Model a flanged ball valve body with square actuator pad

Software: Siemens NX

Task statement

Model a flanged ball valve body with a square actuator mounting pad as a single solid part in millimetres, then produce a dimensioned drawing of it. Work from the supplied dimensioned diagrams: diagram_01.png and its detail views diagram_01_detail01.png to diagram_01_detail04.png.

Body and flanges:

- The body is a horizontal flow passage with an end flange at each end.
- The overall face-to-face length is 328 mm.
- Between the flanges, the body is a double-tapered, barrel-like shell. Two conical halves meet at the mid-plane and blend into the flanges with small fillets.
- Each end flange is a circular disc of Ø200 with a Ø196 diameter as dimensioned on the front view.
- Each flange has six through bolt holes equally spaced on a bolt circle.
- Each flange has a central bore through the flow passage.

Neck and actuator pad:

- A cylindrical neck rises vertically from the top of the body to a square actuator mounting pad.
- The pad is 200 mm square with R20 corner radii.
- The pad has four through holes on a square pattern. On the top view these are located 84 mm from each flange face and 80 + 80 mm apart along the flow axis.
- A central stem bore of Ø48 passes down through the pad and neck.
- The stem bore has a Ø55 counterbore at the pad top face.

Vertical dimensions:

- From the flow axis to the underside of the body: 100 mm.
- From the flow axis to the neck reference: 80 mm.
- From that reference to the top of the pad: 105 mm.
- Total height: 285 mm.

The finished solid should measure approximately 200 × 328 × 285 mm overall.

Part file:

Save the model as FLANGED_VALVE_BODY.prt containing one solid body.

Drawing:

- Create the drawing in FLANGED_VALVE_BODY_dwg1.prt on one sheet in third angle projection.
- Show a top view, a front view, a side or section view and an isometric view. Hidden edges should be shown in the orthographic views.
- Dimension the views, including R20 on the pad, the Ø55 counterbore, the Ø48 stem bore, the Ø200 flanges and the 200 pad width.
- Include a title block with a title, a drawing number and the sheet number (1 OF 1).
- State that dimensions are in millimetres.

Rubrics

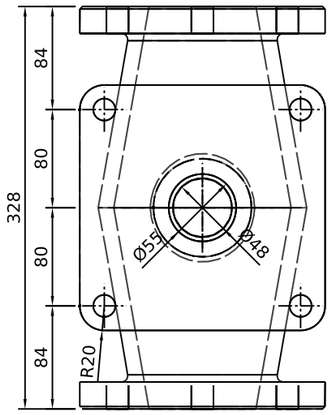
- **R1:** The model shall consist of a single solid body with overall extents of approximately 200 × 328 × 285 mm.
- **R2:** The model shall have a flange-to-flange (face-to-face) length of 328 mm along the flow axis.
- **R3:** The model shall have a circular flange of Ø200 at each end of the flow passage.
- **R4:** The model shall have six through bolt holes equally spaced on a bolt circle in each end flange.
- **R5:** The model shall have a through flow bore along the body axis.
- **R6:** The model shall have a double-tapered body between the flanges formed by two conical halves meeting at the mid-plane.
- **R7:** The model shall have a cylindrical neck connecting the body to a square actuator mounting pad 200 mm wide.
- **R8:** The model shall have R20 corner radii on the square actuator pad.
- **R9:** The model shall have four through mounting holes in the actuator pad, spaced 160 mm (80 + 80) apart along the flow axis.
- **R10:** The model shall have a Ø48 stem bore through the pad and neck with a Ø55 counterbore at the pad top face.
- **R11:** The model shall place the pad top face 285 mm above the body underside, with the flow axis 100 mm above the underside.
- **R12:** The drawing shall contain top, front and isometric views and a side or section view, in third angle projection.
- **R13:** The drawing shall dimension R20 on the pad, the Ø55 counterbore and the Ø48 stem bore.
- **R14:** The drawing shall dimension the Ø200 flanges and the 200 pad width.
- **R15:** The drawing shall include a title block with a title, a drawing number and sheet 1 OF 1.
- **R16:** The model shall be saved as FLANGED_VALVE_BODY.prt and the drawing as FLANGED_VALVE_BODY_dwg1.prt.

Input files

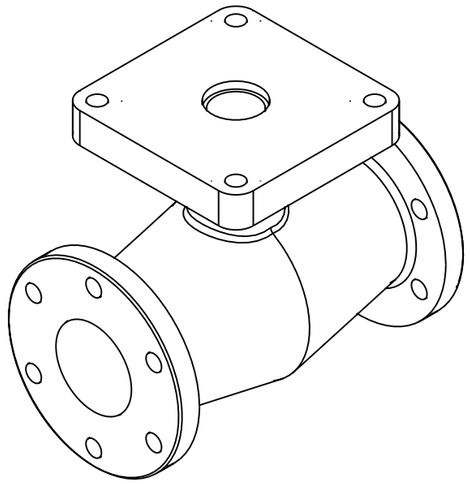
- task_files/diagrams/diagram_01.pdf
- task_files/diagrams/diagram_01.png
- task_files/diagrams/diagram_01_detail01.png
- task_files/diagrams/diagram_01_detail02.png
- task_files/diagrams/diagram_01_detail03.png
- task_files/diagrams/diagram_01_detail04.png

Deliverables

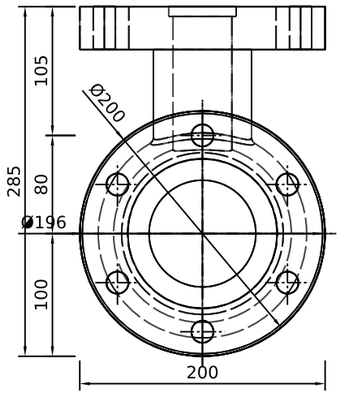
- **.prt:** output_files/project_files/FLANGED_VALVE_BODY_dwg1.prt: The deliverable is FLANGED_VALVE_BODY.prt containing the single-solid valve body model in millimetres, plus FLANGED_VALVE_BODY_dwg1.prt containing the dimensioned four-view drawing with title block.
- **.prt:** output_files/project_files/FLANGED_VALVE_BODY.prt: The deliverable is FLANGED_VALVE_BODY.prt containing the single-solid valve body model in millimetres, plus FLANGED_VALVE_BODY_dwg1.prt containing the dimensioned four-view drawing with title block.
- **.stp:** output_files/project_files/FLANGED_VALVE_BODY.stp: STEP export of the model in the same units.



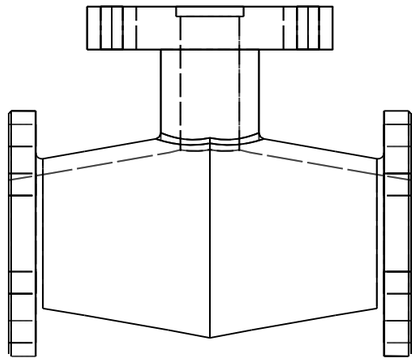
TOP VIEW



ISOMETRIC VIEW



FRONT VIEW



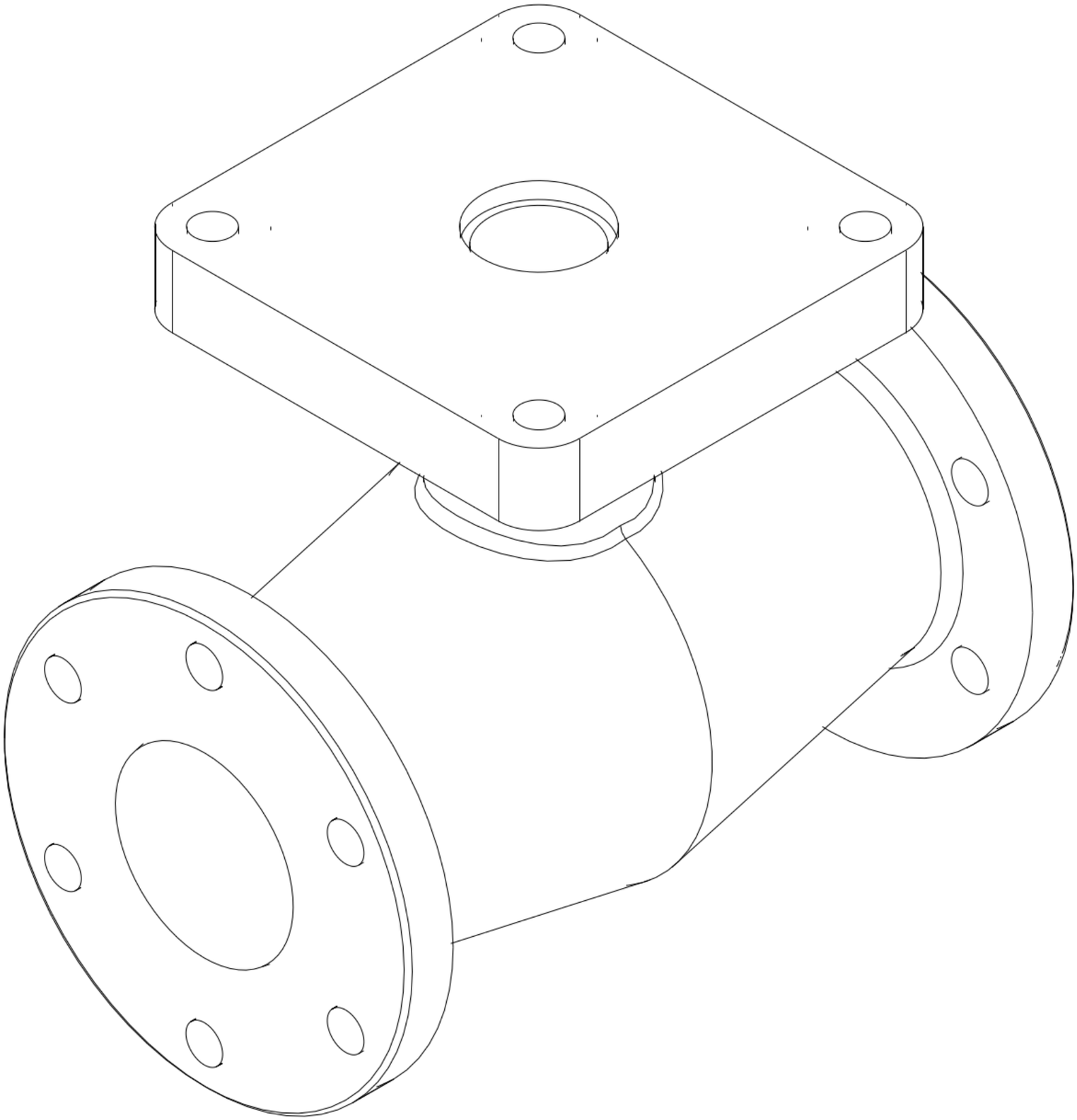
RIGHT SIDE VIEW

NOTES
1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED.
2. DO NOT SCALE THE DRAWING; USE THE FIGURED DIMENSIONS.
3. VIEWS IN THIRD ANGLE PROJECTION.

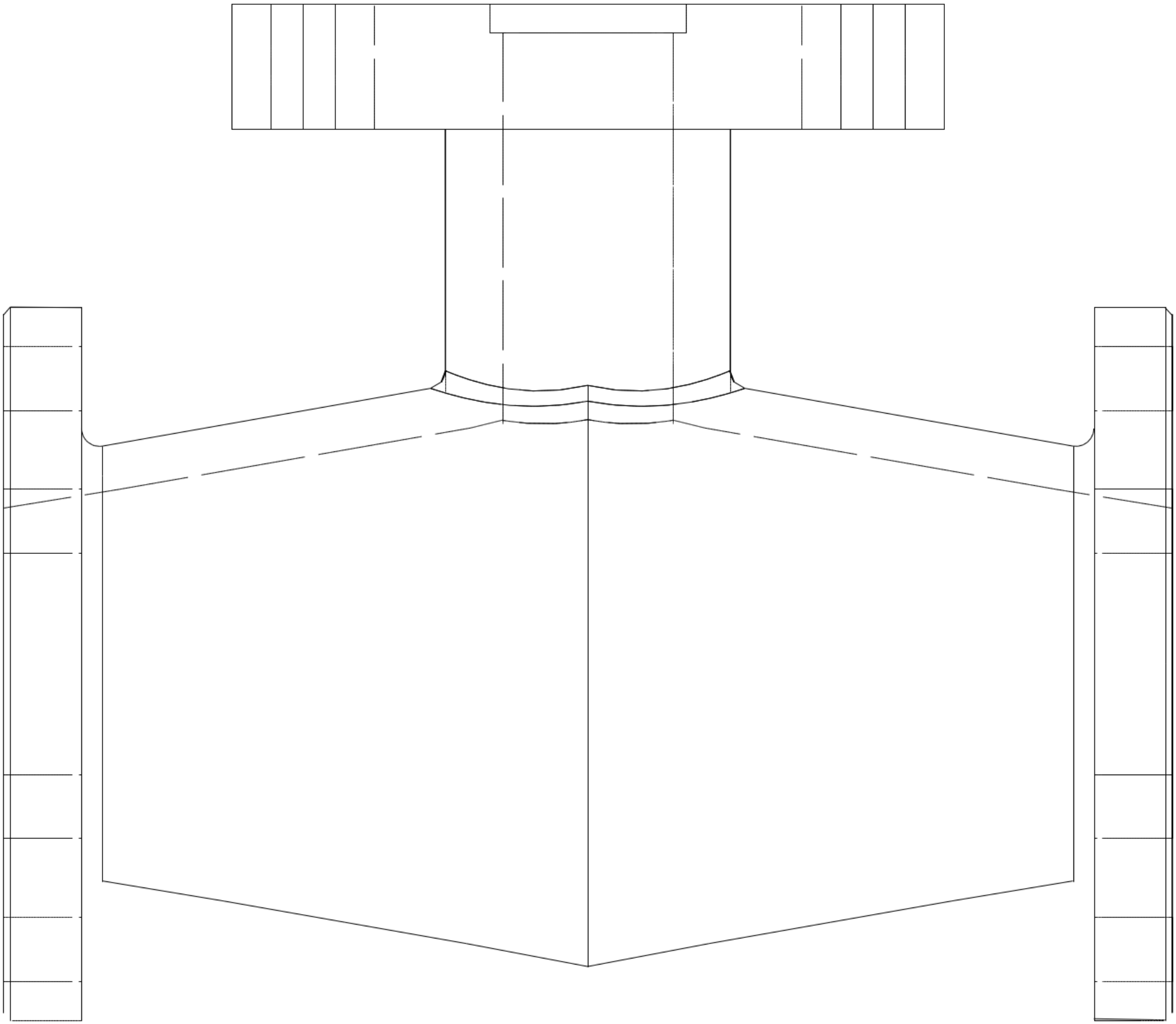
UNITS	SCALE	PROJECTION
MILLIMETRES	**1:5**	

TITLE	SIZE
FLANGED BALL VALVE BODY WITH SQUARE ACTUATOR PAD	**A3**

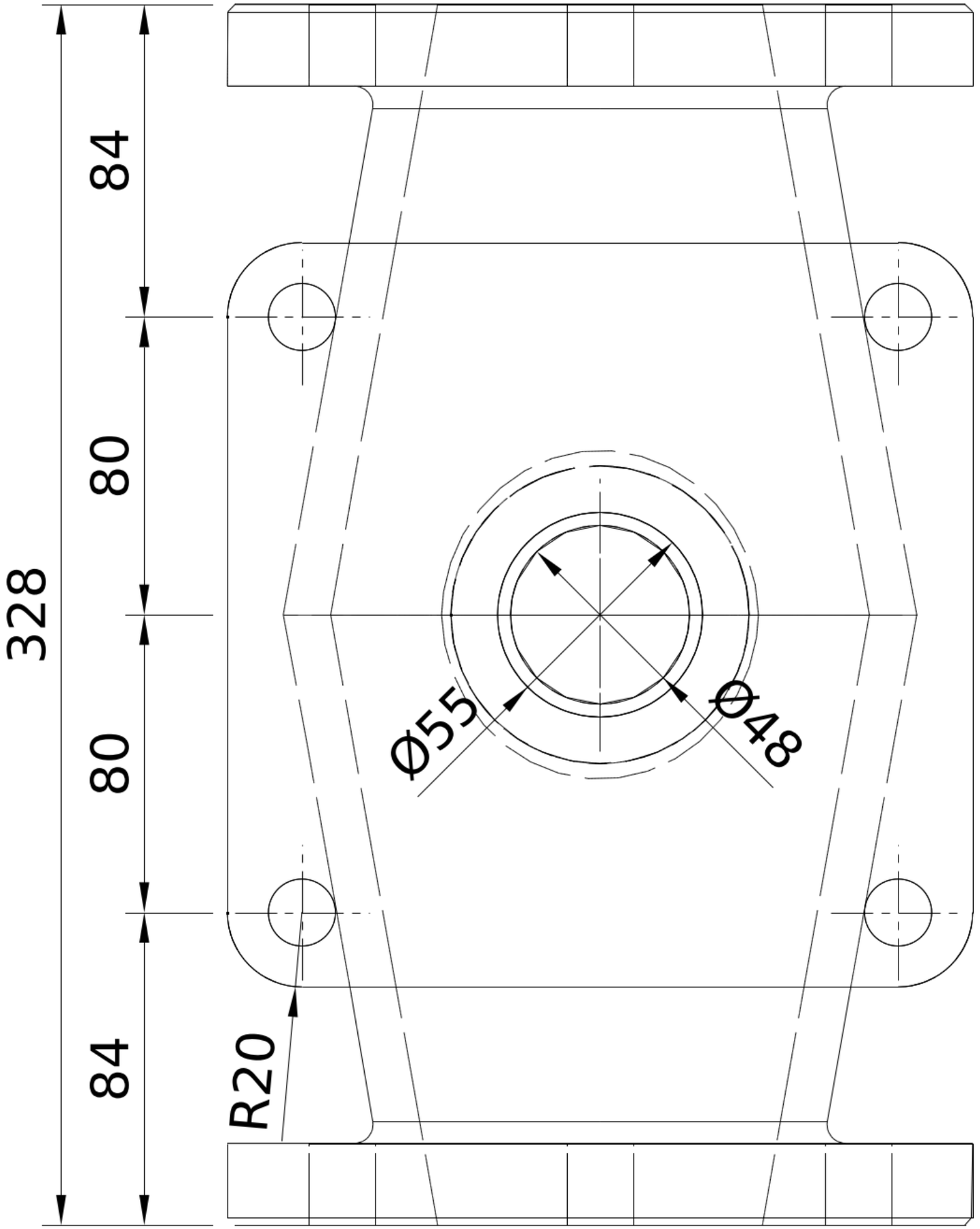
DRAWING NO.	REV	SHEET
MKV-423A70C3-01	**0**	**1 OF 1**

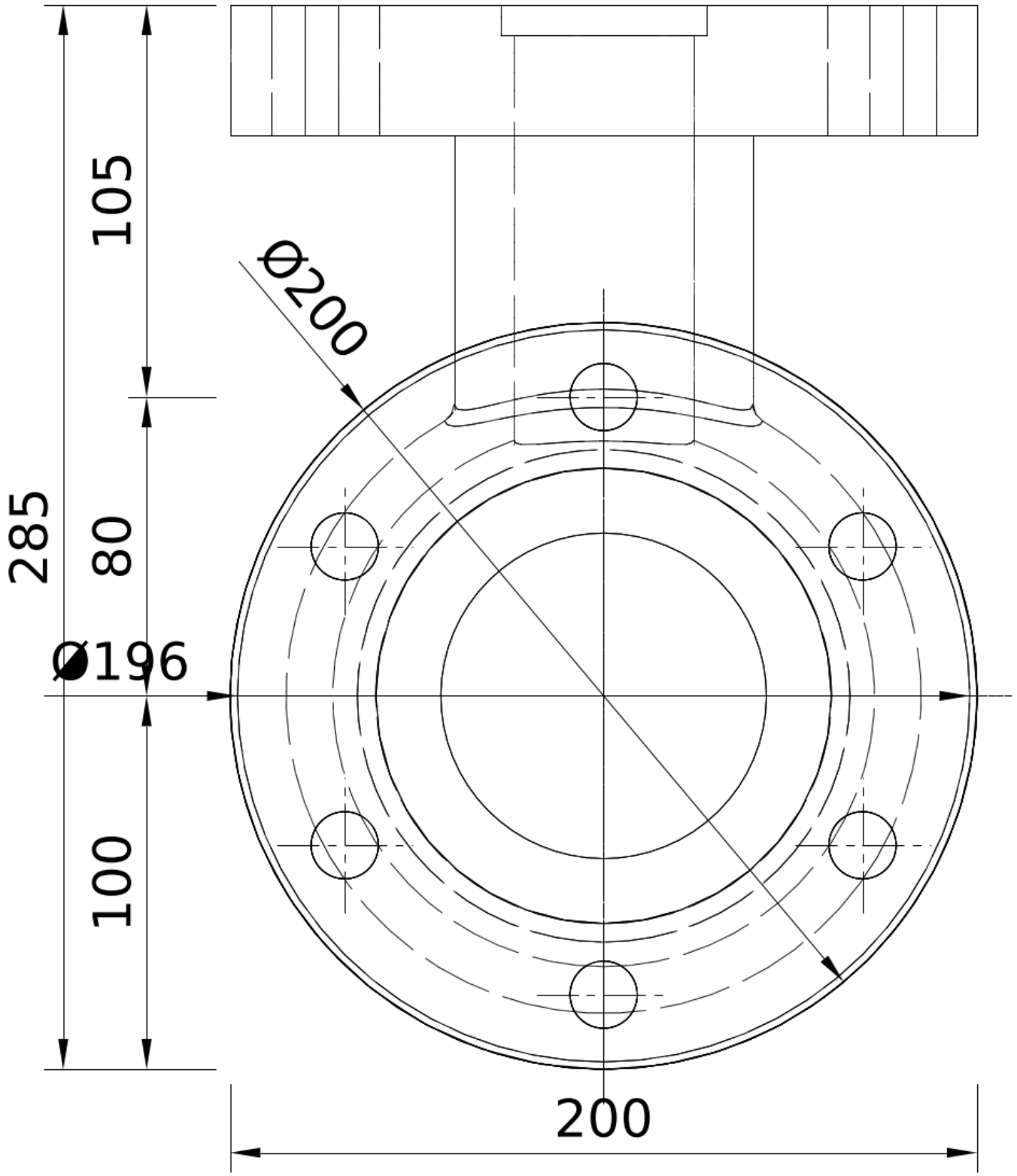


ISOMETRIC VIEW



DETAIL 2 · VIEW 2 · SHEET ZONES D3-E4


328
84
80
80
84
Ø55
Ø48
R20



FRONT VIEW