USER MANUAL

PROSENSE DPM2-P SERIES
DIGITAL PANEL METER
FREQUENCY / RATE / TACHOMETER / COUNTER MODES

Models:
DPM2-P-HL
DPM2-P-2R-HL

Scan or click the QR code for a series of Configuration and Programming videos for the ProSense DMP Series Panel Meters

In this Chapter...

General Information

Package Contents

- DPM2-P Series digital panel meter
- Quick start guide
- Mounting panel accessories (a sealing gasket and 2 fixing clips)
- Wiring accessories (plug-in terminal block connectors and 2 key tools for wire insertion)
- 4 adhesive engineering unit label sheets

Recycling Instructions

This electronic instrument is covered by the 2012/19/UE European Directive so, it is properly marked with the crossed-out wheeled bin symbol that makes reference to the selective collection for electrical and electronic equipment which indicates that at the end of its lifetime, the final user cannot dispose of it as unsorted municipal waste.

In order to protect the environment and in agreement with the European legislation regarding waste of electrical and electronic equipment from products put on the market after August 13, 2005, the user can give it back, without any cost, to the place where it was acquired to proceed to its controlled treatment and recycling.

General Safety Considerations

All instructions and guidelines for the installation and manipulation that are present in this manual must be considered to ensure personal safety and to prevent damage to either the instrument or any equipment connected to it.

Safety of any equipment incorporated to this instrument is the responsibility of the system installer.

If this electronic indicator is used in a manner not specified by the manufacturer in this manual, the protection provided by the instrument may be impaired.

Symbols Identification

Warning: Potential risk of danger.

Read complete instructions when this symbol appears in order to know the potential risk and know how to avoid it.

Warning: Risk of electric shock.

Instrument protected by double isolation or reinforced isolation.

Maintenance

To ensure instrument accuracy, it is recommended to check its performance according to the technical specifications listed in this manual.

For front cover cleaning, just wipe with a damp cloth and neutral soap product. **DO NOT USE SOLVENTS!**

Technical Support

We strive to make our manuals the best in the industry. We rely on your feedback to let us know if we are reaching our goal. If you cannot find the solution to your particular application, or, if for any reason you need technical assistance, please call us at:

1-800-633-0405

Our technical support group will work with you to answer your questions. They are available Monday through Friday from 9:00 A.M. to 6:00 P.M. Eastern Time. We also encourage you to visit our web site where you can find technical and non-technical information about our products and our company.

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Agency Certifications

$C\,\epsilon$

Description

The ProSense DPM2-P series offers a simple, low cost digital display for counter, tachometer, rate, and frequency applications. The DPM2-P has a 4-digit 14mm character height red LED display, accepts input from AC voltage, magnetic sensors, NPN/PNP sensors, NAMUR sensors, TTL/24V encoders, or switched contacts, and provides selectable sensor excitation voltages. One model includes two SPDT relay outputs that can be set to activate on an increasing or decreasing input signal with hysteresis or time delay operation in tachometer, rate, and frequency modes as well as pulsed or latched operation in counter mode. The meter is powered from an external wide range AC or DC power supply. The 1/8 DIN housing is easy to install in a panel and the meter face has an IP65 rating. Configuration parameters can be totally or selectively locked out to prevent unauthorized or accidental changes to the meter's operation. Additionally, the DPM2-P meters include memory and reset of minimum and maximum display values in tachometer, rate, and frequency modes, and a totalizer display in counter mode. ProSense digital panel meters are backed by a 3 year warranty.

Features

- 96 x 48mm 1/8 DIN
- 4 digit (0 to 9999) red LED display
- Selectable decimal point
- Counter/Tachometer/Rate(Frequency) modes
    - AC voltage
    - Magnetic sensor
    - NAMUR sensor
    - NPN/PNP sensor
    - TTL/24V encoder
    - Switched contact
- AC or DC powered
- Optional (2) Form C SPDT relays

    N.O. or N.C. operation

    Activation on increasing or decreasing input signal

    Hysteresis or time delay operation (tach and rate modes)

    Pulsed or latch operation (counter mode)
- Minimum and maximum value memory (tach and rate modes)
- Totalizer display (counter mode)
- Total or selective configuration lock out

Dimensions and Mounting

Sealing gasket

DPM2 Meter

(2) Fixing clips

Panel mounting surface
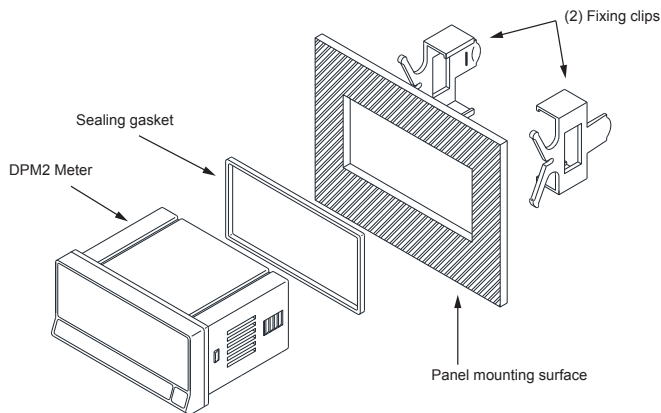
Dimensions mm [in]
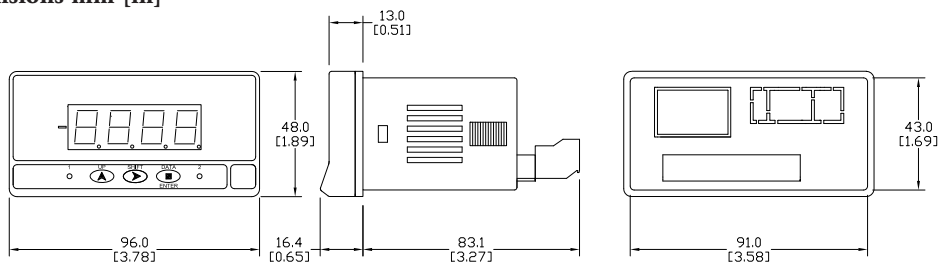
Installation

To install the meter, prepare a 92mm x 45mm panel cut-out and slide the unit inwards making sure to place the sealing gasket between the front side panel and the front bezel.

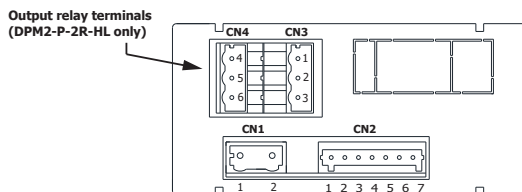| Installation	
Dimensions	96 x 48 x 83.1mm (1/8 DIN)
Panel Cutout	92 x 45mm (Max. panel thickness 10mm)
Case Material	Polycarbonate UL 94 V-0

While holding the unit in place, put the fixing clips on both sides of the case and slide them through the guide tracks until they reach the panel at the rear side.

Press slightly to fasten the clips to the latching slots on the case and get the unit fully assembled and close fitted to achieve a good seal.

To remove the meter from the panel, pull the rear fixing clips latching tabs outwards until they are disengaged, then slide the fixing clips back over the case.

Wiring Terminals

Terminals			
Connector	**CN1**	**CN2**	**CN3 & CN4**
Wire cross section	0.08 to 2.5mm² (28 to 12 AWG)	0.08 to 1.5mm² (28 to 14 AWG)	0.08 to 2.5mm² (28 to 12 AWG)
Strip length	8 to 9mm	6 to 7mm	8 to 9mm
Manufacturer	Wago 231-202/026-000	Wago 734-107	Wago 231-303/026-000
Cage clamp connection	Insertion tool or screwdriver with 0.5 mm x 3.0 mm blade	Insertion tool or screwdriver with 0.3 mm x 1.8 mm blade	Insertion tool or screwdriver with 0.5 mm x 3.0 mm blade

CN1			
AC Supply		**DC Supply**	
1	Line	1	VDC
2	Neutral	2	VDC

Polarity insensitive for DC power

CN2	
Signal Input	
1	- IN (Common)
2	+ IN
3	+ EXC 8 VDC
4	+ EXC 24 VDC
5	RESET
6	N.C.
7	IN HIGH (10-600 VAC)

CN3	
Relay 1	
1	NO1
2	CM1
3	NC1

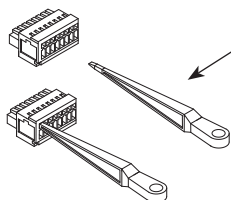| CN4	
Relay 2	
4	NO2
5	CM2
6	NC2

(DPM2-P-2R-HL only)

NO: Normally open contact
CM: Common
NC: Normally closed contact

CN2 Terminals

Insertion Tool (included with meter)

Insert wires into the proper terminal while using the insertion tool to open the clip inside the connector. Release the insertion tool to fix wire to the terminal.
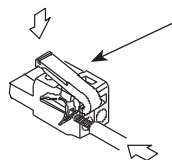
CN1, CN3, CN4 Terminals

Insertion Tool (included with meter)

Insert wires into the proper terminal while using the insertion tool to open the clip inside the connector. Release the insertion tool to fix wire to the terminal.

Warning **Isolation:**

1500Vrms for 1 minute to signal terminals (CN2) and power terminals (CN1).

2500Vrms for 1 minute to signal terminals (CN2) and relays terminals (CN3 or CN4).

2500Vrms for 1 minute to power terminals (CN1) and relays terminals (CN3 or CN4).

Refer to the instructions in this manual to preserve safety protections.

WARNING: If this instrument is not installed and used in accordance with these instructions, the protection provided by it against hazards may be impaired.

To meet the requirements of EN 61010-1 standard, where the unit is permanently connected to main supply, it is obligatory to install a circuit breaking device easily reachable by the operator and clearly marked as the disconnecting device.

To guarantee electromagnetic compatibility, the following guidelines should be kept in mind:

- Power supply wires should be separately routed from signal wires and never run in the same conduit.
- Use shielded cable for signal wiring.
- Cables section should be ≥0.25 mm².

Before connecting signal wires, signal type and input range should be verified to be within the right limits. Do not simultaneously connect more than one input signal to the meter.

Wiring Examples

Wiring for Magnetic Sensor and Switched Contact Input Signal
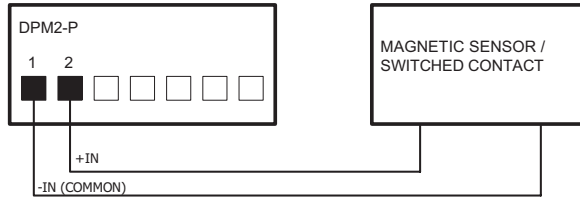
Wiring for NAMUR Sensor Input Signal
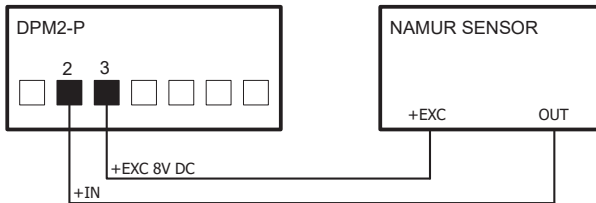
Wiring for NPN, PNP and TTL / 24V DC Encoder

Note:

If an external excitation source is used, its common terminal must be connected to the meter ('-IN (COMMON)' pin 1 of CN2).

AC Voltage Input Signal Wiring

Note:

Frequency measurement of AC voltage input limited to 400Hz.

Remote Counter RESET Function Wiring

O.C. OUTPUT
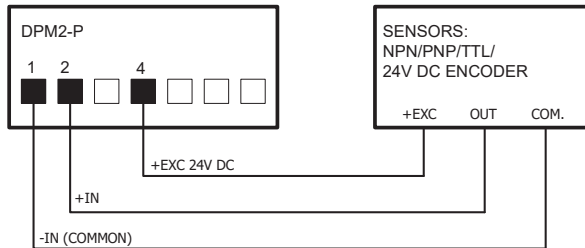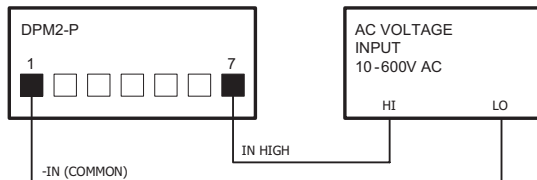
SWITCHED CONTACT

DPM2-P

1   5

RESET

-IN (COMMON)

DPM2-P

1   5

RESET

-IN (COMMON)
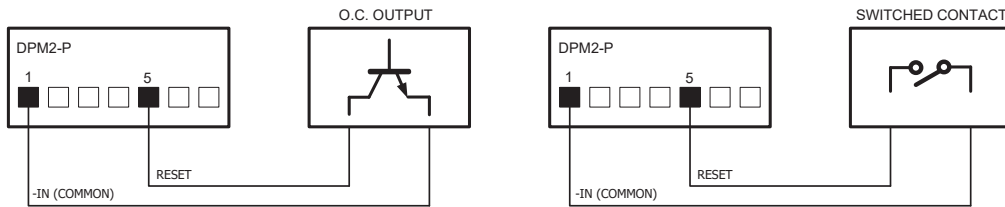
Note:

In both cases, main counter RESET is activated through 1 and 5 terminals when contact is closed and it remains active until the contact is again opened . **Remote totalizer RESET is not available.**

Relay Output Wiring

RELAY 2   **RELAY 1**

NO   NO

CM   4   1   CM

            5   2

NC   6   3   NC
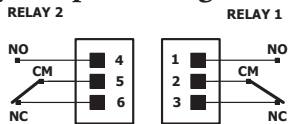
8A/250V MAX.

Important: To guarantee electrical safety according to EN 61010-1 a protective 8A/250V external fuse must be installed.

Display and Keypad

Pro mode is when configuration menu is entered to program the indicator. **RUN** is the normal mode in which display shows the reading according to configuration and input signal value.

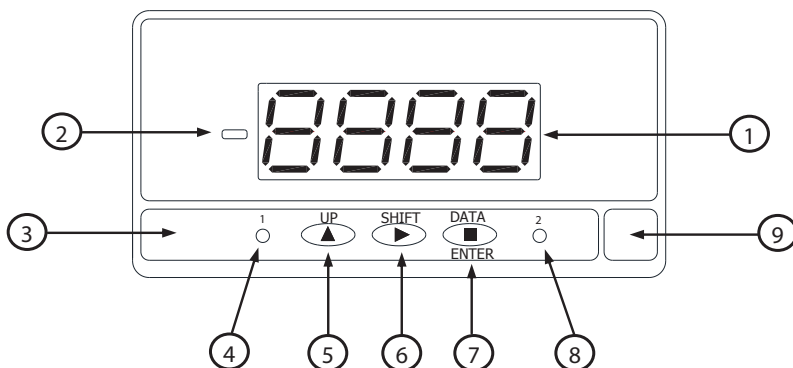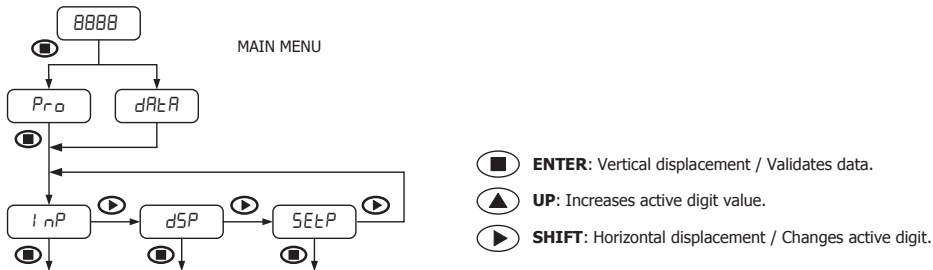| Programming Panel			
#	Description	Run Mode	Programming Mode (Pro)
1	4 digit display Red	Shows value according to configuration.	Shows steps and data during configuration.
2	Minus sign	Not used	Not used
3	Keypad	---	---
4	Setpoint 1 LED	Illuminates when setpoint 1 turns active.	Illuminates when setpoint 1 turns active.
5	UP key	Main counter Reset (when pressed >3s)	Shows setpoint value. Increases value of active digit.
6	SHIFT key	Displays maximum and minimum stored values (tachometer mode only). After 3s of pressing, sets maximum and/or minimum memorized value to current display value (tachometer mode only). Shows sequentially totalizer value in two parts, 'H' and 'L' of 3 digits each (counter mode only). Totalizer RESET (when pressing more than 3s)	Shifts active digit to the next right digit. Shows sequential menu options.
7	DATA/ENTER key	Changes to Pro mode.	Validates selected data and parameters. Moves one step forward in configuration menu. Changes to RUN mode.
8	Setpoint 2 LED	Illuminates when Setpoint 2 turns active.	Illuminates when Setpoint 2 turns active.
9	Free space for units label	---	---

Configuration

When power is applied to the meter, a display test begins automatically to check the function of LED's and digits. Once this test is finished, the display shows the internal software version and then the unit goes to **RUN** mode.

Configuration follows a structure composed of a number of menus and submenus. By pressing **ENTER** key, display shows **"Pro",** pressing again allows access to the main menu level which includes the menus for input configuration (**InP**), display configuration (**dSP**) and relay setpoints configuration (**SEtP**) if relays are present in the meter.

If configuration has been totally locked-out, when pressing **ENTER** key to get into main menu, display shows "**dAtA**" instead of "**Pro**". This indicates that it is only possible to see programmed information and that it is not allowed to modify any parameter from the entire configuration. In this visualization mode, the meter automatically switches back to **RUN** mode after 15 seconds since last key press.

MAIN MENU

ENTER: Vertical displacement / Validates data.

UP: Increases active digit value.

**SHIFT**: Horizontal displacement / Changes active digit.

Once inside each menu, all configuration parameters are sequentially shown and they can then be edited by pressing the **ENTER** key. Numeric values must be entered digit by digit, first selecting digit and then changing its value. When the desired display value is reached, press the **ENTER** key to validate the data and move forward to next configuration step.

Data entered or changed during configuration is stored in device memory after configuration routine belonging to the respective submenu is completed, not before. On last routine step and after the **ENTER** key is pressed, display indicates "**StorE**" and the unit goes back again to **RUN** mode.
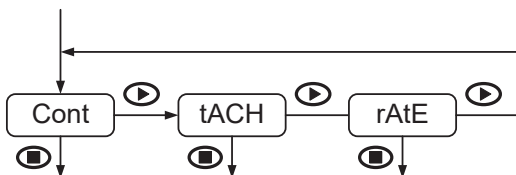
Input Configuration

The first menu corresponds to input configuration which consists of seven options, one for each input signal type: (-1-), (-2-), ... (-7-)
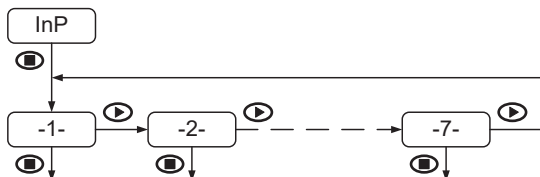
Signal Type:

1:   AC voltage input (10-600 VAC)

2:   Magnetic sensor

3:   NAMUR sensor

4:   PNP sensor

5:   NPN sensor

6:   TTL / 24VDC encoder

7:   Switched contact

Operating Mode

Once input signal type is chosen and **ENTER** key is pressed by repeatedly pressing the **SHIFT** key the display will show the three available operating modes: Counter (**Cont**), rpm meter (**tACH**) and rate meter (**rAtE**).

In **counter** mode the meter always counts up the number of pulses received at the input. Totalizer function is also available.
In **rpm tachometer** mode speed is always displayed in rpm based on the specified number of pulses per revolution from the sensor.
In **rate tachometer/frequency** mode display scaling is possible from an input value given in pulses per second (input frequency) to configure a display-frequency ratio reading in engineering units.

Display Configuration

The second menu corresponds to display configuration consisting of submenus according to previously programmed input type.

#1 Counter Mode
#2 Tachometer Mode
#3 Rate Mode
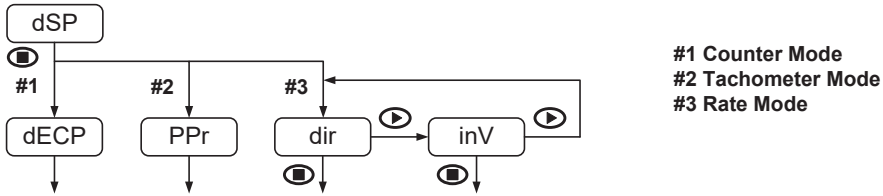
Counter Mode (#1)
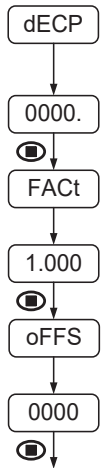
If selected operating mode is counter (**Cont**), the displayed routine after pressing **ENTER** will be as shown here.

Configure the decimal point position "**dECP**". Decimal point position shown at the right means no decimal point. Press **SHIFT** key several times to locate decimal point in desired position.

Press **ENTER**, "**FACt**" is displayed, configurable factor, and then "**1.000**" with first of the four digits flashing. This factor can be programmed from **0.001** to **9.999**.

Display will increase according to the programmed multiplying factor. This factor is set to "1.000" by default, which makes display match the real number of pulses received at the input. A factor of 0.010 will increase display one count every 100 pulses at the input whereas a factor of 2.000 will increase two counts for every pulse at the input.

Press **ENTER**, "**oFFS**" is displayed and then four digits to introduce desired offset value. Offset can be programmed from **0000** to **9999**.
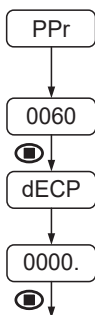
Offset value is shown on display after a main counter **RESET** is done.

Press **ENTER** to save changes and to return back to **RUN** mode.

Simplified main counter operation diagram.
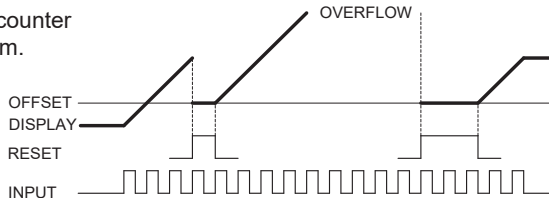
RPM Tachometer Mode (#2)

PPr

0060

dECP

0000.

If selected operating mode is rpm tachometer (**tACH**), the displayed routine after pressing **ENTER** will be as shown here.
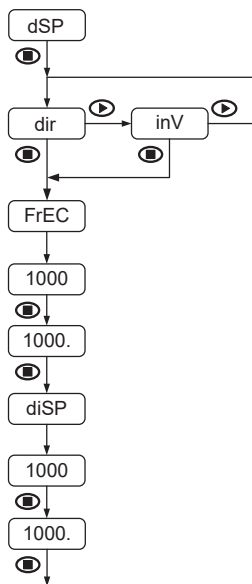
Configure the number of pulses per revolution provided by the sensor connected to the input. After **"PPr"** indication, display shows four digits (by default 0060) which can be programmed between **0001** and **9999**.

Pressing **ENTER**, display shows **"dECP"** and then "0000." to locate decimal point position. It is possible to choose one decimal position or simply no decimal point by pressing **SHIFT** key.

This operating mode always implies a rpm (revolutions per minute) reading and display scaling it is not available.

Press again **ENTER** to save changes and to return back to **RUN** mode.

Rate Tachometer/Frequency Mode (#3)

dSP

dir   inV

FrEC

1000

1000.

diSP

1000

1000.

If selected operating mode is rate tachometer (**rAtE**), the displayed routine after pressing **ENTER** will be as shown here.

Configure the relation between display reading and the number of pulses per second received at the input (input frequency). If increasing frequency must result in an increasing display then "**dir**" (direct proportional variation) must be selected. Select "**inV**" (reverse proportional variation) if increasing frequency must result in a decreasing display. Select desired variation using **SHIFT** key and then press **ENTER**.

Next define display scaling. Display shows "**FrEC**" and then the number of pulses per second at the input must be introduced using **UP** and **SHIFT** keys (1000 by default). Press **ENTER** to accept input frequency value.

Next step defines decimal point position using **SHIFT** key. Frequency resolution can be configured with two (hundredths of a Hertz), one (tenths of a Hertz) or without decimal places (Hz). Press **ENTER** to validate decimal point position.

Third step begins with "**diSP**" message and then a four-digit number which will be the desired display that will correspond to the input frequency value '**FrEC**' previously configured in first step. Once it is entered (1000 by default) press **ENTER** to accept.

Last step defines display decimal point position. Choose desired location using **SHIFT** key and press again **ENTER** to save changes and to return back to **RUN** mode.
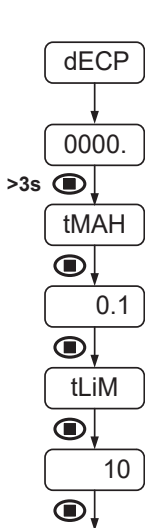
Example of Configuration:

It is desired to measure the speed in m/s of a conveyor belt which is driven by a shaft turning at 300 rpm that is 20 cm in diameter and provides 4 pulses per revolution.

In 1 second the shaft will generate 20 pulses (300 rpm = 5 rev/s and each revolution provides 4 pulses). Input frequency is then **20Hz**. Belt lineal speed is **3.142 m/s** (v = e/t; v = 5 rev x π x 0.2 m/s). The parameters to be configured will be:

Direct proportional variation (**dir**) ; "FrEC": **0020** ; (no decimal point) ; "diSP": **3142** ; decimal point: 3.142

Examples of Configuration Operating as Frequency Meter:

It is possible to operate as a frequency meter configuring the meter as tachometer (**rAtE**) and scaling display properly.

For a mains frequency measurement (**60Hz**), using high voltage input the parameters to configure are direct proportional variation (**dir**) ; "FrEC": **0600** ; decimal point: 060.0 ; "diSP": **0600** ; decimal point: 060.0

Average measurement maximum time (tMAH) and time limit (tLiM) (tachometer mode only)

```
┌────────┐
│  dECP  │
└────────┘
    │
┌────────┐
│  0000. │
└────────┘
>3s ◉ │
┌────────┐
│  tMAH  │
└────────┘
    ◉ │
┌────────┐
│   0.1  │
└────────┘
    ◉ │
┌────────┐
│  tLiM  │
└────────┘
    ◉ │
┌────────┐
│    10  │
└────────┘
    ◉ │
```

The meter configured as tachometer with parameters properly programmed (**"PPr"** and **"dCP"** for **rpm** mode and **"FrEC"** and **"diSP"** for **rate** mode) should operate correctly. However, depending on the sensor type, it may be necessary to modifiy internal measurement times.

After defining decimal point position at the end of the two configuration routines for **rpm** and **rate** modes, it is possible to acces the routine that it is shown here to modify "tMAH" and "tLiM" parameters by pressing ENTER for at least 3 seconds.

AVERAGE MEASUREMENT MAXIMUM TIME "**tMAH**"

With irregular input signals the display may flutter or show unwanted variations due to the number of input cycles detected at each reading not being equal.

"**tMAH**" parameter allows to extend the average measurement time in seconds to increase the signal period measurement time, reducing the possibility of display variations. A value of 0.0 means that no average will be made and every measure will be displayed. This parameter can be programmed from **0.1** to **9.9** seconds (0.1s by default).

To help stabilize the display in case of irregular input signals it is recommended to increment this parameter, taking into account that the display readout will be updated at the programmed time. This parameter can be reduced, if the input signal is stable at operating frequency, to increase the display refresh rate.

Once **tMAH** value is entered, press again **ENTER** to move to the next step.

TIME LIMIT "**tLiM**"

Time limit, programmable from **1** to **99** seconds (10s by default), is the waiting time limit until at least 1 pulse is received at the input before considering it to be 'zero'. If no pulse is detected before programmed time is elapsed, the display goes to zero.

Decreasing the time limit makes the meter respond more quickly to the zero condition when system stops but, this reduction leads to an increment of the minimum displayable reading before display goes to zero. The value for this parameter must always be greater or equal to possible minimum period of input signal.

Once **tLiM** value is entered, press again **ENTER** to save changes.
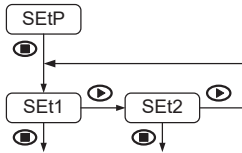
Relay Setpoints Configuration

The menu "**SEtP**" only appears when relays are present in the meter.

Programming steps are similar for both relays on each "**SEt1**" and "**SEt2**" submenus. The parameters to be configured are the following:

SETPOINT VALUE:

00.00: Value entering in counts within available model display range.

(It is not possible to change decimal point position, which is previously defined in display configuration menu).
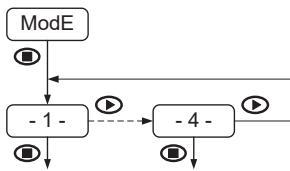
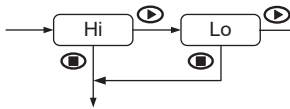|	
00.00:	Value entered in counts within display range. (The decimal point position is previously defined in display configuration menu).

Counter Mode ('Cont')

CONTROL MODES (FOR SETPOINT 2 ONLY):
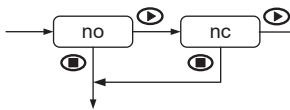
MODE 1: INDEPENDENT

MODE 2: STOP

MODE 3: RESET

MODE 4: CLEAR

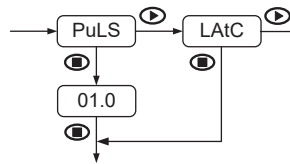**ACTIVATING MODE:**

Hi: High level relay activation.

Lo: Low level relay activation.

CONTACT TYPE:

no: Normally open contact.
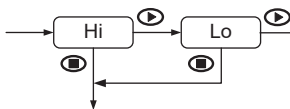
nc: Normally closed contact.

PULSE OR LATCHED OUTPUT:

PuLS: Pulse output with activation time configurable from 0.1 to 99.9s.

LAtC: Latched output.

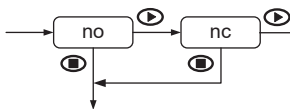## Tachometer Mode ('tACH' and 'rAtE')

ACTIVATING MODE:
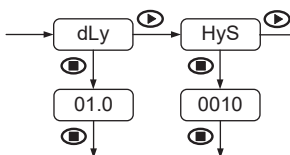
Hi: High level relay activation.

Lo: Low level relay activation.

CONTACTS TYPE:

no: Normally open contact.

nc: Normally closed contact.

TIME DELAY AND HYSTERESIS:

dLy: Programmable delay from **0** to **99.9s**.

HyS: Hysteresis in counts within available model display range.

Function modes description

Alarms are independent, they become active when display value reaches Setpoint level programmed by the user (Setpoints can **not** be referenced to the totalizer). For a complete configuration it is necessary to define the function mode, as well.

HI/LO mode activation

In **HI** mode, output activates when display value goes above Setpoint level, whereas in **LO** mode, output activates when display value falls below Setpoint level.

Time delay (Tachometer mode 'tACH' and 'rAtE' only)

Both output actions can be deferred by a configurable time delay from 0 up to 99.9 seconds.

Time delay activation starts when display value reach each Setpoint '**SET**' either increasing or decreasing, reaching the '**dly**' delay in output activation/deactivation as right figure shows.
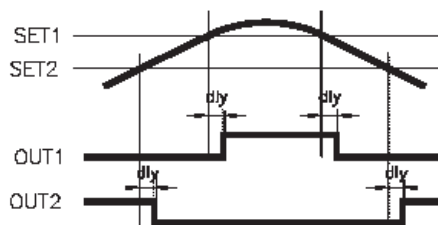
Time delay for OUT1 (HI mode) and for OUT2 (LO mode)

Asymmetrical hysteresis (Tachometer mode 'tACH' and 'rAtE' only)

Both output actions can be deferred by a hysteresis level which is configurable in counts within full available display. Decimal point position is the previously defined in display configuration menu.

Asymmetrical hysteresis action only starts in the output deactivation edge, obtaining as a result the '**hys**' delay as indicated on the right figure.

Hysteresis delay for OUT1 (HI mode) and for OUT2 (LO mode)

Note that outputs activation is not affected by hysteresis and they activate in each case just when Setpoint '**SET**' is reached by display.

1, 2, 3 and 4 control modes (for counter mode 'Cont' and Setpoint 2 only)

Outputs are respectively shown overlapped in the following diagrams as pulse output ⊓ or latch output ⌐⌐ .
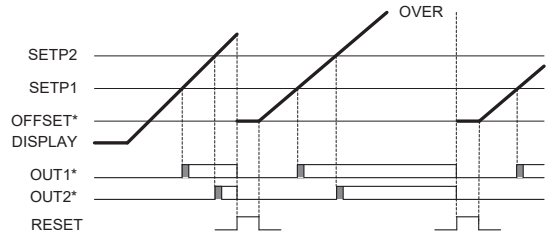
MODE 1: INDEPENDIENT

Relays will be activated when main counter reaches their respective Setpoint values. They will be deactivated when the necessary conditions are met depending on how output is configured, 'pulse' or 'latched'.

MODE 2: STOP

Relay 1 activates when the main counter reaches its respective Setpoint value and Relay 2 stops it when Setpoint 2 is reached. Main counter remains stopped until a RESET is done. Relays will be deactivated when display goes down below their respective Setpoint value.
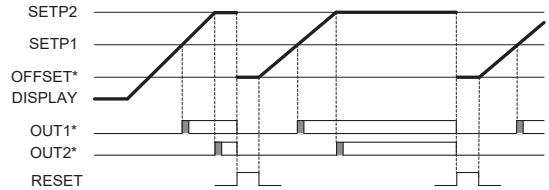
MODE 3: RESET

Relay 1 activates at its Setpoint value. When main counter reaches Setpoint 2, a main counter RESET is done. Relay 2 output is pulse type and remains active for the programmed time. Relay 1 will be deactivated if display goes down below Setpoint 1 value.
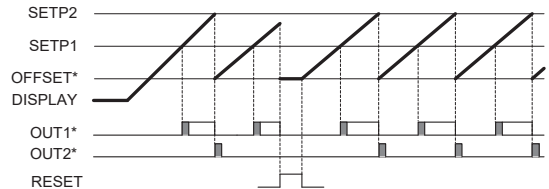
MODE 4: CLEAR

Relay 1 activates at its Setpoint value. When main counter reaches Setpoint 2, relay 2 activates and relay 1 is deactivated (if it was activated). Relay 2 output is latched type. Main counter goes on until a RESET sets display to programmed OFFSET value. Relay 2 will be deactivated if display goes below Setpoint 2.
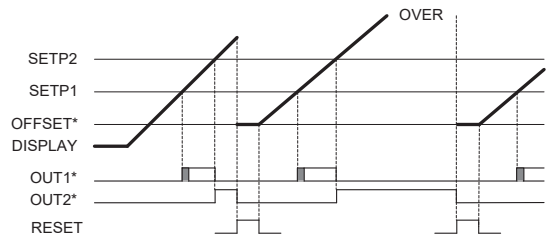
* In all cases, the behavior of OUT1 and OUT2 outputs relays, and consequently of the main counter, changes depending on defined OFFSET level.

Pulse output "PuLS" (Counter mode only 'Cont')
(几)

Relay activates when its Setpoint is reached by display and deactivates after a period of time. This activation time is a parameter which can be programmed between 0.1s and 9.9s.

Latched output "LAtC" (Counter mode only 'Cont')
(⌐‾‾⌐)

Relay activates when its Setpoint is reached by display and remains activated until a RESET makes display go below that Setpoint.

RESET, TOTALIZER, and MAX/MIN Functions

RESET Counter Mode ('Cont')
Main counter **RESET** function activates only in **RUN** mode by pressing **UP** key or closing contact between 1 and 5 pins of CN2 connector and remains active until the key is released or input pin contact is opened. Main counter **RESET** sets display to zero or to configured OFFSET value.

TOTALIZER Counter Mode ('Cont')
The Totalizer function is available only when operating as a counter and it is not possible to disable it. It consists in a 6-digit counter that increases at every received pulse applying the configured factor.

Totalizer value is displayed after indication "**tot**" when pressing **SHIFT** key in a sequence of two partial readings of three digits each. Decimal point is located in the same position as in main counter. The less significant digits are preceded by a "**L**" whereas the most significant by a letter "**H**". If totalizer range is exceeded, display will directly display "**OuE**". This sequence lasts 15 seconds, alternating low and high readings (if most significant digits are null they will not be shown). If **SHIFT** key is not again pressed, the meter will automatically switch back to **RUN** mode after that time.

The TOTALIZER RESET function activates while visualizing totalizer value, **SHIFT** key is pressed for at least 3 seconds. After this time zero is displayed. This function always sets totalizer value to zero since there is no associated OFFSET available for it and does not affect the main counter either.

MAX/MIN Tachometer Mode ('tACH' and 'rAtE')

This device detects and stores in memory maximum and minimum values reached by the input signal. These values remain in memory when the power supply is removed. When pressing the **SHIFT** key repeatedly, **MAX/MIN** function shows saved maximum and minimum values in display since last **RESET** function activation.

In order to differentiate this values indication from a mode **RUN** indication, decimal point blinks during the time these values are shown. The unit automatically switches back to **RUN** mode after 15 seconds have elapsed since the last key press.

First **SHIFT** key pressing shows "**MAH**" in display followed by the maximum value, a second pressing now shows "**Min**" followed by the minimum value and finally, a third press shows "**run**" to go back again into **RUN** mode.

MAX/MIN RESET function activates when visualizing maximum or minimum values **SHIFT** key is pressed for at least 3 seconds. If maximum is the displayed value, current input signal value will replace the previous maximum saved value. In the same way, current input signal will replace saved minimum value while is the minimum the displayed value.

Direct access to Setpoints values

Pro
▲
SEt1
◉
00.00
◉
SEt2
◉
00.00
◉
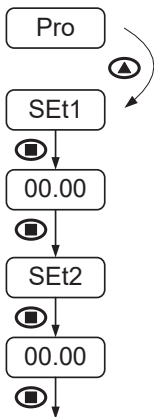
If the DPM2-P has relay outputs, it is possible to access the Setpoints value configuration without having to enter main menu.

To access this submenu, from **RUN** mode and after **ENTER** key is pressed, simply press **UP** key while "**Pro**" is displayed.

FIRST SETPOINT VALUE:

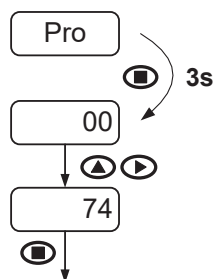**SEt1:** Setpoint 1 value indication.

00.00: Value entering in counts within available model display range.

SECOND SETPOINT VALUE:

SEt2: Setpoint 2 value indication.

00.00: Value entering in counts within available model display range.

Return to default configuration

Pro

⬤ 3s

00

⬆ ⏵

74

⬤

To access this menu from **RUN** mode, press **ENTER** key and while display shows "**Pro**" press **ENTER** again for at least 3 seconds.

Display shows "**00**" and the code '**74**' must be entered through **SHIFT** and **UP** keys.

Finally press **ENTER** to validate and return to **RUN** mode.

Access to lock-out configuration menu

8888

⬤ 3s

CodE

0000

⬤
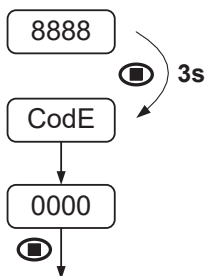
To access this menu from **RUN** mode, press **ENTER** key for at least 3 seconds.

Display shows "**CodE**" and then "**0000**". Security code must be entered with the **SHIFT** and **UP** keys (by default this code is **0000**).

Finally press **ENTER** to begin with lock-out level configuration. If entered security code is wrong, the meter will go back to **RUN** mode.

CONFIGURATION LOCK-OUT

Lock-out menu

In order to prevent accidental or undesirable modifications of meter parameters, a selective or total configuration lock-out is available. By default the unit is delivered unlocked, giving access 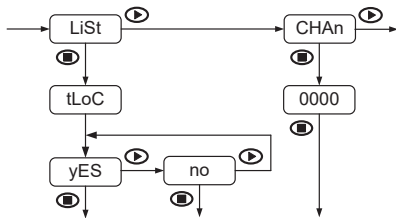to all programming levels. Once in this menu, the first option will be to choose between lock-out level setting ("**LiSt**") or security access code changing ("**CHAn**").

If "**LiSt**" option is selected, display will show momentarily "**tLoc**". Total configuration lock-out is activated by selecting "**yES**", then routine directly jumps to RESET function (**rSt**) and SHIFT key for MAX/MIN function (**MAH**) lock-out configuration before the unit goes back to **RUN** mode. **When total lock-out is set, no data can be entered or modified**, although it will still be possible to view all programmed parameters. Under these conditions when entering main menu, initial indication will be "**dAtA**" instead of "**Pro**".

When "**no**" option is selected, the next step to configure a partial lock-out is displayed. **When a partial lock-out is set, only non-locked data can be entered or modified**. Under these conditions when entering main menu, initial indication will be "**Pro**".

The following configuration access can be locked-out:

- Setpoint 1 configuration (**SEt1**)
- Setpoint 2 configuration (**SEt2**)
- Input configuration (**InP**)
- Display configuration (**dSP**)
- RESET function configuration (**rSt**)
- SHIFT key configuration for MAX/MIN function (**MAH**)
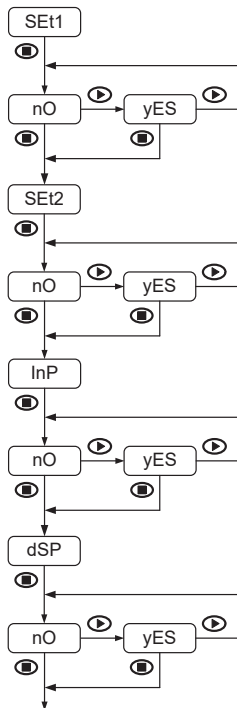
In each case lock-out is activated by selecting "**yES**" option and deactivated by selecting "**no**".

Setpoints 1 and 2 configuration lock-out is available only if the DPM2-P has output relays.

RESET function configuration lock-out (**rSt**) is available only when operating as counter ('**Cont**').

SHIFT key for MAX/MIN function configuration lock-out (**MAH**) is available only when operating as tachometer ('**tACH**' or '**rAtE**').
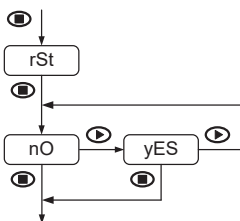
RESET function activated through UP key can be blocked, as well (only when operating as counter 'Cont').

NOTE:

Totalizer RESET function lock-out is not available and it will always remain active.
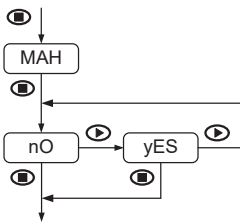
SHIFT key lock-out for MAX/MIN function is configurable in the same way as previous configurations (only when operating as tachometer 'tACH' or 'rAtE').

When lock-out is enabled (selecting "yES") it is not possible to visualize maximum or minimum values by pressing SHIFT key, although meter internally continues detecting and saving new extreme values reached by input signal.

Once the meter programming is completed, if there are parameters that are going to be frequently changed, a partial lock-out is recommended. A total lock-out is recommended when configuration parameters will be constant for a long time.

Changing the default security code and keeping the new one in a safe place is also strongly recommended.

Technical Specifications

Technical Specifications		
Signal Input	Maximum Frequency	7.5 kHz (counter mode) 25kHz (tachometer rpm or rate modes)
	Minimum Frequency (tachometer rpm or rate modes)	0.01 Hz
AC voltage Input	Range	10 to 600 VAC
Magnetic Sensor Input	Sensitivity	Vin min. ≥ 100mV for f ≥ 1kHz
NAMUR Sensor	R_C	1kΩ
	I_{ON}	< 1mA DC
	I_{OFF}	> 3mA DC
NPN/PNP Sensors Input	R_C	1kΩ
	Logic level "0"	< 2.4 VDC
	Logic level "1"	> 2.6 VDC
TTL/24V Encoder Input	Logic level "0"	< 2.4 VDC
	Logic level "1"	> 2.6 VDC
Switched Contact Input	V_C	5V (internal)
	R_C	3.9 kΩ
	Cutoff frequency (Fc)	20Hz
Accuracy at 23ºC ±5ºC (tachometer rpm or rate modes)	Accuracy	± (0.01% of reading +1digit)
	Temperature coefficient	50ppm / ºC
	Warm-up time	5 minutes
Power Supply and Fuses	20-265VAC 50/60 Hz or 11-265VDC (Recommended fusing 3A/250V, 5mm x 20mm glass miniature or DIN 41661 equivalent)	
Power Consumption	3W	
Sensor Excitations	8V @ 60mA ; 24V ± 3V @ 30mA	

Technical Specifications Continued		
Display	Range	0 to 9999
	Type	4 digit, 14mm (0.55")
	Totalizer (counter mode)	0 to 999999
	Decimal point	Configurable
	LEDs	Relay 1, Relay 2
	Display refresh rate (tachometer rpm or rate modes)	0.1 s to 9.9 s (configurable)
	Display/frequency overrange indication	"OuE"
	Relays, maximum and minimum value refresh	10 times per second
	OFFSET (counter mode)	Keypad
	RESET (counter and totalizer)	Keypad
	Remote RESET (counter)	Switched contact
	MAX./MIN. and MAX./MIN. RESET functions (tachometer rpm or rate modes)	Keypad
Relay (2R option)	Maximum switching current (resistive load)	8A
	Maximum switching power	2000VA / 192W
	Maximum switching voltage	400VAC / 125VDC
	Contact rating	8A @ 250VAC / 24VDC
	Contact resistance	≤ 100mΩ at 6VDC @ 1A
	Contact type	SPDT
	Operate time	≤ 10ms
Environmental Conditions	Operating temperature	-10ºC to +60ºC (14ºF to 140ºF)
	Storage temperature	-25ºC to +85ºC (-13ºF to 185ºF)
	Relative humidity (non-condensing)	<95% @ 40ºC (104ºF)
	Maximum altitude	2000m
	Frontal protection degree	IP65
Environmental Air	No corrosive gases permitted	
Agency Approvals	CE	

Instrumentation Configuration Notes

INPUT:

      TYPE: _____

      MODE: CONT ☐   TACH ☐   RATE ☐

DISPLAY:

      MULT. FACTOR: _____

      OFFSET: _____

      PPR: _____

      DISP. VARIATION: DIR ☐   INV ☐

      INPUT FREQUENCY: _____

      DISPLAY: _____

      TMAX.: _____

      TLIM.: _____

SETPOINTS:

      SET1: _____

            ACT. MODE: no ☐   nc ☐

            DLY / PULSE TIME: _____ / _____

            HYS / LATCH: _____ / _____

      SET2: _____

            CONTROL MODE: _____

            ACT. MODE: no ☐   nc ☐

            DLY / PULSE TIME: _____ / _____

            HYS / LATCH: _____ / _____

LOCK-OUT:

      ACCESS CODE: _____