

## 1.0 RECEIVING & UNPACKING

The packaging has been designed to provide maximum protection and to ensure that the instrument arrives in perfect condition, however we cannot guarantee that the instrument has not been exposed to unduly rough handling in transit.

Unpack the instrument carefully and if there is any sign of damage or discrepancies, please notify the sales office immediately.

The unit is packed in a re-usable container. After removal of the unit, the packing should be retained for future use. If returning to factory for re-calibration or service please use original packing to provide maximum protection.

## 2.0 DESCRIPTION

The DM420 series of loop powered indicators are designed for series connection into a 4/20mA current loop and display digitally, in engineering units, the process variable represented by the current flow. Housed in a 98 x 48mm DIN standard panel mounted case with 12.7mm high L.C.D. digits, the DM420 requires 1v only from the loop .

The DM421 is similar to the DM420 except that it requires less than 3v from the loop.

The DM420X is a version approved for hazardous area use and requires 1.6v from the loop.

## 3.0 INSTALLATION & WIRING

### 3.1 General Precautions

- a) The indicator should remain in its packaging prior to installation and stored in a dry environment not subject to extremes of temperature.
- b) The indicator should not be installed adjacent to switch gear, electromagnetic starters, contactors, thyristor power units or motors.
- c) The signal cables connected to the indicator should not run in the same trunking as power cables. Screened cables are recommended at all times.
- d) On the DM420X the following precautions MUST be observed when in used in hazardous areas :
  - 1) The electrical circuit in the hazardous area must be capable of withstanding an A.C. test voltage of 500v RMS to earth or frame of the apparatus.
  - 2) The capacitance and either the inductance or the inductance to resistance (L/R) ratio of the hazardous area cables must not exceed the parameters specified in the schedule of the appropriate safety barrier certificate and/or systems certificate.
  - 3) The installation must comply with requirement as specified in BS5345 Part 4 1977.
  - 4) For further information ask for systems drawing SD3-1247-01.

## 3.2 Installation

- a) Legends are fitted by the user into the legend window on the front panel.
- b) The instrument is panel mounted and is held in by two metal clamp bars on diagonally opposite corners, fitted from the rear. Panel cut out size is 92 x 44mm. An optional gasket is available to seal the DM420 to the panel. This **must** be fitted if moisture on the front panel is expected.
- c) Indicators are normally supplied factory calibrated to the specified range at the time of ordering and no further adjustments are required. If the range was not specified the unit will be set for 0.0 to 100.0 range. If a new range or calibration check is required refer to section 5.0.

## 3.3 Wiring

**WARNING:** This instrument must only be connected in series into a 4/20mA loop. Any other connection may result in damage.

- a) The indicator is a two wire device, designed to be connected in series with a 4/20mA current loop. Connection can be made at any point. Refer to section 6.0 for connection details.
- b) On the DM420 series a two pin plug located at the rear is provided for connection. Refer to section 6.0 for location of plug. A terminal is provided to earth case metalwork.

## 4.0 TROUBLESHOOTING

If the indicator is connected and found not to function correctly review the following procedures :

- a) Check all electrical connections are clean and tight and of the correct polarity. Check correct links are set. Check the polarity of the wiring is correct.
- b) Verify that the loop supply available to the indicator is greater than the minimum operating voltage.
- c) Connect a current meter in series with the current loop and check current is between 4/20 mA. If possible vary current over the working range. If no current is present check the PCB mounted fuse FS1 (not fitted to DM420X) and replace if blown. For more details refer to section 6.1.

Note : On the DM420 series some disassembly is necessary to obtain access to the fuse , see section 6.1.

- d) If the above tests fail to provide a working system, replace the indicator with a new unit and return faulty unit for repair.

## 5.0 CALIBRATION

CAUTION Calibration MUST NOT be carried out in the Hazardous Area.

## 5.2 Procedure

- Note : DM420X version only. To maintain IP20 enclosure rating, rear panel jumper links are fitted internally and the PCB module must be withdrawn from case to perform calibration. refer to section 6.0 for removal procedure.

Equipment :Current calibrator range 0/20 mA dc. Accuracy 0.01%

- a) Connect calibrator to indicator terminals in order to simulate current loop. Set to 20mA and allow two minutes warm up period.
- b) Set the required decimal point position by fitting 'Decimal Point' link to the correct position. Refer to section 6 for the correct position.
- c) Remove 'Offset' link and fit to 'Cal' position.
- d) Set current to 16mA, adjust coarse and then fine span potentiometers to obtain the required display span. Note span equals the expected 20mA reading minus the expected 4mA reading.
- e) Remove link from 'Cal' position and return to 'Offset' link position 'Norm'.
- f) Set the current to 4mA and adjust coarse and then fine offset potentiometers to obtain the required reading at 4mA. If the required reading is positive and cannot be obtained move 'Offset' link to 'Pos' position to obtain more adjustment.
- g) Set current to 20mA and check display for the correct 20mA reading. Small errors of up to two counts may be trimmed out using the fine potentiometer. Errors greater than two counts point to incorrect calibration in step d) possibly due to the incorrect calculation of span. return to step c) and repeat procedure.
- h) Set current to 12mA and check display reads mid scale +/-1 count.
- i) Switch off supply and remove test equipment.

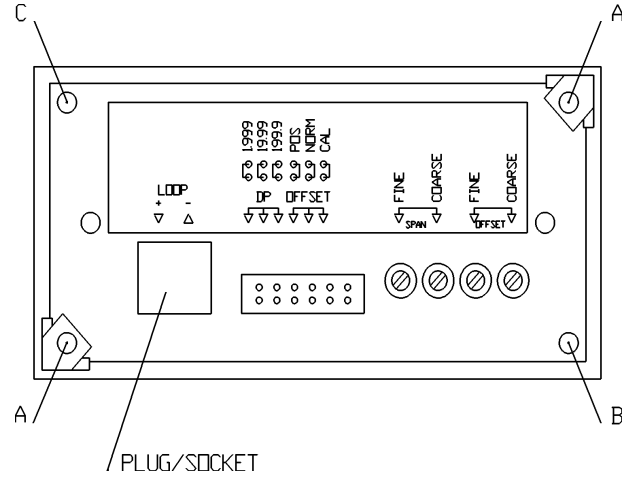
### 5.2.1 Example Range 50/150 Deg C, Span 100 Deg C.

- a) Check 'Decimal Point' link is set to 100.0 Deg C.
- b) Check 'Offset' link is set to 'Cal' position.
- c) Set current to 16mA and adjust coarse and then fine span potentiometers until display reads 100.0 Deg C.
- d) Remove link from 'Cal' position and return to 'Offset' link position 'Norm'.
- e) Set current to 4mA and adjust coarse and the fine offset potentiometers until display reads 50 Deg C.
- f) Set current to 20mA and check display reads 150 Deg C.
- g) Set current to 12mA and check display reads 100 Deg C, +/-1 count.
- h) Switch off supply and remove test equipment.

## 6.0 COMPONENT LOCATION

The rear panel contains the loop input connections, links to set the decimal point, the offset and for re-calibration together with the fine/coarse span/offset potentiometer controls.

- Note : 1) To obtain 1888 range remove the decimal point link.  
 2) To obtain access to the links on the DM420X the back cover needs to be removed.



Panel cutout : 92 x 44 mm.

## 6.1 Fuse Replacement

To replace a faulty fuse it will be necessary to remove the electronic module from the case assembly as follows:

- Remove two screws at A, one screw and shakeproof washer at B and one self tapping screw at C.
- Remove three pillars at A and B releasing the rear cover and exposing the electronic module.
- Remove rear cover and carefully withdraw the module from the rear of case.
- Remove faulty fuse and renew.

Fuse order codes are as follows :

	Rating	Part Number
DM420	125mA	25-100-0012-50
DM421	62mA	25-100-0062-01

- Re-assemble the module into case.
- Refit rear cover, pillars and screws.

Note : DO NOT over tighten pillars and screws.

# DM420 SERIES LOOP POWERED INDICATORS

Designed, manufactured and supported by :

## STATUS INSTRUMENTS LTD

Green Lane  
 Tewkesbury  
 Glos. GL20 8HD  
 UK  
 Sales : 01684 853300  
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