

## INSTRUCTION MANUAL

# EXPLOSION PROOF PRESSURE SWITCHES

**Type number:** 8 7 0 - 0 - 0 0 □ - 0

**Serial number:**

**Date of manufacture:**

February 20<sup>th</sup>, 2001

**The serial number of the instruction manual shall conform  
to that indicated on the instrument!**

*Dear User,*

*You are recommended to read through this instruction manual, before installing this device. For personal and material safety, and for the optimal efficiency of the appliance, the instruction manual should be got to know before installing, using or maintaining.*

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## 1. PURPOSE AND FIELD OF APPLICATION

The series of pressure switches includes high precision industrial switches for use primarily in the gas- and petroleum industry; however, they are well suitable to be used in other industry sectors e.g. in the chemical industry and food industry.

The pressure switches are designed to break or close electric circuits with high accuracy on reaching a predetermined pressure value.

Their explosion proof design is in conformity with the provisions of MSZ EN 50014, 50018, 50019. The explosion safety class is: EEx de IIB T6.

## 2. SPECIFICATION

### 2.1. Types available

8 7 0 - 0 - 0 0 □ - 0

	Set point range [bar]	Base setting [bar]	Switching difference [bar]	Max. permissible overload [bar]
<b>1</b>	0.2 - 1.6	0.8	0.06	6
<b>2</b>	0.2 - 2.5	1.5	0.1	16
<b>3</b>	0.5 - 6.0	3.0	0.15	16
<b>4</b>	1.0 - 10.0	5.0	0.3	16
<b>5</b>	3.0 - 16.0	8.0	0.5	25
<b>6</b>	4.0 - 25.0	15.0	1.0	60
<b>7</b>	10.0 - 40.0	20.0	1.3	60
<b>8</b>	16.0 - 63.0	30.0	2.0	130
<b>9</b>	20.0 - 80.0	40.0	2.5	130

### 2.2. Technical parameters

Pressure connection	M20x1.5 or on order
Switching range	according to the table
Reproducibility	max. 1% of the pressure set
Additional error due to changes in temperature (related to the upper limit of range)	
- type 870-0-001-0	≤ 0,5 % / 10 °C
- type 870-0-002...9-0	≤ 0,3 % / 10 °C

Permissible electric load	0 to 10 A, 250 V AC with resistive load
	0 to 5 A, 250 V AC with inductive load
	0 to 1 A, 24 V DC

Dielectric strength	2 kV rms
Fuse is not included	
Switching frequency	10 /min
<u>Parameters of the switch</u>	
- service life	10 x 10 <sup>6</sup> switching actions with sinusoidal pressure changes at room temperature, 4000 V rms, to DIN VDE 0110.
- test voltage	IP65
Protection	EEx de IIB T6
Safety class	approx. 1.2 kg
Mass	vertical
Mounting position	-20 to +60° C (without solidification)
Ambient temperature range	-40°C...+100°C
Sensing element operating temperature:	
Vibration resistance	
- Up to 4 g without any change in the preset values	
- Beyond 4 g, the switching difference may suffer slight changes	
- Over 25 g: the device is not allowed to be operated	

### 3. TECHNICAL DESCRIPTION

#### 3.1. Principle of operation

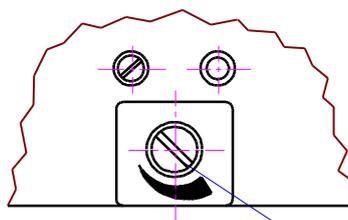
The pressure sensing element of the pressure switches consists of a spring loaded bellow diaphragm made of stainless material which, under the effect of pressure changes, actuates a lever system. In turn, the lever system operates a micro-switch. The micro-switch breaks or closes the circuit at the preset pressure value.

#### 3.2. Structural design

The casing that accommodates the micro-switch and its electric connection is of pressure proof design, with safety class EEx de.

The bellow diaphragm that isolates the medium to be measured as well as other parts in contact with the medium to be measured are made of stainless material, which enables the device to be used for aggressive media.

The switching pressure can be set within the specified limits by means of a threaded shaft as shown in the Fig. below.



- turn clockwise to decrease
- turn counterclockwise to increase

Switching pressure

The switching point can be adjusted accurately by means of a pressure gauge or pressure testing equipment, with the cover removed- of course, out of the hazardous area.

Unless otherwise agreed, the pressure switches will be delivered with settings indicated in the table of available types.

The pressure sensing assembly is of compact - welded - design without any sealing components; thus, any danger of damage is excluded during normal use.

The explosion proof casing of the pressure switch is in conformity with the provisions of standard MSZ EN 50018

In the case of very aggressive or heavily viscous media susceptible of solidifying, the pressure switches can be used integrated with the pressure transfer device of type 340 made by MMG WA an overload exceeding that permitted is expected, the overpressure limiter of type 341 shall be inserted upstream to the pressure switch.

The parts of the pressure-proof casing is assembled together by means of socket-head screws and spring washers. In addition of the data labels indicating the technical parameters and the circuit connection diagram, a life danger warning label is also mounted on the device. Depending on the application, a screwed earthing terminal is provided either at the inner 4-terminal connector or on the outer surface off the casing.

The gap sizes specified for the pressure-proof casing and implemented in the device are shown in the Fig. 1 "EEx gap sizes"

#### 4. STORAGE

The device shall be stored in a room of temperature between -50 and +70 °C with atmosphere free of polluting and corrosive components. The relative air humidity shall be between 30 and 80%.

#### 5. MOUNTING

Before mounting, the device shall be verified by visual inspection.

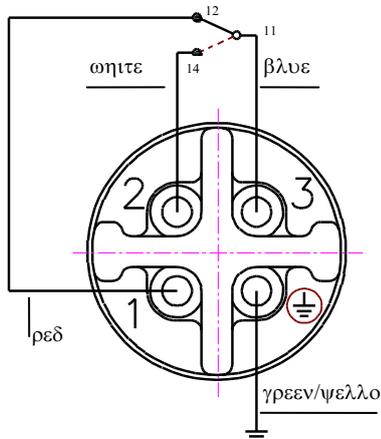
Make sure whether

- the pressure value is correct,
- the parameters of the built-in switch are in conformity with those of the circuit controlled, and the casing and sealing is free of any damage,
- the components necessary for cable stuffing exist,
- the earthing screw and the set screw fastening the cable bushing are provided,
- the data label is free of any damage,
- the screws are properly tightened

The device shall be mounted in vertical position (according to the outline drawing) with the pressure connection at the bottom.

##### 5.1. Electric cable connection

The cable shall be connected to the insulator bushing as shown in the Fig. below.:



The outer cable diameter shall be between 12 and 14 mm

Cable connection:

- bared length 10 mm,
- section: 0.5 to 1.5 mm<sup>2</sup>

## 5.2. Connection of process pipelines

Depending on the design, the pressure switch can be connected directly by means of a threaded stub of M20 x 1.5 or G 1/2 thread on special order. In the case of pipeline dia. 6 x 1, an additional fitting listed in the accessories shall be used for mounting to an M20 x 1.5 threaded stub.

## 6. MAINTENANCE

The device is allowed to be electrically connected and/or dismantled only with power supply shut off. In addition, it is allowed to be opened, disassembled, adjusted and maintained only out of the hazardous area.

For the purpose of cleaning, the choke screw can be removed; however, the device is not allowed to be operated without its choke screw!

## 7. WARRANTY

MMG AM Co. undertakes a warranty of one year from the date of delivery.

Any unprofessional use or maintenance of the device within the warranty period releases the manufacturer from any obligation relating to the warranty.

## 8. ACCESSORIES

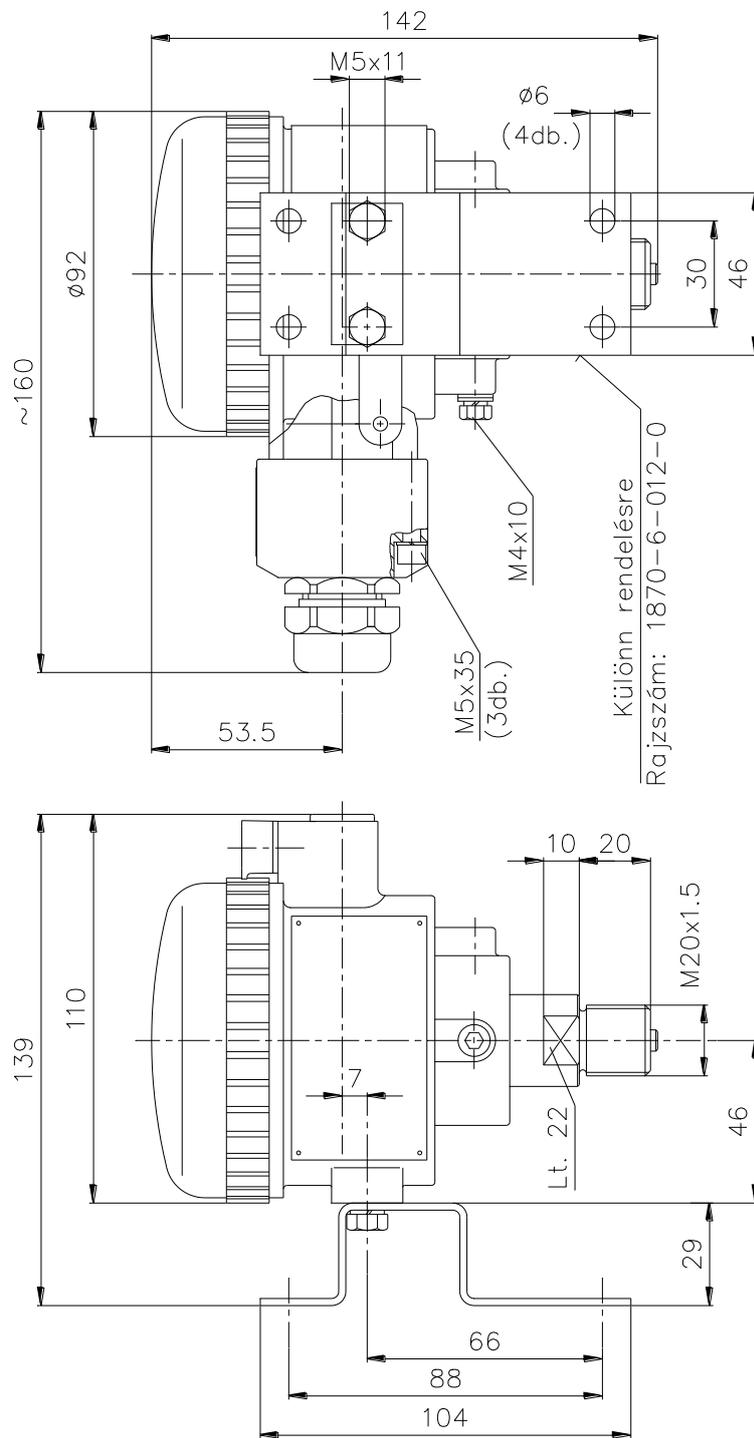
1 Sealing ring	Drawing No.: 1870-6-101-0
1 Plug wrench	
1 Special wrench (on order)	Drawing No. 1870-1-016-0
1 Supporting plate (if the device is the replacement for the old type 1806)	Drawing No: 8384-6-500-1
Further accessories for the connection of pipeline dia. 6 x 1:	
1 Threaded adapter (M20 x 1,5 / dia. 6 x 1)	Drawing No: 1870-6-100-1
1 Cutting ring	Drawing No: 9002-6-510-3
1 Union nut	Drawing No: 9002-6-611-3

## 9. EEx d GAP SIZES

Gap	Diameter	Tolerance		Width of joints [mm]	Gap lengths [mm]
A	∅1,0	H9	+0,025 0	L1 = 20	δ< 1,025
B	∅2,0	H12	+0,090 0	L1 = 20	δ<0,115
		h9	0 -0,025		
C	∅36	H8	+0,039 0	LC = 17 LC1 = 29	δ<0,103
		f8	-0,025 -0,064		
E	∅24	H9	+0,052 0	LE = 10	δ<0,104
			0		

		h9	-0,052	LE1 =14,5	
D	G 1/4" A			L2 = 9	
F	M80x1,5 6g/6H			LF = 9	





**Fig. 2 - Outline drawing**