rapid® GERMAN TECHNOLOGY

LCD 20	# 21 002
LCD 18 E	# 21 004
LCD 18 U	# 21 005
LCD 18 U/E	# 21 008
LCD 18 UK	# 21 009
LCD 18 UB	# 21 010
LCD 18 K	# 21 021
LCD 18 S	# 21 022

LCD 18 E

LCD 18 K

LCD 18 S

LCD 20

LCD 18 U

LCD 18 U/E

LCD 18 UK

LCD 18 UB

1. Before putting into operation

Please check that the technical data of the installation match with those of the lube meter, for example connections, pressure, flow range and medium. Once the meter has been installed, please make sure that no air, pressure shocks or particles can damage the meter. Please check all connections to leakage. After the installation we recommend to do several transactions into an approved tank. Should the use of different oil viscosities show discrepancies by the error limit, this can immediately be corrected at the site. This avoids to remove or exchange the meter. In case of pretested meters can corrections be carried out by technicians or officials of the National Weights and Measure Laboratory.

2. Details of unit operation

2.1 Battery
The battery is exchangeable. The exchange has to be effected by skilled personnel, since the calibration factor must be reprogrammed at the same time. Battery type: Lithium CR 1/2 AA. A battery symbol is warning when battery change is necessary.

2.2 RESET
The display of the batch register memory can be put to ZERO by pushing the RESET button. A reset is not possible during a batch process. Resetting of the totalizer is only possible through internal programming.

2.3 Interruption of batch process
By releasing the meter trigger, the batch process is interrupted. When pulled again, the batch process will be continued at the very point where it was interrupted, unless the RESET button has been pushed in the meantime. The display will remain unchanged during the interruption. If the batch process is interrupted by external source – e. g. failure of a transfer pump – the procedure is the same.

2.4 Functional control
In normal operation, the register board totalizes flow in the lube meter by sensing reed switch actions, as described below. The batch display may be reset to zero by momentarily pressing the RESET button on the front panel. This action will set the batch accumulator to zero and cause the register to enter a selftest mode, as described below. For the self test, it is necessary that the display is activated with all numerics set to "8" and all other indicators set to "on" for a period of 0,8 seconds. If flow or reed switch action takes place during the self test period, the resultant pulses are processed as normal flow accumulations. This accumulation of flow can only be reset by pressing the RESET button, or by reprogramming the register for a different unit of measure. During the self test period, the meter will compare the double redundant storage of the correction factor, the unit of measure and direction of rotation. If two or more values do not correspond, the register will show a series of dashes (- - -) and will become inoperative.
If flow sensing or reed switch action is present at any time and it is not preceded by a pressing of the RESET button, the flow accumulations will be added to the value already present in the batch accumulator.

2.5 Totalizer
Pressing the TOTAL button will cause the accumulator memory value to be displayed, for as long as the button is being pressed, but only as long as no volume pulses are coming in (see also calibration or correction factor). The factory programmed correction factor results from accuracy testing of bare meter with the mounted electronic register:

Example: Quantity dispensed 4,2 litres, Quantity displayed 4,0 litres, Correction factor k 4,2/4,0 = 1,05

Pressing the TOTAL and the RESET button simultaneously in this sequence will cause the programmed correction factor to be displayed, as long as both buttons are depressed.
As soon as volume signals come in, all keyboard commands will be ignored!

2.6 Monitoring of false pulses
During measurement, the microprocessor controls the phase position of both reed switches (30° to 150° phase shift).

Errors caused by incorrect phase sequence:
If more than two (2) phase errors are notec after a RESET, the LCD display is flashing slowly (1 second interval). This type of error is resettable by depressing the RESET button.
If it is not possible to stop the flashing, there is another fault and the register has to be exchanged.
The flashing can e. g. also be caused by a short-time reverse flow when starting up the oil dispense system, or by an insufficiently aerated oil pipe (pressure shocks). This can be prevented by installing an appropriate non-return valve.

Errors in stored variables: (i.e. correction factor, unit of measure, direction of rotation)
These errors are indicated by a series of dashes across the display and are not resettable. The register has to be removed from service.

2.7 Installation procedure

The meter series is equipped with a 1/2" BSP female thread on the inlet side. In order to obtain a leakage free connection from the meter to the hose, the hose end must have a 1/2" BSP male thread.

We recommend to proceed as follows before screwing in:
1. Clean both threads from fat.
2. Brush the 1/2" male thread at the hose with liquid sealant (e.g. Eurolock 310100 or equivalent solang of other manufacturers). Please be careful that no sealing gets into the meter.
3. Screw both parts together.
   Do not overtighten the screw connection, otherwise the swivel of the meter could be damaged.
4. The instruction of the sealing manufacturer should be absolutely followed.
5. The meter mounting should only be carried out by authorized specialist staff.

The right selection of the components as well as the mounting in accordance with the regulations is in the responsibility of the user.

3. Programming and use

3.1

The units of measure and the correction factor can be programmed. A momentary contact programming button is located on the bottom of the register, which is accessible only when the register has been removed from the meter. Removing the register from the meter requires the removal of a sealed register mounting screw. This seal has to be restamped by the Office of Weights and Measures. Activating the programming button (by pressing it for 3 seconds) will immediately force the register into the program mode. Any reed switch activity during the program mode will cause the register to exit from the program mode. The programming button must be pressed continually during any programming procedure.

Programming procedure:

a) Upon initial activation of the board mounted program button, the register will display
   - Correction factor = 0,000
   - Unit of measure L

   The programmable correction factor has a range of 0,0000 to 9,9999. The decimal point is always located after the first digit. When "litres" is programmed or selected as the unit of measure, the decimal point will immediately change to a comma and will remain so as long as "litres" is the selected or programmed unit of measure (Default values are 0,0000, "clockwise" and "QT", if no values have been programmed previously).

b) The unit of measure indicator in the display will immediately begin flashing at 0,3 second rate, all other display action being constant, indicating that the unit of measure is available for change. With each depression of the RESET button, the unit of measure indicator will step through its individual four values in sequence, which are (QT) – GAL – L – PT.

c) Depressing the TOTAL button will store the presently displayed data as the current value for the new setting.

d) Any depression of the RESET button will increment the first or left most digit of the correction factor. Depressing the TOTAL button will store the presently displayed value as the current value.

e) This depression of the TOTAL button in step d) will initiate flashing action of the next successive digit in the correction factor and allow it to be scrolled with the RESET button. All other digits will remain constant. This successive programming action will be continued for the remaining four digits of the correction factor. The four right most digits of the correction factor will be allowed to assume the full range of values from zero (0) to nine (9). Each depression of the TOTAL button will store the value present on the display as the current value for that digit.

f) Successive depressions of the TOTAL button will continue to enable flashing and scrolling of the digits or unit of measure in sequence. The action will continue even if a particular unit of measure or correction digit has already been selected by a previous action.

g) If no scrolling by the RESET button is undertaken between depressions of the TOTAL button, then the present value of a digit or unit of measure as displayed will be utilized as the current value for the digit or unit of measure.

h) Removing pressure from the program button at any time during the programming process will force the values presently displayed (just entered or previously entered) to be stored as permanent values. The storage of the new values will be indicated by the entire display flashing three times to acknowledge the process.

i) During the process of the programming operation as per item h) the seed number in the memory of the mP is multiplied by the correction factor. The result is the proper batch volume increment which corresponds to one input pulse. It will be stored as well as the unit of measure with simple redundancy to assure security.

j) The contents of the totalizer counter will be kept during reprogramming, as long as the unit of measure is not changed. If programming as described under h) is completed with a new unit of measure, the totalizer counter will automatically be zeroed. It does not matter if the units of measure have been toggled during the course of the programming only the final stored value is important.

   After release of the program button, the microprocessor will switch off all functions, incl. LCD display, only the data storage will remain constant. This status will remain unchanged until the RESET or TOTAL button are pressed. A new depressing of the program button enables a new switch off.

   The program button does not work after the microprocessor has been switched off as described above.

Example: Correction of the accuracy

Quantity dispensed: 1,6 l
Quantity displayed: 1,52 l
Correction factor k = 1,6/1,52 = 1,0526

a) Display current correction factor by pressing and holding TOTAL and RESET buttons simultaneously.
   Example: 0,9950 (Make a note of this number)

b) Calculation of the new correction factor
   0,9950 x 1,0526 = 1,0473

c) Remove the 3 screws holding register module from the meter

d) Press and hold program button until programming procedure is completed

e) Display will show the following data
   - momentary correction factor
   - unit of measure (flashing)
   - direction of rotation

f) Press TOTAL button until right most correction factor digit that you wish to change begins to flash (in this case, 0).

g) Press RESET button until desired digit appears (in this case, 3).

h) Press TOTAL button until the next digit you wish to change begins to flash (in this case, the first 7).

i) Press RESET button until desired digit appears (in this case, 4).

j) Press TOTAL button until the next digit you wish to change begins to flash (in this case, the second 0).

k) Press RESET button until desired digit appears (in this case, 1).

l) Release PROGRAM button. The display will flash 3 times and show the new programmed data.

m) The register module can now be remounted on the meter.

Note: After programming, display will be blank. Press RESET button to re-activate the display.

3.2

On the bottom of the register is a round opening in which 2 contacts need to be pressed for a period of 3 seconds to enter the programming mode. Once the programming is completed, please press the 2 contacts again for 3 seconds to bring the register into the sleeping mode. Press the Reset button to reactivate the register

4. Technical Data

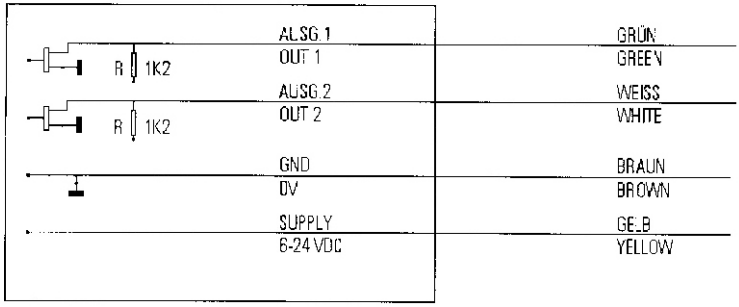
5-digit display with totalizer

Size	:	DN 1/2"
Pressure	:	PN 70 bar BSP
Flow range	:	0-35 l/min. (0-10 l/min.)
Temperature	:	-10°C to +50°C
Accuracy	:	±0,5% (±0,3%)
Viscosity	:	8-2000 mPas

5. Wiring diagram

The wiring configuration is different for the meters 102128 and 102130 to channel 1 = white; channel 2 = green

Wiring diagram



Wiring diagram