CLARK
DS 3000A & DS 3000P
Dual-line Rate/Totalizer, Analog or Pulse Input

DESCRIPTION

Simultaneous display of rate and total makes the 2-line DS3000 Rate/Totalizer an ideal choice for flow applications. The DS3000A may be configured for a variety of analog input signals, while the DS3000P will take pulse input signals. Via the UV resistant, Nema 4X front panel, the main and secondary displays may be programmed to display totals, engineering units, custom legends, min/max values or relay setpoints.

FEATURES

- Nema 4X, IP65 Front Panel
- User Configurable, Sunlight Readable Display
- Input Power: 85-365 VAC or 12/24 VDC
- Large, Dual-Line, 6-Digit Display for Simultaneous Rate & Total
- 9-Digit Totalizer; Total Stored in Non-volatile Memory
- 2 or 4 Relays + Isolated 4-20 mA Output Options
- Programmable Displays & Function Keys
- Rates in Units per Second, Minute, Hour, or Day
- Total, Grand Total or Non-Resettable Grand Total
- Password Protection for Total Reset

SPECIFICATIONS

GENERAL

Display: Main display: 0.60" (15 mm) high, second display: 0.46" (12mm) high. Displays are 6 digits (-99999 to 999999), red LEDs , leading zeros surpressed.
Display Intensity: Eight user selectable intensity levels
Overrange: Display flashes 999999 **Underrange:** -99999
Front Panel: NEMA 4X, IP65
Programming Methods: Four front panel buttons, digital inputs, PC and multi-point linearization utility, or cloning using Copy function.
Recalibration: All ranges are calibrated at the factory. Recalibration is recommended at least every 12 months.
Max/Min Display: Max/Min values are stored until reset or power is turned off.
Decimal Point: Up to five decimal places: d.dddddd, d.dddd, d.ddd, d.dd, d.d, ddddd
Password: Multiple programmable passwords protect settings and totals.
Non-Volatile Memory: All programmed settings are stored in nonvolatile memory for a minimum of ten years if power is lost.
Power Options: 85-265 VAC 50/60 Hz, 90-265 VDC 20 W max, or jumper selectable 12/24 VDC ±10%, 15 W max.
Fuse: Required external fuse: UL Recognized, 5 A max, slow blow; up to 6 meters may share one 5 A fuse.
Isolated Transmitter Power Supply: Terminals P– & P+: 24 VDC ± 10% @ 200 mA max (standard), (12/24 VDC powered models rated @ 100 mA max). 5 or 10 VDC @ 50 mA max, selectable with internal jumper J4.
Isolation: 4 kV input/output-to-power line. 500 V input-to-output or output-to-P+ supply.
Temperature: Operating:-40 to 65°C. Storage temperature range: -40 to 85°C. Relative humidity: 0 to 90% non-condensing.
Connections: Removable screw terminal blocks accept 12 to 22 AWG wire, RJ45 for external relays, digital I/O, and serial communication adapters.
Enclosure: 1/8 DIN, high impact plastic, UL 94V-0, color: black
Mounting: 1/8 DIN panel cutout required: 3.622" x 1.772" (92 mm x 45 mm). Two panel mounting bracket assemblies are provided.
Overall Dimensions: 4.68" x 2.45" x 5.64" (119 mm x 62 mm x 143 mm) (W x H x D); Weight: 9.5 oz (269 g)

ANALOG INPUT (MODEL DS3000A)

Field selectable: 0-20, 4-20 mA, ±10 VDC (0-5, 1-5, 0-10 V)
Accuracy: ±0.03% of calibrated span ±1 count, square root & programmable exponent accuracy range: 10-100% of calibrated span
Display Update Rate: 5/second (200 ms)
Temperature Drift: 0.005% of calibrated span/°C max from 0 to 65°C ambient, 0.01% of calibrated span/°C max from -40 to 0°C ambient
Math Function: Linear, square root, programmable exponent, or round horizontal tank volume calculation.
Multi-Point Linearization: 2 to 32 points
Programmable Exponent: 1.0001 to 2.9999
Low-Flow Cutoff: 0-999999 (0 disables cutoff function)
Calibration Range: Input : 4-20 mA, ±10 V. Minimum span: 0.15 mA or 0.10 V
Input Overload: Current input protected by resettable fuse, 30 VDC max.
Noise Filter: Programmable from 2 to 199 (0 will disable filter)
Filter Bypass: Programmable from 0.1 to 99.9% of calibrated span
Normal Mode Rejection: Greater than 60 dB at 50/60 Hz

PULSE INPUT (MODEL DS3000P)

Field selectable: Pulse or square wave 0-5 V, 0-12 V, or 0-24 V @ 30 kHz; TTL; open collector 4.7 kohm pull-up to 5 V @ 30 kHz; NPN or PNP transistor, switch contact 4.7 kohm pull-up to 5 V @ 40 Hz.
Low Voltage Mag Pickup (Isolated): 40mVp-p to 8Vp-p
Minimum Input Frequency: 0.001 Hz -> Minimum frecuency is dependent on high gate setting
Maximum Input Frequency: 30,000 Hz (10,000 for Low Voltage Mag Pickup)
Input Impedance: Pulse input: Greater than 300 kohm @ 1 kHz. Open collector/switch input: 4.7 kohm pull-up to 5 V.
Accuracy: ±0.03% of calibrated span ±1 count
Display Update Rate: Total: 10/sec, Rate: 10/sec to 1/100 sec
Temperature Drift: Rate display is not affected by changes in temperature.
Multi-Point Linearization: 2 to 32 points
Low-Flow Cutoff: 0-999999 (0 disables cutoff function)
Calibration: May be calibrated using K-factor, scale using internal calibration, or by applying an external calibration signal.
K-Factor: Field programmable K-factor converts input pulses to rate in engineering units. 0.00001 to 999,999 pulses/unit.
Time Base: Second, minute, hour, or day
Gate: Low gate: 0.1-99.9 seconds; High gate: 2.0-999.9 seconds

SPECIFICATIONS (continued)

RATE/TOTALIZER

Display Assignment: Each display may be assigned to rate, total, grand total, alternate R & T, units, or set point.
Alternating Display: Either display may be programmed to alternate between rate and total or rate and grand total every 10 seconds.
Total Conversion Factor: 0.00001 to 59,999
Totalizer Rollover: Totalizer rolls over when display exceeds 999,999,999. Relay status reflects the display value.
Totalizer Presets: Up to eight, user selectable under Setup menu. Any set point can be assigned to total and may be programmed anywhere in the range of the meter for total alarm indication.
Programmable Total Reset Delay: 0.1 to 999.9 seconds; applied to the first relay assigned to total or grand total. If the meter is programmed to reset total to zero automatically when the preset is reached, then a delay will occur before the total is reset.
Total Reset: Via front panel button, external contact closure on digital inputs, automatically via user selectable preset value and time delay, or via serial communications.
Non-Resettable Total: The grand total can be programmed as a nonresettable total by entering the password "050873". Caution: Once the Grand Total has been programmed as "non-resettable" the feature cannot be disabled.

RELAYS

Rating: 2 or 4 SPDT (Form C) internal and/or 4 SPST (Form A) external; rated 3 A @ 30 VDC and 125/250 VAC resistive load; 1/14 HP @ 125/250 VAC for inductive loads
Noise Suppression: Noise suppression is recommended for each relay contact switching inductive loads.
Deadband: 0-100% of span, user programmable
Relay Assignment: Relays may be assigned to rate, total, or grand total.
High or Low Alarm: User may program any alarm for high or low trip point.
Relay Operation: automatic (non-latching), latching (requires manual acknowledge), sampling (based on time), off (disable unused relays), and manual control mode.
Relay Reset: User selectable via front panel buttons, digital inputs, or PC
Time Delay: 0 to 999.9 seconds, on & off relay time delays.
Fail-Safe Operation: Programmable and independent for each relay.
Note: Relay coil is energized in non-alarm condition. In case of power failure, relay will go to alarm state.

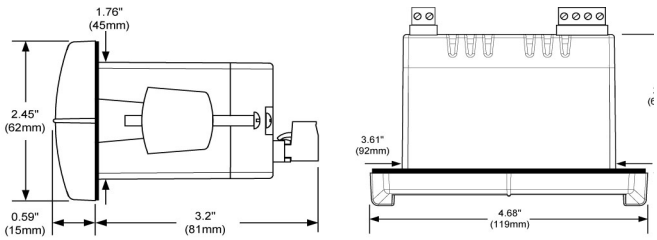
4-20 mA TRANSMITTER OUTPUT

Output Source: Rate, total, grand total, max, min, set points 1-8, or manual control
Scaling Range: 1.000 to 23.000 mA for any display range
Calibration: Factory calibrated: 4.000 to 20.000 = 4-20 mA output
Analog Output Programming: 23.000 mA maximum for all parameters: Overrange, underrange, max, min, and break
Accuracy: +/- 0.1% FS +/- 0.004 mA
External Loop Power Supply: 35 VDC maximum
Output Loop Resistance: (Power/Minimum Resistance/Maximum Resistance)
24 VDC / 10 ohm / 700 ohm; 35 VDC external/ 100 ohm / 1200 ohm

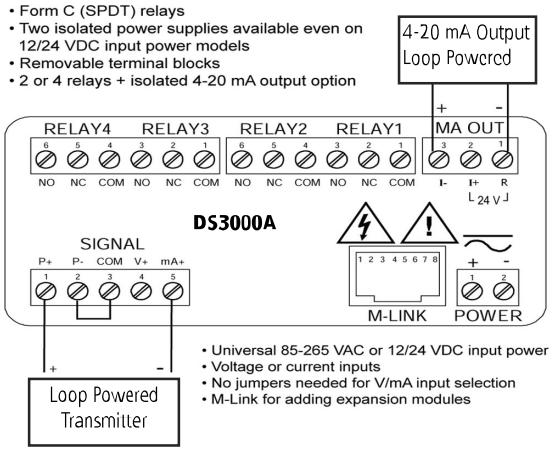
OTHER OPTIONS AVAILABLE (Consult factory for details)

Serial Communication
Digital I/O Expansion Module
4-Relay Expansion Module

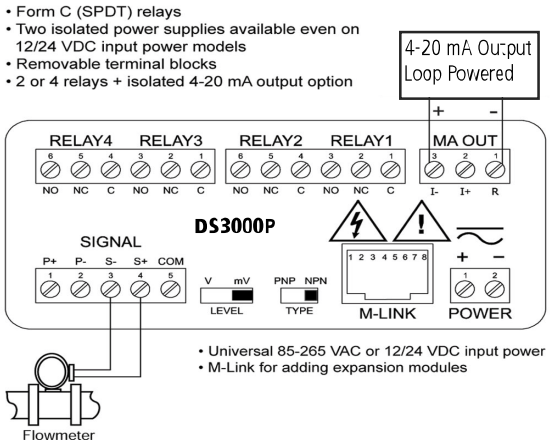
MOUNTING DIMENSIONS



Notes:
1. Panel cutout required: 3.622" x 1.772" (92 x 45)
2 Panel thickness: 0.040" - 0.250" (1.0 – 6.4)
3. Mounting brackets lock in place for easy mounting



CONNECTIONS



DS3000P shown in NEMA 4X enclosure
Order Option - ENC
Additional enclosure options include plastic, stainless steel, and painted steel. Enclosures for multiple meters are also available. Consult factory for details.

ORDERING INFORMATION

EXAMPLE: DS3000P-ENC

Model	Description	Option
DS3000	A = Rate / Totalizer for Analog Input P = Rate / Totalizer for Pulse / Frequency Input	ENC = plastic NEMA 4X enclosure

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