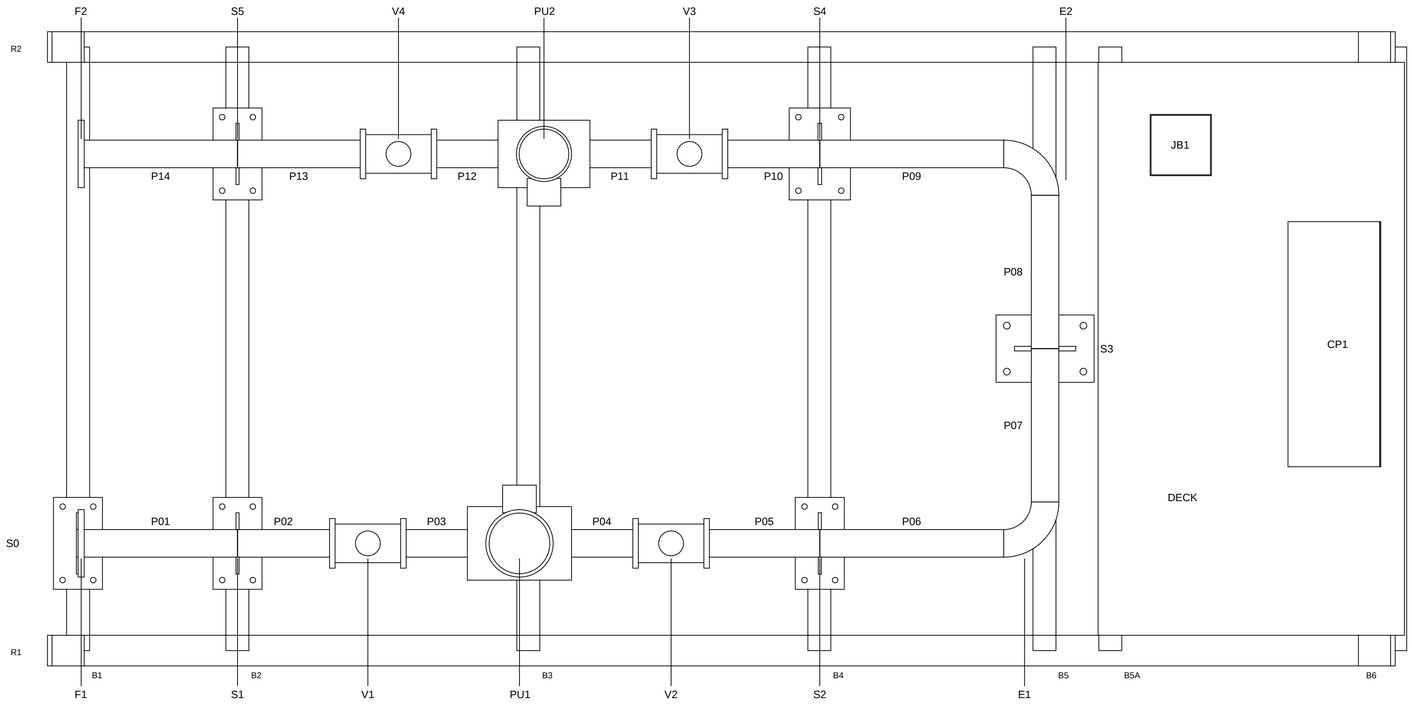
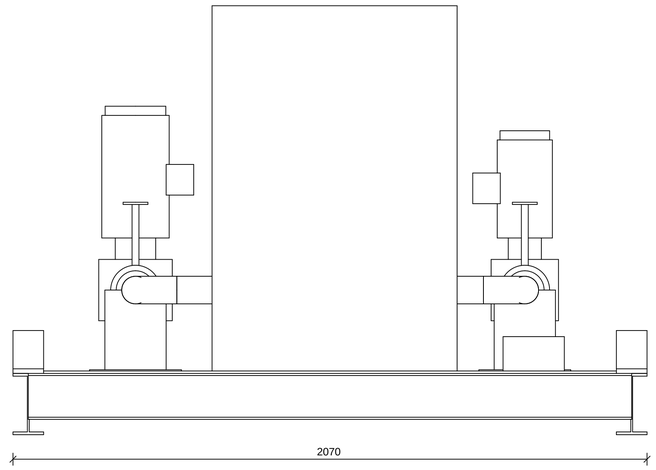
PLAN

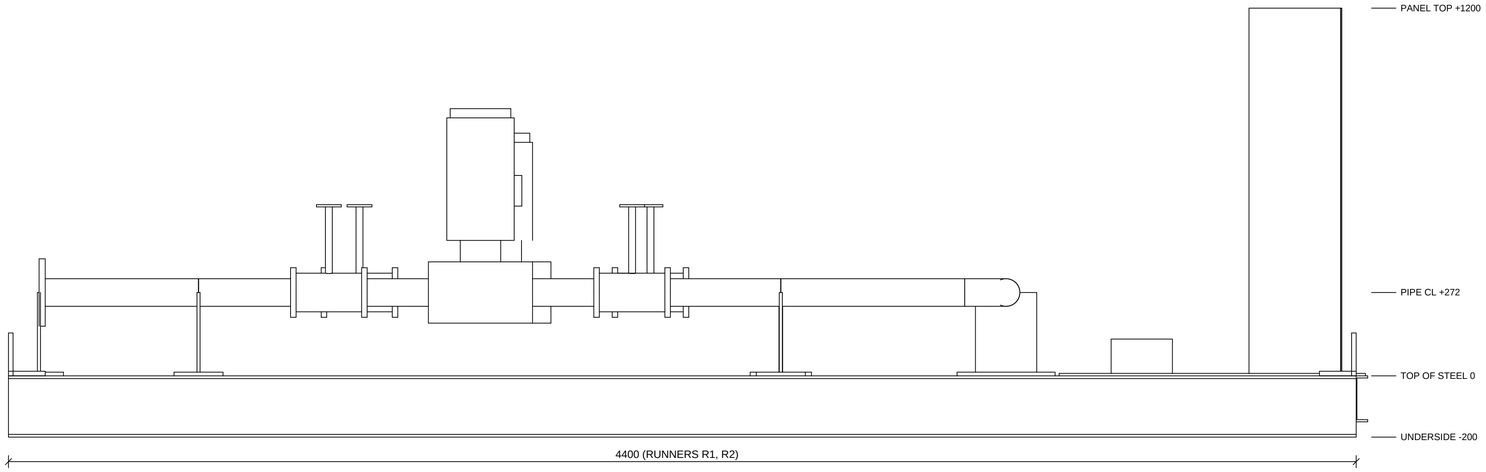


ELEVATION B - FROM THE PANEL END



Skid data	Value
Runners (overall length x width)	4400 x 2070 mm
Pipe centreline above top of steel	272 mm
Smart Components in the drawing	46
Port connections (both ends recorded)	29
Definitions used (bundled + yours)	11 (9 + 2)
Total mass (SCSCHEDULE)	1198.68 kg
Pipe 90 x 4 (DN80 class), total length	5360 mm

ELEVATION A - FROM THE FRONT



PIPE LOOP IN FLOW ORDER (EACH > IS A PORT CONNECTION)

S0 > F1 > P01 > S1 > P02 > V1 > P03 > PU1 > P04 > V2 > P05 > S2 > P06 > E1 > P07 > S3 > P08 > E2 > P09 > S4 > P10 > V3 > P11 > PU2 > P12 > V4 > P13 > S5 > P14 > F2

Inlet at F1 (primary flow in), outlet at F2 (secondary flow out). Every connection is written on both components: SCCONNECT and SCDISCONNECT change both sides, and a change to one component moves every component joined to it (a translation, never a turn).

COMPONENT KEY

Tags	Component (definition)	Values	Qty	Mass each kg
F1, F2	Flange (flange)	bolt_margin=35 bore=90 hole_d=18 holes=8 rim=30 thickness=20	2	4.65
P01 to P14	Pipe (pipe)	size=90x4, lengths 200 to 600	14	1.70 to 5.09
E1, E2	Elbow (elbow)	angle=90 bend_ratio=1.5 size=90x4	2	1.80
V1 to V4	Valve, generic (valve-generic)	d=90 flange_t=18 length=250 stem=220	4	27.74
PU1	Inline pump set (inline-pump, yours)	variant Duty-4kW	1	234.91
PU2	Inline pump set (inline-pump, yours)	variant Duty-2.2kW (SCREPLACE of spool SP2)	1	158.61
S0, S1, S2, S5	Pipe saddle support (pipe-saddle, yours)	defaults	4	8.26
S3	Pipe saddle support (pipe-saddle, yours)	variant Heavy	1	12.24
S4	Pipe saddle support (pipe-saddle, yours)	t=12 bl=200 (typed in the dock)	1	10.15
R1, R2	Universal beam (universal-beam)	size=200x100 length=4400, top-start	2	99.89
B1 to B6, B5A	Universal beam (universal-beam)	size=150x75 length=1970, top-start	7	26.75
DECK	Steel plate (steel-plate)	length=1000 thickness=8 width=1870	1	117.44
LUG1 to LUG4	Structural bracket (structural-bracket)	leg_h=140 leg_l=120 t=15 width=100	4	2.88
CP1	Electrical panel (electrical-panel)	depth=300 height=1200 width=800	1	63.83
JB1	Junction box (junction-box)	depth=120 length=200 width=200	1	0.56

NOTES

1. Every part is a Smart Component placed from the component library (SCPLACE). The views are hidden-line projections of their solids (FLATSHOT).
2. The pipe loop was put together off the skid, each part snapped onto the free port of the one before, then lifted onto saddle S0 by one SCCONNECT: 28 joined components followed.
3. Dimensions in mm. Level 0 is the top of the skid steel.

Stratal CAD

cad.stratal.co.uk

TITLE
PM-01 LTHW injection loop pump module
General arrangement

PROJECT	DRAWN		
PM-01 pump module (fictional)	Stratal CAD demo		
DRAWING NO.	SHEET	SCALE	SIZE
STR-SC-001	1 of 5	1:10	A1
SOFTWARE		DATE	
Stratal CAD 0.1.8, Smart Components 0.1.0		12 Nov 2026	

STATUS
DEMONSTRATION DRAWING - NOT FOR MANUFACTURE

SCHEDULE (SCSCHEDULE TABLE, ALL COMPONENTS)

Component schedule

Name	Sizes	Material	Quantity	Mass (kg)
Elbow	Outside diameter 90, Wall thickness 4, Bend radius / diameter 1.5, Bend angle 90	Structural steel	2	3.60
Electrical panel	Width 800, Height 1200, Depth 300, Wall thickness 2	Structural steel	1	63.83
Flange	Bore diameter 90, Bore edge to bolt circle 35, Bolt circle to outer edge 30, Bolt hole diameter 18	Structural steel	2	9.30
Inline pump set	Length 300, Width 220, Height 200, Branch bore 80	Cast iron	1	158.61
Inline pump set	Length 340, Width 240, Height 200, Branch bore 80	Cast iron	1	234.91
Junction box	Length 200, Width 200, Depth 120, Wall thickness 3	PVC	1	0.56
Pipe	Outside diameter 90, Wall thickness 4, Length 200	Structural steel	4	6.79
Pipe	Outside diameter 90, Wall thickness 4, Length 300	Structural steel	2	5.09
Pipe	Outside diameter 90, Wall thickness 4, Length 360	Structural steel	1	3.05
Pipe	Outside diameter 90, Wall thickness 4, Length 400	Structural steel	1	3.39
Pipe	Outside diameter 90, Wall thickness 4, Length 500	Structural steel	4	16.97
Pipe	Outside diameter 90, Wall thickness 4, Length 600	Structural steel	2	10.18
Pipe saddle support	Web thickness 10, Base plate thickness 12, Base length along the pipe 160, Base width across the pipe 300	S275	4	33.03
Pipe saddle support	Web thickness 12, Base plate thickness 12, Base length along the pipe 200, Base width across the pipe 300	S275	1	10.15
Pipe saddle support	Web thickness 15, Base plate thickness 12, Base length along the pipe 220, Base width across the pipe 320	S275	1	12.24
Steel plate	Length 1000, Width 1870, Thickness 8	Structural steel	1	117.44
Structural bracket	Width 100, Base leg length 120, Upright height 140, Thickness 15	Structural steel	4	11.54
Universal beam	Depth 150, Flange width 75, Web thickness 5, Flange thickness 7	Structural steel	7	187.28
Universal beam	Depth 200, Flange width 100, Web thickness 6, Flange thickness 9	Structural steel	2	199.78
Valve, generic	End diameter 90, Face to face 250, Flange thickness 18, Stem height above body 220	Structural steel	4	110.96

CHANGE RECORD

No	Command	What was done	What the command line said
1	SCCREATE	New pipe-saddle: closed polyline web, base box, 4 holes, 7 parameters	Saved Pipe saddle support (pipe-saddle) as version 1
2	SCCREATE	From housing: inline-pump, ports start/end, 4 motor steps	Saved Inline pump set (inline-pump) as version 1
3	SCLIB	Variant pipe-saddle Light and Heavy (both with tp=12)	Added the variant ... (now version 3)
4	SCPLACE	46 components; 28 snapped to a free port within 1 mm	Connected its port ... (snapped onto it)
5	SCCONNECT	S0 out (kept) and F1 back (brought): loop lifted onto the skid	moved by 0,5000,272; 28 connected components followed
6	SCREPLACE	Spool SP2 to inline-pump, variant Duty-2.2kW	2 connections kept
7	SCEDIT	PU1 variant=Duty-4kW (40 mm longer)	1 rebuilt; 22 connected components followed
8	SCEDIT	P05 length=360 (back onto saddles S2, S4)	1 rebuilt; 19 connected components followed
9	SCEDIT	S1 bw=230 (refused by a rule)	Bolt holes run under the saddle web (it is 200 wide)
10	SCEDIT	P06 length=20000 (refused by a limit)	Length must be between 50 and 12000
11	SCEDIT	V1 to V4 stem=220 flange_t=18 (one undo step)	Changed 4 components: 4 rebuilt
12	SCDISCONNECT	V3, every connection; then SCCONNECT twice	Freed 2 connections; Connected ... (they already met)
13	SCPROPS, SCAPPLY	S4 t=12 bl=200 typed in the dock (PANELSET)	Changed bl 200, t 12 on 1 object
14	SCLIB	Export, Delete and Import inline-pump; Duplicate, Variant, Rename, Delete a copy	Imported Inline pump set (inline-pump) as version 1
15	SCCREATE, SCLIB	Edit pipe-saddle: 3 properties, 1 rule (v4); Latest on S0 to S5	Updated 6 components to the library's current definition
16	SCUPDATE	All components	SCUPDATE: 0 rebuilt, 46 up to date

DEFINITIONS IN THIS DRAWING

Definition	Name	Version	Source	Variants	Used
elbow	Elbow	1	bundled	-	2
electrical-panel	Electrical panel	1	bundled	-	1
flange	Flange	1	bundled	-	2
inline-pump	Inline pump set	1	yours	Duty-2.2kW, Duty-4kW	2
junction-box	Junction box	1	bundled	-	1
pipe	Pipe	1	bundled	-	14
pipe-saddle	Pipe saddle support	4	yours	Light, Heavy	6
steel-plate	Steel plate	1	bundled	-	1
structural-bracket	Structural bracket	1	bundled	-	4
universal-beam	Universal beam	1	bundled	-	9
valve-generic	Valve, generic	1	bundled	-	4

COMPONENT LIBRARY (SCLIB LIST): 42 DEFINITIONS

Category	Id	Name	Version	Source, variants
Architectural	ceiling	Ceiling	1	bundled
	curtain-wall	Curtain wall	1	bundled
	door	Door	1	bundled
	floor	Floor	1	bundled
	foundation-pad	Foundation, pad	1	bundled
	foundation-strip	Foundation, strip	1	bundled
	railing-straight	Railing, straight	1	bundled
	roof-duo-pitch	Roof, duo-pitch	1	bundled
	roof-mono-pitch	Roof, mono-pitch	1	bundled
	stair-straight	Stair, straight flight	1	bundled
	wall	Wall	1	bundled
	window	Window	1	bundled
Electrical	cable-tray	Cable tray	1	bundled
	conduit	Conduit	1	bundled
	electrical-panel	Electrical panel	1	bundled
	enclosure	Enclosure	1	bundled
	junction-box	Junction box	1	bundled
Mechanical	bearing	Bearing	1	bundled
	bracket-mech	Bracket	1	bundled
	elbow	Elbow	1	bundled
	flange	Flange	1	bundled
	housing	Housing	1	bundled
	inline-pump	Inline pump set	1	yours, Duty-2.2kW, Duty-4kW
	pipe	Pipe	1	bundled
	spur-gear	Spur gear	1	bundled
	shaft-stepped	Stepped shaft	1	bundled
	valve-generic	Valve, generic	1	bundled
Structural	angle	Angle	1	bundled
	base-plate	Base plate	1	bundled
	channel	Channel	1	bundled
	circular-hollow-section	Circular hollow section	1	bundled
	concrete-beam	Concrete beam	1	bundled
	concrete-column-round	Concrete column, round	1	bundled
	concrete-column-square	Concrete column, square	1	bundled
	concrete-slab	Concrete slab	1	bundled
	i-beam	I-beam	1	bundled, Light, Heavy
	rectangular-hollow-section	Rectangular hollow section	1	bundled
	steel-plate	Steel plate	1	bundled
	structural-bracket	Structural bracket	1	bundled
	universal-beam	Universal beam	1	bundled
	universal-column	Universal column	1	bundled
Supports	pipe-saddle	Pipe saddle support	4	yours, Light, Heavy

Not available (said by SCLIB List)	Reason
Helical or curved stair	needs a sweep along a curve, which the plugin SDK does not offer.
Curved railing	needs a sweep along a curve, which the plugin SDK does not offer.
Hipped roof with curved members	needs a loft or a sweep, which the plugin SDK does not offer.
Swept bend other than a circular elbow	needs a sweep along a curve (the elbow is a revolve, which the SDK has).

COMPONENT REGISTER

Tag	Definition	Ver	Variant	Typed values	Rot	Connections (port: tag.port)	kg
S0	pipe-saddle	4	-	-	0	out: F1.back	8.26
F1	flange	1	-	bolt_margin=35 bore=90 hole_d=18 holes=8 rim=30 thickness=20	0	face: P01.start; back: S0.out	4.65
P01	pipe	1	-	length=500 size=90x4	0	start: F1.face; end: S1.in	4.24
S1	pipe-saddle	4	-	-	0	in: P01.end; out: P02.start	8.26
P02	pipe	1	-	length=300 size=90x4	0	start: S1.out; end: V1.start	2.55
V1	valve-generic	1	-	di=90 flange_t=18 length=250 stem=220	0	start: P02.end; end: P03.start	27.74
P03	pipe	1	-	length=200 size=90x4	0	start: V1.end; end: PU1.start	1.70
PU1	inline-pump	1	Duty-4kW	-	0	start: P03.end; end: P04.start	234.91
P04	pipe	1	-	length=200 size=90x4	0	start: PU1.end; end: V2.start	1.70
V2	valve-generic	1	-	di=90 flange_t=18 length=250 stem=220	0	start: P04.end; end: P05.start	27.74
P05	pipe	1	-	length=360 size=90x4	0	start: V2.end; end: S2.in	3.05
S2	pipe-saddle	4	-	-	0	in: P05.end; out: P06.start	8.26
P06	pipe	1	-	length=600 size=90x4	0	start: S2.out; end: E1.start	5.09
E1	elbow	1	-	angle=90 bend_ratio=1.5 size=90x4	0	start: P06.end; end: P07.start	1.80
P07	pipe	1	-	length=500 size=90x4	90	start: E1.end; end: S3.in	4.24
S3	pipe-saddle	4	Heavy	-	90	in: P07.end; out: P08.start	12.24
P08	pipe	1	-	length=500 size=90x4	90	start: S3.out; end: E2.start	4.24
E2	elbow	1	-	angle=90 bend_ratio=1.5 size=90x4	90	start: P08.end; end: P09.start	1.80
P09	pipe	1	-	length=600 size=90x4	180	start: E2.end; end: S4.in	5.09
S4	pipe-saddle	4	-	bl=200 t=12	180	in: P09.end; out: P10.start	10.15
P10	pipe	1	-	length=300 size=90x4	180	start: S4.out; end: V3.start	2.55
V3	valve-generic	1	-	di=90 flange_t=18 length=250 stem=220	180	start: P10.end; end: P11.start	27.74
P11	pipe	1	-	length=200 size=90x4	180	end: PU2.start; start: V3.end	1.70
PU2	inline-pump	1	Duty-2.2kW	length=300	180	start: P11.end; end: P12.start	158.61
P12	pipe	1	-	length=200 size=90x4	180	start: PU2.end; end: V4.start	1.70
V4	valve-generic	1	-	di=90 flange_t=18 length=250 stem=220	180	start: P12.end; end: P13.start	27.74
P13	pipe	1	-	length=400 size=90x4	180	start: V4.end; end: S5.in	3.39
S5	pipe-saddle	4	-	-	180	in: P13.end; out: P14.start	8.26
P14	pipe	1	-	length=500 size=90x4	180	start: S5.out; end: F2.face	4.24
F2	flange	1	-	bolt_margin=35 bore=90 hole_d=18 holes=8 rim=30 thickness=20	0	face: P14.end	4.65
R1	universal-beam	1	-	length=4400 size=200x100	0	-	99.89
R2	universal-beam	1	-	length=4400 size=200x100	0	-	99.89
B1	universal-beam	1	-	length=1970 size=150x75	90	-	26.75
B2	universal-beam	1	-	length=1970 size=150x75	90	-	26.75
B3	universal-beam	1	-	length=1970 size=150x75	90	-	26.75
B4	universal-beam	1	-	length=1970 size=150x75	90	-	26.75
B5	universal-beam	1	-	length=1970 size=150x75	90	-	26.75
B5A	universal-beam	1	-	length=1970 size=150x75	90	-	26.75
B6	universal-beam	1	-	length=1970 size=150x75	90	-	26.75
DECK	steel-plate	1	-	length=1000 thickness=8 width=1870	0	-	117.44
LUG1	structural-bracket	1	-	leg_h=140 leg_l=120 t=15 width=100	0	-	2.88
LUG2	structural-bracket	1	-	leg_h=140 leg_l=120 t=15 width=100	180	-	2.88
LUG3	structural-bracket	1	-	leg_h=140 leg_l=120 t=15 width=100	0	-	2.88
LUG4	structural-bracket	1	-	leg_h=140 leg_l=120 t=15 width=100	180	-	2.88
CP1	electrical-panel	1	-	depth=300 height=1200 width=800	90	-	63.83
JB1	junction-box	1	-	depth=120 length=200 width=200	0	-	0.56

COMPONENT PROPERTIES DOCK, S4 BEFORE SCAPPLY

Row	Value	Field key
Pipe saddle support #251		
Definition	Pipe saddle support (pipe-saddle, version 3)	
Variant	None	variant
Web thickness (mm)	10	t
Base plate thickness (mm)	12	tp
Base length along the pipe (mm)	160	bl
Base width across the pipe (mm)	300	bw
Bolt hole diameter (mm)	18	hole_d
Hole centre to edge (mm)	30	edge
ch (mm)	272	
Material	S275	material
Rotation (deg)	180	rotation
Connections	in: Pipe #242 end; out: Pipe #255 start	
Changes	Type a value, then SCAPPLY writes it.	

NOTES

1. The schedule at top left is the plugin's own SCSCHEDULE table (text 2.5 mm), grouped by definition and sizes.
2. Register: one row per component, read from its data (definition, version, variant, typed values, rotation, connections); mass from SCSCHEDULE of that component alone.

Stratal CAD

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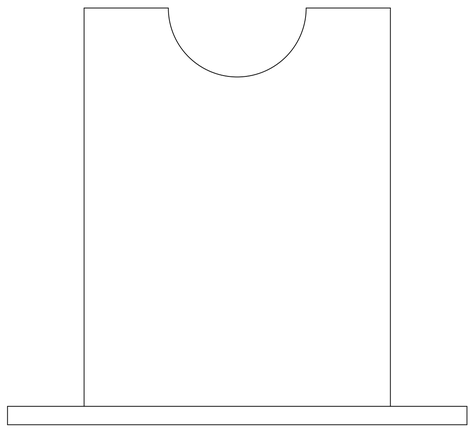
TITLE
PM-01 LTHW injection loop pump module
Schedules, register and change record

PROJECT	DRAWN		
PM-01 pump module (fictional)	Stratal CAD demo		
DRAWING NO.	SHEET	SCALE	SIZE
STR-SC-002	2 of 5	1:1	A1
SOFTWARE		DATE	
Stratal CAD 0.1.8, Smart Components 0.1.0		12 Nov 2026	

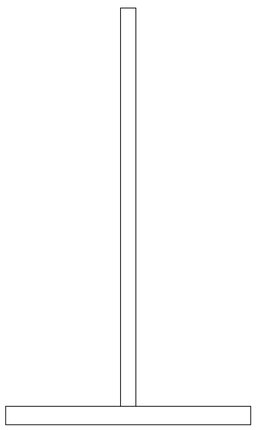
STATUS
DEMONSTRATION DRAWING - NOT FOR MANUFACTURE

Definition	Value
Id, name	pipe-saddle, Pipe saddle support
Category	Supports
Version	4
Material, density	S275, 7850 kg/m3
Made with	SCCREATE New, Start Polyline
Placed in this drawing	S0 to S5 (6)

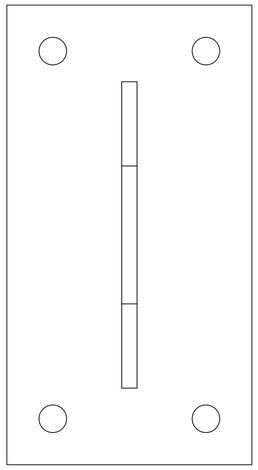
VIEW ALONG THE PIPE



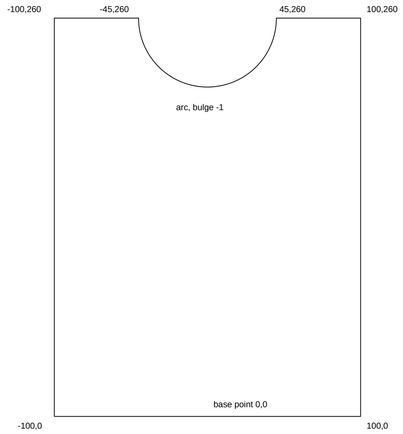
SIDE VIEW



PLAN



CREATOR OUTLINE (POLYLINE)



Pipe cradle centre: z = ch = tp + 260 (ports in and out, 1 mm apart)

PARAMETERS

Key	Label	Kind	Default	Min	Max	Group / worked out as
t	Web thickness	length	10	6	25	Web
tp	Base plate thickness	length	12	8	30	Base
bl	Base length along the pipe	length	160	100	400	Base
bw	Base width across the pipe	length	300	220	500	Base
hole_d	Bolt hole diameter	length	18	12	26	Holes
edge	Hole centre to edge	length	30	20	60	Holes
ch	ch	length	=			= tp+260

RULES

Rule (must be true)	Message when it is not
2*edge + hole_d < bl	Bolt holes overlap along the pipe
t + hole_d < bl - 2*edge	The web runs into the bolt holes
bw/2 - edge - hole_d/2 > 100	Bolt holes run under the saddle web (it is 200 wide)
edge > hole_d	Hole centres too close to the plate edge
hole_d <= 26	Bolt holes over 26 mm need a bigger plate

STEPS

Step	Kind	Op	Arguments (expressions of the parameters)
1	profile outline 6 pts	new	height=t nx=1 ny=0 nz=0 ox=-t/2 oz=tp xx=0 xy=1 xz=0
2	box	add	ox=-bl/2 oy=-bw/2 oz=0 x=bl y=bw z=tp
3	cylinder	cut	height=tp+2 ox=-(bl/2-edge) oy=-(bw/2-edge) oz=-1 radius=hole_d/2 repeat=2 repeat_dx=bl-2*edge
4	cylinder	cut	height=tp+2 ox=-(bl/2-edge) oy=bw/2-edge oz=-1 radius=hole_d/2 repeat=2 repeat_dx=bl-2*edge

SCCREATE SESSION, AS TYPED

No	Typed at the SCCREATE prompt
1	New pipe-saddle "Pipe saddle support" Supports
2	Param Add key=t kind=length default=10 min=6 max=25 "label=Web thickness" group=Web
3	Param Add key=tp kind=length default=12 min=8 max=30 "label=Base plate thickness" group=Base
4	Param Add key=bl ... default=160 min=100 max=400 "label=Base length along the pipe" group=Base
5	Param Add key=bw ... default=300 min=220 max=500 "label=Base width across the pipe" group=Base
6	Param Add key=hole_d ... default=18 min=12 max=26 "label=Bolt hole diameter" group=Holes
7	Param Add key=edge ... default=30 min=20 max=60 "label=Hole centre to edge" group=Holes
8	Param Derived ch = tp+260
9	Start Polyline (the closed outline selected), base point 0,0, Extrude, height t
10	Bind 1 nx 1 / ny 0 / nz 0 / xx 0 / xy 1 / xz 0 (stand the outline upright)
11	Bind 1 ox -t/2 ; Bind 1 oz tp
12	Step Add Box bl bw tp -bl/2 -bw/2 0
13	Step Cut Cylinder hole_d/2 tp+2 -(bl/2-edge) -(bw/2-edge) -1
14	Bind 3 repeat 2 ; Bind 3 repeat_dx bl-2*edge
15	Step Cut Cylinder hole_d/2 tp+2 -(bl/2-edge) bw/2-edge -1 (and Bind 4 the same)

No	(continued)
16	Rule Add "2*edge + hole_d < bl" "Bolt holes overlap along the pipe"
17	Rule Add "t + hole_d < bl - 2*edge" "The web runs into the bolt holes"
18	Rule Add "bw/2 - edge - hole_d/2 > 100" "Bolt holes run under the saddle web ..."
19	Rule Add "edge > hole_d" "Hole centres too close to the plate edge"
20	Port Add in -0.5 0 ch -1 0 0 ; Port Add out 0.5 0 ch 1 0 0
21	Insertion Add base 0 0 0 ; Insertion Add pipe-centre 0 0 ch
22	Material S275 7850
23	Property CradleHeight = ch ; BasePlateArea = bl*bw/1e6 ; WebThickness = t
24	Variant Add Light t=8 tp=10 bl=140 bw=260 (Light breaks a rule: fixed later by SCLIB Variant)
25	Variant Add Heavy t=15 tp=20 bl=220 bw=320 hole_d=22 edge=35
26	Preview (pick) ; t=15 tp=20 bl=220 (built again) ; Preview Reset
27	Export "...\library exports\pipe-saddle draft.sc.json"
28	Save (version 1); later SCLIB Variant Light and Heavy (versions 2, 3)
29	Edit pipe-saddle ; Property BoltHoles = 4 ; BoltCircleX = bl-2*edge ; BoltCircleY = bw-2*edge
30	Rule Add "hole_d <= 26" ... ; Preview ; Save (version 4) ; then SCLIB Latest on S0 to S5

PORTS AND INSERTION POINTS

Point	Name	x	y	z	Facing
port	in	-0.5	0	ch	-1 0 0
port	out	0.5	0	ch	1 0 0
insertion	base	0	0	0	
insertion	pipe-centre	0	0	ch	

VARIANTS

Variant	Values
Light	bl=140 bw=280 t=8 tp=12
Heavy	bl=220 bw=320 edge=35 hole_d=22 t=15 tp=12

PROPERTIES

Property	Expression
BasePlateArea	bl*bw/1e6
BoltCircleX	bl-2*edge
BoltCircleY	bw-2*edge
BoltHoles	4
CradleHeight	ch
WebThickness	t

SADDLES PLACED IN THE SKID

Tag	Variant	Typed values	Version	Rotation	Mass kg
S0	-	defaults	4	0	8.26
S1	-	defaults	4	0	8.26
S2	-	defaults	4	0	8.26
S3	Heavy	defaults	4	90	12.24
S4	-	bl=200 t=12	4	180	10.15
S5	-	defaults	4	180	8.26

NOTES

1. Made with SCCREATE New from the closed polyline shown (its vertices in mm from the base point), extruded by t and stood upright by binding the profile plane (nx=1, xx=0, xy=1).
2. Views are of saddle S1 at its defaults. Saved to the user library as pipe-saddle.sc.json, version 4.

Stratal CAD

cad.stratal.co.uk

TITLE

PM-01 LTHW injection loop pump module
User definition: pipe saddle support

PROJECT	DRAWN
PM-01 pump module (fictional)	Stratal CAD demo

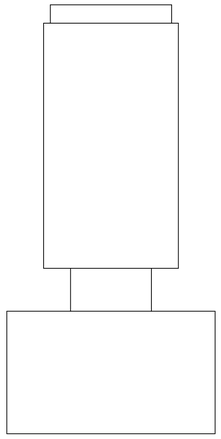
DRAWING NO.	SHEET	SCALE	SIZE
STR-SC-003	3 of 5	1:2	A1

SOFTWARE	DATE
Stratal CAD 0.1.8, Smart Components 0.1.0	12 Nov 2026

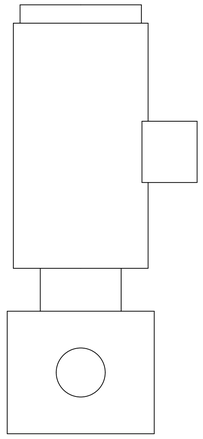
STATUS

DEMONSTRATION DRAWING - NOT FOR MANUFACTURE

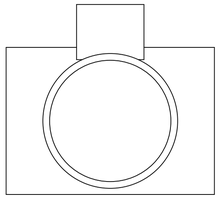
PU1 SIDE VIEW



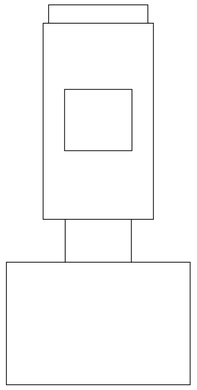
PU1 END VIEW



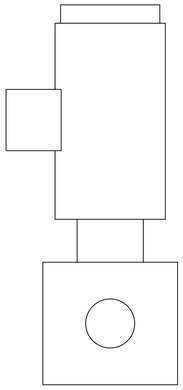
PU1 PLAN



PU2 SIDE VIEW



PU2 END VIEW



Definition	Value
Id, name	inline-pump, Inline pump set
Category	Mechanical
Version	1 (exported, deleted, imported)
Material, density	Cast iron, 7200 kg/m3
Copied from	housing version 1
PU1 mass (Duty-4kW)	234.91 kg
PU2 mass (Duty-2.2kW)	158.61 kg

PARAMETERS

Key	Label	Kind	Default	Min	Max	Group / worked out as
length	Length	length	300	40	600	Size
width	Width	length	220	80	600	Size
height	Height	length	200	80	400	Size
bore	Branch bore	length	80	10	120	Size
motor_d	Motor diameter	length	180	100	400	Motor
motor_h	Motor length	length	320	150	900	Motor
oah	oah	length	=			= height/2+70+motor_h+30

RULES

Rule (must be true)	Message when it is not
bore + 10 < min(width, height)	Bore leaves less than 5 of wall
motor_d < 2*width	The motor is more than twice as wide as the casing
bore < width - 40	The branch bore leaves less than 20 mm of casing each side
motor_d*0.6 < length	The lantern is longer than the casing

STEPS

Step	Kind	Op	Arguments (expressions of the parameters)
1	box	new	ox=0 oy=-width/2 oz=-height/2 x=length y=width z=height
2	profile/circle	cut	d=bore height=length+2 nx=1 ny=0 nz=0 ox=-1 xx=0 xy=1 xz=0
3	cylinder	add	height=70 ox=length/2 oy=0 oz=height/2 radius=motor_d*0.3
4	cylinder	add	height=motor_h ox=length/2 oy=0 oz=height/2+70 radius=motor_d/2
5	cylinder	add	height=30 ox=length/2 oy=0 oz=height/2+70+motor_h radius=motor_d*0.45
6	box	add	ox=length/2-55 oy=motor_d/2-10 oz=height/2+70+motor_h*0.35 x=110 y=90 z=100

PORTS AND INSERTION POINTS

Point	Name	x	y	z	Facing
port	start	0	0	0	-1 0 0
port	end	length	0	0	1 0 0
insertion	bore-start	0	0	0	
insertion	base-centre	length/2	0	-height/2	

VARIANTS

Variant	Values
Duty-2.2kW	motor_d=180 motor_h=320
Duty-4kW	length=340 motor_d=220 motor_h=400 width=240

PROPERTIES

Property	Expression
Bore	bore
FaceToFace	length
Height	height
Length	length
MotorDiameter	motor_d
OverallHeight	oah
Width	width

SCCREATE SESSION, AS TYPED

No	Typed at the SCCREATE prompt
1	From housing inline-pump "Inline pump set"
2	Param Change bore max=120 ; length default=300 ; width default=220 ; height default=200
3	Param Change bore default=80 "label=Branch bore"
4	Param Add key=motor_d kind=length default=180 min=100 max=400 "label=Motor diameter" group=Motor
5	Param Add key=motor_h kind=length default=320 min=150 max=900 "label=Motor length" group=Motor
6	Param Derived oah = height/2+70+motor_h+30
7	Port Remove bore-start ; Port Remove bore-end
8	Port Add start 0 0 0 -1 0 0 ; Port Add end length 0 0 1 0 0
9	Step Add Cylinder motor_d*0.3 70 length/2 0 height/2 (lantern)
10	Step Add Cylinder motor_d/2 motor_h length/2 0 height/2+70 (motor)
11	Step Add Cylinder motor_d*0.45 30 length/2 0 height/2+70+motor_h (cowl)
12	Step Add Box 110 90 100 length/2-55 motor_d/2-10 height/2+70+motor_h*0.35 (terminal box)
13	Rule Add "motor_d < 2*width" ... ; "bore < width - 40" ... ; "motor_d*0.6 < length" ...
14	Material "Cast iron" 7200
15	Property MotorDiameter = motor_d ; OverallHeight = oah ; FaceToFace = length
16	Variant Add Duty-2.2kW motor_d=180 motor_h=320
17	Variant Add Duty-4kW motor_d=220 motor_h=400 length=340 width=240
18	Preview (pick) ; motor_d=220 motor_h=400 (built again) ; Save (version 1)

COMPONENT PROPERTIES DOCK (SCPROPS PU1)

Row	Value	Field key
Inline pump set #181		
Definition	Inline pump set (inline-pump, version 1)	
Variant	Duty-4kW	variant
Length (mm)	340	length
Width (mm)	240	width
Height (mm)	200	height
Branch bore (mm)	80	bore
Motor diameter (mm)	220	motor_d
Motor length (mm)	400	motor_h
oah (mm)	600	
Material	Cast iron	material
Rotation (deg)	0	rotation
Connections	start: Pipe #169 end; end: Pipe #185 start	
Changes	Type a value, then SCAPPLY writes it.	

LIBRARY ROUND TRIP AND COPIES (SCLIB)

SCLIB option	What the command line said
Export inline-pump	Wrote ...\library exports\inline-pump.sc.json.
Delete inline-pump	Deleted your definition inline-pump. Components placed with it keep their own copy.
Import inline-pump.sc.json	Imported Inline pump set (inline-pump) as version 1. SCPLACE places it.
Duplicate pipe-saddle pipe-saddle-wide	Copied pipe-saddle as your definition pipe-saddle-wide (version 1).
Variant pipe-saddle-wide Wide bw=420	Added the variant Wide to pipe-saddle-wide (now version 2).
Rename pipe-saddle-wide pipe-saddle-420	Renamed pipe-saddle-wide to pipe-saddle-420 (version 2).
Delete pipe-saddle-420	Deleted your definition pipe-saddle-420.
Delete housing	Not deleted: 'housing' is a bundled definition and cannot be removed.

NOTES

1. Made with SCCREATE From the bundled housing: bore limit raised, its ports replaced by start and end, and lantern, motor, cowl and terminal box added as steps. A solid envelope, not a pump selection.
2. PU1 is the Duty-4kW variant; PU2 is Duty-2.2kW, swapped in for the spool SP2 by SCREPLACE (connections kept).

Stratal CAD

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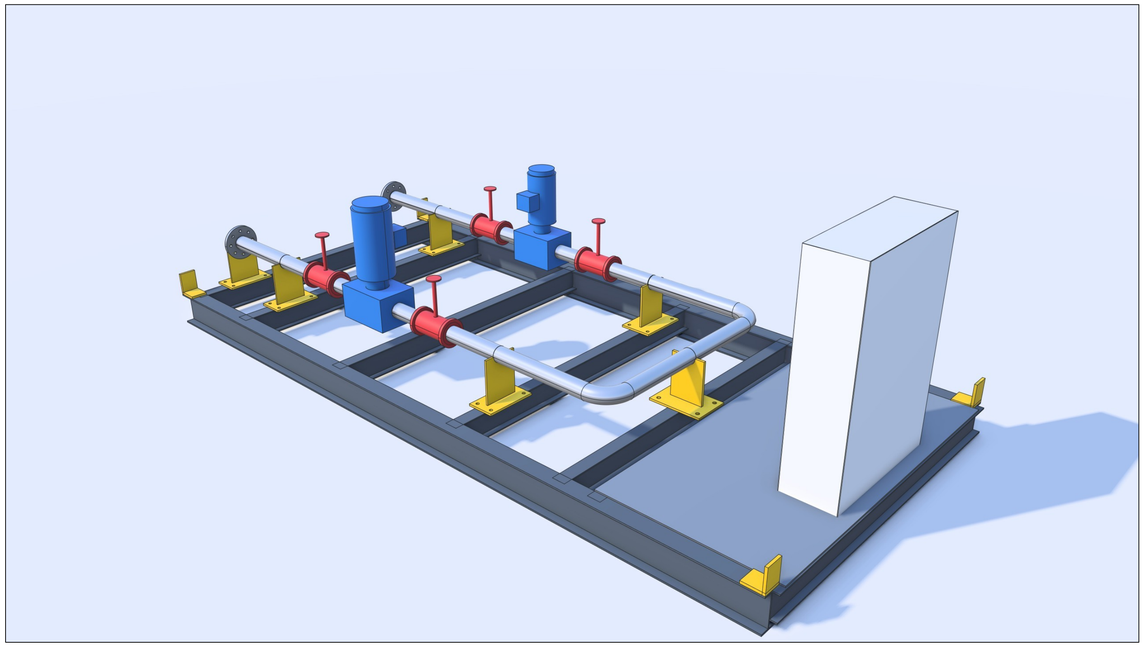
TITLE

PM-01 LTHW injection loop pump module
User definition: inline pump set

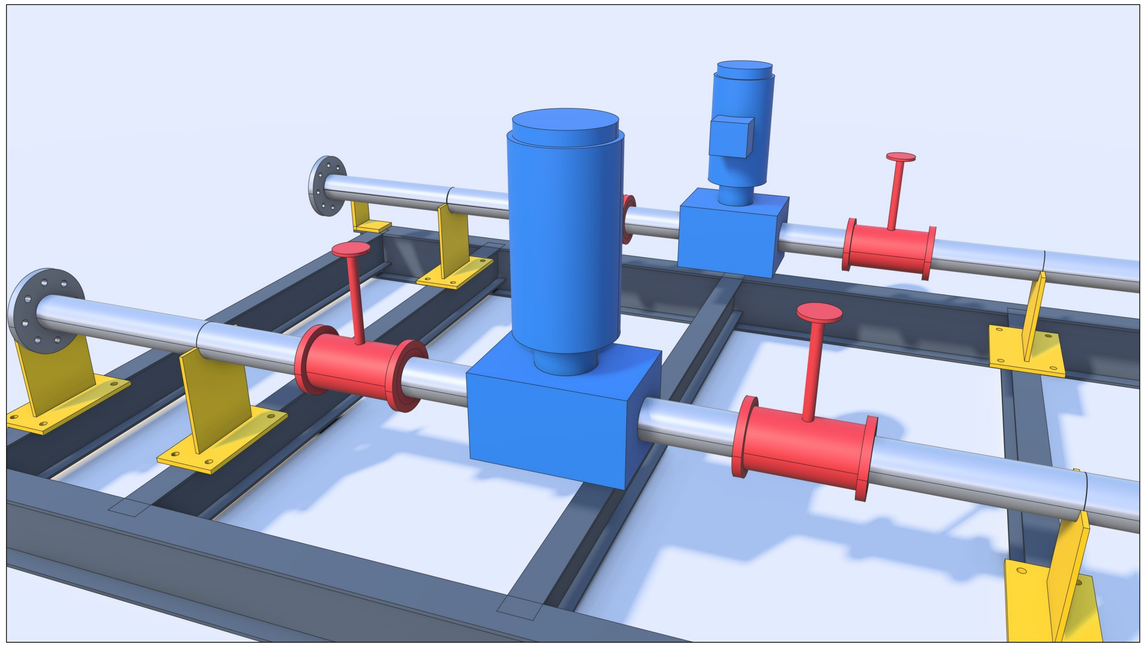
PROJECT	DRAWN		
PM-01 pump module (fictional)	Stratal CAD demo		
DRAWING NO.	SHEET	SCALE	SIZE
STR-SC-004	4 of 5	1:5	A1
SOFTWARE	DATE		
Stratal CAD 0.1.8, Smart Components 0.1.0	12 Nov 2026		

STATUS

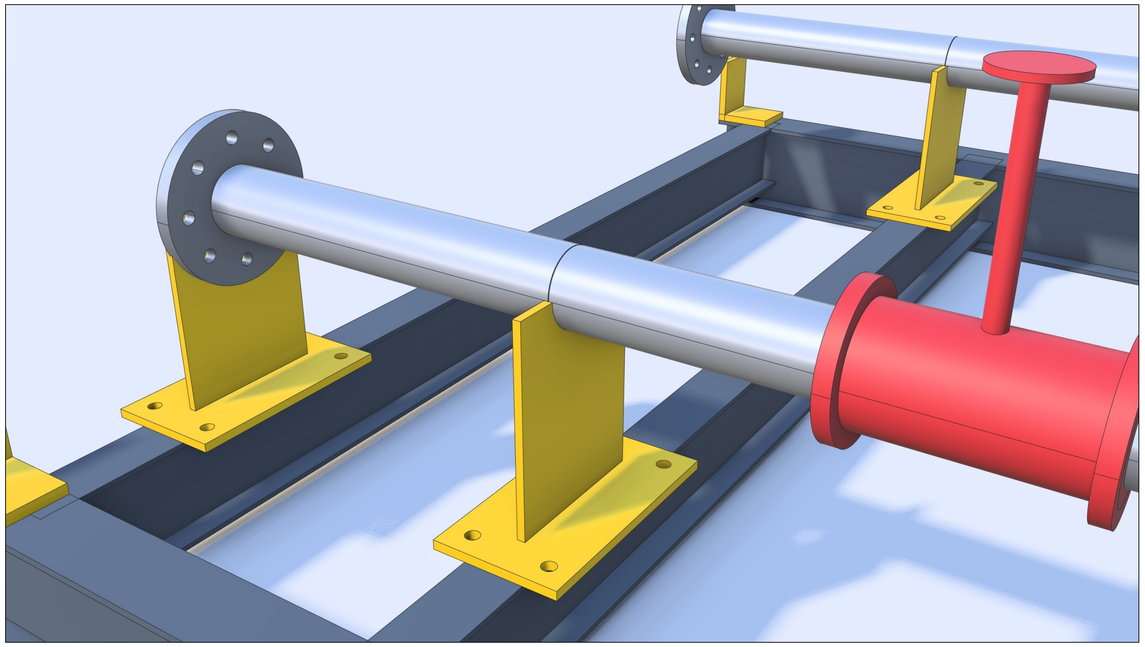
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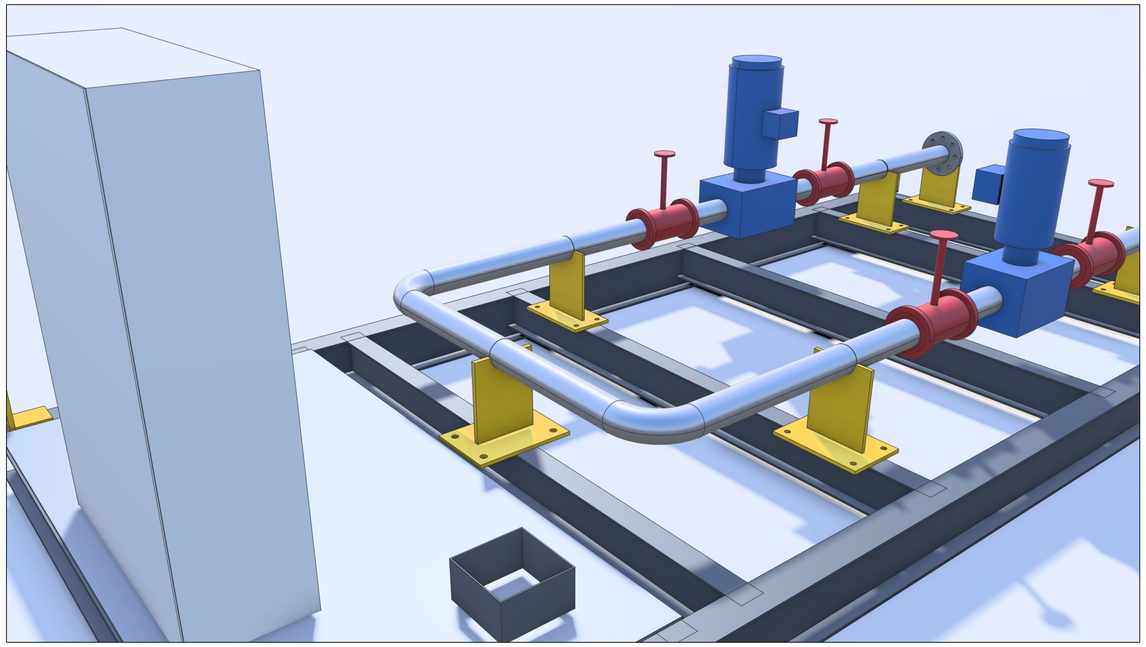
Hero view: the finished module (RENDERSTILL)



Pumps P1 (Duty-4kW) and P2 (Duty-2.2kW) with their isolating valves



Inlet: flange F1 on anchor saddle S0, saddle S1 (the user definition)



Crossover: elbows E1, E2 and the heavy saddle S3

Stratal CAD

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TITLE
PM-01 LTHW injection loop pump module
3D views (renders)

PROJECT		DRAWN	
PM-01 pump module (fictional)		Stratal CAD demo	
DRAWING NO.	SHEET	SCALE	SIZE
STR-SC-005	5 of 5	NTS	A1
SOFTWARE		DATE	
Stratal CAD 0.1.8, Smart Components 0.1.0		12 Nov 2026	

STATUS
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