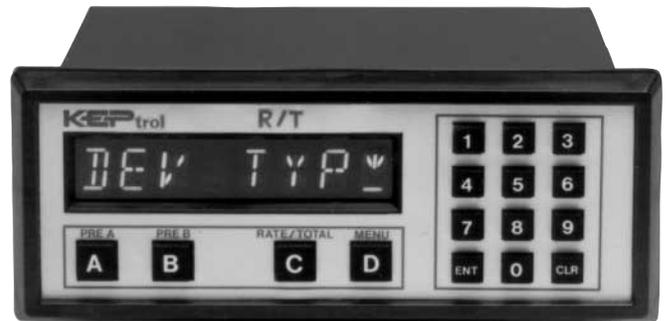# KEPTROL R/T

TOTALIZER / RATEMETER

Features

- Pulse or Analog Input

- Display Total, Rate or Grand Total

- Two Alarm Outputs, User Selectable for Total, Rate or Grand Total

- Pulse Input to 20 kHz Count Frequency

- K-Factor Programmable to 8 Places

- Two Stage Security Lockout

- Two Way RS232/422/ Communications Option

- NEMA 4X/IP 65 Front Panel

- Scalable Analog Output of Rate or Total

- 16 Point Linearization Option

Description:

Featuring 8 digits of bright, .55", alpha-numeric display, the pulse input version of the KEPtrol R/T can accept up to 20,000 pulses per second. The analog input version accepts inputs, such as 4 to 20mA or 1 to 5V. The standard KEPtrol R/T has two separate, 8 digit, floating decimal, "K" factors to convert the inputs to meaningful total and rate data. An optional 16 point K-factor can linearize flow from meter outputs. The user, with the push of a button, can toggle back and forth to view the total of the batch, the rate of flow and the grand total count. Two control outputs can be assigned independently by the user to activate at preset batch total, rate or grand total for .1 to 9.9 seconds or until reset.

A scaled pulse output is also provided by an open collector driver. Since the output frequency is user selectable at 10, 200, 2K or 20K Hz, the unit can transmit the total data to remote electro-mechanical or electronic totalizers as well as computers, programmable controllers or other monitor equipment.

An optional analog output allows the user to select low and high settings to control strip chart recorders or other peripherals. Up to 15 units can be connected to optional RS232 or RS422 communications port to set control points or access data. With RS422M it is possible to communicate with up to 256 units on a single serial link. This option is also compatible with Opto 22's Optomux Network.

Specifications:

Display: 8 Digit, .55" High, 15 Segment, Red Orange, LED.
Input Power (Internally Fused)
A: 110 VAC ±15% or 12 to 27 VDC
B: 220 VAC ±15% or 12 to 27 VDC
Current: Maximum 250 mA DC or 3.2 VA at rated AC voltage.
Output Power: (On AC powered units only)
+12 VDC at 100mA. Separate Isolated 12 VDC at 100mA to allow +12 VDC or +24 VDC regulated ±5% worst case.
DC Outputs are supplied with resettable fuses.
Memory: EEPROM stores all program and total data for minimum of 10 years if power is lost.
Pulse Inputs:

3A: Standard, High impedance pulse input. Open or 0 to 1 VDC (low), 3 to 30 VDC (high), 10K Ohm impedance, 20 kHz max. input speed (min. on/off 25 μsec.).
3B: Same as 3A but has 4.7K Ohm input pull up resistors to +5 VDC on input for pulsing with contact to ground or NPN open collector transistor.

Analog Inputs:

The current loop or voltage input is converted to a highly linear 0 to 10 kHz frequency. This frequency can then be scaled by the 8 digit K-Factors to total or display rate in separate engineering units.
Accuracy over full temperature range:
Zero error: +0.175% full scale max.
Overall error: +0.5% full scale max.
5A/7A: 4-20mA, 250 Ohm impedance
5B/7B: 0-20mA, 250 Ohm impedance
5C/7C: 1-5 VDC, 15K Ohm impedance
5D/7D: 0-5 VDC, 15K Ohm impedance
5E/7E: 0-10 VDC, 15K Ohm impedance
6A: 4-20 mA, Square Law, 250 Ohm impedance

Reset:

Front push button: "Clear" resets displayed number and control output. Remote: 3 to 30 VDC positive edge resets the totalizer and control output. Impedance: 10K to ground (-DC)
Minimum pulse: 5 msec.

Temperature:

Operating: +32°F (0°C) to +130°F (+54°C).
Storage: -40°F (-40°C) to +200°F (+93°C).
ET: Extended Temperature -40° to 158°F (-40° to 70° C)
    ET not available with analog inputs or outputs
Humidity: 0-90% Noncondensing
Listing: CE Compliant
Totalizer: Each of the total and grand total counters have 8 digits. In the set-up mode choose "R0" (reset to zero) for adding operation or "SP" (set to preset) for subtracting operation. While viewing the total, the display can be made to flash the grand total by pressing "ENT". Activating "CLR" while the grand total is flashing, resets the grand total counter.

Ratemeter: Accurate to 51/2 digits (±1 display digit). The rate meter can be programmed to accept almost any number of pulses per unit of measurement, sample from 2 to 24 seconds maximum, and autorange up to 6 digits of significant information. The rate meter with a "K" factor of 1 displays the rate of pulses per second. Simply dial in the proper "K" factor to display in minutes, hours or other units of measurement. Press the "C" button while the unit is displaying the total to display the rate; "R" is displayed on the left side of the display.

Lockout: Two stage lockout available for allowing change of presets only or total lockout of front panel parameter changes. Unauthorized front panel changes can be prevented by entering a user selected four digit code.

Factored Output: The KEPtrol R/T gives one pulse out for each factored total count. Open collector sinks 30 VDC maximum to 1 volt maximum at 100mA maximum. Output speed is user select-able (see table below). An internal buffer holds up to 10,000 pulses for output at the selected frequency before "DATALOST" flashes, indicating pulses are lost. If factored rate exceeds 7 digits "RFF…" flashes. These alarms indicate that speed has been exceeded.

Speed(HZ)	10	200	2000	20000
Min. on/off (msec)	47.5	2.0	0.2	0.013

Control Outputs: (Each of two outputs)
1. NPN Transistor Version: (Optional)
Open collector sinks max. 250mA from 30 VDC when active.
2. SPDT Relay Version:
10A 120/240 VAC or 28 VDC (Standard).

Analog Output: Digital input or analog input (except Square Law) versions can be ordered with an analog output of the rate or total reading. User keys in the low and high settings at set-up.
Current Outputs:
A sinking driver generates a corresponding linear current through the external devices, updating with each update of the rate. Accuracy is ±.5% worst case. Compliance voltage must be 3 to 24 VDC, non inductive. (The KEPtrol R/T can provide the DC source as long as the drop across all devices being driven does not exceed 21 V).
Voltage Outputs:
When the voltage out option is ordered, a controlled voltage output is located at terminal 3 and referenced to pin 12 (ground). Accuracy is .1% @ 20°C (max. drift .01%/C°).

Preset Alarms: Two control presets are provided on the KEPtrol R/T. The preset numbers can be made to flash without interrupt-ing the control function by pressing "A" (Preset A) or "B" (Preset B). Press "ENT" to return to rate or total display. Change the preset by clearing the flashing preset number and keying in a new number before pressing the "ENT" button. (Count pulses may be lost if the preset is changed while pulses are coming in.) In the "Relay Set-Up" the user selects either or both preset outputs to be activated by the total, grand total or rate. If selected for total or grand total the outputs can be set to activate at the preset total for 0.1 to 9.9 seconds or latch (0.0 setting) until reset. If selected for rate control, the rate will be compared with the preset at each display update and the output activated if the rate is equal to or greater than the preset. The output drops out again only if the rate drops below the preset. If the rate goes out of scale the display will show all "F" and the output will remain in the state prior to going out of scale.

K-Factor: In the standard unit a fixed K-Factor is used to convert the input pulses or frequency generated internally by the analog input to engineering units. The 8 digit K-Factor dividers, with decimal keyed into any position, allow easy direct entry of any K-
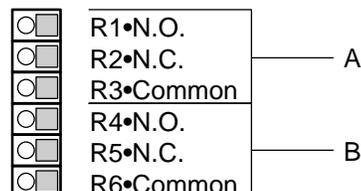
Factor greater than 0.0001 to 99999999. Separate K-Factors may be entered for the total and rate section. Thus, you may batch and total in gallons and display rate in liters per hour. The maximum factored count speed is 20,000 Hz. The maximum factored rate is 7 digits.

16 POINT LINEARIZATION variable K-factor option makes flow systems more accurate and often extends their usable range by allowing users to dial in different K-factors for different flow rates. It works with either pulse input or standard analog current loop or voltage input. It is recommended for flow meters whose K-factors change with different rates of flow. From 3 to 16 points of frequency (0 to 10,000 Hz) and K-factors (.0001 to 999,999) are dialed in at set up. The unit uses 8 digit floating math to interpolate between settings. Rate per second, per minute or per hour programmability eliminates the need to calculate sepa-rate K-factors for total and rate.
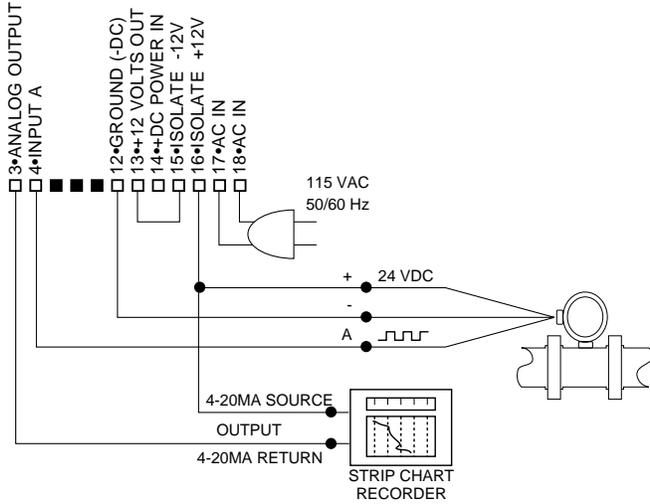
Outcard: RS232 or RS422 serial two way communication op-tions are available. Several units can be linked together and addressed separately to transmit unit status or accept new set points in the standard ASCII format. Baud rates of 300, 600,1200, 2400, 4800 or 9600 as well as choice of odd, even, space or mark parity can be selected by keypad control. With RS422M up to 256 units can be linked together and addressed separately to transmit unit status or accept new set points. Baud rate is automatically selected from 300 to 19.2K. It is also OPTOMUX compatible.
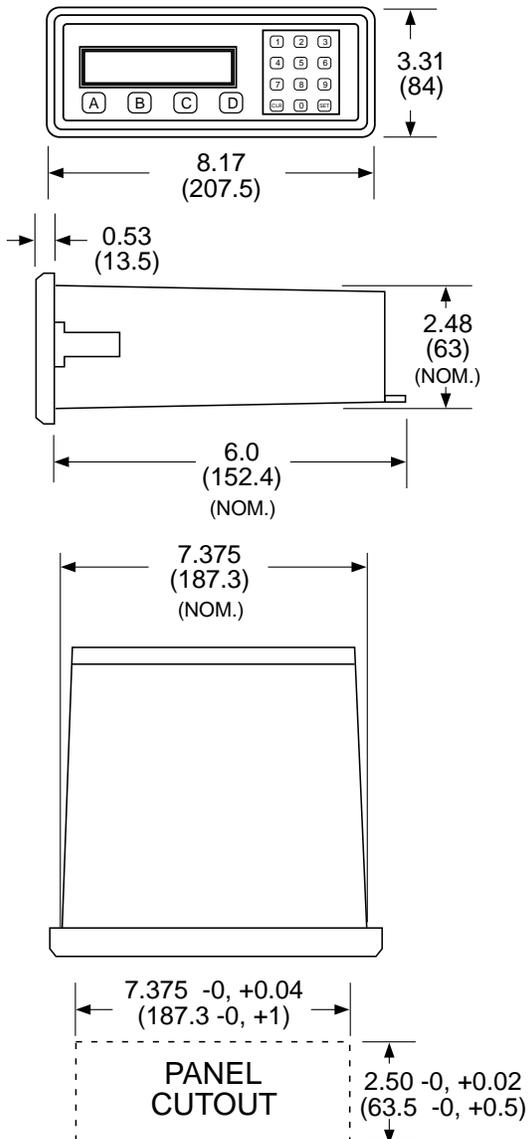
Termination:

1•Not Used
2•Scaled Pulse Output O.C.
3•Analog Output (Sink)
4•Input A (Pulse/Analog)
5•Reset Input
6•Not Used
7•Not Used
8•Not Used
9•Not Used
10•Not Used
11•Ground (-DC)
12•Ground (-DC)
13•+12 Volts Out
14• +DC Power In
15•Isolate -12 Volts
16•Isolate +12 Volts
17•AC In
18•AC In
19•Preset B Open Collector
20•Preset A Open Collector

R1•N.O.
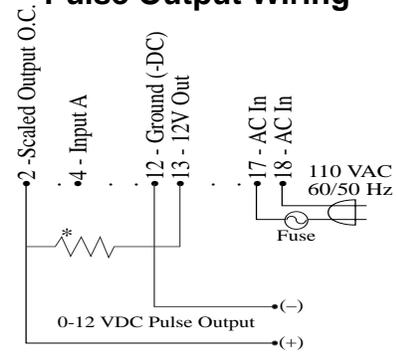R2•N.C.   ——— A
R3•Common
R4•N.O.
R5•N.C.   ——— B
R6•Common

Pulse Input With Analog Output

3•ANALOG OUTPUT
4•INPUT A
12•GROUND (-DC)
13•+12 VOLTS OUT
14•+DC POWER IN
15•ISOLATE -12V
16•ISOLATE +12V
17•AC IN
18•AC IN

115 VAC
50/60 Hz

+ 24 VDC
-
A

4-20MA SOURCE
OUTPUT
4-20MA RETURN

STRIP CHART
RECORDER

Pulse Output Wiring

2 - Scaled Output O.C.
4 - Input A
12 - Ground (-DC)
13 - 12V Out
17 - AC In
18 - AC In

110 VAC
60/50 Hz
Fuse

*

0-12 VDC Pulse Output
(—)
(+)

* Must be greater than 150 Ohms

Dimensions:

3.31
(84)

8.17
(207.5)

0.53
(13.5)

2.48
(63)
(NOM.)

6.0
(152.4)
(NOM.)

7.375
(187.3)
(NOM.)

7.375 -0, +0.04
(187.3 -0, +1)

PANEL
CUTOUT

2.50 -0, +0.02
(63.5 -0, +0.5)

Ordering Information

Example	KRT8	A	3A	2	A	1	3

Series:
 KEPtrol R/T

Operating Voltage:
 A: 110 VAC ±15% or 12 to 27 VDC
 B: 220 VAC ±15% or 12 to 27 VDC

Control Inputs:
* 3A: STD Pulse 3-30 VDC 20 kHz Max.
* 3B: As 3A, with 4.7 KΩ pull up resistors
 5A: 4-20 mA
 5B: 0-20 mA
 5C: 1-5 VDC
 5D: 0-5 VDC
 5E: 0-10 VDC
 6A: 4-20 mA Square Law
 7A: 4-20mA in, 4-20mA out
 7B: 0-20mA in, 4-20mA out
 7C: 1-5VDC in, 4-20mA out
 7D: 0-5VDC in. 4-20mA out
 7E: 0-10VDC in, 4-20mA out

For Other Outputs:
Add X for 0-20mA out
Add Y for 0-5V out
Add Z for 0-10V out

Control Outputs:
 1: Open Collector
 2: SPDT Relay 10A

Input Speed:
* A: 0-40 CPS (Inputs 3A, 3B)
* C: 0-400 CPS (Inputs 3A, 3B)
* E: 0-20K CPS (Inputs 3A, 3B)
 K: Inputs 5A-5E, 6A, 7A-7E
* Dip switch selectable,
 all units can be field modified easily.

Options: (Multiple Options Available)
 1: RS232 Serial Interface
 2: RS422 Serial Interface
 3: 4-20 mA Output (Input 3A or 3B only)
 3X: 0-20 mA Output (Input 3A or 3B only)
 3Y: 0-5VDC Output (Input 3A or 3B only)
 3Z: 0-10VDC Output (Input 3A or 3B only)
 4: 16 Point Linearization Opt.
 ET: Extended Temperature:
    -40° to 158°F (-40° to 70° C)
  ET not available with analog inputs or outputs
 UL/CSA: UL/CSA Approved Unit (pending) . (consult factory)

Accessories:
NEMATROL 4X1 - NEMA 4X/IP 65 Enclosure for
 wall mounting accommodating 1 'TROL Series unit.
NEMATROL 4X2 - NEMA 4X/IP 65 Enclosure for
 wall mounting accommodating 2 'TROL Series unit.
FLEXCOVER #36120
XTROL7/4- Explosion proof housing (see Accessories)
P1000 Printer (see Accessories)