



ВИКА България ЕООД, БЦ Сердика, бул. Акад. Иван Гешов 2Е, сгр. 3А, ет.1, офис
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АЕЦ-Козлодуй ЕАД
3320 Козлодуй
Bulgarien

Оферта

QUOB00005299-1

18-Jan-21

Клиент	4111.0011	Номер оферта	QUOB00005299
Номер запитване		Контакт	Александър Стоянов
Дата запитване	14-Jan-21	Телефон	+35 928213812
Контакт	Станислав Димитров	Факс	+359 2 8213813
Телефон	+359 2 97374015	E-mail	aleksander.stoyanov@wika.com
E-mail	SADimitrov@npp.bg		
ДДС номер	BG106513772		
Доставчик			
Условия за плащане	30 дни от доставката	Режим доставка	Speedy
Отстъпка		Условия на доставка	DDP
Валута	BGN		
Метод на плащане			

Поз.	К-во	Единица	Артикул	Ваш № артикул	Срок на доста	Цена/бр.	за Нетна стойнк
10	30.00	Pcs	83163541		5-6 седмици	945.00	/1 28.350,00
			switchGAUGE PGS23.100/160 манометър с ключове, бурдоновата тръба измервателна система от неръждаема стомана Спецификациите в съответствие с проспекта: PV 22.02 and AC 08.01 прекъсвач: магнитно-скачащ контакт, модел 821 първи контакт: H3(2) втори контакт: HO(1) Ел.Връзка: plug sidewise размер: 160 обхват на измерване: обхват на манометър за налягане Обхват: 0...2.5 bar Присъединяване: M20 x 1.5 свързваща позиция: lower mount Демпфериран (напълнен корпус с течност): с Корпус: with pressure blowout disk Стандартен манометър за налягане: International (standard Europe) Клас на точност: class 1.0 Запълване на корпус с флуид: Силиконово масло M50 Прозорец: laminated safety glass Вид защита: IP 65 Допустима температура на флуида: -20 ... +100 °C (-4 ... +212 °F) Допустима околна температура: -20 ... +60 °C манифактурно лого: *WIKAI* Сериен номер на циферблата: Serial number *...* Протокол от изпитване 2.2 по EN 10204				

ВИКА България ЕООД
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Банка
УНИКРЕДИТ БУЛБАНК АД
BG72UNCR70001518942241
BIC UNCRBGSF
ИД Но.: 131407408
ДДС Но.: BG131407408



Оферта **QUOB00005299**
4111.0011 АЕЦ-Козлодуй ЕАД, Козлодуй

Стра 2 / 5
18-Jan-21

Поз. К-во Единица Артикул Срок на доста Цена/бр. за Нетна стойнк

Сертификат Език: English and German
Сертификат за: pressure gauge
Formal certificate: Manufactured according to state-of-the-art
сертификат за инспекция 3.1 EN 10204
тип Сертификат: Inspection certificate acc. to EN 10204 3.1
Сертификат Език: English and German
Сертификат за: pressure gauge
Accuracy: Calibration values listed
Material certificate: Wetted parts material (metal contents) with mill certificate incl. chemical analysis
Pressure and stability test: 1.3 x full scale range; duration 5 minutes

Митнически тарифен номер: 90262040

20	13.00 Pcs	83163542	5-6 седмици	955.00	/1	12.415,00
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switchGAUGE PGS23.100/160
манометър с ключове,
бурдоновата тръба измервателна система от неръждаема стомана
Спецификациите в съответствие с проспекта: PV 22.02 and AC 08.01
прекъсвач: магнитно-скачащ контакт, модел 821
първи контакт: H3(2)
втори контакт: HO(1)
Ел.Връзка: plug sidewise
размер: 160
обхват на измерване: обхват на манометър за налягане
Обхват: 0...60 bar
Присъединяване: M20 x 1.5
свързваща позиция: lower mount
Демпфериран (напълнен корпус с течност): с
Корпус: with pressure blowout disk
Стандартен манометър за налягане: International (standard Europe)
Клас на точност: class 1.0
Запълване на корпус с флуид: Силиконово масло M50
Прозорец: laminated safety glass
Вид защита: IP 65
Допустима температура на флуида: -20 ... +100 °C (-4 ... +212 °F)
Допустима околна температура: -20 ... +60 °C
манифактурно лого: *WIKAI*
Сериен номер на циферблата: Serial number *...*
Протокол от изпитване 2.2 по EN 10204
Сертификат Език: English and German
Сертификат за: pressure gauge
Formal certificate: Manufactured according to state-of-the-art
сертификат за инспекция 3.1 EN 10204
тип Сертификат: Inspection certificate acc. to EN 10204 3.1
Сертификат Език: English and German
Сертификат за: pressure gauge
Accuracy: Calibration values listed
Material certificate: Wetted parts material (metal contents) with mill certificate incl. chemical analysis
Pressure and stability test: 1.3 x full scale range; duration 5 minutes

Митнически тарифен номер: 90262040



Оферта **QUOV00005299**
4111.0011 АЕЦ-Козлодуй ЕАД, Козлодуй

Стра 3 / 5
18-Jan-21

Поз.	К-во	Единица	Артикул	Срок на доста	Цена/бр.	за	Нетна стойнк
30	22.00	Pcs	83163544	5-6 седмици	995.00	/1	21.890,00
<p>switchGAUGE PGS23.100/160 манометър с ключове, бурдоновата тръба измервателна система от неръждаема стомана Спецификациите в съответствие с проспекта: PV 22.02 and AC 08.01 прекъсвач: магнитно-скачащ контакт, модел 821 първи контакт: H3(2) втори контакт: HO(1) Ел.Връзка: plug sidewise размер: 160 обхват на измерване: обхват на манометър за налягане Обхват: 0...250 bar Присъединяване: M20 x 1.5 свързваща позиция: lower mount Демпфериран (напълнен корпус с течност): с Корпус: with pressure blowout disk Стандартен манометър за налягане: International (standard Europe) Клас на точност: class 1.0 Запълване на корпус с флуид: Силиконово масло M50 Прозорец: laminated safety glass Вид защита: IP 65 Допустима температура на флуида: -20 ... +100 °C (-4 ... +212 °F) Допустима околна температура: -20 ... +60 °C манифактурно лого: *WIKAI* Сериен номер на циферблата: Serial number *...* Протокол от изпитване 2.2 по EN 10204 Сертификат Език: English and German Сертификат за: pressure gauge Formal certificate: Manufactured according to state-of-the-art сертификат за инспекция 3.1 EN 10204 тип Сертификат: Inspection certificate acc. to EN 10204 3.1 Сертификат Език: English and German Сертификат за: pressure gauge Accuracy: Calibration values listed Material certificate: Wetted parts material (metal contents) with mill certificate incl. chemical analysis Pressure and stability test: 1.3 x full scale range; duration 5 minutes</p>							
Митнически тарифен номер: 90262040							
40	9.00	Pcs	83163545	6-7 седмици	945.00	/1	8.505,00
<p>switchGAUGE PGS23.100/160 манометър с ключове, бурдоновата тръба измервателна система от неръждаема стомана Спецификациите в съответствие с проспекта: PV 22.02 and AC 08.01 прекъсвач: магнитно-скачащ контакт, модел 821 първи контакт: H3(2) втори контакт: HO(1) Ел.Връзка: plug sidewise размер: 160 обхват на измерване: обхват на манометър за налягане Обхват: 0...40 bar Присъединяване: M20 x 1.5 свързваща позиция: lower mount</p>							



Оферта **QUOB00005299**
4111.0011 АЕЦ-Козлодуй ЕАД, Козлодуй

Стра 4 / 5
18-Jan-21

Поз. К-во Единица Артикул Срок на доста Цена/бр. за Нетна стойнс

Демпфериран (напълнен корпус с течност): с
Корпус: with pressure blowout disk
Стандартен манометър за налягане: International (standard Europe)
Клас на точност: class 1.0
Запълване на корпус с флуид: Силиконово масло M50
Прозорец: laminated safety glass
Вид защита: IP 65
Допустима температура на флуида: -20 ... +100 °C (-4 ... +212 °F)
Допустима околна температура: -20 ... +60 °C
манифактурно лого: *WIKAI*
Сериен номер на циферблата: Serial number *...*
Протокол от изпитване 2.2 по EN 10204
Сертификат Език: English and German
Сертификат за: pressure gauge
Formal certificate: Manufactured according to state-of-the-art
сертификат за инспекция 3.1 EN 10204
тип Сертификат: Inspection certificate acc. to EN 10204 3.1
Сертификат Език: English and German
Сертификат за: pressure gauge
Accuracy: Calibration values listed
Material certificate: Wetted parts material (metal contents) with mill certificate incl. chemical analysis
Pressure and stability test: 1.3 x full scale range; duration 5 minutes

Митнически тарифен номер: 90262040

50	2.00 Pcs	83163546	3-4 седмици	273.00	/1	546,00
<p>Манометри с тръбна пружина, неръждаема стомана сери Модел: 233.50 Спецификациите в съответствие с проспекта: PM 02.02 Измервателна система: stainless steel Запълване на корпус: с Номинална големина: 160 mm Обхват: 0...40 bar Присъединяване: M20 x 1.5 Позиция на конектора: долно Прозорец: laminated safety glass Стрелка: стандартна стрелка Клас на точност: class 1.0 Материал на елемент на налягане: Measuring System 316L Запълване на корпус с флуид: глицерин Вид защита: IP 65 Допустима температура на флуида: + 100 °C Допустима околна температура: -20 ... +60 °C Стандартен манометър за налягане: International (standard Europe) манифактурно лого: *WIKAI* with Serial number Протокол от изпитване 2.2 по EN 10204 Сертификат Език: English and German Сертификат за: pressure gauge Formal certificate: Manufactured according to state-of-the-art сертификат за инспекция 3.1 EN 10204</p>						



Оферта **QUOB00005299**
4111.0011 АЕЦ-Козлодуй ЕАД, Козлодуй

Стра 5 / 5
18-Jan-21

Поз. К-во Единица Артикул Срок на доста Цена/бр. за Нетна стойнк

тип Сертификат: Inspection certificate acc. to EN 10204 3.1
Сертификат Език: English and German
Сертификат за: pressure gauge
Accuracy: Calibration values listed
Material certificate: Wetted parts material (metal contents) with mill certificate incl. chemical analysis
Pressure and stability test: 1.3 x full scale range; duration 5 minutes

Митнически тарифен номер: 90262040

60 5.00 Pcs 83163547 3-4 седмици 273.00 /1 1.365,00

Манометри с тръбна пружина, неръждаема стомана
серии
Модел: 233.50
Спецификациите в съответствие с проспекта: РМ 02.02
Измервателна система: stainless steel
Запълване на корпус: с
Номинална големина: 160 mm
Обхват: 0...250 bar
Присъединяване: M20 x 1.5
Позиция на конектора: долно
Прозорец: laminated safety glass
Стрелка: стандартна стрелка
Клас на точност: class 1.0
Материал на елемент на налягане: Measuring System 316L
Запълване на корпус с флуид: глицерин
Вид защита: IP 65
Допустима температура на флуида: + 100 °C
Допустима околна температура: -20 ... +60 °C
Стандартен манометър за налягане: International (standard Europe)
манифактурно лого: *WIKAI*
with Serial number
Протокол от изпитване 2.2 по EN 10204
Сертификат Език: English and German
Сертификат за: pressure gauge
Formal certificate: Manufactured according to state-of-the-art
сертификат за инспекция 3.1 EN 10204
тип Сертификат: Inspection certificate acc. to EN 10204 3.1
Сертификат Език: English and German
Сертификат за: pressure gauge
Accuracy: Calibration values listed
Material certificate: Wetted parts material (metal contents) with mill certificate incl. chemical analysis
Pressure and stability test: 1.3 x full scale range; duration 5 minutes

Митнически тарифен номер: 90262040



Нетна стойност на стоките
Нетна стойност
ДДС - 20 %
Total gross amount

BGN
73,071.00
73,071.00
14,614.20
87,685.20

Валидна до: 13-Feb-21



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Банка
УНИКРЕДИТ БУЛБАНК АД
BG72UNCR70001518942241
BIC UNCRBGFS
ИД Но.: 131407408
ДДС Но.: BG131407408

Приложение 1 - Техническа спецификация за доставка на манометри.

ТЕХНИЧЕСКИ ПАРАМЕТРИ НА МАНОМЕТРИТЕ

Пълните технически параметри на манометрите са предоставени в приложени брошури **PV 22.02** и **AC 08.01** и брошура **PM 02.02**

СЕРТИФИКАТИ И ПРОТОКОЛИ ОТ ИЗПИТАНИЯ

ЕС декларация за съответствие

- Директива EMC
- Директива за оборудването под налягане
- Директива за ниско напрежение
- Директива RoHS

Протокол от изпитване 2.2 по EN 10204; Език на сертификата: английски и немски; Сертификат за: манометър

Официален сертификат: Произведено в съответствие с най-съвременните технологии

Сертификат за проверка 3.1 по EN 10204

Тип сертификат: Сертификат за инспекция съгл. по DIN EN 10204 3.1; Език на сертификата: английски и немски; Сертификат за: манометър

Точност: Изброени стойности за калибриране

Сертификат за материал: Материал с мокри части (метално съдържание) със сертификат за фреза, вкл. химичен анализ

Изпитване за налягане и стабилност: 1,3 x обхват на скалата; продължителност 5 минути

ЗАБЕЛЕЖКИ:

- 1) Предлаганите манометри са запълнени със силиконово масло M50 поради условия на работа „подложени на непрекъснати вибрации“, съгласно т.1.1 от Техническото задание.
По ваше желание като опция предлагаме същите манометри и без пълнеж.
- 2) Работният диапазон на манометрите е (-20, +60)°C за температура на околната среда и (-20, +100)°C за измерваната среда.
Като опция можем да предложим нискотемпературна версия на манометър с работен диапазон (-70, +60)°C, при изискване за непрекъсната работа при -25°C.
Използването на нискотемпературна версия ще доведе до промяна в цната.

ТЕХНИЧЕСКА СПЕЦИФИКАЦИЯ

Технически характеристики		Забележка	Предложение
1.	ЕКМ -30 бр. (АТ и реактори)		30 бр.
1.1.	Манометър		PGS23.100/160 (реф. 83163541)
			Брошури PV 22.02 and AC 08.01
	Диаметър	160мм	160мм
	Работен диапазон	0+2,5bar	0÷2,5bar
	Клас на точност	1.0	1.0
	Степен на защита	IP 65	IP 65
	Корпус	Неръждаема стомана	Неръждаема стомана
	Присъединяване на манометъра	Радиално М20х1,5	Радиално М20х1,5
	Присъединяване на кабела	Радиално чрез European Universal Plug Conector	Клема 1 -ниска оставка Клема 2-висока оставка Клема 4-общ
	Пълнеж на корпуса	Без пълнеж	Запълнен със силиконово масло М50 (виж заб.1 по-горе)
		Без пълнеж	Без пълнеж (опция)
	Работен температурен диапазон	(-25, +50)°C	(-20, +60)°C
1.2.	Граничен сигнализатор за две стойности		
	Контакти: Два броя магнитноскачащи, първия да е НЗ, а втория НО. Работното налягане е между двете оставки. При спадане на налягането под първа оставка, първи контакт се затваря. При повишаване на налягането над втора оставка, втори контакт се затваря.		Да, виж брошура AC 08.01 (прикачена)
	Номинално напрежение	250V AC/DC	250V AC/DC
	Максимален работен ток	2 A AC/DC	2 A AC/DC
	Максимален комутационен ток	1 A AC/DC	1 A AC/DC
	Мощност на контактите	60W/VA	60W/VA

Технически характеристики		Забележка	Предложение
	Преходно съпротивление на контактите	≤100mΩ	≤100mΩ
2.	ЕКМ (компресори) – 13 бр.		13 бр.
2.1.	Манометър III степен		PGS23.100/160 (реф. 83163542)
			Брошури PV 22.02 and AC 08.01
	Диаметър	160мм	160мм
	Работен диапазон	0+60bar	0÷60bar
	Клас на точност	1.0	1.0
	Степен на защита	IP 55 (54)	IP 65
	Корпус	Неръждаема стомана	Неръждаема стомана
	Присъединяване на манометъра	Радиално M20x1,5	Радиално M20x1,5
	Присъединяване на кабела	Радиално чрез European Universal Plug Conector	Клема 1 -ниска оставка Клема 2-висока оставка Клема 4-общ
	Пълнеж на корпуса	Без пълнеж	Запълнен със силиконово масло M50 (виж заб.1 по-горе)
		Без пълнеж	Без пълнеж (опция)
	Работен температурен диапазон	(-25, +50)°C	(-20, +60)°C
2.2.	Граничен сигнализатор за две стойности		
	Контакти: Два броя магнитноскачащи, първия да е НЗ, а втория НО. Работното налягане е между двете оставки. При спадане на налягането под първа оставка, първи контакт се затваря. При повишаване на налягането над втора оставка, втори контакт се затваря.		Да, виж брошура AC 08.01 (прикачена)
	Номинално напрежение	250V AC/DC	250V AC/DC
	Максимален работен ток	2 A AC/DC	2 A AC/DC
	Максимален комутационен ток	1 A AC/DC	1 A AC/DC
	Мощност на контактите	60W/VA	60W/VA
	Преходно съпротивление на контактите	≤100mΩ	≤100mΩ

	Технически характеристики		Забележка	Предложение
3.	ЕКМ (компресори) – 22 бр.			22 бр.
3.1.	Манометър IV степен и командване			PGS23.100/160 (реф. 83163544)
				Брошури PV 22.02 and AC 08.01
	Диаметър	160мм		160мм
	Работен диапазон	0+250bar		0÷250bar
	Клас на точност	1.0		1.0
	Степен на защита	IP 55 (54)		IP 65
	Корпус	Неръждаема стомана		Неръждаема стомана
	Присъединяване на манометъра	Радиално M20x1,5		Радиално M20x1,5
	Присъединяване на кабела	Радиално чрез European Universal Plug Conector	Клема 1 -ниска оставка Клема 2-висока оставка Клема 4-общ	Клема 1 -ниска оставка Клема 2-висока оставка Клема 4-общ
	Пълнеж на корпуса	Без пълнеж		Запълнен със силиконово масло M50 (виж заб.1 по-горе)
		Без пълнеж		Без пълнеж (опция)
	Работен температурен диапазон	(-25, +50)°C		(-20, +60)°C
3.2.	Граничен сигнализатор за две стойности			
	Контакти: Два броя магнитноскачащи, първия да е НЗ, а втория НО. Работното налягане е между двете оставки. При спадане на налягането под първа оставка, първи контакт се затваря. При повишаване на налягането над втора оставка, втори контакт се затваря.			Да, виж брошура AC 08.01 (прикачена)
	Номинално напрежение	250V AC/DC		250V AC/DC
	Максимален работен ток	2 A AC/DC		2 A AC/DC
	Максимален комутационен ток	1 A AC/DC		1 A AC/DC

	Мощност на контактите	60W/VA		60W/VA
	Преходно съпротивление на контактите	≤100mΩ		≤100mΩ

	Технически характеристики		Забележка	Предложение
4.	ЕКМ (компресори) – 9 бр.			9 бр.
4.1.	Манометри редуциране			PGS23.100/160 (реф. 83163545)
				Брошури PV 22.02 and AC 08.01
	Диаметър	160мм		160мм
	Работен диапазон	0+40bar		0+40bar
	Клас на точност	1.0		1.0
	Степен на защита	IP 55 (54)		IP 65
	Корпус	Неръждаема стомана		Неръждаема стомана
	Присъединяване на манометъра	Радиално M20x1,5		Радиално M20x1,5
	Присъединяване на кабела	Радиално чрез European Universal Plug Conector	Клема 1 -ниска оставка Клема 2-висока оставка Клема 4-общ	Клема 1 -ниска оставка Клема 2-висока оставка Клема 4-общ
	Пълнеж на корпуса	Без пълнеж		Запълнен със силиконово масло M50 (виж заб.1 по-горе)
		Без пълнеж		Без пълнеж (опция)
	Работен температурен диапазон	(-25, +50)°C		(-20, +60)°C
4.2.	Граничен сигнализатор за две стойности			
	Контакти: Два броя магнитноскачащи, първия да е НЗ, а втория НО. Работното налягане е между двете оставки. При спадане на налягането под първа оставка, първи контакт се затваря. При повишаване на налягането над втора оставка, втори контакт се затваря.			Да, виж брошура AC 08.01 (прикачена)
	Номинално напрежение	250V AC/DC		250V AC/DC
	Максимален работен ток	2 A AC/DC		2 A AC/DC
	Максимален комутационен ток	1 A AC/DC		1 A AC/DC
	Мощност на контактите	60W/VA		60W/VA

	Преходно съпротивление на контактите	≤100mΩ		≤100mΩ
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	Технически характеристики		Забележка	Предложение
5.	Манометър (компресори) – 2 бр.			2 бр.
5.1.	Манометър контрол налягане балони			PGS233.50 (реф. 83163546)
				Брошура PM 02.02
	Диаметър	160мм		160мм
	Работен диапазон	0+40bar		0+40bar
	Клас на точност	1.0		1.0
	Степен на защита	IP 65		IP 65
	Корпус	Неръждаема стомана		Неръждаема стомана
	Присъединяване на манометъра	Радиално M20x1,5		Радиално M20x1,5
	Пълнеж на корпуса	Без пълнеж		Запълнен със силиконово масло M50 (виж заб.1 по-горе)
		Без пълнеж		Без пълнеж (опция)
	Работен температурен диапазон	(-25, +50)°C		(-20, +60)°C
	Граничен сигнализатор	Без сигнализатори		Без сигнализатори
6.	Манометър (компресори) – 5 бр.			5 бр.
6.1.	Манометър контрол налягане балони			PGS233.50 (реф. 83163546)
				Брошура PM 02.02
	Диаметър	160мм		160мм
	Работен диапазон	0+250bar		0+250bar
	Клас на точност	1.0		1.0
	Степен на защита	IP 65		IP 65
	Корпус	Неръждаема стомана		Неръждаема стомана
	Присъединяване на манометъра	Радиално M20x1,5		Радиално M20x1,5

	Пълнеж на корпуса	Без пълнеж		Запълнен със силиконово масло M50 (виж заб.1 по-горе)
		Без пълнеж		Без пълнеж (опция)
	Работен температурен диапазон	(-25, +50)°C		(-20, +60)°C
4.2.	Граничен сигнализатор	Без сигнализатори		Без сигнализатори

Electrical switch contacts

- Model 821, magnetic snap-action contact
- Model 831, inductive contact
- Model 830 E, electronic contact
- Model 851, reed contact

WIKA data sheet AC 08.01

Applications

- Control and regulation of industrial processes
- Monitoring of plants and switching of circuits
- Indication of limit conditions
- Inductive contact for completely fail-safe switching, even in explosion hazardous areas
- Machine building, general plant construction, chemical industry, petrochemical industry, power plants, mining, on-/offshore and environmental technology

Special features

- High reliability and long service life
- Can be incorporated within all relevant pressure and temperature measuring instruments
- Up to 4 switch contacts per measuring instrument
- Optionally with liquid-filled case for high dynamic pressure loads and vibrations
- Inductive contact also available in safety version and electronic contact for PLCs

Description

Switch contacts (electrical switch contacts) make or break an electric control circuit dependent upon the pointer position of the indicating measuring instrument. The switch contacts are adjustable over the full extent of the scale range (see DIN 16085), and are mounted predominantly below the dial, though also partly on top of the dial.

The instrument pointer (actual value pointer) moves freely across the entire scale range, independent of the setting. The set pointer for the switch point of circular instruments and square panel-mounted instruments can be adjusted using a removable adjustment key in the window. Contacts in flush panel-mounted instruments are adjustable using a screwdriver through the window.



**Pressure gauge model 212.20.100
with switch contact model 821**



**Bimetal thermometer model 55 with
inductive contact model 831**

Contact actuation is made when the actual value pointer travels beyond or below the desired switch point. Instruments with electrical switch contacts can also be delivered with optional special approvals. Depending on the instrument model, e.g. approvals for hazardous areas are available.

Magnetic snap-action contact model 821

Application

These contacts can be used in almost all operating conditions, and even in liquid-damped instruments. The set pointer has an adjustable permanent magnet attached, giving a snap-action characteristic to the contacts, which, furthermore, strengthens the contact pressure. This snap action widely protects the contacts against harmful arc influences, but increases the switching switch hysteresis to 2 % up to 5 % of the measuring span. The switch hysteresis is the difference of the displayed values, measured by reversing the direction of movement and leaving the switch point unchanged. The signal output is achieved either ahead of or behind the movement of the actual value pointer.

Especially in temperature measurement technology, where bimetal measuring systems have only very small actuating forces, and when operating conditions exist in which no vibrations occur, **model 811 sliding contacts** are used. This contact type is not suitable for liquid-damped measuring instruments.

Specifications and loading tables

If the specified data are observed, the switch contacts ensure perfect operation for many years. For higher loads (max. 1,840 VA) and also with instruments with liquid filling, we recommend our model 905.1x contact protection relay (page 9).

In accordance with DIN 16085, requirements on pressure measuring instruments with contacts for switching currents less than 24 V should be agreed specifically between the user and the manufacturer.

For low switching voltages, to maintain switching reliability, the current to be switched should not be less than 20 mA. In order to ensure a high switching reliability of the contacts, even taking ambient influences into account, the switching voltage should not be below 24 V.

When switching inductive or capacitive loads, the usual contact protection measures against contact erosion should be made.

For programmable logic controllers (PLCs), the model 830 E electronic contact is recommended (see page 14 ff.).

Specifications

Limit values for the contact load with resistive load	Magnetic snap-action contact model 821		Sliding contact model 811
	unfilled instruments	filled instruments	unfilled instruments
Rated operating voltage $U_{\text{eff max}}$	250 V	250 V	250 V
Rated current: ¹⁾			
- Switch-on current	1.0 A	1.0 A	0.7 A
- Switch-off current	1.0 A	1.0 A	0.7 A
- Continuous current	0.6 A	0.6 A	0.6 A
Switching power max.	30 W / 50 VA	20 W / 20 VA	10 W / 18 VA
Contact material	Silver-nickel (80 % silver / 20 % nickel / gold-plated)		
Ambient temperature	-20 ... +70 °C		
Number of contacts max.	4		

¹⁾ Values for current ratings shown in the above table apply to instruments with switch version S. For instruments with switch version L, the values should be halved. (For correlation, see Table, Page 3)

Recommended contact load with resistive and inductive loads

Voltage in V (DIN IEC 38) DC / AC	Magnetic snap-action contact model 821						Sliding contact model 811		
	unfilled instruments			filled instruments			unfilled instruments		
	resistive load		inductive load	resistive load		inductive load	resistive load		inductive load
	Direct current	Alternating current	$\cos \phi > 0.7$	Direct current	Alternating current	$\cos \phi > 0.7$	Direct current	Alternating current	$\cos \phi > 0.7$
	mA	mA	mA	mA	mA	mA	mA	mA	mA
220 / 230	100	120	65	65	90	40	40	45	25
110 / 110	200	240	130	130	180	85	80	90	45
48 / 48	300	450	200	190	330	130	120	170	70
24 / 24	400	600	250	250	450	150	200	250	100

Contact material

Depending upon the switching conditions, the switch contacts are subjected to greater or lesser erosion due to the effects of the unavoidable arcing and through mechanical stress. As a result, when selecting the contact material, attention should be paid to the predominant operating conditions. The following contact materials are available:

Silver-nickel composite material

(80 % silver / 20 % nickel / gold-plated)

Material properties:

- Higher hardness and rigidity
- Good erosion resistance
- Low inclination to fuse together
- Low contact resistance

Due to its good balance of properties and wide application possibilities, this composite is used as our standard material.

Platinum-iridium alloy

(75 % platinum, 25 % iridium)

Platinum-iridium is exceptionally chemically resistant, and also hard and very resistant to erosion. It is used for high switching frequencies, high switching powers and in aggressive environments.

Special versions

- Contacts with separate circuits
- Change-over contacts (break or make simultaneously at the set point)
- Contacts fixed
- Contacts coupled
- Contacts with parallel resistance 47 kΩ for cable break monitoring
- Contacts self-cleaning (only with NS 160)
- Contact adjustment lock leaded
- Contact adjustment key fixed
- Connector (instead of cable or cable socket)
- Special contact material platinum-iridium alloy

Allocation of switch version to basic instruments and measuring ranges

(for the determination of limit values, see tables on page 2)

WIKA basic instrument model	Nominal size	Number of contacts in the instrument	Measuring spans	Switch version
2xx.xx	100 and 160	1	≤ 1 bar	L
2xx.xx	100 and 160	1	all others	S
2xx.xx	100 and 160	2	≤ 1.6 bar	L
2xx.xx	100 and 160	2	all others	S
2xx.xx	100	3 or 4	≤ 4 bar	L
2xx.xx	100	3 or 4	all others	S
2xx.xx	160	3 or 4	≤ 2.5 bar	L
2xx.xx	160	3 or 4	all others	S
3xx.xx	160	1 ... 4	all	L
4xx.xx	100 and 160	1 ... 4	all	L
5xx.xx	100 and 160	1 ... 4	all	L
6xx.50	100	1 or 2	≥ 100 mbar	L
7xx.xx	100 and 160	1 ... 4	all	L
55	100 and 160	1 ... 4	all	L
73	100 and 160	1 ... 4	all	L
74	100	1 ... 4	all	L
76	100 and 160	1 ... 4	all	L

Switching functions

The following applies, as a general rule, to the switching functions of the model 821 magnetic snap-action contact and the model 811 sliding contact with our standard settings:





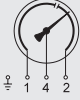


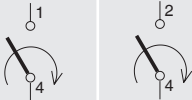



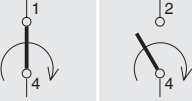




- Index 1** behind the contact model no. means:
Contact makes the circuit when the set point is exceeded.
- Index 2** behind the contact model no. means:
Contact breaks the circuit when the set point is exceeded.
- Index 3** behind the contact model no. means: When the set value is exceeded, one circuit breaks and one circuit makes **simultaneously** (change-over contact).

For switch contacts with multiple contacts, the 1st contact is the one closest to the left start of scale value or end value (for vacuum gauge).

The switching function, described in the following table, follows the **clockwise rotary motion** of the instrument pointer (actual value pointer).

If the actual value pointer moves **anticlockwise**, the **reverse switching function** occurs!

Note: If the switch contacts are to be set (adjusted) anticlockwise, the index figures in brackets must be used in accordance with DIN 16085. Combinations are possible.

Circuit diagram	Switching function on pointer movement in a clockwise direction	Contact model with switching function index for magnetic snap-action contacts and sliding contacts (special version)
Single contact ¹⁾		
	Contact makes when the set point is exceeded	 821.1 and 811.1 (.5)
	Contact breaks when the set point is exceeded	 821.2 and 811.2 (.4)
	Contact changes over (change-over contact), i.e. 1 contact breaks and 1 contact makes when the set point is exceeded	 821.3 and 811.3 (.6)
Double contact ¹⁾		
	1st and 2nd contact makes when the set points are exceeded	 821.11 and 811.11 (.55)
	1st contact makes, 2nd contact breaks when the set points are exceeded	 821.12 and 811.12 (.54)
	1st contact breaks, 2nd contact makes when the set points are exceeded	 821.21 and 811.21 (.45)
	1st and 2nd contact breaks when the set points are exceeded	 821.22 and 811.22 (.44)
Triple contact ¹⁾		
	1st contact breaks, 2nd contact makes, 3rd contact breaks when the set points are exceeded	 821.212 and 811.212 (.454)

1) When ordering, attach the corresponding index of the required switching functions (note order 1st, 2nd, 3rd contact) to the contact model no., see example 821.212.

The **connection terminals** and **connection wires** are marked in accordance with the table above. Protective conductors are always yellow-green. **Mounting options:** see page 20/21

Reed contact model 851

Application

Reed contacts are often used for switching small voltages and currents, since their hermetically sealed design, in combination with contacts in inert gas, cannot become corroded on the contact surfaces.

Their high reliability and low contact resistance make them suitable for a large number of applications. They include, for example, PLC applications, signal conversion in measuring instruments, signal lights, acoustic signal transmitters and many more.

Their hermetically sealed design makes these contacts ideally suited for use at high altitudes. However, the thinner the atmosphere, then the greater must be the contact clearance so that no contact burn occurs.

Reed contacts need no auxiliary power supply and are very insensitive to vibrations, due to their low weight. For 2 contacts, the individual switches are galvanically separated from each other.

Note

Due to its ability to simultaneously switch both the smallest currents and voltages as well as powers of up to 60 watts, this contact form is ideal for applications in which the signal has not yet been exactly defined in the planning phase.

Operating principle

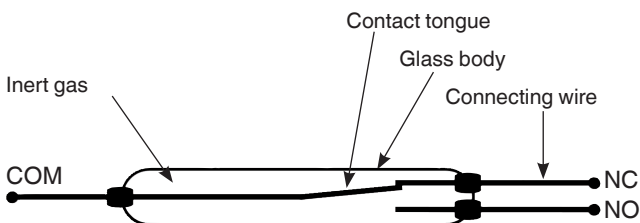
A reed contact consists of three contact tongues (change-over contact, SPDT), made of a ferromagnetic material, which are fused in a glass body under an inert gas atmosphere.

To minimise wear and guarantee a low contact resistance, the contact tongues are provided with a metallic coating in the area of the contact surfaces. The reed contact is actuated by an external magnetic field (for example a permanent magnet) with a sufficient field strength. The switching status is maintained until the magnetic field strength has fallen below a certain value.

Predominantly, WIKA uses mainly bistable and magnetically-biased reed contacts. The bias maintains the signal status until a magnetic field having the opposite magnetic polarity resets the contact.

Functional diagram

Reed contact, SPDT (change-over contact), not activated



COM = common
NC = normally closed
NO = normally open

Due to the hard coating of the contact surface with, for example, ferromagnetic rhodium, the reed contact achieves a very long service life. The number of possible switching cycles of a reed contact depends largely on the level of the electrical load, but, based on experience, is in the range of 10^6 to 10^7 .

If only signal loads or small loads are switched, then switching operations in excess of 10^8 are easily achievable. With switching voltages below 5 V (arcing limit), switching operations beyond 10^9 can be achieved. For capacitive or inductive loads, the use of a protective circuit is required since the resulting current, or voltage spikes would destroy the reed contact or at least significantly reduce its service life. For this, see the chapter on contact protection measures on page 7.

If a magnetic field passes the reed contact, both contact tongues attract each other and close the contact. The electrical current can flow.

If the magnetic field moves away, the field strength drops with increasing distance. The contact remains closed through the bistability. Only a new traverse of the reed contact with a magnetic field in the opposite direction opens the two contact tongues again. The electrical current is interrupted.

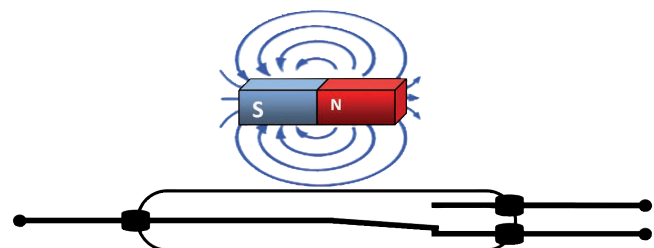
As with other mechanical switches, the reed contact is also not bounce-free. However, the bounce times are shorter than most other mechanical contacts. Nevertheless, this physical property should be considered, especially in PLC applications (keyword: software debounce / button debounce).

Example:

If the switch point for a 10 bar switchGAUGE is set, for example, to 1 bar and the instrument pointer sweeps this value with the magnet in the positive direction, the reed contact will change state and maintain it, even if the pointer continues to 10 bar.

The reed contact will only further change its state if the pointer passes 1 bar in the direction of 0.

Reed contact, SPDT (change-over contact) activated



Specifications, reed contact model 851

This contact can be built-in in the following models:

- 712.15.100
- 712.15.160
- 732.15.100
- 732.15.160
- PGS23.100
- PGS23.160
- PGS63HP.100
- PGS63HP.160
- PGS43,100
- PGS43.160
- PGS43HP.100
- PGS43HP.160
- DPGS43,100
- DPGS43.160
- DPGS43HP.100
- DPGS43HP.160
- APGS43.100
- APGS43.160

Limit values for the contact load with resistive load	
Contact version	Change-over contact
Type of contact	bistable
Max. switching voltage	AC 250 V / DC 250 V
Min. switching voltage	not required
Switching current	≤ 1 A
Min. switching current	not required
Transport current	≤ 2A
cos φ	1
Switching power	60 VA/W
Contact resistance (static)	100 mΩ
Insulation resistance	10 ⁹ Ω
Breakdown voltage	DC 1,000 V
Switching time incl. contact chatter	4.5 ms
Contact material	Rhodium
Switch hysteresis	3 ... 5 %

- The limit values presented here must not be exceeded independently of each other.
- When using two contacts, these cannot be set to the same point. In this case, a minimum clearance of approx. 30° is required.
- The adjustment range of the contacts is 10 ... 90 % of the scale.
- The Switch hysteresis can be set in manufacturing such that the reed contact will actuate exactly at the required switch point. For this, we need the switching direction to be specified on order.
- In the model 700.0x and 230.15 2" pressure gauges, further reed contacts are used. For the specifications, please refer to the data sheets.

Reasons for an overload of magnetic snap-action or reed contacts

General information

Each mechanical switch has 4 physical limits. These are:

- Maximum electrical switching voltage
- Maximum electrical switching current
- Maximum electrical load to be switched
- Maximum mechanical switching frequency

Outside these specified physical limits, the switch should not be operated. Should even only one of these limits be exceeded during operation, the service life of the switch will be shortened. The further that one or more limits are exceeded, the greater the shortening of the life of the switch - even as far as immediate failure.

Causes of electrical overload

Maximum electrical switching voltage

When switching an electrical load, an arc may arise, more or less visible, between the contact surfaces. Due to the resulting, locally limited, high heat, the contact material gradually evaporates during each switching process (material loss, burn-off). The higher the voltage to be switched, the larger are the arcs and thus the contact material evaporates more and faster. The contact will be permanently damaged.

Maximum electrical switching current

When switching an electrical current, the contact surface will be heated through the charge carrier flow (contact resistance). If the maximum permissible switching current is exceeded, the contacts begin to fuse together. This can lead to the welding or sticking of the two contact surfaces. The contact will be permanently damaged.

Maximum electrical power

The maximum electrical power which a contact can switch is defined as the switching voltage multiplied by the switching current. This electrical power heats the contact and should not be exceeded (welding, sticking). The contact will be permanently damaged.

Maximum mechanical switching frequency

The maximum possible switching frequency is dependent upon the wear of the bearing points and also the material fatigue.

Minimum electrical values

Each mechanical contact also has a contact resistance due to impurity layers (impurity-film resistance R_F).

This impurity-film resistance exists through oxidation or corrosion on the contact surfaces and increases the electrical resistance of the switch.

With switching of small loads, this layer is not penetrated.

Only by switching higher voltages and currents is this destroyed. This effect is known as fritting, and the required minimum voltage is the fritting voltage.

If this voltage is not reached when switching, the impurity-film resistance will continue to increase and the switch will cease to work. This effect is reversible.

Further notes

Such electrical overloads can be based, for example, on the following:

- Filament lamps absorb up to 15 times more current at the moment of switching-on than during operation (nominal value).
- Capacitive loads, at the moment of switching on, create a short circuit (long control lines, lines running parallel to each other).
- Inductive loads (relay, fuse, solenoid valve, rolled cable drum, electric motors) generate, on switching, very high voltages (up to 10 times the rated voltage).

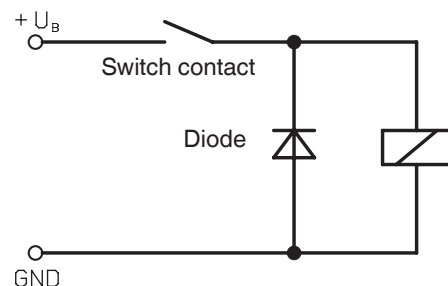
Contact protection measures

Mechanical contacts must not exceed the specified electrical values for switching current and switching voltage, not even for a short time only.

For capacitive or inductive loads we recommend one of the following protective circuits:

1. Inductive load with DC voltage

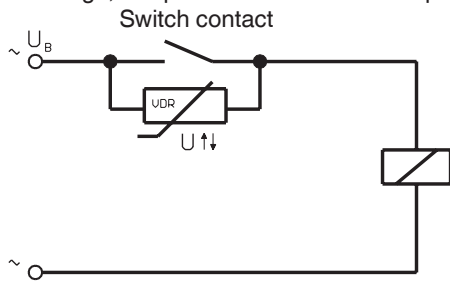
With DC voltage the contact protection can be achieved via a free-wheeling diode, connected in parallel to the load. The polarity of the diode must be arranged so that it closes when the operating voltage is on.



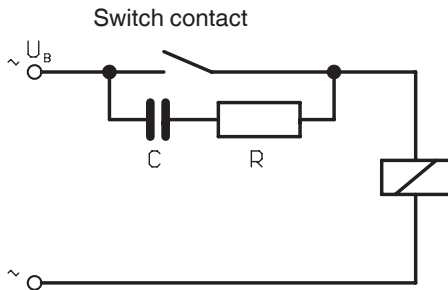
Example: Contact protection measure with free-wheeling diode

2. Inductive load with AC voltage

With AC voltage, two protection measures are possible.



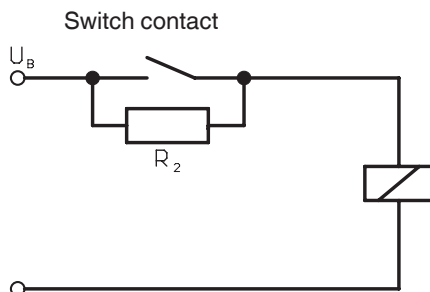
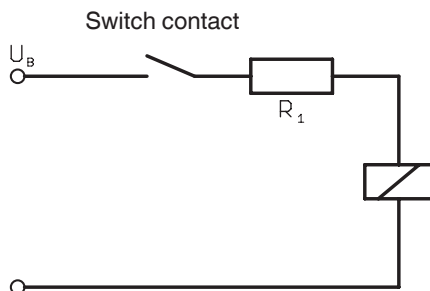
Example: Contact protection measure with voltage-dependent resistor VDR



Example: Contact protection measure with RC element

3. Capacitive load

With capacitive loads elevated make currents arise. These can be reduced by series-connecting resistors in the supply line.



Example: Contact protection measure with current-limiting resistor

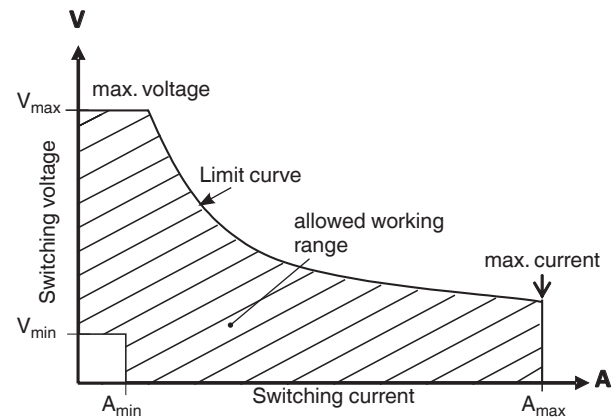
Contact curve

The hatched area of the contact curve shows the permissible electrical values for the respective contact.

The voltage to be switched must neither be above the maximum nor below the minimum switching voltage ($V_{\max} \leq U_s \leq V_{\min}$).

The current to be switched must neither be above the maximum nor below the minimum switching current ($A_{\max} \leq I_s \leq A_{\min}$).

The power to be switched may only lie below the limit curve.



Contact protection relay

Contact protection relays are used for model 821 and model 811 switch contacts if the permissible switching power of the contacts is not sufficient.

The contact protection relays are controlled by the switch contacts and switch the load.

On the contact side, you are working with a low control voltage, but on the output side can be a high load.

Contact protection relays consist of a power supply, control unit, switching amplifier and relay output. The contacts are supplied with a clocked DC voltage of 35 ... 40 V from the control unit (i.e. only about every hundredth switching occurs under voltage). This way, optimal contact protection and switching reliability for several million switching cycles is achieved.

Liquid-filled measuring instruments with contacts, which switch frequently, should generally be operated with contact protection relays. Although the filling increases the service life of the mechanical measuring system, at the same time it increases the erosion of the contact pins.

In addition to the outputs for operating the contacts, an additional output with a DC voltage of 24 V (max. 20 mA) is available. With this, for example, control lamps or transmitters can be supplied.

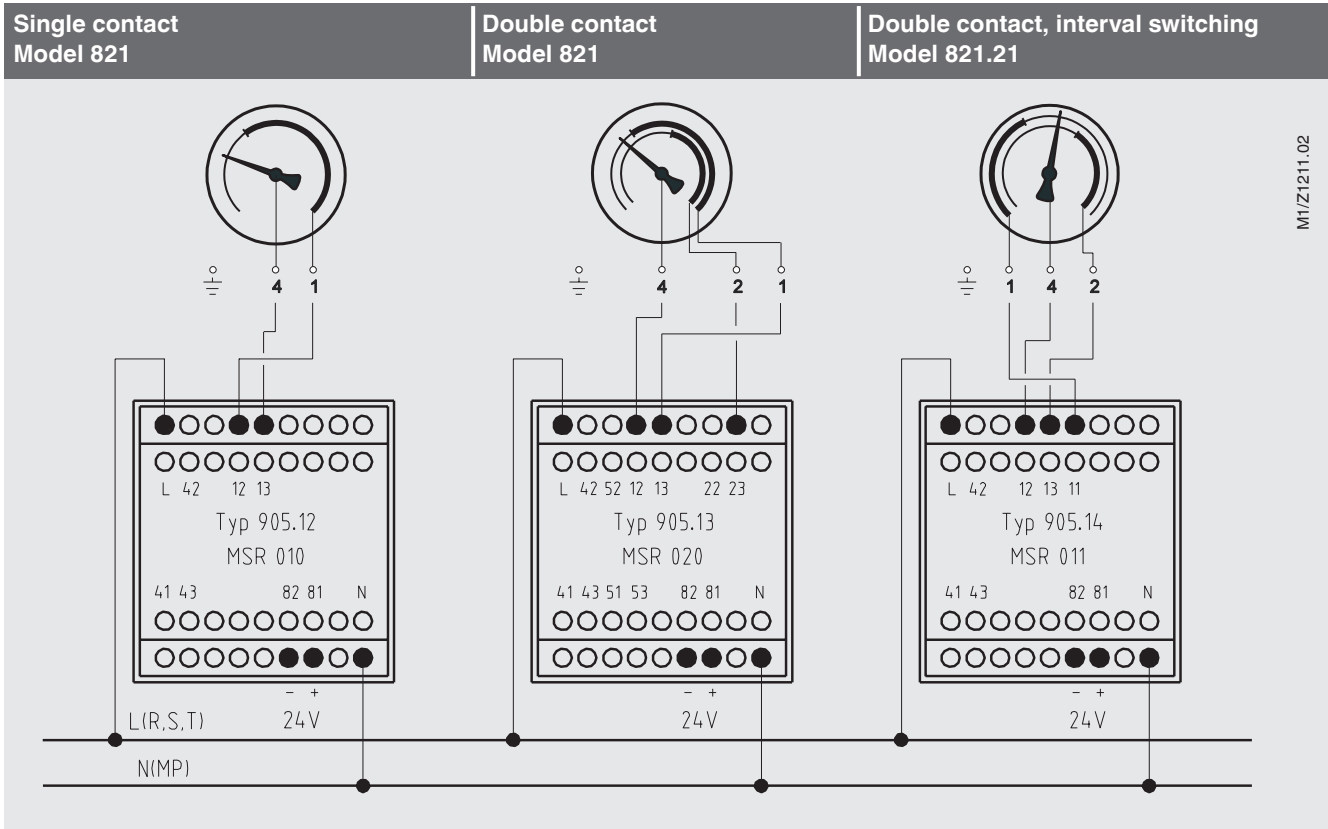
In order to suppress unintentional switching (e.g. vibration), the switching signal must apply for a min. 0.5 seconds, so that the output of the contact protection relay switches (fall delay).

Model overview

Model	for connection to instruments	Function/output	
905.12 MSR 010	with 1 contact	1 switch contact / change-over contact	<p>Contact protection relay L - N 230 V 45...60 Hz</p> <p>MSR 010</p> <p>Permissible contact load: 1,840 VA, 250 V, 8 A</p> <p>DC voltage output: DC 24 V</p> <p>1036688</p>
905.13 MSR 020	with 2 contacts	2 switch contacts / change-over contacts	<p>Contact protection relay L - N 230 V 45...60 Hz</p> <p>MSR 020</p> <p>Permissible contact load: 1,840 VA, 250 V, 8 A</p> <p>DC voltage output: DC 24 V</p> <p>1036696</p>
905.14 MSR 011	with 2 contacts (Function 21 is essential)	Two-point controller / bistable change-over contact (for interval switching with pump control)	<p>Contact protection relay L - N 230 V 45...60 Hz</p> <p>MSR 011</p> <p>Permissible contact load: 1,840 VA, 250 V, 8 A</p> <p>DC voltage output: DC 24 V</p> <p>1036700</p>

Specifications	Contact protection relay model 905.12 ... 14
Power connection	AC 230 V -10 % / +6 %, 45 ... 60 Hz
Power consumption	approx. 2.5 VA
Pulse control voltage	35 to 40 V; galvanically isolated from the mains
Pulse duration ratio: Pause	1 : 100 (typical)
Pulse width	250 µs (typical)
Fall delay	approx. 0.5 s
Relay output	potential-free, change-over contact or changeover - bistable - (see Model overview)
■ Permissible load	AC 250 V, 8 A, 1,840 VA
Voltage output	DC 24 V
■ Permissible load	20 mA
Pin assignment	DIN 45410
Ingress protection per IEC/EN 60529	Protective insulation
Isolation class	C/250 V per VDE 0110
Case - dimensions per drawing	Form C, page 15
Case - material	Polyamide 6.6, green
Protection class	Case: IP40, terminals: IP20
Temperature range	0 ... 70 °C
Mounting	Standard rail 35 x 7.5 mm per DIN 50022 (Adapter for individual mounting is included in the scope of delivery)

Connection examples for the contact protection relay



Inductive contact model 831

Application

Measuring instruments with WIKA inductive contacts may be used in zone 1 and 2 hazardous areas. Provided that they are supplied from a suitable and certified control circuit (e.g. WIKA model 904.28 control unit).

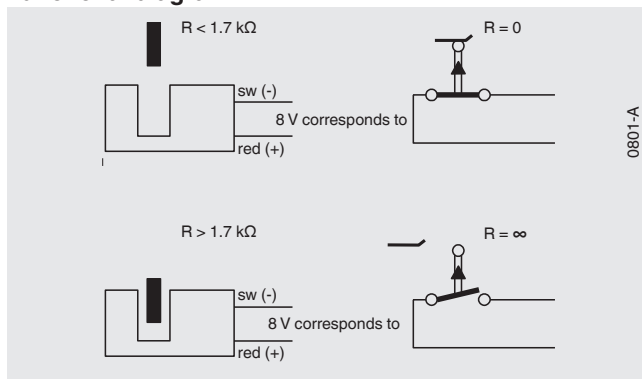
Outside of hazardous areas, these WIKA inductive contacts are primarily used where particularly safe switching at higher switching rates is important. Since the contacts also work in liquid filling, such instruments can even be used in very specific operating conditions. Some typical application areas are in chemical, petrochemical and nuclear plants.

Operating principle

The WIKA inductive contact works in a non-contact way. Essentially, it consists of the control head (initiator), attached to the set pointer, with its fully potted electronics and the mechanical assembly with the moving flag. The flag is moved by the instrument pointer (actual value pointer).

The control head is supplied with a DC voltage. When the flag enters the slot in the control head, this then increases its internal resistance (= damped condition / the initiator has high impedance). The subsequent change in the current acts as the input signal for switching amplifiers of the control unit.

Functional diagram



The control unit effectively works without influence on the measuring system. The non-contact “contact system” produces no wear within the electrical system. The assembly dimensions correspond to the model 821 contacts. Setting of the set points is carried out as for these contacts.

Ambient temperature: -25 ... +70 °C ¹⁾

Control head used (slot sensor): Model 831

Advantages of the WIKA inductive contact

- Long service life due to non-contact sensor
- Low influence on the display
- Universal application, even with filled instruments
- Insensitive against aggressive environments (potted electronics, non-contact contact operation)
- Explosion-protected, can be used in zone 1 and 2

Design concept of the WIKA inductive system

The WIKA inductive system consists of the WIKA inductive contact built in to the measuring instrument (as already described) and the WIKA control unit (see page 15 ff.).

The **control unit** consists of

- Power supply unit
- Switching amplifier
- Output relay

The power supply unit converts the AC mains voltage into a DC voltage. The switching amplifier supplies the control head and switches the output relay. Via the output relay, high electrical powers can be switched.

There are two **designs for the WIKA control unit:**

- with **intrinsically safe** control circuit (Ex version)
- with **non-intrinsically safe** control circuit (non-Ex version)

The **intrinsically safe control units** conform to EN 50014 / EN 50020 and are type tested. With them, inductive contacts can be used in zone 1 or 2 hazardous areas.

Note: The control unit itself must be installed outside the hazardous area!

The switch behaviour of the control unit can be manipulated by inserting wire bridges or through slide switches. A reversal of the direction of action can be achieved: e.g. due to the flag in the slot sensor, the output relay is either de-energised or energised. In addition, line break monitoring can be switched on.

With the **non-intrinsically safe control unit**, inductive contacts should not be used in hazardous areas. Their direction of action is fixed. The output relay is de-energised when the flag passes through the air gap. The line break monitoring is in series. In addition to the outputs for operating the switch contacts, an additional output with a DC voltage of 24 V (max. 20 mA) is available. Thus, for example, control lamps can be powered.

1) With use in hazardous areas, the upper limit values for the ambient temperature, specified in the test certificate, must be observed! These are dependent upon the voltage, current, power and temperature class.

Switching functions

The following applies, as a general rule, to the switching functions of the model 831 inductive contacts in connection with our standard settings:





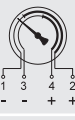
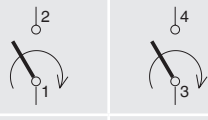
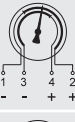

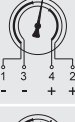
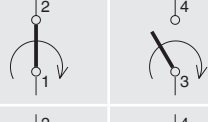
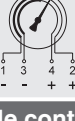

Index 1 behind the inductive contact model no. means: **Contact makes** the control circuit when the set point is exceeded (flag **leaves control head**).

Index 2 behind the inductive contact model no. means: **Contact breaks** the control circuit when the set point is exceeded (flag **enters control head**).

For inductive contacts with multiple contacts, the 1st contact is the one closest to the left start of scale value or end value (be careful with vacuum gauges).

The switching function, described in the following table, follows the **clockwise rotary motion** of the instrument pointer (actual value pointer). If the actual value pointer moves **anticlockwise**, the **reverse switching function** occurs!

Note: If the inductive contacts are to be set (adjusted) anticlockwise, the index figures in brackets must be used in accordance with DIN 16085. Combinations are possible.

Circuit diagram ²⁾	If the pointer of the measuring instrument moves clockwise, on exceeding the defined set point, the flag is driven:	Switching function (illustration of the principle)	Inductive contact model with function index of the switching function
Single contact ¹⁾			
	out of the control head	Contact makes	 831.1 (.5)
	into the control head	Contact breaks	 831.2 (.4)
Double contact ¹⁾			
	the 1st and 2nd contacts from the control head	1st and 2nd contact makes	 831.11 (.55)
	of the 1st contact from the control head, of the 2nd contact into the control head	1st contact makes 2nd contact breaks	 831.12 (.54)
	of the 1st contact into the control head, of the 2nd contact from the control head	1st contact breaks, 2nd contact makes	 831.21 (.45)
	of the 1st and 2nd contacts into the control head	1st and 2nd contacts break	 831.22 (.44)
Triple contact ¹⁾			
A number of instruments can be fitted with up to 3 inductive contacts (see page 20/21). Technical notes page 13. Switching and switch behaviour in principle as in the previous table.			

1) When ordering, attach the corresponding index of the required switching functions (note order 1st, 2nd, 3rd contact) to the inductive contact model no.

2) Thin line means: Flag in control head, control circuit open. Thick line means: flag out of the control head, control circuit closed

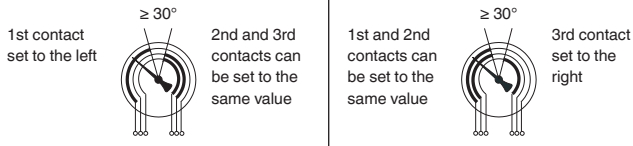
The **connection terminals** and **connection wires** are marked in accordance with the table above.

Mounting options: see page 20/21

Triple contact

With inductive contacts in the triple design, the setting of all three contacts to the same set point is not physically possible. Either the left (= no. 1 contact) or the right contact (= no. 3 contact) must be separated by $\geq 30^\circ$ to the left or the right of the two set pointers, which may be set to the same value:

Examples



Combination of all triple contacts

The 1st set pointer is set approx. 30° to the left

The 3rd set pointer is set approx. 30° to the right

Model	Model
831.1.11	831.11.1
831.1.12	831.11.2
831.1.21	831.12.1
831.1.22	831.12.2
831.2.11	831.21.1
831.2.12	831.21.2
831.2.21	831.22.1
831.2.22	831.22.2

Special versions with inductive contacts

■ Safety inductive contact, model 831 SN and 831 S1N

For safety-critical applications, such as for the construction of self-monitoring controls, type-tested components must be used. Corresponding certifications are available for the model 831 SN and model 831 S1N safety inductive contacts. The pre-condition is operation with a similarly certified fail-safe control unit (isolating amplifier), e.g. model 904.30 KHA6-SH-Ex1 (see page 16).

Measuring instruments with safety inductive contacts may be used in zone 1 hazardous areas. Control head used (SN/S1N slot sensor): Model 831 from Pepperl & Fuchs

Switch behaviour, model 831 SN

If the flag is in the slot sensor, then the output of the downstream control unit (0 signal) is **inhibited**, i.e. the output relay is **de-energised** (= safe state).

For the function index of the switching functions, the emergence of the flag from or insertion into the control head and also the installation options, the same information applies as for model 831 inductive contacts (see page 12).

Switch behaviour, model 831 S1N

If the flag is not in, but rather **outside** the slot sensor, then the output of the downstream control unit (0 signal) is inhibited, i.e. the output relay is **de-energised** (= safe state).

For the function index of the switching functions, the same information applies as for model 831 inductive contacts with the following difference:

Index 1 behind the inductive contact model no. means: **Contact breaks** the control circuit when the set point is exceeded in the clockwise direction (flag enters control head).

Index 2 after the inductive contact model no. means: **Contact breaks** the control circuit when the set point is exceeded in the clockwise direction (flag moves out of the control head).

Mounting options in accordance with table on page 20/21.

■ Triple contact NS 160, settable to one set point

If the setting of 3 contacts to a single set point is absolutely needed, then this can be achieved with NS 160 through the use of a smaller control head. This must be defined on ordering.

■ Quadruple contacts

With NS 144 x 72 panel-mount pressure gauges with a single measuring system, up to 4 inductive contacts are possible (see page 20).

Electronic contact model 830 E

Description, application

Direct switching of small capacities which are usually required in connection with a PLC can be realised by this inductive contact with integrated amplifier model 830 E which is factory-installed directly into the measuring instrument.

The usual advantages of inductive contacts, such as fail-safe contact operation, no wear due to proximity contact operation as well as practically no effect on the measuring system, also apply here.

No additional control unit is required.

The electronic contact can be selected with 2- or 3-wire design and is implemented with PNP output. The operating voltage is DC 10 ... 30 V. The maximum switching current is 100 mA.

The model 830 E electronic contact is **not intrinsically safe** and therefore not suitable for applications in hazardous areas!

For further specifications, see page 15.

For the function index of the switching functions, the same information applies as for model 831 inductive contacts with the following difference:

Index 1 behind the inductive contact model no. means: **Contact breaks** the control circuit when the set point is exceeded in the clockwise direction (flag enters control head).

Index 2 after the inductive contact model no. means: **Contact breaks** the control circuit when the set point is exceeded in the clockwise direction (flag moves out of the control head).

Note: The direction of the action of the flag is also reversible, as with model 831!

Electrical connection

Control and switching electronics in the sensor, electrical connection via cable socket

- To connect a PLC control unit or for direct switching of small capacities

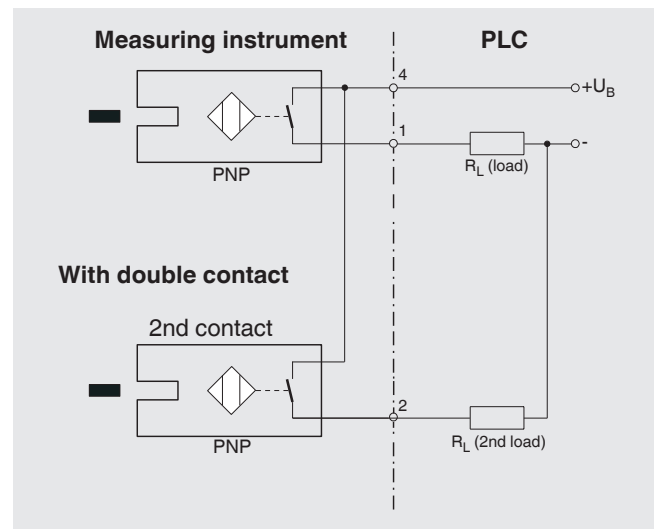
- PNP transistor

With PNP switching instruments, the switched output is a connection towards PLUS. The load R_L between the switched output and the MINUS should be selected in a way not to exceed the maximum switching current of 100 mA.

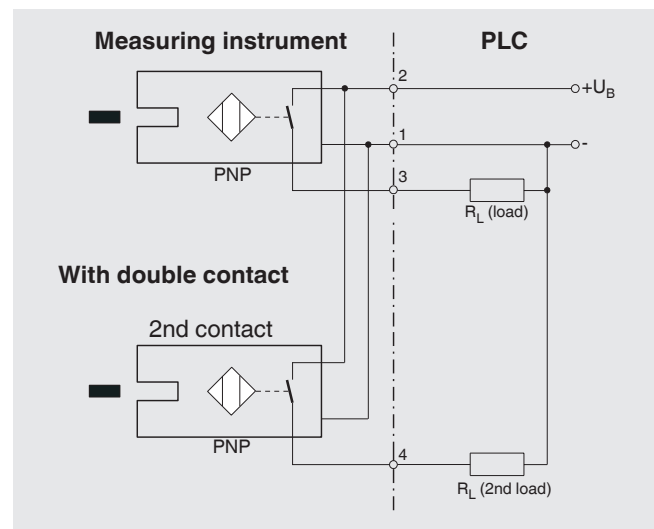
- Flag emerges from slot sensor:
Contact open (output not active)

- Flag retreats into slot sensor:
Contact closed (output active)

2-wire system (standard)

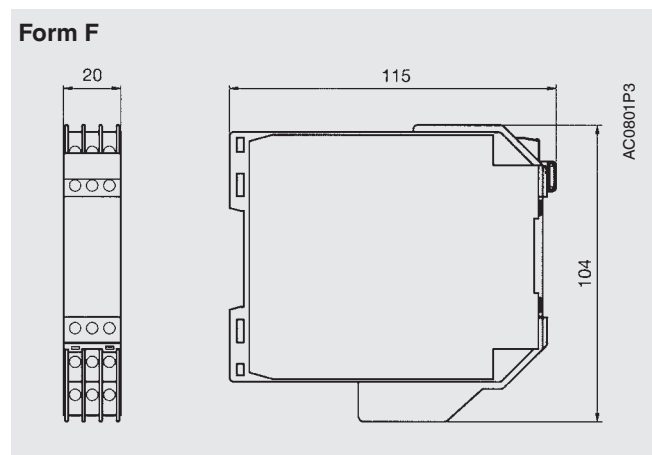
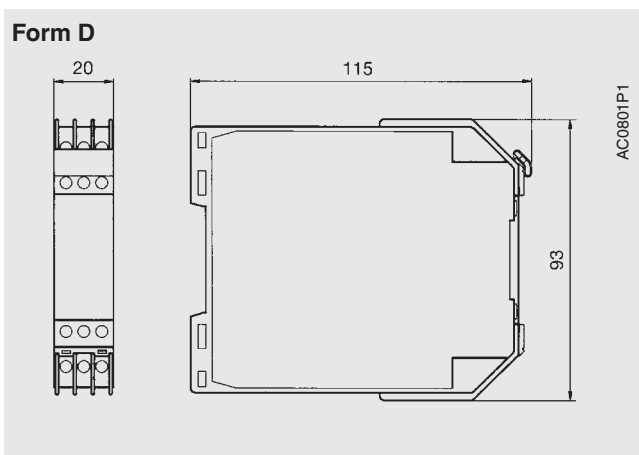
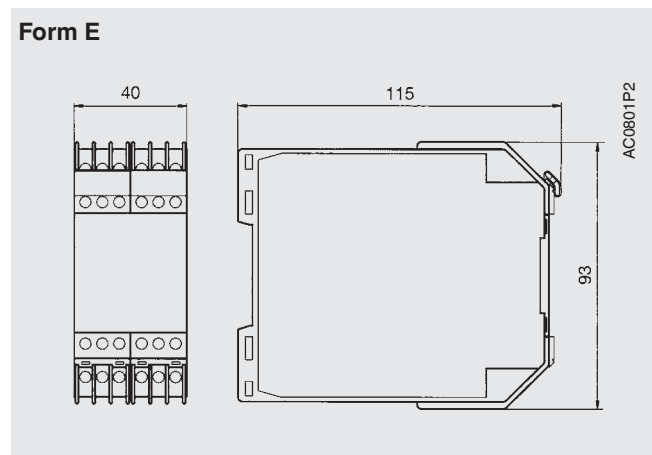
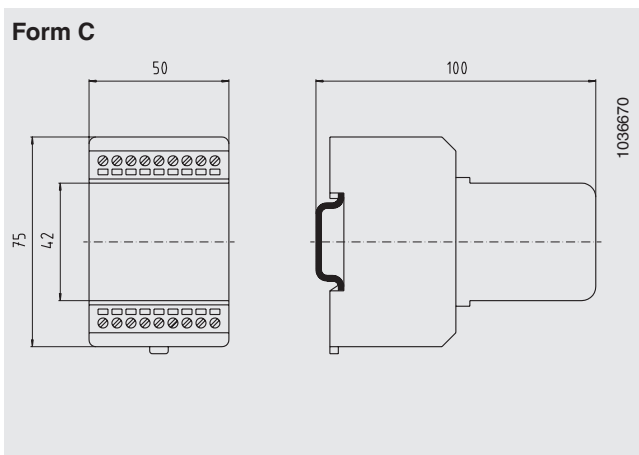


3-wire system



Specifications	Electronic contact model 830 E
Power supply	DC 10 ... 30 V
Residual ripple	max. 10 %
No-load current	≤ 10 mA
Switching current	≤ 100 mA
Residual current	≤ 100 μA
Function of switching element	Normally open
Type of output	PNP transistor
Voltage drop (with I _{max.})	≤ 0.7 V
Reverse polarity protection	conditional U _B (the switched output 3 or 4 must never be set directly to minus)
Anti-inductive protection	1 kV, 0.1 ms, 1 kΩ
Oscillator frequency	Approx. 1,000 kHz
EMC	Per EN 60947-5-2
Ambient conditions and temperature	In accordance with measuring instrument
Installation	Direct in measuring instrument, maximum 2 inductive contacts possible

Dimensions of the control units for inductive contacts



Control units for inductive contacts

Ex versions (for connection example, see page 23)

Control unit, model 904.28 KFA6-SR2-Ex1.W

- For operating one measuring instrument with one inductive contact
- Intrinsically safe control circuit [EEx ia] IIC in accordance with EN 50227 and NAMUR
- 1 relay output with change-over contact
- LED status display for mains (green), relay output (yellow) and line break (red)
- Add-on case form D

Note

Direction of action can be set with the slide switch, S1:

Operating current: Switch S1 in position I

Quiescent current: Switch S1 in position II

Line break detection: Switch S3 in position I

Control unit model 904.29 KFA6-SR2-Ex2.W

- To operate one measuring instrument with two inductive contacts or for two measuring instruments with only one inductive contact
- Intrinsically safe control circuit [EEx ia] IIC in accordance with EN 50227 and NAMUR
- 2 relay outputs with 1 change-over contact each
- LED status display for mains (green), 2 x relay output (yellow) and 2 x line break (red)
- Add-on case, form F

Note

Direction of action can be set with the slide switches, S1 & S2:

Operating current: Switch S1 and S2 in position I

Quiescent current: Switch S1 and S2 in position II

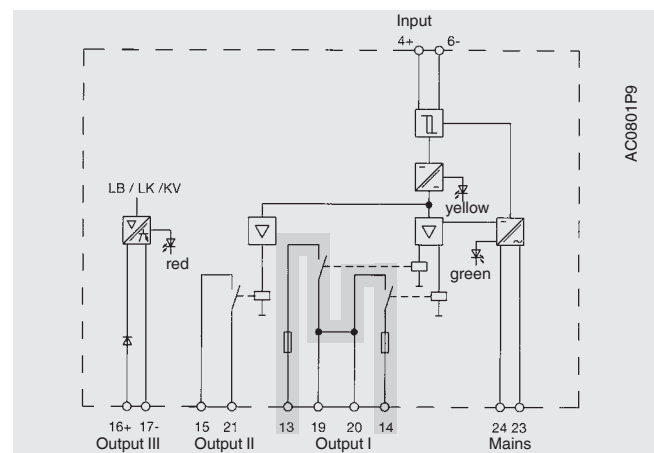
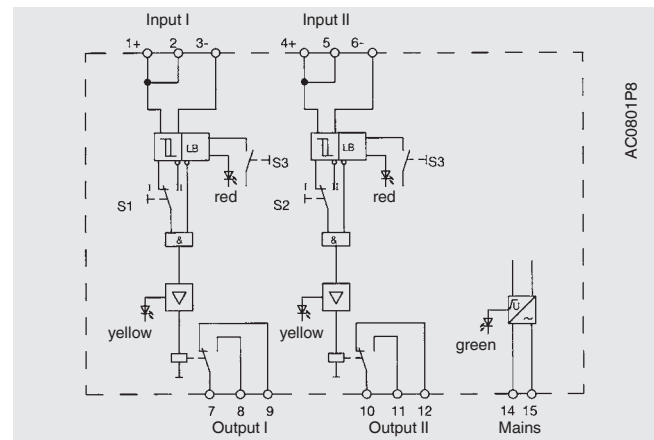
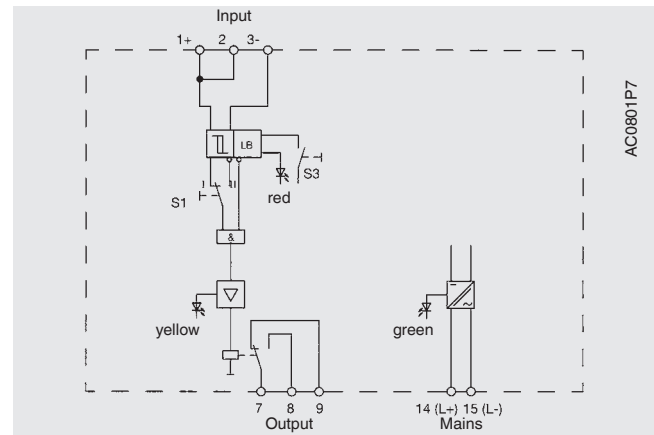
Line break detection: Switch S3 in position I

Fail-safe control unit

For safety-relevant circuits, type-tested parts are mandatory. Such approvals are provided by the **SN or S1N safety inductive contacts** (see page 13). If these inductive contacts are operated **together** with the **model 904.30 fail-safe control unit**, this arrangement corresponds to the TÜV safety requirements for important circuits and is self-monitoring. If an error occurs (mechanical damage, power failure, component failure, short circuit, line break) within the circuit, the safe state is always established at the output.

Model 904.30 KHA6-SH-Ex1

- Fail-safe control unit
- For operating one measuring instrument with one SN or S1N fail-safe inductive contact
- Control circuit intrinsically safe [EEx ia] IIC
- 1 safety-related relay output, 1 incrementing output and 1 passive electronic output



- LED status display for mains (green), relay output (yellow) and line-break and short circuit (red)
- Add-on case form E

Specifications of the control units	Model 904.28 KFA6-SR2-Ex1.W	Model 904.29 KFA6-SR2-Ex2.W	Model 904.30 fail-safe KHA6-SH-Ex1
Supply			
Power supply	AC 230 V ± 0 %, 45 ... 65 Hz	AC 230 V ± 0 %, 45 ... 65 Hz	AC 85 ... 253 V, 45 ... 65 Hz
Power consumption	1 VA	1.3 VA	3 VA
Input			
Quantity	1	2	1
Open-circuit voltage	DC 8 V	DC 8 V	DC 8.4 V
Short-circuit current	8 mA	8 mA	11.7 mA
Switch point	$1.2 \text{ mA} \leq I_s \leq 2.1 \text{ mA}$	$1.2 \text{ mA} \leq I_s \leq 2.1 \text{ mA}$	$2.1 \text{ mA} \leq I_s \leq 5.9 \text{ mA}$
Switch hysteresis	approx. 0.2 mA	approx. 0.2 mA	
Control line resistance	100 Ohm	100 Ohm	50 Ohm
Voltage	$U_0 \leq \text{DC } 10,6 \text{ V}$	$U_0 \leq \text{DC } 10,6 \text{ V}$	$U_0 \leq \text{DC } 59,56 \text{ V}$
Current	$I_0 \leq 19,1 \text{ mA}$	$I_0 \leq 19,1 \text{ mA}$	$I_0 \leq 16,8 \text{ mA}$
Power	$P_0 \leq 51 \text{ mW}$	$P_0 \leq 51 \text{ mW}$	$P_0 \leq 41 \text{ mW}$
Ignition protection type	[EEEx ia] IIC	[EEEx ia] IIC	[EEEx ia] IIC
Perm. external capacitance	2.9 µF	2.9 µF	650 nF
Perm. external inductance	100 mH	100 mH	5 mH
Output			
Relay outputs	1 change-over contact	1 change-over contact each	1 safety-related relay output
Load capacity AC	253 V, 2 A, 500 VA, $\cos \varphi > 0.7$	253 V, 2 A, 500 VA, $\cos \varphi > 0.7$	250 V, 1 A, $\cos \varphi > 0.7$
Load capacity DC	40 V, 2 A; resistive load	40 V, 2 A; resistive load	24 V, 1 A; resistive load
Rise delay	approx. 20 ms	approx. 20 ms	20 ms
Fall delay	approx. 20 ms	approx. 20 ms	20 ms
Max. switching frequency	10 Hz	10 Hz	5 Hz
Ambient conditions			
Lower limit temperature	-20 °C	-20 °C	-20 °C
Upper limit temperature	+60 °C	+60 °C	+60 °C
Perm. relative humidity	max. 75%	max. 75%	max. 75%
Ingress protection per IEC/EN 60529	IP20	IP20	IP20
Case			
Form	Add-on case	Add-on case	Add-on case
Dimensions in accordance with the drawing	Form D, page 15	Form F, page 15	Form E, page 15
Mounting	on standard rail 35 x 7.5 mm (DIN EN 50022) or screw fixing		
Weight	approx. 0.15 kg	approx. 0.15 kg	approx. 0.28 kg
Order number	2014505	2014521	2014548

Further control units are available for operation with a voltage supply of DC 20 ... 30 V:

- Model 904.31 (KFD2-SR2- Ex1.W) - 1 relay output
Order number: 2114003
- Model 904.32 (KFD2-SR2- Ex2.W) - 2 relay outputs
Order number: 2143569
- Model 904.33 (KFD2-SH- Ex1) - 1 safety-related relay output (DC 20 ... 35 V)
Order number: 2307618

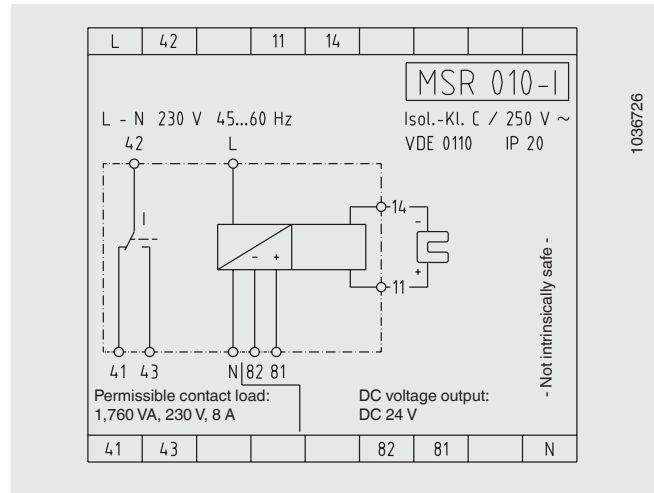
Control units for inductive contacts

Non-Ex versions

(for connection example, see page 23)

Control unit model 904.25 MSR 010-I

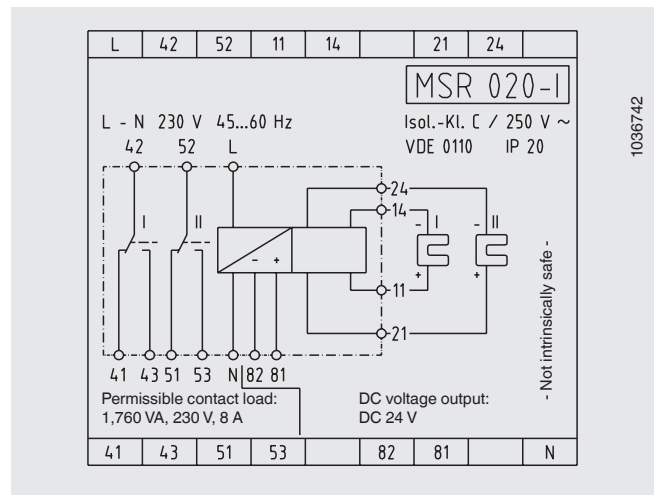
- For operating one measuring instrument with one inductive contact
- 1 relay output with 1 change-over contact
- Add-on case form C



1036726

Control unit model 904.26 MSR 020-I

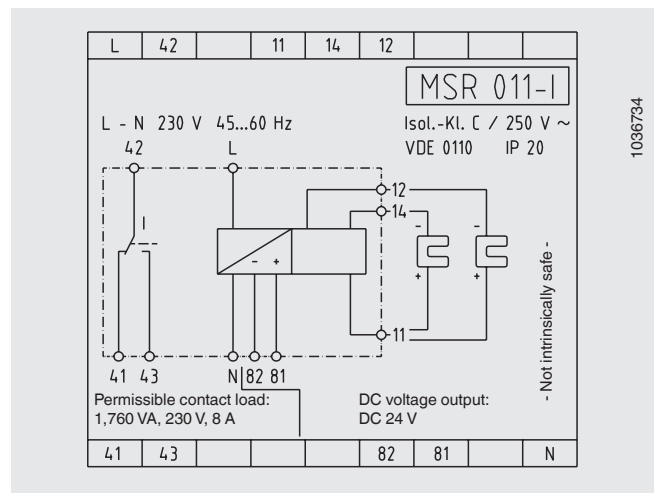
- To operate one measuring instrument with two inductive contacts or for two measuring instruments with only one inductive contact
- 2 relay outputs with 1 change-over contact each
- Add-on case form C



1036742

Control unit model 904.27 MSR 011-I

- For two-point control (interval switching in conjunction with model 831.12 inductive contacts)
- 1 relay output with 1 change-over contact
- Add-on case form C



1036734

Specifications of the control units	Model 904.25 MSR 010-I	Model 904.26 MSR 020-I	Model 904.27 MSR 011-I
Supply			
Power supply	AC 230 V -10 % / +6 %, 45 ... 60 Hz		
Power consumption	approx. 2.5 VA		
Input			
Quantity	1	2	2
Control voltage	DC 8.5 V (typical)		
Short-circuit current	I _k approx. 5 mA		
Switch point	1.5 mA typical		
Switch hysteresis	approx. 0.2 mA		
Output			
Relay outputs	1 change-over contact	1 change-over contact each	2 change-over contacts
Load capacity	AC 230 V / 8 A / 1,760 VA		
Rise delay	approx. 10 ms		
Fall delay	approx. 10 ms		
Voltage output	DC 24 V max. 20 mA		
Ambient conditions			
Lower limit temperature	0 °C		
Upper limit temperature	+70 °C		
Perm. relative humidity	max. 75 %		
Ingress protection per IEC/EN 60529	Case: IP40 / terminals: IP20		
Case			
Dimensions in accordance with the drawing	Form C, page 15		
Material	Polyamide 6.6, colour green		
Mounting	on standard rail 35 x 7.5 mm (DIN EN 50022) or individual mounting with accompanying adapter		
Weight	approx. 0.24 kg	approx. 0.27 kg	approx. 0.24 kg

Mounting possibilities for switch contacts in pressure gauges

Number of possible contacts in connection with the full scale value (= scale range)

Model	NS	Electrical connection	Magnetic snap-action contact model 821				Inductive contact model 831 Electronic contact model 830 E 1)			
			Number of contacts				Number of contacts			
			1	2	3	4 2)	1	2	3 3)	4
			Full scale value in bar				Full scale value in bar			
212.20	100, 160	A	1	1.6	4	4	1	1.6	1.6	-
232.50	100, 160	A	1	1.6	2.5	2.5	0.6	1	1.6	-
233.50	100, 160	A	1	1.6	2.5	2.5	0.6	1	1.6	-
232.30, 233.30	100	A	1	1.6	4	4	1	1.6	1.6	-
232.30, 233.30	160	B	1	1.6	2.5	2.5	0.6	1	1.6	-
232.36	100	A	1	1.6	4	4	1	1.6	1.6	-
312.20	160	A	1 5)	1 5)	1.6 5)	1.6 5)	1	1	1.6	-
332.30	160	B	1 5)	1 5)	1.6 5)	1.6 5)	1	1	1.6	-
333.30	160	B	-	-	-	-	1	1	1.6	-
4x2.12	100, 160	A	0.025	0.025	0.025	0.025	0.025	0.025	0.025	-
4x3.12	100, 160	A	0.025	0.025	0.025	0.025	0.025	0.025	0.025	-
422.20 4)	100, 160	A	0.025	0.025	0.04	0.04	0.025	0.025	0.025	-
423.20 4)	100, 160	A	0.025	0.025	0.04	0.04	0.025	0.025	0.025	-
4x2.30 4)	100	A	0.025	0.025	0.04	0.04	0.025	0.025	0.025	-
4x2.30 4)	160	B	0.025	0.025	0.04	0.04	0.025	0.025	0.025	-
4x3.30 4)	100	A	0.025	0.025	0.04	0.04	0.025	0.025	0.025	-
4x3.30 4)	160	B	0.025	0.025	0.04	0.04	0.025	0.025	0.025	-
4x2.50 4)	100, 160	A	0.025	0.025	0.04	0.04	0.025	0.025	0.025	-
4x3.50 4)	100, 160	A	0.025	0.025	0.04	0.04	0.025	0.025	0.025	-
432.36 4)	100	A	0.025	0.025	0.04	0.04	0.025	0.025	0.025	-
432.36 4)	160	B	0.025	0.025	0.04	0.04	0.025	0.025	0.025	-
433.36 4)	100	A	0.025	0.025	0.04	0.04	0.025	0.025	0.025	-
433.36 4)	160	B	0.025	0.025	0.04	0.04	0.025	0.025	0.025	-
432.56 4)	100, 160	A	0.025	0.025	0.04	0.04	0.025	0.025	0.025	-
433.56 4)	100, 160	A	0.025	0.025	0.04	0.04	0.025	0.025	0.025	-
532.52	100, 160	A	0.04	0.04	0.04	0.04	0.04	0.04	0.04	-
532.53	100, 160	A	0.04	0.04	0.04	0.04	0.04	0.04	0.04	-
532.54	100, 160	A	0.025	0.025	0.04	0.04	0.025	0.025	0.025	-
6xx.50	100	A	-	-	-	-	0.1	0.1	-	-
632.51	100, 160	A	0.0025	0.0025	-	-	0.0025	0.0025	0.0025	-
711.12	100, 160	A	1	1.6	4	-	1	1	-	-
732.02	100	A	1	1.6	4	-	1	1	-	-
732.14	100, 160	A	0.06	0.06	0.1	0.1	0.06	0.06	0.1	-
733.14	100, 160	A	0.06	0.06	0.1	0.1	0.06	0.06	0.1	-
732.51 4)	100, 160	A	0.025	0.025	0.04	0.04	0.025	0.025	0.025	-
736.51	100, 160	A	0.0025 6)	0.0025 6)	-	-	0.0025	0.0025	0.0025	-

1) Electronic contact model 830 E only 1 or 2 contacts

2) The setting of all four contacts to a single set point is not possible in the standard version.
Either the left (= no. 1 contact) or the right contact (= no. 4 contact) must be separated by approx. 30° (for NS 100 instruments) and by approx. 15° (for NS 160 instruments) to the left or the right of the three other set pointers (which may be set to the same value). If the setting of all four contacts to a single set point is absolutely needed, then this is possible with NS 160 as a special case (using a smaller control head) and must be specified on ordering.

3) With circular instruments, the setting of all three contacts to a single set point is not possible in the standard design. Either the left (= no. 1 contact) or the right contact (= no. 3 contact) must be separated by approx. 30° to the left or the right of the two set pointers (which may be set to the same value). If the setting of all three contacts to a single set point is absolutely needed, then this is possible with NS 160 as a special case (using a smaller control head) and must be specified on ordering. See also page 13.

4) Scale range 0 ... 0.025 bar: Class 2.5

5) Without magnet

6) With flammable, explosive gases, after feasibility test

Mounting possibilities for switch contacts in temperature measuring instruments

Temperature measuring instrument		Electrical connection	Magnetic snap-action contact Model 821			Sliding contact ¹⁾ Model 811			Inductive contact model 831 Electronic contact model 830 E ²⁾		
Model series	NS		Number of contacts			Number of contacts			Number of contacts		
			1	2	3	1	2	3	1	2	3
55	100	A	on request			x	x	-	x	x	-
55	160	B	on request			x	x	-	x	x	-
73	100	E	x	x	x	x	x	x	x	x	-
73	160	E	x	x	x	x	x	x	x	x	x

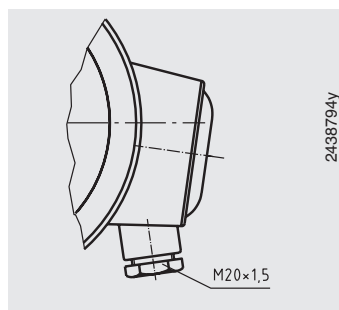
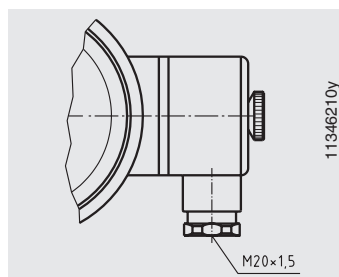
1) Not with liquid-damped instruments

2) Electronic contact model 830 E only 1 or 2 contacts

Electrical standard connections

For instruments with switch contacts and a max. of 2 contacts, as seen from the front:

- A Cable terminal box from PA 6, black, ingress protection IP65, temperature resistance -40 ... +80 °C, per VDE 0110, Isolation group C/250 V, M20 x 1.5 cable gland (facing downwards), strain relief, 6 screw terminals + PE for conductor cross-section 2.5 mm², fitted on the right-hand side of the case
- B Cable terminal box from PA 6, black, ingress protection IP65, temperature resistance -40 ... +80 °C, per VDE 0110, Isolation group C/250 V, M20 x 1.5 cable gland (facing downwards), strain relief, 4 mantle terminals + PE for conductor cross-section 2.5 mm², fitted on the right-hand side of the case
- C Terminal block (Luster terminals), for conductor cross-section 2.5 mm², mounted on the rear of the case
- D Rack-mounting terminals DIN 41611 in accordance with VDE 0110 Isolation group C, for conductor cross-section 2.5 mm², mounted on the rear of the case



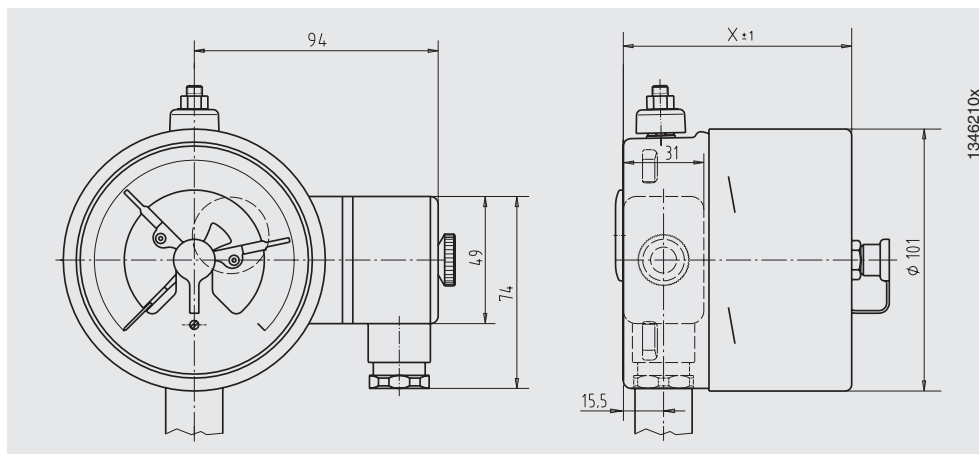
E As with A, but mounted on the left of the case.

For instruments with 3 or more contacts and also for special contacts, electrical connection on request

Option: Connectors (e.g. DIN 43650) on request

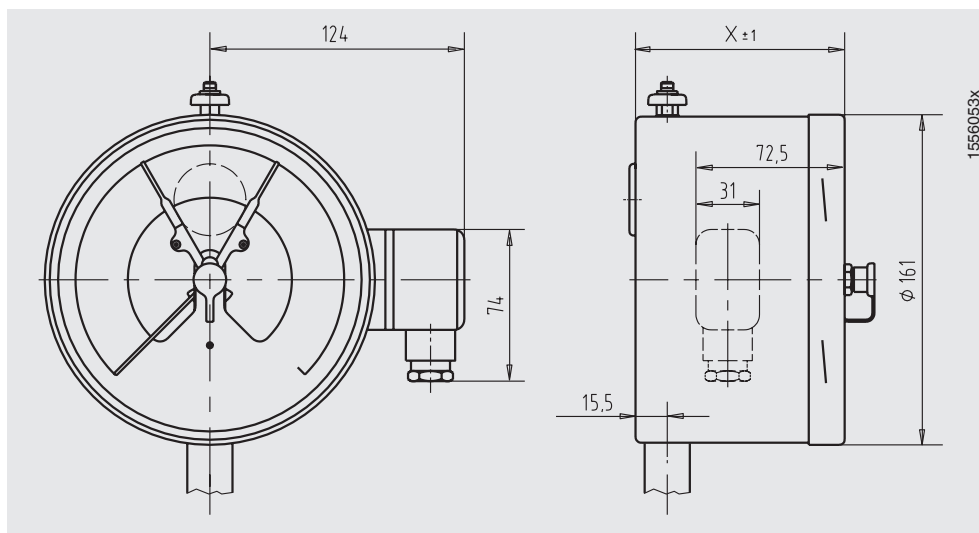
Dimensions in mm (examples)

Contact instrument NS 100



Type of contact	Dimension X in mm
Single or double contact	88
Double (change-over) contact	113
Triple contact	96
Quadruple contact	113

Contact instrument NS 160

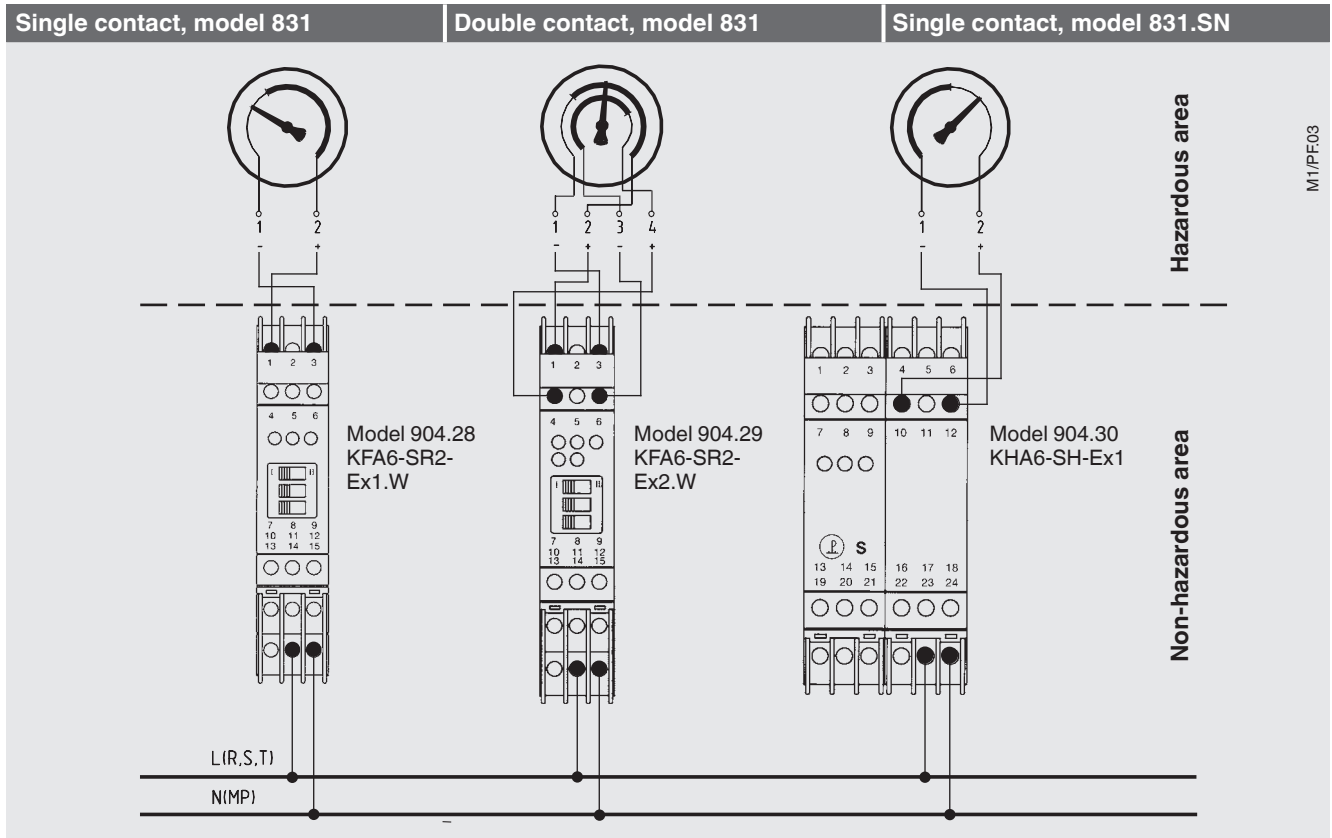


Type of contact	Scale range	Dimension X in mm
Single or double contact	to 0 ... 60 bar ¹⁾	102
Double contact	≥ 0 ... 100 bar	116
Triple or quadruple contact	to 0 ... 60 bar ¹⁾	116
	≥ 0 ... 100 bar	129.5

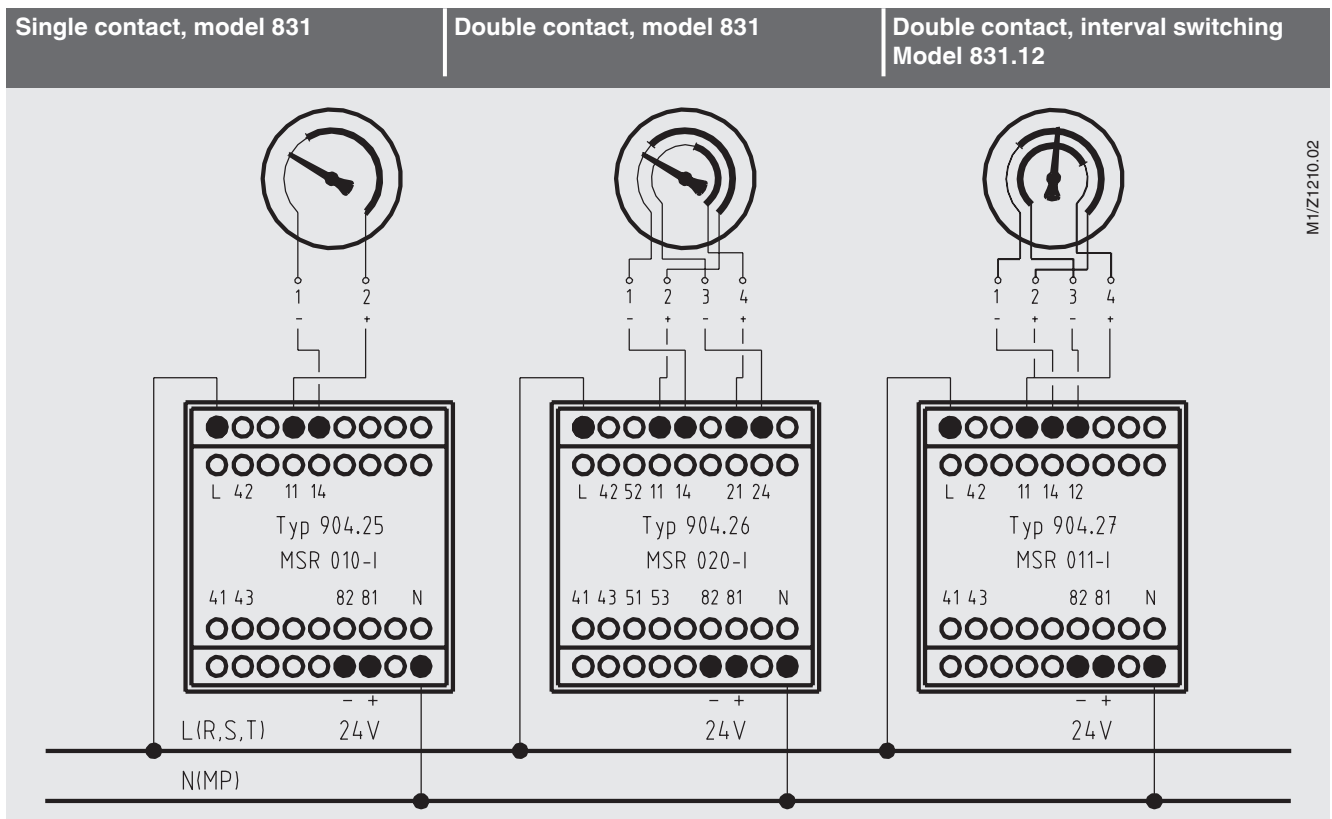
1) As well as with mechanical temperature measuring instruments.

Connection examples for inductive contacts

Ex version, with model 904.28/29/30 control units, K*A6-SR2(SH)-Ex



Non-Ex version, with model 904.2x control units



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We reserve the right to make modifications to the specifications and materials.



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Bourdon tube pressure gauge, stainless steel

For the process industry, standard version

Models 232.50, 233.50, NS 63 [2 ½"], 100 [4"] and 160 [6"]

WIKA data sheet PM 02.02



for further approvals
see page 5

Applications

- For gaseous and liquid aggressive media that are not highly viscous or crystallising, also in aggressive environments
- Chemical and petrochemical industries, oil and gas industry, power engineering and also water and wastewater technology
- Machine building and general plant construction

Special features

- Excellent load-cycle stability and shock resistance
- With case filling (model 233.50) for applications with high dynamic pressure loads and vibrations
- Completely from stainless steel
- Scale ranges from 0 ... 0.6 to 0 ... 1,600 bar [0 ... 10 to 0 ... 20,000 psi]



**Bourdon tube pressure gauge, model 232.50,
NS 100 [4"]**

Description

This high-quality Bourdon tube pressure gauge has been designed especially for the process industry.

The use of high-quality stainless steel materials and the robust design are geared to applications in the chemical and process engineering industries. Thus the instrument is suitable for liquid and gaseous media, also in aggressive environments.

Scale ranges of 0 ... 0.6 to 0 ... 1,600 bar [0 ... 10 to 0 ... 20,000 psi] ensure the measuring ranges required for a wide variety of applications.

WIKA manufactures and qualifies the pressure gauge in accordance with the standards EN 837-1 and ASME B40.100. This instrument has as safety function a blow-out device with blow-out plug on the back of the case. In the event of a failure, overpressure can escape there.

The model 233.50 with liquid-filled case is suitable for high dynamic pressure loads and vibrations.

Specifications

Basic information	
Standard	<ul style="list-style-type: none"> ■ EN 837-1 ■ ASME B40.100 <p>For information on the "Selection, installation, handling and operation of pressure gauges", see Technical information IN 00.05.</p>
Nominal size (NS)	<ul style="list-style-type: none"> ■ Ø 63 mm [2 ½"] ■ Ø 100 mm [4"] ■ Ø 160 mm [6"]
Window	Laminated safety glass (NS 63 [2 ½"]: Polycarbonate)
Case	<p>Safety level "S1" per EN 837-1</p> <p>Stainless steel, with blow-out device at case circumference, 12 o'clock (NS 63 [2 ½"]) and on the back of the case (NS 100 [4"] and 160 [6"])</p> <p>Scale ranges ≤ 0 ... 16 bar [≤ 0 ... 300 psi] with compensating valve to vent and reseal case</p>
Ring	Bayonet ring, stainless steel
Mounting	<ul style="list-style-type: none"> ■ Without ■ Panel mounting flange, stainless steel ■ Panel mounting flange, polished stainless steel ■ Triangular profile ring, stainless steel polished with mounting bracket ■ Surface mounting flange, stainless steel
Case filling (model 233.50)	<ul style="list-style-type: none"> ■ Without ■ Glycerine ■ Glycerine-water mixture for NS 100 [4"] and 160 [6"] with scale range ≤ 0 ... 2.5 bar [≤ 0 ... 40 psi] or for NS 63 [2 ½"] with scale range ≤ 0 ... 4 bar [≤ 0 ... 60 psi] ■ Silicone oil

Measuring element	
Type of measuring element	Bourdon tube, C-type or helical type
Material	<ul style="list-style-type: none"> ■ Stainless steel 316L ■ Monel (models 262.50 and 263.50)
Leak tightness	<ul style="list-style-type: none"> ■ Helium tested, leakage rate: < 5 · 10⁻³ mbar l/s ■ Helium tested, leakage rate: < 1 · 10⁻⁶ mbar l/s

Accuracy specifications		
Accuracy class		
NS 63 [2 ½"]	■ EN 837-1	Class 1.6
	■ ASME B40.100	±2 ½ % of measuring span (grade A)
NS 100 [4"], 160 [6"]	■ EN 837-1	Class 1.0
	■ ASME B40.100	±1.0 % of measuring span (grade 1A)
Temperature error	On deviation from the reference conditions at the measuring system: ≤ ±0.4 % per 10 °C [≤ ±0.4 % per 18 °F] of full scale value	
Reference conditions		
Ambient temperature	+20 °C [68 °F]	

Scale ranges

Scale range	
bar	kg/cm ²
0 ... 0.6	0 ... 0.6
0 ... 1	0 ... 1
0 ... 1.6	0 ... 1.6
0 ... 2.5	0 ... 2.5
0 ... 4	0 ... 4
0 ... 6	0 ... 6
0 ... 10	0 ... 10
0 ... 16	0 ... 16
0 ... 25	0 ... 25
0 ... 40	0 ... 40
0 ... 60	0 ... 60
0 ... 100	0 ... 100
0 ... 160	0 ... 160
0 ... 250	0 ... 250
0 ... 400	0 ... 400
0 ... 600	0 ... 600
0 ... 1,000	0 ... 1,000
0 ... 1,600	0 ... 1,600
kPa	MPa
0 ... 100	0 ... 0.1
0 ... 160	0 ... 0.16
0 ... 250	0 ... 0.25
0 ... 400	0 ... 0.4
0 ... 600	0 ... 0.6
0 ... 1,000	0 ... 1
0 ... 1,600	0 ... 1.6
0 ... 250	0 ... 2.5
0 ... 400	0 ... 4
0 ... 600	0 ... 6
0 ... 1,000	0 ... 10
0 ... 1,600	0 ... 16
0 ... 2,500	0 ... 25
0 ... 4,000	0 ... 40
0 ... 6,000	0 ... 60
0 ... 10,000	0 ... 100
0 ... 16,000	0 ... 160

Scale range	
psi	psi
0 ... 10	0 ... 1,000
0 ... 15	0 ... 1,500
0 ... 30	0 ... 2,000
0 ... 60	0 ... 3,000
0 ... 100	0 ... 4,000
0 ... 160	0 ... 5,000
0 ... 200	0 ... 6,000
0 ... 300	0 ... 7,500
0 ... 400	0 ... 10,000
0 ... 600	0 ... 20,000
0 ... 800	

Vacuum and +/- scale ranges

Scale range	
bar	MPa
-0.6 ... 0	-0.06 ... 0
-1 ... 0	-0.1 ... 0
-1 ... +0.6	-0.1 ... +0.06
-1 ... +1.5	-0.1 ... +0.15
-1 ... +3	-0.1 ... +0.3
-1 ... +5	-0.1 ... +0.5
-1 ... +9	-0.1 ... +0.9
-1 ... +15	-0.1 ... +1.5
-1 ... +24	-0.1 ... +2.4
kPa	psi
-60 ... 0	-30 inHg ... 0
-100 ... 0	-30 inHg ... +15
-100 ... +60	-30 inHg ... +30
-100 ... +150	-30 inHg ... +60
-100 ... +300	-30 inHg ... +100
-100 ... +500	-30 inHg ... +160
-100 ... +900	-30 inHg ... +200
-100 ... +1,500	-30 inHg ... +300
-100 ... +2,400	

Further information on: Scale ranges

Special scale ranges

Unit

Other scale ranges on request

- bar
- psi
- kg/cm²
- kPa
- MPa

Further information on: Scale ranges

Dial

Scale colour	Black
Material	Aluminium
Special scale	<ul style="list-style-type: none"> ■ Without ■ With temperature scale for refrigerant, e.g. for NH3: R 717 Other scales on request
Pointer	Aluminium, black

Process connections

Standard	<ul style="list-style-type: none"> ■ ISO 1179-2 ■ ISO 7 ■ ANSI/B1.20.1
Size	
ISO 1179-2	<ul style="list-style-type: none"> ■ G 1/8 B, male thread ■ G 1/4 B, male thread ■ G 1/2 B, male thread ■ M12 x 1.5, male thread ■ M20 x 1.5, male thread
ISO 7	<ul style="list-style-type: none"> ■ R 1/4, male thread ■ R 1/2, male thread
ANSI/B1.20.1	<ul style="list-style-type: none"> ■ 1/4 NPT, male thread ■ 1/2 NPT, male thread
Materials (wetted)	
Process connection	<ul style="list-style-type: none"> ■ NS 100 [4"], 160 [6"]: Stainless steel 316L ■ NS 63 [2 1/2"]: 316 Ti ■ Monel (models 262.50 and 263.50)
Bourdon tube	<ul style="list-style-type: none"> ■ Stainless steel 316L ■ Monel (models 262.50 and 263.50)


Other process connections on request

Operating conditions










Medium temperature		
Unfilled instruments	-40 ... +200 °C [-40 ... +392 °F]	
Instruments with glycerine filling	-20 ... +100 °C [-4 ... +212 °F]	
Instruments with silicone oil filling	-40 ... +100 °C [-40 ... +212 °F]	
Ambient temperature		
Unfilled instruments or with silicone oil filling	-40 ... +60 °C [-40 ... +140 °F]	
Instruments with glycerine filling	-20 ... +60 °C [-4 ... +140 °F]	
Pressure limitation		
NS 63 [2 1/2"]	Steady	3/4 x full scale value
	Fluctuating	2/3 x full scale value
	Short time	Full scale value
NS 100 [4"], 160 [6"]	Steady	Full scale value
	Fluctuating	0.9 x full scale value
	Short time	1.3 x full scale value
Ingress protection per IEC/EN 60529	<ul style="list-style-type: none"> ■ IP65 ■ IP66 (only selectable for scale ranges from 0 ... 20 bar [0 ... 400 psi]) 	

Approvals

Approvals included in the scope of delivery

Logo	Description	Country
	EU declaration of conformity Pressure equipment directive PS > 200 bar, module A, pressure accessory	European Union
-	CRN Safety (e.g. electr. safety, overpressure, ...) For scale ranges ≤ 1,000 bar	Canada

Optional approvals

Logo	Description	Country
	EU declaration of conformity	European Union
	ATEX directive Hazardous areas - Ex h Gas [IIC T6 ... T1 Gb X] Dust [IIIC T85° ... T450°C Db X]	
	EAC Hazardous areas	Eurasian Economic Community
	GOST Metrology, measurement technology	Russia
	KazInMetr Metrology, measurement technology	Kazakhstan
-	MTSCHS Permission for commissioning	Kazakhstan
	BelGIM Metrology, measurement technology	Belarus
	UkrSEPRO Metrology, measurement technology	Ukraine
	Uzstandard Metrology, measurement technology	Uzbekistan
-	CPA Metrology, measurement technology	China
	DNV GL Ships, shipbuilding (e.g. offshore)	International

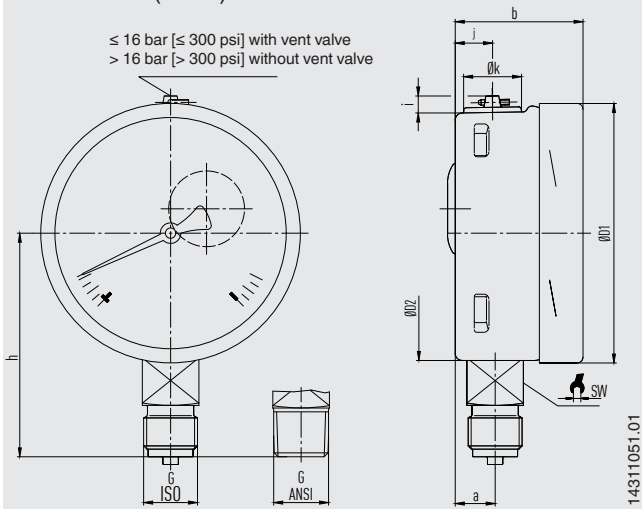
Certificates (option)

Certificates	
Certificates	<ul style="list-style-type: none"> ■ 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, indication accuracy) ■ 3.1 inspection certificate per EN 10204 (e.g. indication accuracy)
Recommended recalibration interval	1 year (dependent on conditions of use)

→ Approvals and certificates, see website

Dimensions in mm [in]

Lower mount (radial)



Process connection with thread per ISO 1179-2

NS	G	Dimensions in mm [in]								
		h ±1	a	b	D1	D2	i	y	k	SW
63 [2 ½"]	G ¼ B	54 [2.13]	9.5 [0.37]	33 [1.30]	63 [2.48]	62 [2.44]	6 [0.24]	10 [0.39]	15 [0.59]	14 [0.55]
	G ⅝ B	51 [2.01]								
	M12 x 1.5	54 [2.13]								
100 [4"]	G ¼ B	80 [3.15]	15.5 [0.61]	49.5 [1.95]	101 [3.98]	99 [3.90]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	G ½ B	87 [3.43]								
	M12 x 1.5	80 [3.15]								
	M20 x 1.5	87 [3.43]								
160 [6"]	G ¼ B	111 [4.37]	15.5 [0.61]	49.5 [1.95] ¹⁾	161 [6.34]	159 [6.26]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	G ½ B	118 [4.65]								
	M12 x 1.5	111 [4.37]								
	M20 x 1.5	118 [4.65]								

Process connection with thread per ISO 7

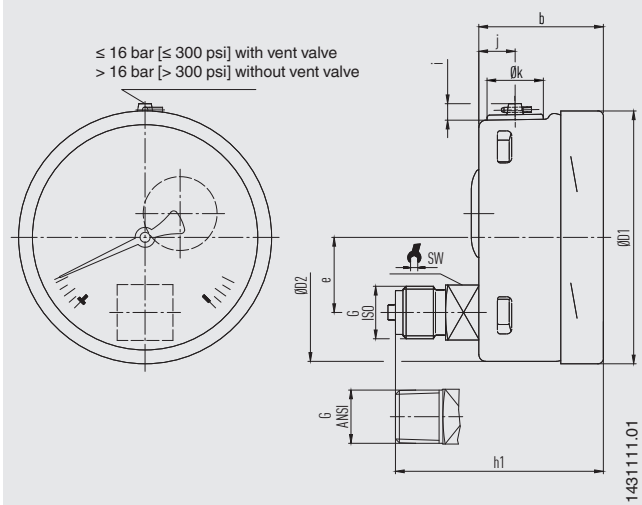
NS	G	Dimensions in mm [in]								
		h ±1	a	b	D1	D2	i	y	k	SW
63 [2 ½"]	R ¼	54 [2.13]	9.5 [0.37]	33 [1.30]	63 [2.48]	62 [2.44]	6 [0.24]	10 [0.39]	15 [0.59]	14 [0.55]
100 [4"]	R ¼	80 [3.15]	15.5 [0.61]	49.5 [1.95]	101 [3.98]	99 [3.90]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	R ½	86 [3.39]								
160 [6"]	R ¼	111 [4.37]	15.5 [0.61]	49.5 [1.95] ¹⁾	161 [6.34]	159 [6.26]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	R ½	117 [4.60]								

Process connection with thread per ANSI/B1.20.1

NS	G	Dimensions in mm [in]								
		h ±1	a	b	D1	D2	i	y	k	SW
63 [2 ½"]	¼ NPT	54 [2.13]	9.5 [0.37]	33 [1.30]	63 [2.48]	62 [2.44]	6 [0.24]	10 [0.39]	15 [0.59]	14 [0.55]
	⅝ NPT	51 [2.01]								
100 [4"]	¼ NPT	80 [3.15]	15.5 [0.61]	49.5 [1.95]	101 [3.98]	99 [3.90]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	½ NPT	86 [3.39]								
160 [6"]	¼ NPT	111 [4.37]	15.5 [0.61]	49.5 [1.95] ¹⁾	161 [6.34]	159 [6.26]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	½ NPT	117 [4.60]								

¹⁾ Plus 16 mm [0.630 in] with scale range 0 ... 1,600 bar [0 ... 20,000 psi]

Lower back mount



Process connection with thread per ISO 1179-2

NS	G	Dimensions in mm [in]								
		h ±1	b	D1	D2	e	i	y	k	SW
63 [2 ½"]	G ¼ B	57 [2.24]	33 [1.30]	63 [2.48]	62 [2.44]	18.5 [0.73]	6 [0.24]	10 [0.39]	15 [0.59]	14 [0.55]
	G ⅝ B	54 [2.13]								
	M12 x 1.5	57 [2.24]								
100 [4"]	G ¼ B	76 [2.99]	49.5 [1.95]	101 [3.98]	99 [3.90]	30 [1.18]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	G ½ B	83 [3.27]								
	M12 x 1.5	76 [2.99]								
	M20 x 1.5	83 [3.27]								
160 [6"]	G ¼ B	76 [2.99] ²⁾	49.5 [1.95] ¹⁾	161 [6.34]	159 [6.26]	50 [1.97]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	G ½ B	83 [3.27] ²⁾								
	M12 x 1.5	76 [2.99] ²⁾								
	M20 x 1.5	83 [3.27] ²⁾								

Process connection with thread per ISO 7

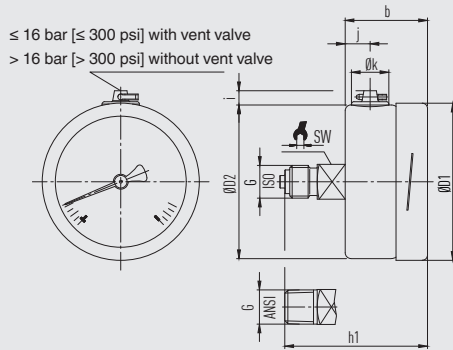
NS	G	Dimensions in mm [in]								
		h ±1	b	D1	D2	e	i	y	k	SW
63 [2 ½"]	R ¼	57 [2.24]	33 [1.30]	63 [2.48]	62 [2.44]	18.5 [0.73]	6 [0.24]	10 [0.39]	15 [0.59]	14 [0.55]
100 [4"]	R ¼	76 [2.99]	49.5 [1.95]	101 [3.98]	99 [3.90]	30 [1.181]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	R ½	82 [3.23]								
160 [6"]	R ¼	76 [2.99] ²⁾	49.5 [1.95] ¹⁾	161 [6.34]	159 [6.26]	50 [1.97]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	R ½	82 [3.23] ²⁾								

Process connection with thread per ANSI/B1.20.1

NS	G	Dimensions in mm [in]								
		h ±1	b	D1	D2	e	i	y	k	SW
63 [2 ½"]	¼ NPT	54 [2.13]	33 [1.30]	63 [2.48]	62 [2.44]	50 [1.97]	6 [0.24]	10 [0.39]	15 [0.59]	14 [0.55]
	⅝ NPT	51 [2.01]								
100 [4"]	¼ NPT	80 [3.15]	49.5 [1.95]	101 [3.98]	99 [3.90]	50 [1.97]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	½ NPT	86 [3.39]								
160 [6"]	¼ NPT	76 [2.99] ²⁾	49.5 [1.95] ¹⁾	161 [6.34]	159 [6.26]	50 [1.97]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	½ NPT	82 [3.23] ²⁾								

1) Plus 16 mm [0.630 in] with scale range 0 ... 1,600 bar [0 ... 20,000 psi]
 2) Plus 16 mm [0.630 in] with scale ranges ≥ 0 ... 100 bar [≥ 0 ... 1,500 psi]

NS 63 [2 1/2"], centre back mount



14112247.01

Process connection with thread per ISO 1179-2

NS	G	Dimensions in mm [in]							
		h ±1	b	D1	D2	i	y	k	SW
63 [2 1/2"]	G 1/4 B	57 [2.24]	33 [1.30]	63 [2.48]	62 [2.44]	6 [0.24]	10 [0.39]	15 [0.59]	14 [0.55]
	G 1/8 B	54 [2.13]							
	M12 x 1.5	57 [2.24]							

Process connection with thread per ISO 7

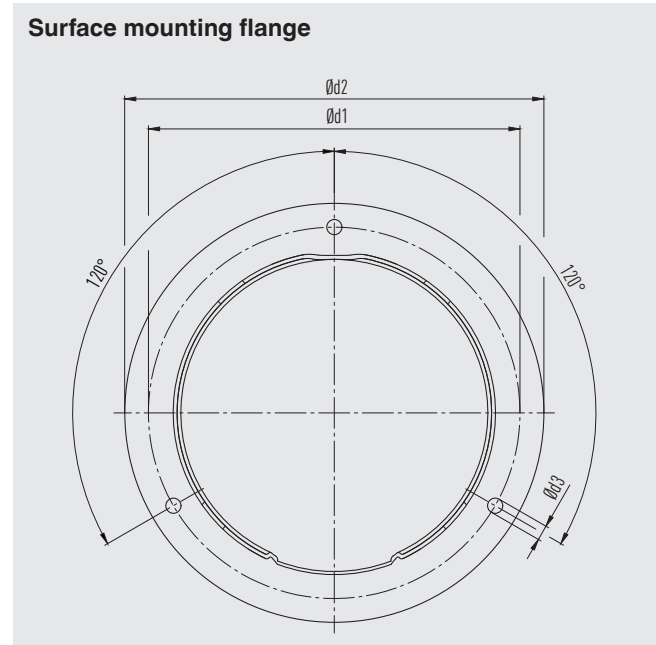
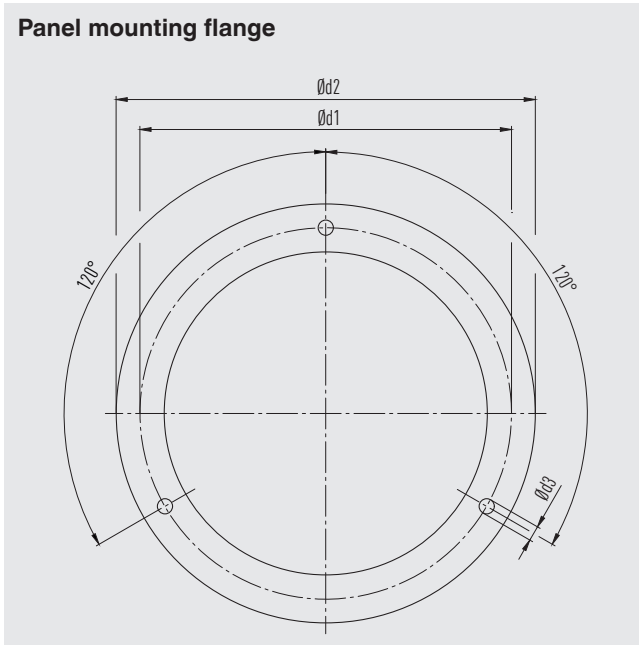
NS	G	Dimensions in mm [in]							
		h ±1	b	D1	D2	i	y	k	SW
63 [2 1/2"]	R 1/4	57 [2.24]	33 [1.30]	63 [2.48]	62 [2.44]	6 [0.24]	10 [0.39]	15 [0.59]	14 [0.55]

Process connection with thread per ANSI/B1.20.1

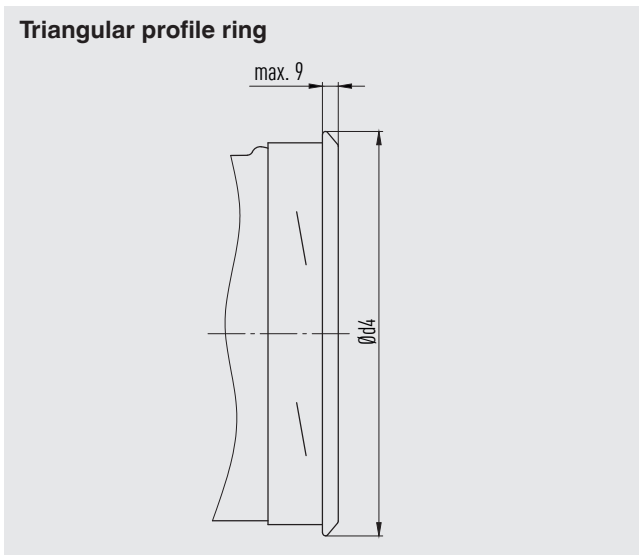
NS	G	Dimensions in mm [in]							
		h ±1	b	D1	D2	i	y	k	SW
63 [2 1/2"]	1/4 NPT	57 [2.24]	33 [1.30]	63 [2.48]	62 [2.44]	6 [0.24]	10 [0.39]	15 [0.59]	14 [0.55]
	1/8 NPT	54 [2.13]							

Accessories

Dimensions in mm [in]





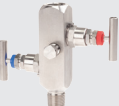





NS	Dimensions in mm [in]			
	Recommended panel cutout	d1	d2	d3
63 [2 ½"]	Ø 67 ±0.3 / Ø 2.6 [Ø 2.64 ±0.01 / Ø 0.10]	75 [2.95]	85 [3.35]	3.6 [0.14]
100 [4"]	Ø 104 ±0.5 / Ø 4.1 [Ø 4.04 ±0.02 / Ø 0.16]	117 [4.61]	132 [5.20]	4.8 [0.19]
160 [6"]	Ø 164 ±0.5 / Ø 6.5 [Ø 6.46 ±0.02 / Ø 0.26]	178 [7.01]	196 [7.71]	5.8 [0.23]



NS	Dimensions in mm [in]	
	Recommended panel cutout	d4
63 [2 ½"]	Ø 64.5 ±0.5 / Ø 2.5 [Ø 2.54 ±0.02 / Ø 0.01]	≤ 69 [2.72]
NS 100 [4"]	Ø 102 ±1.0 / Ø 4.0 [Ø 4.02 ±0.04 / Ø 0.16]	≤ 108 [4.25]
NS 160 [6"]	Ø 162.6 ±1.0 / Ø 6.4 [Ø 6.40 ±0.04 / Ø 0.25]	≤ 168 [6.61]

Accessories and spare parts

Model	Description
	910.17 Sealings → see data sheet AC 09.08
	910.15 Syphons → see data sheet AC 09.06
	910.13 Overpressure protector → see data sheet AC 09.04
	IV10, IV11 Needle valve and multiport valve → see data sheet AC 09.22
	IV20, IV21 Block-and-bleed valve → see data sheet AC 09.19
	IVM Monoflange, process and instrument version → see data sheet AC 09.17
	BV Ball valve, process and instrument version → see data sheet AC 09.28
	IBF2, IBF3 Monoblock with flange connection → see data sheet AC 09.25

Ordering information

Model / Nominal size / Scale range / Process connection / Connection location / Options

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Bourdon tube pressure gauge with switch contacts

For the process industry, NS 100 and 160

Models PGS23.100 and PGS23.160

WIKA data sheet PV 22.02



for further approvals see
page 8

switchGAUGE

Applications

- Control and regulation of processes
- Monitoring of plants and switching of circuits
- For gaseous and liquid aggressive media that are not highly viscous or crystallising, also in aggressive environments
- Chemical industry, petrochemical industry, power plants, mining, on-/offshore, environmental technology, machine building and general plant construction

Special features

- Up to 4 switch contacts per instrument
- Also available with case filling for high dynamic pressure loads or vibrations
- Instruments with inductive contacts for use in hazardous areas
- Instruments with contacts for PLC applications
- Instruments optionally available in safety version S3 per EN 837

Description

Wherever the process pressure has to be indicated locally and, at the same time, circuits need to be switched, the model PGS23.1x0 switchGAUGE finds its use.

Switch contacts (electrical switch contacts) make or break an electric control circuit dependent upon the pointer position of the indicating measuring instrument. The switch contacts are adjustable over the full extent of the scale range (see DIN 16085), and are mounted predominantly below the dial, though also partly on top of the dial. The instrument pointer (actual value pointer) moves freely across the entire scale range, independent of the setting.

The set pointer can be adjusted using a removable adjustment key in the window.



Model PGS23.100 with switch contact model 831.1

Switch contacts consisting of several contacts can also be set to a single set point. Contact actuation is made when the actual value pointer travels beyond or below the desired set point.

The pressure gauge is manufactured in accordance with DIN 16085 and fulfils all requirements of the relevant standards (EN 837-1) and regulations for the on-site display of the working pressure of pressure vessels.

As switch contacts, magnetic snap-action contacts, reed switches, inductive contacts and electronic contacts are available. Inductive contacts can be used in hazardous areas. For triggering programmable logic controllers (PLC), electronic contacts and reed switches can be used.

Specifications

Models PGS23.100 and PGS23.160	
Nominal size in mm	<ul style="list-style-type: none"> ■ 100 ■ 160
Accuracy class	1.0
Scale ranges	0 ... 0.6 bar [0 ... 8.7 psi] to 0 ... 1,600 bar [0 ... 23,206 psi] other units (e.g. psi, kPa) available or all other equivalent vacuum or combined pressure and vacuum ranges
Scale	Single scale Option: Dual scale
Pressure limitation	
Steady	Full scale value
Fluctuating	0.9 x full scale value
Short time	1.3 x full scale value
Connection location	<ul style="list-style-type: none"> ■ Lower mount (radial) ■ Lower back mount
Process connection	<ul style="list-style-type: none"> ■ G ½ B ■ G ¼ B ■ G ⅜ B ■ ½ NPT ■ M20 x 1.5 others on request
Permissible temperature ¹⁾	
Medium	+200 °C [+392 °F] max. with unfilled instruments +100 °C [+212 °F] max. with filled instruments
Ambient	-20 ... +60 °C [-4 ... 140 °F]
Temperature effect	When the temperature of the measuring system deviates from the reference temperature (+20 °C): max. ±0.4 %/10 K of full scale value
Case	<ul style="list-style-type: none"> ■ Version S1 per EN 837: With blow-out device in case back ■ Safety version S3 per EN837: With solid baffle wall (Solidfront) and blow-out back
Case filling	Without Option: With case filling
Wetted materials	
Process connection, pressure element	Stainless steel 316L, option: Monel (model PGS26)
Non-wetted materials	
Case, movement, bayonet ring	Stainless steel
Dial	Aluminium, white, black lettering
Instrument pointer	Aluminium, black
Set pointer	Aluminium, red
Window	Laminated safety glass
Ingress protection per IEC/EN 60529	IP65 ²⁾ Option: IP66
Electrical connection	Cable socket PA 6, black Per VDE 0110 insulation group C/250 V Cable gland M20 x 1.5 Strain relief 6 screw terminals + PE for conductor cross-section 2.5 mm ² For dimensions see page 9 others on request

1) For hazardous areas, the permissible temperatures of the contact model 831 shall apply exclusively (see page 5). These must not be exceeded at the instrument either (for details see operating instructions). If necessary, measures for cooling (e.g. syphon, instrumentation valve, etc.) have to be taken.

2) Ingress protection IP54 with safety version case and connection location lower back mount.

Switch contacts

Magnetic snap-action contact model 821

- No control unit and no power supply required
- Direct switching up to 250 V, 1 A
- Up to 4 switch contacts per measuring instrument

Inductive contact model 831

- Suitable for use in hazardous areas with corresponding control unit (model 904.xx)
- Long service life due to non-contact sensor
- Low influence on the indication accuracy
- Fail-safe switching at high switching frequency
- Insensitive to corrosion
- Also available in safety version
- Up to 3 switch contacts per measuring instrument

Electronic contact model 830 E

- For direct triggering of a programmable logic controller (PLC)
- 2-wire system (option: 3-wire system)
- Long service life due to non-contact sensor
- Low influence on the indication accuracy
- Fail-safe switching at high switching frequency
- Insensitive to corrosion
- Up to 3 switch contacts per measuring instrument

Reed switch model 851

- No control unit and no power supply required
- Direct switching up to 250 V, 1 A
- For direct triggering of a programmable logic controller (PLC)
- Free from wear as without contact
- NS 100: Maximum two change-over contacts per measuring instrument
- NS 160: Maximum one change-over contact per measuring instrument (switching voltages AC < 50 V and DC < 75 V, switch contact not adjustable from outside)

Switching function

The switching function of the switch is indicated by index 1, 2 or 3.

Model 8xx.1: Normally open (clockwise pointer motion)

Model 8xx.2: Normally closed (clockwise pointer motion)

Models 821.3 Change-over; one contact breaks and one and 851.3: contact makes simultaneously when pointer reaches set point

For further information on switch contacts, see data sheet AC 08.01

Other versions

- Contact model 821 with separate circuits
- Contact model 821 as change-over contact (break or make simultaneously at the set point)
- Contact model 821 with cable break monitoring (parallel resistance 47 k Ω and 100 k Ω)
- Contact materials for contact model 821: Platinum-iridium alloy and gold-silver alloy
- Contacts fixed, without contact adjustment lock
- Contact adjustment lock leaded
- Contact adjustment key fixed
- Connector (instead of cable socket)

Specifications for instruments with magnetic snap-action contact model 821

Measuring span	Nominal size	Max. number of contacts	Switching current range I	Switch version ¹⁾
≤ 1.0 bar	100, 160	1	0.02 ... 0.3 A	L
> 1.0 bar	100, 160	1	0.02 ... 0.6 A	S
≤ 1.6 bar	100, 160	2	0.02 ... 0.3 A	L
> 1.6 bar	100, 160	2	0.02 ... 0.6 A	S
≤ 4.0 bar	100	3 or 4	0.02 ... 0.3 A	L
> 4.0 bar	100	3 or 4	0.02 ... 0.6 A	S
≤ 2.5 bar	160	3 or 4	0.02 ... 0.3 A	L
> 2.5 bar	160	3 or 4	0.02 ... 0.6 A	S

1) Design of the contact coil: Version "L" = light-weight, version "S" = heavy

The recommended setting range of the contacts is 25 ... 75 % of the scale (0 ... 100 % on request).

Contact material (standard): Silver-nickel, gold-plated

Setting the contacts

The recommended minimum clearance between 2 contacts is 20 % of the measuring span.

The switch hysteresis is 2 ... 5 % (typical).

Characteristics	Unfilled instruments		Filled instruments	
	Resistive load		Resistive load	
	Switch version "S"	Switch version "L"	Switch version "S"	Switch version "L"
Rated operating voltage U_{eff}	≤ 250 V		≤ 250 V	
Rated operating current				
Switch-on current	≤ 1.0 A	≤ 0.5 A	≤ 1.0 A	≤ 0.5 A
Switch-off current	≤ 1.0 A	≤ 0.5 A	≤ 1.0 A	≤ 0.5 A
Continuous current	≤ 0.6 A	≤ 0.3 A	≤ 0.6 A	≤ 0.3 A
Switching power	≤ 30 W / ≤ 50 VA		≤ 20 W / ≤ 20 VA	

Recommended contact load with resistive and inductive loads

Operating voltage	Unfilled instruments			Filled instruments		
	Resistive load		Inductive load	Resistive load		Inductive load
	Direct current	Alternating current	cos φ > 0.7	Direct current	Alternating current	cos φ > 0.7
DC 220 V / AC 230 V	100 mA	120 mA	65 mA	65 mA	90 mA	40 mA
DC 110 V / AC 110 V	200 mA	240 mA	130 mA	130 mA	180 mA	85 mA
DC 48 V / AC 48 V	300 mA	450 mA	200 mA	190 mA	330 mA	130 mA
DC 24 V / AC 24 V	400 mA	600 mA	250 mA	250 mA	450 mA	150 mA

Specifications for instruments with inductive contact model 831

Measuring span	Nominal size	Case version	Max. number of contacts
0.6 bar	100, 160	S1	1
0.6 bar	160	S3	1
1.0 bar	100, 160	S1	2
1.0 bar	100	S3	1
1.0 bar	160	S3	2
≥ 1.6 bar	100, 160	S1, S3	3

Legend:

S1 = Standard version, with blow-out device (per EN 837)

S3 = Safety version, Solidfront (per EN 837)

The recommended setting range of the contacts is 10 ... 90 % of the scale (0 ... 100 % on request).

Setting of contacts to identical set point

Up to 2 contacts can be set to an identical set point. For a version with 3 contacts this is not possible. The left (no. 1) or right (no. 3) contact may not be set to the same set point as the other 2 contacts. The required displacement is approx. 30°, optionally to the right or to the left.

Available contact versions

- 831-N
- 831-SN, safety version ¹⁾
- 831-S1N, safety version ¹⁾, inverted signal

¹⁾ only operate with a corresponding isolating amplifier (model 904.3x)

Permissible temperature ranges

T6	T5 ... T1	T135 °C
-20 ... +60 °C	-20 ... +70 °C	-20 ... +70 °C

For further information on hazardous areas, see operating instructions.

Associated isolating amplifiers and control units

Model	Version	Ex version
904.28 KFA6 - SR2 - Ex1.W	1 contact	yes
904.29 KFA6 - SR2 - Ex2.W	2 contacts	yes
904.30 KHA6 - SH - Ex1	1 contact	yes - safety equipment
904.33 KFD2 - SH - Ex1	1 contact	yes - safety equipment
904.25 MSR 010-I	1 contact	no
904.26 MSR 020-I	2 contacts	no
904.27 MSR 011-I	Two-point control	no

Specifications for instruments with electronic contact model 830 E

Measuring span	Nominal size	Case version	Max. number of contacts
0.6 bar	100, 160	S1	1
0.6 bar	160	S3	1
1.0 bar	100, 160	S1	2
1.0 bar	100	S3	1
1.0 bar	160	S3	2
≥ 1.6 bar	100, 160	S1, S3	2

Legend:

S1 = Standard version, with blow-out device (per EN 837)

S3 = Safety version, Solidfront (per EN 837)

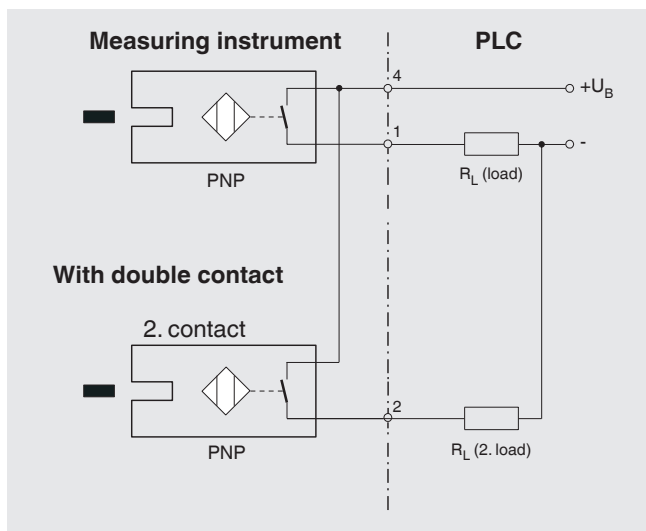
The recommended setting range of the contacts is 10 ... 90 % of the scale (0 ... 100 % on request).

Setting of contacts to identical set point

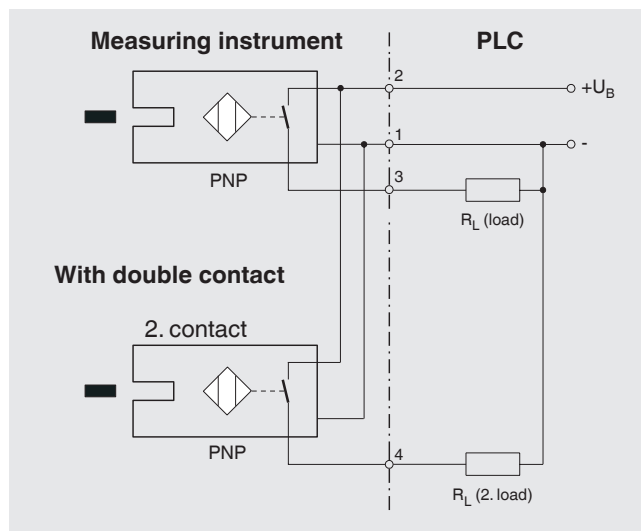
Up to 2 contacts can be set to an identical set point. For a version with 3 contacts this is not possible. The left (no. 1) or right (no. 3) contact may not be set to the same set point as the other 2 contacts. The required displacement is approx. 30°, optionally to the right or to the left.

Characteristics	
Contact version	Normally open, normally closed
Type of output	PNP transistor
Operating voltage	DC 10 ... 30 V
Residual ripple	max. 10 %
No-load current	≤ 10 mA
Switching current	≤ 100 mA
Residual current	≤ 100 μA
Voltage drop (with $I_{max.}$)	≤ 0.7 V
Reverse polarity protection	Conditional U_B (the switched output 3 or 4 must never be set directly to minus)
Anti-inductive protection	1 kV, 0.1 ms, 1 kΩ
Oscillator frequency	approx. 1,000 kHz
EMC	per EN 60947-5-2

2-wire system (standard)



3-wire system



Specifications for instruments with reed switch model 851

Measuring span	Nominal size	Case version	Max. number of contacts
≥ 1.0 bar	100, 160	S1, S3 ¹⁾	1
≥ 1.6 bar	100, 160	S1, S3 ¹⁾	2

1) Case version S3 with NS 100

Legend:

S1 = Standard version, with blow-out device (per EN 837)

S3 = Safety version, Solidfront (per EN 837)




Switching power P_{\max} 60 W / 60 VA

Switching current 1 A

Characteristics	
Contact version	Change-over contact
Type of contact	Bistable
Max. switching voltage	AC/DC 250 V
Min. switching voltage	Not required
Switching current	AC/DC 1 A
Min. switching current	Not required
Transport current	AC/DC 2 A
cos φ	1
Switching power	60 W/ VA
Contact resistance (static)	100 m Ω
Insulation resistance	10 ⁹ Ω
Breakdown voltage	DC 1,000 V
Switching time incl. contact chatter	4.5 ms
Contact material	Rhodium
Switch hysteresis	3 ... 5 %

- The limit values presented here must not be exceeded.
- When using two contacts, these cannot be set to the same point. Depending on the switching function, a minimum clearance of 15 ... 30° is required.
- The setting range of the contacts is 10 ... 90 % of the scale.
- The switching function can be set in manufacturing such that the reed contact will actuate exactly at the required switch point. For this, we need the switching direction to be specified on order.

Approvals

Logo	Description	Country
 	EU declaration of conformity <ul style="list-style-type: none"> ■ EMC directive ■ Pressure equipment directive ■ Low voltage directive ■ RoHS directive ■ ATEX directive (option) ¹⁾ Hazardous areas - Ex ia Gas [II 2G Ex ia IIC T6/T5/T4 Gb] Dust [II 2D Ex ia IIIB T135°C Db]	European Union
	IECEx (option) ¹⁾ Hazardous areas - Ex ia Gas [Ex ia IIC T6/T5/T4 Gb] Dust [Ex ia IIIB T135°C Db]	International
	EAC (option) <ul style="list-style-type: none"> ■ EMC directive ■ Pressure equipment directive ■ Low voltage directive ■ Hazardous areas ¹⁾ 	Eurasian Economic Community
	GOST (option) Metrology, measurement technology	Russia
	KazInMetr (option) Metrology, measurement technology	Kazakhstan
-	MTSCHS (option) Permission for commissioning	Kazakhstan
	BelGIM (option) Metrology, measurement technology	Belarus
-	CRN Safety (e.g. electr. safety, overpressure, ...)	Canada

1) Only for instruments with inductive contact model 831

Certificates (option)

- 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, indication accuracy)
- 3.1 inspection certificate per EN 10204 (e.g. indication accuracy)

Approvals and certificates, see website

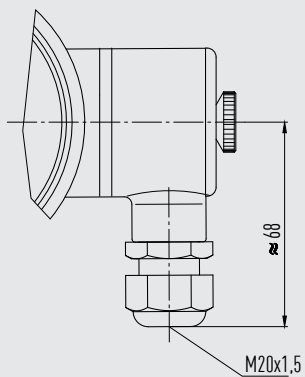
Accessories

- Panel mounting flange, polished stainless steel
- Surface mounting flange, stainless steel
- Sealings (model 910.17, see data sheet AC 09.08)
- Valves (models IV20/IV21, see data sheet AC 09.19, and models IV10/IV11, see data sheet AC 09.22)
- Syphons (model 910.15, see data sheet AC 09.06)
- Overpressure protector (model 910.13, see data sheet AC 09.04)
- Cooling element (model 910.32, see data sheet AC 09.21)
- Diaphragm seal

Dimensions in mm

Cable socket

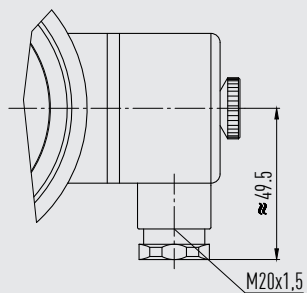
Contact models: 821 and 851



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Only use cable with a diameter of 5 ... 10 mm

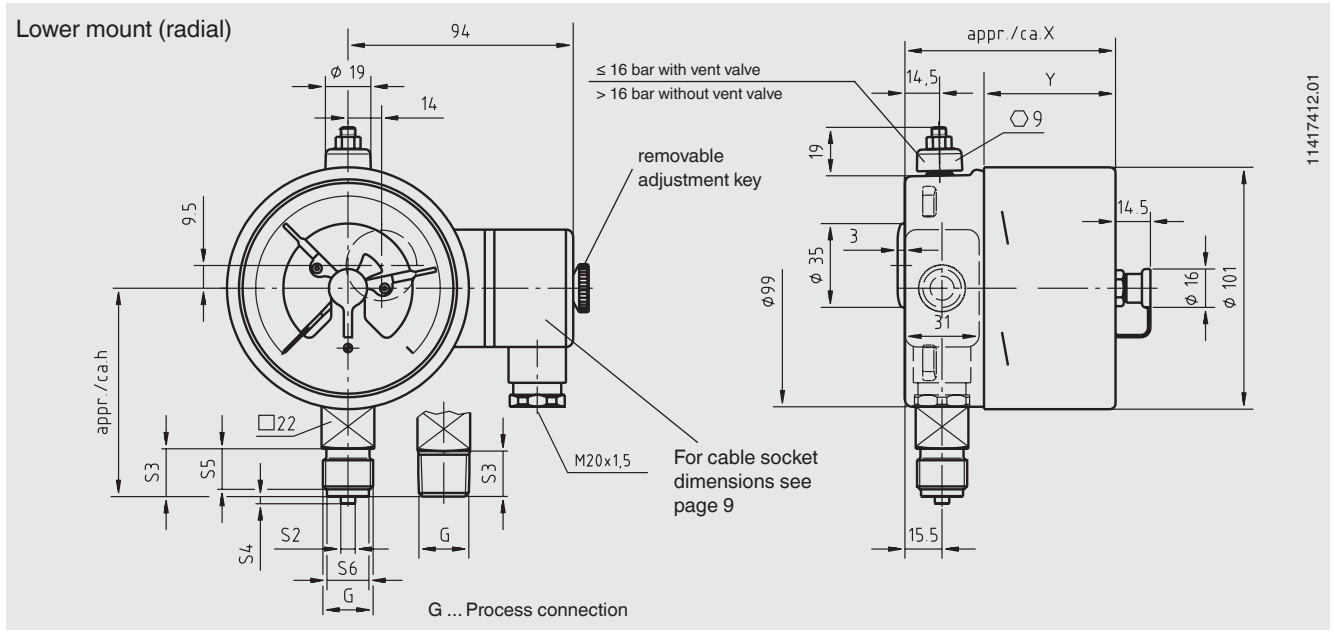
Contact models: 831 und 830 E



14336089.01

Only use cable with a diameter of 7 ... 13 mm

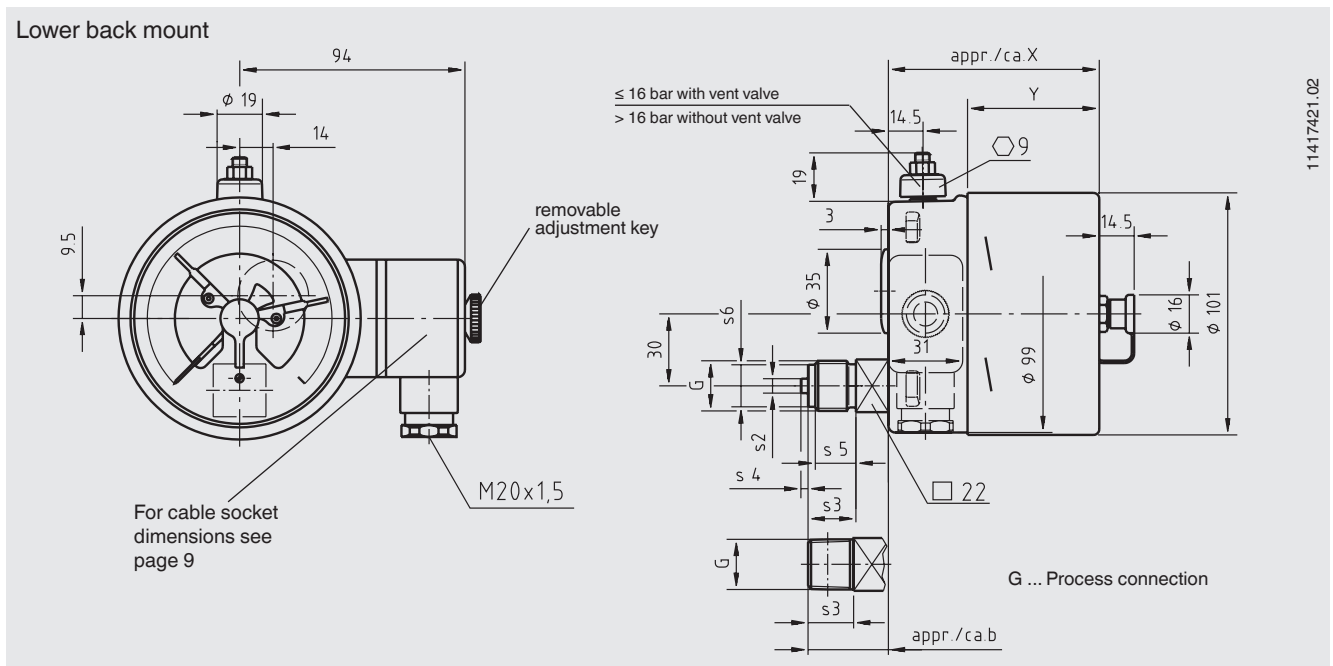
switchGAUGE model PGS23.100 with switch contact model 821, 831 or 830 E



11417412.01

Type of contact	Dimensions in mm	
	X	Y
Single or double contact	88	55
Double (change-over) contact	113	80
Triple contact	96	63
Quadruple contact	113	80

Process connection	Dimensions in mm					
	h ±1	S2	S3	S4	S5	S6
G ½ B	87	6	20	3	17	17.5
G ¼ B	80	5	13	2	11	9.5
G ⅜ B	83	5.5	16	3	13	13
½ NPT	86	-	19	-	-	-



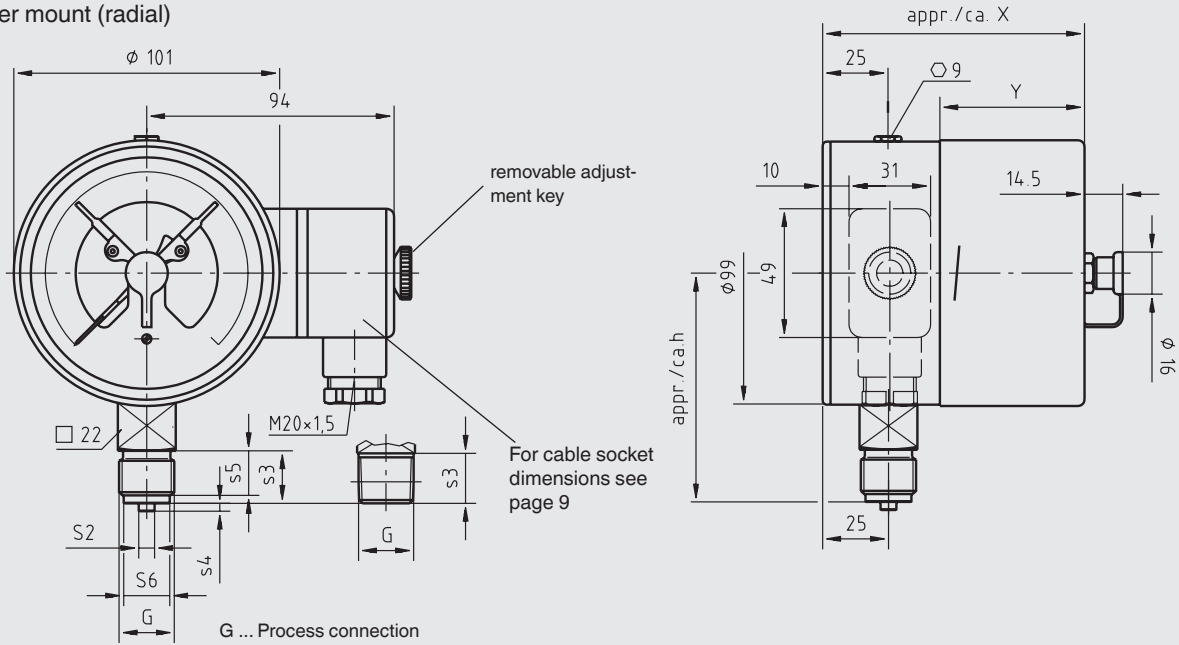
11417421.02

Type of contact	Dimensions in mm	
	X	Y
Single or double contact	88	55
Double (change-over) contact	113	80
Triple contact	96	63
Quadruple contact	113	80

Process connection	Dimensions in mm					
	b	S2	S3	S4	S5	S6
G ½ B	33.5	6	20	3	17	17.5
G ¼ B	26.5	5	13	2	11	9.5
G ⅜ B	29.5	5.5	16	3	14	13
½ NPT	32.5	-	19	-	-	-

switchGAUGE model PGS23.100 (safety version) with switch contact model 821, 831 or 830 E

Lower mount (radial)

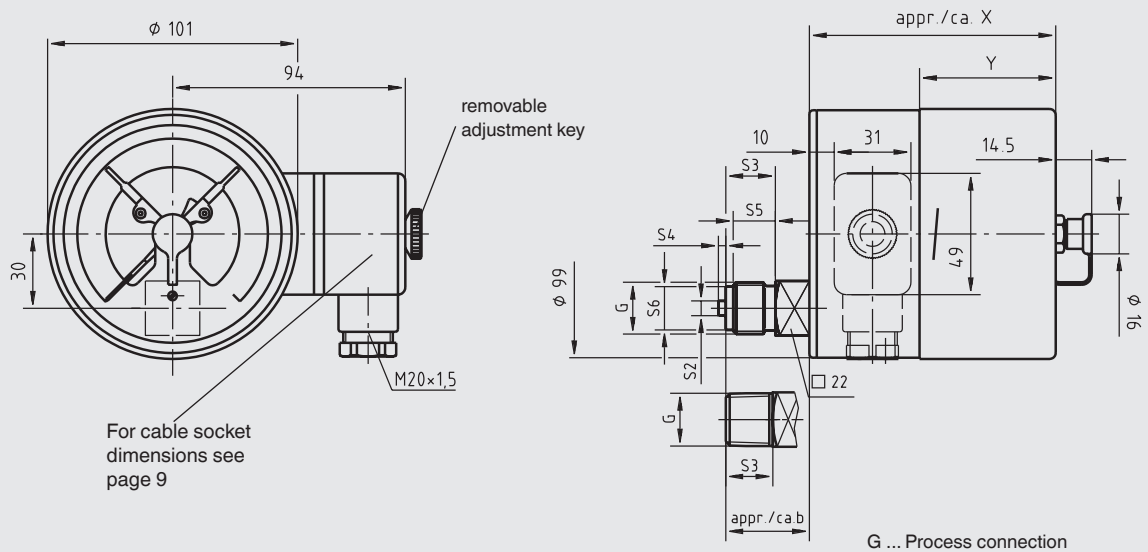


11417005.01

Type of contact	Dimensions in mm	
	X	Y
Single or double contact	97	55
Double (change-over) contact	122	80
Triple contact	105	63
Quadruple contact	122	80

Process connection	Dimensions in mm					
	h ± 1	S2	S3	S4	S5	S6
G 1/2 B	87	6	20	3	17	17.5
G 1/4 B	80	5	13	2	11	9.5
G 3/8 B	83	5.5	16	3	14	13
1/2 NPT	86	-	19	-	-	-

Lower back mount

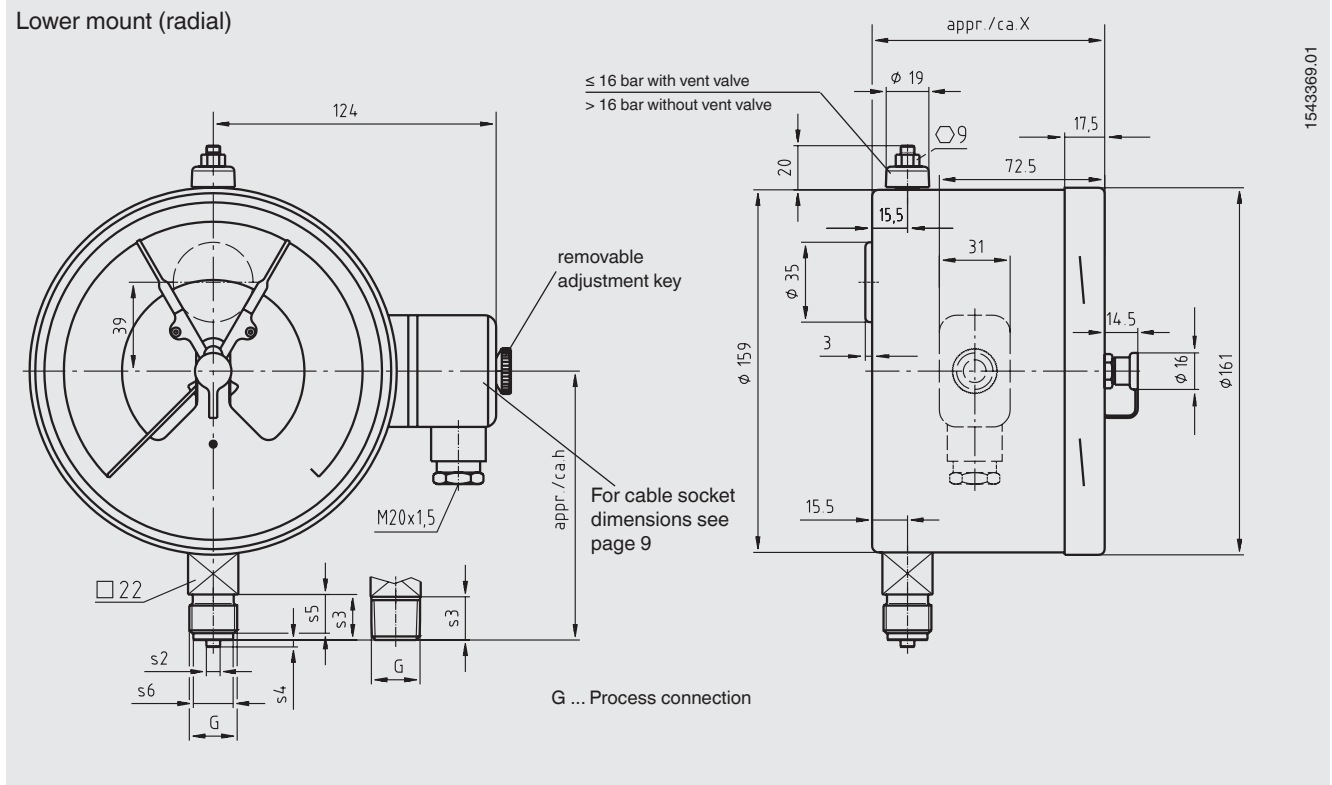


11417013.02

Type of contact	Dimensions in mm	
	X	Y
Single or double contact	97	55
Double (change-over) contact	122	80
Triple contact	105	63

Process connection	Dimensions in mm					
	b	S2	S3	S4	S5	S6
G 1/2 B	33.5	6	20	3	17	17.5
G 1/4 B	26.5	5	13	2	11	9.5
G 3/8 B	29.5	5.5	16	3	14	13
1/2 NPT	32.5	-	19	-	-	-

switchGAUGE model PGS23.160 with switch contact model 821, 831 or 830 E

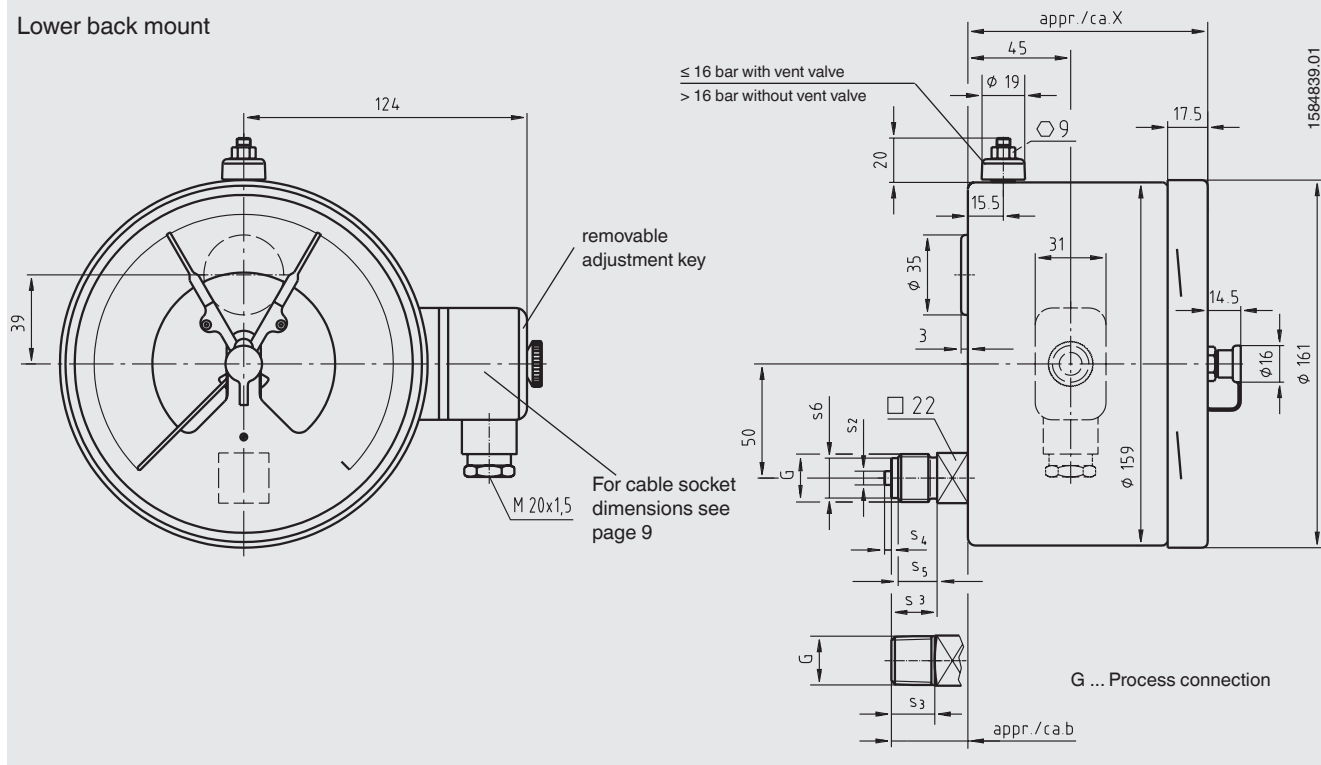


Type of contact	Dimensions in mm
	X
Single, double or triple contact	102 ¹⁾
Double (change-over) contact, quadruple contact	116 ¹⁾

Process connection	Dimensions in mm					
	h ± 1	S2	S3	S4	S5	S6
G 1/2 B	118	6	20	3	17	17.5
G 1/4 B	111	5	13	2	11	9.5
G 3/8 B	114	5.5	16	3	14	13
1/2 NPT	117	-	19	-	-	-

1) Plus 14 mm with pressure ranges $\geq 0 \dots 100$ bar

Lower back mount

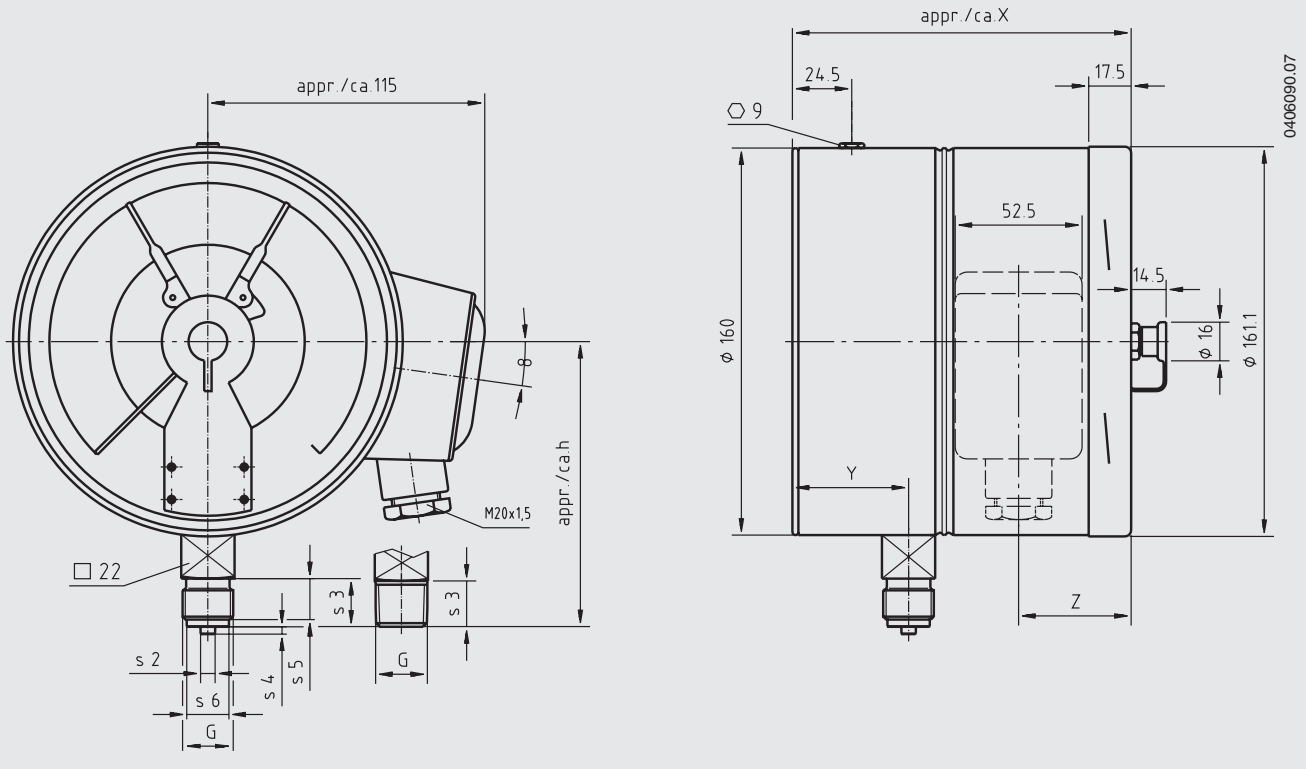


Type of contact	Dimensions in mm
	X
Single, double or triple contact	105
Double (change-over) contact, quadruple contact	119

Process connection	Dimensions in mm					
	b	S2	S3	S4	S5	S6
G ½ B	33.5	6	20	3	17	17.5
G ¼ B	26.5	5	13	2	11	9.5
G ⅜ B	29.5	5.5	16	3	14	13
½ NPT	32.5	-	19	-	-	-

switchGAUGE model PGS23.160 (safety version) with switch contact model 821, 831 or 830 E

Lower mount (radial)



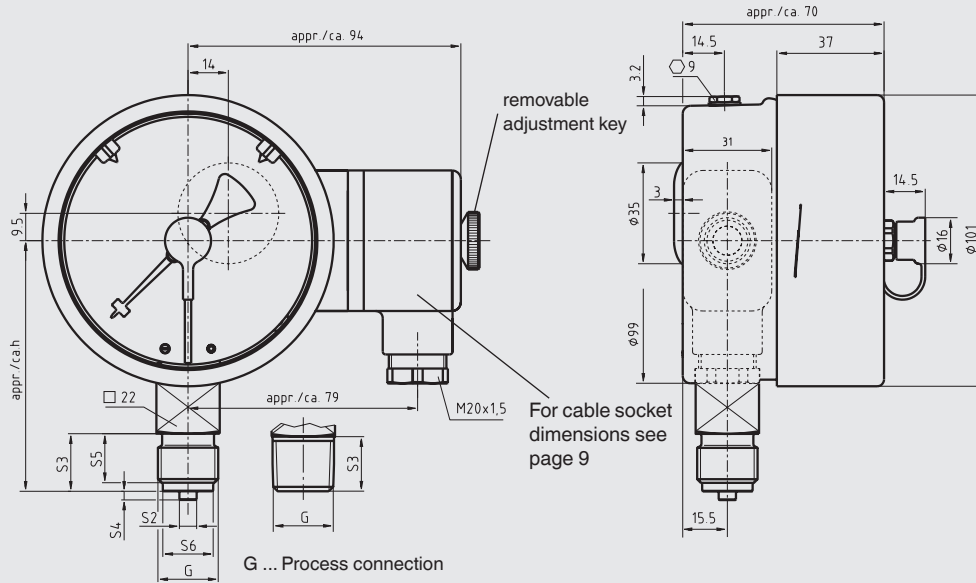
Type of contact	Dimensions in mm		
	X	Y	Z
Single or double contact	141	30.5 ¹⁾	48
Triple contact	153.5	30.5 ¹⁾	60.5

Process connection	Dimensions in mm					
	h ±1	S2	S3	S4	S5	S6
G ½ B	118	6	20	3	17	17.5
½ NPT	117	-	19	-	-	-
M20 x 1.5	118	6	20	3	17	17.5

1) Plus 17 mm with pressure ranges ≤ 0 ... 60 bar

switchGAUGE model PGS23.100 with switch contact model 851.3 or 851.33

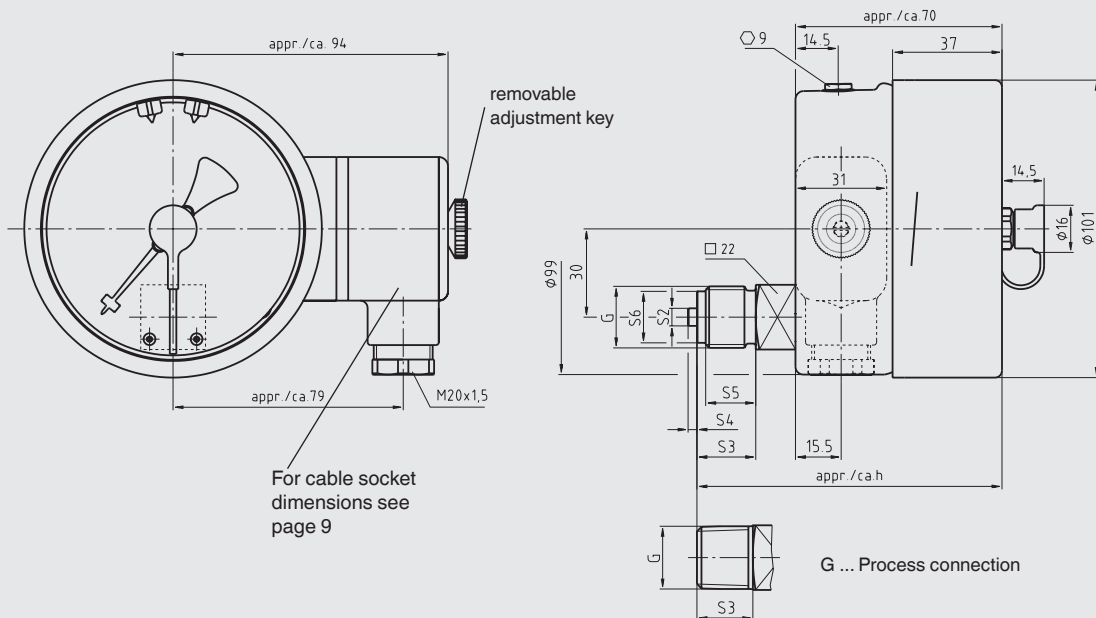
Lower mount (radial)



11421955.01

Process connection	Dimensions in mm					
	h ±1	S2	S3	S4	S5	S6
G ½ B	87	6	20	3	17	17.5
G ¼ B	80	5	13	2	11	9.5
G ⅜ B	83	5.5	16	3	14	13
½ NPT	86	-	19	-	-	-

Lower back mount

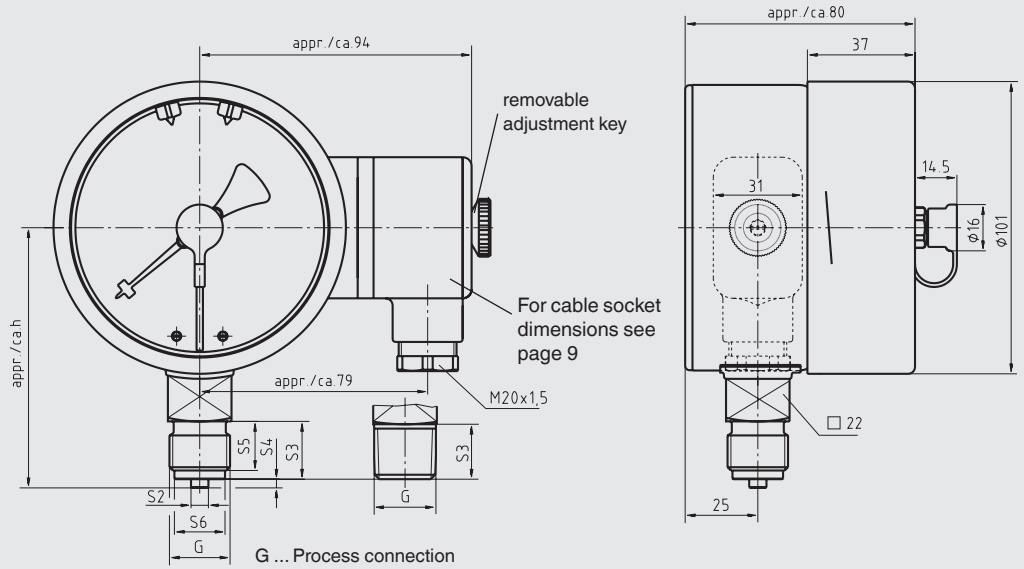


14034487.01

Process connection	Dimensions in mm					
	h ±1	S2	S3	S4	S5	S6
G ½ B	103	6	20	3	17	17.5
G ¼ B	96	5	13	2	11	9.5
G ⅜ B	99	5.5	16	3	14	13
½ NPT	102	-	19	-	-	-

switchGAUGE model PGS23.100 (safety version) with switch contact model 851.3 or 851.33

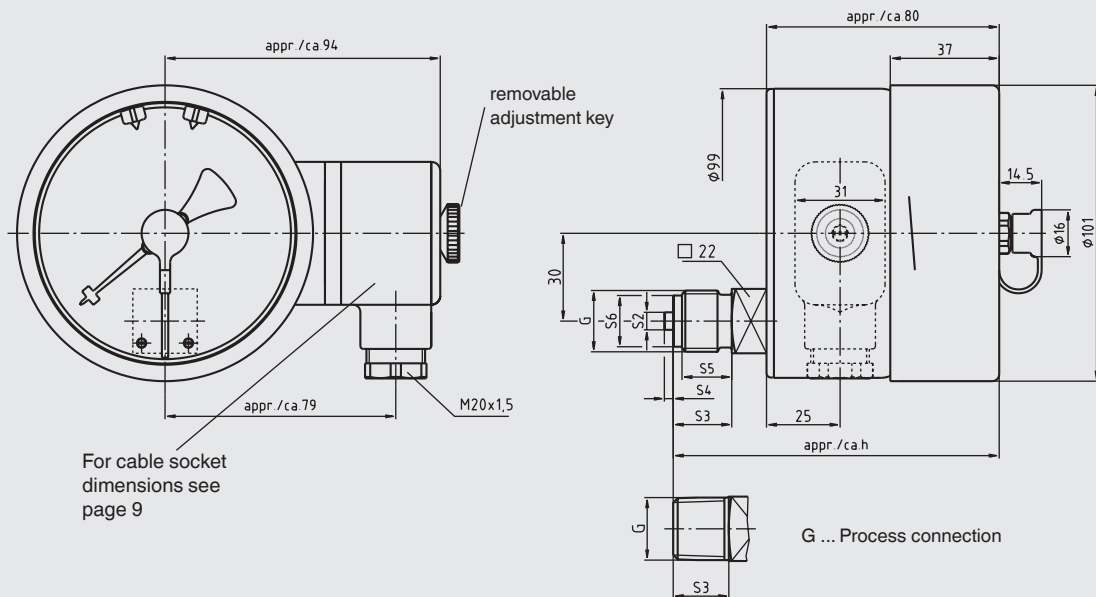
Lower mount (radial)



14034797.01

Process connection	Dimensions in mm					
	$h \pm 1$	S2	S3	S4	S5	S6
G ½ B	87	6	20	3	17	17.5
G ¼ B	80	5	13	2	11	9.5
G ¾ B	83	5.5	16	3	13	13
½ NPT	86	-	19	-	-	-

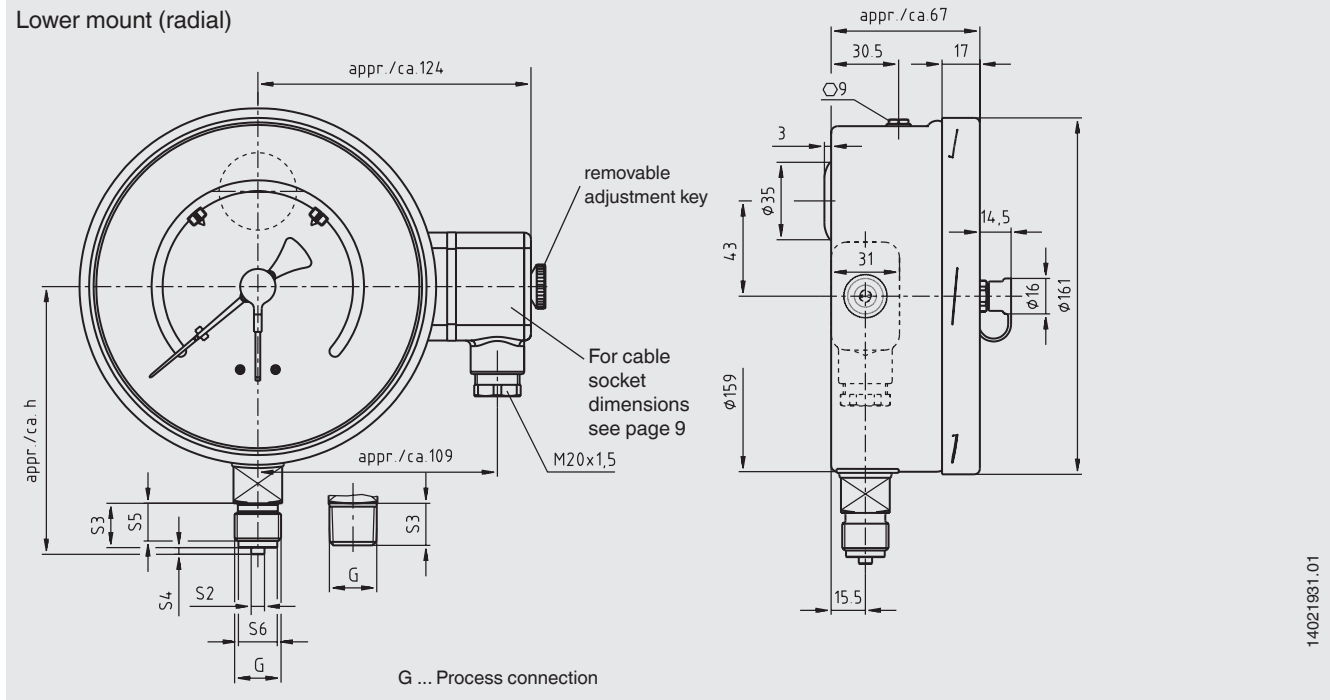
Lower back mount



14034471.01

Process connection	Dimensions in mm					
	$h \pm 1$	S2	S3	S4	S5	S6
G ½ B	112	6	20	3	17	17.5
G ¼ B	105	5	13	2	11	9.5
G ¾ B	108	5.5	16	3	14	13
½ NPT	111	-	19	-	-	-

switchGAUGE model PGS23.160 with switch contact model 851.3 or 851.33



Process connection	Dimensions in mm					
	h ±1	S2	S3	S4	S5	S6
G ½ B	118	6	20	3	17	17.5
G ¼ B	111	5	13	2	11	9.5
G ⅜ B	114	5.5	16	3	14	13
½ NPT	117	-	19	-	-	-

Ordering information

Model / Nominal size / Contact model / Contact version / Connection location / Process connection / Options

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