

TIM-2000-5 Pulse Meter (aka: K 400 Pulser or TIM-2000-5P)

USE AND MAINTENANCE MANUAL

K 400 PULSER

INTRODUCTION

The K400 series represents a meters developed to satisfy a wide range of requirements for the control, measurement, dispensing and transfer of lubricating oils and fuels. Its measurement principle is based on modular elliptical gears that provide high accuracy over a wide range of flow rates together with reduced loss of head.

The fluid passing through the instrument turns the gears whose rotation transfers constant "fluid units".

The exact measurement of the fluid dispensed is carried out by counting the rotations of the gears and, thus, the "fluid units" transferred.

The magnetic coupling, consisting of magnets installed in the gears and a magnetic switch located outside the measurement chamber, guarantees the seal of the measurement chamber and ensures the transmission of the impulses generated by the rotation of the gears to the microprocessor.

The meter housing is manufactured of extruded aluminum and is furnished with external guides for a practical and simple installation. The various models are differentiated by the length of the housing, which is related to their ability to function at higher flow rates.

The meter is furnished with threaded and aligned input and output connections to allow easy installation on the tubing. The diameter and thread are a function of the model.

A net filter is installed in the opening of the input connector, accessible from the outside by means of a cover provided for the purpose, that protects the gears of the meter from any dirt present in the system.

The PULSER version is a pulse emitter (reed bulb) that translates variations in the magnetic field generated by the rotation of the gears into electrical impulses to be sent to an external receiver that is connected as shown in the attached diagram. The pulser does not need its own electric power, in as much as it is powered directly by its connection with the receiver.

The type of pulse emitted is represented by a square wave generated by voltage variations, which can be diagrammed as follows:



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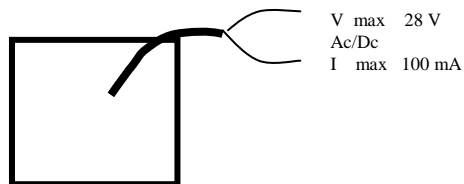
Calibration of the instrument is performed by means of the external pulse receiver.

TECHNICAL DATA

Resolution	L/pulse	0.01	Viscosity Range	cSt	2 – 2000
Range of Flow Rates	L/min	1-30	Accuracy (within capacity range)		± 0.5 %
Working Pressure	bar	70	Repetitiveness		0.2 %
Bursting Pressure	bar	150	Weight	Kg	1
Storage Temperature	°C	- 20 – + 70	Input and Output Connection Thread		1/2 " Gas
Storage Humidity	R.H.	95%	Impulse Type		Clean contact
Working Temperature	°C	- 10 – + 60	Max. Current	mA	100 mA
Loss of Head (maximum flow rate with diesel fuel)	bar	0.4	Max. Voltage	Volt	28 Va c/dc
Compatible Fluids		Diesel Fuel, gasoline, oil	Impulses per liter (approx.)	n°	100

INSTALLATION

The model K400 is designed to be permanently installed on a fuel distribution line. Do not use conical connections that could damage the housing of the meter or the connection flange. The



position of the filter determines the input direction of the flow. The pulser must be connected by two wires observing the electrical specifications shown in the diagram:

MAINTENANCE

The model K400 is designed to require a minimum of maintenance. The only required maintenance are:

Cleaning the Measurement Chamber

If necessary because of the particular nature of the fluid being dispensed

CLEANING THE MEASUREMENT CHAMBER

Cleaning the measurement chamber can be performed without removing the device from the line or the dispensing gun on which it is installed.

ATTENTION

Always make sure that the liquid has drained from the meter before cleaning.

To clean the chamber, proceed as follows

- Unscrew the 4 sealing screws on the upper cover (pos.14).
- Remove the cover (pos. 13) and the OR seal (pos. 12)
- Remove the 2 elliptical gears (pos. 10)
- Clean where necessary. For this procedure use a brush and a pointed object, such as a small screwdriver.
- Be careful not to damage the housing or the gears.
- Carry out the reverse procedure to reassemble the device. To make easier the installation, assemble first gear to the second gear with the major axis at 90° with respect to the first gear.
- Check that the gears rotate freely before closing the cover.

ATTENTION

Reassemble the gears following the mounting diagram shown on the exploded view.

ATTENTION

Only one of the two modularly coupled gears described is equipped with magnets. Be careful that the single elliptical gear on the top shall be assembled with the 2 magnets (pos.23) that shall not be disassembled from the gear.

TROUBLESHOOTING (cause / solution)

Problem	Possible Cause	Solution
Inaccuracy	Calibration not correct	Perform calibration with the appropriate procedure
	Working flow rate outside the capacity range	Calibrate the device with the impulse receiver Reduce or increase the flow rate until it enters the indicated capacity range
High loss of head	Gears obstructed	Clean the measurement chamber
Not counting	Gears mounted incorrectly	Check the position of the gear with the magnets
	Reed bulb out of work	Change the cover with the reed bulb

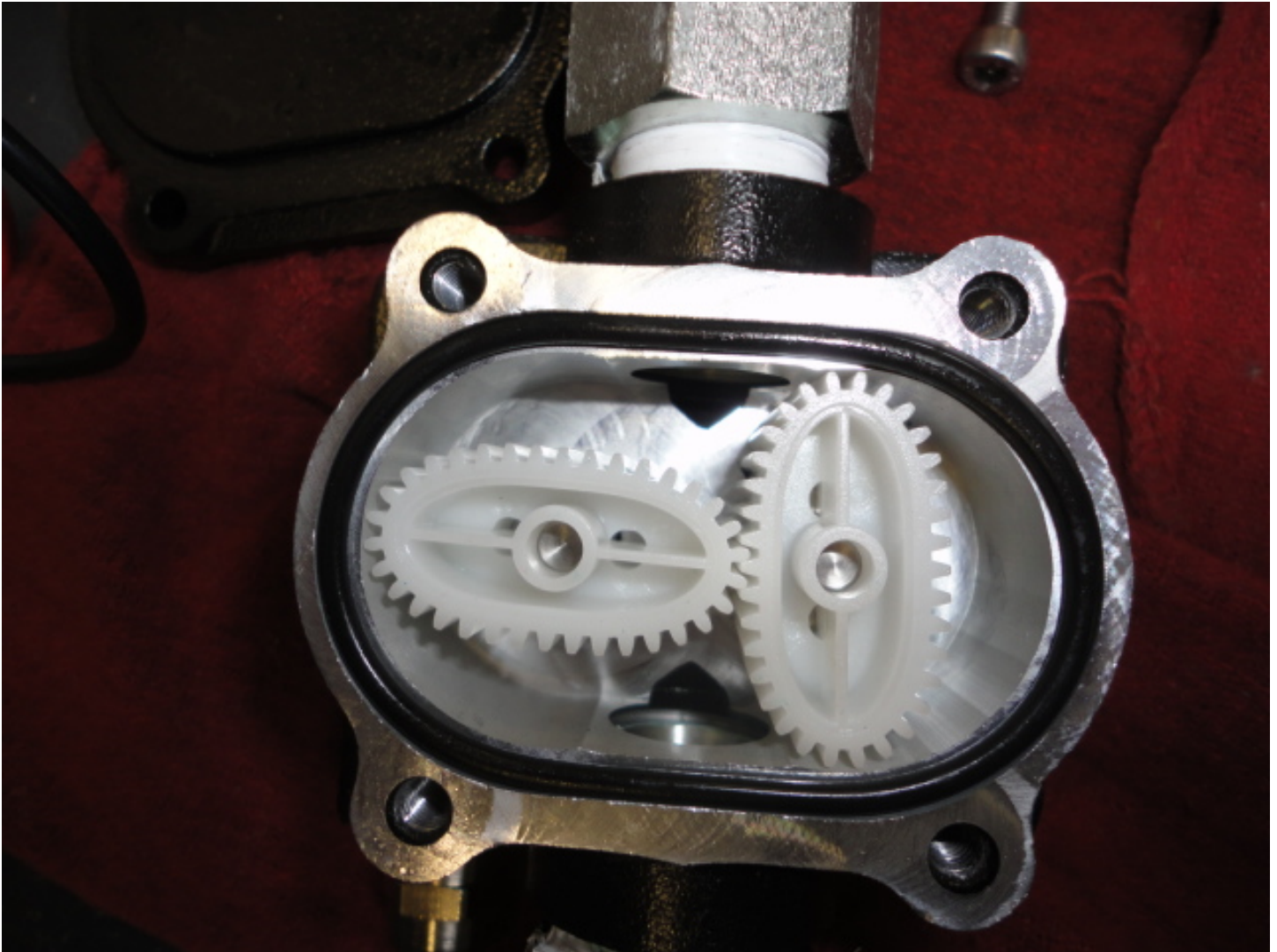
TIM-2000-5 Troubleshooting

- 1) Remove the pulse meter from system.
 - 2) Connect multimeter leads (set to read continuity/Ohms) to the pulse meter leads.
 - 3) Spin gears (air/hand) and verify that continuity is broken/made.
 - 4) Verify that the gears are not broken and that the gears rotate smoothly.
- Note: The application of 24VAC (if it's hooked up to the solenoid wires) will damage the pulse meter.



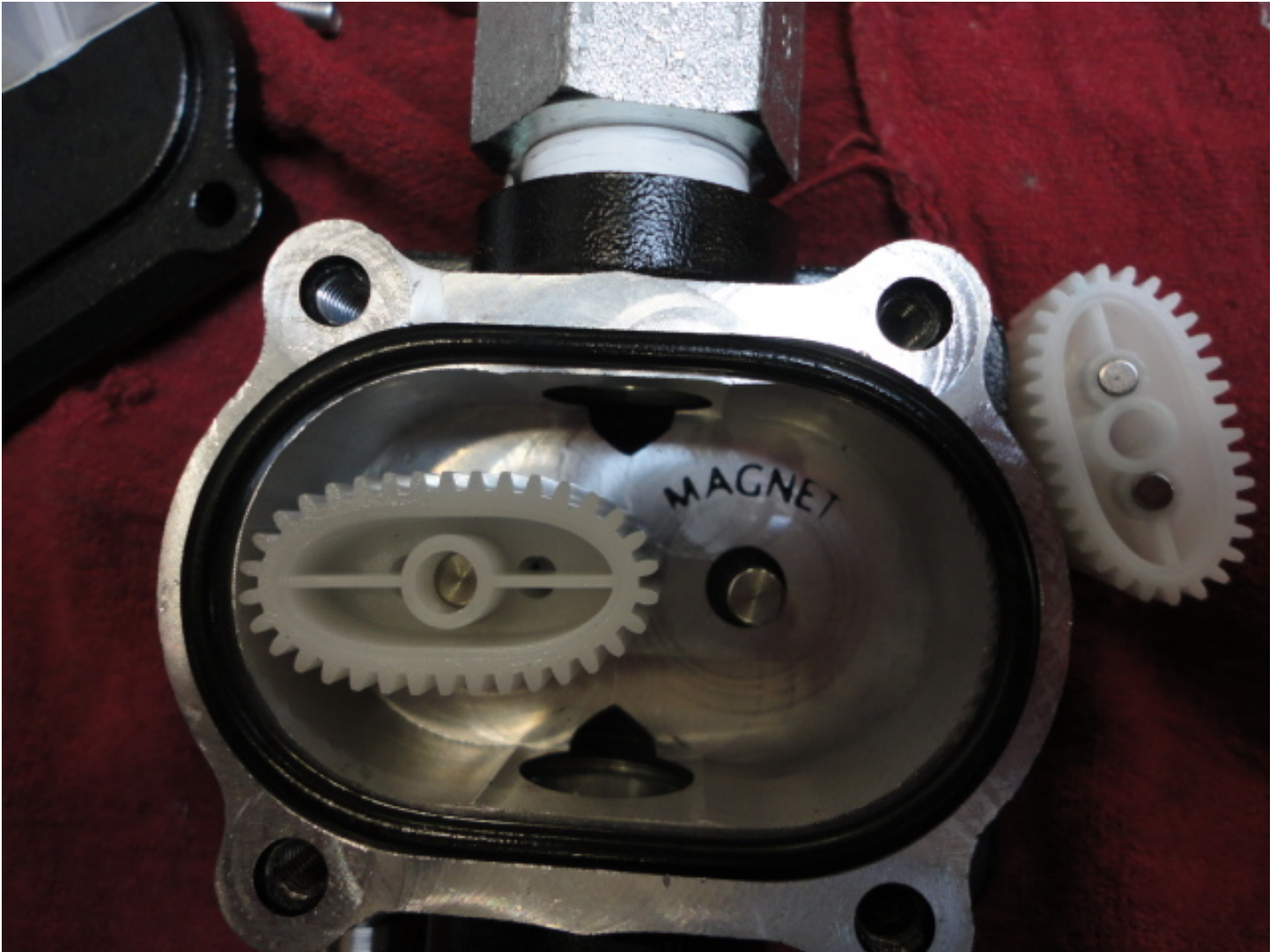
Note:

In this picture, the gear on the right contains two rotating magnets and the gear on the left contains zero rotating magnets. The magnets are on the opposite side of the gear away from the camera.



Note:

In this picture the gear has been removed and flipped upside down. You can see the two small cylindrical magnets in this picture. The biggest problem is getting the gears to mesh properly during reassembly. There is only one way that it's going to work. The teeth have to be meshed properly.



TIM-2000-5 Pulse Meter is *not* directional (it is bidirectional).

