

KDG MOBREY

SERIES 18K1 Tank Status Monitor



**A versatile instrument for
Liquid Level Tank Contents
Monitoring and Control
applications**

FEATURES

- Analogue level input from 2- or 3-wire transmitters
- Six-digit readout
- Bar graph indication of percentage of contents
- Tank shape compensation
- Wide selection of alarms and control points with relay output
- Analogue output option — linearised for tank shape
- Rate-of-contents-change alarm facility
- Temperature Display/Alarm and Automatic Temperature Compensation option using 3-wire PT100 RTD
- 96 DIN Panel Mounting

Description

The Tank Status Monitor generates a digital readout of level and/or volumetric contents of a tank. The output from the transmitter is continuously monitored, digitised and scaled for level display or by using the programmed tank shape tables, in selectable volumetric or mass units. Provision is also made for an optional analogue output (contents), which can be utilised for driving a dial indicator, or for chart recorder/data logger input.

Depending upon the application, a number of setpoints can be programmed, either to generate alarms, or to initiate control outputs. Up to five output relays can be utilised, for setpoints or

setpoint bands as required. In addition, an alarm using rate-of-contents-change is available.

Suitable level sensing transmitters can be supplied by KDG or, alternatively, the unit can be utilised in installations with suitable existing level transmitters of other manufacture.

The Tank Status Monitor can be interfaced to Intrinsically Safe (Zone 0 or 1) transmitters using I.S. certified Zener Barriers in the input/output signal lines.

An internal power source is available to supply transmitters (50 mA maximum at 24 V d.c.).

Operational data

Service:

Liquid level/contents display with alarm and control outputs.

Modes:

RUN covers all normal operations, including contents readout, display of alarms, etc.

DATA ENTRY is password protected. It allows resetting of alarm/control setpoints, S.G. values, etc.

CALIBRATION is protected by its own password and gives further access to the software when recalibration or similar operations must be carried out.

Input ranges (level signal):

Factory selectable from:

0-1 mA, 0-10 mA, 0-20 mA, 4-20 mA or 0-1 V d.c.

Event inputs:

Two contact closure inputs (opto-isolated) for:

- Remote alarm acknowledge.
- Leak detection enable/inhibit.

Analogue output (optional):

One, corresponding to 0-100% contents. Factory selectable from 0-1 mA, 0-10 mA, 0-20 mA, 4-20 mA or 0-10 V d.c.

Output relays:

Up to four output relays (SPCO) plus 1 off (SPNO or SPNC), all providing volt-free contacts for monitoring by remote instruments or outputting alarm and control status. Debounce and hysteresis (deadband) values for outputs are individually programmable. Maximum relay contact ratings are 5 A 250 V a.c. (resistive load). Relays can also be programmed for normally energised or normally de-energised operation.

Alarm conditions:

Two types of alarms are provided, system and setpoint, all annunciated by an internally generated audible tone, by a flashing Alarm LED on the fascia and by the alarm identity being displayed sequentially with the measured value on the digit display. Local or remote acknowledgment mutes the tone and if a relay has been allocated, it can also be acknowledged.

Setpoint alarm for level/contents:

Alarm and control setpoints are settable as % Full Tank Contents. Setting is to nearest 0.1% and hysteresis and debounce (delay) are individually adjustable. One or more alarms may be used to drive any one relay.

Control outputs:

For each control an output relay is allocated, and the 'ON' and 'OFF' setpoints are individually settable as % Full Tank Contents. Setting is to the nearest 0.1% and debounce (delay) is individually adjustable for each control.

Rate of level change alarm:

An optional feature where an alarm can be raised should the tank level change at more than a predetermined rate: e.g. $\pm 1\%$ per 10 minutes. Both percentage and period are settable.

Indication and controls (front panel):

Six-digit, seven-segment red LED, 15 mm high, for measured variable indication and alarm identification.

One twenty-segment red LED bar for measured volume indication.

One LED for alarm annunciation.

Four LED's to indicate selected units of level or contents.

Four push switches whose function varies with the selected mode of operation.

Specific gravity compensation (hydrostatic level transmitters):

Compensation for S.G. values in 0.001 steps can be set into the unit.

Performance data

Analogue input:

A/D resolution 10 bit + 1 s.b.

A/D linearity maximum error 0.1% f.s.r.

Maximum error at reference temperature 0.1%.

Error due to temperature shift (within specified tolerances):

- Zero: less than 0.01% per °C.
- Span: less than 0.012% per °C

Series mode rejection: greater than 40 dB at 50 Hz.

Common mode rejection: greater than 60 dB at 50 Hz.

Maximum common mode voltage: 20 V rms or 1 V d.c.

Analogue output:

D/A resolution: 10 bit + 1 s.b.

D/A linearity: maximum error 0.2% f.s.r.

Maximum error at reference temperature: 0.2%.

Error due to temperature shift less than 0.05% per °C.

Maximum load resistance — current output:

- 750 ohms at 20 mA.
- 1K5 ohms at 10 mA.
- 15 K ohms at 1 mA.

Minimum load resistance — voltage output:

- 10 K ohms.

Computational unit:

Accuracy better than 0.005%.

Tank shape table:

Accuracy dependant upon tank shape and number of points entered in table.

Typically 32 points available, linear interpolation between each point. In some instances up to 64 points available.

Power supply:

Factory selected from:

- 24 V d.c. (nominal)*
- 100-132 V rms, 50/60 Hz. 18 VA max.
- 200-264 V rms, 50/60 Hz. 18 VA max.

Note: For I.S. applications input voltage must not exceed 250 V rms.

Environmental:

Humidity:

0% to 95% RH (non condensing).

Temperature:

Ambient temperature 0°C to 45°C.
Storage temperature -30°C to 80°C.

Temperature input:

Accuracy: Typically $\pm 0.6^\circ\text{C}$ over a $\pm 10^\circ\text{C}$ shift in ambient from calibration temperature.

Protection:

Front panel: IP65 when mounted with suitable gasket.

Rear of case: IP30.

Electrical connections:

Power: IEC plug/socket (a.c.) mains. 3-pin connector for d.c.

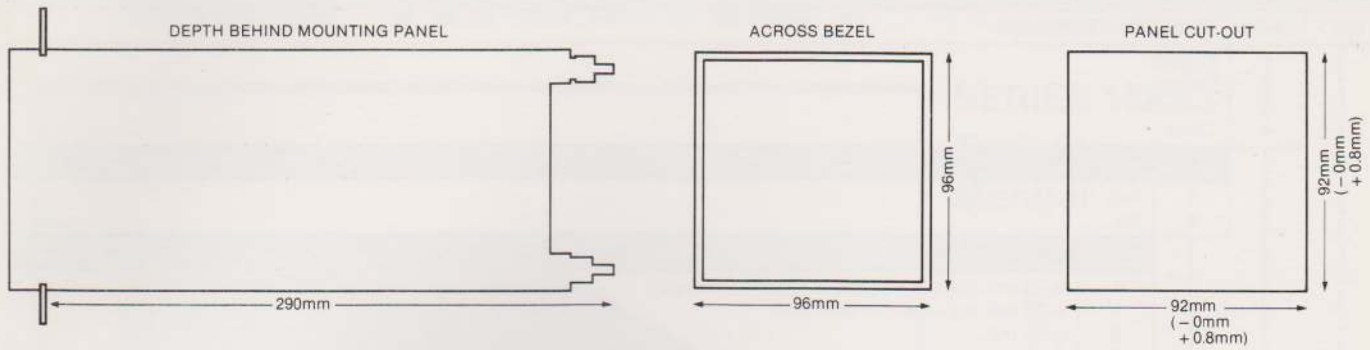
All other terminations, screw terminals to matching two-part connector on rear panel.

Note: No voltage in excess of 250 V a.c. should be applied across any two relay output terminals on the rear panel.

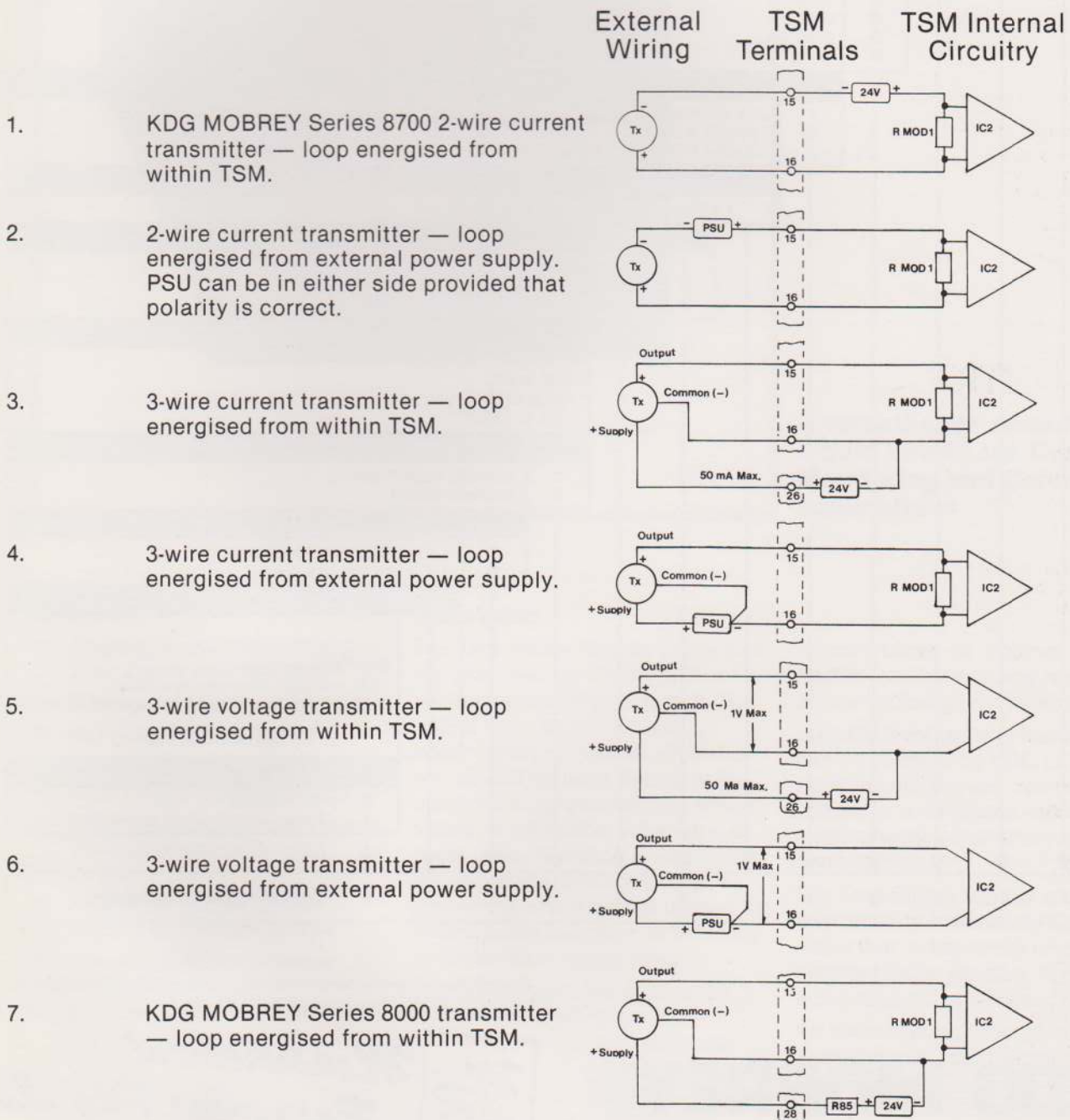
* Actual operating range 21-30 V d.c. Max. current demand at 21 V d.c. is 500 mA. However, d.c. power supply should be capable of providing a 2 A startup current demand.

FOR SERIES 8000 AND 8700 LIQUID LEVEL TRANSMITTERS REFER TO PRODUCT DATA SHEETS NOS. 0002, 0004 AND 0005.

Outline drawing



Level Transmitter Power Supply Options



Ordering information

Model	Tank Status Monitor 96 DIN Panel Mounting												
18K1	Code	Front Panel Language											
	1	English											
	2	French											
	3	German											
	4	Other											
	Code	Factory Configured											
	1	Yes											
	2	No											
	Code	Level Input Signal											
	1	4-20 mA (for KDG Series 8700 transmitters)											
	2	4-20 mA (for other transmitters)											
	3	0-20 mA											
	4	0-10 mA											
5	0-1 mA (for KDG Series 8000 transmitters)												
6	0-1 V d.c.												
Code	Analogue Output												
1	4-20 mA												
2	0-20 mA												
3	0-10 mA												
4	0-1 mA												
5	0-10 V d.c.												
6	None												
Code	Power Supply												
1	24 V d.c. Nominal												
2	100-132 V 50/60 Hz 1 phase												
3	200-264 V 50/60 Hz 1 phase												
Code	Number of Output Relays (1 fitted as standard)												
()	Please specify — 1 to 5 available												
Code	Secondary Display Units												
1	UK gallons												
2	US gallons												
3	m ³ (Not English Front Panels)												
Code	R. T. D. Input												
0	No temperature input												
1	-200 to 0°C												
2	-50 to +150°C												
3	+125 to +325°C												
Code	Relay No. 1 — Mode Selection												
1	Normally open (Form A)												
2	Normally closed												
Code	Earth (Ground) Selection												
1	0 V of instrument earthed												
2	0 V of instrument floating												
Code	Transmitter Type / Power Supply												
1	See Table on page 3 (N.B. — Unless otherwise specified 4-20 mA inputs will be set as internally sourced)												
2													
3													
4													
5													
6													
7													
Code	Custom Units												
0	Not required												
1	Please specify (mass or volume)												
18K1	1	1	5	6	3	4	2	0	1	2	7	0	Typical ordering information

The right is reserved to amend without notice details given in this publication.

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