

PERFORMANCE
MADE
SMARTER

Product manual

2261

mV transmitter



EAC

UK
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TEMPERATURE | I.S. INTERFACES | COMMUNICATION INTERFACES | MULTIFUNCTIONAL | ISOLATION | DISPLAY

No. 2261V103-UK
From serial no.: 211141001

PR
electronics

6 Product Pillars

to meet your every need

Individually outstanding, unrivalled in combination

With our innovative, patented technologies, we make signal conditioning smarter and simpler. Our portfolio is composed of six product areas, where we offer a wide range of analog and digital devices covering over a thousand applications in industrial and factory automation. All our products comply with or surpass the highest industry standards, ensuring reliability in even the harshest of environments and have a 5-year warranty for greater peace of mind.



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Our range of temperature transmitters and sensors provides the highest level of signal integrity from the measurement point to your control system. You can convert industrial process temperature signals to analog, bus or digital communications using a highly reliable point-to-point solution with a fast response time, automatic self-calibration, sensor error detection, low drift, and top EMC performance in any environment.



I.S. Interface

We deliver the safest signals by validating our products against the toughest safety standards. Through our commitment to innovation, we have made pioneering achievements in developing I.S. interfaces with SIL 2 Full Assessment that are both efficient and cost-effective. Our comprehensive range of analog and digital intrinsically safe isolation barriers offers multifunctional inputs and outputs, making PR an easy-to-implement site standard. Our backplanes further simplify large installations and provide seamless integration to standard DCS systems.



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We provide inexpensive, easy-to-use, future-ready communication interfaces that can access your PR installed base of products. All the interfaces are detachable, have a built-in display for readout of process values and diagnostics, and can be configured via push-buttons. Product specific functionality includes communication via Modbus and Bluetooth and remote access using our PR Process Supervisor (PPS) application, available for iOS and Android.



Multifunction

Our unique range of single devices covering multiple applications is easily deployable as your site standard. Having one variant that applies to a broad range of applications can reduce your installation time and training, and greatly simplify spare parts management at your facilities. Our devices are designed for long-term signal accuracy, low power consumption, immunity to electrical noise and simple programming.



Isolation

Our compact, fast, high-quality 6 mm isolators are based on microprocessor technology to provide exceptional performance and EMC-immunity for dedicated applications at a very low total cost of ownership. They can be stacked both vertically and horizontally with no air gap separation between units required.



Display

Our display range is characterized by its flexibility and stability. The devices meet nearly every demand for display readout of process signals and have universal input and power supply capabilities. They provide a real-time measurement of your process value no matter the industry and are engineered to provide a user-friendly and reliable relay of information, even in demanding environments.

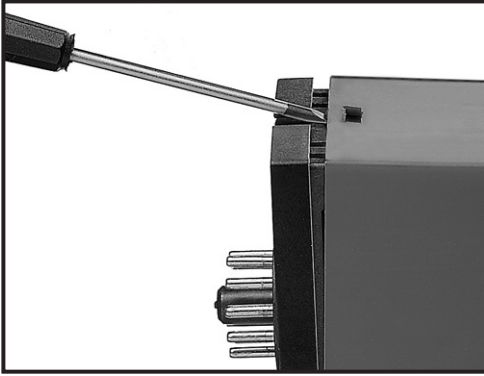
mV transmitter

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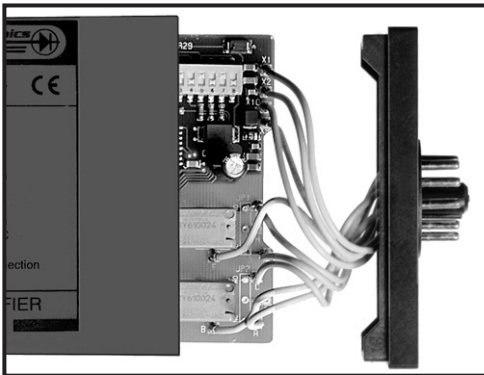
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How to dismantle system 2200



Picture 1:

The back panel of the module is detached from the housing by way of a screwdriver.



Picture 2:

After this, the back panel can be pulled out together with the PCB, but please notice the position of the PCB as there is a number of different positions in the house. Do not pull the wires unnecessarily, instead pull the PCB.

Switches and jumpers can now be moved.

When assembling the back plate and housing, please make sure no wires are stuck.

mV transmitter 2261

- Load cell amplifier
- mV to current / voltage conversion
- Front-programmable / LED display
- Relative calibration of input span
- NPN / PNP input for external taring
- Supply for standard transducers

Application

Tank filling and draining, weighing with a taring function, measurement of cable tensile force, level control and signal conversion / amplification.

The 2261 converts bipolar mV signals from transducers supplied directly by the module to standard current / voltage signals. The 2261 is suitable for load cell applications. By way of the relative calibration function the scale can be tared, i.e. 0 and 100% calibrated without the need of the equivalent load. By way of the taring function the measured range is set to either 0% when filling or 100% when draining.

Technical characteristics

The 2261 is microprocessor-controlled and basic-calibrated meaning that input and output can be programmed acc. to the requested signal range without any readjustment. This guarantees high accuracy and flexibility.

The user interface consists of a 3-digit display and 3 front function keys which are used for taring or change of input / output signal range.

Inputs

Analog input

The analog input can be programmed for voltage in the range -40...100 mVDC with a min. span of 10 mV and max. offset of 70% of max. mV value.

A percentage overrange of the selected measurement range can be defined, thereby making the unit react to an mV input outside the selected 0 and 100% range.

The display will show the input percentage.

The output must be scaled in such a way that the selected overrange is within the allowed output signal range.

Digital input

The digital signal can be selected as either NPN (short circuit to gnd.), or PNP (+24 VDC).

Taring

Taring can either be by way of the digital input or from the front.

At 0% taring, the analog input will show 0% after taring. At 100% taring, the analog input will show 100% after taring, corresponding to tara + net weight = gross weight.

The analog input span is not changed but is kept relative to the new offset value.

The taring function can be disabled at the front.

Standard current / voltage output

The analog output can be programmed to current in the range 0...20 mA or voltage in the range 0...10 VDC with a min. span of 5 mA or 250 mVDC with max. offset of 50% of the selected max. value.

By short-circuiting pins 2 and 3, the voltage signal is available between pins 2 and 1.

For voltage signals in the range 0...1 VDC, a 50 Ω shunt (DP 2-1) is applied; in the range 0...10 VDC, a 500 Ω shunt (DP 2-2) is applied.

When both voltage and current signals are used simultaneously, the mA loop must go to ground through the internal shunt.

Front error LED

At an incorrect output, the red LED will flash, e.g. at overrange saturation.

Transducer supply

Front-programmable to 5...13 VDC. It is up to the customer to ensure a max. load of 230 mA (e.g. 6 parallel 350 Ω load cells).

Sense

When the transducer supply is applied, the sense input can be used for compensation for cable resistance to the transducer.

Electrical specifications

Environmental conditions

Operating temperature	-20 to +60°C
Calibration temperature.	20...28°C
Relative air humidity	< 95% RH (non-cond.)
Protection degree	IP50

Mechanical specifications

Dimensions (HxWxD) (D is excl. pins).	80.5 x 35.5 x 84.5 mm
Weight	130 g

Common specifications

Supply voltage	19.2...28.8 VDC
Internal consumption	2.2 W
Max. consumption	7.2 W
Signal / noise ratio	Min. 60 dB
Signal dynamics, input	17 bit
Signal dynamics, output	16 bit
Updating time	20 ms
Response time, programmable.	0.06...999 s
Temperature coefficient.	< $\pm 0.01\%$ of span/ $^{\circ}\text{C}$
Linearity error	< $\pm 0.1\%$ of span
Effect of supply voltage change.	< $\pm 0.002\%$ of span/ $\%V$
Auxiliary voltages:	
Transducer supply	5...13 VDC
Load (max.)	230 mA
EMC immunity influence	< $\pm 0.5\%$

Electrical specifications - INPUT

mV input

Measurement range	-40...100 mV
Min. measurement range (span).	10 mV
Max. offset	70% of selected max. value
Input in relation to supply gnd.	> -5 V and < +10 V
Max. cable resistance per wire.	15 Ω
Suppression of transducer cable resistance.	> 300
Input resistance	> 10 M Ω
Overrange.	0...999% of selected measurement range

Digital input

NPN	Pull up 24 VDC / 6.9 mA
PNP.	Pull down 0 VDC / 6.9 mA
Trig level low	< 6 VDC
Trig level high	> 10.5 VDC
Pulse width	> 30 ms

Electrical specifications - Output

Current output

Signal range.	0...20 mA
Min. signal range (span).	5 mA
Max. offset	50% of selected max. value
Load (max.)	20 mA / 600 Ω / 12 VDC
Load stability	< $\pm 0.01\%$ of span/100 Ω
Current limit.	< 23 mA

Voltage output through internal shunt

Signal range.	0...10 VDC
Min. signal range (span).	250 mVDC
Max. offset	50% of selected max. value
Load (min.)	500 k Ω
Voltage limit	< 11.5 VDC

Observed authority requirements

EMC.	2014/30/EU & UK SI 2016/1091
RoHS	2011/65/EU & UK SI 2012/3032
EAC	TR-CU 020/2011

Of span = Of the presently selected range

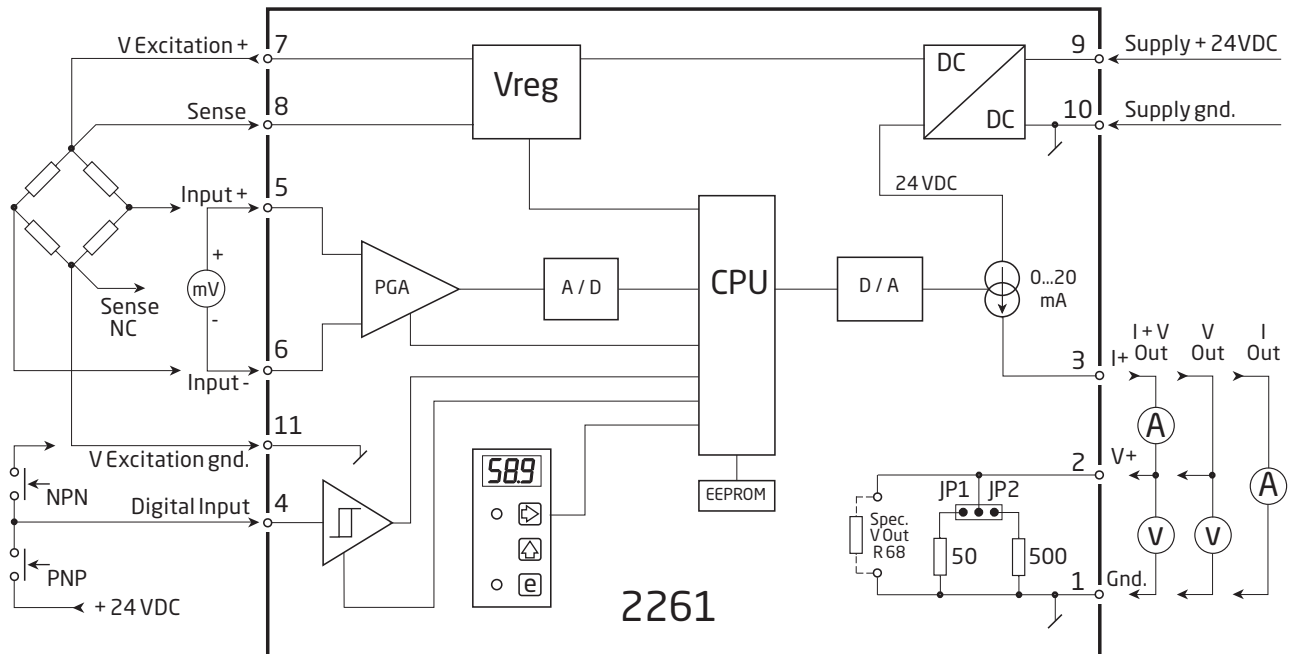
Order

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Hardware programming

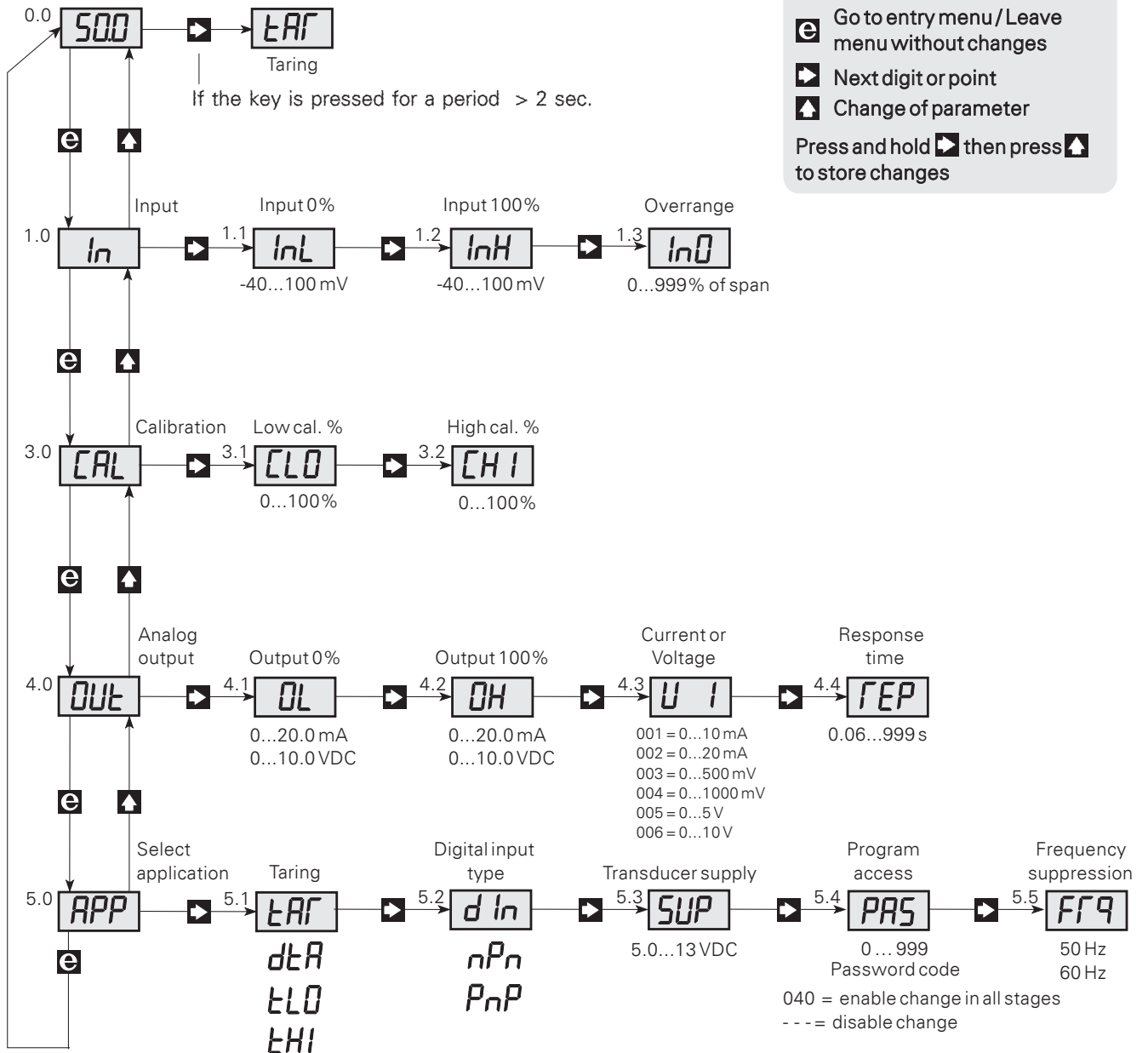
JP1	JP2	Output range	MENU 4.3
OFF	OFF	0...10 mA 0...20 mA	001 002
ON	OFF	0...500 mV 0...1000 mV	003 004
OFF	ON	0...5 V 0...10 V	005 006

Block diagram



Routing diagram

If no buttons are pressed for a period of 2 minutes, display returns to stage 0.0



Programming / operating the function keys

Documentation for routing diagram

General

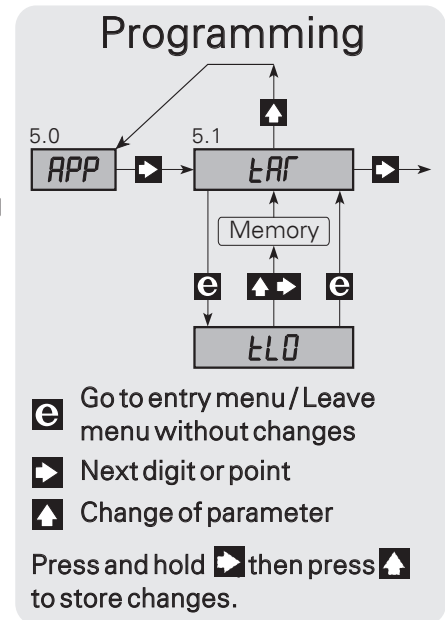
The programming is menu-controlled. The main menus are numbered in level 0 (x.0), and the submenus are numbered in level 1 (x.1 to x.5). Each submenu has an accompanying entry menu. The menus are structured in such a way that the menus most frequently used are closer to the default menu 0.0. Please note that programming is only possible when submenu 5.4 PAS has the value 040.

Main, sub, and entry menus are selected by the 3 function keys **e**, **▶**, and **▲** as outlined in the routing diagram. Activating **e** in the submenus will display the set value in the entry menu.

In entry menus, the digit that can be changed will flash. Active digit position is shifted by the **▶** key and changed by the **▲** key. When the decimal point flashes, its position can be shifted by the **▲** key.

In entry menus with fixed parameters, you switch between the parameters by the **▲** key.

Store by first activating the **▶** key and then the **▲** key simultaneously.

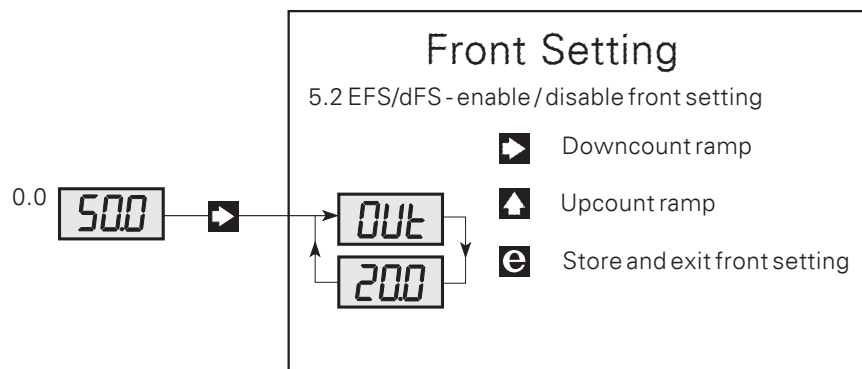


0.0 Default - The input value is displayed in % of the input span.

The display returns to default at power ON, or if no keys have been activated for a period of 2 minutes.

▶ tAR - Taring

When submenu 5.1 has been selected for {tLO or tHI}, activating the **▶** key for more than 2 s will tare the input value to the value it had when activated. The input span is not affected but is kept relative to the new offset value.



1.0 In - Setting of input span

1.1 InL - Setting of 0% input value

Valid selections are -40...100 mV.

1.2 InH - Setting of 100% input value

Valid selections are -40...100 mV.

1.3 InO - Setting of overrange

The analog output follows the set input span on a linear basis {1.1 - InL and 1.2 - InH} with a limit at 20.5 mA (normally approx. 103% input span).

When the input signal is < or > the set input span, the display will track this and show -xx or xxx% until the input begins to limit.

The overrange is set in % of the input span and guarantees that the input does not begin to limit within the percentage overrange, neither below nor above the set input span, provided that the input span \pm overrange is within the signal range -40 to 100 mV.

Setting the overrange does not affect the analog output.

If the overrange measurement is to be included in the analog output signal, the output signal for the set input span must be selected to provide room for the overrange within the signal range of the output (0...20 mA / 0...10 VDC).

Example:

A signal of 5...15 mV corresponds to a weight of 0...1000 kilo.

It must be possible to detect a 50% overrange of the scale on the analog output of the mV transmitter at the same time as the display shows 150%.

The following settings will result in the requested function with an output signal of 4...19.9 mA:

Input: InL = 5.0, InH = 15.0, InO = 50.0

Output: OL = 4.0, OH = 14.6, UI = 002

Please note that the output span has been set to (14.6 mA - 4.0 mA) = 10.6 mA which, with an addition of 50%, will result in a span of $(10.6 + (10.6 * 50/100)) = 15.9$ mA.

3.0 CAL - Setting of calibration values

The calibration function is a relative calibration, i.e. the percentage input value for the low calibration must be entered in submenu 3.1{CLO - Calibration Low}, and the percentage input value for the high calibration must be entered in submenu 3.2 {CHI - Calibration High}. The entered percentages are used for calculating the actual input span.

When {CHI - Calibration High} is activated, the calculation is made using the percentages in {CLO} and {CHI}.

3.1 CLO - Setting of low calibration value

Key **0**. Enter the calibration value by the **0** and **0** keys.

Connect the low calibration signal to the input. Activate the **0** and **0** keys simultaneously.

3.2 CHI - Setting of high calibration value

Key **0**. Enter the calibration value by the **0** and **0** keys.

Connect the high calibration signal to the input. Activate the **0** and **0** keys simultaneously.

The input span is now calculated using the entered calibration values. The mV values are read from the submenus {1.1 - InL and 1.2 - InH}.

4.0 Out - Setting of analog output

4.1 OL - Low - 0% setting of analog output

Valid selections are current in the range 0.0...20.0 mA or voltage in the range 0.0...10.0 VDC.

4.2 OH - High - 100% setting of analog output

Valid selections are current in the range 0.0...20.0 mA or voltage in the range 0.0...10.0 VDC.

4.3 UI - Selection of current or voltage output

See the hardware programming for correct jumper setting. Possible selections are:

001 = Current output in the range 0...10 mA

002 = Current output in the range 0...20 mA

003 = Voltage output in the range 0...500 mV

004 = Voltage output in the range 0...1000 mV

005 = Voltage output in the range 0...5 V

006 = Voltage output in the range 0...10 V


4.4 rEP - Setting of response time


Valid selections are 0.0...999 s. If the set response time is < 0.06 s, the response time will be 0.06 s.

5.0 APP - Application selection

5.1 tAR - Selection of taring type

Possible selections are tLO - 0% taring enable, tHI - 100% taring enable, or dtA - taring disabled.

If tLO is selected, activating the  key for more than 2 s or activating the digital input will tare the input signal to 0%.

If tHI is selected, activating  for more than 2 s or activating the digital input will tare the input signal to 100% (max.).

The 2 types of taring can be used for filling or emptying respectively.

If a 0% (tLO) taring is selected, the analog input will show 0% after taring. If a 100% (tHI) taring is selected, the input will show 100% after taring corresponding to tara + net weight = gross weight.

Taring is either from the digital input or from front.

5.2 dIN - Selection of digital input type

Possible selections are:




PnP = mechanical contact or open collector transistor connected to +24 VDC.

nPn = mechanical contact or open collector transistor connected to gnd.

5.3 SUP - Setting of supply voltage for transducer

Valid selections are 5.0...13 VDC.

5.4 PAS - Setting of password

Key . When the password is 040, changes can be made in all menu points. When the password is <> 040, programming is blocked in all menu points, but access is open for reading the settings. Enter the password by the  and  keys.

When the password is correct, activate  and  simultaneously. Valid selections are 0...999.

5.5 Frq - Selection of common mode frequency suppression

Possible selections are 50 or 60 Hz.

Document history

The following list provides notes concerning revisions of this document.

Rev. ID	Date	Notes
103	2232	UKCA added.

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