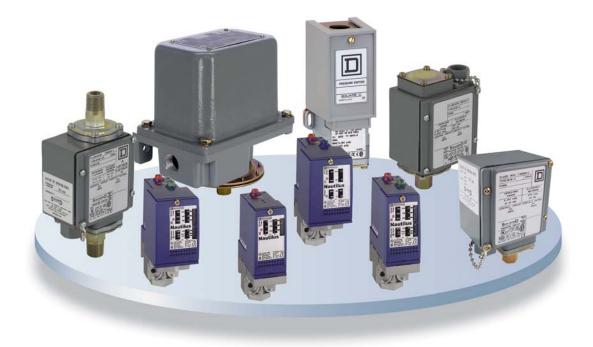
Industrial Pressure Switches

and Vacuum Switches

Catalog 9012CT9701R04/09

2009 9012G, 9016G, and XMLA, B, C, D





Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com

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by **Schneider** Electric

Selection Guide

Industrial Pressure Switches XML Electromechanical Pressure Switches

	Type of installation	Control circuits							
Applications	Media controlled	Air, water, hydraulic oil	s, corrosive fluids, viscous	products					
Applications	Type of operation	Fixed differential: Detection of a single threshold	Adjustable differential Regulation between two thresholds	:	Dual-stage switches: Fixed differential, detection at each threshold				
Fluid characte	eristics	Air, fresh water, sea water, corrosive fluids, viscous products, up to 320 °F (160 °C) depending on model							
Size (pressure	e range)	-1 to 500 bar (-14.5 to	–1 to 500 bar (–14.5 to 7250 psi)						
Dimensions o width x height x c	• •	35 x 68 x 75		46 x 68 x 85	35 x 68 x 75				
Type of conta	cts	1 C/O single-pole, sna	p action	2 C/O single-pole, simultaneous, snap action	1 C/O single-pole, snap action				
Degree of pro	tection	IP 66 with terminal con IP 65 with plug-in conn		IP 66 with terminal connections	IP 66 with terminal connections IP 65 with plug-in connector				
Agency listing	js	UL, CSA, CCC, BV, LF	ROS, RINA, GL, DNV, VIT-S	SEPRO					
Electrical con	nection	Screw terminals: 1 tap Connector: DIN 43650		1.5 mm for ISO conduit/cable; or P	PG 13.5 conduit/cable entry				
Pressure con	nection	G 1⁄4 (BSP female) G 1-1⁄4" (BSP female)	for viscous products						
Catalog numb	per	XMLA	XMLB	XMLC	XMLD				
Pages		pages 10–78							
Other version	s	For electromechanical sales office.	pressure and vacuum switc	hes with alternative tapped cable	or fluid entries, consult your local				



Selection Guide

Industrial Pressure Switches 9012G Pressure and 9016G Vacuum Switches

	Type of installation	Control circuits					Power circuits	
Applications	Media controlled Air, water, hydraulic oils, ⁽¹⁾ gases, steam							
	Type of operation	Fixed differential: Detection of a single threshold	Adjustable differential: Regulation between two thresholds	Differential- Pressure (change in the difference between two pressures)	Dual-stage switches: Fixed differential, detection at each threshold	Vacuum switches for control circuits	Vacuum switches for power circuits	



Fluid characteristics	up to 248 °F (120 °C)										
Size (pressure range)		iaphragm: 0.2-675 psi on falling pressure iston actuated: 20-9,000 psi on falling pressure									
Dimensions of case (mm) Width x height x depth	See "Dimensions" b	ee "Dimensions" beginning on page 96.									
Type of contacts	SPDT or DPDT dou	PDT or DPDT double break contacts DPST (SPDT for Form H)									
Degree of protection	IP 66 conforming to	IP 66 conforming to IEC 60957									
Agency listings	UL Listed and CSA	UL Listed and CSA Certified as industrial control equipment									
Electrical connection (enclosed devices)		3.5, or ISO M20; 3/4" duit entry, unthreaded		ly on NEMA 7 and 9.	1/2"-14 NPT	3 x 1/2" conduit entry, unthreaded					
Pressure connection	G1/4 (BSP) female,	1/4" NPTF, 1/4-18 NF	PT internal or externa	I (depending on mode	el), 1/2"-14 NPT						
Catalog number	9012GD, GE, GF, GR, GS, GT										
Pages	pages 85–92	pages 87–93	page 89	page 90	page 94	page 95					
Other versions	_	i									

1. The hydraulic fluids used for laboratory testing are equivalent to SAE 30 W oils. If oils have less viscosity than this type of oil, leakage can be expected. Schneider Electric does not have test data to support or predict fluid bypass with oils less than SAE 30W.



Terminology

Operating Range

The difference between the minimum decreasing-pressure low point (PB) and the maximum increasing-pressure high point (PH) setting values.

Size

Pressure switches and vacuum-pressure switches

Maximum value of the operating range.

Vacuum switches

Minimum value of the operating range.

Operating Point on Rising Pressure (PH)

Pressure switches

The upper pressure setting at which the pressure switch actuates the contacts on rising pressure.

Vacuum switches

The lower vacuum setting at which the vacuum switch resets the contacts on rising vacuum.

Operating Point on Falling Pressure (PB)

The pressure at which the switch output changes state on falling pressure.

Switches with fixed differential

Depending on the switch, either the high or low operating point is adjustable, and the other operating point follows. The window is fixed.

Switches with adjustable differential

An adjustable differential allows independent setting of both operating points.

Differential

The difference between the operating point on rising pressure (PH) and the operating point on falling pressure (PB).

Spread

For dual-stage switches, the spread indicates the difference between the two operating points on rising pressure (PH2 and PH1) and, for vacuum switches, the difference between the two operating points on falling pressure (PB2 and PB1).

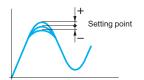
Differential-Pressure Sensing

Switches for differential-pressure sensing measure the difference between two pressures.

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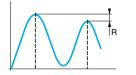


Accuracy (switches with setting scale)



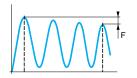
The tolerance between the point at which the switch actuates its contacts and the value indicated on the setting scale. Where very high setting accuracy is required (initial installation of the product), it is recommended to use separate measuring equipment (pressure gauge, etc.).

Repeat Accuracy (R)



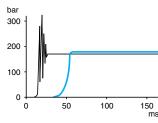
The tolerance between two consecutive switching operations

Drift (F)



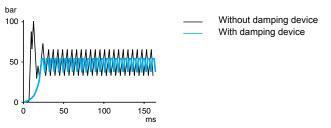
The tolerance of the operating point throughout the entire service life of the switch.

Maximum Allowable Pressure



The maximum value of an accidental pressure surge of very short duration (a few milliseconds).

Example 1: With destructive (burst) pressure level



Example 2: With destructive (burst) pressure level and destructive pressure oscillations

Maximum allowable pressure per cycle (Ps)

The maximum pressure level per cycle that the switch can withstand for optimum service life.

Surge

A surge is a high rate of rise in pressure, normally of short duration, caused by starting a pump or by opening and closing a valve. Depending on frequency and duration, surge can reduce service life. Extremely high rates of rise in pressure can be damaging even if they are within the limits of the maximum allowable pressure.

Destruction pressure

Also called *burst pressure*, the destruction pressure is the maximum rated pressure that the switch can withstand before its destruction—for instance, through rupturing or component failure.

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10/2009

Selecting a Pressure Switch



The deciding factors in the selection of a pressure switch for use on control circuits¹ depend on the requirements of the application. Consider the following requirements to help determine the appropriate catalog number for your application.

- 1. Setpoints: Do you want to control/monitor one setpoint or two?
- One setpoint: fixed differential
- Two setpoints: adjustable differential

Corrosive fluid ≤ 160 °C

- 2. Fluids: What fluids do you want to control?
- Hydraulic oil, air, fresh water ≤ 70 °C
- Hydraulic oil, air, fresh water ≤ 160 °C
 - Viscous fluid ≤ 160 °C

Steam

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Sea water ≤ 70 °C
Sea water ≤ 160 °C

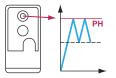
Ensure that the wetted parts of the switch are compatible with the system fluid.

- 3. Pressure Range: What pressure range does the system experience?
- Note: Select pressure settings that fall within the middle 80% of the pressure range. The pressure applied during a normal cycle should never exceed the maximum range value listed for the switch. Pressure surges should be less than the maximum allowable pressure listed for the switch.

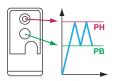
Rated Pressure								
Х	ML	9012G	/ 9016 G ⁽¹⁾					
psi	bar	psi	bar					
0 to 0.725	0 to 0.05	0.2 to 10	0.01 to 0.69					
0 to 5.075	0 to 0.35	1 to 40	0.07 to 2.76					
-14.5 to -4.06	-1 to -0.28	1.5 to 75	0.10 to 5.17					
-14.5 to -2.03	-1 to -0.14	3 to 150	0.21 to 10.34					
-2.9 to -0.029	-0.2 to -0.02	5 to 250	0.34 to 17.24					
-7.25 to 72.5	-0.5 to 5	13 to 425	0.90 to 29.30					
0 to 14.5	0 to 1	20 to 675	1.38 to 46.54					
0 to 36.25	0 to 2.5	0 to 75	0 to 5.17					
0 to 58	0 to 4	0 to 175	0 to 12.07					
0 to 145	0 to 10	0 to 500	0 to 34.47					
0 to 290	0 to 20	20 to 1000	1.38 to 68.95					
0 to 507.5	0 to 35	90 to 2900	6.21 to 199.95					
0 to 580	0 to 40	170 to 5600	11.72 to 386.11					
0 to 1015	0 to 70	270 to 9000	18.62 to 620.53					
0 to 2320	0 to 160	0 to 5000	0 to 344.74					
0 to 4350	0 to 300	0 to 28 inHg	•					
0 to 7250	0 to 500	0 to 25 inHg						
0 10 7250	0 to 500	5 to 25 inHg (9016GVG only)						
(1) For 9016G vacuum switches, the unit of rated pressure is inHg.								

4. **Surges:** How frequent are surges in your system, and what is their maximum pressure level? Applications experiencing frequent or high-pressure surges may require a device with a higher pressure range.

Fixed differential



Adjustable differential



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For switches used on power circuits, see catalog 9013CT9701, Commercial Pressure Switches, Class 9013 Types F and G.

Introduction

Industrial Pressure Switches Selecting a Pressure Switch

- 5. Enclosure: What type of enclosure do you need?
- Open style
- NEMA Type 1

- NEMA Type 7, 9
 - NEMA Type 4, 4X, 13 / IP66, IP65
- 6. Output: What output type do you require?
- SPDT contacts, 1 N/O, 1 N/C
- 2 SPDT contacts, 1 N/O, 1 N/C
- Dual stage, 1 SPDT contact each stage, 1 N/O, 1 N/C
- Horsepower rated, 9016GVG vacuum switch only
- 7. Electrical Connection: What type of electrical connection do you require?
- 1⁄2"- 14 NPTF

¾"-14 NPTF (available only on NEMA 7 & 9)
No threaded connection

(open style or NEMA 1 only)

• Type 13 (PG 13.5) metric threads

ISO M20 metric threads

- 8. Pressure Connection: What type of pressure connection do you require?
- 1/4"- 18 NPTF (female)
- PT ¼ (JIS B0203)

1⁄2" - 14 NPT

- 7/16"-20 UNF-2B
- G 1/4 BSP (female) metric thread

9. Special Features: Do you require any special features?

See Table 78 on page 91. When switches must be factory set and only one setting is identified, specify whether this setting is on rising or falling pressure.

See Table 78 on page 91 of the catalog for available modifications for 9012 and 9016G Pressure Switches. (Form designations are added to the end of the part number of the standard device for these products.)

Some examples are:

- Pilot light
- Prewired receptacles
- External range adjustment
- Range scale window
- Special factory pressure settings
- Pressure Connections

10. System response time

• If system response time is critical, select a switch with a volumetric displacement that is compatible with the overall system. See Table 1.

Table 1: Volumetric Displacement of 9012G Pressure Switches

Class 9012 Type	Volumetric Displacement ⁽¹⁾ (in ³)	Volumetric Displacement ⁽¹⁾ (cm ³)
GAR, GAW, GDR, GDW-1& 21	0.20774	3.40422
GAR, GAW, GDR, GDW-2 & 22	0.07040	1.15385
GAR, GAW, GDR, GDW-4 & 24	0.04320	0.70805
GAR, GAW, GDR, GDW-5 & 25	0.02144	0.35140
GAR, GAW, GDR, GDW-6 & 26	0.01376	0.22553
GBR, GBW, GER, GEW-1 & 21	0.00200	0.13112
GBR, GBW, GER, GEW-2 & 22	0.00512	0.08392
GCR, GCW, GFR, GFW-1 & 21	0.00320	0.05245
GCR, GCW, GFR, GFW-2 & 22	0.00117	0.01922
GCR, GCW, GFR, GFW-3 & 23	0.00060	0.00924
GCR, GCW, GFR, GFW-4 & 24	0.00037	0.00612
(1) Figures shown are total displacement. When	en switch is operated between settings only	, displacement is 1/3 of the values show

XML Electromechanical Pressure Switches

Introduction

XML pressure and vacuum switches for control circuits are used to control the pressure of hydraulic oils, fresh water, sea water, air, steam, corrosive fluids, or viscous products, up to 7250 psi (500 bar).

- XMLA pressure and vacuum switches have a fixed differential and are for detection of a single threshold. They incorporate a 1 C/O single-pole contact.
- **XMLB** pressure and vacuum switches have an adjustable differential and are for regulation between two thresholds. They incorporate a 1 C/O single-pole contact.
- **XMLC** pressure and vacuum switches have an adjustable differential and are for regulation between two thresholds. They incorporate two C/O single-pole contacts.
- XMLD pressure and vacuum switches are dual-stage switches, each stage with a fixed differential, and are for detection at each threshold. They incorporate two C/O single-pole contacts (one per stage).

Setting

XMLA: Pressure and vacuum switches with fixed differential

- **Rising pressure**—Operating point PH is set by adjusting the red screw (1).
- Falling pressure—Operating point PB is not adjustable.

The difference between the trip and reset points of the contact is the inherent differential of the switch (contact differential, friction, etc.).

XMLB and XMLC: Pressure and vacuum switches with adjustable differential

When setting the pressure and vacuum switches, first adjust the operating point on rising pressure (PH), then the operating point on falling pressure (PB).

- Rising pressure—Operating point PH is set by adjusting the red screw (1).
- Falling pressure—Operating point PB is set by adjusting the green screw (2).

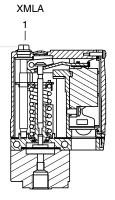
XMLD: Dual-stage pressure and vacuum switches with fixed differential for each threshold

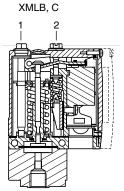
Operating point on rising pressure of stage 1 and stage 2

- First stage operating point on rising pressure (PH1) is set by adjusting the red screw (1).
- Second stage operating point on rising pressure (PH2) is set by adjusting the blue screw (2).

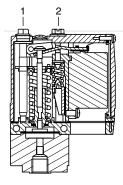
Operating point on falling pressure

- The operating points on falling pressure (PB1 and PB2) are not adjustable.
- The difference between the trip and reset points of each contact is the inherent differential of the switch (such as contact differential or friction).





XMLD





Contenting to standards CE, IECEK 8007-75-1, UL 50, ICA 222-8°-14 Product certifications U., CSA, CC, IV, LASA, NA, GL, DW, VV SERPRO Product tertifications Properties transmit Ambient air temperature, "F (*C) Progenations-13 to 158 (-25 to 770). Stonger-40 to 158 (-26 to 170). Product controlled Hydraulic ols, air fesh welver, aso under, 32-307 °F (10 to 160 °C) depending on model Materials Case: zinc alloy. Component materials in contact with fluid: see pages 77-78 Operating position All position Vibration resistance 60 gr conforming to EC 68-24? Operating position Case: zinc alloy. Component materials in contact with fluid: see pages 77-78 Operating a text (operating cycles/minute) Case: zinc alloy. Component materials in contact with fluid: see pages 77-78 Operating rate (operating cycles/minute) Case: zinc alloy. Component materials in contact with fluid: see pages 77-78 Operating rate (operating cycles/minute) Case: zinc alloy. Case: zin	Table 2: Environmental specificat	ions								
Protective treatment Standard version "TC": Special version "TH" Amblem fair temperature, "F (*C) For operation -::13 or 158 (-23 to -70), Storage: -40 to +158 (-40 to +70) Fluids or products controlled Hydrakov, sea water, 32-30 °F (10 to 10° C), depending on model Materials Class: Lorinov failed, webcas products, 32-30 °F (10 to 10° C), depending on model Materials Class: Lorinov failed, webcas products, 32-30 °F (10 to 10° C), depending on model Materials Class: Lorinov failed, webcas products, 32-30 °F (10 to 10° C), depending on model Materials Class: Lorinov failed, webcas products, 32-30 °F (10 to 10° C), depending on model Specific shock protection Class: Lorinov faile (ClaS 62-24 coupt; MLL 13-····· XML-001-····· and XMLBM03····· 2 goal Deperating rate (operating cycles/minute) Class: Lorinov faile (ClaS 62-24 coupt; MLL 13-····· XML-001-····· and XMLBM03····· 2 goal Deperating rate (operating cycles/minute) Protective answrites: up to 10 cycles/minute for temperatures greater than 32 °F (10 °C). Deperating rate (operating cycles/minute) Protective answrite: up to 10 cycles/minute for temperatures greater than 32 °F (10 °C). Deperating rate (operating cycles/minute) Protective answrite: up to 10 cycles/minute for temperatures greater than 32 °F (10 °C). Deperating rate (operating cycles/minute) Protective answrite: up to 60 cycles/minute f	Conformity to standards	CE, IEC/EN 60947-5	-1, UL 508, (CSA C22-2	n° 14					
Ambient air temperature, "F (*C) For genetator: -12 to +136 (-25 to *D). Stoage: -40 to +136 (-40 to +70). Fluids or products controlled Hydracic cells, air, fresh water, sax axis, "S = 200," F (b to 160, °C), depending on model Materials Case: site cellsy. Component materials in contact with fluid: see pages 77-78 Operating position All position All positions All positions All position Operating position All positions All positions All position Shock resistance B0 gn conforming to IEC 84-27 except XML-354XML-401 and XMLBM03: 2 gn Schock resistance B0 gn conforming to IEC 84-27 except XML-354XML-601 and XMLBM03: 2 gn Begree of protection Case: site conforming to IEC 84-27 except XML-354XML-601 and XMLBM03: 2 gn Degree of protection Case: site conforming to IEC 84-27 except XML-354XML-601	Product certifications	UL, CSA, CCC, BV,	L, CSA, CCC, BV, LROS, RINA, GL, DNV, VIT-SEPRO							
Fluids or products controlled Hedmule oils, air. Kesh valer, 52-320 °F (0 to 100°C), depending on model Materials Case: zine ally: Component materials in contact with fluid: see pages 77-78 Operating position All position Vibration resistance Since resistance Sock resistance Case: zine ally: Component materials in contact with fluid: see pages 77-78 Operating position All position- ducts with start with vibration resistance Sinck resistance Component materials in contact with fluid: see pages 77-78 Operating rate (operating cycles/minute) Reside contenting to IEC 1440, IEC 558 and N° C 20-030 Degree of protection Case: zine with vibration reside. IP 66 contenting to IEC CPN 60529 Contract Minute Vibration reside. IP 66 contenting to IEC CPN 60529 Contract Minute Series with vibration reside. IP 66 contenting to IEC CPN 60529 Pressure connection(1) • 12 /+ 40 (B float2) • 12 cycles/minute for temperatures greater than 32 °F (0 °C), Repeat accuracy Pressure connection(1) • 14 /4 (BP float2) • 12 cycles/minute for temperatures greater than 32 °F (0 °C), Repeat accuracy Pressure connection(1) • 14 /4 (BP float2) • 12 cycles/minute for temperatures greater than 32 °F (0 °C), Repeat accuracy Pressure connection(1) • 14 (BP float2) • 10 cycles/minute (P = 14 / 48 Ret 200)	Protective treatment	Standard version "T	andard version "TC". Special version "TH"							
Fulds or products controlled Sieam, containe Ruids, viecous products, 32-30 °F, 00 1 80 °C, 4 depending on model Materials Case, 20 alty, Component materials in contact with fluid: see pages 77-78 Operating position Al position Vibration resistance 80 gn conforming to IEC 88-327 evector XML-136XML-001and XMLBH03: 2 gn Shock resistance 80 gn conforming to IEC 88-327 evector XML-136XML-001	Ambient air temperature, °F (°C)	For operation: -13 to	o +158 (–25	to +70). Sto	orage: –40 t	o +158 (–40	0 to +70)			
Operating position All position Vibration resistance d in (20300 Hz) conforming to IEC 68.2.8 except XML 1.35************************************	Fluids or products controlled									
Vibration resistance 4 gr (20. 500 Hz) conforming to IEC 882-84 Vibration resistance 50 gn conforming to IEC 882-27 except XML-135, XML-001 and XMLBM03: 30 gn Electric shock protection Class I conforming to IEC 842-27 except XML-145, XML-001 and XMLBM03: 30 gn Degree of protection Class I conforming to IEC 842-27 except XML-145, XML-001, XML-001	Materials	Case: zinc alloy. Co	mponent ma	terials in co	ntact with fl	uid: see pa	ges 77–78			
Violation resistance except XML-135 , XML-051 , MML-135 , XML-135	Operating position	All positions								
Electric shock protection Class I conforming to IEC 1140, IEC 536 and NF C 20-030 Degree of protection Serve terminal models: IP 66 conforming to IEC/EN 60529 Operating rate (operating cycles/minute) Piston version switches: up 10 G0 cycles/minute for temperatures greater than 32 °F (0 °C). Repeat accuracy < 2% Pressure connection(1) • 0 14 (BSP female) conforming to NF E 03-005, ISO 228 • 14 * NFT female) • 0 14 (BSP female) conforming to NF E 03-005, ISO 228 • 14 * NFT female) • 0 14 (BSP female) conforming to NF E 03-005, ISO 228 • 14 * NFT female) • 0 14 (BSP female) conforming to NF E 03-005, ISO 228 • 14 * NFT female) • 0 14 (BSP female) conforming to NF E 03-005, ISO 228 • 14 * NFT female) • 0 14 (BSP female) conforming to NF E 03-005, ISO 228 • 14 * NFT female) • 0 14 (BSP female) conforming to ISO 228 • 14 * NFT female • 0 14 (BSP female) conforming to ISO 228 • 14 * NFT female • 0 14 (BSP female) conforming to ISO 228 • 14 * NFT female • 0 14 (BSP female) conforming to ISO 228 • 14 * NFT female • 0 14 (BSP female) conforming to ISO 228 • 15 × Use page 20, "Interpretation of the Catalog Number for XAL 20 N (A350 A consult your local sales office. Table 3: Contact Mable X • 0 0 47-51	Vibration resistance					2 gn				
Degree of protection Serve terminal models: IP 68 conforming to IECEN 80228 Operating rate (operating cycles/minute) Pison version switches: up to 60 cycles/minute for temperatures greater than 32 °F (0°C). Repeat accuracy <2% Pressure connection(1) • 6 14 (85P female) conforming to IECEN 80228 Itertical Connection(1) • C 14 (85P female) conforming to NFE 03 005, ISO 228 • 114 / NTF female • PT 144 (18 B0203). Electrical Connection(1) • C 14 (85P female) conforming to NFE 03 005, ISO 228 • 113 / NTE distance across the male conforming to NFE 03 005, ISO 228 • 113 / NTE distance across 1 iso M2 13 lapped entry • 150 M20 x 15 lapped entry • Connector models, entre M12 or DN 43550 A: consult your local sales office. • Sec page 20, 'Interpretation of the Catalog Number for XML Devices," for more information on specifying the electrical and pressure connections. • So M2 or 15 lapped entry • Connector models, entre M12 or DN 43550 A: consult your local sales office. • Connector models = M2 or AV is 0 a A: conforming to IECEN 0047-1 UL = 300 V conforming to IECEN 0047-1	Shock resistance	50 gn conforming to	IEC 68-2-27	except XN	IL•L35•••••,	XML•001••	••• and XM	LBM03••••	: 30 gn	
Degrating rate (operating cycles/minute) Connector models: IP 65 conforming to IE/CEN 06329 Operating rate (operating cycles/minute) Pison version switches: up to 30 cycles/minute for temperatures greater than 32 'F (0 'C). Bepragraversion switches: up to 30 cycles/minute for temperatures greater than 32 'F (0 'C). Bepragraversion switches: up to 30 cycles/minute for temperatures greater than 32 'F (0 'C). Bepragraversion switches: up to 30 cycles/minute for temperatures greater than 32 'F (0 'C). Bepragraversion switches: up to 30 cycles/minute for temperatures greater than 32 'F (0 'C). Bepragraversion switches: up to 30 cycles/minute for temperatures greater than 32 'F (0 'C). Bepragraversion switches: up to 30 cycles/minute for temperatures greater than 32 'F (0 'C). Bepragraversion switches: up to 30 cycles/minute for temperatures greater than 32 'F (0 'C). Bepragraversion switches: up to 30 cycles/minute for temperatures greater than 32 'F (0 'C). Bepragraversion switches: up to 30 cycles/minute for temperatures greater than 32 'F (0 'C). Bepragraversion switches: up to 30 cycles/minute for temperatures greater than 32 'F (0 'C). Bepragraversion switches: up to 30 cycles/minute for temperatures greater than 32 'F (0 'C). Bepragraversion switches: up to 30 cycles/minute for temperatures greater than 32 'F (0 'C). Bepragraversion switches: up to 30 cycles/minute for temperatures greater than 32 'F (0 'C). Bepragraversion switches: up to 30 cycles/minute for temperatures greater than 32 'F (0 'C). Bepragraversion switches: up to 30 cycles/minute for temperatures greater than 32 'F (0 'C). Bepragraversion switches: up to 30 cycles/minute for temperatures greater than 32 'F (0 'C). Bepragraversion switches: up to 30 cycles/minute for temperatures greater than 32 'F (Electric shock protection	Class I conforming t	o IEC 1140,	IEC 536 an	d NF C 20-	030				
Operating 'rate (operating 'cycles/minute) Diaphagm version switches: up to 120 cycles/minute for temperatures greater than 32 °F (0 °C). Repeat accuracy < 2% Pressure connection ⁽¹⁾ : 10° APTF ferrate '10° PT 14 (IS SD 2003). Electrical Connection ⁽¹⁾ : 10° APTF ferrate '10° APTF ferrate '10° APT 14 (IS SD 2003). ************************************	Degree of protection					529				
• G 14 (GSP female) conforming to NF E 03-005, ISO 228 • Yer NPT femals • Onenctor models, ether M12 or DNN 43650 A. consult your local sales office. • Onector models, ether M12 or DNN 43650 A. consult your local sales office. • Onector models, ether M12 or DNN 43650 A. consult your local sales office. • Onector models, ether M12 or DNN 43650 A. consult your local sales office. • NAC-15, B300 (Ule = 240 V, le = 1.5 A - Ule = 120 V, le = 3.4) • DN 490 47-3 • II = 300 V conforming to IEC/EN 60947-1 • II = 300 V conforming to IEC/EN 60947-1 • II = 300 V conforming to IEC/EN 60947-1 • Stee vamonage belocontacts (8 teminal), singalection	Operating rate (operating cycles/minute)									
Pressure connection ⁽¹⁾ • 14* NPT F tenale • Pr 14 (J18 B020). • Pr 14 (J18 B020). Electrical Connection ⁽¹⁾ • 107 NPT electrical connections • 100 M02 x 15 lapped entry • 100 NPg 13.5 (n* 13) lapped entry • Observe terminal models • Connectro models, either M12 or DN 43550 A: consult your local sales office. (1) See page 20, "Interpretation of the Catalog Number for XML Devices," for more information on specifying the electrical and pressure connections. Table 3: Contact block specifications • AC-15; B300 (Ue = 240 V, Ie = 15 A - Ue = 120 V, Ie = 3.4) • DC 13; B300 V conforming to IEC/EN 60947-1 UI = 500 V conforming to IEC/EN 60947-1 UI = 500 V conforming to IEC/EN 60947-1 UI = 90 V conforming to IEC/EN 60947-1 Type of contacts Silver tipped contacts MLD 2 CO single-pole contacts (8 terminal), sing action MLD 2 CO single-pole contacts (8 terminal), singared. Silver tipped contacts Silver tipped contacts Silver tipped contacts Silver tipped contacts Connorming to CENELECE EN 60013 Short-circuit protection 10 A carning to CENELECE EN 6013 Short-circuit protection 10 A carnidge tuse type gG (g)	Repeat accuracy									
Electrical Connection ⁽¹⁾ for sorew terminal models Elso M20 x 1.5 tapped entry Connector models, either M12 or DIN 43650 A: consult your local sales office. (1) See page 20. "Interpretation of the Catalog Number for XML Devices," for more information on specifying the electrical and pressure connections. Table 3: Contact block specifications A-C-15; B300 (Ue = 240 V, le = 1.5 A - Ue = 120 V, le = 3 A), =: DC - 13; R300 (Ue = 250 V, le = 0.1 A) conforming to IEC 947-5-1 Rated operational specifications A-C-15; B300 (Ue = 250 V, le = 0.1 A) conforming to IEC 947-5-1 Rated insulation voltage U = 500 V conforming to IEC/EN 60947-1 U = 500 V conforming to IEC/EN 60947-1 WL and XMLE 1 C/O single-pole contacts (8 terminal), single action XML 2 or C/ single-pole contacts (8 terminal), single action XML 2 or C/ single-pole contacts (8 terminal), single action XML 2 or C/ single-pole contacts (8 terminal), single action XML 2 or C/ single-pole contacts (8 terminal), single action XML 2 or C/ single-pole contacts (8 terminal), single action XML 2 or C/ single-pole contacts (8 terminal), single action XML 2 or C/ single-pole contacts (8 terminal), staggered, single action XML 2 or C/ single-pole contacts (8 terminal), staggered, single action XML 2 or C/ single-pole contacts (8 terminal), staggered, single action XML 2 or C/ single-pole contacts (8 terminal), staggered, single action XML 2 or C/ single-pole contacts (8 terminal), staggered, single action XML 2 or C/ single-pole contacts (8 terminal), staggered, single action XML 2 or C/ single-pole contacts (8 terminal), staggered, single action XML 2 or C/ single-pole contacts (8 terminal), staggered, single actio	Pressure connection ⁽¹⁾	 1/4" NPTF female 	,	ng to NF E ()3-005, ISO	228				
① See page 20, "Interpretation of the Catalog Number for XML Devices," for more information on specifying the electrical and pressure connections. Table 3: Contact block specifications Rated operational specifications ~ AC-15; B300 (Ue = 240 V, le = 1.5 A - Ue = 120 V, le = 3 A) · DC-13; R300 (Ue = 260 V, le = 1.5 A) · DC + 15; R300 (Ue = 240 V, le = 1.5 A) · DC + 15; R300 (Ue = 240 V, le = 1.5 A) · DC + 15; R300 (Ue = 240 V, le = 1.5 A) · DC + 15; R300 (Ue = 240 V, le = 1.5 A) · DC + 15; R300 (Ue = 240 V, le = 1.5 A) · DC + 15; R300 (Ue = 240 V, le = 1.5 A) · DC + 15; R300 (Ue = 240 V, le = 1.5 A) · DC + 15; R300 (Ue = 240 V, le = 1.5 A) · DC + 15; R300 (Ue = 240 V, le = 1.5 A) · DC + 15; R300 (Ue = 240 V, le = 1.5 A) · DC + 15; R300 (Ue = 240 V, le = 1.5 A) Rated insultation voltage UI = 500 V conforming to IC/EN 60947-1 Ull = 500 V conforming to IC/EN 60947-1 Vill = 20 (C) single-pole contacts (8 terminal), snap action		 ISO M20 x 1.5 ta DIN Pg 13.5 (n° 1 	oped entry 3) tapped er	ntry	650 A. cons	ult vour loc	al sales off	ce		
Rated operational specifications \sim AC-15; B300 (Ue = 240 V, Ie = 1.5 A - Ue = 120 V, Ie = 3.A) \therefore DC-13; R300 (Ue = 250 V, Ie = 0.1 A) conforming to IEC S47-5-1 Appendix A, EN 60 947-5-1Rated insulation voltageUi = 500 V conforming to IEC/EN 60947-1 Ui = 300 V conforming to IEC/EN 60947-1Rated impulse withstand voltageU imp = 6 kV conforming to IEC/EN 60947-1Type of contacts Silver tipped contactsXMLA and XMLB 1 C/O single-pole contacts (4 terminal), snap action XMLD 2 C/O single-pole contacts (5 terminal), snap action XMLC 2 C/O single-pole contacts (5 terminal), snap action XMLD 2 C/O single-pole contacts (5 terminal), snap action XMLC 2 C/O single-pole contacts (5 terminal), snap action XMLD 2 C/O single-pole contacts (5 terminal), snap action XMLC 2 C/O single-pole contacts (5 terminal), snap action XMLA and XMLB AC supply \sim 50/00 Hz rm Inductive circuit, the = 10 AOperating rate: 3600 operating cycles/hour Load factor: 0.5 $\sum 0 = 0 = 0 = 0 = 0 = 0 = 0 = 0 = 0 = 0 $	⁽¹⁾ See page 20, "Interpretation of the Catalog Num		,			,			ections.	
Rated operational specifications::: DC -13; R300 (Ue = 250 V, le = 0.1 A) conforming to IEC 947-5-1 Appendix A, EN 60 947-5-1Rated insulation voltageU = 500 V conforming to IEC/EN 60947-1 U = 300 V conforming to UL 508, C5A C22.2 nº 14 U = 500 V conforming to IEC/EN 60947-1Type of contacts Silver tipped contactsXMLA and XMLB: 1 C/O single-pole contact (4 terminal), snap action XMLC: 2 C/O single-pole contacts (4 terminal), snap action XMLC: 2 C/O single-pole contacts (4 terminal), snap action XMLD: 2 C/O single-pole contacts (5 terminal), snap action 	Table 3: Contact block specification	ons								
Rated instantion voltageUI = 300 V conforming to UL 508, CSA C22-2n° 14Rated impulse withstand voltageU imp = 6 kV conforming to ILC 508, CSA C22-2n° 14Type of contactsU imp = 6 kV conforming to IEC/EN 60947-1Silver typed contactsXMLL and XMLE 1 C/O single-pole contact (4 terminal), snap action XMLD: 2 C/O single-pole contact (8 terminal), staggered, snap actionResistance across terminals (mΩ)< 2 C/O single-pole contacts (8 terminal), staggered, snap action	Rated operational specifications	DC-13; R300 (Ue					1 Appendix	κ A,		
Type of contacts Silver tipped contacts XMLA and XMLB: 1 C/O single-pole contact (4 terminal), snap action XMLC: 2 C/O single-pole contacts (8 terminal), staggered, snap action Resistance across terminals (mC) < 25 conforming to NF C 93-050 method A or IEC 255-7 category 3	Rated insulation voltage				-2 n° 14					
Ype of contactsXMLC: 2 C/O single-pole contacts (8 terminal), simultaneous, snap action XMLD: 2 C/O single-pole contacts (8 terminal), staggered, snap action XMLD: 2 C/O single-pole contacts (8 terminal), staggered, snap action XMLD: 2 C/O single-pole contacts (8 terminal), staggered, snap action XMLD: 2 C/O single-pole contacts (8 terminal), staggered, snap action XMLD: 2 C/O single-pole contacts (8 terminal), staggered, snap action XMLD: 2 C/O single-pole contacts (8 terminal), staggered, snap action XMLD: 2 C/O single-pole contacts (8 terminal), staggered, snap action XMLD: 2 C/O single-pole contacts (8 terminal), staggered, snap actionTerminal referencingConforming to CENELEC EN 50013Short-circuit protection10 A cartridge fuse type gG (gl)ConnectionScrew clamp terminals. Clamping capacity, min: 1 x 0.2 mm², max: 2 x 2.5 mm²Electrical durability Conforming to IEC/EN 60947-5-1 Appendix CXMLA and XMLB A C supply ~ 50/60 Hz rm Inductive circuit, Ithe = 10 AOperating rate: 3600 operating cycles/hour Load factor: 0.5Terminal, staggered, snap action tilisation categories AC-15 and DC-13Operating rate: 3600 operating cycles/hour Load factor: 0.5Terminal referencingConforming to IEC/EN construct utilisation categories AC-15 and DC-13Terminal referencing to a start in the start	Rated impulse withstand voltage	U imp = 6 kV confor	ming to IEC/	EN 60947-	1					
Terminal referencing Conforming to CENELEC EN 50013 Short-circuit protection 10 A cartridge fuse type gG (gl) Connection Screw clamp terminals. Clamping capacity, min: 1 x 0.2 mm², max: 2 x 2.5 mm² Electrical durability Screw clamp terminals. Clamping capacity, min: 1 x 0.2 mm², max: 2 x 2.5 mm² Conforming to IEC/EN 60947-5-1 Appendix C XMLA and XMLB AC supply ~ 50/60 Hz rm. Inductive circuit, Ithe = 10 A Operating rate: 3600 operating cycles/hour 7 Load factor: 0.5 7 Description 9 Description 0.5 Description 10 for 1 million operating cycles Voltage V		XMLC: 2 C/O single	-pole contac	ts (8 termin	al), simultar	neous, snap	o action			
Short-circuit protection 10 A cartridge fuse type gG (gI) Connection Screw clamp terminals. Clamping capacity, min: 1 x 0.2 mm ² , max: 2 x 2.5 mm ² XMLA and XMLB AC supply ~ 50/60 Hz rm Inductive circuit, ithe = 10 A XMLA and XMLB AC supply ~ 50/60 Hz rm Inductive circuit, ithe = 10 A Operating rate: 3600 operating cycles/hour Load factor: 0.5 D c supply: DC supply: DC supply: Dower broken in W for 1 million operating cycles D c supply: Dower broken in W for 1 million operating cycles Voltage V 24 48 120 D supply: Dower broken in W for 1 million operating cycles Voltage V 24 48 120 Voltage V 24 48 120 D supply:: Power broken in W for 1 million operating cycles D supply:: Power broken in W for 5 million operating cycles	Resistance across terminals (mΩ)	< 25 conforming to I	NF C 93-050	method A	or IEC 255-	7 category	3			
Connection Screw clamp terminals. Clamping capacity, min: 1 x 0.2 mm ² , max: 2 x 2.5 mm ² Electrical durability Conforming to IEC/EN 60947-5-1 Appendix C Utilisation categories AC-15 and DC-13 XMLA and XMLB AC supply ~ 50/60 Hz rm. Inductive circuit, ithe = 10 A XMLC and XMLD AC supply ~ 50/60 Hz rm. Inductive circuit, ithe = 10 A Operating rate: 3600 operating cycles/hour Load factor: 0.5 7 9	Terminal referencing	Conforming to CEN	ELEC EN 50	013						
Electrical durability Conforming to IEC/EN 60947-5-1 Appendix C Utilisation categories AC-15 and DC-13 XMLA and XMLB AC supply ~ 50/60 Hz rm Inductive circuit, Ithe = 10 A XMLC and XMLD AC supply ~ 50/60 Hz rm Inductive circuit, Ithe = 10 A Operating rate: 3600 operating cycles/hour Load factor: 0.5 Image: Comparison of the state of th	Short-circuit protection	10 A cartridge fuse t	ype gG (gl)							
Conforming to IEC/EN 60947-5-1 Appendix C Utilisation categories AC-15 and DC-13AC supply \sim 50/60 Hz rm Inductive circuit, ithe = 10 AAC supply \sim 50/60 Hz rm Inductive circuit, ithe = 10 AOperating rate: 3600 operating cycles/hour Load factor: 0.5 $v_{0.2}^{0.1}$ <	Connection	Screw clamp termin	als. Clampin	g capacity,	min: 1 x 0.2	mm ² , max	: 2 x 2.5 m	n ²		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Conforming to IEC/EN 60947-5-1 Appendix C	AC supply \sim 50/60		L.		AC supply	${ m y}\sim$ 50/60		A	
Power broken in W for 1 million operating cycles Power broken in W for 5 million operating cycles Voltage V 24 48 120 Voltage V 24 48 120	cycles/hour	0.2		48 V 110 V 5 10	20	0	0.5 1		3 4 5	
		Power broken in W	-		1	Power bro	ken in W fo	1	· ·	
m W 31 29 26 m W 10 7 4		Voltage V	24	48	120	Voltage	V	24	48	120
		m W	31	29	26	m	W	10	7	4

Table 2: Environmental specifications

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Function

Pressure and vacuum switches control or regulate pressure or vacuum levels in hydraulic or pneumatic systems. They transform the pressure change into a digital electrical signal when the preset operating points are reached.

Switches for control circuits

Switches with control-duty rated electrical contacts, designed for control of contactors, relays, power valves, PLC inputs, etc.

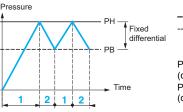
Switches for power circuits

Switches with power electrical contacts (1, 2, or 3 pole) designed for direct switching of single-phase or three-phase motors (pumps, compressors, etc.).

Pressure switch operating principle

Fixed Differential: Detection of a Single Threshold

Fixed differential switches have a single adjustable setting point (either PH or PB). The differential between the high and low points (PH–PB) depends on the construction of the switch. It is not adjustable.



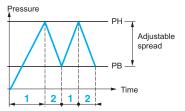
--- Adjustable value --- Non adjustable value

PH = High point (on rising pressure) PB = Low point (on falling pressure)



Adjustable Differential: Regulation between Two Thresholds

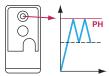
Adjustable differential switches have setting points for both the high point (PH) and the low point (PB). Both of these points can be independently adjusted.



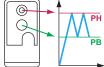
 Adjustable value
 PH = High point (on rising pressure)
 PB = Low point (on falling pressure) Example: Contact schematics of XMLB

₽́ = ,	₽ =[
12 14	4 5
1	2

Fixed differential

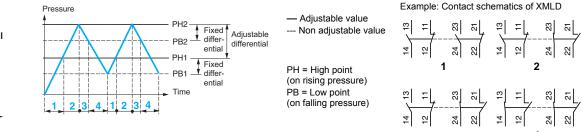


Adjustable differential





Dual-stage switches allow two distinct levels of control to be monitored with one device. Each stage allows detection of a single threshold with a single setting point (fixed differential). Both these points can be independently adjusted. However, for both stages, the differential between the high point and the low point (PH1–PB1 and PH2–PB2) is fixed and depends on the construction of the switch.



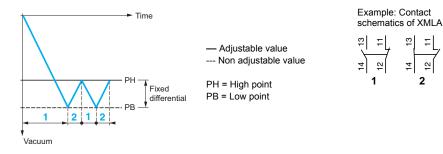


12 14

Vacuum switch operating principle

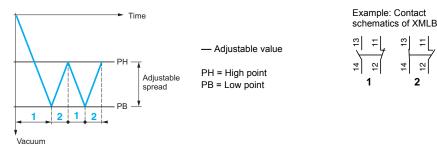
Detection of a single threshold

The switches for detection of a single threshold (fixed differential) have a single adjustable setting point (PH). The differential between the high and low points (PH-PB) depends on the inherent characteristics of the switch. It is not adjustable.



Regulation between two thresholds

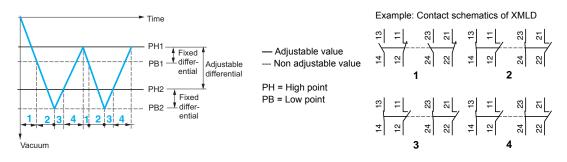
The switches for regulation between two thresholds (adjustable differential) have both a high point setting (PH) and a low point setting (PB). Both of these points can be independently adjusted.



Detection of two thresholds

The dual-stage switches, for detection at each threshold, have an adjustable high point setting for each stage (PH1 and PH2). Both of these points can be independently adjusted.

For both stages, the differential between the high point and the low point (PH1-PB1 and PH2-PB2) depends on the inherent characteristics of the switch. It is not adjustable.



Maximum allowable accidental pressure

The maximum accidental pressure of XML switches is equal to at least 2.25 times the switch size.

If accidental overpressures occur and their duration is less than 50 milliseconds, the pressure damping device incorporated in the XML switches (sizes 10 bar and greater) reduces the effect.

Application range of pressure and vacuum switches types XML, XMA and XMX, for control circuits

Insulation voltage limit V 500 (3 240 200 150 (4) 120 100 60 Inductive loads 48 Heating limit (Ith) 24 20 (1) 15 (2) 10 8 6 5 1 mA 2 mA 3 mA 6 mA 10 mA 1 A 1.5 A 2 A 3 A 6 A 10 A (1) Standard PLC input, type 1 Pressure switches Application range (2) Standard PLC input, type 2 (3) Switching capacity conforming to IEC 947-5-1, XMLA, XMLB, XMLC, XMLD utilisation category AC-15, DC-13 XMX (upcoming product) B300 240 V 1.5 A R300 250 V 0.1 A (4) Switching capacity conforming to IEC 947-5-1, XMLE. XMLF. XMLG utilisation category AC-15, DC-13 B300 120 V 3 A R300 125 V 0.22 A

On standard loads: Continuous duty, frequent switching.

PLC: Programmable Logic Controller

On small loads: The use of electromechanical pressure and vacuum switches with programmable logic controllers is becoming more prevalent. On small loads, the switches maintain a failure rate of less than 1 for 100 million operating cycles. Results may vary depending on application.



Selecting the switch size

After establishing the type of switch required for the application (single threshold detection or regulation between two thresholds), the selection of its size depends on the following criteria:

- the differential: difference between the high point (PH) and the low point (PB),
- · the maximum pressure allowable per cycle,
- repeat accuracy, precision and minimum drift.

Selecting a fixed differential pressure switch for detecting a single threshold

Main criterion: minimum differential

Example: for a selected high point (PH) of 7 bar









XMLA035••••• Differential = 2 bar

As a general rule, avoid working at

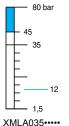
the upper or lower limits of the

operating range.

Select an XMLA010 (the lowest size)

Main criterion: tolerance to overpressures Example: for a selected high point (PH) of 12 bar





35 bai

15

XMLA035 ·····

18

Adjustable from 1.5-35 bar

XMLA020••••• Allowable accidental overpressure = 45 bar

Allowable accidental overpressure = 80 bar

Select an XMLA035 ••••• (the highest size)

Main criterion: repeat accuracy, precision and minimum drift Example: for a selected high point (PH) of 18 bar



XMLA020••••• Adjustable from 1–20 bar

Select an XMLA035 ·····

Table 4: Converting Units of Pressure

	psi	kg/cm ²	bar	atm	mm Hg (Torr)	mm H ₂ O	Ра
1 psi =	1	0.07031	0.06895	0.06805	51.71	703.7	6895
1 kg/cm ² =	14.22	1	0.98066	0.96784	735.55	10 000	98 066
1 bar =	14.50	1.0197	1	0.98695	750.06	10 197	10 ⁵
1 atm =	14.70	1.0333	1.0132	1	760.0	10 333	101 325
1 mm Hg = (Torr)	0.01934	1.360 x 10 ⁻³	1.333 x 10 ⁻³	1.316 x 10 ⁻³	1	13.59	133.3
1 mm H ₂ O=	1.421 x 10 ⁻³	10 ⁻⁴	\sim 10 ⁻⁴	\sim 10 ⁻⁴	0.07361	1	\sim 9.80
1 Pa =	1.45 x 10 ⁻⁴	1.0197 x 10 ⁻⁵	10 ⁻⁵	9.8695 x 10 ⁻⁶	7.5 x 10 ⁻³	0.10197	1
Example: 1 bar = 1	4.50 psi = 10 ⁵ F	Pa	•		-	-	•

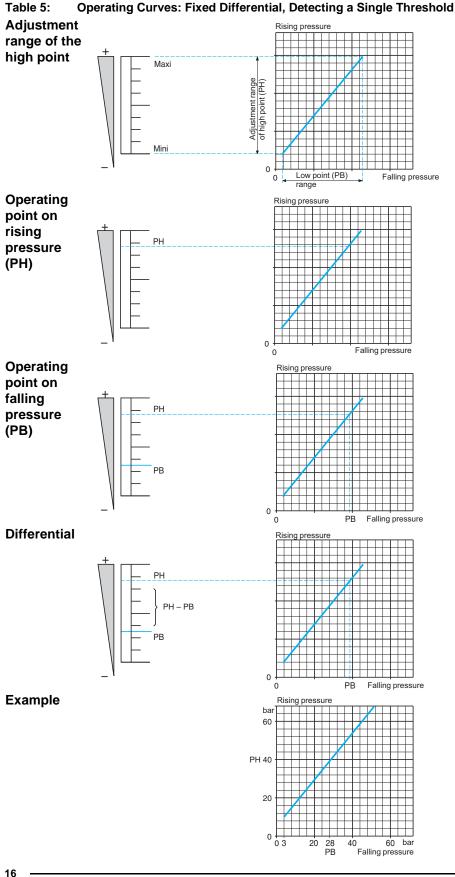
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Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com

Industrial Pressure Switches XML Electromechanical Pressure Switches



Defined by the difference between the minimum and maximum high point (PH) setting values.

For a high set point (PH), the lower point (PB) is fixed and cannot be adjusted.

For a low set point (PB), the higher point (PH) is fixed and cannot be adjusted.

The upper pressure setting at which the pressure or vacuum switch actuates the contacts on rising pressure.

Adjustable throughout the range on rising pressure.

The pressure at which the switch contact changes state on falling pressure.

The lower point (PB) is not adjustable and is entirely dependent on the high point setting (PH) and the inherent differential of the switch.

PH-PB = inherent differential

The difference between the operating point on rising pressure (PH) and the operating point on falling pressure (PB).

This point is not adjustable, so the value of the differential is fixed.

It is the inherent differential of the switch (contact differential, friction, etc.).

Operating point on rising pressure (PH) is 40 bar (set value at which the contact changes state on rising pressure).

The operating point on falling pressure (PB) is 28 bar (fixed value at which the contact returns to its original state).

Conclusion: the differential is 40 - 28 = 12 bar.

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Industrial Pressure Switches XML Electromechanical Pressure Switches

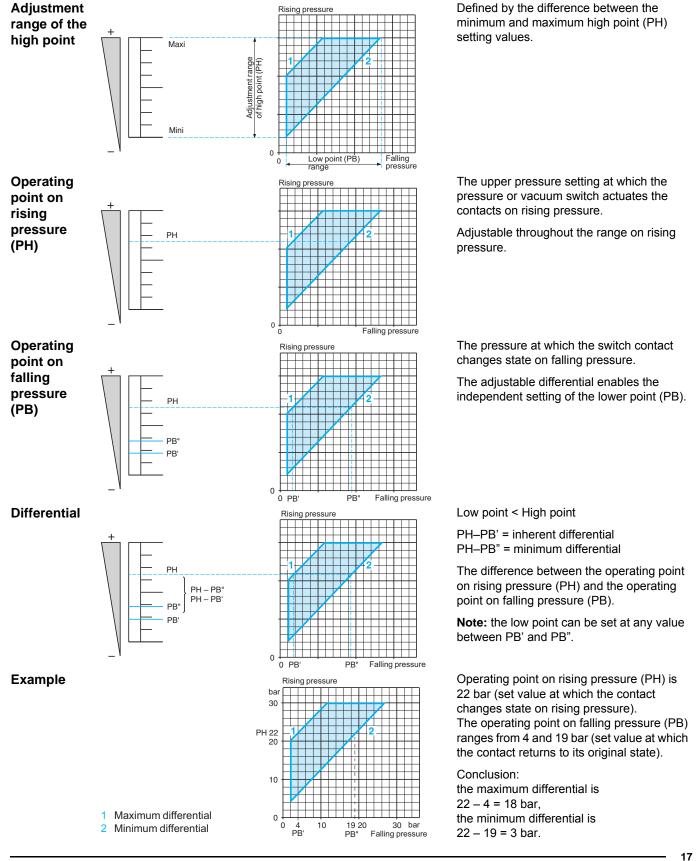


Table 6: Operating Curves: Adjustable Differential, Regulating between Two Thresholds

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Introduction

Industrial Pressure Switches XML Electromechanical Pressure Switches

Table 7: Operating Curves: Dual-Stage, Fixed Differential, Detection at Each Threshold (switching on rising pressure) Adjustment Defined by the difference between the Rising pressure ranges of the minimum and maximum high point setting values of each stage (PH1 and operating points PH2). PH1 and PH2 on rising pressure point high 0 0 of high point PH1 **Operating point** The upper pressure setting at which the pressure or vacuum switch actuates PH2 on rising contact 2 on rising pressure. pressure Adjustable throughout the range on rising PH2 pressure. Rising pressure **Operating point** The upper pressure setting at which the pressure or vacuum switch actuates PH1 contact 1 on rising pressure. on rising pressure PH2 PH1 PH1 Rising pressure 0 PH1 PH1 Spread PH1 < PH2 Rising pre PH2-PH1' = maximum spread PH2-PH1" = minimum spread The difference between operating points PH2 and PH1 on rising pressure. PH2 – PH1" PH2 – PH1' **Note:** operating point PH1 can be set at PH1 any value between PH1' and PH1". PH1 0 0 PH1 Rising pressure PH1 Example: Second stage operating point on rising Rising pressure ba pressure (PH2) = 20 bar (set value at Determining 30 which contact 2 changes state on rising operating points pressure). First stage operating point on rising (PH1) can be set between 4.5 and 17 bar PH2 20 pressure for the on rising pressure. two stages Conclusion: 10 the maximum spread is: 20 - 4.5 = 15.5 bar, 1 Maximum spread 0 the minimum spread is: 10 17 20 PH1" 30 bar 2 Minimum spread Rising pressure 20 – 17 = 3 bar.

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pressure

(PB1 or PB2)

Differential

Example:

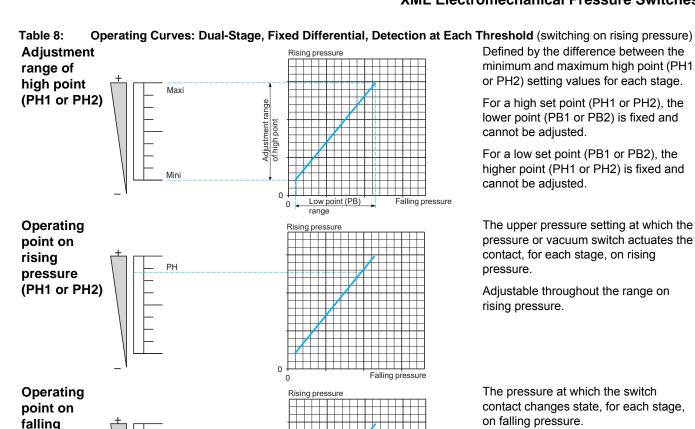
stage 1 =

stage 2 =

segment EF

segment GH

Industrial Pressure Switches XML Electromechanical Pressure Switches



0

0

30

PH 20

10

0

03

Rising

Rising pr

Falling pressure

Falling pressure

30 bar

Falling pressure

PB

PB

The lower point (PB) is not adjustable and is entirely dependent on the high point setting (PH) and the inherent differential of the switch.

PH-PB = inherent differential

The difference between the operating point on rising pressure (PH) and the operating point on falling pressure (PB), for each stage. This point is not adjustable, so the value of the differential is fixed. It is the inherent differential of the switch (contact differential, friction, etc.) for each of its two stages.

For stage 2 (segment GH):

Operating point on rising pressure (PH2) is 20 bar (set value at which contact 2 changes state on rising pressure). The operating point on falling pressure (PB2) is 14 bar (fixed value at which contact 2 returns to its original state).

Conclusion: for stage 2, the differential is: 20 - 14 = 6 bar.

Repeat the same procedure for stage 1 (segment EF).

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PH

PH – PB

Maximum spread
 Minimum spread

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19

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PB

10 14 20

Industrial Pressure Switches XML Electromechanical Pressure Switches

Interpretation of the Catalog Number for XML Devices

Table 9: Interpreting the Catalog Number (Example: XMLA004A2S13)

		XML				2	S	1	3	
Designation		Catalo	bg N	lumbe	er					
Nautilus Pres	sure Switch	XML	1							
	Nonadjustable differential, single pole		А							
Turne	Adjustable differential, single pole		В							
Туре	Adjustable differential, double pole		С							
	Nonadjustable differential, double pole		D							
	0.05			L05						
	0.35			L35						
	0.35 Overpressure 0.30 (4.35)			S35						
	-1 to -0.28			M01						
	-1 to -0.14			M02						
	-0.2 to -0.02			M03						
	-0.5 to 5			M05						
	1		-	001		-	-		_	
	2.5		-	002		-	-		_	
				S02		-			_	
Operating						-				
range	4 <u>4</u> <u>0</u> <u>0</u> <u>0</u> <u>0</u> <u>0</u> <u>0</u> <u>0</u> <u>0</u>			004 804						
bar (psi)	4 Overpressure 0.30 (4.35)			S04						
-	10			010						
	10 Overpressure 0.30 (4.35)			S10						
	20			020						
	20 Overpressure 0.30 (4.35)			S20						
	35			035						
	40			040						
	70			070						
	160			160						
	300			300						
	500			500						
	Diaphragm type									
	Hydraulic oils, air, fresh, or sea water, 32–158 °F (0–70 °C)				А					
	Hydraulic oils, air, fresh, or sea water, 32–320 °F (0–160 °C)				в					
	Corrosive fluid				С					
	Viscous products				P					
	Hydraulic oils or air, 32–140 °F (0–60 °C)				R					
	Fresh or sea water, 32–320 °F (0–160 °C)				s					
Input fluid	Vacuum type with diaphragm				Ĕ					
	Hydraulic oils, air, fresh or sea water, 32–158 °F (0–70 °C)		-		V		-		_	
	Hydraulic oils, air, fresh or sea water, $32-320$ °F (0-160 °C)	_			Ť				_	
					<u> </u>				_	
	Piston type									
	Hydraulic oils or air, 32–320 °F (0–160 °C)				D					
	Fresh or sea water, 32–320 °F (0–160 °C)				E					
	Corrosive fluid, 32–320 °F (0–160 °C)				Ν					
Display	Not provided					1				
. ,	Provided					2				
Electrical	Threaded hole						S			
Connection	DIN 43650 connector						С			
	M12 threaded connector (Micro Change type)						D			
Contact type	Dry contact							1		
	European									
	Pressure G 1/4 (BSP female)									
	Electrical Type 13 (Pg 13.5)								1	
	Pressure G 1/4 (BSP female)								,	
	Electrical ISO M20								2	
Entry type	U.S.A.									
	Pressure 1/4 in. NPTF									
	Electrical 1/2 in. NPT								3	
	Japan									
	Pressure PT 1/4 (JIS B0203)									
	. ,								4	
	Electrical 1/2 in. PF (JIS B0202)									

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Table 10:Size: -1 bar (-14.5 psi)Fixed differential, for detection of a single thresholdSwitches with 1 C/O single-pole contactPressure connection 1/2" NPT or 1/4" BSP

XMLA Vacuum Swite	ches	With setting sca	ale	Without setting scale				
Adjustable Range of O (Falling pressure)	perating Point (PB)	-0.28 to -1 bar (-4.0	6 to –14.5 psi)					
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector			
Catalog Numbers ⁽¹⁾								
Fluids Controlled For materials in contact with	Hydraulic oils, fresh water, sea water, air, up to 158 °F (70 °C)	XMLAM01V2S13	XMLAM01V2C11	XMLAM01V1S13	XMLAM01V1C11			
fluid, see pages 77–78	Hydraulic oils, fresh water, sea water, air, corrosive fluids, up to 320 $^\circ\text{F}$ (160 $^\circ\text{C})$	XMLAM01T2S13	XMLAM01T2C11	XMLAM01T1S13	XMLAM01T1C11			
Weight, lb (kg)		1.51 (0.685)	1.58 (0.715)	1.51 (0.685)	1.58 (0.715)			
Supplementary Spec	cifications (not shown under gene	ral specifications)						
Inherent Differential	At low setting	0.24 bar (3.48 psi), ±0.05 bar (±0.72 psi)						
(add to PB to get PH)	At high setting	0.24 bar (3.48 psi), ±0.05 bar (±0.72 psi)						
Maximum Allowable	Per cycle	5 bar (72.5 psi)						
Pressure	Accidental	9 bar (130.5 psi)						
Destruction Pressure		18 bar (261 psi)						
Cable Entry and Wire S	Size for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.						
Connector Type for Co	nnector Models	DIN 43650A, 4-pin male. For suitable female connector, see page 73.						
Vacuum Switch Style		Diaphragm						
(1) For 1 entry tapped for P	G 13.5 conduit/cable entry, replace S13 with	S11 (example: XMLAI	M01V2S13 becomes X	MLAM01V2S11).				
Operating Curves				Connection				
Rising pressure bar -1 -0.76 -0.6 -0.4	4 -0.2 -0.04 0 -0.2 -0.2 k0.28		Time	Terminal model				
	-0.4 -0.6 -0.8	PH PB Vacuum — Adjustable value Non adjustable val		Connector mode Vacuum switch cor $\begin{bmatrix} -\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \end{bmatrix}$				

Other Versions

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

Table 11:Size: -1 bar (-14.5 psi)
Adjustable differential, for regulation between two thresholds
Switches with 1 C/O single-pole contact
Pressure connection 1/2" NPT or 1/4" BSP

Vacuum switches ty	pe XMLB	With setting sca	ale	Without setting scale			
Adjustable Range of O (Falling pressure)	perating Point (PB)	-0.14 to -1 bar (-2.0	3 to –14.5 psi)				
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector		
Catalog Numbers ⁽¹⁾							
Fluids Controlled For materials in contact with	Hydraulic oils, fresh water, sea water, air, up to 158 °F (70 °C)	XMLBM02V2S13	XMLBM02V2C11	XMLBM02V1S13	XMLBM02V1C11		
fluid, see pages 77–78	Hydraulic oils, fresh water, sea water, air, corrosive fluids, up to 320 °F (160 °C)	XMLBM02T2S13	XMLBM02T2C11	XMLBM02T1S13	XMLBM02T1C11		
Weight, lb (kg)		2.24 (1.015)	2.27 (1.030)	2.24 (1.015)	2.27 (1.030)		
Supplementary Spec	cifications (not shown under gene	ral specifications)					
Possible Differential	Min. at low setting	0.13 bar (1.88 psi), ±0.02 bar (±0.29 psi)					
(add to PB to get PH)	Min. at high setting	0.13 bar (1.88 psi), ±0.02 bar (±0.29 psi)					
	Max. at high setting	0.8 bar (11.6 psi)					
Maximum Allowable	Per cycle	5 bar (72.5 psi)					
Pressure	Accidental	9 bar (130.5 psi)					
Destruction Pressure		18 bar (261 psi)					
	Size for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.					
Connector Type for Co	nnector Models	DIN 43650A, 4-pin male. For suitable female connector, see page 73.					
Vacuum Switch Style		Diaphragm					
	G 13.5 conduit/cable entry, replace S13 with	S11 (example: XMLBI	M02V2S13 becomes XI				
Operating Curves				Connection			
Rising pressure bar 1 - 0.87 - 0.6 - 0.4 1 - 0.6 1 - 0	1 Maximum differential 2 Minimum differential 2 Minimum differential Adjustable value	PH PB Vacuum		Terminal model			

Other Versions

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

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Table 12:Size: -1 bar (-14.5 psi)
Adjustable differential, for regulation between two thresholds
Switches with 2 C/O single-pole contacts
Pressure connection 1/2" NPT or 1/4" BSP

Vacuum switches type	XMLC	With setting scale	
Adjustable Range of Oper (Falling pressure)	rating Point (PB)	–0.14 to –1 bar (–2.03 to –14.5 psi)	
Electrical Connection		Terminals	
Catalog Numbers ⁽¹⁾			
Fluids Controlled	Hydraulic oils, fresh water, sea water, air, up to 158 °F (70 °C)	XMLCM02V2S13	
For materials in contact with fluid, see pages 77–78	Hydraulic oils, fresh water, sea water, air, corrosive fluids, up to 320 °F (160 °C)	XMLCM02T2S13	
Weight, lb (kg)		2.24 (1.015)	
Supplementary Specifi	ications (not shown under gene	ral specifications)	
Dessible Differential	Min. at low setting	0.13 bar (1.89 psi), ±0.02 bar (±0.29 psi).	
Possible Differential (add to PB to get PH)	Min. at high setting	0.14 bar (2.03 psi), ±0.02 bar (±0.29 psi).	
	Max. at high setting	0.8 bar (11.6 psi)	
Maximum Allowable	Per cycle	5 bar (72.5 psi)	
Pressure	Accidental	9 bar (130.5 psi)	
Destruction Pressure		18 bar (261 psi)	
Cable Entry and Wire Size	e for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm	n² maximum.
Vacuum Switch Style		Diaphragm	
(1) For 1 entry tapped for PG 1	3.5 conduit/cable entry, replace S13 with	S11 (example: XMLCM02V2S13 becomes X	MLCM02V2S11).
Operating Curves			Connection
Rising pressure bar -0.86 -0.6 -0.4	-0.14 0 -0.14 0 -0.01 -0.01 -0.2 -0.4 -0.4 -0.4 -0.4 -0.4 -0.6 -0.8	PH PB Vacuum	Terminal model $\begin{array}{c c} \hline \hline \hline \hline \hline \hline \hline \hline \hline \hline$
Other Versions		ble entries (such as NPT), consult your local s	sales office.



Table 13:Size: -1 bar (-14.5 psi)
Dual-stage, fixed differential, for detection at each threshold
Switches with 2 C/O single-pole contacts (one per stage)
Pressure connection 1/2" NPT or 1/4" BSP

Pressure connection 1/2" NPT of 1/4" BSP				
Vacuum switches type XMLD		Without setting scale		
Adjustable Range of Operating	2nd stage operating point (PB2)	–0.12 to –1 bar (–1.74 to –14.5 psi)		
Points (Falling pressure)	1st stage operating point (PB1)	-0.10 to -0.98 bar (-1.45 to -14.21 psi)		
Spread between the Two Stages (F	PB2—PB1)	0.02 to 0.88 bar (0.29 to 12.76 psi)		
Electrical Connection		Terminals		
Catalog Numbers ⁽¹⁾				
Fluids Controlled For materials in contact with fluid, see	Hydraulic oils, fresh water, sea water, air, up to 158 °F (70 °C)	XMLDM02V1S13		
pages 77–78	Hydraulic oils, fresh water, sea water, air, corrosive fluids, up to 320 °F (160 °C)	XMLDM02T1S13		
Weight, Ib (kg)		2.24 (1.015)		
Supplementary Specifications	(not shown under general specific	ations)		
Inherent Differential	At low setting	0.1 bar (1.45 psi), ±0.035 bar (±0.51 psi)		
(add to PB1/PB2 to get PH1/PH2)	At high setting	0.1 bar (1.45 psi), ±0.02 bar (±0.29 psi)		
Maximum Allowable Pressure	Per cycle	5 bar (72.5 psi)		
	Accidental	9 bar (130.5 psi)		
Destruction Pressure		18 bar (261 psi)		
Cable Entry and Wire Size for Tern	ninal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.		
Vacuum Switch Style		Diaphragm		
	/cable entry, replace S13 with S11 (example	e: XMLDM02V1S13 becomes XMLDM02V1S11).		
Operating Curves				
High setting trip points of contacts	s 1 and 2	Inherent Differential of contacts 1 and 2		
PH1 setting (falling pressure)		Rising pressure Time		
-0.98 -0.8 -0.6 -0.4 -0.12 0 -0.12 0 -0.12 0 -0.12 0 -0.2 0 -0.4 0 -0.12 0 -0.2 0 -0.2 0 -0.2 0 -0.2 0 -0.2 0 -0.2 0 -0.2 0 -0.4 0 -0.0	S EF Contact 1 (stage 1)			
Connection: Terminal model				
Contact 1 (stage 1) Contact 2 (stage 2)			
14	22 23 23			
Other Versions	For switches with alternative tapped cable	entries (such as NPT), consult your local sales office.		

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Connection

 Table 14:
 Size: -200 mbar (-2.9 psi)

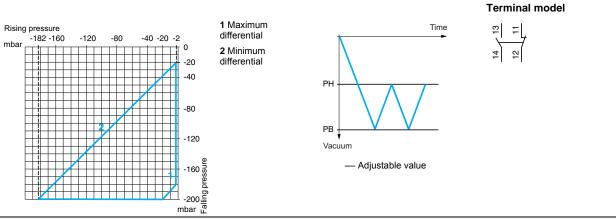
 Adjustable differential, for regulation between two thresholds

 Switches with 1 C/O single-pole contact

 Pressure connection 1/2" NPT or 1/4" BSP

Vacuum switches type XMLB		With setting scale	
Adjustable Range of Ope (Falling pressure)	rating Point (PB)	-20 to -200 mbar (-0.29 to -2.9 psi)	
Electrical Connection		Terminals	
Catalog Numbers ⁽¹⁾			
Fluids Controlled	Hydraulic oils, air, up to 320 °F (160 °C)	XMLBM03R2S13	
For materials in contact with fluid, see pages 77–78	Fresh water, sea water, corrosive fluids, up to 320 °F (160 °C)	XMLBM03S2S13	
Weight, Ib (kg)		7.30 (3.310)	
Supplementary Specifi	ications (not shown under ge	neral specifications)	
Describle Differential	Min. at low setting	18 mbar (0.26 psi), ±2 mbar (±0.29 psi)	
Possible Differential (add to PB to get PH)	Min. at high setting	18 mbar (0.26 psi), ±2 mbar (±0.29 psi)	
(add to r b to get r ff)	Max. at high setting	180 mbar (2.6 psi)	
Maximum Allowable	Per cycle	1 bar (14.5 psi)	
Pressure	Accidental	2 bar (29 psi)	
Destruction Pressure		3.5 bar (50.75 psi)	
Cable Entry and Wire Size	e for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.	
Vacuum Switch Style		Diaphragm	
(1) For 1 entry tapped for PG 1	3.5 conduit/cable entry, replace S13	with S11 (example: XMLBM03R2S13 becomes XMLBM03R2S11).	

Operating Curves



Other Versions

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

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Table 15:Size 50 mbar (0.72 psi)
Adjustable differential, for regulation between two thresholds
Switches with 1 C/O single-pole contact
Pressure connection 1/2" NPT or 1/4" BSP

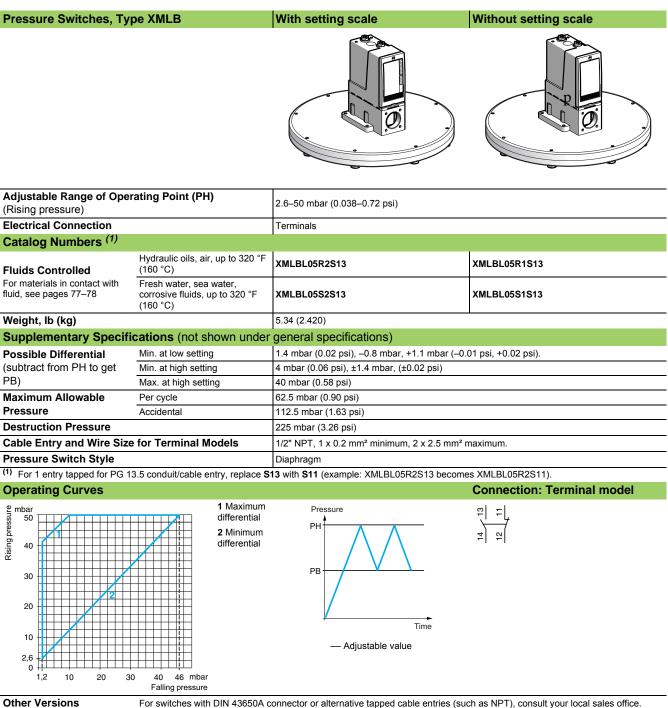


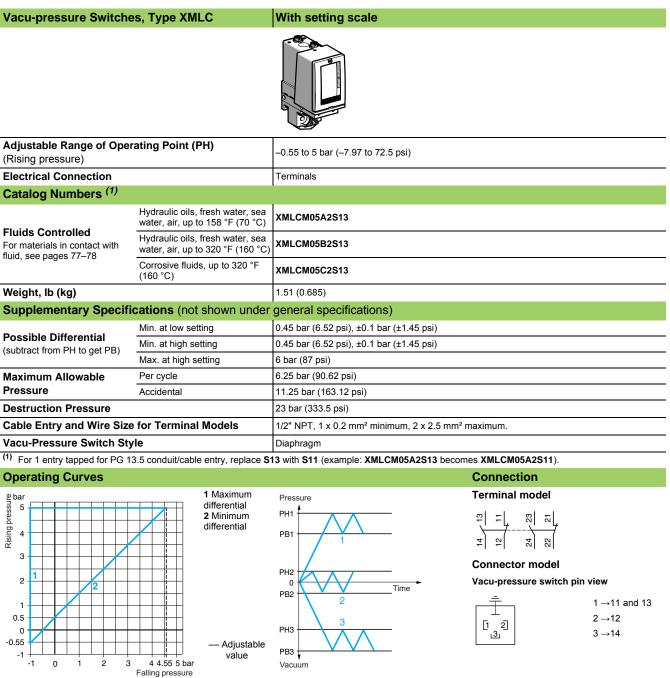


Table 16:Size 5 bar (72.5 psi)
Adjustable differential, for regulation between two thresholds
Switches with 1 C/O single-pole contact
Pressure connection 1/2" NPT or 1/4" BSP

Vacu-Pressure Switches, Type XMLB		With setting scale		Without setting scale	
Adjustable Range of Ope (Rising pressure)	rating Point (PH)	–0.5 to 5 bar (–7.25 to	o 72.5 psi)		
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector
Catalog Numbers ⁽¹⁾					
	Hydraulic oils, fresh water, sea water, air, up to 158 °F (70 °C)	XMLBM05A2S13	XMLBM05A2C11	XMLBM05A1S13	XMLBM05A1C11
Fluids Controlled For materials in contact with	Hydraulic oils, fresh water, sea water, air, up to 320 °F (160 °C)	XMLBM05B2S13	XMLBM05B2C11	XMLBM05B1S13	XMLBM05B1C11
fluid, see pages 77-78	Corrosive fluids, up to 320 °F (160 °C)	XMLBM05C2S13	XMLBM05C2C11	XMLBM05C1S13	XMLBM05C1C11
	Viscous products, up to 320 °F (160 °C) (G1¼" pressure connection)	XMLBM05P2S13	XMLBM05P2C11	XMLBM05P1S13	XMLBM05P1C11
Weight, Ib (kg)		1.51 (0.685)	1.58 (0.715)	1.55 (0.705)	1.62 (0.735)
Supplementary Specifi	ications (not shown under gene	ral specifications)			
Describe Differential	Min. at low setting	0.5 bar (7.25 psi), ±0.05 bar (±0.72 psi)			
(SUDTRACT from PH to get PB) -	Min. at high setting	0.5 bar (7.25 psi), ±0.05 bar (±0.72 psi)			
	Max. at high setting	6 bar (87 psi)			
Maximum Allowable	Per cycle	6.25 bar (90.62 psi)			
Pressure	Accidental	11.25 bar (163.12 psi)		
Destruction Pressure		23 bar (333.5 psi)			
Cable Entry and Wire Size	e for Terminal Models	1/2" NPT, 1 x 0.2 mm ² minimum, 2 x 2.5 mm ² maximum.			
Connector Type for Conn	ector Models	DIN 43650A, 4-pin male. For suitable female connector, see page 73.			
Vacu-Pressure Switch Sty	-	Diaphragm			
⁽¹⁾ For 1 entry tapped for PG 1	3.5 conduit/cable entry, replace S13 with	S11 (example: XMLBM	105A2S13 becomes XI	MLBM05A2S11).	
Operating Curves				Connection	
ebar ns 5 built built Built	1 Maximum differential 2 Minimum differential	Pressure PH1 PB1		Terminal model $ \begin{array}{c} $	
2 1 2		PH2 0	Time	 ⊢ ⊢ ⊢ Connector mode! Vacu-pressure swite 	
		PB2 2 PH3 3 PB3 Vacuum			$1 \rightarrow 11 \text{ and } 13$ $2 \rightarrow 12$ $3 \rightarrow 14$
Other Versions	Falling pressure For switches with alternative tapped cal	ble entries (such as NF	T), consult your local s	sales office.	



Table 17:Size 5 bar (72.5 psi)
Adjustable differential, for regulation between two thresholds
Switches with 2 C/O single-pole contacts
Pressure connection 1/2" NPT or 1/4" BSP



Other Versions

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

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Table 18:Size 350 mbar (5.07 psi)
Adjustable differential, for regulation between two thresholds
Switches with 1 C/O single-pole contact
Pressure connection 1/2" NPT or 1/4" BSP

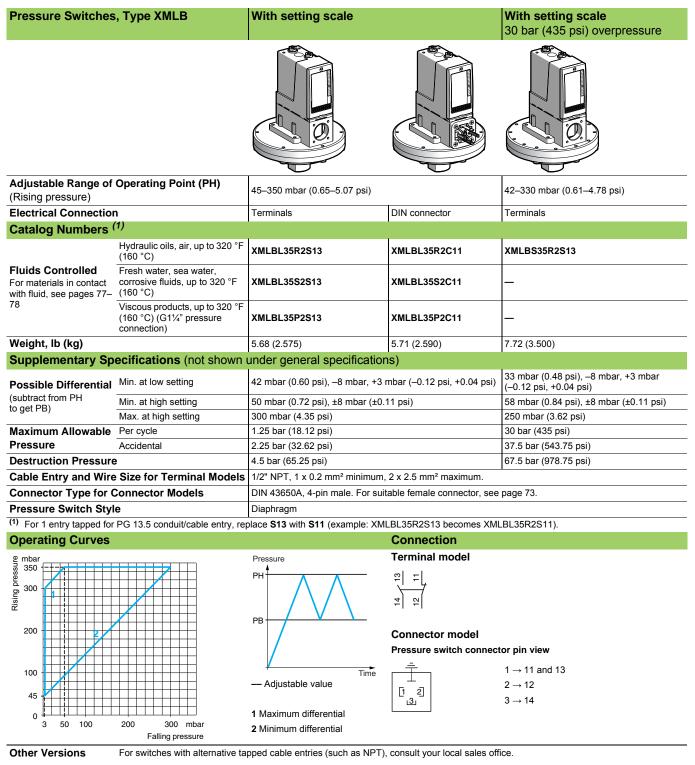


Table 19:Size 350 mbar (5.07 psi)
Adjustable differential, for regulation between two thresholds
Switches with 1 C/O single-pole contact
Pressure connection 1/2" NPT or 1/4" BSP

Pressure connection 1/2 NP1 or 1/4 BSP				
Pressure Switches, Ty	pe XMLB	Without setting scale		
Adjustable Range of Oper (Rising pressure)	rating Point (PH)	45–350 mbar (0.65–5.07 psi)		
Electrical Connection		Terminals	DIN connector	
Catalog Numbers ⁽¹⁾				
	Hydraulic oils, air, up to 320 °F (160 °C)	XMLBL35R1S13	XMLBL35R1C11	
Fluids Controlled For materials in contact with	Fresh water, sea water, corrosive fluids, up to 320 °F (160 °C)	XMLBL35S1S13	XMLBL35S1C11	
fluid, see pages 77–78	Viscous products, up to 320 °F (160 °C) (G1¼" pressure connection)	XMLBL35P1S13	XMLBL35P1C11	
Weight, Ib (kg)		5.68 (2.575)	5.71 (2.590)	
Supplementary Specifi	ications (not shown under ge	eneral specifications)		
Possible Differential	Min. at low setting	42 mbar (0.60 psi), –8 mbar, +3 mbar (–0.12 psi, +0.04 psi)		
Possible Differential –	Min. at high setting	50 mbar (0.72 psi), ±8 mbar (±0.11 psi)		
· · · · ·	Max. at high setting	300 mbar (4.35 psi)		
Maximum Allowable	Per cycle	1.25 bar (18.12 psi)		
Pressure	Accidental	2.25 bar (32.62 psi)		
Destruction Pressure		4.5 bar (65.25 psi) 1/2" NPT 1 x 0.2 mm ² minimum 2 x 2.5 mm ² maximum		
Cable Entry and Wire Size		1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.		
Connector Type for Conn	ector Models	DIN 43650A, 4-pin male. For suitable female connector, see page 73.		
Pressure Switch Style		Diaphragm		
	3.5 conduit/cable entry, replace S13	with S11 (example: XMLBL35R1S13 becomes >		
Operating Curves			Connection	
e mbar 350 50 300 200 100 45	1 Maximum differential 2 Minimum differential	Pressure PH PB Time Adjustable value	Terminal model $\begin{array}{c c} & & & \\ & & \\ \hline \hline & & \\ \hline \\ & & \\ \hline \hline \\ \hline \\$	
	300 mbar		$\begin{array}{c} 2 \rightarrow 12 \\ 3 \rightarrow 14 \end{array}$	
0 00 100 200	Falling pressure			
Other Versions	For switches with alternative tennes	d apple entring (queb as NDT), appault your least		

Other Versions

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For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

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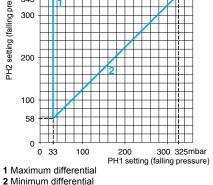
Table 20:Size 350 mbar (5.07 psi)
Adjustable differential, for regulation between two thresholds
Switches with 2 C/O single-pole contacts
Pressure connection 1/2" NPT or 1/4" BSP

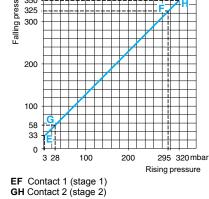
Pressure Switches, Type XMLC		With setting scale	With setting scale 30 bar (435 psi) overpressure
Adjustable Range of Oper (Rising pressure)	rating Point (PH)	45–350 mbar (0.65–5.07 psi)	42–330 mbar (0.61–4.78 psi)
Electrical Connection		Terminals	
Catalog Numbers ⁽¹⁾			
Fluids Controlled	Hydraulic oils, air, up to 320 °F (160 °C)	XMLCL35R2S13	XMLCS35R2S13
For materials in contact with fluid, see pages 77–78	Fresh water, sea water, corrosive fluids, up to 320 °F (160 °C)	XMLCL35S2S13	_
Weight, Ib (kg)		5.68 (2.575)	7.72 (3.500)
Supplementary Specifi	cations (not shown under	general specifications)	
-	Min. at low setting	20 mbar (0.29 psi), ±20 mbar (±0.29 psi)	40 mbar (0.58 psi), ±20 mbar (±0.29 psi)
Possible Differential (subtract from PH to get PB)	Min. at high setting	35 mbar (0.51 psi), ±20 mbar (±0.29 psi)	88 mbar (1.27 psi), ±20 mbar (±0.29 psi)
	Max. at high setting	300 mbar (4.35 psi)	230 mbar (3.33 psi)
Maximum Allowable	Per cycle	1.25 bar (18.12 psi)	30 bar (435 psi)
Pressure	Accidental	2.25 bar (32.62 psi)	37.5 bar (543.75 psi)
Destruction Pressure		4.5 bar (65.25 psi)	67.5 bar (978.75 psi)
Cable Entry and Wire Size	e for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.	
Pressure Switch Style		Diaphragm	
(1) For 1 entry tapped for PG 1	3.5 conduit/cable entry, replace S	13 with S11 (example: XMLCL35R2S13 becom	es XMLCL35R2S11).
Operating Curves			Connection
200 45 0 0 2550 100 200	1 Maximum differential 2 Minimum differential 3 Minimum differential	Pressure PH PB Time Adjustable value	Terminal model $\begin{array}{c c} \hline \hline \hline \hline \hline \hline \hline \hline \hline \hline$
	Falling pressure	pped cable entries (such as NPT), consult your l	

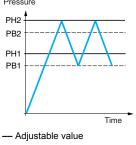


Table 21:Size 350 mbar (5.07 psi)
Dual-stage, fixed differential, for detection at each threshold
Switches with 2 C/O single-pole contacts (one per stage)
Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Type XMLD		Without setting scale	
Adjustable Range of	2nd stage operating point (PH2)	58–350 mbar (0.84–5.07 psi)	
Each Operating Point (Rising pressure)	1st stage operating point (PH1)	33–325 mbar (0.48–4.71 psi)	
Spread between the Tw	o Stages (PH2–PH1)	25–310 mbar (0.36–4.50 psi)	
Electrical Connection		Terminals	
Catalog Numbers ⁽¹⁾			
Fluids Controlled	Hydraulic oils, air, up to 320 °F (160 °C)	XMLDL35R1S13	
For materials in contact with fluid, see pages 77–78	Fresh water, sea water, corrosive fluids, up to 320 °F (160 °C)	XMLDL35S1S13	
Weight, Ib (kg)		5.68 (2.575)	
Supplementary Spec	ifications (not shown under g	eneral specifications)	
Inherent Differential	At low setting	30 mbar (0.44 psi), ±10 mbar (±0.15 psi)	
(subtract from PH1/PH2 to get PB1/PB2)	At high setting	30 mbar (0.44 psi), ±8 mbar (±0.11 psi)	
Maximum Allowable	Per cycle	1.25 bar (18.12 psi)	
Pressure	Accidental	2.25 bar (32.62 psi)	
Destruction Pressure		4.5 bar (65.25 psi)	
Cable Entry and Wire Si	ize for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.	
Pressure Switch Style		Diaphragm	
⁽¹⁾ For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13		with S11 (example: XMLDL35R1S13 becomes XMLDL35R1S11).	
Operating Curves	Operating Curves		
High setting trip points	of contacts 1 and 2	Inherent differential of contacts 1 and 2	
e mbar 350 343 50 50 50 50 50 50 50 50 50 50 50 50 50		Pressure PH2 PB2 PH2 PB2 PH2 PH2 PH2 PH2 PH2 PH2 PH2 PH	







--- Non adjustable value

Connection

Terminal model

For switches with alternative tapped cable entries (such as NPT), consult your local sales office. Contact 1 (stage 1) Contact 2 (stage 2)



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Other Versions



Table 22:Size 1 bar (14.5 psi)Fixed differential, for detection of a single thresholdSwitches with 1 C/O single-pole contactPressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Type XMLA		With setting scale	With setting scale		Without setting scale	
Adjustable Range of Ope (Rising pressure)	erating Point (PH)	0.03–1 bar (0.435–14.5	psi)			
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector	
Catalog Numbers ⁽¹⁾						
Fluids Controlled	Hydraulic oils, air, up to 320 °F (160 °C)	XMLA001R2S13	XMLA001R2C11	XMLA001R1S13	XMLA001R1C11	
For materials in contact with fluid, see pages 77–78	Fresh water, sea water, corrosive fluids, up to 320 °F (160 °C)	XMLA001S2S13	XMLA001S2C11	XMLA001S1S13	XMLA001S1C11	
Weight, Ib (kg)		5.63 (2.555)	5.67 (2.570)	5.63 (2.555)	5.67 (2.570)	
Supplementary Specif	ications (not shown under	general specification	ons)			
Inherent Differential	At low setting	0.02 bar (0.29 psi), ±0.0)1 bar (±0.14 psi)			
(subtract from PH to get PB)	At high setting	0.04 bar (0.58 psi), ±0.0	01 bar (±0.14 psi)			
Maximum Allowable	Per cycle	1.25 bar (18.12 psi)				
Pressure	Accidental	2.25 bar (32.62 psi)				
Destruction Pressure		4.5 bar (65.25 psi)				
Cable Entry and Wire Siz	e for Terminal Models	1/2" NPT, 1 x 0.2 mm ² r	minimum, 2 x 2.5 mm² m	aximum.		
Connector Type for Con	nector Models	DIN 43650A, 4-pin male	e. For suitable female co	nnector, see page 73.		
Pressure Switch Style		Diaphragm				
(1) For 1 entry tapped for PG	13.5 conduit/cable entry, replace S	13 with S11 (example: X	MLA001R2S13 becomes	s XMLA001R2S11).		
Operating Curves				Connection		
일 bar		Pressure		Terminal model		
^e bar 1 ^b ^b ^b ^b ^b ^b ^b ^b ^b ^b		РН		원 아이프 (주) 전 Connector model		
0,4 0,2 0,03 0,01 0,2 0,04 0,6 0,8 0,96 bar		— Adjustable value Non adjustable value	Time	Pressure switch conn	ector pin view $1 \rightarrow 11 \text{ and } 13$ $2 \rightarrow 12$ $3 \rightarrow 14$	
	Falling pressure					

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.



Table 23:Size 1 bar (14.5 psi)
Adjustable differential, for regulation between two thresholds
Switches with 1 C/O single-pole contact
Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, T	Pressure Switches, Type XMLB		9	Without setting s	scale
Adjustable Range of Op (Rising pressure)	erating Point (PH)	0.05–1 bar (0.72–14.5 p	osi)		
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector
Catalog Numbers ⁽¹⁾		.	1	1	
	Hydraulic oils, air, up to 320 °F (160 °C)	XMLB001R2S13	XMLB001R2C11	XMLB001R1S13	XMLB001R1C11
Fluids Controlled (2)	Fresh water, sea water, corrosive fluids, up to 320 °F (160 °C)	XMLB001S2S13	XMLB001S2C11	XMLB001S1S13	XMLB001S1C11
(2)	Viscous products, up to 320 °F (160 °C) (G1¼" pressure connection)	XMLB001P2S13	XMLB001P2C11	XMLB001P1S13	XMLB001P1C11
Weight, lb (kg)		5.68 (2.575)	5.71 (2.590)	5.68 (2.575)	5.71 (2.590)
Supplementary Spec	ifications (not shown under	general specification	ons)		
-	Min. at low setting	0.04 bar (0.58 psi), ±10	mbar (±0.14 psi)		
Possible Differential	Min. at high setting	0.06 bar (0.87 psi), ±20 mbar (±0.29 psi)			
(subtract from PH to get PB)	Max. at high setting	0.75 bar (10.87 psi)			
Maximum Allowable	Per cycle	1.25 bar (18.12 psi)			
Pressure	Accidental	2.25 bar (32.62 psi)			
Destruction Pressure		4.5 bar (65.25 psi)			
Cable Entry and Wire Si	ze for Terminal Models	1/2" NPT, 1 x 0.2 mm ² r	ninimum, 2 x 2.5 mm² m	aximum.	
Connector Type for Cor	nnector Models	DIN 43650A, 4-pin male	e. For suitable female co	nnector, see page 73.	
Pressure Switch Style		Diaphragm			
 (1) For 1 entry tapped for PG (2) Component materials of u 	13.5 conduit/cable entry, replace S units in contact with the fluid, see pa	13 with S11 (example: X ges 77–78.	MLB001R2S13 becomes	S XMLB001R2S11).	
Operating Curves				Connection	
Bear Sector	1 Maximum differential 2 Minimum differential — Adjustable	Pressure PH PB		Terminal model $\begin{array}{c} $	
0.2	Adjustable value	γ	Time	⊥ [1_2] 	$1 \rightarrow 11$ and 13 $2 \rightarrow 12$ $3 \rightarrow 14$
Other Versions	For switches with alternative tappe	d cable entries (such as	NPT) consult your local	sales office	

Other Versions

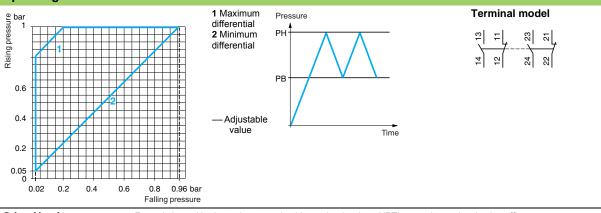
For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

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Table 24:Size 1 bar (14.5 psi)
Adjustable differential, for regulation between two thresholds
Switches with 2 C/O single-pole contacts
Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Type XMLC		With setting scale	
Adjustable Range of Ope (Rising pressure)	erating Point (PH)	0.05–1 bar (0.725–14.5 psi)	
Electrical Connection		Terminals	
Catalog Numbers ⁽¹⁾			
Fluids Controlled	Hydraulic oils, air, up to 320 °F (160 °C)	XMLC001R2S13	
(2)	Fresh water, sea water, corrosive fluids, up to 320 °F (160 °C)	XMLC001S2S13	
Weight, Ib (kg)		5.63 (2.555)	
Supplementary Specif	fications (not shown under	r general specifications)	
	Min. at low setting	0.03 bar (0.43 psi), ±0.01 bar (±0.14 psi)	
Possible Differential	Min. at high setting	0.04 bar (0.58 psi), ±0.03 bar (±0.43 psi)	
(subtract from PH to get PB)	Max. at high setting	0.8 bar (11.6 psi)	
Maximum Allowable	Per cycle	1.25 bar (18.12 psi)	
Pressure	Accidental	2.25 bar (32.62 psi)	
Destruction Pressure		4.5 bar (65.25 psi)	
Cable Entry and Wire Size for Terminal Models		1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.	
Pressure Switch Style		Diaphragm	
(1) For 1 entry tapped for PG(2) Component materials of un	13.5 conduit/cable entry, replace S nits in contact with the fluid, see pa	S13 with S11 (example: XMLC001R2S13 becomes XMLC001R2S11). ages 77–78.	
Operating Curves		Connection	
© bar S 1 20 1	1 Maximum differential 2 Minimum	Pressure Terminal model	



Other Versions

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.



Table 25:Size 1 bar (14.5 psi)
Dual-stage, fixed differential, for detection at each threshold
Switches with 2 C/O single-pole contacts (one per stage)
Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Type XMLD

Without setting scale

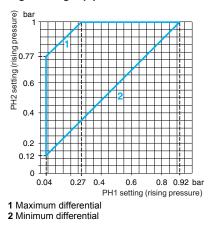


Adjustable Range of	2nd stage operating point (PH2)	0.12–1 bar (1.74–14.5 psi)	
Each Operating Point (Rising pressure)	1st stage operating point (PH1)	0.04–0.92 bar (0.58–13.34 psi)	
Spread between the T	wo Stages (PH2–PH1)	0.08–0.73 bar (1.16–10.59 psi)	
Electrical Connection		Terminals	
Catalog Numbers (1))		
Fluids Controlled (2)	Hydraulic oils, air, up to 320 °F (160 °C)	XMLD001R1S13	
	Fresh water, sea water, corrosive fluids, up to 320 °F (160 °C)	XMLD001S1S13	
Weight, Ib (kg)		5.68 (2.575)	
Supplementary Spe	cifications (not shown und	der general specifications)	
Inherent Differential	At low setting	0.03 bar (0.44 psi), ±0.01 bar (±0.14 psi)	
(subtract from PH1/PH2 to get PB1/PB2)	At high setting	0.07 bar (1.02 psi), ±0.04 bar (±0.58 psi)	
Maximum Allowable	Per cycle	1.25 bar (18.12 psi)	
Pressure	Accidental	2.25 bar (32.62 psi)	
Destruction Pressure		4.5 bar (65.25 psi)	
Cable Entry and Wire Size for Terminal Models		1/2" NPT, 1 x 0.2 mm ² minimum, 2 x 2.5 mm ² maximum.	
Pressure Switch Style		Diaphragm	
(1) For 1 entry tapped for F	G 13.5 conduit/cable entry, replace	e S13 with S11 (example: XMLD001R1S13 becomes XMLD001R1S11).	

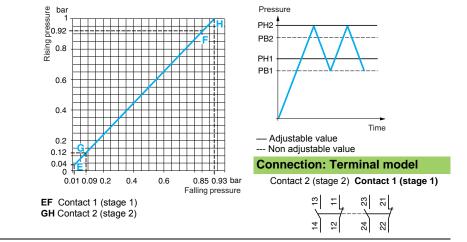
⁽²⁾ Component materials of units in contact with the fluid, see pages 77–78.

Operating Curves

High setting trip points of contacts 1 and 2



Inherent differential of contacts 1 and 2



Other Versions

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

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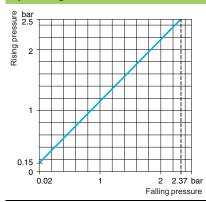
Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com

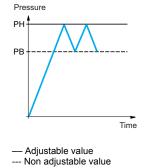
Table 26: Size 2.5 bar (36.25 psi) Fixed differential, for detection of a single threshold Switches with 1 C/O single-pole contact Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Ty	pe XMLA	With setting sca	le	Without setting	scale	
		0.00				
Adjustable Range of Ope (Rising pressure)	rating Point (PH)	0.15–2.5 bar (2.17–36	.25 psi)			
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector	
Catalog Numbers ⁽¹⁾						
	Hydraulic oils, fresh water, sea water, air, up to 158 °F (70 °C)	XMLA002A2S13	XMLA002A2C11	XMLA002A1S13	XMLA002A1C11	
Fluids Controlled (2)	Hydraulic oils, fresh water, sea water, air, up to 320 °F (160 °C)	XMLA002B2S13	XMLA002B2C11	XMLA002B1S13	XMLA002B1C11	
	Corrosive fluids, up to 320 °F (160 °C)	XMLA002C2S13	XMLA002C2C11	XMLA002C1S13	XMLA002C1C11	
Weight, Ib (kg)		2.19 (0.995)	2.23 (1.010)	2.19 (0.995)	2.23 (1.010)	
Supplementary Specifi	ications (not shown under g	eneral specificatio	ns)			
Inherent Differential	At low setting	0.13 bar (1.88 psi), ±0.03 bar (±0.43 psi)				
(subtract from PH to get PB)	At high setting	0.13 bar (1.88 psi), ±0.03 bar (±0.43 psi)				
Maximum Allowable	Per cycle	5 bar (72.5 psi)				
Pressure	Accidental	9 bar (130.5 psi)				
Destruction Pressure		18 bar (261 psi)				
Cable Entry and Wire Size	e for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.				
Connector Type for Conn	ector Models	DIN 43650A, 4-pin male. For suitable female connector, see page 73.				
Pressure Switch Style		Diaphragm				
¹⁾ For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLA002A2S13 becomes XMLA002A2S11).						

(1) For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLA002A2S13 becomes XMLA002A2S11).
 (2) Component materials of units in contact with the fluid, see pages 77–78.

Operating Curves





Connection



Connector model

Pressure switch connector pin view



 $1 \rightarrow 11$ and 13 2
ightarrow 12 $3 \rightarrow 14$

Other Versions

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.



Table 27:Size 2.5 bar (36.25 psi)
Adjustable differential, for regulation between two thresholds
Switches with 1 C/O single-pole contact
Pressure connection 1/2" NPT or 1/4" BSP

110000	re connection 1/2" NPT or					
Pressure Switches,	Type XMLB	With setting s	scale	Without settin	ng scale	With setting scale 30 bar (435 psi) overpressure
Adjustable Range of C (Rising pressure)	Operating Point (PH)	0.3–2.5 bar (4.35–	-36.25 psi)			
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector	Terminals
Catalog Numbers (1)	1	<u> </u>	1	<u> </u>	
	Hydraulic oils, fresh water, sea water, air, up to 158 °F (70 °C)	XMLB002A2S13	XMLB002A2C11	XMLB002A1S13	XMLB002A1C11	_
Fluids Controlled	Hydraulic oils, fresh water, sea water, air, up to 320 °F (160 °C)	XMLB002B2S13	XMLB002B2C11	XMLB002B1S13	XMLB002B1C11	_
(2)	Hydraulic oils, fresh water, air, up to 320 °F (160 °C)	_	-	•	-	XMLBS02B2S13
	Corrosive fluids, up to 320 °F (160 °C)	XMLB002C2S13	XMLB002C2C11	XMLB002C1S13	XMLB002C1C11	_
Weight, Ib (kg)		2.24 (1.015)	2.27 (1.030)	2.24 (1.015)	2.27 (1.030)	7.72 (3.500)
Supplementary Spe	cifications (not shown und	ler general spec	cifications)			
Possible Differential (subtract from PH to get	Min. at low setting	0.16 bar (2.32 psi), –0.8 mbar, +1.1 mbar (–0.01 psi, +0.02 psi)				0.1 bar (1.45 psi), –0.8 mbar, +1.1 mbar (–0.01 psi, +0.02 psi)
PB)	Min. at high setting	,	, ±1.4 mbar (±0.02	psi)		0.22 bar (3.19 psi), ±1.4 mbar (±0.02 psi)
	Max. at high setting	1.75 bar (25.37 ps	i)			1.45 bar (21 psi)
Maximum Allowable	Per cycle	5 bar (72.5 psi)				30 bar (435 psi)
Pressure	Accidental	9 bar (130.5 psi)				37.5 bar (543.75 psi)
Destruction Pressure	Size for Terminal Medale	18 bar (261 psi)		0.5		67.5 bar (978.75 psi)
	Size for Terminal Models		mm² minimum, 2 x 2		70	
Connector Type for Co		DIN 43650A, 4-pin male. For suitable female connector, see page 73.				
(1) For 1 entry tapped for F		Diaphragm				
(2) Component materials of	PG 13.5 conduit/cable entry, replace f units in contact with the fluid, see	e S13 with S11 (exa pages 77–78	mple: XMLBL05R2	S13 becomes XML	BL05R2S11).	
Operating Curves					Connection	
	1 Maximum o	differential	Pressure		Terminal mode	1
Bar 22.5 1 1 0.3	PB Connector mo Pressure switch			del connector pin view 1 → 11 and 13 2 → 12 3 → 14		
0 0.14 0.75 1 2 2.29 bar Falling pressure						
Other Versions	For switches with alternative tapp	eu cadie entries (su	ch as NPT), consul	t your local sales of	IICE.	

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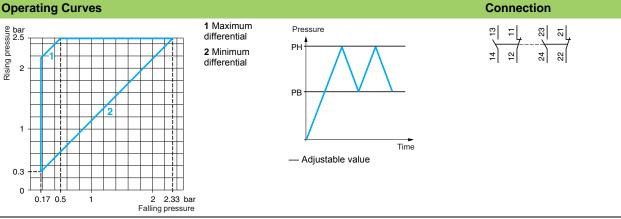
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Table 28: Size 2.5 bar (36.25 psi) Adjustable differential, for regulation between two thresholds Switches with 2 C/O single-pole contacts Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Ty	pe XMLC	With setting scale	With setting scale 30 bar (435 psi) overpressure		
Adjustable Range of Ope (Rising pressure)	rating Point (PH)	0.3–2.5 bar (4.35–36.25 psi)			
Electrical Connection		Terminals			
Catalog Numbers ⁽¹⁾					
	Hydraulic oils, fresh water, air, up to 320 °F (160 °C)	-	XMLCS02B2S13		
Fluids Controlled (2)	Hydraulic oils, fresh water, sea water, air, up to 320 °F (160 °C)	XMLC002B2S13	-		
	Corrosive fluids, up to 320 °F (160 °C)	XMLC002C2S13	-		
Weight, Ib (kg)		2.19 (0.995)	7.72 (3.500)		
Supplementary Specif	ications (not shown under ge	eneral specifications)			
	Min. at low setting	0.13 bar (1.89 psi), ±0.02 bar (±0.29 psi)	0.1 bar (1.45 psi), ±0.02 bar (±0.29 psi)		
Possible Differential (subtract from PH to get PB)	Min. at high setting	0.17 bar (2.47 psi), ±0.03 bar (±0.43 psi)	0.18 bar (2.61 psi), ±0.03 bar (±0.43 psi)		
(Subirdet Hom Fir to get FD)	Max. at high setting	2 bar (29 psi)	1.25 bar (18.12 psi)		
Maximum Allowable	Per cycle	5 bar (72.5 psi)	30 bar (435 psi)		
Pressure	Accidental	9 bar (130.5 psi)	37.5 bar (543.75 psi)		
Destruction Pressure		18 bar (261 psi) 67.5 bar (978.75 psi)			
Cable Entry and Wire Siz	e for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.			
Pressure Switch Style		Diaphragm			
(1)					

(1) For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLC002B2S13 becomes XMLC002B2S11).
 (2) Component materials of units in contact with the fluid, see pages 77–78.

Operating Curves



Other Versions

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.



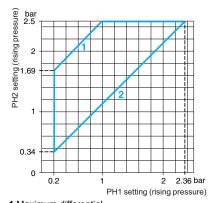
Table 29: Size 2.5 bar (36.25 psi) Dual-stage, fixed differential, for detection at each threshold Switches with 2 C/O single-pole contacts (one per stage) Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches,	Type XMLD	Without setting scale			
Adjustable Range of	2nd stage operating point (PH2)	0.34–2.5 bar (4.93–36.25 psi)			
Each Operating Point (Rising pressure)	1st stage operating point (PH1)	0.2–2.36 bar (2.9–34.22 psi)			
Spread between the Tv	vo Stages (PH2–PH1)	0.14–1.5 bar (2.03–21.75 psi)			
Electrical Connection		Terminals			
Catalog Numbers ⁽¹⁾					
Fluids Controlled	Hydraulic oils, fresh water, sea water, air, up to 320 °F (160 °C)	XMLD002B1S13			
(2)	Corrosive fluids, up to 320 °F (160 °C)	XMLD002C1S13			
Weight, lb (kg)		2.24 (1.015)			
Supplementary Spec	cifications (not shown under	general specifications)			
Inherent Differential (subtract from PH1/PH2	At low setting	0.14 bar (2.03 psi), ±0.04 bar (±0.58 psi)			
to get PB1/PB2)	At high setting	0.19 bar (2.76 psi), ±0.07 bar (±1.02 psi)			
Maximum Allowable	Per cycle	5 bar (72.5 psi)			
Pressure	Accidental	9 bar (130.5 psi)			
Destruction Pressure		18 bar (261 psi)			
Cable Entry and Wire S	Size for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.			
Pressure Switch Style		Diaphragm			
(1) For 1 entry tapped for P	(1) For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLD002B1S13 becomes XMLD002B1S11).				

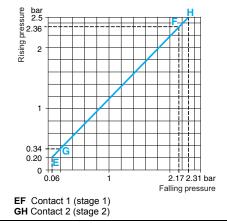
(1) For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLD002B1S13 becomes XMLD002B1S11).
 (2) Component materials of units in contact with the fluid, see pages 77–78.

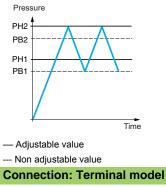
Operating Curves

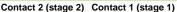
High setting trip points of contacts 1 and 2



Inherent differential of contacts 1 and 2







1 Maximum differential 2 Minimum differential

Other Versions

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.



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Table 30:Size 4 bar (58 psi)Fixed differential, for detection of a single thresholdSwitches with 1 C/O single-pole contactPressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Type XMLA		With setting sca	le	Without setting scale		
Adjustable Range of Oper (Rising pressure)	rating Point (PH)	0.4–4 bar (5.8–58 psi)				
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector	
Catalog Numbers ⁽¹⁾					1	
-	Hydraulic oils, fresh water, sea water, air, up to 158 °F (70 °C)	XMLA004A2S13	XMLA004A2C11	XMLA004A1S13	XMLA004A1C11	
Fluids Controlled	Hydraulic oils, fresh water, sea water, air, up to 320 °F (160 °C)	XMLA004B2S13	XMLA004B2C11	XMLA004B1S13	XMLA004B1C11	
(2)	Corrosive fluids, up to 320 °F (160 °C)	XMLA004C2S13	XMLA004C2C11	XMLA004C1S13	XMLA004C1C11	
	Viscous products, up to 320 °F (160 °C) (G1¼" pressure connection)	XMLA004P2S13	XMLA004P2C11	XMLA004P1S13	XMLA004P1C11	
Weight, Ib (kg)		1.51 (0.685)	1.58 (0.715)	1.51 (0.685)	1.58 (0.715)	
Supplementary Specifi	cations (not shown under ge	eneral specification	s)			
Inherent Differential	At low setting	0.35 bar (5.07 psi), ±0.03 bar (±0.43 psi)				
(subtract from PH to get PB)	At high setting	0.35 bar (5.07 psi), ±0	.03 bar (±0.43 psi)			
Maximum Allowable	Per cycle	5 bar (72.5 psi)				
Pressure	Accidental	9 bar (130.5 psi)				
Destruction Pressure		18 bar (261 psi)				
Cable Entry and Wire Size	e for Terminal Models	1/2" NPT, 1 x 0.2 mm ² minimum, 2 x 2.5 mm ² maximum.				
Connector Type for Connector	ector Models	DIN 43650A, 4-pin male. For suitable female connector, see page 73.				
Pressure Switch Style		Diaphragm				
 (1) For 1 entry tapped for PG 13 (2) Component materials of unit 	3.5 conduit/cable entry, replace S13 ts in contact with the fluid, see pages	with S11 (example: XML 577–78.	A004A2S13 becomes >	KMLA004A2S11).		
Operation curves				Connection		
≌ bar		Pressure		Terminal model		
enseed building a second secon		РН РВ		$\begin{array}{c c} & & & \\ & & \\ \hline & & \\ \hline & & \\ \hline & \\ \hline \\ \hline$	ector pin view	
	3 3.65 4 bar Falling pressure	— Adjustable value Non adjustable valu	Time Je		$1 \rightarrow 11$ and 13 $2 \rightarrow 12$ $3 \rightarrow 14$	



For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

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Table 31:Size 4 bar (58 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 1 C/O single-pole contact
Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Type XMLB		With setting s	scale	Without settir	ng scale	With setting scale 30 bar (435 psi) overpressure
Adjustable Range of (Rising pressure)	Operating Point (PH)	0.25–4 bar (3.62–5	58 psi)			
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector	Terminals
Catalog Numbers	(1)					
	Hydraulic oils, fresh water, sea water, air, up to 158 °F (70 °C)	XMLB004A2S13	XMLB004A2C11	XMLB004A1S13	XMLB004A1C11	—
Fluids Controlled	Hydraulic oils, fresh water, sea water, air, up to 320 °F (160 °C)	XMLB004B2S13	XMLB004B2C11	XMLB004B1S13	XMLB004B1C11	_
(2)	Hydraulic oils, freshwater, air, up to 320 °F (160 °C)	_				XMLBS04B2S13
	Corrosive fluids, up to 320 °F (160 °C)	XMLB004C2S13	XMLB004C2C11	XMLB004C1S13	XMLB004C1C11	_
Weight, lb (kg)		2.24 (1.015)	2.27 (1.030)	2.24 (1.015)	2.27 (1.030)	7.72 (3.500)
Supplementary Sp	ecifications (not shown u	nder general sp	ecifications)			
Possible Differential	Min. at low setting	0.2 bar (2.9 psi), ±	0.01 bar (±0.14 psi))		0.15 bar (2.18 psi), ±0.01 bar (±0.14 psi)
(subtract from PH to get PB)	Min. at high setting	0.25 bar (3.62 psi)	, –0.03 bar, +0.05 b	oar (–0.43 psi, +0.72	! psi)	0.34 bar (4.93 psi), -0.03 bar, +0.05 bar (-0.43 psi, +0.72 psi)
	Max. at high setting	2.4 bar (34.8 psi)				2.46 bar (35.67 psi)
Maximum Allowable		5 bar (72.5 psi)				30 bar (435 psi)
Pressure	Accidental	9 bar (130.5 psi)				37.5 bar (543.75 psi)
Destruction Pressure	-	18 bar (261 psi)				67.5 bar (978.75 psi)
	e Size for Terminal Models	,	nm² minimum, 2 x 2			
Connector Type for (DIN 43650A, 4-pin male. For suitable female connector, see page 73.				
Pressure Switch Styl		Diaphragm				
(2) Component materials	PG 13.5 conduit/cable entry, replated of units in contact with the fluid, see	ace S13 with S11 (e ee pages 77–78.	xample: XMLB004	A2S13 becomes XN		
Operating Curves					Connection	
₽ bar		Pressure			Terminal mode	I
bar 4 4 4 4 4 4 4 4 4 4 4 4 4			$\overline{\bigwedge}$		12 13	
		РВ	<u>\</u>		Connector m	odel

Connector model Pressure switch connector pin view



 $1 \rightarrow 11 \text{ and } 13$ $2 \rightarrow 12$ $3 \rightarrow 14$

Other Versions

0.05

1.6 2

3.75 bar

Falling pressure

З

2

0.25 0

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

- Adjustable value

1 Maximum differential

2 Minimum differential

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Time

Table 32: Size 4 bar (58 psi) Adjustable differential, for regulation between two thresholds Switches with 2 C/O single-pole contacts Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Type XMLC		With setting scale	With setting scale 30 bar (435 psi) overpressure		
Adjustable Range of Ope (Rising pressure)	rating Point (PH)	0.3–4 bar (4.35–58 psi)			
Electrical Connection		Terminals			
Catalog Numbers ⁽¹⁾					
	Hydraulic oils, fresh water, air, up to 320 °F (160 °C)	_	XMLCS04B2S13		
Fluids Controlled (2)	Hydraulic oils, fresh water, sea water, air, up to 320 °F (160 °C)	XMLC004B2S13	-		
	Corrosive fluids, up to 320 °F (160 °C)	XMLC004C2S13	-		
Weight, Ib (kg)		1.51 (0.685)	7.72 (3.500)		
Supplementary Specifi	ications (not shown under ge	neral specifications)			
-	Min. at low setting	0.15 bar (2.18 psi), ±0.02 bar (±0.29 psi)	0.1 bar (1.45 psi), ±0.02 bar (±0.29 psi)		
Possible Differential (subtract from PH to get PB)	Min. at high setting	0.17 bar (2.47 psi), ±0.02 bar (±0.29 psi)	0.25 bar (3.62 psi), ±0.02 bar (±0.29 psi)		
	Max. at high setting	2.5 bar (36.25 psi)	2.20 bar (31.9 psi)		
Maximum Allowable	Per cycle	5 bar (72.5 psi)	30 bar (435 psi)		
Pressure	Accidental	9 bar (130.5 psi)	37.5 bar (543.75 psi)		
Destruction Pressure		18 bar (261 psi)	67.5 bar (978.75 psi)		
Cable Entry and Wire Size	e for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.			
Pressure Switch Style		Diaphragm			

For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLC004B2S13 becomes XMLC004B2S11).
 (2) Component materials of units in contact with the fluid, see pages 77–78.

Operating Curves Connection 1 Maximum **Terminal model** Rising pressure 3 Pressure differential PH 22 21 23 12 13 2 Minimum differential PB 2 Time 1 - Adjustable value 0.3 li. 0 3 3.83bar Falling pressure 0.15 1.5 2

Other Versions

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

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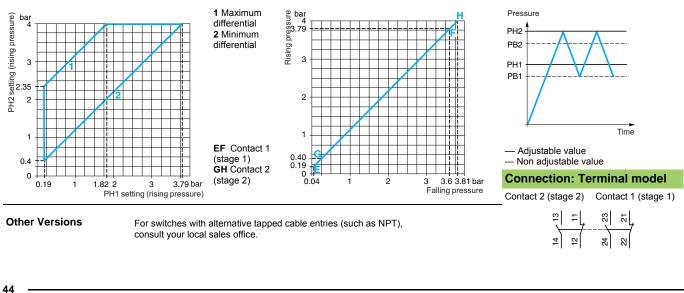
Table 33: Size 4 bar (58 psi) Dual-stage, fixed differential, for detection at each threshold Switches with 2 C/O single-pole contacts (one per stage) Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, T	ype XMLD	Without setting scale				
Adjustable Range of	2nd stage operating point (PH2)	0.40–4 bar (5.8–58 psi)				
Each Operating Point (Rising pressure)	1st stage operating point (PH1)	0.19–3.79 bar (2.76–54.96 psi)				
Spread between the Two Stages (PH2-PH1)		0.21–2.18 bar (3.05–31.61 psi)				
Electrical Connection		Terminals				
Catalog Numbers ⁽¹⁾						
Fluids Controlled	Hydraulic oils, fresh water, sea water, air, up to 320 °F (160 °C)	XMLD004B1S13				
(2)	Corrosive fluids, up to 320 °F (160 °C)	XMLD004C1S13				
Weight, Ib (kg)		2.24 (1.015)				
Supplementary Spec	ifications (not shown under	general specifications)				
Inherent Differential (subtract from PH1/PH2	At low setting	0.15 bar (2.18 psi), ±0.03 bar (±0.43 psi)				
to get PB1/PB2)	At high setting	0.19 bar (2.76 psi), ±0.03 bar (±0.43 psi)				
Maximum Allowable	Per cycle	5 bar (72.5 psi)				
Pressure	Accidental	9 bar (130.5 psi)				
Destruction Pressure		18 bar (261 psi)				
Cable Entry and Wire Si	ze for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.				
Pressure Switch Style		Diaphragm				
 (1) For 1 entry tapped for PG (2) Component materials of u 	13.5 conduit/cable entry, replace S units in contact with the fluid, see pa	13 with S11 (example: XMLD004B1S13 becomes XMLD004B1S11). ges 77–78.				

Operating Curves

High setting trip points of contacts 1 and 2

Inherent differential of contacts 1 and 2

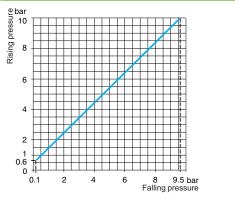


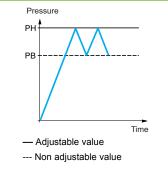
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Table 34: Size 10 bar (145 psi) Fixed differential, for detection of a single threshold Switches with 1 C/O single-pole contact Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Ty	vpe XMLA	With setting sc	ale	Without setting	j scale	
Adjustable Range of Ope (Rising pressure)	erating Point (PH)	0.6–10 bar (8.7–145	psi)			
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector	
Catalog Numbers ⁽¹⁾						
	Hydraulic oils, fresh water, sea water, air, up to 158 °F (70 °C)	XMLA010A2S13	XMLA010A2C11	XMLA010A1S13	XMLA010A1C11	
Fluids Controlled	Hydraulic oils, fresh water, sea water, air, up to 320 °F (160 °C)	XMLA010B2S13	XMLA010B2C11	XMLA010B1S13	XMLA010B1C11	
(2)	Corrosive fluids, up to 320 °F (160 °C)	XMLA010C2S13	XMLA010C2C11	XMLA010C1S13	XMLA010C1C11	
	Viscous products, up to 320 °F (160 °C) (G1¼" pressure connection)	XMLA010P2S13	XMLA010P2C11	XMLA010P1S13	XMLA010P1C11	
Weight, Ib (kg)		1.51 (0.685)	1.58 (0.715)	1.51 (0.685)	1.58 (0.715)	
Supplementary Specif	ications (not shown under ge	eneral specificatio	ns)			
Inherent Differential	At low setting	0.5 bar (7.25 psi), ±0.05 bar (±0.72 psi)				
(subtract from PH to get PB)	At high setting	0.5 bar (7.25 psi), ±0	.05 bar (±0.72 psi)			
Maximum Allowable	Per cycle	12.5 bar (181.25 psi)				
Pressure	Accidental	22.5 bar (326.25 psi)				
Destruction Pressure		45 bar (652.5 psi)				
Cable Entry and Wire Siz	e for Terminal Models	1/2" NPT, 1 x 0.2 mm ² minimum, 2 x 2.5 mm ² maximum.				
Connector Type for Conr	nector Models	DIN 43650A, 4-pin m	ale. For suitable female	e connector, see page 73	3.	
Pressure Switch Style		Diaphragm				
 (1) For 1 entry tapped for PG (2) Component materials of un 	13.5 conduit/cable entry, replace S13 its in contact with the fluid, see pages	with S11 (example: XM s 77–78.	ILA010A2S13 becomes	3 XMLA010A2S11).		
Operating Curves				Connection		





Terminal model



Connector model Pressure switch connector pin view



 $1 \rightarrow 11$ and 13 2
ightarrow 12 $3 \rightarrow 14$



For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

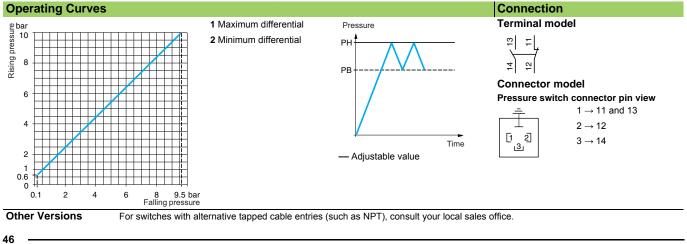
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Table 35:Size 10 bar (145 psi)
Adjustable differential, for regulation between two thresholds
Switches with 1 C/O single-pole contact
Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Type XMLB	With setting scale	Without setting scale	With setting scale 30 bar (435 psi) overpressure
Adjustable Range of Operating Point (PH)	0 7–10 bar (10 15–145 psi)		

(Rising pressure)	0.7–10 bar (10.15–145 psi)					
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector	Terminals
Catalog Numbers (1)					
	Hydraulic oils, fresh water, sea water, air, up to 158 °F (70 °C)	XMLB010A2S13	XMLB010A2C11	XMLB010A1S13	XMLB010A1C11	—
	Hydraulic oils, fresh water, air, up to 320 °F (160 °C)	_	_	_	_	XMLBS10A2S13
Fluids Controlled	Hydraulic oils, fresh water, air, up to 320 °F (160 °C)	XMLB010B2S13	XMLB010B2C11	XMLB010B1S13	XMLB010B1C11	—
(2)	Corrosive fluids, up to 320 °F (160 °C)	XMLB010C2S13	XMLB010C2C11	XMLB010C1S13	XMLB010C1C11	—
	Viscous products, up to 320 °F (160 °C) (G1¼" pressure connection)	XMLB010P2S13	XMLB010P2C11	XMLB010P1S13	XMLB010P1C11	_
Weight, Ib (kg)		1.55 (0.705)	1.62 (0.735)	1.55 (0.705)	1.62 (0.735)	7.72 (3.500)
Supplementary Spe	ecifications (not shown un	der general spe	ecifications)			
Possible Differential	Min. at low setting	0.57 bar (8.26 psi)	0.45 bar (6.52 psi), ±0.05 bar (±0.72 psi).			
(subtract from PH to get PB)	Min. at high setting	0.85 bar (12.32 ps	0.85 bar (12.32 psi), -0.1 bar, +0.15 bar (-1.45 psi, +2.17 psi)			
	Max. at high setting	7.5 bar (108.75 ps	i)			6.25 bar (90.62 psi)
Maximum Allowable	Per cycle	12.5 bar (181.25 p	osi)			30 bar (435 psi)
Pressure	Accidental	22.5 bar (326.25 p	osi)			37.5 bar (543.75 psi)
Destruction Pressure		45 bar (652.5 psi)	67.5 bar (978.75 psi)			
	Size for Terminal Models	1/2" NPT, 1 x 0.2 ı	mm² minimum, 2 x 2	2.5 mm² maximum.		
Connector Type for C	onnector Models	DIN 43650A, 4-pin male. For suitable female connector, see page 73.				
Pressure Switch Style	9	Diaphragm				
 (1) For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLB010A2S13 becomes XMLB010A2S11). (2) Component materials of units in contact with the fluid, see pages 77–78. 						



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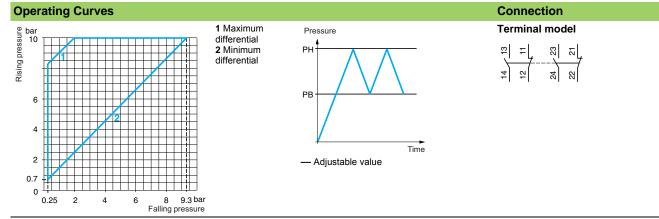
Table 36:Size 10 bar (145 psi)
Adjustable differential, for regulation between two thresholds
Switches with 2 C/O single-pole contacts
Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Ty	vpe XMLC	With setting scale	With setting scale 30 bar (435 psi) overpressure		
Adjustable Range of Ope (Rising pressure)	rating Point (PH)	0.7–10 bar (10.15–145 psi)			
Electrical Connection		Terminals			
Catalog Numbers ⁽¹⁾					
	Hydraulic oils, fresh water, air, up to 158 °F (70 °C)	-	XMLCS10A2S13		
Fluids Controlled (2)	Hydraulic oils, fresh water, sea water, air, up to 320 °F (160 °C)	XMLC010B2S13	-		
	Corrosive fluids, up to 320 °F (160 °C)	XMLC010C2S13	-		
Weight, Ib (kg)		1.51 (0.685)	7.72 (3.500)		
Supplementary Specif	ications (not shown under ge	eneral specifications)			
-	Min. at low setting	0.45 bar (6.53 psi), ±0.05 bar (±0.72 psi)	0.25 bar (3.62 psi), ±0.05 bar (±0.72 psi)		
Possible Differential (subtract from PH to get PB)	Min. at high setting	0.70 bar (10.15 psi), ±0.01 bar (±1.45 psi)	0.65 bar (9.42 psi), ±0.01 bar (±1.45 psi)		
	Max. at high setting	8 bar (116 psi)	5.6 bar (81.2 psi)		
Maximum Allowable	Per cycle	12.5 bar (181.25 psi)	30 bar (435 psi)		
Pressure	Accidental	22.5 bar (326.25 psi)	37.5 bar (543.75 psi)		
Destruction Pressure		45 bar (652.5 psi)	67.5 bar (978.75 psi)		
Cable Entry and Wire Siz	e for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.			
Pressure Switch Style		Diaphragm			

Pressure Switch Style

(1) For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLC010B2S13 becomes XMLC010B2S11).

(2) Component materials of units in contact with the fluid, see pages 77–78.



Other Versions

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

© 1998–2009 Schneider Electric All Rights Reserved Schneider Gelectric Table 37: Size 10 bar (145 psi) Dual-stage, fixed differential, for detection at each threshold Switches with 2 C/O single-pole contacts (one per stage) Pressure connection 1/2" NPT or 1/4" BSP

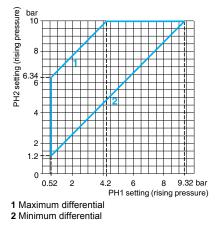
Pressure connection 1/2" NPT or 1/4" BSP				
Pressure Switches, Typ	be XMLD	Without setting scale		
Adjustable Range of Each Operating Point	2nd stage operating point (PH2)	1.2–10 bar (17.4–145 psi)		
(Rising pressure)	1st stage operating point (PH1)	0.52–9.32 bar (7.54–135.14 psi)		
Spread between the Two S	Stages (PH2–PH1)	0.68–5.8 bar (9.86–84.1 psi)		
Electrical Connection		Terminals		
Catalog Numbers ⁽¹⁾				
Fluids Controlled	Hydraulic oils, fresh water, sea water, air, up to 320 °F (160 °C)	XMLD010B1S13		
(2)	Corrosive fluids, up to 320 °F (160 °C)	XMLD010C1S13		
Weight, Ib (kg)		1.55 (0.705)		
Supplementary Specifie	cations (not shown under	general specifications)		
Inherent Differential (subtract from PH1/PH2	At low setting	0.45 bar (6.53 psi), ±0.05 bar (±0.72 psi)		
to get PB1/PB2)	At high setting	0.6 bar (8.7 psi), ±0.1 bar (±1.45 psi)		
Maximum Allowable	Per cycle	12.5 bar (181.25 psi)		
Pressure	Accidental	22.5 bar (326.25 psi)		
Destruction Pressure		45 bar (652.5 psi)		
Cable Entry and Wire Size	for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.		
Pressure Switch Style		Diaphragm		

(1) For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLD010B1S13 becomes XMLD010B1S11).

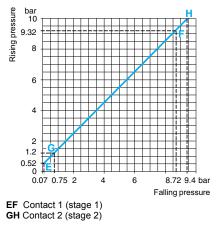
(2) Component materials of units in contact with the fluid, see pages 77–78.

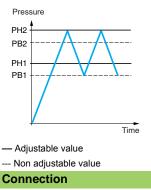
Operating Curves

High setting trip points of contacts 1 and 2



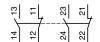
Inherent differential of contacts 1 and 2





Terminal model

Contact 2 (stage 2) Contact 1 (stage 1)



Other Versions

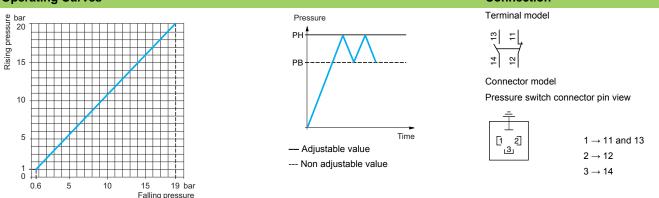
For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

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Table 38:Size 20 bar (290 psi)Fixed differential, for detection of a single thresholdSwitches with 1 C/O single-pole contactPressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Ty	vpe XMLA	With setting scale		Without setting	Without setting scale	
Adjustable Range of Ope (Rising pressure)	erating Point (PH)	1–20 bar (14.5–290	psi)			
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector	
Catalog Numbers ⁽¹⁾						
	Hydraulic oils, fresh water, sea water, air, up to 158 °F (70 °C)	XMLA020A2S13	XMLA020A2C11	XMLA020A1S13	XMLA020A1C11	
Fluids Controlled	Hydraulic oils, fresh water, sea water, air, up to 320 °F (160 °C)	XMLA020B2S13	XMLA020B2C11	XMLA020B1S13	XMLA020B1C11	
(2)	Corrosive fluids, up to 320 °F (160 °C)	XMLA020C2S13	XMLA020C2C11	XMLA020C1S13	XMLA020C1C11	
	Viscous products, up to 320 °F (160 °C) (G1¼" pressure connection)	XMLA020P2S13	XMLA020P2C11	XMLA020P1S13	XMLA020P1C11	
Weight, lb (kg)		1.51 (0.685)	1.58 (0.715)	1.51 (0.685)	1.58 (0.715)	
Supplementary Specif	ications (not shown under ge	eneral specificatio	ons)			
Inherent Differential	At low setting	0.4 bar (5.8 psi), ±0.	2 bar (±2.9 psi)			
(subtract from PH to get PB)	At high setting	1 bar (14.5 psi), ±0.1	bar (±1.45 psi)			
Maximum Allowable	Per cycle	25 bar (362.5 psi)				
Pressure	Accidental	45 bar (652.5 psi)				
Destruction Pressure		90 bar (1305 psi)				
Cable Entry and Wire Siz	e for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.				
Connector Type for Connector Models		DIN 43650A, 4-pin male. For suitable female connector, see page 73.				
Pressure Switch Style		Diaphragm				
 (1) For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLA020A2S13 becomes XMLA020A2S11). (2) Component materials of units in contact with the fluid, see pages 77–78. 						
Operating Curves				Connection		





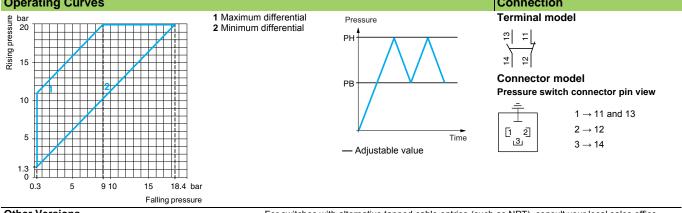
For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

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Table 39:Size 20 bar (290 psi)
Adjustable differential, for regulation between two thresholds
Switches with 1 C/O single-pole contact
Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches,	Type XMLB	With setting s	scale	Without setting	-	With setting scale 30 bar (435 psi) overpressure
Adjustable Range of ((Rising pressure)	Operating Point (PH)	1.3–20 bar (18.9–	290 psi)			
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector	Terminals
Catalog Numbers (1)	·				
	Hydraulic oils, fresh water, sea water, air, up to 158 °F (70 °C)	XMLB020A2S13	XMLB020A2C11	XMLB020A1S13	XMLB020A1C11	_

	water, air, up to 158 °F (70 °C)	XMLB020A2S13	XMLB020A2C11	XMLB020A1S13	XMLB020A1C11	—
	Hydraulic oils, fresh water, air, up to 320 °F (160 °C)	_	_	_	_	XMLBS20A2S13
Fluids Controlled (2)	Hydraulic oils, fresh water, air, up to 320 °F (160 °C)	XMLB020B2S13	XMLB020B2C11	XMLB020B1S13	XMLB020B1C11	_
(2)	Corrosive fluids, up to 320 °F (160 °C)	XMLB020C2S13	XMLB020C2C11	XMLB020C1S13	XMLB020C1C11	—
	Viscous products, up to 320 °F (160 °C) (G1¼" pressure connection)	XMLB020P2S13	XMLB020P2C11	XMLB020P1S13	XMLB020P1C11	_
Weight, Ib (kg)		1.55 (0.705)	1.62 (0.735)	1.55 (0.705)	1.62 (0.735)	7.72 (3.500)
Supplementary Spe	ecifications (not shown und	er general spe	cifications)			
Possible Differential	Min. at low setting	1 bar (14.5 psi), ±0.25 bar (±3.63 psi)				0.95 bar (13.78 psi), ±0.25 bar (±3.63 psi)
(subtract from PH to get PB)	Min. at high setting	1.6 bar (23.20 psi	1.45 bar (21.03 psi), ±0.25 bar (±3.63 psi)			
	Max. at high setting	11 bar (159.5 psi)	12.6 bar (182.7 psi)			
Maximum Allowable	Per cycle	25 bar (362.5 psi)				30 bar (435 psi)
Pressure	Accidental	45 bar (652.5 psi)				37.5 bar (543.75 psi)
Destruction Pressure	1	90 bar (1305 psi)	67.5 bar (978.75 psi)			
Cable Entry and Wire	Size for Terminal Models	1/2" NPT, 1 x 0.2	mm² minimum, 2 x	2.5 mm ² maximum	1.	
Connector Type for Connector Models DIN 43650.		DIN 43650A, 4-pir	DIN 43650A, 4-pin male. For suitable female connector, see page 73.			
		Diaphragm				
 (1) For 1 entry tapped for (2) Component materials 	PG 13.5 conduit/cable entry, replac of units in contact with the fluid, see	e S13 with S11 (ex pages 77–78.	ample: XMLB020A	2S13 becomes XM	ILB020A2S11).	
Operating Curves					Connection	



Other Versions

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

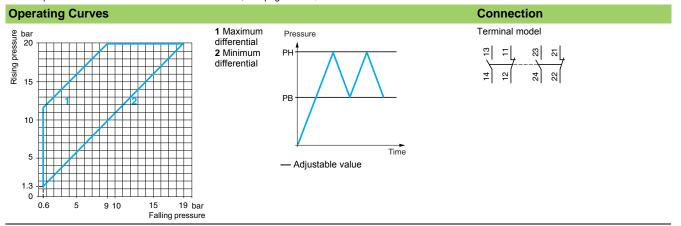
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Table 40: Size 20 bar (290 psi) Adjustable differential, for regulation between two thresholds Switches with 2 C/O single-pole contacts Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Type XMLC		With setting scale	With setting scale 30 bar (435 psi) overpressure	
Adjustable Range of Oper (Rising pressure)	ating Point (PH)	1.3–20 bar (18.85–290 psi)		
Electrical Connection		Terminals		
Catalog Numbers ⁽¹⁾				
	Hydraulic oils, fresh water, air, up to 158 °F (70 °C)	_	XMLCS20A2S13	
Fluids Controlled (2)	Hydraulic oils, fresh water, sea water, air, up to 320 °F (160 °C)	XMLC020B2S13	-	
	Corrosive fluids, up to 320 °F (160 °C)	XMLC020C2S13	-	
Weight, lb (kg)		1.51 (0.685)	7.72 (3.500)	
Supplementary Specifi	cations (not shown under	general specifications)		
-	Min. at low setting	0.7 bar (10.15 psi), ±0.2 bar (±2.9 psi)	0.7 bar (10.15 psi), ±0.2 bar (±2.9 psi)	
Possible Differential (subtract from PH to get PB)	Min. at high setting	1 bar (14.5 psi), ±0.2 bar (±2.9 psi)	1.15 bar (16.67 psi), ±0.2 bar (±2.9 psi)	
(SUDITACI ITOTI FIT IO YEL PB)	Max. at high setting	11 bar (159.5 psi)	11.70 bar (169.6 psi)	
Maximum Allowable	Per cycle	25 bar (362.5 psi)	30 bar (435 psi)	
Pressure	Accidental	45 bar (652.5 psi)	37.5 bar (543.75 psi)	
Destruction Pressure		90 bar (1305 psi)	67.5 bar (978.75 psi)	
Cable Entry and Wire Size for Terminal Models		1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.		
Cable Entry and Wire Size	for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm²	maximum.	

For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLC020B2S13 becomes XMLC020B2S11).
 (2) Component materials of units in contact with the fluid, see pages 77–78.





For switches with alternative tapped cable entries (such as NPT), consult your local sales office.



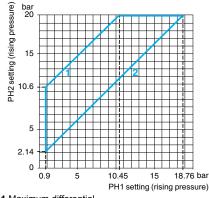
Table 41: Size 20 bar (290 psi) Dual-stage, fixed differential, for detection at each threshold Switches with 2 C/O single-pole contacts (one per stage) Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches,	, Type XMLD	Without setting scale		
Adjustable Range of	2nd stage operating point (PH2)	2.14–20 bar (31.03–290 psi)		
Each Operating Point (Rising pressure)	1st stage operating point (PH1)	0.9–18.76 bar (13.05–272.02 psi)		
Spread between the T	wo Stages (PH2–PH1)	1.24–9.55 bar (17.98–138.48 psi)		
Electrical Connection		Terminals		
Catalog Numbers (1)			
Fluids Controlled	Hydraulic oils, fresh water, sea water, air, up to 320 °F (160 °C)	XMLD020B1S13		
(2)	Corrosive fluids, up to 320 °F (160 °C)	XMLD020C1S13		
Weight, lb (kg)		1.55 (0.705)		
Supplementary Spe	cifications (not shown under g	jeneral specifications)		
Inherent Differential (subtract from PH1/PH2	At low setting	0.7 bar (10.15 psi), ±0.15 bar (±2.18 psi)		
to get PB1/PB2)	At high setting	1.3 bar (18.85 psi), ±0.3 bar (±4.35 psi)		
Maximum Allowable	Per cycle	25 bar (362.5 psi)		
Pressure	Accidental	45 bar (652.5 psi)		
Destruction Pressure		90 bar (1305 psi)		
Cable Entry and Wire	Size for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.		
Pressure Switch Style)	Diaphragm		
(1) = 1 + 1 + 1 + 1 + 1				

(1) For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLD020B1S13 becomes XMLD020B1S11). (2) Component materials of units in contact with the fluid, see pages 77–78.

Operating Curves

High setting trip points of contacts 1 and 2

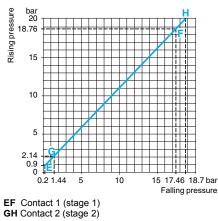


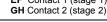
1 Maximum differential 2 Minimum differential

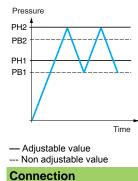
Other Versions

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

Inherent differential of contacts 1 and 2







Terminal model

Contact 2 (stage 2) Contact 1 (stage 1)

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4	12	24	22

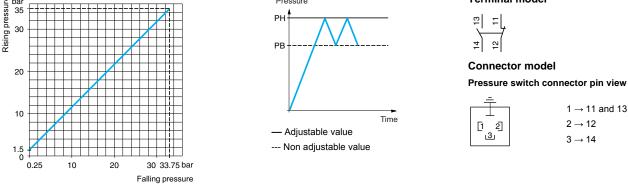
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Table 42:Size 35 bar (507.5 psi)Fixed differential, for detection of a single thresholdSwitches with 1 C/O single-pole contactPressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Ty	vpe XMLA	With setting scale		Without setting scale		
Adjustable Range of Ope (Rising pressure)	erating Point (PH)	1.5–35 bar (21.75–507	7.5 psi)			
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector	
Catalog Numbers ⁽¹⁾						
	Hydraulic oils, fresh water, sea water, air, up to 158 °F (70 °C)	XMLA035A2S13	XMLA035A2C11	XMLA035A1S13	XMLA035A1C11	
Fluids Controlled	Hydraulic oils, fresh water, sea water, air, up to 320 °F (160 °C)	XMLA035B2S13	XMLA035B2C11	XMLA035B1S13	XMLA035B1C11	
(2)	Corrosive fluids, up to 320 °F (160 °C)	XMLA035C2S13	XMLA035C2C11	XMLA035C1S13	XMLA035C1C11	
	Viscous products, up to 320 °F (160 °C) (G1¼" pressure connection)	XMLA035P2S13	XMLA035P2C11	XMLA035P1S13	XMLA035P1C11	
Weight, Ib (kg)		1.53 (0.695)	1.60 (0.725)	1.53 (0.695)	1.60 (0.725)	
Supplementary Specif	ications (not shown under	general specificat	ions)			
Inherent Differential	At low setting	1.25 bar (18.12 psi), ±0.25 bar (±3.62 psi)				
(subtract from PH to get PB)	At high setting	1.25 bar (18.12 psi), ±	0.25 bar (±3.62 psi)			
Maximum Allowable	Per cycle	45 bar (652.5 psi)				
Pressure	Accidental	80 bar (1160 psi)				
Destruction Pressure		160 bar (2320 psi)				
Cable Entry and Wire Siz	e for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.				
Connector Type for Connector Models		DIN 43650A, 4-pin ma	le. For suitable female of	connector, see page 73.		
Pressure Switch Style		Diaphragm				
 (1) For 1 entry tapped for PG (2) Component materials of ur 	13.5 conduit/cable entry, replace S its in contact with the fluid, see pa	13 with S11 (example:) ges 77–78.	XMLA035A2S13 becom	es XMLA035A2S11).		
Operating Curves				Connection		
		Pressure		Terminal model		





For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

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Adjustable differential, for regulation between two thresholds
Switches with 1 C/O single-pole contact
Pressure connection 1/2" NPT or 1/4" BSP

110350	ire connection 1/2 NPT or 1/					
Pressure Switches	, Type XMLB	With setting scal	le	Without setting	scale	
Adjustable Range of (Rising pressure)	Operating Point (PH)	3.5–35 bar (50.75–507	.5 psi)			
Electrical Connection	1	Terminals	DIN connector	Terminals	DIN connector	
Catalog Numbers (1)					
	Hydraulic oils, fresh water, sea water, air, up to 158 °F (70 °C)	XMLB035A2S13	XMLB035A2C11	XMLB035A1S13	XMLB035A1C11	
Fluids Controlled	Hydraulic oils, fresh water, sea water, air, up to 320 °F (160 °C)	XMLB035B2S13	XMLB035B2C11	XMLB035B1S13	XMLB035B1C11	
(2)	Corrosive fluids, up to 320 °F (160 °C)	XMLB035C2S13	XMLB035C2C11	XMLB035C1S13	XMLB035C1C11	
	Viscous products, up to 320 °F (160 °C) (G1¼" pressure connection)	XMLB035P2S13	XMLB035P2C11	XMLB035P1S13	XMLB035P1C11	
Weight, Ib (kg)		1.58 (0.715)	1.64 (0.745)	1.58 (0.715)	1.64 (0.745)	
Supplementary Specifications (not shown under general specifications)						
Possible Differential	Min. at low setting	1.7 bar (24.65 psi), -0.	5 bar, +0.7 bar (-7.25 p	osi, +10.15 psi)		
(subtract from PH to get	Min. at high setting	2.55 bar (36.97 psi), -0.5 bar, +0.7 bar (-7.25 psi, +10.15 psi)				
PB)	Max. at high setting	20 bar (290 psi)				
Maximum Allowable Pressure	Per cycle	45 bar (652.5 psi)				
	Accidental	80 bar (1160 psi)				
Destruction Pressure		160 bar (2320 psi) 1/2" NPT, 1 x 0.2 mm ² minimum, 2 x 2.5 mm ² maximum.				
	Size for Terminal Models	DIN 43650A, 4-pin male. For suitable female connector, see page 73.				
Connector Type for C		Diaphragm				
Pressure Switch Style		13 with S11 (example: XMLB035A2S13 becomes XMLB035A2S11).				
	of units in contact with the fluid, see page		IMLB035A2515 Decom	es AMLBUSSAZSTT).		
Operating Curves				Connection		
		Pressure		Terminal model		
		РН		$\begin{array}{c c} & & & \\ & & \\ \hline & & \\ \hline & & \\ \hline & \\ \hline \\ \hline$	nector pin view 1 → 11 and 13	
10		Adjustable value	Time		$2 \rightarrow 12$ $3 \rightarrow 14$	
1.8 10 15	20 32.45 bar Falling pressure	1 Maximum differential 2 Minimum differential				



For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

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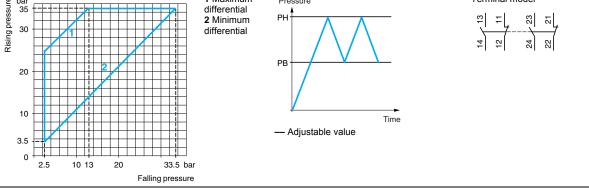


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Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com

Table 44:Size 35 bar (507.5 psi)
Adjustable differential, for regulation between two thresholds
Switches with 2 C/O single-pole contacts
Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Ty	pe XMLC	With setting scale		
Adjustable Range of Oper (Rising pressure)	rating Point (PH)	3.5–35 bar (50.75–507.5 psi)		
Electrical Connection		Terminals		
Catalog Numbers ⁽¹⁾				
Fluids Controlled	Hydraulic oils, fresh water, sea water, air, up to 320 °F (160 °C)			
(2)	Corrosive fluids, up to 320 °F (160 °C)	XMLC035C2S13		
Weight, Ib (kg)		1.53 (0.695)		
Supplementary Specifi	cations (not shown under	general specifications)		
	Min. at low setting	1 bar (14.5 psi), ±0.2 bar (±2.9 psi)		
Possible Differential (subtract from PH to get PB)	Min. at high setting	1.5 bar (21.75 psi), ±0.5 bar (±7.25 psi)		
(Sublidet Holl I II to get I D)	Max. at high setting	22 bar (319 psi)		
Maximum Allowable	Per cycle	45 bar (652.5 psi)		
Pressure	Accidental	80 bar (1160 psi)		
Destruction Pressure		160 bar (2320 psi)		
Cable Entry and Wire Size	e for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.		
Pressure Switch Style Diaphragm		Diaphragm		
(1) For 1 entry tapped for PG 1(2) Component materials of unit	3.5 conduit/cable entry, replace Satisfies in contact with the fluid, see page	13 with S11 (example: XMLC035B2S13 beci ges 77–78.	omes XMLC035B2S11).	
Operating Curves			Connection	
e bar 35 e 20	1 Maximum differential 2 Minimum	Pressure PH	Terminal model 약 두 , 왕 전 ,	



Other Versions

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

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Table 45:Size 35 bar (507.5 psi)
Dual-stage, fixed differential, for detection at each threshold
Switches with 2 C/O single-pole contacts (one per stage)
Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Type XMLD

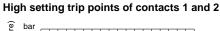
Without setting scale

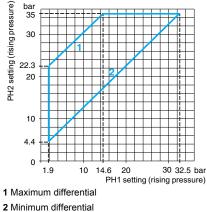


Adjustable Range of Each Operating Point	2nd stage operating point (PH2)	4.4–35 bar (63.8–507.5 psi)		
(Rising pressure)	1st stage operating point (PH1)	1.9–32.5 bar (27.55–471.25 psi)		
Spread between the Two S	Stages (PH2–PH1)	2.5–20.4 bar (36.25–295.8 psi)		
Electrical Connection		Terminals		
Catalog Numbers ⁽¹⁾				
Fluids Controlled	Hydraulic oils, fresh water, sea water, air, up to 320 °F (160 °C)	XMLD035B1S13		
(2)	Corrosive fluids, up to 320 °F (160 °C)	XMLD035C1S13		
Weight, Ib (kg)		1.58 (0.715)		
Supplementary Specific	cations (not shown under	general specifications)		
Inherent Differential	At low setting	1.5 bar (21.75 psi), ±0.3 bar (±4.35 psi)		
(subtract from PH1/PH2 to get PB1/PB2)	At high setting	2.6 bar (37.7 psi), ±0.7 bar (±10.15 psi)		
Maximum Allowable	Per cycle	45 bar (652.5 psi)		
Pressure Accidental		80 bar (1160 psi)		
Destruction Pressure		160 bar (2320 psi)		
Cable Entry and Wire Size	for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.		
Pressure Switch Style		Diaphragm		
(1) For 1 entry tapped for PG 13	3.5 conduit/cable entry, replace S	13 with S11 (example: XMLD035B1S13 becomes XMLD035B1S11).		

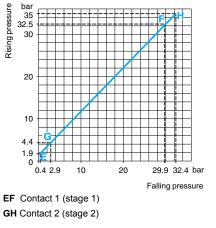
(1) For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLD035B1S13 becomes XMLD035B1S11).
 (2) Component materials of units in contact with the fluid, see pages 77–78.

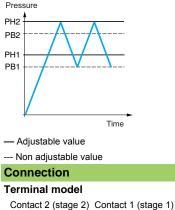
Operating Curves





Inherent differential of contacts 1 and 2





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4	12	24	52

Other Versions

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

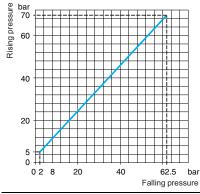
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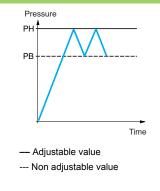


Table 46:Size 70 bar (1015 psi)Fixed differential, for detection of a single thresholdSwitches with 1 C/O single-pole contactPressure connection 1/2" NPT or 1/4" BSP

	With setting scale		Without setting scale		
Adjustable Range of Operating Point (PH) (Rising pressure)5-70 bar (72.5-1015 psi)	i)				
Electrical Connection Terminals	DIN connector	Terminals	DIN connector		
Catalog Numbers ⁽¹⁾					
Hydraulic oils, up to 320 °F XMLA070D2S13 X	XMLA070D2C11	XMLA070D1S13	XMLA070D1C11		
Fluids Controlled (2)Fresh water, sea water, up to 320 °F (160 °C)XMLA070E2S13X	XMLA070E2C11	XMLA070E1S13	XMLA070E1C11		
Corrosive fluids, air, up to 320 °F (160 °C) XMLA070N2S13 X	XMLA070N2C11	XMLA070N1S13	XMLA070N1C11		
Weight, lb (kg) 1.53 (0.695) 1	1.60 (0.725)	1.53 (0.695)	1.60 (0.725)		
Supplementary Specifications (not shown under general specification	ns)				
Inherent Differential At low setting 3 bar (43.5 psi), ±1 bar (±	±14.5 psi)				
(subtract from PH to get PB) At high setting 7.5 bar (108.75 psi), ±1 b	bar (±14.5 psi)				
Maximum Allowable Per cycle 90 bar (1035 psi)					
PressureAccidental160 bar (2320 psi)	160 bar (2320 psi)				
Destruction Pressure 320 bar (4640 psi)					
Cable Entry and Wire Size for Terminal Models 1/2" NPT, 1 x 0.2 mm² million	ninimum, 2 x 2.5 mm² n	naximum.			
Connector Type for Connector Models DIN 43650A, 4-pin male.	. For suitable female co	onnector, see page 73.			
Pressure Switch Style Piston	Pressure Switch Style Piston				
 (1) For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XM (2) Component materials of units in contact with the fluid, see pages 77–78. 	ILA070D2S13 become	s XMLA070D2S11).			

Operating Curves





Connection





Connector model Pressure switch connector pin view



 $1 \rightarrow 11 \text{ and } 13$ $2 \rightarrow 12$ $2 \rightarrow 14$



Other Versions

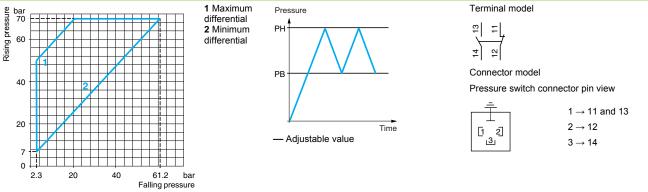
For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

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Table 47:Size 70 bar (1015 psi)
Adjustable differential, for regulation between two thresholds
Switches with 1 C/O single-pole contact
Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Type XMLB		With setting sca	le	Without setting	scale	
Adjustable Range of Ope (Rising pressure)	erating Point (PH)	7–70 bar (101.5–1015	5 psi)			
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector	
Catalog Numbers ⁽¹⁾				·	·	
-	Hydraulic oils, up to 320 °F (160 °C)	XMLB070D2S13	XMLB070D2C11	XMLB070D1S13	XMLB070D1C11	
Fluids Controlled (2)	Fresh water, sea water, up to 320 °F (160 °C)	XMLB070E2S13	XMLB070E2C11	XMLB070E1S13	XMLB070E1C11	
	Corrosive fluids, air, up to 320 °F (160 °C)	XMLB070N2S13	XMLB070N2C11	XMLB070N1S13	XMLB070N1C11	
Weight, lb (kg)		1.58 (0.715)	1.64 (0.745)	1.58 (0.715)	1.64 (0.745)	
Supplementary Specif	ications (not shown unde	r general specificat	tions)			
	Min. at low setting	4.7 bar (68.15 psi), -0	0.4 bar, +0.7 bar (–5.8 ps	si, +10.15 psi)		
Possible Differential (subtract from PH to get PB)	Min. at high setting	8.8 bar (127.6 psi), -0).6 bar, +0.8 bar (–8.7 ps	si, +11.6 psi)		
	Max. at high setting	50 bar (725 psi)				
Maximum Allowable	Per cycle	90 bar (1035 psi)				
Pressure	Accidental	160 bar (2320 psi)				
Destruction Pressure		320 bar (4640 psi)				
Cable Entry and Wire Siz	e for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.				
Connector Type for Connector Models		DIN 43650A, 4-pin male. For suitable female connector, see page 73.				
Pressure Switch Style		Piston				
 (1) For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLB070D2S13 becomes XMLB070D2S11). (2) Component materials of units in contact with the fluid, see pages 77–78. 						
Operating Curves				Connection		
⁰ har	1 Maximum	Pressure		Terminal model		



Other Versions

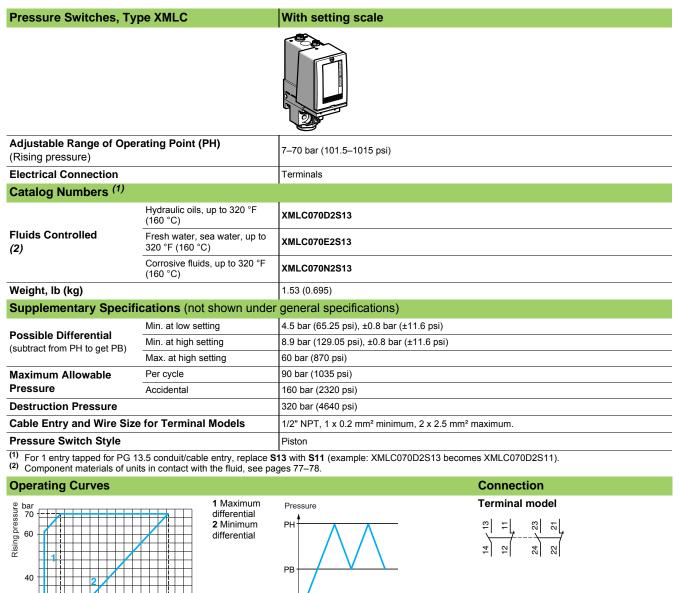
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For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

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Table 48: Size 70 bar (1015 psi) Adjustable differential, for regulation between two thresholds Switches with 2 C/O single-pole contacts Pressure connection 1/2" NPT or 1/4" BSP



20 40 61.1 Falling pressure **Other Versions**

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For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

- Adjustable value

Time

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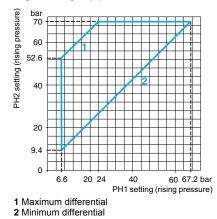
7 0 2.5 10

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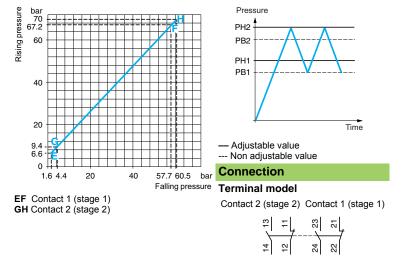
Table 49:Size 70 bar (1015 psi)
Dual-stage, fixed differential, for detection at each threshold
Switches with 2 C/O single-pole contacts (one per stage)
Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Typ	be XMLD	Without setting scale			
Adjustable Range of Each	2nd stage operating point (PH2)	9.4–70 bar (136.3–1015 psi)			
Operating Point (Rising pressure)	1st stage operating point (PH1)	6.6–67.2 bar (95.7–974.4 psi)			
Spread between the Two S	Stages (PH2–PH1)	2.8–46 bar (40.6–667 psi)			
Electrical Connection		Terminals			
Catalog Numbers ⁽¹⁾					
	Hydraulic oils, up to 320 °F (160 °C)	XMLD070D1S13			
Fluids Controlled (2)	Fresh water, sea water, up to 320 °F (160 °C)	XMLD070E1S13			
(2)	Corrosive fluids, air, up to 320 °F (160 °C)	XMLD070N1S13			
Weight, lb (kg)		1.58 (0.715)			
Supplementary Specifie	cations (not shown under gene	ral specifications)			
Inherent Differential (subtract from PH1/PH2	At low setting	5 bar (72.5 psi), ±1.5 bar (±21.75 psi)			
to get PB1/PB2)	At high setting	9.5 bar (137.75 psi), ±2 bar (±29 psi)			
Maximum Allowable	Per cycle	90 bar (1035 psi)			
Pressure	Accidental	160 bar (2320 psi)			
Destruction Pressure		320 bar (4640 psi)			
Cable Entry and Wire Size	for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.			
Pressure Switch Style		Piston			
 (1) For 1 entry tapped for PG 13 (2) Component materials of unit 	3.5 conduit/cable entry, replace S13 with is in contact with the fluid, see pages 77-	S11 (example: XMLD070D1S13 becomes XMLD070D1S11). -78.			
Operating Curves					

High setting trip points of contacts 1 and 2



Inherent differential of contacts 1 and 2



Other Versions

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

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Table 50:Size 160 bar (2320 psi)Fixed differential, for detection of a single thresholdSwitches with 1 C/O single-pole contactPressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Type XMLA		With setting sca	ale	Without setting	j scale	
Adjustable Range of Ope (Rising pressure)	rating Point (PH)	10–160 bar (145–232	20 psi)			
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector	
Catalog Numbers ⁽¹⁾						
	Hydraulic oils, up to 320 °F (160 °C)	XMLA160D2S13	XMLA160D2C11	XMLA160D1S13	XMLA160D1C11	
Fluids Controlled (2)	Fresh water, sea water, up to 320 °F (160 °C)	XMLA160E2S13	XMLA160E2C11	XMLA160E1S13	XMLA160E1C11	
	Corrosive fluids, air, up to 320 °F (160 °C)	XMLA160N2S13	XMLA160N2C11	XMLA160N1S13	XMLA160N1C11	
Weight, Ib (kg)		1.65 (0.750)	1.72 (0.780)	1.65 (0.750)	1.72 (0.780)	
Supplementary Specifi	ications (not shown under	general specifica	itions)			
Inherent Differential	At low setting	5.5 bar (79.75 psi), ±	1 bar (±14.5 psi)			
(subtract from PH to get PB)	At high setting	18 bar (261 psi), ±3 b	oar (±43.5 psi)			
Maximum Allowable	Per cycle	200 bar (2900 psi)				
Pressure	Accidental	360 bar (5220 psi)				
Destruction Pressure		720 bar (10,440 psi)				
Mechanical life		6 x 10 ⁶ operating cycles				
Cable Entry and Wire Size	e for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.				
Connector Type for Conn	ector Models	DIN 43650A, 4-pin male. For suitable female connector, see page 73.				
Pressure Switch Style		Piston				
 (1) For 1 entry tapped for PG 1 (2) Component materials of un 	3.5 conduit/cable entry, replace S its in contact with the fluid, see pa	13 with S11 (example: ges 77–78.	XMLA160D2S13 becom	mes XMLA160D2S11).		
Operating Curves				Connection		
bar 160 000 140 120		Pressure PH		Terminal model		
100				Connector mode	I	

Pressure switch connector pin view



 $1 \rightarrow 11 \text{ and } 13$ $2 \rightarrow 12$ $3 \rightarrow 14$



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80

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20 10

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

- Adjustable value

--- Non adjustable value

Time

4.5 20 40 60 80 100 120 142 160 bar

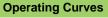
Falling pressure

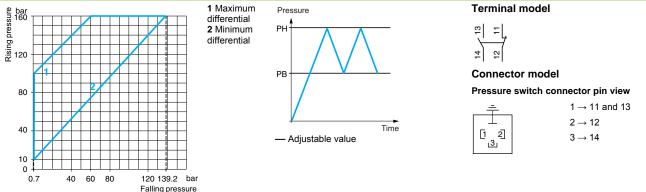


Connection

Table 51:Size 160 bar (2320 psi)
Adjustable differential, for regulation between two thresholds
Switches with 1 C/O single-pole contact
Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Type XMLB		With setting scale		Without setting scale		
Adjustable Range of Ope (Rising pressure)	rating Point (PH)	10–160 bar (145–2320) psi)			
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector	
Catalog Numbers ⁽¹⁾						
	Hydraulic oils, up to 320 °F (160 °C)	XMLB160D2S13	XMLB160D2C11	XMLB160D1S13	XMLB160D1C11	
Fluids Controlled (2)	Fresh water, sea water, up to 320 °F (160 °C)	XMLB160E2S13	XMLB160E2C11	XMLB160E1S13	XMLB160E1C11	
	Corrosive fluids, air, up to 320 °F (160 °C)	XMLB160N2S13	XMLB160N2C11	XMLB160N1S13	XMLB160N1C11	
Weight, Ib (kg)		1.65 (0.750)	1.72 (0.780)	1.65 (0.750)	1.72 (0.780)	
Supplementary Specif	ications (not shown under	general specificat	ions)			
-	Min. at low setting	9.3 bar (134.85 psi), –1.8 bar, +1.5 bar (–26.1 psi, +21.75 psi)				
Possible Differential (subtract from PH to get PB)	Min. at high setting	20.8 bar (301.6 psi), -	1.9 bar, +1.6 bar (–27.5	i5 psi, +23.2 psi)		
	Max. at high setting	100 bar (1450 psi)				
Maximum Allowable	Per cycle	200 bar (2900 psi)				
Pressure	Accidental	360 bar (5220 psi)				
Destruction Pressure		720 bar (10,440 psi)				
Cable Entry and Wire Siz	e for Terminal Models	1/2" NPT, 1 x 0.2 mm ²	^e minimum, 2 x 2.5 mm ²	maximum.		
Connector Type for Conr	nector Models	DIN 43650A, 4-pin male. For suitable female connector, see page 73.				
Pressure Switch Style		Piston				
 (1) For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLB160D2S13 becomes XMLB160D2S11). (2) Component materials of units in contact with the fluid, see pages 77–78. 						





Other Versions

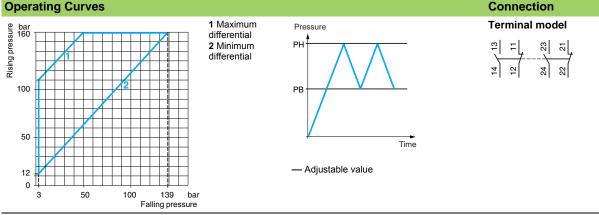
For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

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Table 52:Size 160 bar (2320 psi)Adjustable differential, for regulation between two thresholdsSwitches with 2 C/O single-pole contactsPressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Ty	/pe XMLC	With setting scale
Adjustable Range of Ope (Rising pressure)	erating Point (PH)	12–160 bar (174–2320 psi)
Electrical Connection		Terminals
Catalog Numbers ⁽¹⁾		
-	Hydraulic oils, up to 320 °F (160 °C)	XMLC160D2S13
	Fresh water, sea water, up to 320 °F (160 °C)	XMLC160E2S13
	Corrosive fluids, up to 320 °F (160 °C)	XMLC160N2S13
Weight, Ib (kg)		1.65 (0.750)
Supplementary Specif	fications (not shown under g	eneral specifications)
-	Min. at low setting	9 bar (130.5 psi), ±0.9 bar (±13.05 psi)
Possible Differential (subtract from PH to get PB)	Min. at high setting	21 bar (304.5 psi), ±0.9 bar (±13.05 psi)
(Sublidet nom i nie get i D)	Max. at high setting	110 bar (1590 psi)
Maximum Allowable	Per cycle	200 bar (2900 psi)
Pressure	Accidental	360 bar (5220 psi)
Destruction Pressure		720 bar (10,440 psi)
Mechanical life		6 x 10 ⁶ operating cycles
Cable Entry and Wire Siz	e for Terminal Models	1/2" NPT, 1 x 0.2 mm ² minimum, 2 x 2.5 mm ² maximum.
Pressure Switch Style		Piston
 (1) For 1 entry tapped for PG (2) Component materials of ur 	13.5 conduit/cable entry, replace S13 nits in contact with the fluid, see page	s with S11 (example: XMLC160D2S13 becomes XMLC160D2S11).
Operating Curves		Connection

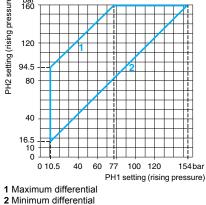


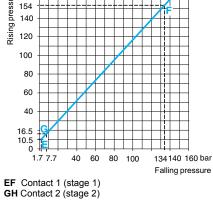
Other Versions

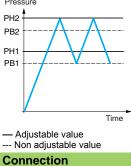
For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

Schneider Gelectric Table 53:Size 160 bar (2320 psi)
Dual-stage, fixed differential, for detection at each threshold
Switches with 2 C/O single-pole contacts (one per stage)
Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches,	Type XMLD	Without setting scale
Adjustable Range of	2nd stage operating point (PH2)	16.5–160 bar (239.25–2320 psi)
Each Operating Point (Rising pressure)	1st stage operating point (PH1)	10.5–154 bar (152.25–2233 psi)
Spread between the T	wo Stages (PH2–PH1)	6–83 bar (87–1203.5 psi)
Electrical Connection		Terminals
Catalog Numbers (1)	
	Hydraulic oils, up to 320 °F (160 °C)	XMLD160D1S13
Fluids Controlled (2)	Fresh water, sea water, up to 320 °F (160 °C)	XMLD160E1S13
(2)	Corrosive fluids, air, up to 320 °F (160 °C)	XMLD160N1S13
Weight, Ib (kg)		1.65 (0.750)
Supplementary Spe	cifications (not shown under gen	neral specifications)
Inherent Differential (subtract from PH1/PH2	At low setting	8.8 bar (127.6 psi), ±1.5 bar (±21.75 psi)
to get PB1/PB2)	At high setting	20 bar (290 psi), ±7 bar (±101.5 psi)
Maximum Allowable	Per cycle	200 bar (2900 psi)
Pressure	Accidental	360 bar (5220 psi)
Destruction Pressure		720 bar (10,440 psi)
Cable Entry and Wire	Size for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.
Pressure Switch Style		Piston
 (1) For 1 entry tapped for F (2) Component materials of 	PG 13.5 conduit/cable entry, replace S13 w f units in contact with the fluid, see pages	ith S11 (example: XMLD160D1S13 becomes XMLD160D1S11). 77–78.
Operating Curves		
High setting trip point	s of contacts 1 and 2	Inherent differential of contacts 1 and 2
e bar 160		Bar H Pressure







Terminal model

Contact 2 (stage 2) Contact 1 (stage 1)

13	₽Ļ	23	₽
4	12	24	22

Other Versions

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

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Table 54: Size 300 bar (4350 psi) Fixed differential, for detection of a single threshold Switches with 1 C/O single-pole contact Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Type XMLA		With setting scale Without setting scale		scale		
Adjustable Range of Oper (Rising pressure)	rating Point (PH)	20–300 bar (290–4350	0 psi)			
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector	
Catalog Numbers ⁽¹⁾			• 	• •		
	Hydraulic oils, up to 320 °F (160 °C)	XMLA300D2S13	XMLA300D2C11	XMLA300D1S13	XMLA300D1C11	
Fluids Controlled (2) (3)	Fresh water, sea water, up to 320 °F (160 °C)	XMLA300E2S13	XMLA300E2C11	XMLA300E1S13	XMLA300E1C11	
	Corrosive fluids, air, up to 320 °F (160 °C)	XMLA300N2S13	XMLA300N2C11	XMLA300N1S13	XMLA300N1C11	
Weight, Ib (kg)		1.65 (0.750)	1.72 (0.780)	1.65 (0.750)	1.72 (0.780)	
Supplementary Specifi	ications (not shown under	general specificat	ions)			
Inherent Differential	At low setting	16.5 bar (239.25 psi), ±3 bar (±43.5 psi)				
(subtract from PH to get PB)	At high setting	35 bar (507.5 psi), ±6	bar (±87 psi)			
Maximum Allowable	Per cycle	375 bar (5437.5 psi)				
Pressure	Accidental	675 bar (9787.5 psi)				
Destruction Pressure		1350 bar (19,575 psi)				
Cable Entry and Wire Size		1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.				
Connector Type for Conn	ector Models	DIN 43650A, 4-pin male. For suitable female connector, see page 73.				
Pressure Switch Style		Piston				
 For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLA300D2S13 becomes XMLA300D2S11). (2) Component materials of units in contact with the fluid, see pages 77–78. (3) Only for control of group 2 fluids, in accordance with directive 97/23/EEC. 						
Operating Curves				Connection		
		Pressure PH		Terminal model ಐ ㅌ		
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Connector model

Pressure switch connector pin view

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ightarrow 12 $\mathbf{3} \to \mathbf{14}$

Other Versions

3.5

200

100

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For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

--- Adjustable value

--- Non adjustable value

Time

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100

200

265 300

bar Falling pressure



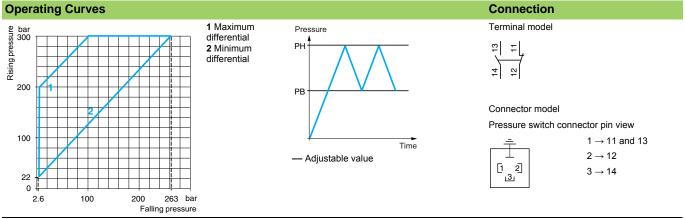
Selection and Specifications

Industrial Pressure Switches XML Electromechanical Pressure Switches

Table 55: Size 300 bar (4350 psi) Adjustable differential, for regulation between two thresholds Switches with 1 C/O single-pole contact Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Type XMLB		With setting sca	setting scale Without setting scale		g scale	
Adjustable Range of Ope (Rising pressure)	erating Point (PH)	22–300 bar (319–435	50 psi)			
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector	
Catalog Numbers ⁽¹⁾						
	Hydraulic oils, up to 320 °F (160 °C)	XMLB300D2S13	XMLB300D2C11	XMLB300D1S13	XMLB300D1C11	
Fluids Controlled (2) (3)	Fresh water, sea water, up to 320 °F (160 °C)	XMLB300E2S13	XMLB300E2C11	XMLB300E1S13	XMLB300E1C11	
	Corrosive fluids, air, up to 320 °F (160 °C)	XMLB300N2S13	XMLB300N2C11	XMLB300N1S13	XMLB300N1C11	
Weight, lb (kg)		1.65 (0.750)	1.72 (0.780)	1.65 (0.750)	1.72 (0.780)	
Supplementary Specif	ications (not shown under ge	eneral specification	ns)			
Describle Differential	Min. at low setting	19.4 bar (281.3 psi), -1.5 bar, +1.7 bar (-21.75 psi, +24.65 psi)				
Possible Differential (subtract from PH to get PB)	Min. at high setting	37 bar (536.5 psi), -1 bar, +4 bar (-14.5 psi, +58 psi)				
	Max. at high setting	200 bar (2900 psi)				
Maximum Allowable	Per cycle	375 bar (5437.5 psi)				
Pressure	Accidental	675 bar (9787.5 psi)				
Destruction Pressure		1350 bar (19,575 psi))			
Cable Entry and Wire Siz	e for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.				
Connector Type for Conr	nector Models	DIN 43650A, 4-pin male. For suitable female connector, see page 73.			3.	
Pressure Switch Style		Piston				
(1) = (() () () () ()						

For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLB300D2S13 becomes XMLB300D2S11).
 (2) Component materials of units in contact with the fluid, see pages 77–78.
 (3) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.



Other Versions

10/2009

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

66



Table 56:Size 300 bar (4350 psi)
Adjustable differential, for regulation between two thresholds
Switches with 2 C/O single-pole contacts
Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Ty	pe XMLC	With setting scale		
Adjustable Range of Ope (Rising pressure)	rating Point (PH)	22–300 bar (319–4350 psi)		
Electrical Connection		Terminals		
Catalog Numbers ⁽¹⁾				
	Hydraulic oils, up to 320 °F (160 °C)	XMLC300D2S13		
Fluids Controlled (2) (3)	Fresh water, sea water, up to 320 °F (160 °C)	XMLC300E2S13		
	Corrosive fluids, air, up to 320 °F (160 °C)	XMLC300N2S13		
Weight, Ib (kg)		1.65 (0.750)		
Supplementary Specifi	ications (not shown under	r general specifications)		
Possible Differential	Min. at low setting	16 bar (232 psi), ±0.9 bar (±13.05 psi)		
(subtract from PH to get PB)	Min. at high setting	35 bar (507.5 psi), ±0.9 bar (±13.05 psi)		
	Max. at high setting	240 bar (3480 psi)		
Maximum Allowable	Per cycle	375 bar (5437.5 psi)		
Pressure	Accidental	675 bar (9787.5 psi)		
Destruction Pressure		1350 bar (19,575 psi)		
Mechanical life		3 x 10 ⁶ operating cycles		
Cable Entry and Wire Size	e for Terminal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.		
Pressure Switch Style		Piston		
(2) Component materials of un	3.5 conduit/cable entry, replace S its in contact with the fluid, see pa luids, in accordance with directive		nes XMLC300D2S11).	
Operating Curves			Connection	
Bar 300 200 200 200	1 Maximum differential 2 Minimum differential	Pressure PH PB	Terminal model $\begin{array}{c c} & & \\ & & $	

Other Versions

6

60 100

100

22

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

- Adjustable value

Time

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200 265 bar Falling pressure

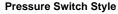


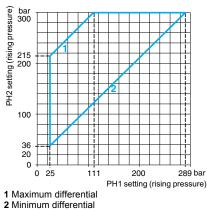
Table 57: Size 300 bar (4350 psi) Dual-stage, fixed differential, for detection at each threshold Switches with 2 C/O single-pole contacts (one per stage) Pressure connection 1/2" NPT or 1/4" BSP

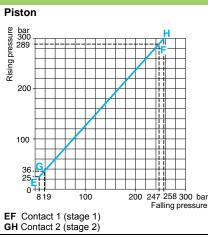
Pressure Switches, 1	Type XMLD	Without setting scale		
Adjustable Range of Each Operating Point	2nd stage operating point (PH2)	36–300 bar (522–4350 psi)		
(Rising pressure)	1st stage operating point (PH1)	25–289 bar (362.5–4190.5 psi)		
Spread between the Two Stages (PH2–PH1)		11–189 bar (159.5–2740.5 psi)		
Electrical Connection		Terminals		
Catalog Numbers ⁽¹⁾				
	Hydraulic oils, up to 320 °F (160 °C)	XMLD300D1S13		
Fluids Controlled	Fresh water, sea water, up to 320 °F (160 °C)	XMLD300E1S13		
(2) (3)	Corrosive fluids, air, up to 320 °F (160 °C)	XMLD300N1S13		
Weight, Ib (kg)		1.65 (0.750)		
Supplementary Spec	ifications (not shown under ge	eneral specifications)		
Inherent Differential (subtract from PH1/PH2	At low setting	17 bar (246.5 psi), ±2.5 bar (±36.25 psi)		
to get PB1/PB2)	At high setting	42 bar (609 psi), ±9 bar (±130.5 psi)		
Maximum Allowable	Per cycle	375 bar (5437.5 psi)		
Pressure	Accidental	675 bar (9787.5 psi)		
Destruction Pressure		1350 bar (19,575 psi)		
Cable Entry and Wire S		1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.		

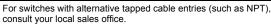
For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLD300D1S13 becomes XMLD300D1S11).
 (2) Component materials of units in contact with the fluid, see pages 77–78.
 (3) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

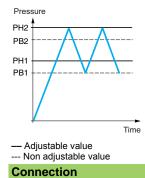
Operating Curves











Terminal model

Contact 2 (stage 2) Contact 1 (stage 1)



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10/2009

Other Versions

Schneider Gelectric

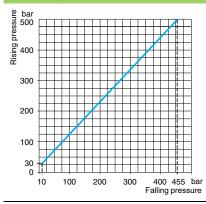
Table 58: Size 500 bar (7250 psi) Fixed differential, for detection of a single threshold Switches with 1 C/O single-pole contact Pressure connection 1/2" NPT or 1/4" BSP

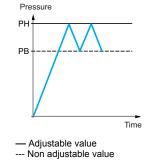
Pressure Switches, Type XMLA		With setting scale		Without setting scale	
Adjustable Range of Operating Point (PH) (Rising pressure)		30–500 bar (435–7250 psi)			
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector
Catalog Numbers ⁽¹⁾					
	Hydraulic oils, up to 320 °F (160 °C)	XMLA500D2S13	XMLA500D2C11	XMLA500D1S13	XMLA500D1C11
Fluids Controlled (2) (3)	Fresh water, sea water, up to 320 °F (160 °C)	XMLA500E2S13	XMLA500E2C11	XMLA500E1S13	XMLA500E1C11
	Corrosive fluids, air, up to 320 °F (160 °C)	XMLA500N2S13	XMLA500N2C11	XMLA500N1S13	XMLA500N1C11
Weight, lb (kg)		1.65 (0.750)	1.72 (0.780)	1.65 (0.750)	1.72 (0.780)
Supplementary Specif	ications (not shown under	general specificat	ions)		
Inherent Differential	At low setting	20 bar (290 psi), ±6 ba	ar (±87 psi)		
(subtract from PH to get PB)	At high setting	45 bar (652.5 psi), ±10 bar (±145 psi)			
Maximum Allowable	Per cycle	625 bar (9062.5 psi)			
Pressure	Accidental	1125 bar (16,312.5 ps	i)		
Destruction Pressure		2250 bar (32,625 psi)			
Mechanical life		3 x 10 ⁶ operating cycles			
Cable Entry and Wire Size for Terminal Models		1/2" NPT, 1 x 0.2 mm ² minimum, 2 x 2.5 mm ² maximum.			
Connector Type for Conr	ector Models	DIN 43650A, 4-pin male. For suitable female connector, see page 73.			
Pressure Switch Style		Piston			
(1) For 1 entry tapped for PG 1	3.5 conduit/cable entry, replace S	13 with S11 (example: 2	XMLA500D2S13 becom	nes XMLA500D2S11).	

(2) Component materials of units in contact with the fluid, see pages 77–78.

(3) Only for control of group 2 fluids, in accordance with directive 97/23/EEC

Operating Curves





Terminal model



Connector model

Pressure switch connector pin view

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1 2	

 $1 \rightarrow 11 \text{ and } 13$ 2
ightarrow 12 $3 \rightarrow 14$

Other Versions

For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

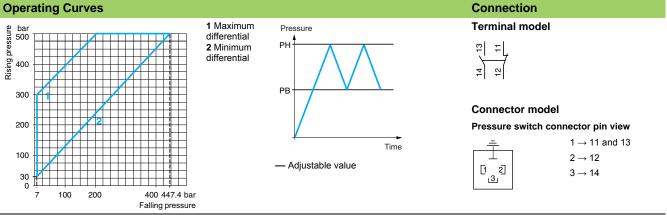
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Schneider Belectric

Table 59: Size 500 bar (7250 psi) Adjustable differential, for regulation between two thresholds Switches with 1 C/O single-pole contact Pressure connection 1/2" NPT or 1/4" BSP

Pressure Switches, Type XMLB		With setting scale		Without setting scale	
Adjustable Range of Operating Point (PH) (Rising pressure)		30–500 bar (435–7250 psi)			
Electrical Connection		Terminals	DIN connector	Terminals	DIN connector
Catalog Numbers ⁽¹⁾					
	Hydraulic oils, up to 320 °F (160 °C)	XMLB500D2S13	XMLB500D2C11	XMLB500D1S13	XMLB500D1C11
Fluids Controlled (2) (3)	Fresh water, sea water, up to 320 °F (160 °C)	XMLB500E2S13	XMLB500E2C11	XMLB500E1S13	XMLB500E1C11
	Corrosive fluids, air, up to 320 °F (160 °C)	XMLB500N2S13	XMLB500N2C11	XMLB500N1S13	XMLB500N1C11
Weight, Ib (kg)		1.65 (0.750)	1.72 (0.780)	1.65 (0.750)	1.72 (0.780)
Supplementary Specifications (not shown under		general specifications)			
Describe Differential	Min. at low setting	23 bar (333.5 psi), –2.6 bar, +3.8 bar (–37.7 psi, +55.1 psi)			
Possible Differential (subtract from PH to get PB)	Min. at high setting	52.6 bar (762.7 psi), -14.8 bar, +11.2 bar (-214.6 psi, +162.4 psi)			
(cabilact i cini i i i co got i b)	Max. at high setting	300 bar (4350 psi)			
Maximum Allowable	Per cycle	625 bar (9062.5 psi)			
Pressure	Accidental	1125 bar (16,312.5 psi	i)		
Destruction Pressure		2250 bar (32,625 psi)			
Cable Entry and Wire Size for Terminal Models		1/2" NPT, 1 x 0.2 mm ² minimum, 2 x 2.5 mm ² maximum.			
Connector Type for Connector Models		DIN 43650A, 4-pin male. For suitable female connector, see page 73.			
Pressure Switch Style		Piston			
(1) Ford anti-standard for DO d		40			

For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLB500D2S13 becomes XMLB500D2S11).
 (2) Component materials of units in contact with the fluid, see pages 77–78.
 (3) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.



Other Versions

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For switches with alternative tapped cable entries (such as NPT), consult your local sales office.

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Table 60:Size 500 bar (7250 psi)Adjustable differential, for regulation between 2 thresholdsSwitches with 2 C/O single-pole contactsPressure connection 1/2" NPT or 1/4" BSP

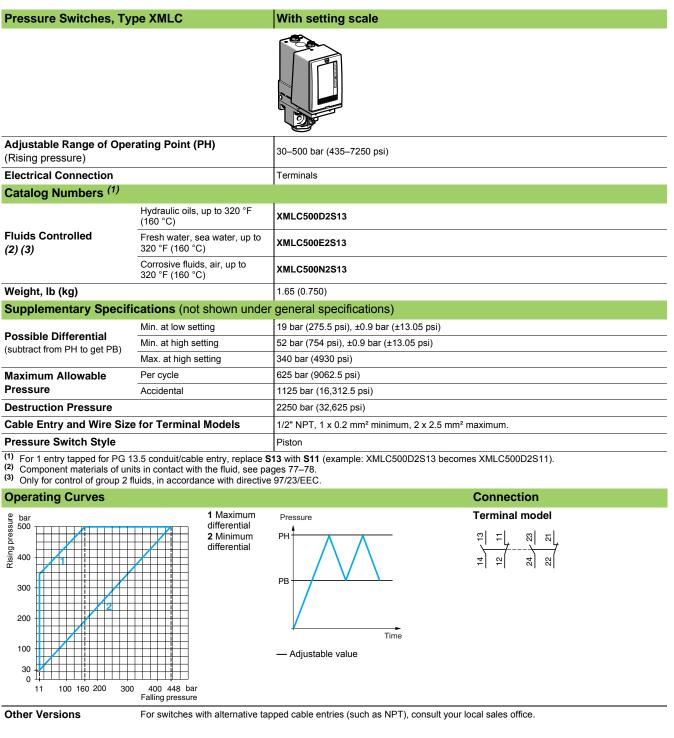




Table 61:Size 500 bar (7250 psi)
Dual-stage, fixed differential, for detection at each threshold
Switches with 2 C/O single-pole contacts (one per stage)
Pressure connection 1/2" NPT or 1/4" BSP

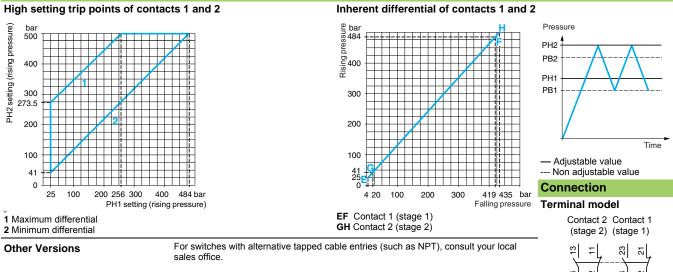
D	Without setting scale		
2nd stage operating point (PH2)	41–500 bar (594.5–7250 psi)		
	25–484 bar (362.5–7018 psi)		
PH2–PH1)	16–244 bar (232–3538 psi)		
	Terminals		
Hydraulic oils, up to 320 °F (160 °C)	XMLD500D1S13		
Fresh water, sea water, up to 320 °F (160 °C)	XMLD500E1S13		
Corrosive fluids, air, up to 320 °F (160 °C)	XMLD500N1S13		
	1.65 (0.750)		
(not shown under general spe	ecifications)		
At low setting	21 bar (304.5 psi), ±3 bar (±43.5 psi)		
At high setting	65 bar (942.5 psi), ±10 bar (±145 psi)		
Per cycle	625 bar (9062.5 psi)		
Accidental	1125 bar (16,312.5 psi)		
	2250 bar (32,625 psi)		
ninal Models	1/2" NPT, 1 x 0.2 mm² minimum, 2 x 2.5 mm² maximum.		
	Piston		
	2nd stage operating point (PH2) Ist stage operating point (PH1) PH2–PH1) Hydraulic oils, up to 320 °F (160 °C) Fresh water, sea water, up to 320 °F 160 °C) Corrosive fluids, air, up to 320 °F 160 °C) (not shown under general spont At low setting At high setting Per cycle Accidental		

(1) For 1 entry tapped for PG 13.5 conduit/cable entry, replace S13 with S11 (example: XMLD500D1S13 becomes XMLD500D1S11).

(2) Component materials of units in contact with the fluid, see pages 77–78.

⁽³⁾ Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

Operating Curves



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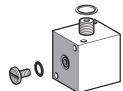


XMLZL003 XMLZL004



XMLZL001

XMLZL011



XMLZL005



XMLZA•••, XMLZB•••



Table 62:	Accessories for Pressure Switches and Vacuum Switches

Description		Specific characteristics	For use with switches	Catalog number	Weight Ib (kg)	
Rear fixing bracket for vibrations > 2 gn		_	XML•L35 XML•001	XMLZL006	0.51 (0.230)	
Additional top support brac for vibrations > 4 gn	cket	_	XMLAM01 XML•M05 XMLA004 XML•010 to XML•500	XMLZL002	0.04 (0.020)	
Knurled adjustment knob, f fits over adjustment screw(s) setting		_	All models	XMLZL003	0.022 (0.010)	
Fixing plate for replacing an XMJA or XMGB switch by an XML switch		_	XMLAM01 XML•M05 XMLA004 XML•010 to XML•500	XMLZL004	0.024 (0.110)	
Lead sealable protective cover to prevent unauthorized access to adjustment screws and fixing screw of switch cover		_	XMLA XMLB	XMLZL001	0.08 (0.035)	
Lead sealable protective cc to deter unauthorized access screws		_	All models	XMLZL011	0.07 (0.030)	
	Without setting	24/48 Vac/Vdc	XMLA/B	XMLZZ024	0.20 (0.090)	
	scale	110/240 Vac	XMLA/B	XMLZZ120	0.20 (0.090)	
Indicator modules and			XMLA	XMLZA024	0.20 (0.090)	
associated covers, 2 LEDs (orange and green)	With setting	24/48 Vac/Vdc	XMLB	XMLZB024	0.20 (0.090)	
	scale	110/240 Vac	XMLA	XMLZA120	0.20 (0.090)	
		110/240 Vac	XMLB	XMLZB120	0.20 (0.090)	
Hydraulic block for base mounting directly onto fluid manifold		_	All models	XMLZL005	0.53 (0.240)	
Female connector, DIN 43650A		—	XMLC11	XZCC43FCP40B	0.08 (0.035)	
Jumper cables, DIN 43650		L = 1 m	XMLC11	XZCR1523062K1	0.18 (0.080)	
straight, male for splitter be (for connections, see catalog		L = 2 m	XMLC11	XZCR1523062K2	0.024 (0.110)	
Adapter, G 1/4" – G 3/8" ma	ale/female	_	All models	XMLZL012	0.29 (0.130)	

Table 63: Renewal Parts

Description	Specific characteristics	For use with switches	Catalog number	Weight Ib (kg)	
Sealing gasket	For sizes ≥ 300 bar	XMLA/B/C/D	XMLZL010	0.03 (0.015)	
		XML•S35	XMLZL013	0.13 (0.060)	
Diaphragms	_	XML•S02	XMLZL014	0.09 (0.040)	
		XML•S04	XMLZL015	0.07 (0.030)	

XZCC43FCP40B Connector Pinout

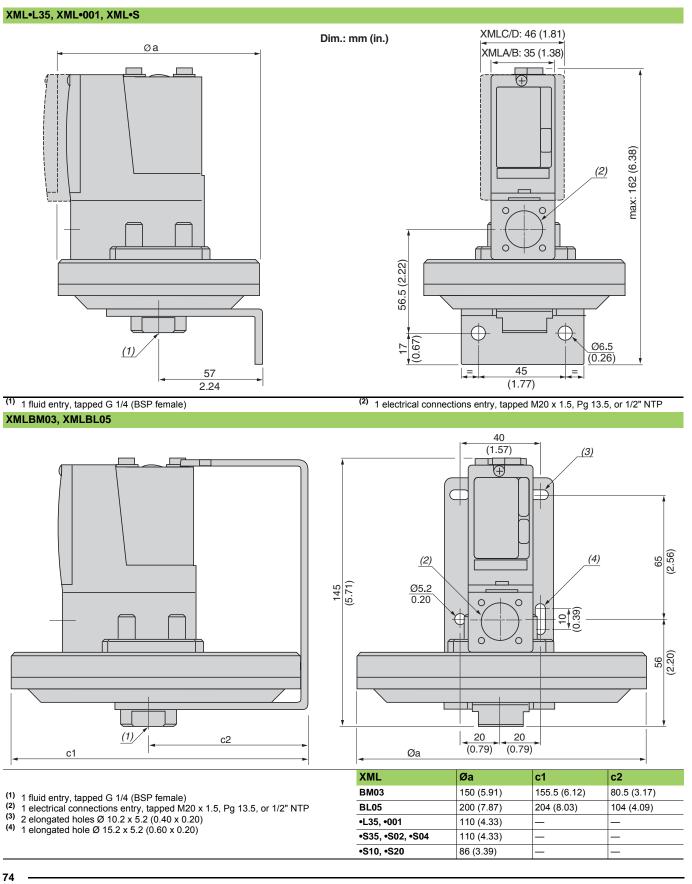


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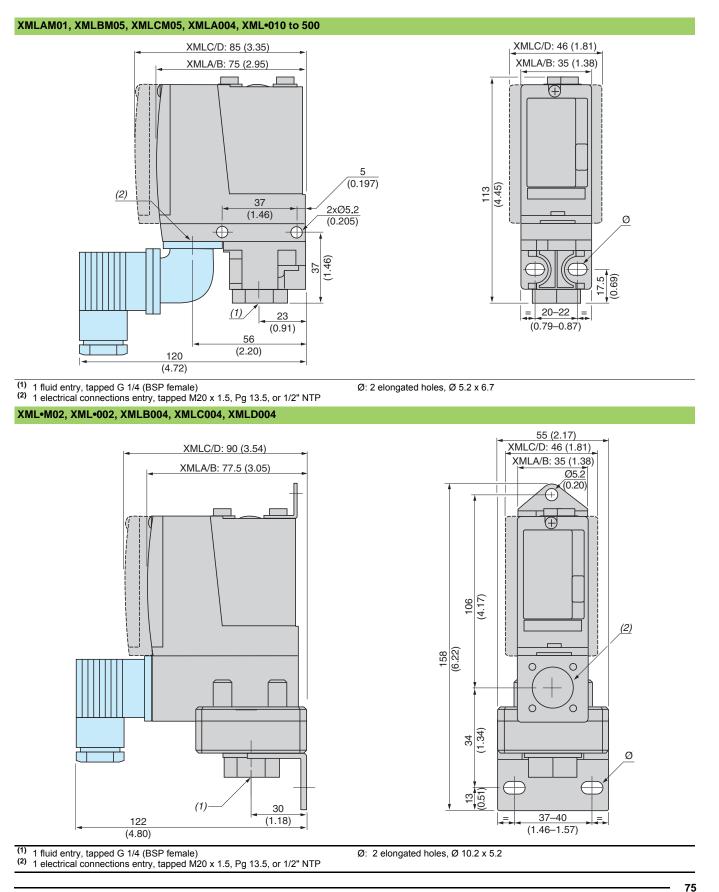


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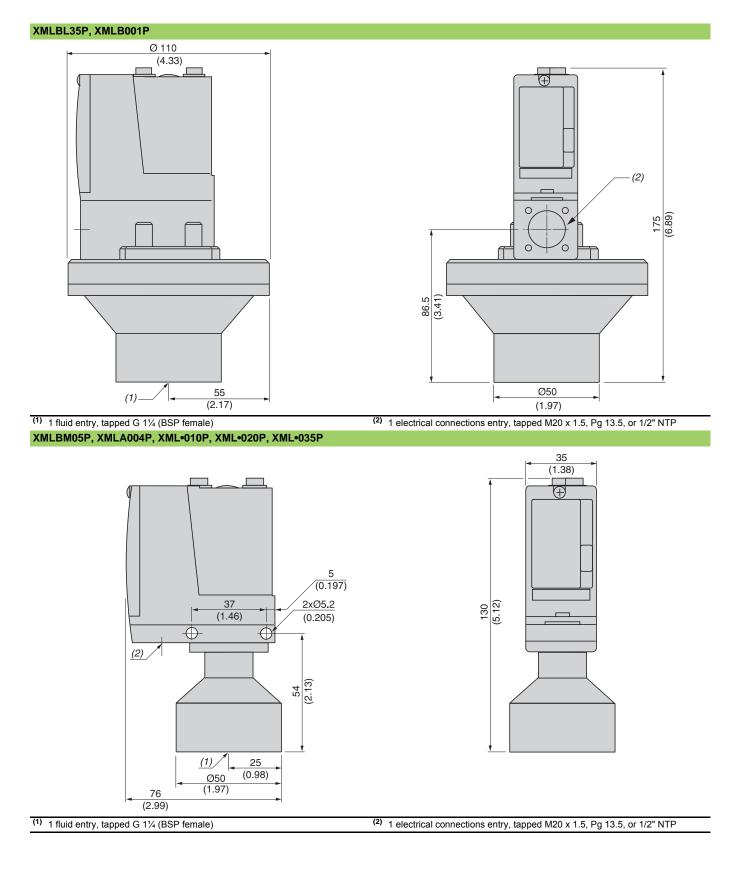


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Materials in Contact with Fluid

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Table 64: **Component Materials in Contact with Fluid**

Pressure or vacuum switch catalog number	Zinc alloy	Stainless steel	Brass	Steel	Nitrile	PTFE	FPM, FKM	Aluminium
XMLAM01V••••, XML•M02V••••		(1)						
XMLAM01T••••, XML•M02T••••		(2)						
XMLBM03R••••								
XMLBM03S****		(3)						
XML•M05A••••		(1)						
XML•M05B••••		(1)						
XML•M05C••••		(1)						
XMLBM05•••••		(1)						
XMLBL05R****								
XMLBL05S****		(3)						
XML•L35R••••, XML•S35R••••		(1)						
XML•L35S••••		(3)						
XMLBL35P****		(1)						
XML•001R••••		(1)						
XML•001S••••		(3)						
XMLB001P••••		(1)						
XML•002A••••								
XML•002B••••, XML•S02B••••								
XML•002C••••		(3)						
XMLA004A••••								
XMLA004B••••								
XMLA004C****		(2)						
XMLA004P••••								

Materials in contact with fluid

(1) 1.4307 (AISI 316L) (2) 1.4404 (AISI 316L) (3) 1.4305 (AISI 303)



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Materials in Contact with Fluid

Industrial Pressure Switches XML Electromechanical Pressure Switches

Table 65: Component Materials in Contact with Fluid (continued)

Pressure switch catalog number	Zinc alloy	Stainless steel	Brass	Steel	Nitrile	PTFE	FPM, FKM	Aluminium
XMLB004A****								
XML•004B••••, XML•S04B••••								
XML•004C••••		(3)						
XML•010A••••								
XML•010B••••								
XML•010C••••		(2)						
XML•010P••••, XML•S10A••••								
XML•020A••••, XML•035A••••								
XML•020B••••, XML•035B••••								
XML•020C••••, XML•035C••••		(2)						
XML•020P••••, XML•035P••••, XML•S20A••••								
XML•070D••••, XML•160D••••								
XML•070E••••, XML•160E••••		(4)						
XML•070N••••, XML•160N••••		(5)						
XML•300D••••								
XML•300E••••		(4)						
XML•300N••••		(5)						
XML•500D••••								
XML•500E••••								
XML•500N••••4		(5)						

Materials in contact with fluid

(1) 1.4307 (AISI 316L) (2) 1.4404 (AISI 316L)

(3) 1.4305 (AISI 303)

(4) 1.4303 (AISI 305) (4) 1.4404 (AISI 316L) + 1.4462 (5) 1.4404 (AISI 316L) + 1.4305 (AISI 303)

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9012G Pressure Switches

The 9012G pressure switches are UL Listed and CSA Certified as industrial control equipment. They are used to interface pneumatic or hydraulic systems with electrical control systems by opening or closing electrical contacts in response to pressure changes in the system. They have outstanding repeatability and drift performance. Their efficient design uses durable, low mass components for excellent performance under heavy duty vibration and shock conditions.

The 9012G pressure switches line offers devices with either diaphragm or piston actuators—for optimum life, versatility, and speed of operation. A variety of modifications are available (see page 91). Features include the following:

- High shock resistance
- Dual numerical range scale (psi and kPa)
- High set-point stability

- One or two SPDT double-break contacts
- Internal or external range adjustment
- No drain line required
- Adjustable or fixed (fixed) differentialSingle-stage, dual-stage, or differential-pressure
- Single-stage, dual-stage, or differential-pressure operation

The 9012G diaphragm switches range from 0.2–675 psi falling pressure. Buna-N diaphragms and zinc-plated steel flanges are standard. Diaphragms of Viton[®] flourocarbon or ethylene propylene are available as well as stainless steel flanges.

The 9012G piston actuated switches range from 20–9,000 psi falling pressure. They have sealed pistons and can be used on air, water, oil, or any media compatible with the actuator material. The switches come standard with stainless steel pistons and housings, Viton diaphragms and O-ring seals, and Teflon[®] retaining rings. Ethylene propylene diaphragms and O-ring seals are also available.

The 9012G industrial pressure switches are available as open type or in NEMA Type 1 enclosures. The backplate is steel with a plastic cover. Open devices in pressure ranges up to 250 psi are available with internal- or external-threaded pressure connectors, ideally suiting them for panel mounting.

The 9012G machine tool pressure switches with NEMA Type 4, 4X, or 13 (IP66) cast aluminum enclosures are UL Listed and CSA Certified as industrial control equipment. They are also UL Marine Listed for use on vessels greater than 65 ft long where ignition protection is not required.

The 9012G machine tool switches are also available in NEMA Type 7 & 9 cast aluminum enclosures. These are UL Listed for use in Class I, Divisions 1 and 2, Groups C and D, and Class II, Divisions 1 and 2, Groups E, F, G hazardous locations.

Application and General Information

9012 pressure switches can generally be used in any application where electrical contacts must open or close in response to a system pressure change, within the electrical and pressure ratings of the switch. Pressure switches are used in a wide variety of applications such as the following:

- compressed air systems
- HVAC equipment
- chillers
- pumping systems
- machine tools

- stamping presses
- automatic grinders
- welders
- process equipment
- molding machines

Pressure switches typically perform one of the following two functions:

- Monitoring the pressure in the system. The switch can be used either as an interlock that sequences operations in an automatic system, or to give an audio or visual signal, typically an alarm of an undesired condition, at predetermined pressures. A switch with a **fixed** differential is generally used in these applications.
- Controlling the pressure in the system by starting and stopping a pump or a compressor at predetermined pressures. A switch with an **adjustable** differential is usually needed in these applications.

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Diaphragm Life

The elastomer diaphragms used on 9012G switches can withstand high speed cycling and wide pressure changes. They can tolerate operating speeds up to 200 cycles per minute with no negative impact on the life of the diaphragm.

Diaphragm life is affected by pressure medium compatibility. Standard diaphragms on 9012G devices are Buna-N nitrile in zinc-plated steel flanges. Also available are Viton fluorocarbon and ethylene propylene diaphragms, as well as Type 316 stainless steel flanges.

The diaphragm can withstand wide pressure changes on each operating cycle. However, the pressure applied to the diaphragm during the normal operating cycle should never exceed the maximum value listed in the Range column in the catalog listing. Regularly cycling the pressure above this value reduces life considerably. If significant surges are common, or if pressures are higher than those listed in the Range column, consider using a piston device.

Piston Life

For long piston life, the pressure medium should be filtered to keep foreign matter such as dirt and chips out of the piston assembly. 9012G sealed piston devices are not recommended for use on dry gas media, since this usage could cause some leakage past the seal. Depending on the gas, the media pressure, and the rate of operation, the amount of leakage could render the switch inoperable. (Note, however, that some weepage of the media is necessary to lubricate the seals. This small amount of weepage does not indicate a problem.)

Surges

One of the most destructive conditions for a pressure switch is hydraulic surge. A surge is a high rate of rise in pressure, normally of short duration, caused by starting a pump or by opening and closing a valve. Extremely high rates of rise in pressure can be damaging even if they are within the limits of the maximum allowable pressure.

To limit the effect of surges, the switch should be mounted as close to an accumulator and as far from the pump or quick acting valve as possible. The 9012G piston actuated switches have a 0.020 in. pressure orifice to help reduce the effects of minor surges. 9012G diaphragm actuated switches have a 0.060 in. pressure orifice. A restrictor with a small orifice placed in the line between the switch and the pump or valve will further help to protect the switch. Using a surge snubber such as the 9049A26 or A26S will also protect the switch.

Vibration

Among other things, excessive vibration can cause contact bounce, chatter, or premature contact transfer, especially when system pressure is near the operating point of the switch. Remote mounting of the switch is the best way to avoid problems.

Use on Steam

Switches should not be applied directly on steam exceeding 15 psig. However, with steam capillary tubing installed between the pressure connection and the switch, steam pressure up to 250 psig can be applied—provided this does not exceed the maximum allowable pressure rating of the switch or the maximum temperature rating at the actuator. Refer to the instruction bulletin supplied with the device.

Dual-Stage Operation

The 9012G dual-stage pressure switches provide two distinct levels of control from one device. These switches are most commonly used where dual functions are required, or in sequencing applications such as alarm-shutdowns.

Differential-Pressure Operation

The 9012G pressure switches for differential-pressure sensing can monitor changes in the difference between two pressures. These unidirectional devices signal that a predetermined pressure difference was reached, resulting from a widening or narrowing of the difference between two pressures.



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Piston- vs. Diaphragm-Actuated Devices

Selecting between piston and diaphragm devices depends on several criteria:

- maximum allowable pressure
- range and differential
- surges
- medium (whether hydraulic or pneumatic)

Maximum allowable pressures for piston devices are much higher than for diaphragm devices. Most diaphragm devices have a maximum allowable pressure of 850 psi or less, whereas all piston devices have a maximum allowable pressure of 10,000 psi or more.

Range and differential for diaphragm devices are lower than for piston devices. Many applications call for a low differential, such as 20 psi. This may exclude piston devices, which have a minimum differential of 60 psi or more.

Surges are a part of every hydraulic system. While many are small and have only a small effect on the switch, some are significant and can potentially destroy a pressure switch. Diaphragm devices are the most sensitive to surges and are most easily damaged. Piston devices are more tolerant of surges and last longer in the same application.

Hydraulic systems, which typically use oil-based media, are more demanding applications than pneumatic systems. Pressure switches used in hydraulic applications typically experience higher pressures, have wider pressure variations, and produce more surges, since the medium does not compress. Pneumatic systems, which typically use air, place fewer demands on a system, since these applications typically experience lower pressures and the medium can compress, cushioning the effects of surges. Table 66 offers basic guidelines for determining the selection of a piston- versus a diaphragm-operated pressure switch.

Maximum allowable pressures	High	Piston	
Maximum anowable pressures	Lower	Diaphragm	
Pressures	High pressures	Piston	
Flessules	Low differentials or pressures	Diaphragm	
Surges	Constant	Piston	
Surges	Minimal	Diaphragm or piston	
Media	Hydraulic systems	Piston	
Media	Pneumatic systems	Diaphragm	

Table 66: Piston vs. Diaphragm

Technical Overview

Operating Points (Set Points)

Pressure switches have two operating points:

- Increasing pressure operating point (rising pressure)
- Decreasing pressure operating point (falling pressure)

These operating points are also called the set points of the switch.

Differential

The *differential* is the difference in pressure between the rising and falling pressure points. It can be adjustable or fixed.

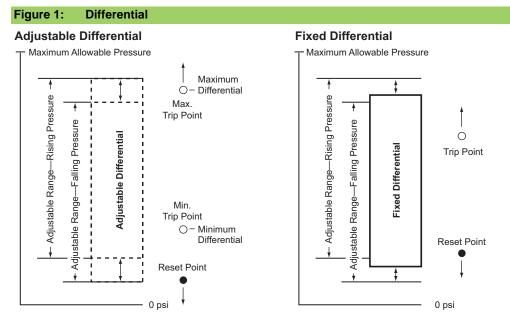
Range

The *range* refers to the pressure limits within which the operating points (settings) can be adjusted. The range of the 9012G pressure switch is tied to the decreasing pressure operating point. Adding the differential to the decreasing pressure operating point determines the increasing pressure operating point.

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Fixed Differential

To determine the operating range on rising pressure for a fixed differential switch, add the differential to the decreasing pressure operating point.

For example, to determine the range on increasing pressure for a 9012GDW5 switch:

- 1. Range on decreasing pressure = 3 to 150 psi
- 2. Fixed differential = 6.0 ± 0.8 psi
- 3. Range on increasing pressure = 9 ± 0.8 to 156 ± 0.8 psi

Adjustable Differential

For adjustable differential switches, add the minimum differential to the low end of the range and the maximum differential to the high end of the range.

For example, to determine the range on increasing pressure for a 9012GAW5:

- 1. Range on decreasing pressure = 3 to 150 psi
- 2. Adjustable differential = 6.0 to 30 psi
- 3. Range on increasing pressure = 9 to 180

During the normal operating cycle, system pressure should never exceed the upper limit of the range when using a diaphragm actuated switch. This greatly reduces the life of the diaphragm. For optimum life, operate the switch in the middle 80% of the range.

Maximum Allowable Pressure

Maximum allowable pressure is the pressure to which a switch can be subjected without causing a change in operating characteristics, shift in settings, or damage to the device.

System pressure surges may occur during machine startup or from valve operation. Surges are not normally detrimental to the life of a switch if the surge is within the maximum allowable pressure rating of the switch. Diaphragm actuated switches should not be subjected to more than 10 surges per day. More frequent surges greatly reduce the life of the diaphragm.

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Specifications

Environment

Table 67: Environmental Specifications

Conformity to standards	CE, IEC 60957.5.1, UL 508, CSA 3211-03
Conformity to standards	CE, IEC 00957.5.1, OL 500, CSA 5211-05
Product certifications	UL Listed and CSA Certified as industrial control equipment
Protective treatment	Marine use: "HT" (does not apply to 9016GVG)
Fluids controlled	Air, water, hydraulic oils, gases, steam (depending on the model)
Materials	Cast aluminum enclosures (9012 NEMA 1 and 9016 GVG are stamped metal enclosure and molded cover)
Operating position	Operates in all positions
Shock resistance	50 g
Degree of protection	Depends on model
Operating rate (operating cycles/minute)	120 operations/minute max. 9016GVG: 60 operations/minute max.
Repeat accuracy	± 0.1 to $\pm 1.0\%$ (does not apply to 9016GVG)
Drift	±1.0% of the adjustable range over 1 million operations
Pressure connection	G1/4 (BSP) female, 1/4" NPTF, or 1/2"-14 NPT
Electrical connection	1/2"-14 NPTF, PG13.5, or ISO M20 (also, 3/4"-14 NPTF available only on NEMA 7 and 9). NEMA 1 is 1/2" conduit entry, unthreaded. (does not apply to 9016 GVG)

Contact Arrangement

Table 68: 9012G Machine Tool and Vacuum Switches (except GVG)

Туре	Contact Arrangement	Contact Symbol						
Single Pole Double Throw (SPDT)	1 N.O., 1 N.C.	Same Polarity						
Snap switch contains two double-break contact elements (1 N.O. and 1 N.C.) that must be used on circuits of same polarity.								
Double Pole Double Throw (DPDT)	2 N.O., 2 N.C.	Same Polarity Same Polarity						

Each set contains two electrically separated sets of contact elements allowing use on circuits of opposite polarity.

Table 69: Circuit Ratings

			AC—	50 or 60) Hz			DC	AC or DC	
Contacts	ge (V)	Inductive 35% Power Factor				Resistive 75% Power Factor	ge (V)	Inductive and Resistive		Continuous Carrying
Col	Voltage	Ма	ake	Bre	eak	Make and Break	Voltage	Make and Break Amperes		Amperes
	-	Α	VA	Α	VA	Amperes		Single Throw	Double Throw	
	120	60	7200	6	720	6	125	0.55	0.22	10
SPDT	240	30	7200	3	720	3	250	0.27	0.11	10
SEDI	480	15	7200	1.5	720	1.5	600 ⁽¹⁾	0.10	—	10
	600	12	7200	1.2	720	1.2	-	—	_	-
	120	60	7200	6	720	6	125	0.22	0.22	10
DPDT	240	30	7200	3	720	3	250	0.11	0.11	10
DFDI	480	15	7200	1.5	720	1.5	600	_	_	10
	600	12	7200	1.2	720	1.2	_	_	_	_

⁽¹⁾ 600 Vdc rating does not apply.

Acceptable Wire Sizes: 12-22 AWG.

Recommended Terminal Clamp Torque: 7 in-Ibs

Not recommended for use on circuits below 24 V, 20 mA.

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Technical Overview

Industrial Pressure Switches 9012G Pressure Switches

Table 70: Interpreting the Catalog Number (excluding 9016GVG)

				90120	A	R	2	2	
Designation				Catalog	Nu	mb	er		
	Pressure Switch			9012G					
Classification	Vacuum Switch			9016G					
		Diaphragm, Low Pressure—Adjustable	9		Α				
		e		В					
	Single-Stage	Piston—Adjustable			С				
	Single-Stage	Diaphragm, Low Pressure—Fixed			D				
		Diaphragm, High Pressure—Fixed			E				
Actuator Type—		Piston—Fixed			F				
Differential Type		Diaphragm, Low Pressure—Adjustable)		G				
	Differential-Pressure	Diaphragm, High Pressure—Adjustable	e		н				
		Piston— Adjustable			J				
		Diaphragm, Low Pressure—Adjustable	9		K				
	Dual-Stage	Diaphragm, High Pressure—Adjustable	e		L				
		Piston—Adjustable			М				
	1					G			
Enclosure,	Open					0			
NEMA Туре	7, 9					R			
	4, 4X, 13					W			
Contacts	Single-pole, double-th						blank		
Contacts	Double-pole, double-t	throw					2		
	Diaphragm	Single or Dual Stage, Low Pressure	0.2–10					1	
			1–40					2	
			1.5–75					4	
			3–150					5	
			5–250					6	
	Biapinagin	Single or Dual Stage, High Pressure	13–425					1	
Pressure			20–675					2	
Range (psi)		Differential-Pressure, Low Pressure	0–75					1	
Jee (1997)		,	0–175					4	
		Differential-Pressure, High Pressure	0–500					1	
			20–1000					1	
		Single or Dual Stage	90–2900					2	
	Piston		170–5600					3	
			270–9000					4	
		Differential-Pressure	0–5000					1	
Vacuum (inHg)	Diaphragm	Single Stage, Low Pressure	0–28					1	
、 3 /			0–25					2	
Options	Factory modifications	and accessories							See Tables 78–80 on page 91 Table 83 on page 93, and Table 89 on page 99

Table 71: Pressure Range (psi)—Contacts Change on Decreasing Pressure

Actuator	Switch Style	Range (psi)	Fixed Differential	Adjustable Differential	Pressure Code
		0.2–10	0.6±0.1	0.6–2	1
		1–40	1.6±0.4	1.6–8	2
	Single or Dual Stage, Low Pressure	1.5–75	3.0±0.5	3.5–15	4
	Low Flessure	3–150	6.0±0.8	6.0–30.0	5
Diamban		5–250	10.0±1.5	10.0–49	6
Diaphragm	Single or Duel Stage Lligh Dressure	13–425	16±3.5	16–90	1
	Single or Dual Stage, High Pressure	20-675	27±5	27–130	2
		0–75	0.25±10	0.25–10	1
	Differential-Pressure, Low Pressure	0–175	—	0.5–36	4
	Differential-Pressure, High Pressure	0–500	—	3–175	1
		20–1000	89±18	89–200	1
	Gianta en Dural Otana	90–2900	255±30	255–560	2
Piston	Single or Dual Stage	170-5600	578±110	578–1260	3
		270-9000	788±140	788–1900	4
	Differential-Pressure	0–5000	—	15-825	1

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Table 72:

Selection and Modifications

Fixed Differential

NEMA Type 4, 4X, 13 Enclosure

9012G Machine Tool Pressure Switches for Single-Stage Operation

The 9012G single-stage pressure switches are control circuit rated devices. These switches are used in pneumatic or hydraulic systems on a wide variety of machine and process applications to protect the equipment. They either control or monitor the system pressure.

9012GDW1

Range on Decreasing Pressure psig Approximate Differential At Mid Range, psig (1) Maximum Allowable Pressure, psig Class 9012 Type SPDT Diaphragm Actuated - Buna-N Nitrile Diaphragm, Zinc Plated Steel Housing 0.2-10 0.6 ± 0.1 100 GDW1 GDW21 1.40 1.6 ± 0.4 100 GDW2 GDW21 3150 6.0 ± 0.8 475 GDW5 GDW24 3150 6.0 ± 0.8 475 GDW5 GDW24 1.3-425 10.4 ± 3.5 850 GEW21 GEW21 20-675 27 ± 5 2000 GEW22 GEW21 20-675 27 ± 5 2000 GEW21 GEW21 20-675 27 ± 5 2000 GEW21 GEW21 20-675 27 ± 5 2000 GFW1 GFW21 90-2900 170 ± 15 15000 GFW2 GFW22 170-5600 289 ± 55 20000 GFW3 GFW23 270-9000 495 ± 70 25000 GFW24 GFW24 Standards/Ratings G14 (BSP) female, 1/4" NPTF, or 1/2"-1	UL Liste	ed and CSA Certified as Indu	strial Control Equi	pment				
Decreasing Pressure psig Mid Range, psig (1) Allowable Pressure, psig SPDT DPDT Diaphragm Actuated – Buna-N Nitrile Diaphragm, Zinc Plated Steel Housing 0.2-10 0.6 ± 0.1 100 GDW1 GDW2 1-40 1.6 ± 0.4 100 GDW2 GDW2 GDW2 1.5-75 3.0 ± 0.5 240 GDW4 GDW2 3-150 6.0 ± 0.8 475 GDW6 GDW26 5-250 10.0 ± 1.5 750 GDW6 GDW28 13-425 16 ± 3.5 850 GEW1 GEW21 20-675 27 ± 5 2000 GEW2 GEW22 7000 59 ± 9 10000 GFW1 GFW21 90-2900 170 ± 15 15000 GFW2 GFW22 170-6600 289 ± 55 20000 GFW3 GFW23 270-9000 495 ± 70 25000 GFW3 GFW23 270-9000 495 ± 70 25000 GFW3 GFW23 270-9000 495 ± 70 25000 GFW3 <td< th=""><th>Range on</th><th>Approximate Differential At</th><th>Maximum</th><th>Class 90</th><th>12 Туре</th></td<>	Range on	Approximate Differential At	Maximum	Class 90	12 Туре			
0.2-10 0.6 ± 0.1 100 GDW1 GDW21 1-40 1.6 ± 0.4 100 GDW2 GDW22 1.5-75 3.0 ± 0.5 240 GDW4 GDW24 3-150 6.0 ± 0.8 475 GDW5 GDW26 5-250 10.0 ± 1.5 750 GDW6 GDW26 13-425 16 ± 3.5 850 GEW1 GEW21 20-675 27 ± 5 2000 GEW2 GEW22 Piston Actuated - #440 Stainless Steel Piston. #303 Stainless Steel Housing, Viton® Fluorocarbon Diaphragm and O-ring, Teflon® Retaining Ring 20-1000 59 ± 9 10000 GFW1 GFW21 90-2900 170 ± 15 15000 GFW2 GFW22 170-5600 289 ± 55 20000 GFW3 GFW23 270-9000 495 ± 70 25000 GFW4 GFW24 GFW24 Specifications Fluids Controlled Air, water, hydraulic oils, gases, steam (depending on the model) Ferset Gew24 GEW24 GEW24 GEW24 GEW24 GEW24 GEW24 GEW24 <td></td> <td></td> <td></td> <td>SPDT</td> <td>DPDT</td>				SPDT	DPDT			
1-40 1.6 ± 0.4 100 GDW2 GDW22 1.5-75 3.0 ± 0.5 240 GDW4 GDW24 3-150 6.0 ± 0.8 475 GDW5 GDW25 5-250 10.0 ± 1.5 750 GDW6 GDW26 13-425 16 ± 3.5 850 GEW1 GEW21 20-675 27 ± 5 2000 GEW2 GEW22 Piston Actuated - #440 Stainless Steel Piston. #303 Stainless Steel Housing, Viton [®] Fluorocarbon Diaphragm and O-ring, Teflon [®] Retaining Ring 20-1000 59 ± 9 10000 GFW1 GFW21 90-2800 170 ± 15 15000 GFW2 GFW22 GFW23 270-9000 495 ± 70 25000 GFW3 GFW24 Specifications Fluids Controlled Air, water, hydraulic oils, gases, steam (depending on the model) Pressure connection G1/4 (BSP) female, 1/4" NPTF, or 1/2"-14 NPT. For metric threads, add M after the W on all types. Voltage Limits 600 V Continuous Current 10 A Electrical Connections 1/2"-14 NPTF, PG13.5, or ISO M20. For metric threads, add M after the W on all types. S	Diaphragm Actuated -	Buna-N Nitrile Diaphragm, Zinc	Plated Steel Housing	g				
1.5-75 3.0 ± 0.5 240 GDW4 GDW24 3-150 6.0 ± 0.8 475 GDW5 GDW25 5-250 10.0 ± 1.5 750 GDW6 GDW24 20-675 27 ± 5 2000 GEW2 GEW21 20-675 27 ± 5 2000 GEW2 GEW21 20-675 27 ± 5 2000 GFW2 GEW22 Piston Actuated - #440 Stainless Steel Piston. #303 Stainless Steel Housing, Viton [®] Fluorocarbon Diaphragm and O-ring, Teflon [®] Retaining Ring 20-100 59 ± 9 10000 GFW21 GFW21 90-2900 170 ± 15 15000 GFW2 GFW22 170-5600 289 ± 55 20000 GFW3 GFW24 Specifications Fluids Controlled Air, water, hydraulic oils, gases, steam (depending on the model) GFW2 Pressure connection G1/4 (BSP) female, 1/4" NPTF, or 1/2"-14 NPT. For metric threads, add M after the W on all types. Voltage Limits 600 V Continuous Current 10 A 12erctrical Connection 1/2"-14 NPTF, PG13.5, or ISO M20. For metric threads, add M after the W on all types. </td <td>0.2–10</td> <td>0.6 ± 0.1</td> <td>100</td> <td>GDW1</td> <td>GDW21</td>	0.2–10	0.6 ± 0.1	100	GDW1	GDW21			
3-150 6.0 ± 0.8 475 GDW5 GDW25 5-250 10.0 ± 1.5 750 GDW6 GDW26 13-425 16 ± 3.5 850 GEW1 GEW21 20-675 27 ± 5 2000 GEW2 GEW22 Piston Actuated - #440 Stainless Steel Piston. #303 Stainless Steel Housing, Viton [®] Fluorocarbon Diaphragm and O-ring, Teflon [®] Retaining Ring 20-1000 59 ± 9 10000 GFW1 GFW21 90-2900 170 ± 15 15000 GFW2 GFW23 270-9000 289± 55 20000 GFW2 GFW23 270-9000 495 ± 70 25000 GFW4 GFW24 Specifications Fluids Controlled Air, water, hydraulic oils, gases, steam (depending on the model) Pressure connection G14/4 (BSP) female, 1/4" NPTF, or 1/2".14 NPT. For metric threads, add M after the W on all types. Weight (approximate) 3 lb (1.36 kg) Voltage Limits 600 V Continuous Current 10 A Electrical Connections 1/2".14 NPTF, PG13.5, or ISO M20. For metric threads, add M after the W on all types. Standards/Ratings	1–40	1.6 ± 0.4	100	GDW2	GDW22			
5-250 10.0 ± 1.5 750 GDW6 GDW26 13-425 16 ± 3.5 850 GEW1 GEW21 20-675 27 ± 5 2000 GEW2 GEW22 Piston Actuated - #440 Stainless Steel Piston. #303 Stainless Steel Housing, Viton [®] Fluorocarbon Diaphragm and O-ring, Teflon [®] Retaining Ring 20-1000 59 ± 9 10000 GFW1 GFW21 90-2900 170 ± 15 15000 GFW2 GFW22 GFW23 170-5600 289± 55 20000 GFW3 GFW23 270-9000 495 ± 70 25000 GFW4 GFW24 Specifications Fluids Controlled Air, water, hydraulic oils, gases, steam (depending on the model) Pressure connection G1/4 (BSP) female, 1/4" NPTF, or 1/2"-14 NPT. For metric threads, add M after the W on all types. Veight (approximate) 3 lb (1.36 kg) Voltage Limits 600 V Continuous Current 10 A Electrical Connections 1/2"-14 NPTF, PG13.5, or ISO M20. For metric threads, add M after the W on all types. CE, IEC 60957.5.1, UL 508, CSA 3211-03. UL Marine Listed for use on ships/vessels greater than 65 ft long where ignition protection is not required. Temperature	1.5–75	3.0 ± 0.5	240	GDW4	GDW24			
13-42516 ± 3.5850GEW1GEW120-67527 ± 52000GEW2GEW22Piston Actuated - #440 Stainless Steel Piston.#303 Stainless Steel Housing, Viton® Fluorocarbon Diaphragm and O-ring, Teflon® Retaining Ring20-100059 ± 910000GFW1GFW2190-2900170 ± 1515000GFW2GFW22170-5600289± 5520000GFW3GFW23270-9000495 ± 7025000GFW4GFW24SpecificationsFluids ControlledAir, water, hydraulic oils, gases, steam (depending on the model)Pressure connectionG1/4 (BSP) female, 1/4" NPTF, or 1/2"-14 NPT. For metric threads, add M after the W on all types.Voltage Limits600 VContinuous Current10 AElectrical Connections1/2"-14 NPTF, PG13.5, or ISO M20. For metric threads, add M after the W on all types.Standards/RatingsCE, IEC 60957.5.1, UL 508, CSA 3211-0.3. UL Marine Listed for use on ships/vessels greater than 65 ft long where ignition protection is not required.Temperature RatingsMinimumMaximumAmbient-23 °C (-10 °F)40 °C (-40 °F)+85 °C (+185 °F)All with Form Q4-26 °C (-15 °F)Operating CurvesContact Blocks0Contact Blocks0Contact Blocks0Contact Blocks0Contact Blocks0Contact Blocks0Contact Blocks0Contact Blocks0Contact Blocks0 <t< td=""><td>3–150</td><td>6.0 ± 0.8</td><td>475</td><td>GDW5</td><td>GDW25</td></t<>	3–150	6.0 ± 0.8	475	GDW5	GDW25			
20-675 27 ± 5 2000 GEW2 GEW22 Piston Actuated - #440 Stainless Steel Piston. #303 Stainless Steel Housing, Viton [®] Fluorocarbon Diaphragm and O-ring, Teflon [®] Retaining Ring 20-1000 59 ± 9 10000 GFW1 GFW21 90-2900 170 ± 15 15000 GFW2 GFW22 GFW22 170-5600 289 ± 55 20000 GFW3 GFW23 270-9000 495 ± 70 25000 GFW4 GFW24 Specifications Fluids Controlled Air, water, hydraulic oils, gases, steam (depending on the model) Pressure connection G1/4 (BSP) female, 1/4" NPTF, or 1/2"-14 NPT. For metric threads, add M after the W on all types. Weight (approximate) 3 lb (1.36 kg) Voltage Limits 600 V Continuous Current 10 A Electrical Connections 1/2"-14 NPTF, PG13.5, or ISO M20. For metric threads, add M after the W on all types. Standards/Ratings CE, IEC 60957.5.1, UL 508, CSA 3211-03. UL Marine Listed for use on ships/vessels greater than 65 ti long where ignition protection is not required. Temperature Ratings Minimum Maximum Ambient -23 °C (-10 °F) +85 °C (+185 °F) Media	5–250	10.0 ± 1.5	750	GDW6	GDW26			
Piston Actuated – #440 Stainless Steel Piston. #303 Stainless Steel Housing, Viton® Fluorocarbon Diaphragm and O-ring, Teflon® Retaining Ring 20-1000 59 ± 9 10000 GFW1 GFW21 90-2900 170 ± 15 15000 GFW2 GFW22 170-5600 289± 55 20000 GFW3 GFW23 270-9000 495 ± 70 25000 GFW4 GFW24 Specifications Fluids Controlled Air, water, hydraulic oils, gases, steam (depending on the model) Pressure connection G114 (BSP) female, 1/4" NPTF, or 1/2"-14 NPT. For metric threads, add M after the W on all types. Voltage Limits 600 V Continuous Current 10 A Electrical Connections 1/2"-14 NPTF, PG13.5, or ISO M20. For metric threads, add M after the W on all types. CE, IEC 6097.5.1, UL 508, CSA 3211-03. UL Marine Listed for use on ships/vessels greater than 65 ft long where ignition protection is not required. Temperature Ratings Minimum Maximum Ambient -23 °C (-10 °F) -28 °C (-15 °F) -26 °C (-15 °F) Operating Curves Contact Blocks Max. Differential IN.O., IN.C. Same pion </td <td>13–425</td> <td>16 ± 3.5</td> <td>850</td> <td>GEW1</td> <td>GEW21</td>	13–425	16 ± 3.5	850	GEW1	GEW21			
#303 Stainless Steel Housing, Viton® Fluorocarbon Diaphragm and O-ring, Teflon® Retaining Ring 20-1000 59 ± 9 10000 GFW1 GFW21 90-2900 170 ± 15 15000 GFW2 GFW22 170-5600 289± 55 20000 GFW3 GFW23 270-9000 495 ± 70 25000 GFW4 GFW24 Specifications Fluids Controlled Air, water, hydraulic oils, gases, steam (depending on the model) Pressure connection G1/4 (BSP) female, 1/4" NPTF, or 1/2"-14 NPT. For metric threads, add M after the W on all types. Weight (approximate) 3 lb (1.36 kg) Voltage Limits 600 V Continuous Current 10 A Electrical Connections 112"-14 NPTF, PG13.5, or ISO M20. For metric threads, add M after the W on all types. Standards/Ratings CE, IEC 60957.5.1, UL 508, CSA 3211-03. UL Marine Listed for use on ships/vessels greater than 65 ft long where ignition protection is not required. Temperature Ratings Minimum Maximum Ambient -23 °C (-10 °F) +85 °C (+185 °F) Media Diaphragm -40 °C (-40 °F) +120 °C (+250 °F) Ambient -23 °C (-15 °F) Polarity r *120 °C (+250 °F)	20–675	27 ± 5	2000	GEW2	GEW22			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $								
90-2900 170 ± 15 15000 GFW2 GFW22 170-5600 289± 55 20000 GFW3 GFW23 270-9000 495 ± 70 25000 GFW4 GFW24 Specifications Fluids Controlled Air, water, hydraulic oils, gases, steam (depending on the model) Pressure connection G1/4 (BSP) female, 1/4" NPTF, or 1/2"-14 NPT. For metric threads, add M after the W on all types. Weight (approximate) 3 lb (1.36 kg) Voltage Limits 600 V Continuous Current 10 A Electrical Connections 1/2"-14 NPTF, PG13.5, or ISO M20. For metric threads, add M after the W on all types. Standards/Ratings CE, IEC 60957.5.1, UL 508, CSA 3211-03. UL Marine Listed for use on ships/vessels greater than 65 ft long where ignition protection is not required. Temperature Ratings Minimum Ambient -23 °C (-10 °F) Hedia Piston Piston -26 °C (-15 °F) All with Form Q4 -26 °C (-15 °F) All with Form Q4 -26 °C (-15 °F) Max Differential No., No., No.,	#303 Stainless Steel H	ousing, Viton [®] Fluorocarbon Di	aphragm and O-ring,	Teflon [®] Retainin	ng Ring			
170-5600 289± 55 20000 GFW3 GFW23 270-9000 495 ± 70 25000 GFW4 GFW24 Specifications Fluids Controlled Air, water, hydraulic oils, gases, steam (depending on the model) GFW24 GFW24 Pressure connection G1/4 (BSP) female, 1/4" NPTF, or 1/2"-14 NPT. For metric threads, add M after the W on all types. GFW24 Weight (approximate) 3 lb (1.36 kg) Voltage Limits 600 V Continuous Current 10 A Electrical Connections 1/2"-14 NPTF, PG13.5, or ISO M20. For metric threads, add M after the W on all types. Standards/Ratings CE, IEC 60957.5.1, UL 508, CSA 3211-03. UL Marine Listed for use on ships/vessels greater than 65 ft long where ignition protection is not required. Temperature Ratings Minimum Maximum Ambient -23 °C (-10 °F) +85 °C (+185 °F) Operating Curves Contact Blocks Connection Max. Differential 1 N.C. Same Polarity Form H17 Max. Differential 1 N.C. Same Polarity Group Form H17	20–1000	59 ± 9	10000	GFW1	GFW21			
270-9000 495 ± 70 25000 GFW4 GFW24 Specifications Fluids Controlled Air, water, hydraulic oils, gases, steam (depending on the model) Pressure connection G1/4 (BSP) female, 1/4" NPTF, or 1/2"-14 NPT. For metric threads, add M after the W on all types. Weight (approximate) 3 lb (1.36 kg) Voltage Limits 600 V Continuous Current 10 A Electrical Connections 1/2"-14 NPTF, PG13.5, or ISO M20. For metric threads, add M after the W on all types. Standards/Ratings CE, IEC 60957.5.1, UL 508, CSA 3211-03. UL Marine Listed for use on ships/vessels greater than 65 ft long where ignition protection is not required. Temperature Ratings Minimum Maximum Ambient -23 °C (-10 °F) +85 °C (+185 °F) Media Diaphragm -40 °C (-40 °F) Piston -26 °C (-15 °F) +120 °C (+250 °F) All with Form Q4 -26 °C (-15 °F) Form H17 Max. Differential 1 N.O., Same Same Operating Curves Connection Form H17 Max. Differential 2 N.O., N.G. % Same Same Offerential Differential 2 N.O.,	90–2900	170 ± 15	15000	GFW2	GFW22			
Specifications Fluids Controlled Air, water, hydraulic oils, gases, steam (depending on the model) Pressure connection G1/4 (BSP) female, 1/4" NPTF, or 1/2"-14 NPT. For metric threads, add M after the W on all types. Weight (approximate) 3 lb (1.36 kg) Voltage Limits 600 V Continuous Current 10 A Electrical Connections 1/2"-14 NPTF, PG13.5, or ISO M20. For metric threads, add M after the W on all types. Standards/Ratings CE, IEC 60957.5.1, UL 508, CSA 3211-03. UL Marine Listed for use on ships/vessels greater than 65 ft long where ignition protection is not required. Temperature Ratings Minimum Ambient -23 °C (-10 °F) -23 °C (-10 °F) +85 °C (+185 °F) Media Piston Piston -26 °C (-15 °F) All with Form Q4 -26 °C (-15 °F) All with Form Q4 -26 °C (-15 °F) Max. Differential 1N.O., N.C. Same gag Max. Differential 1N.O., N.C. Same gag 2N.O., N.C. Same Folarity Piston -26 °C (-15 °F) Connection Fixed Differential 2N.O., N.C. Same Folarity Same gag	170–5600	289± 55	20000	GFW3	GFW23			
Fluids Controlled Air, water, hydraulic oils, gases, steam (depending on the model) Pressure connection G1/4 (BSP) female, 1/4" NPTF, or 1/2"-14 NPT. For metric threads, add M after the W on all types. Weight (approximate) 3 lb (1.36 kg) Voltage Limits 600 V Continuous Current 10 A Electrical Connections 1/2"-14 NPTF, PG13.5, or ISO M20. For metric threads, add M after the W on all types. Standards/Ratings CE, IEC 60957.5.1, UL 508, CSA 3211-03. UL Marine Listed for use on ships/vessels greater than 65 ft long where ignition protection is not required. Temperature Ratings Minimum Maximum Ambient -23 °C (-10 °F) +85 °C (+185 °F) Media Diaphragm -40 °C (-40 °F) Piston -26 °C (-15 °F) +120 °C (+250 °F) All with Form Q4 -26 °C (-15 °F) Form H17 Operating Curves Contact Blocks Connection Max. Differential Fixed N.O., Same Foirity Gamma foirity Min Differential Fixed N.O., Same Foirity Gamma foirity Min Differential Fixed N.O., Min Circle foirity Gamma foirity Gamma foirity <	270-9000	495 ± 70	25000	GFW4	GFW24			
Pressure connection G1/4 (BSP) female, 1/4" NPTF, or 1/2"-14 NPT. For metric threads, add M after the W on all types. Weight (approximate) 3 lb (1.36 kg) Voltage Limits 600 V Continuous Current 10 A Electrical Connections 1/2"-14 NPTF, PG13.5, or ISO M20. For metric threads, add M after the W on all types. Standards/Ratings CE, IEC 60957.5.1, UL 508, CSA 3211-03. UL Marine Listed for use on ships/vessels greater than 65 ft long where ignition protection is not required. Temperature Ratings Minimum Ambient -23 °C (-10 °F) -23 °C (-10 °F) +85 °C (+185 °F) Media Diaphragm Piston -26 °C (-15 °F) All with Form Q4 -26 °C (-15 °F) All with Form Q4 -26 °C (-15 °F) Max. Differential 1 N.O., 1 N.C. Pige Max. Differential Fixed Differential Fixed Differential Pixed 2 N.O., Standards/Rating 2 N.O., Standards/Rating 2 N.O., Max. Differential 2 N.O., Fixed 0 N.O., Piterential 2 N.O., Piter	Specifications							
Weight (approximate) 3 lb (1.36 kg) Voltage Limits 600 V Continuous Current 10 A Electrical Connections 1/2"-14 NPTF, PG13.5, or ISO M20. For metric threads, add M after the W on all types. Standards/Ratings CE, IEC 60957.5.1, UL 508, CSA 3211-03. UL Marine Listed for use on ships/vessels greater than 65 ft long where ignition protection is not required. Temperature Ratings Minimum Ambient -23 °C (-10 °F) +85 °C (+185 °F) Media Diaphragm Piston -26 °C (-15 °F) All with Form Q4 -26 °C (-15 °F) All with Form Q4 -26 °C (-15 °F) Max. Differential 1 N.O., 1 N.C. Pige Max. Differential Fixed Differential Fixed 2 N.O., Differential 2 N.O., Piston 2 N.O., An Differential 2 N.O., Pixed 2 N.O., Differential 2 N.O., Min Differential 2 N.O.,	Fluids Controlled	Air, water, hydraulic oils, gases, stea	m (depending on the mod	el)				
Voltage Limits 600 V Continuous Current 10 A Electrical Connections 1/2"-14 NPTF, PG13.5, or ISO M20. For metric threads, add M after the W on all types. Standards/Ratings CE, IEC 60957.5.1, UL 508, CSA 3211-03. UL Marine Listed for use on ships/vessels greater than 65 ft long where ignition protection is not required. Temperature Ratings Minimum Ambient -23 °C (-10 °F) -23 °C (-10 °F) +85 °C (+185 °F) Media Diaphragm Piston -26 °C (-15 °F) All with Form Q4 -26 °C (-15 °F) All with Form Q4 -26 °C (-15 °F) All with Form Q4 -26 °C (-15 °F) Max. Differential 1 N.O., 1 N.C. Fixed Differential Fixed 0 Differential 2 N.O., Win Differential 2 N.O., Win Differential 2 N.O., Win Differential 2 N.O., Bit No 2 N.O., Bit No 2 N.O.,	Pressure connection	G1/4 (BSP) female, 1/4" NPTF, or 1/	2"-14 NPT. For metric thre	ads, add M after the	e W on all types.			
Continuous Current 10 A Electrical Connections 1/2"-14 NPTF, PG13.5, or ISO M20. For metric threads, add M after the W on all types. Standards/Ratings CE, IEC 60957.5.1, UL 508, CSA 3211-03. UL Marine Listed for use on ships/vessels greater than 65 ft long where ignition protection is not required. Temperature Ratings Minimum Ambient -23 °C (-10 °F) -23 °C (-10 °F) +85 °C (+185 °F) Media Diaphragm Piston -26 °C (-15 °F) All with Form Q4 -26 °C (-15 °F) All with Form Q4 -26 °C (-15 °F) Max. Differential 1 N.O., Fixed 1 N.O., Differential 2 N.O., Win Differential 2 N.O., Piston 2 N.O., An Differential 2 N.O., Pixed 2 N.O., Differential 2 N.O., Pixed 2 N.O.,	Weight (approximate)	3 lb (1.36 kg)						
Electrical Connections 1/2"-14 NPTF, PG13.5, or ISO M20. For metric threads, add M after the W on all types. Standards/Ratings CE, IEC 60957.5.1, UL 508, CSA 3211-03. UL Marine Listed for use on ships/vessels greater than 65 ft long where ignition protection is not required. Temperature Ratings Minimum Ambient -23 °C (-10 °F) -23 °C (-10 °F) +85 °C (+185 °F) Media Diaphragm Piston -26 °C (-15 °F) All with Form Q4 -26 °C (-15 °F) All with Form Q4 -26 °C (-15 °F) Max. Differential 1 N.O., Fixed 1 N.O., Piderential 2 N.O., Same 2 N.O., All point 2 N.O., Annot No., No., No., Same 2 N.O., All point 2 N.O., Bifferential 2 N.O., All point 2 N.O.,	Voltage Limits	600 V						
Standards/Ratings CE, IEC 60957.5.1, UL 508, CSA 3211-03. UL Marine Listed for use on ships/vessels greater than 65 ft long where ignition protection is not required. Temperature Ratings Minimum Maximum Ambient -23 °C (-10 °F) +85 °C (+185 °F) Media Diaphragm -40 °C (-40 °F) Piston -26 °C (-15 °F) +120 °C (+250 °F) All with Form Q4 -26 °C (-15 °F) All with Form Q4 -26 °C (-15 °F) Max. Differential 1 N.O., Fixed 1 N.O., Differential 2 N.O., Vin Differential 2 N.O., Annot 2 N.O., Vin Differential 2 N.O.,	Continuous Current	10 A						
Standards/katings 65 ft long where ignition protection is not required. Temperature Ratings Minimum Maximum Ambient -23 °C (-10 °F) +85 °C (+185 °F) Media Diaphragm -40 °C (-40 °F) Piston -26 °C (-15 °F) +120 °C (+250 °F) All with Form Q4 -26 °C (-15 °F) +120 °C (+250 °F) Operating Curves Contact Blocks Connection Max. Differential 1 N.O., 1 N.C. Same Polarity Pige Max. Differential 2 N.O., 2 N.O., N.O., N.C.	Electrical Connections	1/2"-14 NPTF, PG13.5, or ISO M20.	For metric threads, add M	after the W on all ty	/pes.			
Ambient -23 °C (-10 °F) +85 °C (+185 °F) Diaphragm -40 °C (-40 °F) +120 °C (+250 °F) Media Piston -26 °C (-15 °F) +120 °C (+250 °F) All with Form Q4 -26 °C (-15 °F) Fixed Fixed Max. Differential 1 N.O., 1 N.C. Same Polarity Form H17 Min Differential 2 N.O., 3 N.C. Same Polarity Form H17	Standards/Ratings			or use on ships/vess	els greater than			
Diaphragm -40 °C (-40 °F) Media Piston -26 °C (-15 °F) All with Form Q4 -26 °C (-15 °F) Operating Curves Contact Blocks Connection Max. Differential 1 N.O., 1 N.C. Same Polarity Fired Bigging Max. Differential 1 N.O., 1 N.C. Same Polarity Form H17 Min Differential 2 N.O., 3 N.C. N.C. Same Polarity Generation	Temperature Ratings	Minimum	Maximum					
Media Piston -26 °C (-15 °F) +120 °C (+250 °F) All with Form Q4 -26 °C (-15 °F) Contact Blocks Connection Operating Curves Contact Blocks Connection Max. Differential 1 N.O., 1 N.C. Same Polarity Form H17 Win Differential 2 N.O., 3 N.C. No., 1 N.C. Same Polarity Generation (Connection)	Ambient	–23 °C (–10 °F)	+85 °C (+185 °F)					
All with Form Q4 -26 °C (-15 °F) Operating Curves Contact Blocks Max. Differential 1 N.O., 1 N.C. Fixed Same Polarity Min Differential 2 N.O., 2 N.O.,	Diaphragm	-40 °C (-40 °F)						
Operating Curves Contact Blocks Connection Max. Differential 1 N.O., 1 N.C. Same Polarity Form H17 Big Fixed 2 N.O., 2 N.O., N.C. Same Polarity	Media Piston	–26 °C (–15 °F)	+120 °C (+250 °F)					
Max. Differential Fixed Differential Min. Differential 2 N.O., A N.C. Same Polarity N C. N C. Same Polarity N C. N C.	All with Form Q4	–26 °C (–15 °F)						
Max. Differential Fixed Differential Min Differential 2 N.O., I N S A C C C C C C C C C C C C C C C C C C	Operating Curves	Contact Blocks	Connection					
Fixed Differential Min Differential 2 N.O., 2 N.O.,	n Max Differential		Form H17					
	End Differential	2 N.O., 2 N.C. Same Polarity Same Polarity Same Polarity Same Polarity Same Polarity Same Polarity Same Same Same Same Same Same Same Same						
Falling pressure	Falling pressure	Polarity	Form H10	Form H11				
SPDT snap switches contain two double-break contact elements (1 N.O., 1 N.C.) that must be used on circuits of the same polarity. ORG WHT DPDT snap switches contain two electrically separated sets of contact elements allowing use on circuits of opposite polarity. Image: Contain two electrically separated sets of contact elements allowing use on circuits of opposite polarity. Image: Contain two electrically separated sets of contact elements allowing use on circuits of the same polarity. Image: Contain two electrically separated sets of contact elements (1 N.O., 1 N.C.) that must be used on circuits of the same polarity. Image: Contain two electrically separated sets of contact elements (1 N.O., 1 N.C.) that must be used on circuits of the same polarity. Image: Contain two electrically separated sets of contact elements (1 N.O., 1 N.C.) that must be used on circuits of the same polarity. Image: Contain two electrically separated sets of contact elements (1 N.O., 1 N.C.) that must be used on circuits of the same polarity. Acceptable Wire Sizes: 12–22 AWG Recommended Terminal Clamp Torque: 7 lb-in	(1 N.O., 1 N.C.) that must b DPDT snap switches conta contact elements allowing u Each set contains two doub 1 N.C.) that must be used o Acceptable Wire Sizes:	e used on circuits of the same polarity. in two electrically separated sets of use on circuits of opposite polarity. ele-break contact elements (1 N.O., on circuits of the same polarity.		04 80 GRN ₹ GRN ₹ 02 60 BLK 043 10 PWHT	7 lb-in			
(1) The differential adds to the range setting and determines the operating point on rising pressure.	(1) The differential adds to	the range setting and determines the	operating point on rising p	ressure.				

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Table 73:

Fixed Differential



9012GDR

	d as Industrial Control Equi		_,, _ , _	, _, _ , _ , •
	Approximate Differential At	Maximum	Class 90	12 Type
Range on Decreasing	Mid Range	Allowable		
Pressure, psig	psig ⁽¹⁾	Pressure, psig	SPDT	DPDT
Diaphragm Actuated -	Buna-N Nitrile Diaphragm, Zinc		a	
0.2–10	1.0 ± 0.1	100	GDR1	GDR21
1-40	2.4 ± 0.8	100	GDR2	GDR22
1.5–75	4.5 ± 1	240	GDR4	GDR24
3–150	9 ± 1.5	475	GDR5	GDR25
5–250	15 ± 3	750	GDR6	GDR26
13–425	25 ± 7	850	GER1	GER21
20-675	41 ± 10	2000	GER2	GER22
Piston Actuated – #440	Stainless Steel Piston.	1		
#303 Stainless Steel Ho	ousing, Viton [®] Fluorocarbon Di	aphragm and O-ring	, Teflon [®] Retainir	ng Ring
20–1000	89 ± 18	10000	GFR1	GFR21
90–2900	255 ± 30	15000	GFR2	GFR22
170–5600	578 ± 110	20000	GFR3	GFR23
270–9000	788 ± 140	25000	GFR4	GFR24
Specifications				
Fluids Controlled	Air, water, hydraulic oils, gases, stea	m (depending on the mo	del)	
Pressure Connection	G1/4 (BSP) female, 1/4" NPTF, or 1/)	
Weight (approximate)	10 lb (4.54 kg)			
Voltage Limits	600 V			
Continuous Current	10 A			
Electrical Connections	1/2"-14 NPTF, PG13.5, 3/4"-14 NPTI	F. or ISO M20		
Otan dan da (Datin na	CE, IEC 60957.5.1, UL 508, CSA 32		for use on vessels gr	eater than 65 ft
Standards/Ratings	long where ignition protection is requ		0	
Temperature Ratings	Minimum	Maximum		
Ambient	-23 °C (-10 °F)	+85 °C (+185 °F)		
Diaphragm	-40 °C (-40 °F)			
Media Piston	-26 °C (-15 °F)	+120 °C (+250 °F)		
All with Form Q4	–26 °C (–15 °F)	o <i>i</i>		
Operating Curves	Contact Blocks	Connection		
인 Max. Differential	1 N.O.,	Form H17		
	ANO Same	FBrown	1	
Max. Differential Max. Differential Fixed Differential Min. Differential	Polarity	-O-STO-O L White	701	
으 Differential	4 0	Red 4 8		
Min. Differential	4 ω 4 2 N.O., Ι Same I			
	2 N.C.			
	Same Same	Black 🛧 1 🛧 Blue		
Falling pressure	Polarity σ σ ν α	Form H10	Form H11	
SPDT snap switches contain	two double-break contact elements	ORG WILT	ORG PED	
	e used on circuits of the same polarity.			:
	wo electrically separated sets of			201
	se on circuits of opposite polarity. e-break contact elements (1 N.O.,		10 DER 05	1 ⁰⁴
	n circuits of the same polarity.			

NEMA Type 7 & 9 Enclosure, Class I & II, Division 1 & 2, Groups C, D, E, F, G

(1) The differential adds to the range setting and determines the operating point on rising pressure.

NOTE: When pressure settings of the switches must be factory set (Form Y1), and only one setting is identified, specify whether this setting is on increasing or decreasing pressure.



File E12443 CCN NOWT File E12158 CCN NKPZ File E12158 CCN NTHT

Haz. Loc., G•R G•W, G•O, G•G Marine Use, G•W





File LR 25490 Class 3211-03 G•W. G•O. G•G File LR 26817 Class 3218-02 G•R

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9012GAW1

 Table 74:
 Adjustable Differential

NEMA Type 4, 4X, 13 Enclosure

UL Listed and CSA Certified as Industrial Control Equipment

Range on Decreasing	-	Maximum Allowable	Class 9012 T	
Pressure, psig	Approximate at Mid Range	Pressure, psig	SPDT	DPDT
	–Buna-N Nitrile Diaphragm, Zin			
0.2–10	0.6–2	100		GAW21
1–40	1.6–8	100		GAW22
1.5–75	3.5–15	240		GAW24
3–150	6.0–30	475		GAW25
5–250	10.0–49	750		GAW26
13–425	16–90	850	-	GBW21
20–675	27–130	2000	GBW2	GBW22
	0 Stainless Steel Piston. Iousing, Viton [®] Fluorocarbon D	aphragm and O-ring,	Teflon [®] Retaining Ri	ng
20–1000	59–200	10000	· · · · · ·	GCW21
90–2900	170–560	15000		GCW22
170–5600	289–1260	20000	GCW3	GCW23
270-9000	495–1900	25000	GCW4	GCW24
Specifications	·	• 		
Fluids Controlled	Air, water, hydraulic oils, gases, stea	m (depending on the mode	el)	
Pressure Connection	G1/4 (BSP) female, 1/4" NPTF, or 1/			all types.
Weight (approximate)	3 lb (1.36 kg)		,	,,
Voltage Limits	600 V			
Continuous Current	10 A			
Electrical Connections	1/2"-14 NPTF, PG13.5, or ISO M20.	For metric threads, add M	after the W on all types.	
Standards/Ratings	CE, IEC 60957.5.1, UL 508, CSA 32 65 ft long where ignition protection is		r use on ships/vessels gre	eater than
Temperature Ratings	Minimum	Maximum		
Ambient	–23 °C (–10 °F)	+85 °C (+185 °F)		
Diaphragm	-40 °C (-40 °F)	, ,		
Media Piston	–26 °C (–15 °F)	+120 °C (+250 °F)		
All with Form Q4	–26 °C (–15 °F)			
Operating Curves	Contact Blocks	Connection		
ial		Form H17		
Max. Differential Adjustable Differential Min. Differential	1 N.O., 1 N.C. 2 N.O., 2 N.C. 2 N.C.	Red ED 2 6 A Black		
Falling pressure	Same Polarity or or v or	Form H10	Form H11	
	in two double-break contact elements be used on circuits of the same			
DPDT snap switch contain contact elements allowing Each set contains two dou	two electrically separated sets of use on circuits of opposite polarity. ble-break contact elements (1 N.O., on circuits of the same polarity. 12–22 AWG	Recommended Terminal	Clamp Torque: 7 lb-i	n

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9012GAR

Table 75: **Adjustable Differential**

NEMA Type 7 & 9 Enclosure, Class I & II, Division 1 & 2, Groups C, D, E, F, G **UL Listed as Industrial Control Equipment**

Range on Decreasing	Adjustable Differential ⁽¹⁾	Maximum Allowable	Class 90	12 Туре
Pressure, psig	Approximate at Mid Range	Pressure, psig	SPDT	DPDT
Diaphragm Actuated – B	Buna-N Nitrile Diaphragm, Zinc	Plated Steel Housing		
0.2–10	1.0–2	100	GAR1	GAR21
1–40	2.4–8	100	GAR2	GAR22
1.5–75	4.5–15	240	GAR4	GAR24
3–150	9–35	475	GAR5	GAR25
5–250	15–49	750	GAR6	GAR26
13–425	25–90	850	GBR1	GBR21
20-675	41–130	2000	GBR2	GBR22
Piston Actuated – #440 \$ #303 Stainless Steel Hou	Stainless Steel Piston. using, Viton [®] Fluorocarbon Dia	phragm and O-ring, Te	eflon [®] Retaining	g Ring
20–1000	89–200	10000	GCR1	GCR21
90–2900	255–560	15000	GCR2	GCR22
170–5600	578–1260	20000	GCR3	GCR23
270-9000	788–1900	25000	GCR4	GCR24
Specifications				
Fluids Controlled	Air, water, hydraulic oils, gases, stear	m (depending on the model)	
Pressure Connection	G1/4 (BSP) female, 1/4" NPTF, or 1/2"-14 NPT			
Weight (approximate)	10 lb (4.54 kg)			
Voltage Limits	600 V			
Continuous Current	10 A			
Electrical Connections	1/2"-14 NPTF, PG13.5, 3/4"-14 NPTF	⁻ , or ISO M20		
Standards/Ratings	CE, IEC 60957.5.1, UL 508, CSA 32 ⁻ long where ignition protection is requi		use on vessels gr	eater than 65 ft
Temperature Ratings	Minimum	Maximum		
Ambient	–23 °C (–10 °F)	+85 °C (+185 °F)		
Diaphragm	–40 °C (–40 °F)			
Media Piston	–26 °C (–15 °F)	+120 °C (+250 °F)		
All with Form Q4	–26 °C (–15 °F)			
Operating Curves	Contact Blocks	Connection		
Busice Provide Adjustable Differential Differential Differential Differential Min. Differential Min. Differential Falling pressure	1 N.O., 1 N.C. 2 N.O., 2 N.C. 2 N.C. 3 Same Polarity 5 Same Polarity 5 Same Polarity 5 Same Polarity 5 Same	Form H17 Red 4 5 6 4 White 2 2 6 4 Black Black 1 4 Blue Form H10 ORG WHT 0 4 5 6 CRN 0 4 5 6 CRN 0 4 5 0 CR 0 5 0 C	Form H11 ORG RED Total Solution (GRN 2 Control of the solution	

polarity.

DPDT snap switch contain two electrically separated sets of contact elements allowing use on circuits of opposite polarity. Each set contains two double-break contact elements (1 N.O., 1 N.C.) that must be used on circuits of the same polarity. Recommended Terminal Clamp Torque: 7 lb-in

Acceptable Wire Sizes: 12–22 AWG Recommended Terminal Clam
⁽¹⁾ The differential adds to the range setting and determines the operating point on rising pressure.

File E12443

File E12158

File E12158

CCN NOWT Haz. Loc., G•R G•W. G•O. G•G CCN NKPZ Marine Use, G•W CCN NTHT



File LR 25490 Class 3211-03 G•W, G•O, G•G

File LR 26817 Class 3218-02 G•R

C F

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Differential-Pressure Operation

Pressure switches for differential-pressure operation are used to monitor the change in the difference between two pressures. The 9012G differential-pressure switches are unidirectional devices and are used in applications to signal that a predetermined pressure difference has been reached as a result of a widening or increasing difference between the two pressures. They can also be used in applications to signal that a predetermined pressure has been reached as a result of a guidening or increasing difference between the two pressures. They can also be used in applications to signal that a predetermined pressure difference has been reached as a result of a narrowing or decreasing difference between the two pressures.



9012GJW1

Working Pressure Range on decreasing X (upper) actuator	Adjustable Difference on Decreasing Pressure (Adds to	Adjustable Differential Actuates on increasing pressure	Maximum Allowable Pressure	Class 90 SPDT	DPDT
	working pressure) Y (lower) actuator	(adds to adjustable difference)			
iaphragm Actuated –	Buna-N Nitrile Diaphra		teel Housing		
0–75	0.25–10	0.8–2	100	GGW1	GGW21
0–175	0.5–36	5–15	240	GGW4	GGW24
0-500	3–175	22–90	850	GHW1	GHW21
iston Actuated – #440	Stainless Steel Piston	•			
	ousing, Viton [®] Fluoroca		and O-ring, Teflo	on [®] Retaining	Ring
0–5000	15-825	80-200	7500	GJW1	GJW21
pecifications			· · · · ·		
uids Controlled	Air, water, hydraulic oils, g	ases steam (dependi	ing on the model)		
ressure Connection	G1/4 (BSP) female, 1/4" N		ing on the model/		
eight (approximate)	3 lb (1.36 kg)	1 11, 01 1/2 - 1 4 NI 1			
oltage Limits	600 V				
ontinuous Current	10 A				
ectrical Connections	1/2"-14 NPTF, PG13.5, or	ISO M20			
	CE, IEC 60957.5.1, UL 508		Aarine Listed for use	on vessels area	ter than
andards/Ratings	65 ft long where ignition pr			on veccele grea	
emperature Ratings	Minimum	Maximum			
mbient	–23 °C (–10 °F)	+85 °C (+185 °F)			
Diaphragm	-40 °C (-40 °F)				
edia Piston	–26 °C (–15 °F)	+120 °C (+250 °F)			
All with Form Q4	–26 °C (–15 °F)				
perating Curves	Contact Blocks	1	Connection		
			Form H17		
Max. Differential Adjustable Differential Min. Differential	1 N.O., 1 N.C. 2 N.O., 2 N.O., 2 N.C.	ity • 4 ω 4 e []		(2 1) 3 4) Black	
Falling pressure	Sam Polar 51 o		Form H10	Form	H11
N.C.) that must be used o PDT snap switch contain t ements allowing use on ci	n two double-break contact e n circuits of the same polarit wo electrically separated set rouits of opposite polarity. Ea nts (1 N.O., 1 N.C.) that mus	y. s of contact ach set contains two	0480 _{BLK} 0260 10 0510 04 0510 0510		τ
the same polarity.	12–22 AWG				7 lb-in

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9012GKW1

Dual-Stage Operation

The 9012G dual-stage pressure switches are designed for use in applications where two separate pressure operations must be controlled by a single pressure monitoring device. These controls are most commonly used where dual functions are required or in sequencing applications such as alarm shutdowns. The spread between the two stages is adjustable, but the differential between the high (rising) and low (falling) operating points of each stage is fixed.

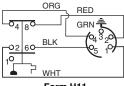
Table 77: Fixed Differential NEMA Type 4, 4X, 13 Enclosure UL Listed and CSA Certified as Industrial Control Equipment

Range Setting	Adjustable Spread		offerential	Maximum	SPDT Each
Pressure limits between	Add to the range setting		operating point to proximate high	Allowable	Stage
which Stage 1 can be adjusted to operate on	to obtain the decreasing		nt for each stage	Pressure	Stage
decreasing pressure	operating point of Stage 2	Stage 1	Stage 2	Flessure	Туре
•••	- Buna-N Nitrile Diaphragn				.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
0.2–10	1-5	1.0 ± 0.2	1.5 ± 0.4	100	GKW1
1–40	4–20	4.0 ± 1.0	6.0 ± 1.5	100	GKW2
1.5–75	6–30	5.0 ± 1.5	8.0 ± 2.0	240	GKW4
3–150	12–75	8.0 ± 2.0	12 ± 3	475	GKW5
5–250	22–110	14 ± 3	21 ± 5	750	GKW6
13–425	40–180	20 ± 4	30 ± 7.5	850	GLW1
20–675	45–250	30 ± 6	45 ± 11	2000	GLW2
	0 Stainless Steel Piston.			0	
	lousing, Viton [®] Fluorocarl		-		
20–1000	50–300	50 ± 10	75 ± 19	10000	GMW1
90–2900	140-800	140 ± 30	210 ± 52	15000	GMW2
170–5600	300–1700	275 ± 60	400 ± 100	20000	GMW3
270–9000	500–2500	400 ± 80	800 ± 150	25000	GMW4
Specifications					
Fluids Controlled	Air, water, hydraulic oils, gas	es, steam (depend	ing on the model)		
Pressure Connection	G1/4 (BSP) female, 1/4" NPT	F, or 1/2"-14 NPT			
Weight (approximate)	3 lb (1.36 kg)				
Voltage Limits	600 V				
Continuous Current	10 A				
Electrical Connections	1/2"-14 NPTF, PG13.5, or ISC	O M20			
Standards/Ratings	CE, IEC 60957.5.1, UL 508, 0 long where ignition protection		Marine Listed for use	e on vessels grea	ater than 65 ft
Temperature Ratings	Minimum	Maximum			
Ambient	–23 °C (–10 °F)	+85 °C (+185 °F)			
Diaphragm	–40 °C (–40 °F)				
Media Piston	–26 °C (–15 °F)	+120 °C (+250 °F	F)		
All with Form Q4	–26 °C (–15 °F)				
Operating Curves	Contact Blocks				
Bigger Max. Differential Bigger Fixed Differential Differential Bigger Min. Differential	1 N.O., Sam Sam	u ↓	Acceptable Wire 12–22 AWG	Sizes:	
Dillerentia	- Jan	e •			

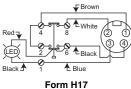
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Industrial Pressure Switches 9012G Pressure Switches

ORG	WHT
O4 80 BLK	≑GRN
	C ₄ 3 20 5 19
	RED
Form H	10



Form H11



Modification		Applies To	Forr
Lock on rising pressure, manual reset only		Available on GDW, GDWM, GEW, GEWM, GFW, GFWM onl	y E3
120 Vac or Vdc neor	nilot light	Available on all GAW thru GMW and clear lens	
	i pilot light	GAWM thru GFWM red len	s G18
24 Vdc only LED		For pilot light conversion kits: clear lens	
		See 9998PC306 through 308 red len	s G22
24 Vdc LED pilot light with green lens		Class 9012 GAW–GMW and GAWM–GFWM, or Class 9016 GAW	G23
SPDT snap switch ra (minimum differential	ated 1.1 A at 125 Vdc doubles)	Available on GAR thru GFR, GAW thru GJW, GAWM thru GFWM	НЗ
receptacle at our conv	receptacle) or interchangeable Crouse-Hinds renience. For use with Brad Harrison #41306, 41307, 41308 or equal	Available on GAW thru GJW single pole devices only See diagrams at left	H1 or H1
Micro connector, 4-p	pin, for 24 Vdc pilot light	G•W (single pole only), except GAW2 and Form B2.	H1
External range	With knob	GAW thru GFW, GAWM thru GFWM, GKW thru GMW	
adjustment with range scale window	Slotted for screwdriver	GAW thru GFW, GAWM thru GFWM, GKW thru GMW	K 1
Pg 13.5 conduit thre connection	ad and ¼-19 BSP pressure	GAW thru GFW, GKW thru GMW	M1
	Standard Buna-N Nitrile diaphragm	GAR, GBR, GDR, GER, GAW, GBW, GDW, GEW, GGW, GHW, GAWM, GBWM, GDWM, GEWM, GKW, GLW	
#316 stainless Ethylene propylene diaphragm		Available on all GGW, GHW except GGW-1, 21. Available on all GAR, GBR, GDR, GER, GAW, GBW, GDW, GEW, GAWM, GBWM, GDWM, GEWM, GKW, GLW except Types 1 and 21	
	Viton [®] fluorocarbon diaphragm	GAR, GAW, GBR, GBW, GDR, GDW, GER, GEW, GGW, GHW, GAWM, GBWM, GDWM, GEWM, GKW, GLW	
Range scale window	(standard with Forms K and K1)	GAW thru GMW, GAWM thru GFWM	
	ng specified special setting, specify whether this g or decreasing pressure.)	All 9012G	Yí
	1/4"-18 NPT external thread	GAR, GAW, GDR, GDW, GGW, GKW Not available in combination with Forms Q1, Q3, Q4	Z
Pressure connection	1/2"-14 NPT external thread, 1/4"-18 NPTF internal thread	GAR, GAW, GDR, GDW, GGW, GKW Not available in combination with Forms Q1, Q3, Q4	Z1
7/16"-20 UNF-2B internal thread		GAR thru GFR; GAW thru GMW Not available in combination with Forms Q1, Q3, Q4	Z18

Table 78: 9012G Machine Tool Modifications

Table 79:Factory Modifications for Renewal Parts Kits for Class 9012 Pressure Switches
Suffixes for renewal parts kits, see page 26.

SPDT span switch rated 1.1.4 at 125 Vdc		Applies to Parts Kit Type	Form
		PC313	H3
	Ctandard Duna N Nitrila dianhragm	PC177–179, PC268, 269	01
	Standard Buna-N Nitrile diaphragm	PC265–267	Q1
#316 stainless steel	Ethylene propulene diaphrogen	PC177–178, PC268, 269	Q3
flange	Ethylene propylene diaphragm	PC266, 267	
	Viton [®] fluorocarbon diaphragm	PC177–178, PC268, 269	0.1
		PC265–267	Q4
	1/4"-18 NPT external thread	PC265–269	Z
Pressure connection	1/2"-14 NPT external thread, 1/4"-18 NPTF internal thread	PC265–269	Z16
	7/16"-20 UNF-2B internal thread	PC177, 178, PC265–273	Z18

Table 80: Class 9049 Accessories for 9012G Pressure Switches

Description	Туре
Stainless steel surge reducer for use on oils, coolants, and hydraulic fluids (not recommended for air or water)	A26S

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SQUARE D

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9012GRG5

Open Type or NEMA Type 1 Enclosure

UL Listed and CSA Certified as Industrial Control Equipment

Range on Decreasing			Class 9	ss 9012 Type	
Pressure, psig	At Mid Range, psig	Pressure, psig	Open Type	NEMA Type 1	
Diaphragm Actuated –	Buna-N Nitrile Diaphragm, Zinc	Plated Steel Housing			
0.2–10	0.4 ± 0.1	100	GR01	GRG1	
1–40	1.2 ± 0.3	100	GRO3	GRG3	
1.5–75	2.2 ± 0.4	240	GRO4	GRG4	
3–150	4.2 ± 1	475	GR05	GRG5	
5–250	7.4 ± 2	750	GRO6	GRG6	
13–425	13 ± 3	850	GSO1	GSG1	
20–675	19 ± 5	2000	GSO2	GSG2	
	Stainless Steel Piston. Dusing, Viton [®] Fluorocarbon Di	aphragm and O-Ring,	Teflon [®] Retain	ing Ring.	
20–1000	49 ± 10	10000	GTO1	GTG1	
90–2900	141 ± 15	15000	GTO2	GTG2	
170–5600	200 ± 40	20000	GTO3	GTG3	
270–9000	350 ± 45	25000	GTO4	GTG4	
Specifications					
Fluids Controlled	Air, water, hydraulic oils, gases, stea	m (depending on the mode	l)		
Pressure Connection	G1/4 (BSP) female, 1/4" NPTF, or 1/2"-14 NPT				
Weight (approximate)	Type 1: 2 lb (0.91 kg); Open: 1.7 lb (0.77)				
Voltage Limits	600 V				
Continuous Current	10 A				
Electrical Connections	1/2" conduit entry, unthreaded				
Standards/Ratings	CE, IEC 60957.5.1, UL 508, CSA 32	11-03			
Temperature Ratings	Minimum	Maximum			
Ambient	–23 °C (–10 °F)	+85 °C (+185 °F)			
Diaphragm	–40 °C (–40 °F)				
Media Piston	–26 °C (–15 °F)	+120 °C (+250 °F)			
All with Form Q4	–26 °C (–15 °F)	1			
Operating Curves	Contact Blocks				
Max. Differential Fixed Differential Min. Differential	SPDT o form C o contacts	Acceptable Wire Sizes: 12–22 AWG			
Min. Differential Falling pressure		Recommended Terminal 7 lb-in	Clamp Torque:		

(1) Determines the operating point on rising pressure.







SQUARE D

File LR 25490 Class 3211-03



9012GNO5



9012GQO2



9012GNG1

Table 82:	Adjustable Differential
	Open Type or NEMA Type 1 Enclosure
	UL Listed and CSA Certified as Industrial Control Equipment

Range on		Approximate Mid Range ⁽¹⁾	Maximum	Class 9	012 Type		
Decreasing Pressure		Differential (adds to the	Allowable Pressure				
psig		decreasing set point)	psig	Open Type	NEMA Type 1		
Diaphr	-	Buna-N Nitrile Diaphragm, Zin		-			
	0.2–10	0.4–0.9	100	GNO1	GNG1		
	1–40	1.2–3.6	100	GNO3	GNG3		
	1.5–75	2.2–6.6	240	GNO4	GNG4		
	3–150	4.2–13.2	475	GNO5	GNG5		
	5–250	7.4–33.6	750	GNO6	GNG6		
	13–425	13–37.2	850	GPO1	GPG1		
	20–675	19–58.8	2000	GPO2	GPG2		
		Stainless Steel Piston.					
#303 S	stainless Steel Ho	ousing, Viton [®] Fluorocarbon [Diaphragm and O-Ring	g, Teflon [®] Retai	ning Ring.		
	20–1000	49–150	10000	GQO1	GQG1		
	90–2900	141–455	15000	GQO2	GQG2		
	170–5600	200–950	20000	GQO3	GQG3		
	270–9000	350–1400	25000	GQO4	GQG4		
Speci	fications						
Fluids (Controlled	Air, water, hydraulic oils, gases, steam (depending on the model)					
Pressu	re Connection	G1/4 (BSP) female, 1/4" NPTF, or 1/2"-14 NPT					
Weight	(approximate)	Type 1 : 2 lb (0.91 kg); Open : 1.7 lb (0.77)					
Voltage	Limits	600 V					
Continu	uous Current	10 A					
Electric	al Connections	1/2" conduit entry, unthreaded					
Standa	rds/Ratings	CE, IEC 60957.5.1, UL 508, CSA 3211-03					
Tempe	erature Ratings	Minimum	Maximum				
Ambier	nt	–23 °C (–10 °F)	+85 °C (+185 °F)				
	Diaphragm	-40 °C (-40 °F)					
Media	Piston	–26 °C (–15 °F)	+120 °C (+250 °F)				
	All with Form Q4	–26 °C (–15 °F)	· · · · ·				
Operat	ting Curves	Contact Blocks					
ressure	Nax. Differential Adjustable Differential	SPDT o form C	Acceptable Wire Sizes: 12–22 AWG				
Risi	Min. Differential Falling pressure	contacts	Recommended Termina 7 Ib-in	Il Clamp Torque:			
(1) Det	termines the operatin	g point on rising pressure.	·				

Table 83: Available Modifications for 9012G Open Type or NEMA Type 1 Enclosure UL Listed and CSA Certified as Industrial Control Equipment

Modification	Applies to	Form
Standard Buna-N Nitrile diaphragm in #316 stainless steel housing	GNG, GNO, GPG, GPO, GRG, GRO, GSG, GSO	Q1
Ethylene propylene diaphragm in #316 stainless steel housing	Not available on GNG, GNO, GRG, GRO1. Available on all other GNG, GNO, GPG, GPO, GRG, GRO, GSG, GSO	Q3
Viton [®] fluorocarbon diaphragm in #316 stainless steel housing	GNG, GNO, GPG, GPO, GRG, GRO, GSG, GSO	Q4
1/4-18 NPT external thread pressure connection	GNG, GNO, GRG, GRO	Z
¹ / ₂ -14 NPT external thread, ¹ / ₄ -18 NPTF internal thread pressure connection. Standard actuator only.	GNG, GNO, GRG, GRO	Z16
V_{16} -20 UNF-2B internal thread pressure connection	GNG, GNO, GPG, GPO, GQG, GQO, GRG, GRO, GSG, GSO, GTG, GTO	Z18

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SQUARE D

9016G Vacuum Switches

9016GAW Switches for Sensitive Control Applications



9016GAW vacuum switches have double throw contacts. Normally open and normally closed circuits allow the use of these controls for standard or reverse action applications. **Standard controls** can be mounted from the front using the bracket provided. Two mounting screws are required for firm attachment to any smooth, flat surface. Allowance must be made for flange projection. **Controls with the Form F modification** include two mounting feet with 9/32" mounting holes on 3–3/4 in. centers. The Range and Differential adjustments are accessed by removing the front cover. Maximum allowable positive pressure: 100 psig. Diaphragms are oil resisting, nitrile butadiene rubber (Buna-N). For electrical ratings and temperature limitations, see Table 68 on page 83. For dimensions and modifications, see page 99.

9016GAW2



9016GAR1

Table 84: 9016GAW Vacuum Switch for Control Applications, Diaphragm Actuated

Range on Decreasin	Adjustable Di	ifferential			Class 90)16 Type		
	Vacuum (inHg) Adds to Range ⁽¹⁾ (inHg)		Contact	Pipe Tap	NEMA Encl	osure Type		
	@ Minimum Range	@ Mid-Range	Arrangement	(NPTF)	4, 4X & 13			
0–28.7	0.8–9	1.3–7.4	1 N.O.–1 N.C.	1⁄4-18	GAW1	GAR1		
0–25	5–20	1	1 N.O1 N.C.	1⁄4-18	GAW2	N/A		
0–28.3	1–9	1.7–7.4	2 N.O2 N.C.	1⁄4-18	GAW21	GAR21		
0–25	5–20		2 N.O2 N.C.	1⁄4-18	GAW22	N/A		
Specifications								
Fluids Controlled		Air, water, hydraulic oils, gases, steam (depending on the model)						
Pressure Connection	G1/4 (BSP) female, 1	/4" NPTF, or 1/2"	-14 NPT					
Weight (approximate)	Type 4, 4X, and 13: 3	ilb (1.36 kg); Typ	e 7 & 9: 10 lb (4.5	64 kg)				
Voltage Limits	600 V							
Continuous Current	10 A							
Electrical Connections	1/2"-14 NPTF, PG13.			on NEMA 7 8	k 9 only)			
Standards/Ratings	CE, IEC 60957.5.1, U	IL 508, CSA 3211	-03					
Temperature Ratings	Minimum		Maximum					
Ambient	–23 °C (–10 °F)		+85 °C (+185 °F)				
Diaphragm	–40 °C (–40 °F)							
Media Piston	–26 °C (–15 °F)		+120 °C (+250 °l	F)				
All with Form Q4	–26 °C (–15 °F)							
Operating Curves	Contact Blocks		Connection Form H17					
enssel Max. Differential Max. Differential Differentia Min. Differential		Same Polarity	Red ED 2 6 Black 1 1	Brown White Black Blue				
Falling pressure	G CI	Same Polarity	Form H10		Form H11			
SPDT snap switches conta (1 N.O., 1 N.C.) that must DPDT snap switch contain elements allowing use on contains two double-break must be used on circuits o	be used on circuits of the two electrically separated ircuits of opposite polarity contact elements (1 N.O. the same polarity.	same polarity. d sets of contact y. Each set		WHT GRN 2 1 RED	ORG RE 04 80 GF 02 60 BLK 10 PWHT	RN \$ •4 ³ 20 •5 10		
Acceptable Wire Sizes:	12–22 AWG		Recommended	Terminal Cla	amp Torque:	7 lb-in		
(1) Add the Differential to the Range to obtain the operating point on increasing vacuum (within vacuum lir The differential increases linearly over the range. The minimum differential doubles with NEMA Type 7								
	az Loc CCN NOWT (GA CCN NKPZ (GA\ CCN NTHT Marine Use (GA\	R) M)	File LR 25490 Class 3211 06 Type GAW only	File LR268 Type GAR	317	CE		

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9016GVG Power Switches



9016GVG1J10

The 9016GVG1 is designed as a companion to the 9036GG float switches in common use on vacuum
heating pumps. Electrical ratings of float and vacuum switch types are equal.

For dimensions and modifications, see page 99.

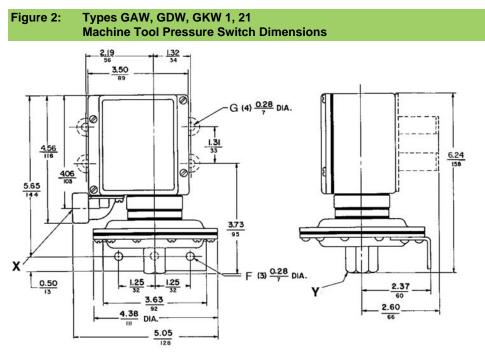
Table 85: 9016GVG Vacuum Switch for Power Applications NEMA Type 1 Enclosure Contacts Open on Increasing Vacuum

Cut-Out Range, inHg	Approximate Adjustable Differential, inHg	Cut-In Range, inHg	Poles	Pressure Connection	Vacuum Setting, inHg	NEMA Type 1 Encl. Class 9016 Type	
					3–8	GVG1J09	
					16.5–25	GVG1J10	
					17–22	GVG1J11	
5–25	5–10 ln. Hg.	0–20	2	1⁄4-18 NPSF	18–23	GVG1J12	
					20–25	GVG1J13	
					Specify other vacuum (minimum order quantity: 4 pieces)	GVG1J99	
Specifi	cations						
Fluids Co	ntrolled	Air, water,	hydraulic	oils, gases, stea	m (depending on the model)	
Pressure	Connection	G1/4 (BSP)) female,	1/4" NPTF, or 1/	2"-14 NPT		
Weight (a	pproximate)	2 lb (0.91)					
Voltage L	imits	600 V					
Continuo	us Current	10 A					
Electrical	Connections	1/4"-18 NPTF or 1/2"-14 NPT					
Standard	s/Ratings	CE, IEC 60957.5.1, UL 508, CSA 3211-03					
Tempera	ature Ratings	Minimum			Maximum		
Ambient		–23 °C (–10 °F)			+85 °C (+185 °F)		
	Diaphragm	–40 °C (–40 °F)					
Media	Piston	–26 °C (–15 °F)			+120 °C (+250 °F)		
	All with Form Q4	–26 °C (–15 °F)					
Operating Curves		Contact Blocks					
Bised Differential Max. Differential Differential Nin. Differential Falling pressure		DPST	∽┣┨		Acceptable Wire Sizes: 8–14 AWG Recommended Terminal 22-27 lb-in	Clamp Torque:	

For other ratings and specifications, see page 83.



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X: Conduit connection: G•W = 1/2-14 NPT; G•WM = 20MMBGS4568, Form M12 = Pg13.5; DIN40430. Y: Pressure connection: G•W = 1/4-18 NPTF; G•WM = 8; Form M14 = G 1/4 BS 2779; RP1/4 ISO 711; R 1/4 DIN 2999; GJ 1/4 UN1339.

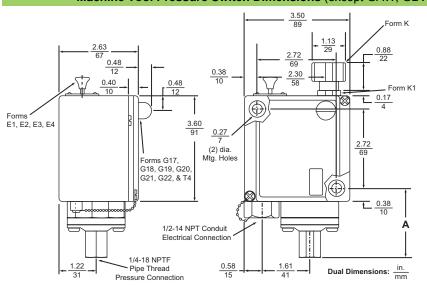


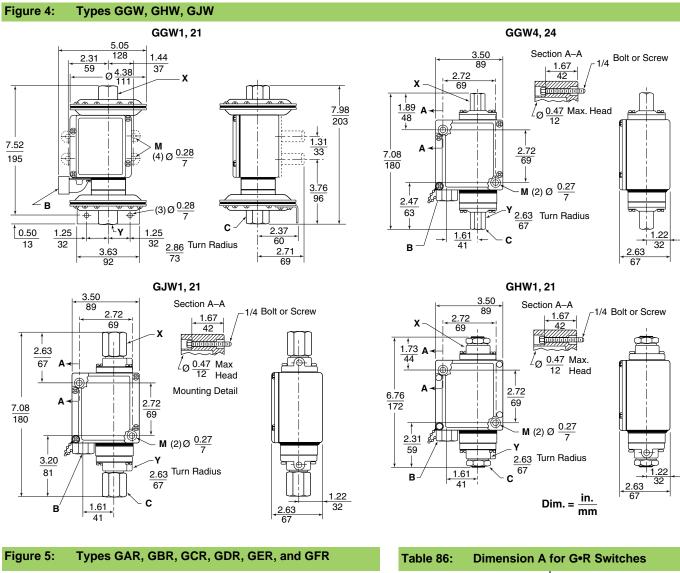
Figure 3: 9012 GAW, GBW, GCW, GDW, GEW, GFW, GKW, GLW, and GMW Machine Tool Pressure Switch Dimensions (except GAW, GDW, GKW 1, 21)

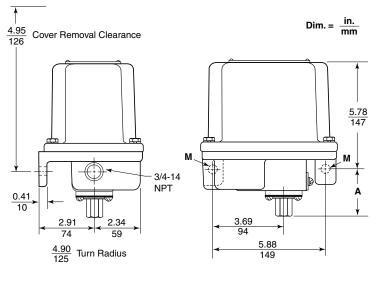
Туре	Dimension A, in. (mm)
GAW, GDW, GKW 2, 4, 5, 6, 22, 24, 25, 26	2.33 (59)
GBW, GEW, GLW 1, 2, 21	2.23 (57)
GCW, GFW, GMW 1, 2, 3, 4, 21, 22, 23, 24	3.15 (80)

NOTE: Dimensions change with metric thread.

For flange and mounting bracket dimensions for low pressure device, see Figure 10.

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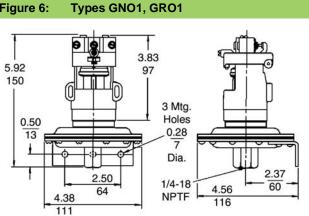
Туре	Dimension A, in. (mm)
GAR1, 2, 21, 22	2.02 (56)
GAR4, 5, 6, 24, 25, 26	1.42 (36)
GBR1, 2, 21, 22; GCR1, 21	1.32 (34)
GCR2, 3, 4, 22, 23, 24	2.24 (57)
GDR1, 2, 21, 22	2.02 (56)
GDR4, 5, 6, 24, 25, 26	1.42 (36)
GER1, 2, 21, 22; GFR1, 21	1.32 (34)
GFR2, 3, 4, 22, 23, 24	2.24 (57)

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Industrial Pressure Switches Dimensions



 \oslash

r'n

1.03

2.06

52

26

<u>4.00</u> 102

1.60

41

Α

Dim. = $\frac{\text{in.}}{\text{mm}}$

9

Types GNO, GRO

0.58 x 0.22

15 6

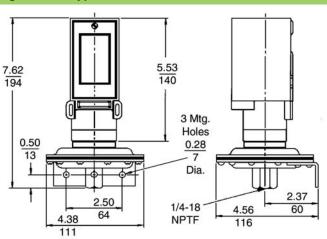
2 mounting

slots

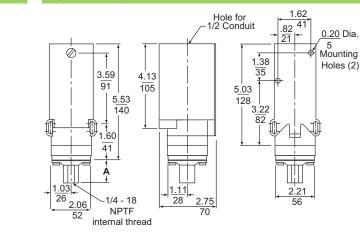
1/4-18 NPTF

internal thread

Figure 7: **Types GNG1, GRG1**



Types GNG, GPG, GQG, GRG, GSG, and GTG Figure 9:



Tab	Table 87: Dimension A for G•O Switches				
Тур	e	Dimension A, in. (mm)			
GNO, GRO 3, 4, 5, 6		1.41 (36)			
GPC), GSO 1, 2, 3	1.31 (33)			
GQ	D, GTO 1, 2, 3, 4	2.24 (57)			

Table 88: Dimension A for G•G Switches		
Dimension A, in. (mm)		
1.41 (36)		
1.31 (33)		
2.24 (57)		

Figure 6:

Figure 8:

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1.17

2.46

63

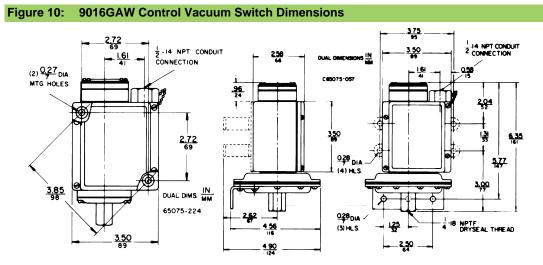
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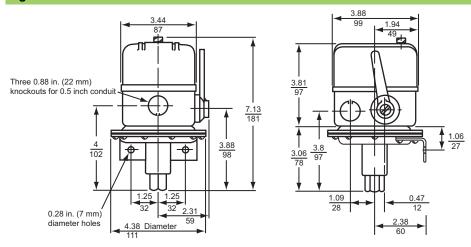
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Description	Form
Mounting feet (GAW 1, 21 only)	F
Viton [®] diaphragm with #316 stainless steel flange	Q4
Range scale window ((standard with Forms K and K1)	V1
Special setting specified (If indicating only one special setting, specify whether this setting is on increasing or decreasing pressure.)	Y1
1/2-18 NPT external thread pressure connection	Z
1/2-14 NPT external thread, 1/4-18 NPTF internal thread pressure connection (standard actuator only)	Z16

Figure 11: 9016GVG Power Vacuum Switch Dimensions





Description	Form
3-way lever plus nameplate with marking: <i>Float only—Vacuum and Float—Continuous</i> (factory modification only)	E
Mounting bracket (for retrofit, order 9049A53 bracket kit)	F
Reverse action, normally open contacts	
1/2 in. male pipe connection (1/2"-18 NPT, external thread) (for retrofit, use 1/2" pipe nipple)	Z

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