BOURDON HAENNI
made to measure

instruments for industry

Medium range pressure switches

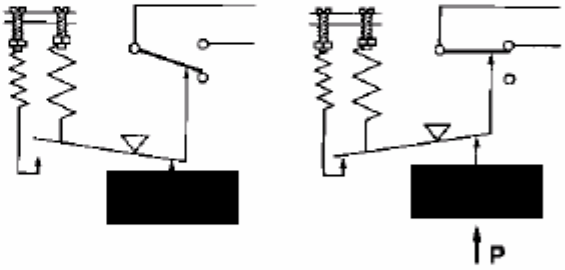
RPP

These pressure switches maintain a constant level of pressure around a preset value, "Regulatory Function", or actuate an alarm or safety circuit when the pressure being monitored reaches a critical level, "Safety Function".

- *All industrial environments*
- *All fluids*
- *One or two thresholds*
- *ADF (explosion proof) EEx d II CT6 version*
- *All stainless steel version for aggressive environments*
- *French Electricity Generating Board (EDF) electronuclear version*
- *Marine version*
- *Intrinsically safe version*
- *Conforms to CE*

Operating principle

A flexing element, bellows, diaphragm or piston, actuates one or two microswitches by means of levers. The set point and the deadband are set by springs mounted in opposition.



Specifications (20°C)

- Black Zamac enclosure and blue cover protected
- Protection IP 65 to NF EN 60529 standard
- Captive screws for cover attachment
- Wall-mounting by removable bracket
- External adjustment screw fitted with an antivibration system locking the set point and the deadband, protected by screwed and sealable caps
- Internal mechanism of bichromate-treated cadmium-plated steel
- Electrical connections via internal terminal-block with PE N°11 cable gland for cable between 7 and 10.5 mm in diameter
- Internal earth connection
- Calibrated scale for set point reading
- Pressure connections: G 1/2, female 1/4 NPT, G 1/4 (171, 172, 173 only)

Technical specifications :

- Storage temperature: - 40°C to + 70°C
- Reproducibility ± 1 % of full scale : microswitch E (GS); ± 2% (other microswitches)
- SPDT microswitches
- Explosion-proof version EEx d II C T6 certificate N° L.C.I.E. 81 60 57- 03
- Intrinsically safe version EEx ia IIC T6, certificate N°LCIE 88 B 6081 X
  This version must be used only with an intrinsically safe electrical installation

Tests certification :

French Electricity Generating Board (EDF) certification of tests HM063/6864 on ZPN 204 SHD

Important :

Any pulsating circuit must be fitted with pulsation dampeners. Mechanical vibrations should be reduced by means of antivibration mounts fitted to the pressure switches.
Normal operation is between 10 % and 90 % of the selected scale. The deadband values given in the tables (see inside pages) are defined under these conditions. The maximum overpressure values correspond to accidental overpressures of limited duration.

01 - N° 302000 GB

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Operating range of RPPA / RPPN / RPPH / RPHN (ZP1) low pressure

• **RPPA** : standard sensing element with treated steel flanges and diaphragm according to (1) or (2).

• **RPPN** : standard sensing element with lower flange in stainless steel 1.4404 (316 L) and diaphragm in Viton.

Scale	P max Accidental	Code	MICROSWITCH								DIMENSIONS
			Adjustable Deadband				Fixed Deadband		Fixed Deadband		Sensing element
			A (SI)		C (SH)		E (GS)		D (GSH)		
			At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	
mbar	bar		mbar	mbar	mbar	mbar	mbar	mbar	mbar	mbar	See figure
-50 to 0	0.15	101 (1)	2 to 25	2.5 to 25	6.5 to 25	7.5 to 25	0.5	0.5	2.5	3	Fig 3
-2 to 10	0.15	102 (1)	1 to 5	1.2 to5	4.5 to 5	4.5 to 5	0.3	0.3	1.5	1.5	Fig 3
-5 to 50	0.15	103 (1)	1.2 to 15	2 to 15	5 to 15	7 to 15	0.4	0.4	1.5	2.5	Fig 3
-8 to 100	0.15	104 (1)	1.5 to 25	2 to 25	5 to 25	10 to 25	0.5	0.5	2	2.5	Fig 3
-200 to 0	1	151 (2)	6 to 80	8 to 80	15 to 80	15 to 80	2	3	7.5	10	Fig 3
0 to 200	1	152 (2)	6 to 80	8 to 80	15 to 80	15 to 80	2	3	7.5	10	Fig 3
0 to 400	1	153 (2)	15 to 150	20 to 150	30 to 150	35 to 150	4	6	18	25	Fig 3

(1) Viton diaphragm
(2) EPDM diaphragm

• **RPPH** : sensing element withstanding overpressure with treated steel flanges and EPDM diaphragm.

• **RPHN** : sensing element withstanding overpressure with lower flange in stainless steel 1.4404 (316 L) and viton diaphragm.

Scale	P max Accidental	Code	MICROSWITCH								DIMENSIONS
			Adjustable Deadband				Fixed Deadband		Fixed Deadband		Sensing element
			A (SI)		C (SH)		E (GS)		D (GSH)		
			At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	
mbar	bar		mbar	mbar	mbar	mbar	mbar	mbar	mbar	mbar	See figure
-50 to 0	10	101	2 to 25	2.5 to 25	6.5 to 25	7.5 to 25	0.6	0.6	2.5	3	Fig 3
-2 to 10	10	102	1 to 10	1 to 10	4.5 to 10	4.5 to 10	0.4	0.4	1.5	1.5	Fig 3
-5 to 50	10	103	1 to 20	2 to 20	4.5 to 20	5 to 20	0.4	0.4	1.5	2.5	Fig 3
-8 to 100	10	104	1.5 to 25	2.5 to 25	5 to 25	10 to 25	0.5	0.5	2	3	Fig 3
-200 to 0	50	151	12 to 80	20 to 80	25 to 80	40 to 80	3	4	14.5	25	Fig 3
0 to 200	50	152	15 to 80	25 to 80	30 to 80	45 to 80	3.5	4	18	30	Fig 3
0 to 400	50	153	17 to 150	30 to 150	35 to 150	50 to 150	4	5.5	20.5	35	Fig 3
0 to 1000	50	154	22 to 150	35 to 150	45 to 150	60 to 150	6	7	26.5	45	Fig 3
0 to 700	100	171*	20 to 350	40 to 350	40 to 350	70 to 350	7	9	24	50	Fig 3
0 to 1500	100	172*	20 to 350	60 to 350	40 to 350	100 to 350	7	9	24	75	Fig 3
0 to 2500	100	173*	25 to 350	90 to 350	50 to 350	160 to 350	9	11	30	110	Fig 3

T° fluid : -15° + 150° C } RPPA/RPPN
T° ambient : -25° + 70°C } RPPH/RPHN

* G 1/4 female connection

- These microswitches can be implemented with two simultaneous contacts : SII (2 x SI), GSS (2 x GS), SHH (2 x SH), GSHH (2 x GSH)
  Warning : in this case, deadbands are multiplied by 1.5
- Explosion-proof model : deadbands are multiplied by 1.5
- SAM version : consult us.

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Operating range of RPPA / RPPN / RPPC / RPPX (ZP2) medium pressure

• **RPPA** : standard sensing element with brass base plate, tombac bellow or nickel plated piston.

• **RPPN** : stainless steel sensing element, stainless steel bellow or nickel plated piston.

Scale	P max Accidental	Code	MICROSWITCH								DIMEN-SIONS
			Adjustable Deadband				Fixed Deadband		Fixed Deadband		
			A (SI)		C (SH)		E (GS)		D (GSH)		Sensing element
			At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	
bar	bar		mbar	mbar	mbar	mbar	mbar	mbar	mbar	mbar	See figure
-1 to 0	1.5	200	25 to 250	35 to 250	80 to 250	95 to 250	5	6	30	42	Fig 4
-1 to 2.5	7	201	80 to 1200	100 to 1200	150 to 1200	200 to 1200	22	25	96	120	Fig 4
0 to 0.2	1.5	202	15 to 100	20 to 100	60 to 100	65 to 100	4	5	18	24	Fig 4
0.05 to 1	1.5	203	20 to 400	25 to 400	80 to 400	95 to 400	4	5	24	30	Fig 4
0.5 to 10	15	204 (1)	200 to 3000	250 to 3000	650 to 3000	850 to 3000	45	50	240	300	Fig 4
3.5 to 25	30	205	600 to 5000	1200 to 5000	750 to 5000	1300 to 5000	60	100	720	1440	Fig 4
			bar	bar	bar	bar	mbar	mbar	bar	bar	
5 to 50	65	206	1 to 10	2 to 10	2.5 to 10	3 to 10	150	200	1.5	2.5	Fig 4
5 to 100	220	207 (3)	2.5 to 15	3 to 15	5.5 to 15	6.5 to 15	700	900	3	3.5	Fig 4
20 to 150	220	208 (3)	2.5 to 15	3.5 to 15	5.5 to 15	6.5 to 15	700	1000	3	4.5	Fig 4
-1 to 3.5	15	209	0.15 to 1.5	0.2 to 1.5	0.65 to 1.5	0.85 to 1.5	45	50	0.2	0.25	Fig 4
			bar	bar	bar	bar	bar	bar	bar	bar	
25 to 175	800	600 (2)	20 to 80	30 to 80	30 to 80	35 to 80	14	10	24	36	Fig 4
30 to 350	800	601 (2)	20 to 100	30 to 100	30 to 100	35 to 100	16	16	24	36	Fig 4
60 to 600	800	602 (2)	20 to 120	30 to 120	30 to 120	35 to 120	16	16	24	36	Fig 4

(1) 30 bar in stainless steel version (2) sensing element with piston (3) stainless steel version only

• **RPPC** : sensing element withstanding overpressure with bichromate finish galvanized base plate and Perbunan diaphragm (code 201 only).

• **RPPX** : sensing element withstanding overpressure with stainless steel base and diaphragm. (except code 201)

Scale	P max Accidental	Code	MICROSWITCH								DIMEN-SIONS
			Adjustable Deadband				Fixed Deadband		Fixed Deadband		
			A (SI)		C (SH)		E (GS)		D (GSH)		Sensing element
			At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	
bar	bar		bar	bar	bar	bar	mbar	mbar	bar	bar	See figure
-1 to +2.5	80	201	0.25 to 2	0.30 to 2	0.8 to 2	1 to 2.5	65	75	0.3	0.35	Fig. 4
0.5 to 10	50	204	0.18 to 3	0.25 to 3	0.63 to 3	0.8 to 3	45	62	0.25	0.3	Fig. 4
3.5 to 25	100	205	0.45 to 10	0.9 to 10	1.5 to 10	3.1 to 10	150	200	0.55	1.1	Fig. 4
5 to 50	100	206	1 to 10	2 to 10	3.5 to 10	7 to 10	200	300	1.5	2.5	Fig. 4
5 to 100	200	207	2 to 25	4 to 25	5 to 25	10 to 25	700	900	2.5	5	Fig. 4
20 to 150	200	208	2 to 25	6 to 25	5 to 25	15 to 25	1500	2000	2.5	7.5	Fig. 4
0.2 to 4	50	210	0.1 to 3	0.18 to 3	0.35 to 3	0.63 to 3	40	50	0.15	0.25	Fig. 4

T° fluid : - 50° + 200° C ; - 50° + 80°C (RPPA only)
T° ambient : -25° + 55° C (all versions)

- These microswitches can be implemented with two simultaneous contacts : SII (2 x SI), GSS (2 x GS), SHH (2 x SH), GSHH (2 x GSH)
  Warning : in this case, deadbands are multiplied by 1.5
- Explosion-proof model : deadbands are multiplied by 1.5
- SAM version : consult us.

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Dimensions (mm)

Watertight case

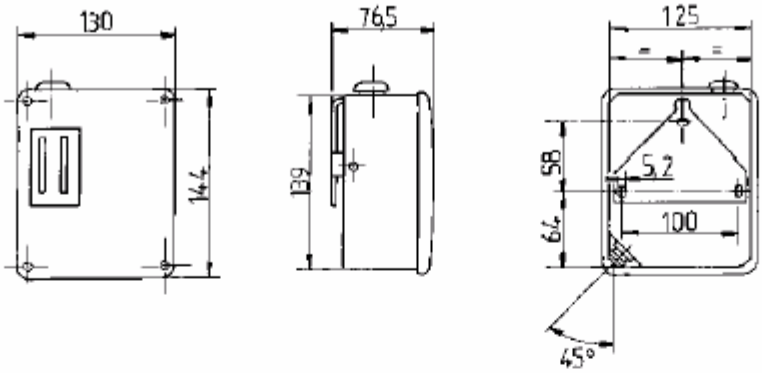
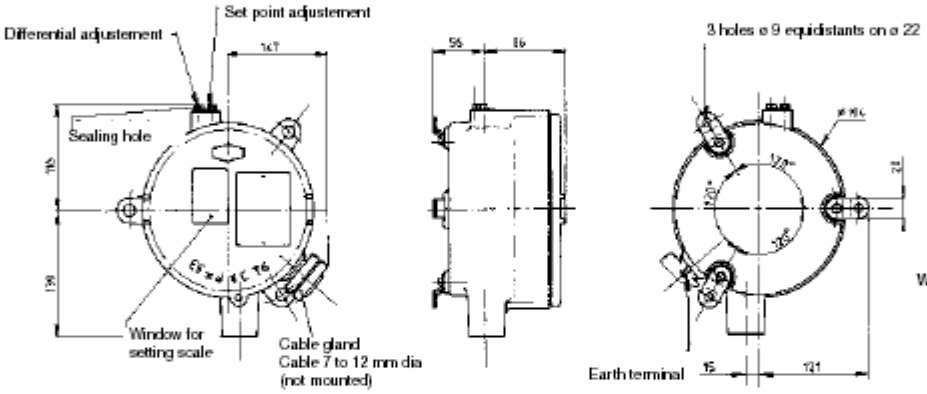


Fig. 1

Explosion-proof case



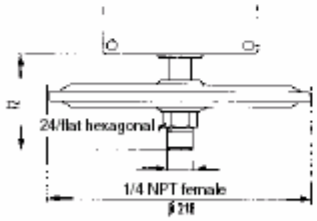
weight of explosion-proof case: 3 kg

Fig. 2

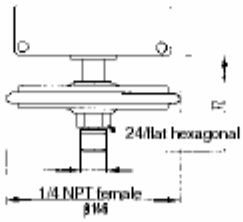
Sensing element

RPPA / RPPH / RPPN / RPHN (ZP1) low pressure

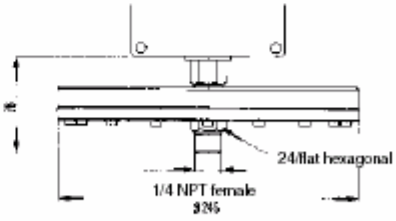
RPPA / RPPN - 101 - 102 - 103 - 104
weight : 3 kg



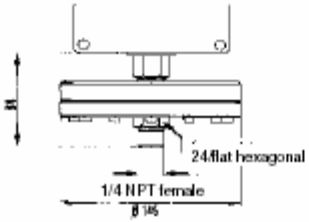
RPPA / RPPN - 151 - 152 - 153
weight : 2.8 kg



RPPH / RPHN - 101 - 102 - 103 - 104
weight : 10 kg



RPPH / RPHN - 151 - 152 - 153
weight : 6.4 kg



RPPH / RPHN - 171 - 172 - 173
weight : 7 kg

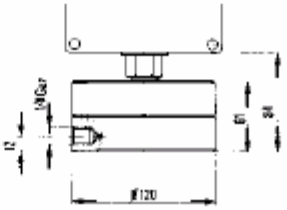


Fig. 3

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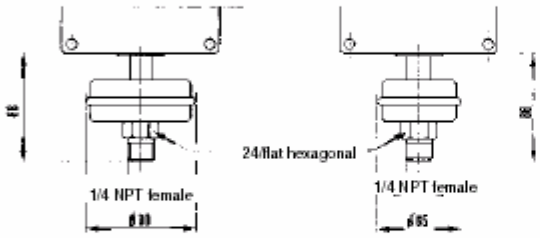
Dimensions (mm)

Sensing element

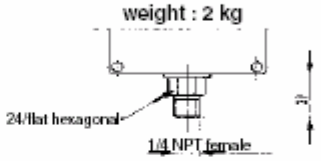
RPPA / RPPC / RPPN / RPPX (ZP2) medium pressure

RPPA / RPPN - 200 - 202 - 203
weight : 2,5 kg

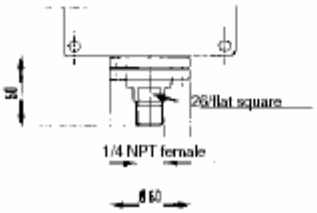
RPPA / RPPN - 201
weight : 2,4 kg



RPPA / RPPN - 204 - 205 - 206 - 207 - 208 - 209
600 - 601 - 602
weight : 2 kg



RPPC - 201
weight : 2,4 kg



RPPX - 204 - 205 - 206 - 207 - 208 - 210
weight : 2,4 kg

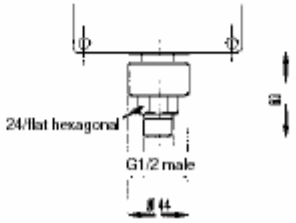


Fig. 4

Accessories

- Adaptator for welded connection in steel ZRM1 or stainless steel ZRMN 1.
- Ring siphon steel or 1.4401 (AISI 316) stainless steel.
- Chemical seal (no bottom housing version): consult chemical seal guide.
- Isolating valve.
- Manifold.
- Pulsation dampener.

Options

Uncoded options
(have to be listed after the code number)

- Knurled knob for adjustment of the set point (ZB2) the deadband (ZB3).
- Tropicalization (SI and SII microswitches only). Micro N
- Gold contact (SI and SII microswitches only). Micro M
- Blow out disc.
- Socket connector.
- MARINE version.
- All stainless steel construction for aggressive environments (screws and sensing element).
- Pneumatic version.
- Electronuclear model, consult us.
- Specific connection.
- Cleanliness for oxygen service.

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Codification

R	P											*

Family:
Pressure switches — R

Type :
Commercial reference

ZP1

ZP	PA
ZPH	PH
ZPN	PN
ZPHN	HN

ZP2

ZP	PA
ZPC	PC
ZPN	PN
ZPX	PX

Microswitch :**

Current rating (resistive circuits) :		AC	DC	
SI	- 1 standard changeover switch (1xSPDT)	5A/250Vac	0.5A/110Vdc	A
SII	- 2 simultaneous changeover switches (2xSPDT)	2 x 5A/250Vac	2x0.5A/110Vdc	B
SH	- 1 hermetically sealed changeover switch (1xSPDT)	2.5A/250Vac	1A/110Vdc	C
GSH	- 1 herm. sealed ultra sensitive changeover switch (1xSPDT)	1A/250Vac	2A/30Vdc	D
GSHH	- 2 herm. sealed ultra sensiti. changeover switches (2xSPDT)	2 x 1A/250Vac	2x2A/30Vdc	V
GS	- 1 ultra sensitive changeover switch (1xSPDT)	2 A/250Vac	1 A/30Vdc	E
GSS	- 2 ultra sensitive changeover switches (2xSPDT)	2 x 2A/250Vac	2x1A/30Vdc	F
SAM	- 2 movable changeover switches	2 x 2A/250Vac	2x1A/30Vdc	G
SHH	- 2 hermetically changeover switches (2xSPDT)	2 x 2.5A/250Vac	2x1A/110Vdc	W
* SRC	- 1 changeover switch with manual reset opening on rise	5A/250 Vac	5A/30Vcc	H
* SRF	- 1 changeover switch with manual reset opening on fall	5A/250Vac	5A/30Vcc	J

* *Not possible in Explosion Proof version.*
** *SPDT microswitches only*

Protection :

A	Standard
E	Explosion proof
Y	IS - Intrinsically safe

Measurement Unit and Range :

ZP1	Range in mbar	RPPA RPPN	RPPH RPHN
101	-50 + 0	X	X
102	-2 + 10	X	X
103	-5 + 50	X	X
104	-8 + 100	X	X
151	-200 + 0	X	X
152	0 + 200	X	X
153	0 + 400	X	X
154	0 + 1000		X
171	0 + 700		X
172	0 + 1500		X
173	0 + 2500		X

ZP2	Range in bar		RPPC	RPPX
200	-1 + 0	X		
201	-1 + 2.5	X	X	
202	0 + 0.2	X		
203	0.05 + 1	X		
204	0.5 + 10	X		X
205	3.5 + 25	X		X
206	5 + 50	X		X
207	5 + 100	X		X
208	20 + 150	X		X
209	-1 + 3.5	X		
210	0.2 + 4			X
600	25 + 175	X		
601	30 + 350	X		
602	60 + 600	X		

2	G 1/4 Female (171, 172, 173 only)
3	G 1/2 Male
6	1/2 NPT Male
8	1/4 NPT Female

- Electronuclear versions : ZPN-M, ZPHN-M,
  Order under the following commercial references:
  ZPN-M, ZPHN-M : code = (SHM or CHM)

*** Uncoded options have to be listed after the code number**

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