

# Autonics Counter/Timer CT SERIES INSTRUCTION MANUAL



CTY Series CTS Series CTM Series  
Thank you for choosing our Autonics product.  
Please read the following safety considerations before use.

## Safety Considerations

- Please observe all safety considerations for safe and proper product operation to avoid hazards.
- Safety considerations are categorized as follows.
  - Warning:** Failure to follow these instructions may result in serious injury or death.
  - Caution:** Failure to follow these instructions may result in personal injury or product damage.
- The symbols used on the product and instruction manual represent the following:
  - ⚠: Represents caution due to special circumstances in which hazards may occur.

## Warning

- Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.) Failure to follow this instruction may result in personal injury, fire, or economic loss.
- The unit must be installed on a device panel before use. Failure to follow this instruction may result in electric shock.
- Do not connect, repair, or inspect the unit while connected to a power source. Failure to follow this instruction may result in electric shock.
- Do not disassemble or modify the unit. Please contact us if necessary. Failure to follow this instruction may result in electric shock or fire.

## Caution

- Do not use the unit outdoors.
- When connecting the power input and relay output cables, use AWG20 (0.05mm<sup>2</sup>) cables and make sure to tighten the terminal screw bolt above 0.74N·m to 0.90N·m. Failure to follow this instruction may result in fire due to contact failure.
- Use the unit within the rated specifications.
- Do not use the unit where the life cycle of the unit, or fire.
- Do not use loads beyond the rated switching capacity of the relay contact.
- Do not use water or oil-based detergent when cleaning the unit. Use dry cloth to clean the unit.
- Do not use the unit where flammable or explosive gas, humidity, direct sunlight, radiant heat, vibration, or impact may be present.
- Keep dust and wire residue from flowing into the unit.

## Manual

For more information about counter/timer, refer to user manual and user manual for communication. Visit our website ([www.autonics.com](http://www.autonics.com)) and download it.

## Ordering Information

|    |   |   |   |    |   |   |
|----|---|---|---|----|---|---|
| CT | 6 | M | - | 2P | 4 | T |
|----|---|---|---|----|---|---|

Communication: No-mark None  
T RS485 communication output

Power supply: 2 24VAC 50/60Hz, 24-48VDC  
4 100-240VAC 50/60Hz

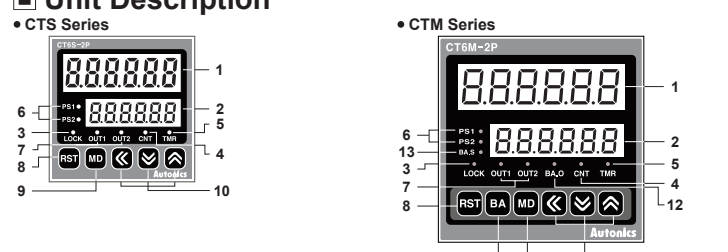
Output: 1P 1-stage preset  
2P 2-stage preset  
I+ Indicator

Size: S DIN W48×H48mm  
M DIN W72×H36mm  
L DIN W72×H72mm

Display digits: 4 9999 (4 digits)  
6 999999 (6 digits)

Item: CT Counter/Timer

## Unit Description

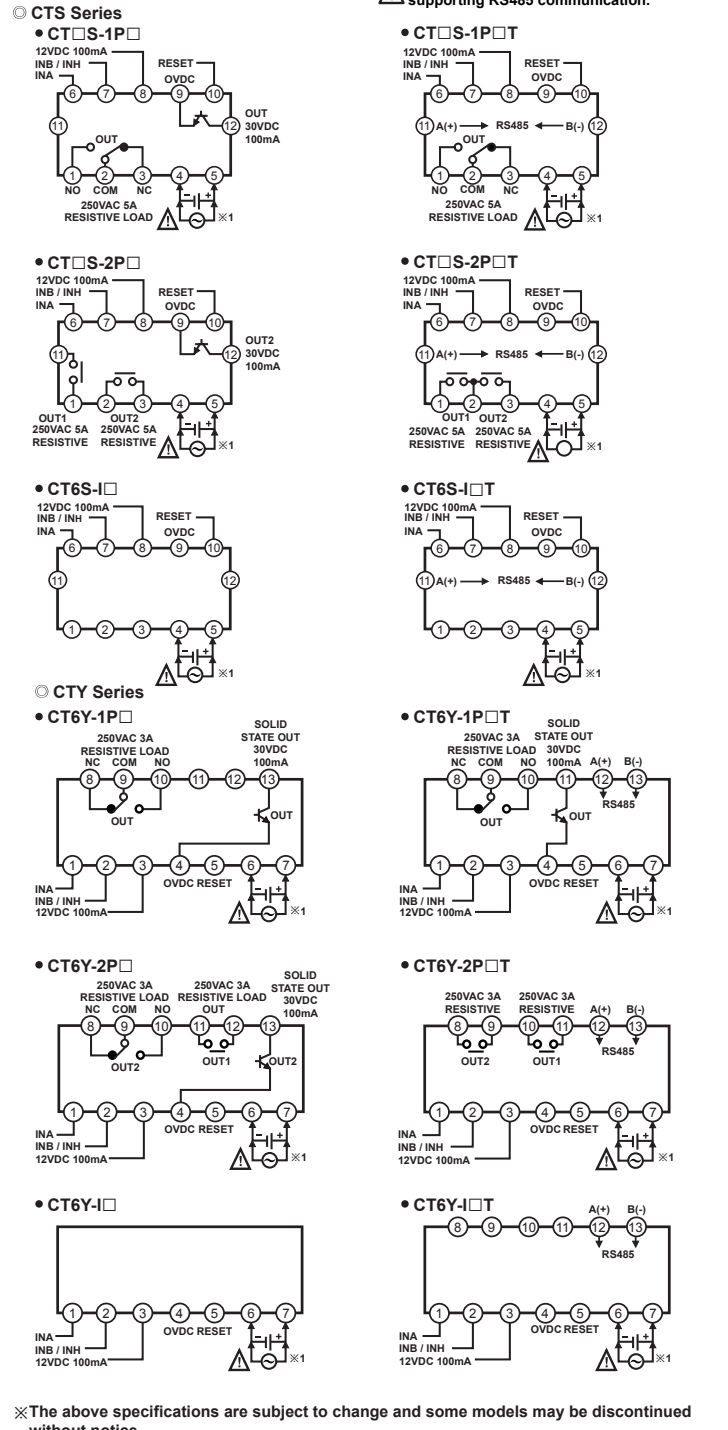


| Item       | Changed | Note                           |
|------------|---------|--------------------------------|
| CTY Series | CTY-1P  | PS2-PS No PS1, OUT1 LEDs       |
|            | CTY-2P  | PS2-PS No PS1, OUT1, OUT2 LEDs |
|            | CTY-4T  | PS2-PS No PS1, OUT1, OUT2 LEDs |

- Counting value display component (red)  
RUN mode: Displays counting value for counter operation or time progress value for timer operation. Function setting mode: Displays setting item.
- Setting value display component (yellow-green)  
RUN mode: Displays setting value.  
Function setting mode: Displays setting component.
- Key lock indicator (LOCK): Turns ON for key lock setting.
- Counter indicator (CNT): Turns ON for counter operation.
- Timer indicator (TMR): Flashes (progressing time) or Turns ON (stopping time) for timer operation.
- Preset value checking and changing indicator (PS1, PS2): Turns ON when checking and changing preset value.
- Output indicator (OUT1, OUT2): Turns ON for the dedicated control output ON.
- RST key  
RUN mode: Press the RST key to reset the counting value. BATCH counter mode: Press the RST key to reset the batch counting value.
- MD key  
RUN mode: Hold the MD key over 3 sec. to enter function setting mode (parameter setting). Hold the MD key over 5 sec. to enter function setting mode (communication setting). Function setting mode: Press the MD key to select function setting mode parameter. Hold the MD key over 3 sec. to return RUN mode.
- Key  
RUN mode: Press the key to enter preset mode. Preset mode: Press the key to move preset digits.
- Key  
RUN mode: Hold the key over 1 sec. to enter Function setting check mode. Preset mode: Press for increasing or decreasing preset value. Function setting mode: Changes the settings. Function setting check mode: Press the key to move the previous parameter. Press the key to the next parameter.
- BA key  
RUN mode: Press the BA key to enter BATCH counter indication mode.
- BATCH output indicator (BA.O) (red)
- BATCH preset value checking and changing indicator (BAS) (yellow-green): Turns ON when checking and changing BATCH preset value.

## Guide for connection

Be sure that connection is varied by supporting RS485 connection.



The above specifications are subject to change and some models may be discontinued without notice.

## Specifications

| Series                                  | CTS   | CT6S-1P                     | CT6Y-1P                     | CT6M-1P                  |
|---|---|-----------------------------|-----------------------------|--------------------------|
| 1-stage preset                          | CT4S-1P   | CT6S-1P                     | CT6Y-1P                     | CT6M-1P                  |
| 2-stage preset                          | CT4S-2P   | CT6S-2P                     | CT6Y-2P                     | CT6M-2P                  |
| Indicator                               | CT4S-1P   | CT6S-1P                     | CT6Y-1P                     | CT6M-1P                  |
| Display digits                          | 4 digits  | 6 digits                    | 6 digits                    | 6 digits                 |
| Display method                          | 7 segment (counting value: red, setting value: yellow-green) LED method   |                             |                             |                          |
| Character size (W×H)                    | 6.5×10mm (4.5×10mm)   | 4.2×9.5mm                   | 6.8×13mm                    | 6.8×13mm                 |
| Setting value                           | 4.5×8mm   | 3.5×7mm                     | 3.5×7mm                     | 5×9mm                    |
| Power AC voltage                        | 100-240VAC 50/60Hz  |                             |                             |                          |
| Supply AC/DC voltage                    | 24VAC 50/60Hz, 24-48VDC   |                             |                             |                          |
| Permissible voltage range               | 90 to 110% of rated voltage   |                             |                             |                          |
| Power AC voltage consumption            | Max. 12VA   |                             |                             |                          |
| Power AC/DC voltage consumption         | AC: Max. 10VA, DC: Max. 8W  |                             |                             |                          |
| INA/INH                                 | Selectable 1cps/30cps/1kcps/5kpcs/10kpcs  |                             |                             |                          |
| Max. counting speed                     | 999 to 9999, 99999 to 999999  |                             |                             |                          |
| Counting range                          | 999 to 9999, 99999 to 999999  |                             |                             |                          |
| Scale                                   | Decimal point up to fifth digit   |                             |                             |                          |
| Min. signal width                       | RESET signal: Selectable 1ms/20ms   |                             |                             |                          |
| Time range                              | 999.999s, 9999.99s, 99999.9s, 999999.9s, 9999999.9s, 99999999.9s, 999999999.9h  |                             |                             |                          |
| Operation method                        | Count up, Count down, Count Up/Down   |                             |                             |                          |
| Min. signal width                       | INA, INH, RESET signal: Selectable 1ms/20ms   |                             |                             |                          |
| Repeat error                            | In case of power ON start: Max. ±0.01% ±0.05s   |                             |                             |                          |
| Start error                             | In case of power start: Max. ±0.01% ±0.03s  |                             |                             |                          |
| Voltage error                           |   |                             |                             |                          |
| Temp. error                             |   |                             |                             |                          |
| Input method                            | Selectable voltage input or no-voltage input [Voltage input]-input impedance: 5.4kΩ, [H]: 5-30VDC, [L]: 0-2VDC [No-voltage input]-short-circuit impedance: Max. 1kΩ.      |                             |                             |                          |
| One-shot output time                    | 0.01s to 99.99s setting   |                             |                             |                          |
| Contact output                          | 1-stage SPDT(1c): 1   | 2-stage SPST(1a): 1         | 2-stage SPST(1a): 1         | 2-stage SPST(1a): 1      |
| Type                                    | 1   | 1                           | 1                           | 1                        |
| Capacity                                | 250VAC 5A resistive load  | 250VAC 3A resistive load    | 250VAC 5A resistive load    | 250VAC 5A resistive load |
| Solid state output (NPN open collector) | 1   | 1                           | 1                           | 1                        |
| Type                                    | 1   | 1                           | 1                           | 1                        |
| Capacity                                | Max. 30VDC, 100mA   |                             |                             |                          |
| External power supply                   | Max. 12VDC ±10%, 100mA  |                             |                             |                          |
| Memory retention                        | Approx. 10 years (non-volatile memory)  |                             |                             |                          |
| Insulation resistance                   | Over 100MΩ (at 500VDC megger)   |                             |                             |                          |
| Dielectric strength                     | 2.00VAC 50/60Hz for 1 min.  |                             |                             |                          |
| Noise resistance                        | Square-wave noise by noise simulator (pulse width 1μs) ±2kV   |                             |                             |                          |
| Mechanical                              | 0.75mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each X, Y, Z direction for 1 hour   |                             |                             |                          |
| Malfunction                             | 0.5mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each X, Y, Z direction for 10 minutes  |                             |                             |                          |
| Shock                                   | Mechanical 300m/s <sup>2</sup> (approx. 30G) in each X, Y, Z direction for 3 times<br>Malfunction 100m/s <sup>2</sup> (approx. 10G) in each X, Y, Z direction for 3 times |                             |                             |                          |
| Relay life                              | Mechanical Min. 10,000,000 operations<br>Malfunction Min. 100,000 operations  |                             |                             |                          |
| Protection structure                    | IP65 (front part, IEC standards)  |                             |                             |                          |
| Environment                             | Ambient temp. -10 to 55°C, storage: -25 to 65°C   |                             |                             |                          |
| Ambient humi.                           | 35 to 85%RH, storage: 35 to 85%RH   |                             |                             |                          |
| Approval                                | CE, VDE, UL, etc.   |                             |                             |                          |
| Weight*                                 | Approx. 212g (approx. 159g)   | Approx. 228g (approx. 140g) | Approx. 322g (approx. 252g) |                          |

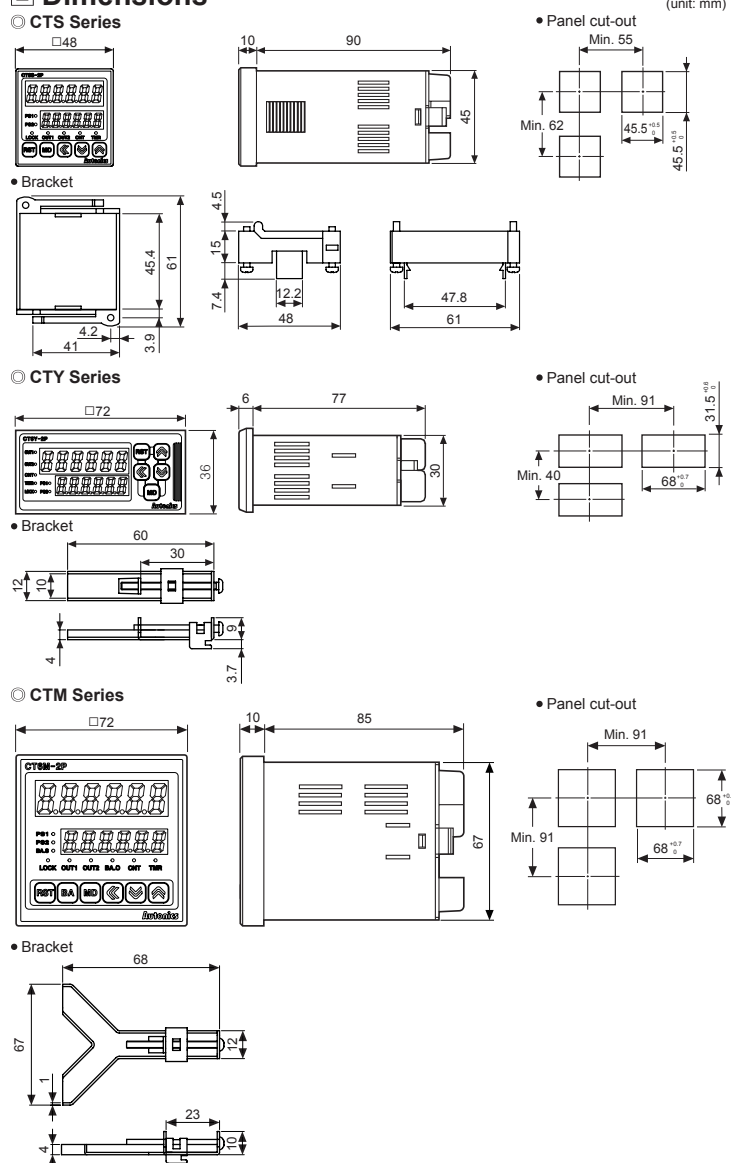
\*1: The weight includes packaging. The weight in parentheses is for unit only.  
\*2: Environment resistance is rated at no freezing or condensation.

## Communication Specifications

| Interface            | Modbus RTU with 16-bit CRC                          |
|----------------------|---|
| Comm. protocol       | RS485   |
| Connection type      | Compliance with EIA RS485                           |
| Application standard | 31 units (address: 1 to 127)                        |
| Max. connection      | Two-wire half duplex                                |
| Comm. type           | Asynchronous  |
| Synchronous method   | Asynchronous  |
| Comm. distance       | Max. 800m   |
| Comm. speed          | 2400, 4800, 9600 (factory default), 19200, 38400bps |
| Comm. response time  | 5 to 99ms (factory default: 20ms)                   |
| Start bit            | 1-bit (fixed)                                       |
| Data bit             | 8-bit (fixed)                                       |
| Parity bit           | None(factory default), Even, Odd                    |
| Stop bit             | 1, 2-bit (factory default: 2-bit)                   |

\*1: It is recommended to use communication converter, RS485 to Serial converter (SCM-38), sold separately. \*2: USB to RS485 converter (SCM-US48), sold separately. Please use a proper twist pair for RS485 communication.

## Dimensions



Panel cut-out (unit: mm)

Panel cut-out

Panel cut-out

Panel cut-out

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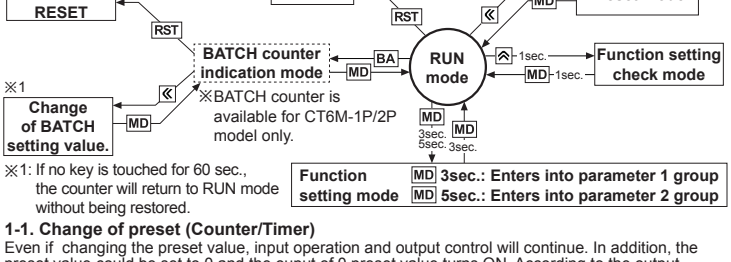
Panel cut-out

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## Basic Operations (Counter/Timer/Communication)

### 1. Operations and functions



\*1: If no key is touched for 60 sec., the counter will return to RUN mode without being restored.

### 1-1. Change of preset (Counter/Timer)

Even if changing the preset value, input operation and output control will continue. In addition, the preset value could be set to 0 and the output of 0 preset value control ON. According to the output mode, preset value could not be set to 0. (When setting to 0, preset value "0" will flash 3 times.)



### 1-2. Function setting check mode

Function setting of function setting mode can be confirmed using the MD and key.

### 1-3. Switching display function in preset indicator

Setting value 1 (PS1) and setting value 2 (PS2) are displayed each time pressing MD key in dual preset mode. (In timer, it is available for on, and, i, and, n, and, o, and, p, and, q, and, r, and, s, and, t, and, u, and, v, and, w, and, x, and, y, and, z, and, aa, and, ab, and, ac, and, ad, and, ae, and, af, and, ag, and, ah, and, ai, and, aj, and, ak, and, al, and, am, and, an, and, ao, and, ap, and, aq, and, ar, and, as, and, at, and, au, and, av, and, aw, and, ax, and, ay, and, az, and, ba, and, bb, and, bc, and, bd, and, be, and, bf, and, bg, and, bh, and, bi, and, bj, and, bk, and, bl, and, bm, and, bn, and, bo, and, bp, and, bq, and, br, and, bs, and, bt, and, bu, and, bv, and, bw, and, bx, and, by, and, bz, and, ca, and, cb, and, cc, and, cd, and, ce, and, cf, and, cg, and, ch, and, ci, and, cj, and, ck, and, cl, and, cm, and, cn, and, co, and, cp, and, cq, and, cr, and, cs, and, ct, and, cu, and, cv, and, cw, and, cx, and, cy, and, cz, and, da, and, db, and, dc, and, dd, and, de, and, df, and, dg, and, dh, and, di, and, dj, and, dk, and, dl, and, dm, and, dn, and, do, and, dp, and, dq, and, dr, and, ds, and, dt, and, du, and, dv, and, dw, and, dx, and, dy, and, dz, and, ea, and, eb, and, ec, and, ed, and, ee, and, ef, and, eg, and, eh, and, ei, and, ej, and, ek, and, el, and, em, and, en, and, eo, and, ep, and, eq, and, er, and, es, and, et, and, eu, and, ev, and, ew, and, ex, and, ey, and, ez, and, fa, and, fb, and, fc, and, fd, and, fe, and, ff, and, fg, and, fh, and, fi, and, fj, and, fk, and, fl, and, fm, and, fn, and, fo, and, fp, and, fq, and, fr, and, fs, and, ft, and, fu, and, fv, and, fw, and, fx, and, fy, and, fz, and, ga, and, gb, and, gc, and, gd, and, ge, and, gf, and, gg, and, gh, and, gi, and, gj, and, gk, and, gl, and, gm, and, gn, and, go, and, gp, and, gq, and, gr, and, gs, and, gt, and, gu, and, gv, and, gw, and, gx, and, gy, and, gz, and, ha, and, hb, and, hc, and, hd, and, he, and, hf, and, hg, and, hh, and, hi, and, hj, and, hk, and, hl, and, hm, and, hn, and, ho, and, hp, and, hq, and, hr, and, hs, and, ht, and, hu, and, hv, and, hw, and, hx, and, hy, and, hz, and, ia, and, ib, and, ic, and, id, and, ie, and, if, and, ig, and, ih, and, ii, and, ij, and, ik, and, il, and, im, and, in, and, io, and, ip, and, iq, and, ir, and, is, and, it, and, iu, and, iv, and, iw, and, ix, and, iy, and, iz, and, ja, and, jb, and, jc, and, jd, and, je, and, jf, and, jg, and, jh, and, ji, and, jj, and, jk, and, jl, and, jm, and, jn, and, jo, and, jp, and, jq, and, jr, and, js, and, jt, and, ju, and, jv, and, jw, and, jx, and, jy, and, jz, and, ka, and, kb, and, kc, and, kd, and, ke, and, kf, and, kg, and, kh, and, ki, and, kj, and, kl, and, km, and, kn, and, ko, and, kp, and, kq, and, kr, and, ks, and, kt, and, ku, and, kv, and, kw, and, kx, and, ky, and, kz, and, la, and, lb, and, lc, and, ld, and, le, and, lf, and, lg, and, lh, and, li, and, lj, and, lk, and, ll, and, lm, and, ln, and, lo, and, lp, and, lq, and, lr, and, ls, and, lt, and, lu, and, lv, and, lw, and, lx, and, ly, and, lz, and, ma, and, mb, and, mc, and, md, and, me, and, mf, and, mg, and, mh, and, mi, and, mj, and, mk, and, ml, and, mm, and, mn, and, mo, and, mp, and, mq, and, mr, and, ms, and, mt, and, mu, and, mv, and, mw, and, mx, and, my, and, mz, and, na, and, nb, and, nc, and, nd, and, ne, and, nf, and, ng, and, nh, and, ni, and, nj, and, nk, and, nl, and, nm, and, nn, and, no, and, np, and, nq, and, nr, and, ns, and, nt, and, nu, and, nv, and, nw, and, nx, and, ny, and, nz, and, oa, and, ob, and, oc, and, od, and, oe, and, of, and, og, and, oh, and, oi, and, oj, and, ok, and, ol, and, om, and, on, and, oo, and, op, and, oq, and, or, and, os, and, ot, and, ou, and, ov, and, ow, and, ox, and, oy, and, oz, and, pa, and, pb, and, pc, and, pd, and, pe, and, pf, and, pg, and, ph, and, pi, and, pj, and, pk, and, pl, and, pm, and, pn, and, po, and, pp, and, pq, and, pr, and, ps, and, pt, and, pu, and, pv, and, pw, and, px, and, py, and, pz, and, qa, and, qb, and, qc, and, qd, and, qe, and, qf, and, qg, and, qh, and, qi, and, qj, and, qk, and, ql, and, qm, and, qn, and, qo, and, qp, and, qq, and, qr, and, qs, and, qt, and, qu, and, qv, and, qw, and, qx, and, qy, and, qz, and, ra, and, rb, and, rc, and, rd, and, re, and, rf, and, rg, and, rh, and, ri, and, rj, and, rk, and, rl, and, rm, and, rn, and, ro, and, rp, and, rq, and, rr, and, rs, and, rt, and, ru, and, rv, and, rw, and, rx, and, ry, and, rz, and, sa, and, sb, and, sc, and, sd, and, se, and, sf, and, sg, and, sh, and, si, and, sj, and, sk, and, sl, and, sm, and, sn, and, so, and, sp, and, sq, and, sr, and, ss, and, st, and, su, and, sv, and, sw, and, sx, and, sy, and, sz, and, ta, and, tb, and, tc, and, td, and, te, and, tf, and, tg, and, th, and, ti, and, tj, and, tk, and, tl, and, tm, and, tn, and, to, and, tp, and, tq, and, tr, and, ts, and, tt, and, tu, and, tv, and, tw, and, tx, and, ty, and, tz, and, ua, and, ub, and, uc, and, ud, and, ue, and, uf, and, ug, and, uh, and, ui, and, uj, and, uk, and, ul, and, um, and, un, and, uo, and, up, and, uq, and, ur, and, us, and, 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za, and, zb, and, zc, and, zd, and, ze, and, zf, and, zg, and, zh, and, zi, and, zj, and, zk, and, zl, and, zm, and, zn, and, zo, and, zp, and, zq, and, zr, and, zs, and, zt, and, zu, and, zv, and, zw, and, zx, and, zy, and, zz, and, aa, and, ab, and, ac, and, ad, and, ae, and, af, and, ag, and, ah, and, ai, and, aj, and, ak, and, al, and, am, and, an, and, ao, and, ap, and, aq, and, ar, and, as, and, at, and, au, and, av, and, aw, and, ax, and, ay, and, az, and, ba, and, bb, and, bc, and, bd, and, be, and, bf, and, bg, and, bh, and, bi, and, bj, and, bk, and, bl, and, bm, and, bn, and, bo, and, bp, and, bq, and, br, and, bs, and, bt, and, bu, and, bv, and, bw, and, bx, and, by, and, bz, and, ca, and, cb, and, cc, and, cd, and, ce, and, cf, and, cg, and, ch, and, ci, and, cj, and, ck, and, cl, and, cm, and, cn, and, co, and, cp, and, cq, and, cr, and, cs, and, ct, and, cu, and, cv, and, cw, and, cx, and, cy, and, cz, and, da, and, db, and, dc, and, dd, and, de, and, df, and, dg, and, dh, and, di, and, dj, and, dk, and, dl, and, dm, and, dn, and, do, and, dp, and, dq, and, dr, and, ds, and, dt, and, du, and, dv, and, dw, and, dx, and, dy, and, dz, and, ea, and, eb, and, ec, and, ed, and, ee, and, ef, and, eg, and, eh, and, ei, and, ej, and, ek, and, el, and, em, and, en, and, eo, and, ep, and, eq, and, er, and, es, and, et, and, eu, and, ev, and, ew, and, ex, and, ey, and, ez, and, fa, and, fb, and, fc, and, fd, and, fe, and, ff, and, fg, and, fh, and, fi, and, fj, and, fk, and, fl, and, fm, and, fn, and, fo, and, fp, and, fq, and, fr, and, fs, and, ft, and, fu, and, fv, and, fw, and, fx, and, fy, and, fz, and, ga, and, gb, and, gc, and, gd, and, ge, and, gf, and, gg, and, gh, and, gi, and, gj, and, gk, and, gl, and, gm, and, gn, and, go, and, gp, and, gq, and, gr, and, gs, and, gt, and, gu, and, gv, and, gw, and, gx, and, gy, and, gz, and, ha, and, hb, and, hc, and, hd, and, he, and, hf, and, hg, and, hh, and, hi, and, hj, and, hk, and, hl, and, hm, and, hn, and, 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lw, and, lx, and, ly, and, lz, and, ma, and, mb, and, mc, and, md, and, me, and, mf, and, mg, and, mh, and, mi, and, mj, and, mk, and, ml, and, mm, and, mn, and, mo, and, mp, and, mq, and, mr, and, ms, and, mt, and, mu, and, mv, and, mw, and, mx, and, my, and, mz, and, na, and, nb, and, nc, and, nd, and, ne, and, nf, and, ng, and, nh, and, ni, and, nj, and, nk, and, nl, and, nm, and, nn, and, no, and, np, and, nq, and, nr, and, ns, and, nt, and, nu, and, nv, and, nw, and, nx, and, ny, and, nz, and, oa, and, ob, and, oc, and, od, and, oe, and, of, and, og, and, oh, and, oi, and, oj, and, ok, and, ol, and, om, and, on, and, oo, and, op, and, oq, and, or, and, os, and, ot, and, ou, and, ov, and, ow, and, ox, and, oy, and, oz, and, pa, and, pb, and, pc, and, pd, and, pe, and, pf, and, pg, and, ph, and, pi, and, pj, and, pk, and, pl, and, pm, and, pn, and, po, and, pp, and, pq