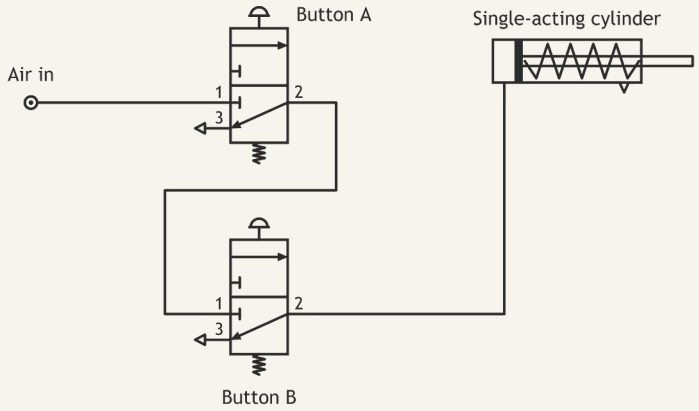
Daily Review

1	**State** which buttons work an AND circuit.	Both
2	**State** which buttons work an OR circuit.	Either one
3	**Name** the valve an OR circuit needs.	Shuttle valve
4	**State** what pushes a single-acting rod in.	A spring
5	**State** the regulator setting while you build.	0 bar

Design and Evaluation

Keep both hands safe.



S3 Engineering Science

By the end of this lesson…



1. I can **design** a circuit from a **brief**
2. I can **simulate** and **build** my design
3. I can **test** it against a **specification**

The Brief

The job

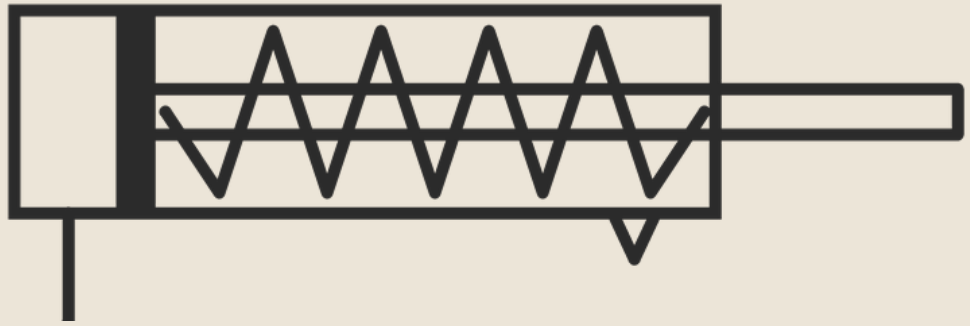
a press stamps a logo on a key ring

The danger

a **hand** under the press

The idea

one **button** for each hand



The Specification

i

Both buttons pressed: the press comes down.

ii

One button only: the press does not move.

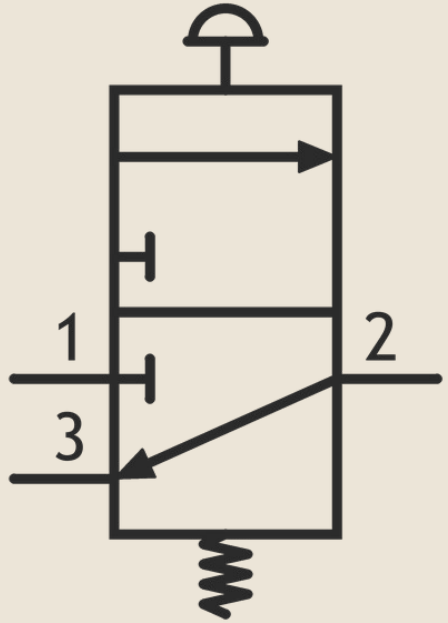
iii

Either button let go: the press goes back up.

Plan It

Design sheet

Choose: OR or AND? **List** the parts.
Draw your circuit on the sheet.
Simulate it. Does it meet i, ii and iii?



Build and Test

Collect the parts on your list, tubing and goggles.

⚠ **SAFETY** Regulator at 0 to build. 1 to 2 bar to test.

Build your design. Hands up. **Test** i, ii, iii.

i

Both buttons pressed: the press comes down.

ii

One button only: the press does not move.

iii

Either button let go: the press goes back up.

Test

tick met or not met

Second Start

1. **State** what a specification is.
2. **State** the control the press needs.
3. **State** what one button does.
4. **State** who checks before the air goes on.
5. **State** the fix if a point fails.

What the design must do

AND

Nothing

The teacher

Air off, check

Test It: Did It Meet the Spec?



1. **State** whether point i was met.
2. **State** whether point ii was met.
3. **State** whether point iii was met.
4. **State** the control your design used.

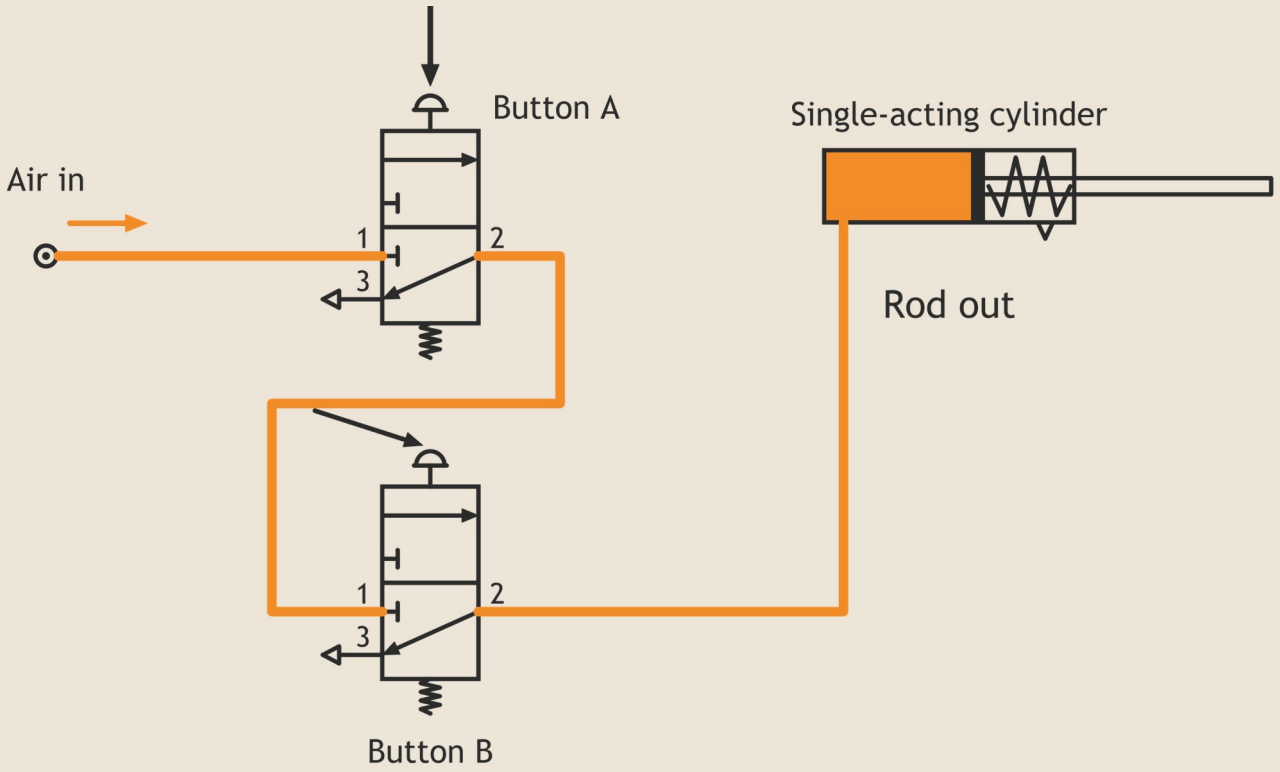
Yes: both, it came down

Yes: one, no movement

Yes: let go, it went up

AND

One Solution: Follow the Air



1 One button: the air **stops** at B. The press stays up.

2 Both buttons: air through A, then B. The press comes **down**.

Evaluate It

Say

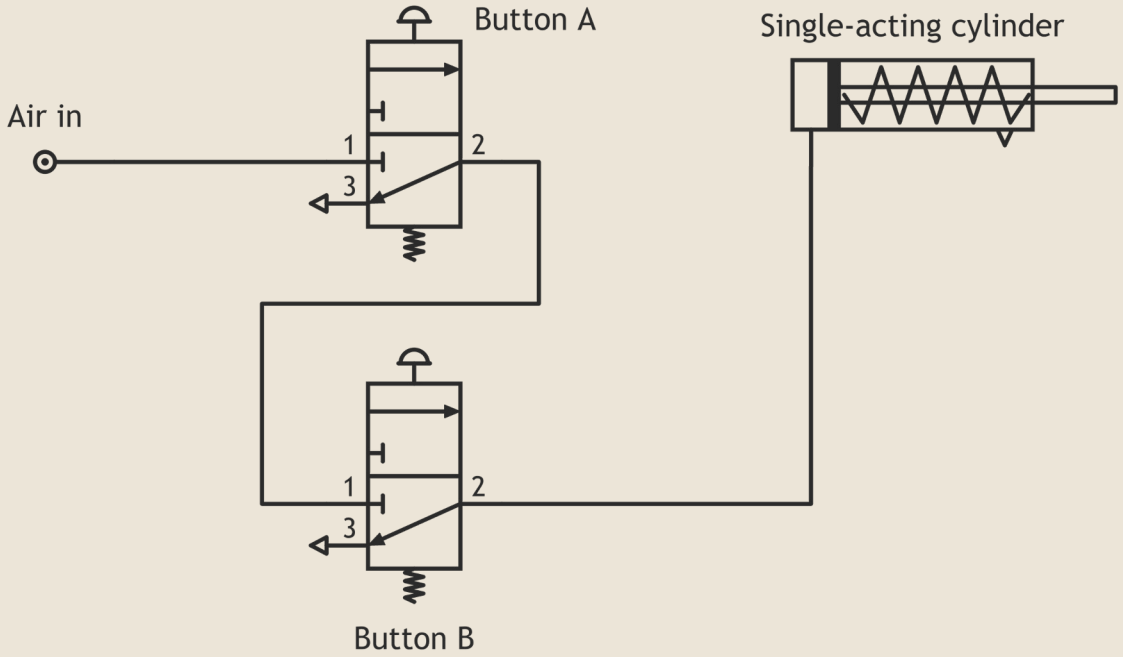
which points were **met**

Improve

one **change** to the design

Justify

why it is better

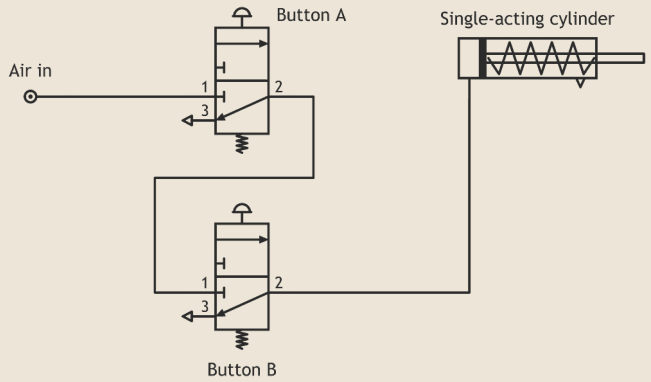


Review Questions

Booklet page 19

Answer Questions 1 to 5 on your own.

Finished? Try the Challenge.



Answers: Review Questions

Question	Answer
1	AND
2	push-button; single-acting
3	Two buttons in a line to the cylinder
4	i, ii, iii: met or not met
5	e.g. flow control: comes down slowly
Challenge	Both hands on buttons, away from the press

Look back — by the end of this lesson…



1. I can **design** a circuit from a **brief**
2. I can **simulate** and **build** my design
3. I can **test** it against a **specification**

Credits

The brief: Sources: brief, AND circuit and air-path drawings by R Stewart, from the Matrix CP2080 kit.

AND circuit: Sources: brief, AND circuit and air-path drawings by R Stewart, from the Matrix CP2080 kit.

R Stewart - October 2026