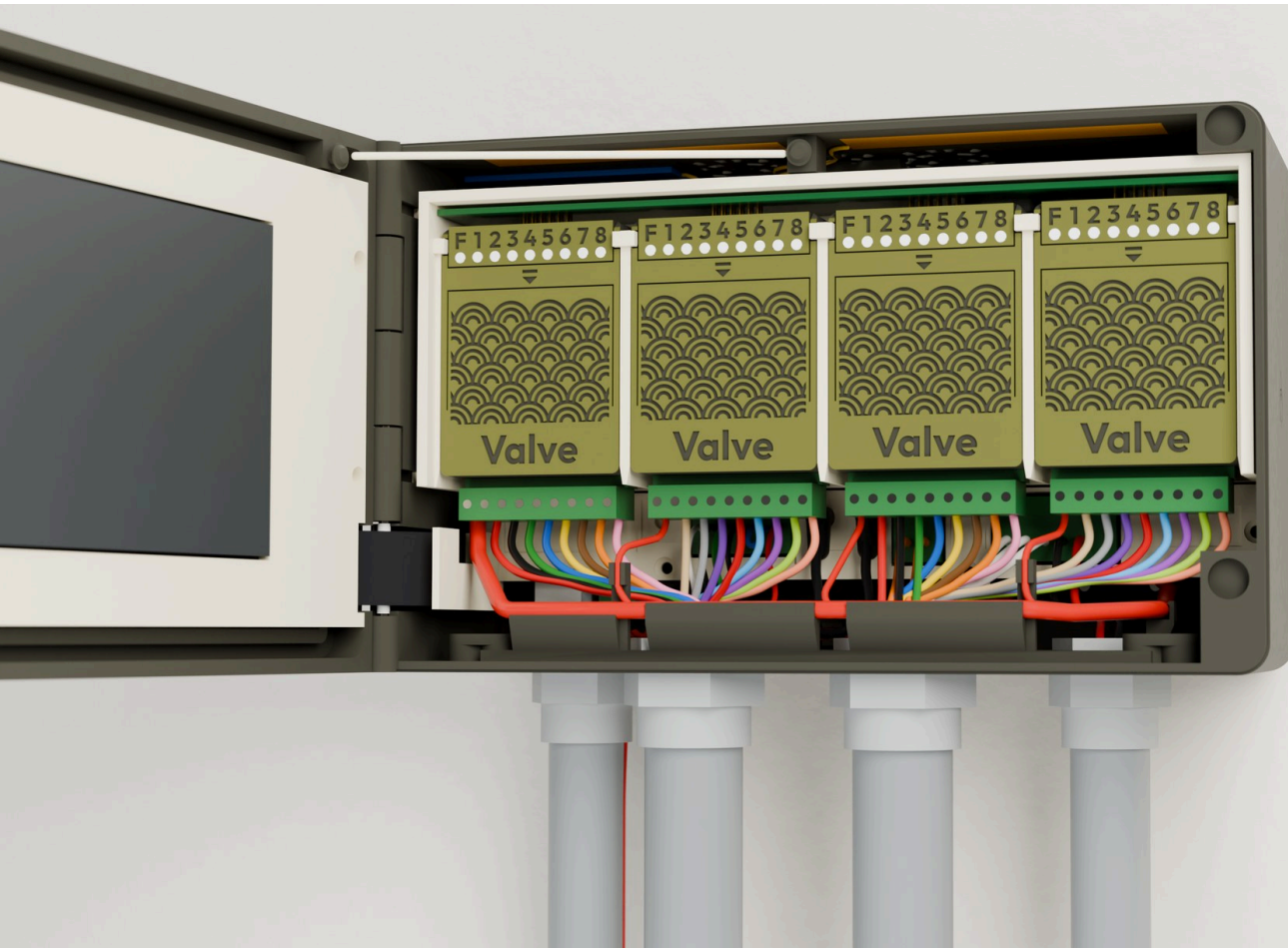




INSTALLATION AND FIELD WIRING GUIDE

Droughtless One

Mounting, conduit, valve and sensor wiring,
and the checks before first power.



READ FIRST

Before you start

This controller runs up to 32 valves from an external 24 V~ supply. Every conductor inside the box is low voltage. Read the two warnings below before you land a wire.

STOP must be closed. An open STOP input holds every valve off, in hardware. If the site has no all-stop switch, fit a jumper from SEN 5 (STOP) to SEN 6 (GND).

Valve commons go on the 24 V~ plug, pins 1–3. Never land them on a SEN GND (pins 2, 4 and 6). Those are DC ground, and joining the two shorts the supply.

Class 2 supply only. Use an external Class 2 transformer, 24 V~, 96 VA recommended. No mains wiring enters this box: a pump runs through a pump-start relay outside it. Keep the transformer unplugged until section 7.

What you need

Class 2 transformer, 24 V~, 96 VA

Closure plugs for any unused openings

Sensor cable for rain/freeze and flow sensors

Pump-start relay with a 24 V~ coil, if the site has a pump

3 mm hex key (M4 lock screws)

Spirit level, drill, tape

Conduit and connectors: ½" × 2, ¾" × 2, as used

Irrigation cable, 18 AWG typical (plugs take 24–12 AWG)

Listed wire connectors, for splicing commons

Wall screws and anchors: #8 (M4) flat head, 7 total

Small flat screwdriver (plug terminals)

Multimeter with continuity

In this guide

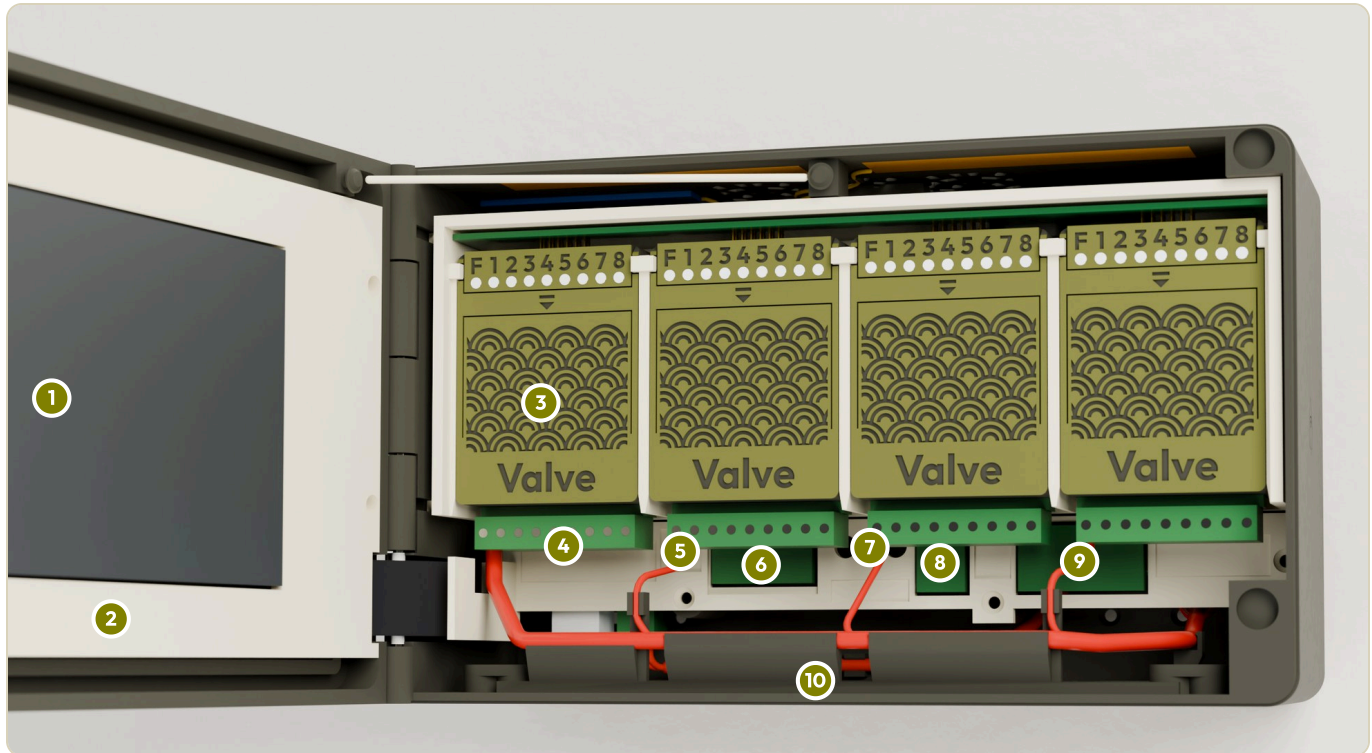
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Printing: pages 1–9 on Letter, portrait. Page 10 on Letter, landscape, at 100 % (actual size). Page 11 on 11 × 17 (Tabloid), landscape.

SECTION 1

The controller at a glance

With the door open. Everything you wire is in the chamber under the cartridges.



- | | |
|--|---|
| <p>1 Door and display. Opens 100° to the left.</p> <hr/> <p>2 Door label. A summary of this guide's wiring pages.</p> <hr/> <p>3 Cartridges 1–4. 8 zones each, 32 in all.</p> <hr/> <p>4 Cartridge field plugs. One per cartridge, facing down. Zone wires land here.</p> <hr/> <p>5 Earth point. Reserved for two-wire. Leave it closed.</p> <hr/> | <p>6 SEN plug. Rain/freeze, flow, all-stop.</p> <hr/> <p>7 CT1, CT2. 3.5 mm sockets for clamp CTs on adjacent controllers.</p> <hr/> <p>8 P/MV plug. Master valve or pump-start relay.</p> <hr/> <p>9 24 V~ plug. Transformer and valve commons.</p> <hr/> <p>10 Gland plate. Four conduit openings, underneath.</p> <hr/> |
|--|---|

The red bundle along the front of the chamber carries the factory feeds, one wire up to each cartridge plug. Leave it in place; your wiring runs behind it. The RJ45 socket is under the plate on the left, behind the SEN plug.

SECTION 2

Mount the controller

The controller hangs on a wall cleat, 11 mm off the wall, and two lock screws hold it down from below.

Choose the spot

- ☐ Indoors or fully under cover: a garage, pump house or utility room. The top vents and the perforated gland plate are open, so keep the box out of rain and sprinkler spray. This prototype enclosure has no ingress rating.
- ☐ A flat wall that takes screws and anchors.
- ☐ 70 mm clear to the left of the box, for the door swing.
- ☐ 230 mm clear in front, so the door can open fully.
- ☐ 30 mm clear to the right, for your fingers at the door grip.
- ☐ Room below the box for conduit to drop straight down.
- ☐ Within reach of the 24 V~ transformer's leads.

Parts

PART	FIXING
Wall cleat	3 × #8 (M4) flat head into the wall
Lock pads × 2	2 × #8 (M4) flat head each
Lock screws × 2	M4 × 22 socket head, 3 mm hex

Steps

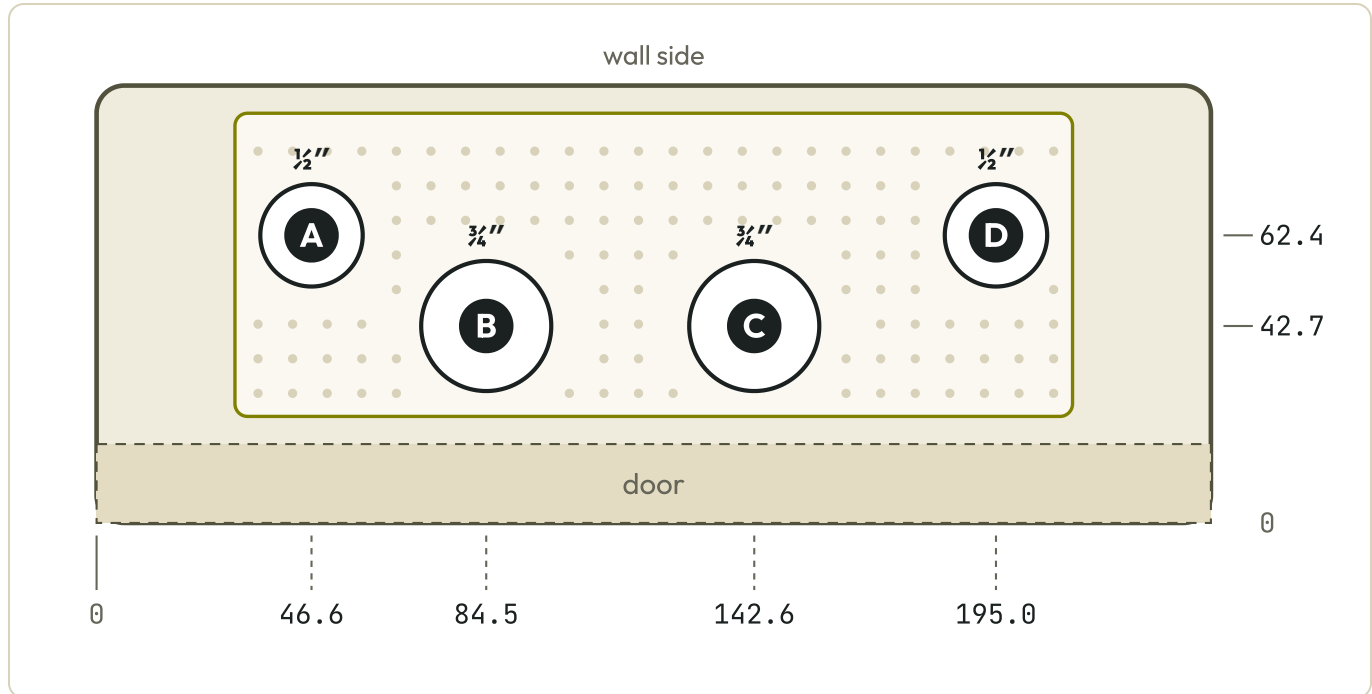
- 1 Print the template on page 10 at 100 %. Check the 100 mm scale bar with a ruler before you drill.
- 2 Tape the template to the wall with its LEVEL line level. Mark the three cleat holes and the four lock-pad holes.
- 3 Drill and fit anchors suited to the wall. Screw the wall cleat on with its angled edge on top, high side against the wall.
- 4 Screw both lock pads on at their marks.
- 5 Lower the controller so its cleat rail drops onto the wall cleat. It self-locates against the wall.
- 6 From below, drive one M4 × 22 lock screw up through each lock pad into the controller. Snug, not tight.

To remove the controller later, back out the two lock screws and lift it off the cleat.

SECTION 3

Bring in the conduit

All wiring enters through the gland plate under the box. Each opening has a job; keep low-voltage signals out of the zone looms.



Underside, door edge at the bottom. Distances in millimetres from the box's left edge and front face.

OPENING	SIZE	CARRIES
A	1/2"	Ethernet, sensor cable, CT leads
B	3/4"	Zone loom, zones 1–16
C	3/4"	Zone loom, zones 17–32, valve commons, P/MV
D	1/2"	24 V~ supply

- 1 Fit a trade-size conduit connector to each opening you use. Tighten its locknut from inside the chamber.
- 2 Seal every unused opening with a closure plug.
- 3 Run conduit down from the connectors and pull the cables through before you start wiring.

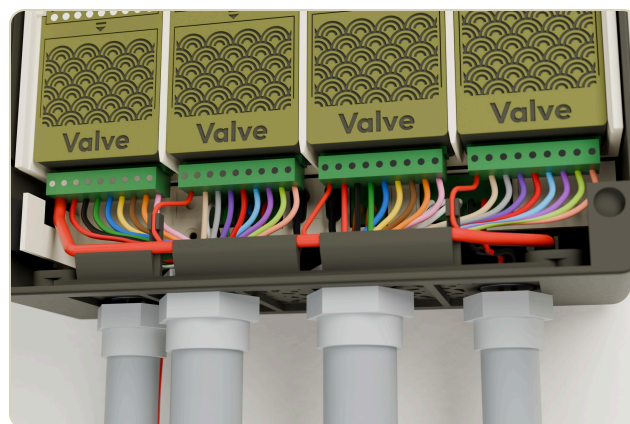
Keep the perforated gland plate clear. It is the controller's air intake. Don't cover it with foam, tape or sealant.

SECTION 4

Wire the valves

Each cartridge runs 8 zones through its own field plug. The plugs pull straight down off the cartridge, so you can wire them in your hand.

- 1 Strip the loom's jacket just above its conduit connector, so the conductors fan out inside the chamber, behind the red factory bundle.
- 2 Pull one cartridge plug straight down. Land each zone wire by the table and tighten the screw. No bare copper should show outside the terminal.
- 3 Push the plug back on until it seats. Repeat for each cartridge.
- 4 Land the valve commons on the 24 V~ plug, pins 1, 2 and 3, one wire per terminal. With more common wires than pins, splice them with a listed wire connector to one short pigtail and land the pigtail.



Two looms rise from openings B and C and fan out to the plugs. Wire colours are illustrative.

Position 1 is the factory feed. It carries switched 24 V~ from the power card. Don't move it or land a field wire in it.

Cartridge field plug

POSITION CONNECTS

1	Factory feed. Leave as shipped.
2-9	Zones 1-8 of this cartridge

Positions count from the left as you face the open box.

CARTRIDGE ZONES

1	1-8
2	9-16
3	17-24
4	25-32

POS 2-9

Cartridge lights

A light above every plug position, labelled on the lid **F 1 2 3 4 5 6 7 8** from the left; the one above F is the status light. At start-up they all sweep green, then red.

STATUS LIGHT

Steady red	Not recognised yet
Green heartbeat	Running normally
Red double flash	A zone has a fault

ZONE LIGHTS

Green	Running
Red double flash	Fault on its last run
Fast blink	Identify, from the app

A fault light goes out once that zone has run cleanly for about 5 seconds. A short that trips twice in a row keeps it on until the controller restarts.

SECTION 5

Wire a master valve or pump start

The P/MV plug has two outputs. Each one switches 24 V~ to a master valve solenoid or to the coil of a pump-start relay. Its wires come up through opening C, with the zone loom.

Never wire a pump motor to P/MV. Each output is fused and carries up to 0.5 A: one solenoid or one relay coil. To run a pump, wire the output to a pump-start relay's coil. The relay, or the pump panel, switches the pump's mains power, outside this box.

P/MV plug

POSITION	OUTPUT	CONNECTS
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1	P/MV2	Master valve solenoid or pump-start relay coil, 24 V~. Its other wire goes on a COM of the 24 V~ plug.
2	P/MV1	Master valve solenoid or pump-start relay coil, 24 V~. Its other wire goes on a COM of the 24 V~ plug.

Positions count from the left as you face the open box. The P/MV plug is left of the 24 V~ plug.

- 1 Pull the P/MV plug straight out of the I/O plate. Land one wire from each master valve or relay coil by the table, one wire per terminal.
- 2 Land the other wire of each one on a COM of the 24 V~ plug (pins 1, 2 and 3). If those are full, splice it into one of the valve commons.
- 3 Push the plug back in until it seats.

Set each output's job in the app, not by wiring. Which output does what, a normally-open or normally-closed master valve, a pump's start delay and stop lag, and which zones each output follows are all settings. Wire either output to either load.

Count it in the supply. A master valve or relay coil draws from the same 96 VA transformer as the valves. Count it like one more valve running.

SECTION 6

Wire sensors, CT clamps and network

Sensors, CT leads and Ethernet come in through opening A, under the I/O plate. Everything on this page is low-voltage DC.

SEN plug

PIN	SIGNAL	CONNECTS
1	SEN1	Rain/freeze sensor, normally-closed contact. Other side to pin 2.
2	GND	Return for the rain/freeze input (DC ground). Never a valve common.
3	SEN2	Flow meter pulse output. Its ground to pin 4.
4	GND	Return for the flow meter input (DC ground). Never a valve common.
5	STOP	All-stop switch, normally closed. Other side to pin 6. No switch: jumper to pin 6.
6	GND	Return for the all-stop input (DC ground). Never a valve common.
7	+5V	Sensor supply, for the flow meter

- 1 Pull the SEN plug straight out of the I/O plate and land the sensor wires by the table, one wire per terminal.
- 2 Each input has its own GND beside it. Land each sensor's return on the GND next to its input: rain/freeze 2, flow meter 4, all-stop 6.
- 3 If the site has no all-stop switch, fit a short jumper from pin 5 (STOP) to pin 6 (GND).
- 4 Push the plug back in until it seats.

CT clamps

SOCKET	CONNECTS
CT1, CT2	Clamp CT around the valve common of an adjacent controller. 3.5 mm plug: tip = signal, sleeve = ground.

The CTs watch other controllers on the site, not this one. Clamp one CT around the valve common of each adjacent controller, not around a zone wire, then plug it in here. The clamps are optional.

Network

PORT	CONNECTS
RJ45	Ethernet, Cat 5e or Cat 6. Optional: LTE is built in.

The RJ45 socket faces down under the I/O plate, on the left. Feed the cable up from opening A and plug it in.

SECTION 7

Connect the supply, check, power up

24 V~ plug

PIN SIGNAL CONNECTS

PIN	SIGNAL	CONNECTS
1-3	COM	Valve commons (section 4)
4	B	Transformer 24 V~, side B
5	A	Transformer 24 V~, side A
6	AUX	24 V~ unswitched, 0.25 A resettable fuse. Leave empty unless specified.

The door label



Inside the door, around the display: the pinouts and rules.

Check before power

Transformer still unplugged. Tick each one.

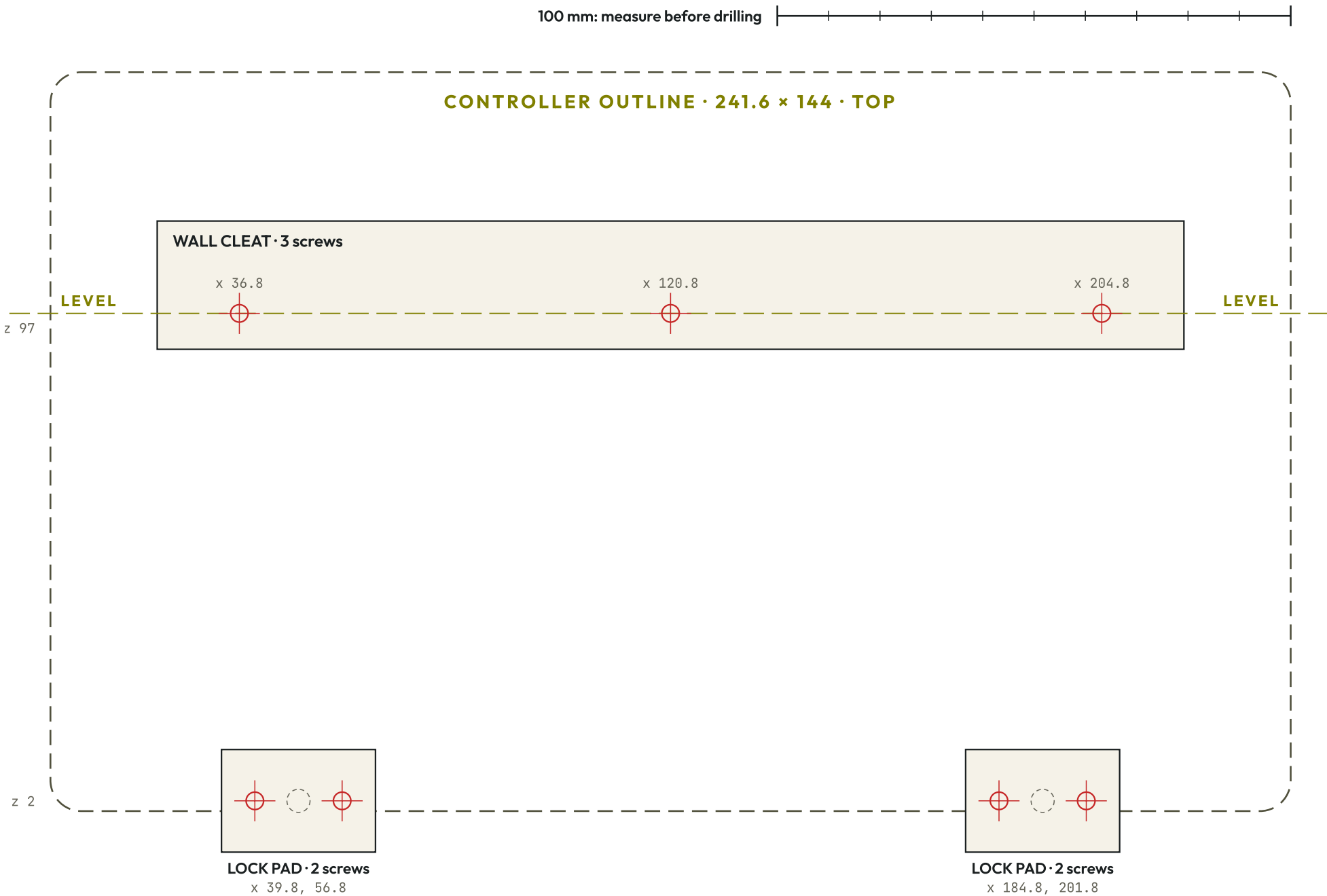
- ☐ Every zone wire is on positions 2–9 of its cartridge plug, and every plug is fully seated.
- ☐ Every valve common is on the 24 V~ plug, pins 1–3.
- ☐ Each P/MV output drives a valve or relay coil, never a pump motor, and returns on a COM.
- ☐ Every terminal holds one wire. Extra valve commons are spliced to a pigtail.
- ☐ Continuity: each SEN GND (pins 2, 4 and 6) to 24 V~ pins 1–3 reads **open**. If one beeps, a valve common is on a SEN GND.
- ☐ Continuity: SEN 5 (STOP) to SEN 6 (GND) reads **closed**, through the all-stop switch or the jumper.
- ☐ The earth knockout on the I/O plate is still closed and nothing is bonded to it.
- ☐ Unused conduit openings are plugged, and the gland plate's perforations are clear.

Power up

- 1 Land the transformer's two leads on the 24 V~ plug: A on pin 5, B on pin 4. Seat the plug.
- 2 Close the door and plug in the transformer. The door display starts up.
- 3 If the display opens on **WiFi Setup**, join the site's Wi-Fi, then tap **Continue to Device Setup**.
- 4 **Device Setup** shows a QR code and an 8-character pairing code. Scan the code with your phone, or go to the address shown under it and type the code, then sign in with your Droughtless account. A code lasts 15 minutes.
- 5 Wait for **Setup complete: Your controller is online and synced**. Then continue commissioning in the Droughtless app.

Mounting template · 1:1

Print at 100 % (“actual size”), never “fit to page”. Check the 100 mm bar.



LOW-VOLTAGE FIELD DEVICES

Ethernet (optional)

LTE is built in. Cat 5e/6 to the RJ45 under the I/O plate.

Terminals: RJ45

Rain / freeze sensor

normally closed contact

Terminals: 1 SEN1, 2 GND 2-conductor cable

Flow meter

3-wire pulse output

Terminals: 3 SEN2, 4 GND, 7 +5V 3-conductor cable

All-stop switch

normally closed; no switch = jumper

Terminals: 5 STOP, 6 GND 2-conductor cable

REQUIRED

CT clamps (optional, up to 2)

Watch an adjacent controller's valves.



3.5 mm plug → CT1 or CT2

One CT per controller, on its common only.

WHICH ZONE GOES WHERE

cartridge	zones	pos 2-9
1	1-8	1-8
2	9-16	9-16
3	17-24	17-24
4	25-32	25-32

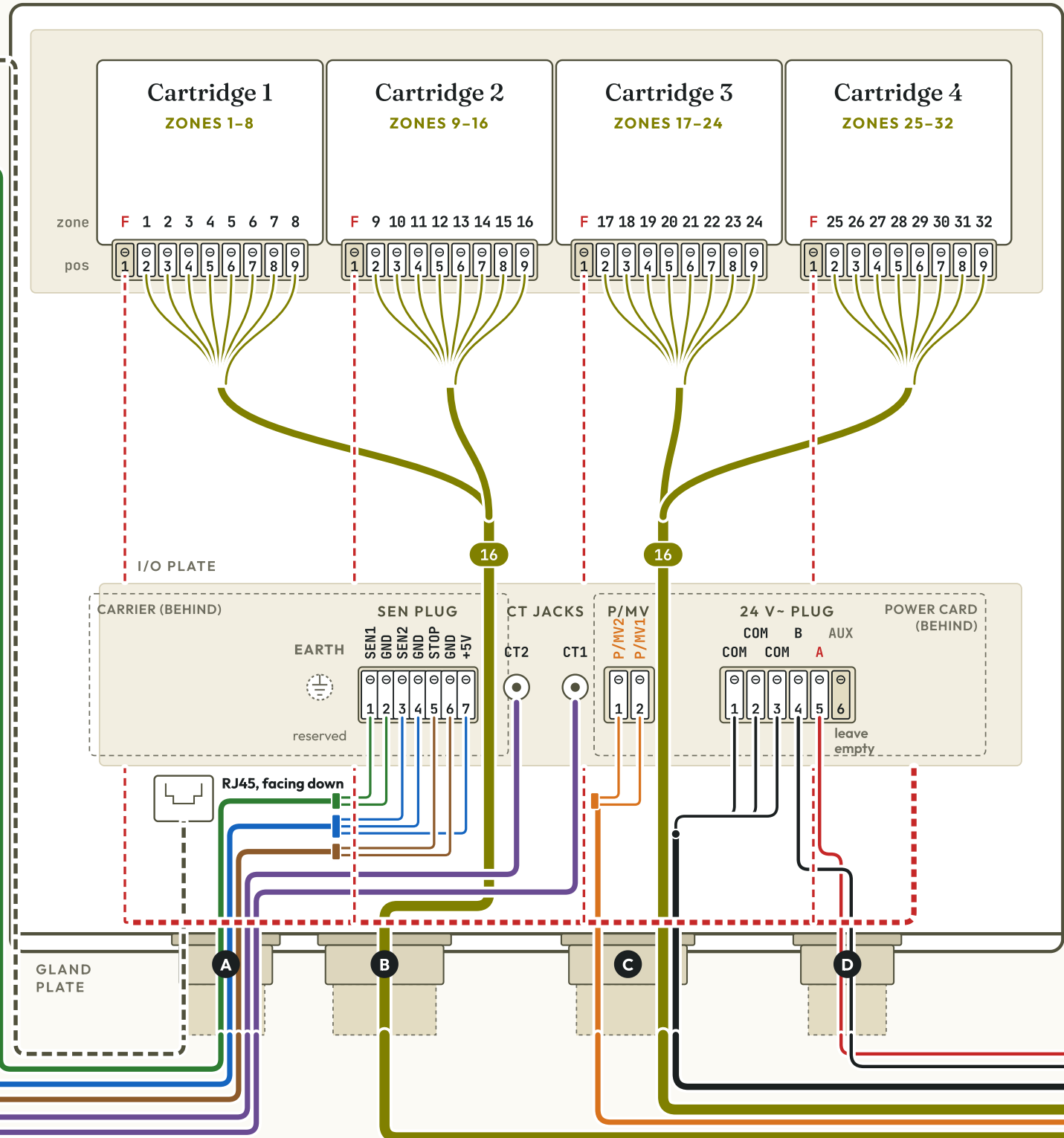
Position 1 is the factory feed. One wire per terminal; 24-12 AWG, 18 AWG typical.

CONDUIT OPENINGS (UNDERSIDE)

- A** ½" Ethernet, sensor cable, CT leads
- B** ¾" Zone loom, zones 1-16
- C** ¾" Zone loom, zones 17-32, valve commons, P/MV
- D** ½" 24 V~ supply

CONTROLLER · FRONT VIEW, DOOR OPEN

241.6 mm wide · left-to-right positions to scale



24 V~ FIELD SIDE

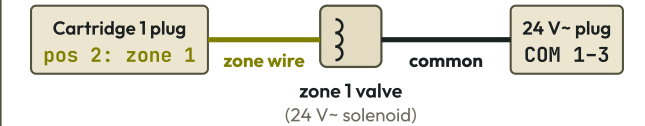
Class 2 transformer

24 V~ secondary, 96 VA. Outside the box.

Terminals: A → pin 5, B → pin 4

Valves (up to 32): one circuit

Every valve is wired the same way.



Zones 1-16 enter through B,

17-32, the commons and P/MV through C.

Positions per cartridge: see the zone table.

P/MV plug: master valve or pump-start relay coil, 24 V~, 0.5 A max each, other wire on COM. Never a motor. Job set in the app. Counts in the 96 VA like a valve.

LEGEND

- Zone wire
- Zone loom (count)
- Valve common
- Supply A
- Supply B
- Factory feed
- Rain / freeze
- Flow meter
- All-stop
- CT lead
- Ethernet
- P/MV output
- Cable jacket ends

BEFORE YOU POWER UP

- 1 STOP must be closed.**
No all-stop switch: jumper SEN 5 to SEN 6. Open STOP = all valves off.
- 2 Valve commons on the 24 V~ plug.**
Pins 1-3. Never on SEN GND 2, 4, 6: DC ground, it shorts the supply.
- 3 Leave the red factory feeds in place.**
They run along the chamber front; your wiring goes behind them.
- 4 Leave AUX and EARTH empty.**
AUX only if the site plan specifies it. EARTH is reserved; never bond it to COM.
- 5 Class 2 supply only.**
No mains wiring enters this box.

Install with guide CM5C-IG-01

Mounting, conduit, AUX, and the pre-power checklist.