide and internal-stop manuals identified.	Add exact accessory source IDs and use them for compatibility checks.
S800 foundation detail incomplete	Supporting-box RevD identified.	Use for foundation, drainage, routing, alignment and reinforcement evidence.

S2500I control-board conflict

Rev D public content identifies both E034 and E124S control paths for S2500I, with an absolute encoder required on E124S and not required on the E034 path. The governed selector rule remains stricter: only 392C uses E034; S2500I continues to use E124S. Record the manufacturer option as a source conflict, not an active selector choice.

392C product-page confirmation

- The current 392/392C product page identifies the E034 board as an integral product feature and lists product SKUs 104583 and 104584.
- The page also describes local or Simply Connect programming and optional XLC standby reduction. These details are informative; they do not change the geometry, locking or stop layers.

C. Underground source expansion

770N document	Current record	Use
Main manual	770N_732615_RevB	Operator limits, angular kits, installation and compatibility.
Quick guide	770N_QUICK_00058I0939_RevB_Multi	Installation/commissioning cross-check.
Foundation box	770_Foundation_Box_732268_RevB	Box dimensions, drainage, cable routes and axis alignment.
Absolute BUS encoder	Absolute Bus Encoder Underground Operator_00058I0952_Rev2	Feedback compatibility and setup.
Internal mechanical stops	Positive_Stop_770_732292_RevB_Multi	Physical-stop compatibility and limits.

770N public source URLs

- <https://www.faac.help/en/documents/770n>
- <https://www.faac.help/en/documents/770n-quick-guide>
- <https://www.faac.help/en/documents/770n-foundation-box>
- <https://www.faac.help/en/documents/770n-encoder>
- <https://www.faac.help/en/documents/770-internal-mechanical-stops>

S800 current source position

- The public record identifies S800_ENC_532116_RevB as current.
- The current source register must no longer describe the draft file as the latest available manual.
- Automatic promotion still requires page-level comparison of technical table, wind limits, positive-stop conditions, support-box installation, Zone B and shaft-position evidence.

D. Further page-level extraction still required

Priority	Manual/pages to extract	Target gap
1	S800_ENC_532116_RevB plus supporting-box RevD	Final product data, stops, wind, foundation and source-delta closure.
2	392_392C_532879_RevB	Rev A to Rev B geometry, wind, stops and technical-data delta.
3	S2500I_532323_RevD and hinge RevB	Weight/width graph, wind, stop choices, pillar and hinge rows.
4	415_00058I0457_Rev3	Complete 415/415L tables and bracket configurations.
5	422_732870_RevC	Cell-by-cell verification of six embedded matrices.
6	402_732143_RevB and 412_732238_RevC	Full geometry and bracket evidence.
7	770N accessory manuals	Foundation, encoder and internal-stop compatibility.

Do not infer missing cells from current-revision identification alone. A revision record proves which manual is current; it does not by itself validate every matrix cell or dimension already in the handbook.

Remaining non-public or engineering gaps

- Swept-body polygons relative to pivot centres.
- Exact bracket usable lengths, weld engagement and maximum extension.
- DAAB project-specific arm, gearbox, structural and drawing approval.
- Effective wind-solidity method for barred or perforated gates.
- Connected UAT, rollback rehearsal and named production acceptance.

E. Revision declaration

Control	Edition 1.3 result
All operator families retained	PASS
Current public manual revisions recorded	PASS
S800 draft-only status corrected	PASS
S2500I E034 conflict controlled	PASS
Internal controller governance preserved	PASS
Unknown geometry invented	NO
Production release status changed	NO - remains controlled internal/manual review
Next update	Page-level source extraction and matrix delta audit