

Measuring Devices

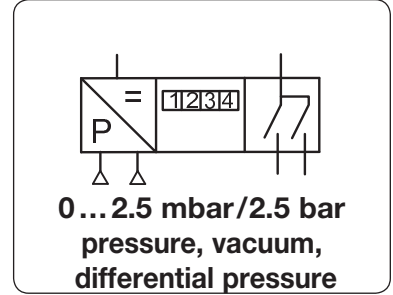
	Description	Pressure range	Connection	Device	Page
Digital display	mounting, for low pressure	0 ... 2.5 mbar / 2.5 bar	4 mm tube	MPV, MPA	14.02
	tragbar, Handmanometer	0 ... 1 mbar / 10 bar	4 mm tube	MHA	14.03
	mounting, programmierbar	external sensor		MPAX	14.04
	mounting, auch ext. Sensor	0 ... 1 mbar / 10 bar	4 mm tube	MKA	14.05
Analogue display	mounting, front ring	-1... 0 / 25 bar	G $\frac{1}{8}$ and G $\frac{1}{4}$	ME	14.06
	mounting, triangular bezel	-1... 0 / 25 bar	G $\frac{1}{8}$ and G $\frac{1}{4}$	MF	14.06
	male thread, Ø 23 mm	0 ... 4 / 16 bar	M5 and G $\frac{1}{8}$	MA	14.07
	male thread, Ø 40 mm	0 ... 1 / 16 bar	G $\frac{1}{8}$	MA	14.07
	male thread Ø 50 mm	0 ... 1 / 60 bar	G $\frac{1}{8}$ and G $\frac{1}{4}$	MA	14.07
	male thread, Ø 63 mm	0 ... 60 mbar / 100 bar	G $\frac{1}{4}$	MA	14.07
Stainless steel	male thread, Ø 40 mm	0 ... 2.5 / 16 bar	G $\frac{1}{8}$ and G $\frac{1}{4}$	MS	14.08
	male thread, Ø 50 mm	0 ... 2.5 / 60 bar	G $\frac{1}{4}$	MS	14.08
	male thread, Ø 63 mm	0 ... 25 mbar / 60 bar	G $\frac{1}{4}$	MS	14.08



14

Pressure Measuring

Description	A piezo-resistive pressure sensor converts the input pressure into a digital electrical signal.	
Medium	compressed air or non-corrosive gases	Overpressure see chart
Voltage supply	16...32 V DC standard, optionally 230 V AC, optional wall power supply	
Electrical connection	screw terminals for wire up to 1.5 mm ²	
Pneumatic connection	P+: pos. pressure P-: vacuum P+/P-: differential pressure, the higher pressure is to be connected at P+	
Process connection	4 mm and 6 mm tube connections	
Display	4-digit LCD display, max. ± 1999	
Output signal	0...10 V, optionally 4...20 mA, impedance < 500 Ω	
Linearity/Hysteresis	< 1% FS, optionally < 0.5% FS	
Long-term stability	< 0.5% FS per year at < 10 mbar, < 0.1% FS per year at > 25 mbar	
Temperature sensitivity	see chart, at 0 to 50 °C / 32 to 122 °F	
Response time	< 1 ms for 10...90% of pressure range	
Temperature range	0 °C to 50 °C / 32 °F to 122 °F compensated pressure range	
Material	Housing: glass fibre-reinforced Noryl plastic	



Repeatability	Temperature error	Linearity error	Over-pressure	Measurement range	Order number
% FS	% FS	% FS	mbar/bar	mbar/bar	

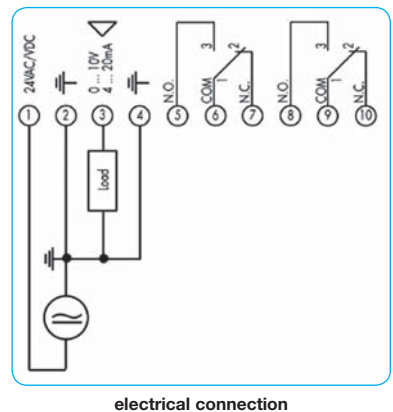
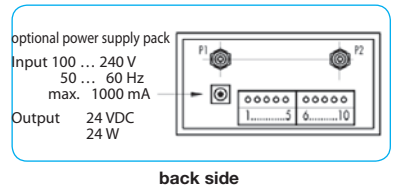
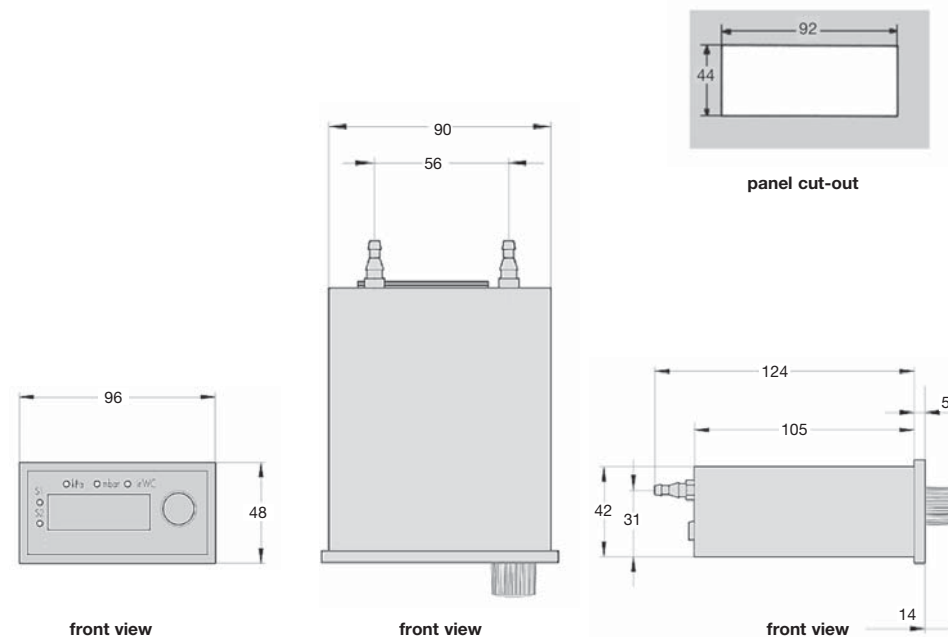
Digital gauge	for compressed air, measurement of positive pressure, vacuum and differential pressure, 24 V DC, outlet signal 0...10 V, 3½-digit display				MPV
0.2	5.0	1.0	25 mbar	0 ... 2,5 mbar	MPV-A2
0.2	5.0	1.0	25 mbar	0 ... 5 mbar	MPV-A5
0.2	2.5	1.0	25 mbar	0 ... 10 mbar	MPV-B1
0.5	1.0	1.0	300 mbar	0 ... 25 mbar	MPV-B2
0.5	1.0	1.0	750 mbar	0 ... 50 mbar	MPV-B5
0.5	1.0	1.0	1 bar	0 ... 100 mbar	MPV-C1
0.5	1.0	1.0	1 bar	0 ... 250 mbar	MPV-C2
0.5	1.0	1.0	1 bar	0 ... 500 mbar	MPV-C5
0.5	1.0	1.0	3 bar	0 ... 1 bar	MPV-01
0.5	1.0	1.0	6 bar	0 ... 2.5 bar	MPV-02



MPV-C1S
with two limit switches

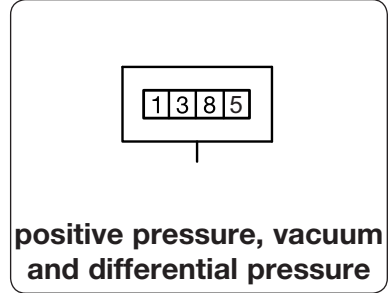
Special options, add the appropriate letter

4...20 mA output signal		MPA-..
two limit switches	with LED, 230 V AC, 1 A, adjustable NOC	MP-..S
linearity 0.5%		MP-..B
230 V AC	supply voltage	MP-..V
deviant measurement range	to be indicated on order	MP-..XX



*1 Handshake on/off, Baudrate 9600

Description	A piezo-resistive pressure sensor converts the input pressure into a digital electrical signal, which is displayed on the LCD. On-off switch is located at the side of the plastic housing.	
Media	compressed air or non-corrosive gases	Overpressure see chart
Pneumatic connection	P+ : pos. pressure P- : vacuum P+/P- : differential pressure, the higher pressure to be connected at P+ plug nipple up to 1 bar, sleeve with union nut from 2 bar on, each for hose internal diameter of Ø 4 mm	
Voltage supply	9 V battery, 2.5 mA, type 6F22, PP3 or similar	
Display	3½-digit LCD display, low battery display at low voltage, optionally 0...1 V	max. ± 1999, 12 mm tall, black numbers, red LED lights up at overpressure, then measurement is faulty
Output signal		Impedance: > 2 kΩ terminal for 2.5 mm 2-pin jack plug
Zero point	All devices have a potentiometer for rough adjustment of zero point at the side of the housing.	
Linearity	see chart, optionally 0.2% FS	Hysteresis < 0.1% FS
Long-term stability	< 0.1% FS per year at > 20 mbar,	< 2% FS per year at < 20 mbar
Temperature sensitivity	see chart, at 0 to 50 °C / 32 to 122 °F	Repeatability see chart
Temperature range	0 °C to 50 °C / 32 °F to 122 °F	Resolution 0,05% FS
Material	Housing: plastic	Protection class IP 54



Repeatability	Temperature error	Linearity error	Over-pressure	Measurement range	Order number
% FS	% FS	% FS	max. bar	mbar/bar	

Hand-operated gauge for compressed air, measurement of positive pressure, vacuum and differential pressure, with battery, 3½-digit display					MHA
1.0	4.0	1.0	0.25	0... 1 mbar	MHA-A1
0.3	2.5	0.8	0.25	0... 2.5 mbar	MHA-A2
0.3	1.2	0.8	0.25	0... 5 mbar	MHA-A5
0.2	1.0	0.8	0.25	0... 10 mbar	MHA-B1
0.1	1.0	0.7	0.35	0... 25 mbar	MHA-B2
0.1	1.0	0.7	0.35	0... 50 mbar	MHA-B5
0.1	1.0	0.5	0.35	0... 100 mbar	MHA-C1
0.1	1.0	0.5	0.75	0... 250 mbar	MHA-C2
0.1	1.0	0.5	1.5	0... 500 mbar	MHA-C5
0.1	1.0	0.5	3.0	-1... 1 bar	MHA-V1
0.1	1.0	0.5	3.0	0... 1 bar	MHA-01
0.1	1.0	0.5	4.0	0... 2 bar	MHA-02
0.1	2.0	0.5	10	0... 8 bar	MHA-08
0.1	2.0	0.5	12	0... 10 bar	MHA-10
0.1	2.3 mbar	1 mbar	3.3	0.7... 1.1 bar _{abs}	MHA-S1



MHA

Gauges
1385
14

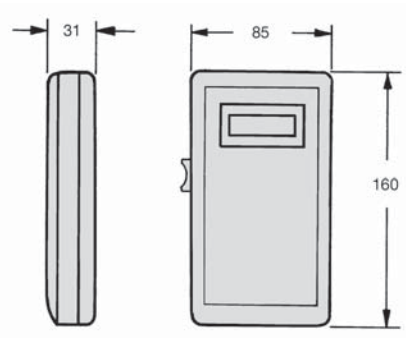
Special options, add the appropriate letter		
linearity < 0.2% FS	from 100 mbar on	MHA- . . B
0-1 V output signal	at electrical connector	MHA- . . N
P _a indication	< 20 mbar: indication P _a > 20 mbar: indication kP _a	MHA- . . P
zero point fine adjustment	in the front	MHA- . . E
range switch	10:1, from measurement range 1 bar on	MHA- . . D
deviant measurement range	to be indicated on order	MHA-XX



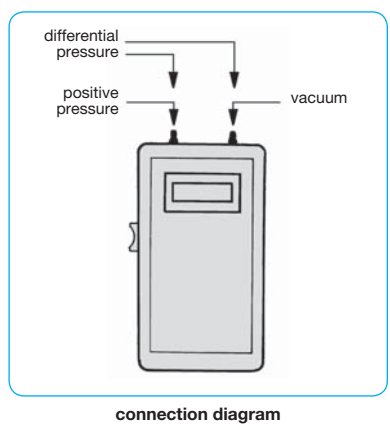
MHA-...E

Accessories

protective bag	for belt attachment	MHT
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MHA

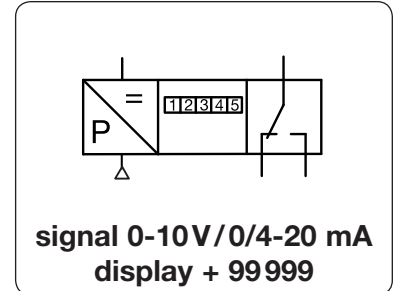


Calibration or test chart: see chapter "Technical Information"

PDF CAD
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Order example:
MHA-A1

Description	Digital, programmable display for dual range input 0 to 10 V DC or 0/4 to 20 mA with 24 V DC transmitter power. Min./max. value memory, 16-point scale for non-linear processes. Programmable function keys / user inputs. Four setpoint alarm outlets. Analogue outlet, interface and bus capabilities. data entry by keypad, optionally by serial interface RS232 with PC software and cable or by RS485		
Programming	11 ... 36 V DC, max. power consumption 11 W or 85 ... 250 V AC, max. power consumption 15 VA		
Supply voltage	5-pin LCD display 14 mm tall, red numbers, background lighting		
Display	terminal strip for area 0.14...1.5 mm ² 0...10 V or 0/4...20 mA		
Electrical connector	2x SPDT 5 A or 4x NOC 3 A, at 24 V DC		
Analogue output card	24 V DC ± 5%, max. 50 mA		
Transistor output card	200 ms		
Measuring rate	input signal x time		
Measurement memory	CE-certified, UL-listed		
Display accuracy	16 bit A/D converter		
Response time	IP 65 in the front		
Temperature range	The electrical plug-in module can be pulled out rearwards.		
Material			

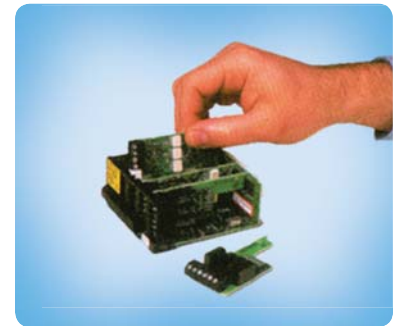


Dimensions			Accuracy	Supply voltage	Input signal	Order number
A	B	C	% FS	V	mA/V	
mm	mm	mm				

Process display	5-digit display, freely scaleable, for external sensor				MPAX
97 50 107	0.12	230 V AC	0/4-20 mA / 0-10 V	MPAX-230	
97 50 107	0.12	24 V DC	0/4-20 mA / 0-10 V	MPAX-24	



MPAX



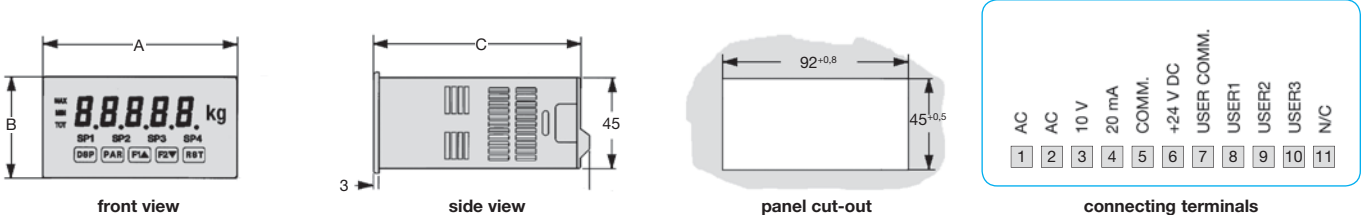
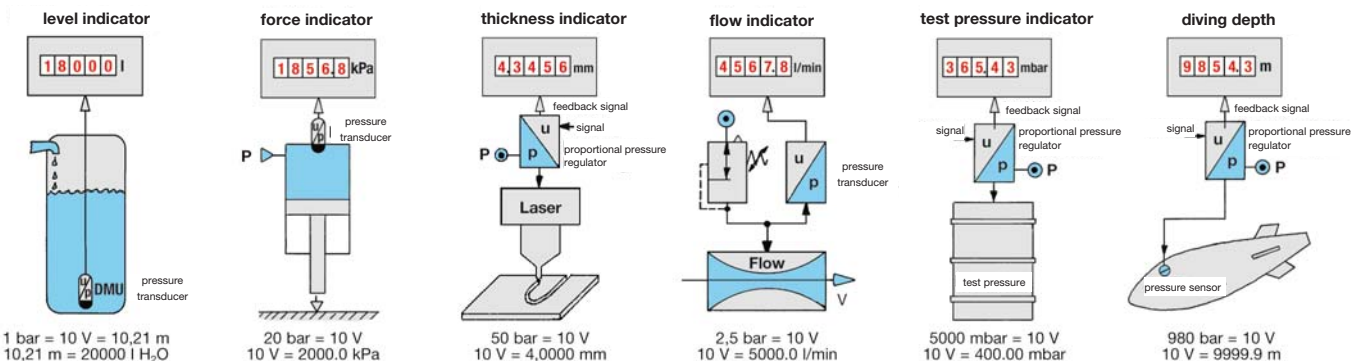
plug-in card

Special options, add the appropriate letter

programming*1	factory-set, e.g. 4-20 mA / 2-10 bar	MPAX-..PR
interface	RS232 with 9-pin D-SUB plug-in card	MPAX-..32
	RS485 with 2 x RJ-11 connectors plug-in card	MPAX-..85
Relay output*2	2 x SPDT 5 A at 230 VAC, plug-in card	MPAX-..2W
	4 x NOC 3 A at 230 VAC, plug-in card	MPAX-..4S
transistor output*2	4 x NPN plug-in card	MPAX-..4N
	4 x PNP plug-in card	MPAX-..4P
output signal	0/4-20 mA oder 0-10 V, free selectable	MPAX-..AA
bus interface	Profibus dp	MPAX-..DP

Accessories

physical units	label sheet with standard dimensions	MPAX-BK
software	for Microsoft Windows®	MPAX-X1
programming kit	software, interface board RS232 plus cable	MPAX-EM
adapter	software, interface board USB plus cable	MPAX-USB



*1 Signal range, indicated values, dimensions or limit value, rounding factor, resolution, total account etc. to be indicated.
 *2 Only one of these two options can be realised.

Description	Suitable for measurement of positive pressure, vacuum or differential pressure.
Media	compressed air or non-corrosive gases
Supply voltage	15...30 V DC standard, optionally 230 V AC \pm 10%
Electrical connector	plug with 7-pin screw terminal for cable cross-sectional area 0.14...1.5 mm ²
Pneumatic connection	P+ : pos. pressure P- : vacuum P+/P- : differential pressure, the higher pressure is to be connected at P+ plug nipple up to 1 bar, sleeve with union nut from 2 bar on, each for hose internal diameter of \varnothing 4 mm
Display	3½-digit LCD display, max. \pm 1999, 14 mm tall, black numbers
Output signal	0...10 V, impedance > 10 k Ω , optionally 4...20 mA, impedance < 500 Ω
Linearity	see chart, optionally 0.2% FS
Long-term stability	< 0.1% FS per year at > 25 mbar, < 1% FS per year at > 5 mbar, < 2% FS per year at < 5 mbar range
Temperature sensitivity	see chart, at 0 °C to 50 °C / 32 °F to 122 °F
Response time	100 ms
Temperature range	-20 °C to 50 °C / -4 °F to 122 °F
Material	Housing: aluminium
	Overpressure see chart
	Hysteresis < 0.1% FS
	Repeatability see chart
	Resolution 1 digit
	Protection class IP 54

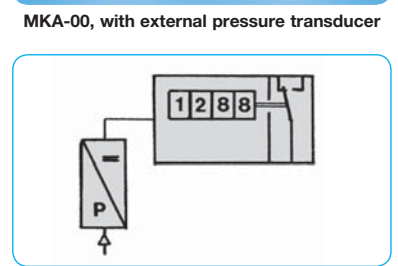
0 ... 1 mbar / 1000 bar
pressure, vacuum, differential pressure

Repeatability	Temperature error	Linearity error	Over-pressure	Measurement range	Order number
% FS	% FS	% FS	max. bar	mbar/bar	

Digital gauge	for compressed air, measurement of positive pressure, vacuum and differential pressure, 24 V DC, outlet signal 0...10 V, 3½-digit display				MKA
1.0	4.0	1.0	0.25	0... 1 mbar	MKA-A1
0.3	2.5	0.8	0.25	0... 2.5 mbar	MKA-A2
0.3	1.2	0.8	0.25	0... 5 mbar	MKA-A5
0.2	1.0	0.8	0.25	0... 10 mbar	MKA-B1
0.1	1.0	0.7	0.35	0... 25 mbar	MKA-B2
0.1	1.0	0.7	0.35	0... 50 mbar	MKA-B5
0.1	1.0	0.5	0.35	0... 100 mbar	MKA-C1
0.1	1.0	0.5	0.75	0... 250 mbar	MKA-C2
0.1	1.0	0.5	1.5	0... 500 mbar	MKA-C5
0.1	1.0	0.5	3.0	-1... 1 bar	MKA-V1
0.1	1.0	0.5	3.0	0... 1 bar	MKA-01
0.1	1.0	0.5	4.0	0... 2 bar	MKA-02
0.1	2.0	0.5	10	0... 8 bar	MKA-08
0.1	2.0	0.5	12	0... 10 bar	MKA-10
0.1	2.3 mbar	1 mbar	3.3	0.7... 1.1 bar _{abs}	MKA-S1

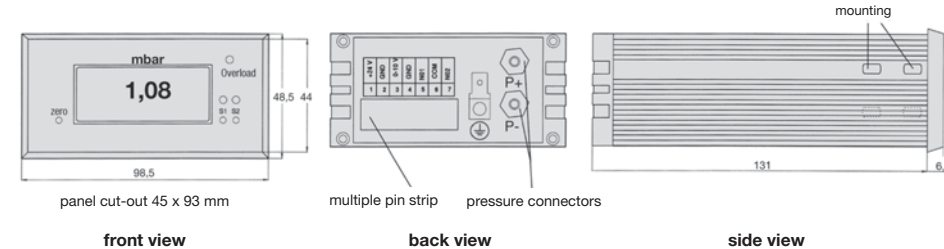
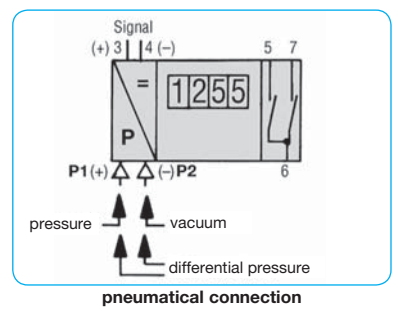
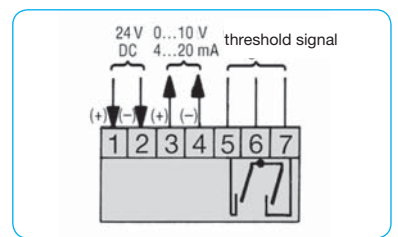


Digital gauge for external sensor	0...10 V input signal, supply voltage 24 V DC, 3½-digit display		MKA*2
96	48	137 e.g. for pressure transducer	MKA-00



Special options, add the appropriate letter

two limit switches	with LED display, 230 V AC, 1 A, hysteresis 2% FS	MKA-..S
linearity < 0.2% FS	from 100 mbar	MKA-..B
4...20 mA output signal	impedance < 500 Ω	MKA-..A
4...20 mA input signal	internal resistance 100 Ω	MKA-00A
P _a indication	< 20 mbar: indication P _a > 20 mbar: indication kP _a	MKA-..P
230 V AC	supply voltage	MKA-..V
RS232*1	interface, 8 bit without parity	MKA-..R
deviant measurement range	to be indicated on order	MKA-XX



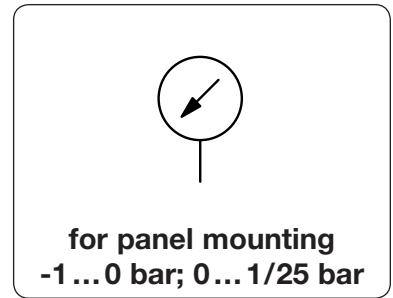
*1 Handshake on/off, Baudrate 9600 *2 indicate pressure range by order

Calibration or test chart: see chapter "Technical Information"
Pressure transducers: see chapter "Pressure Transducers"

PDF CAD
www.aircom.net

Order example:
MKA-A1

Description	Bourdon tube gauge, dust-protected, splash-proof, antirust, oil-resistant and silicone-free.		
Media	all media compliant with brass, e.g. compressed air, non-corrosive gases or fluids		
Scale	white background with black bar scale and red psi scale		
Indicator accuracy	1.6% FS on gauge Ø 63 mm 2.5% FS on gauge Ø 40 mm and Ø 50 mm		
Threaded connection	G $\frac{1}{8}$ or G $\frac{1}{4}$, on central back		
Temperature range	0 °C to 60 °C / 32 °F to 140 °F, for appropriately conditioned compressed air down to -20 °C / -4 °F		
Material	Housing: ABS plastic Lens: acrylic glass	Connection/Inner parts: brass	



Dimensions				Principle	Indicator accuracy	Display range	Order number	Order number
A	B	C	D	R: Bourdon tube K: capsule tube	% FS	bar	G $\frac{1}{8}$	G $\frac{1}{4}$

Gauge with mounting flange							chrome-plated	ME	ME
40	61	51	46	R	2.5	0 ... 2.5		ME4001-02	
						0 ... 4		ME4001-04	
						0 ... 6		ME4001-06	
						0 ... 10		ME4001-10	
50	71	61	52	R	2.5	0 ... 6			ME5002-06
						0 ... 10			ME5002-10
						0 ... 16			ME5002-16
63	85	75	53	R	1.6	-1 ... 0 vac.			ME6302-00
						0 ... 4			ME6302-04
						0 ... 6			ME6302-06
						0 ... 10			ME6302-10
						0 ... 16			ME6302-16

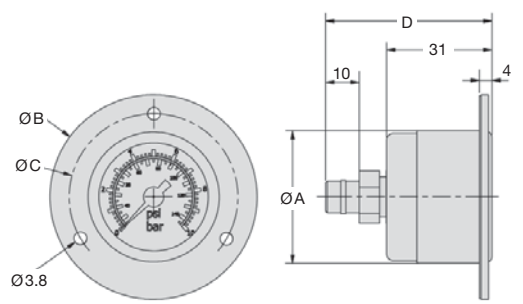


ME5002-10

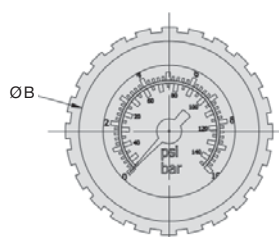
Gauge with triangular bezel							chrome-plated with nut	MF	MF
40	43	-	-	R	2.5	0 ... 2.5		MF4001-02	
						0 ... 4		MF4001-04	
						0 ... 6		MF4001-06	
						0 ... 10		MF4001-10	
50	55	-	-	R	2.5	-1 ... 0 vac.			MF5002-00
						0 ... 6			MF5002-06
						0 ... 10			MF5002-10
						0 ... 16			MF5002-16
63	68	-	-	R	1.6	-1 ... 0 vac.			MF6302-00
				K		0 ... 0.25			MF6302-C2
				R		0 ... 4			MF6302-04
						0 ... 6			MF6302-06
						0 ... 10			MF6302-10
						0 ... 16			MF6302-16
						0 ... 25			MF6302-25



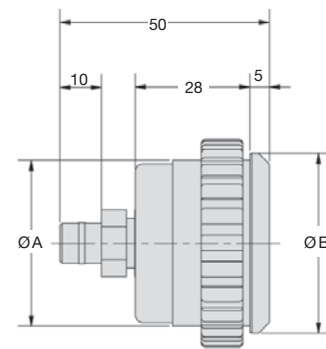
MF5002-10



ME
gauge with mounting flange



MF
gauge with triangular bezel



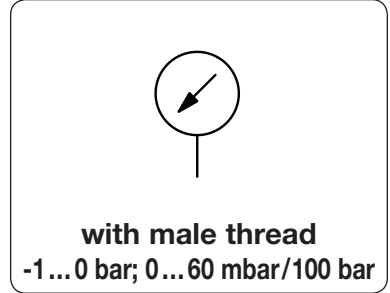
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Order example:
ME4001-02

Pressure Gauge with Male Thread

MA

Description	Pressure gauge with Bourdon tube or capsule, dust-protected, splash-proof, antirust, oil-resistant and silicone-free. The capsule type gauge features an integrated restrictor against pressure peaks.		
Media	all media compliant with brass, e.g. compressed air, non-corrosive gases or fluids		
Scale	Bourdon tube gauge: white background with black bar scale and red psi scale capsule type gauge: white background with black mbar scale		
Indicator accuracy	1.6% FS on gauge Ø 63 mm 2.5% FS on gauge Ø 40 mm and Ø 50 mm, 4% FS on gauge Ø 23 mm		
Connection thread	G½ or G¼, on central back, M5 at gauge Ø 23 mm		
Temperature range	0 °C to 60 °C / 32 °F to 140 °F, for appropriately conditioned compressed air down to -20 °C / -4 °F		
Material	Housing: ABS plastic at Ø 40, Ø 50, Ø 63 mm nickel-plated brass at Ø 23 mm stainless steel 1.4301 at capsule gauge	Lens: acrylic glass Connection/Inner parts: brass Seal: NBR/Buna-N at capsule gauge	



Dimensions	Principle	Indicator accuracy	Display range	Order number	Order number
Ø A	R: Bourdon tube K: capsule tube	% FS	bar/mbar	G½	M5 / G¼

Pressure gauge, round		male thread on central back	MA	MA	
23	R	4	0 ... 4	MA2301-04	MA23M5-04
			0 ... 6	MA2301-06	MA23M5-06
			0 ... 10	MA2301-10	MA23M5-10
			0 ... 12	MA2301-12	MA23M5-12
			0 ... 16	MA2301-16	MA23M5-16
40	R	2.5	0 ... 1	MA4001-01	
			0 ... 2.5	MA4001-02	
			0 ... 4	MA4001-04	
			0 ... 6	MA4001-06	
			0 ... 10	MA4001-10	
50	R	2.5	0 ... 1	MA5001-01	MA5002- 01
			0 ... 2.5	MA5001-02	MA5002- 02
			0 ... 4	MA5001-04	MA5002- 04
			0 ... 6	MA5001-06	MA5002- 06
			0 ... 10	MA5001-10	MA5002- 10
63	K	1.6	0 ... 60 mbar		MA6302- B6
			0 ... 160 mbar		MA6302- C2
			0 ... 250 mbar		MA6302- C3
			0 ... 400 mbar		MA6302- C4
			0 ... 600 mbar		MA6302- C6
63	R	2.5	0 ... 0,6 bar		
63	R	1.6	-1 ... 0 vac.		MA6302- 00
			0 ... 1		MA6302- 01
			0 ... 2,5		MA6302- 02
			0 ... 4		MA6302- 04
			0 ... 6		MA6302- 06
			0 ... 10		MA6302- 10
			0 ... 16		MA6302- 16
			0 ... 25		MA6302- 25
			0 ... 60		MA6302- 60
			0 ... 100		MA6302- 100



MA23M5-10



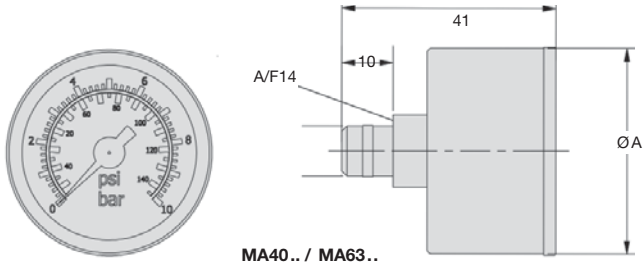
MA5001-16



MA6302-16

Special options, add the appropriate number

for oxygen specially cleaned MA 15



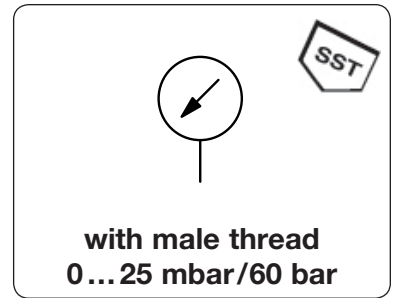
Gauges
14

Gauges
14

Stainless Steel Pressure Gauge with Male Thread

MS

Description	Pressure gauge with Bourdon tube or capsule, dust-protected and splash-proof. The capsule type gauge features an integrated restrictor against pressure peaks.	
Media	all media compliant with stainless steel, e.g. compressed air, gases or fluids	
Scale	Bourdon tube gauge: white background with black bar scale and red psi scale capsule type gauge: white background with black mbar scale	
Indicator accuracy	1.6% FS	Connection thread G $\frac{1}{8}$ or G $\frac{1}{4}$, on central back
Temperature range	medium	0 °C to 100 °C / 32 °F to 212 °F for capsule type gauge 0 °C to 200 °C / 32 °F to 392 °F for Bourdon tube gauge for appropriately conditioned compressed air down to -40 °C / -40 °F
	ambient	max. 60 °C / 140 °F
Material	Housing:	stainless steel 1.4301
	Inspection glass:	laminated safety glass at MS63, single strength glass at MS40 and MS50
	Connection:	stainless steel 1.4571 Seal: FKM at capsule gauge



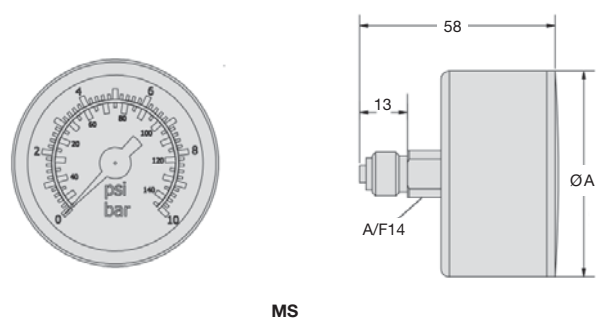
Dimensions	Principle	Indicator accuracy	Display range	Order number	Order number
\varnothing A	R: Bourdon tube	% FS	bar/mbar	G $\frac{1}{8}$	G $\frac{1}{4}$
mm	K: capsule tube				

Pressure gauge	male thread on central back	MS	MS		
40	R	1.6	0 ... 2.5	MS4001-02	MS4002-02
			0 ... 4	MS4001-04	MS4002-04
			0 ... 6	MS4001-06	MS4002-06
			0 ... 10	MS4001-10	MS4002-10
			0 ... 16	MS4001-16	MS4002-16
50	R	1.6	0 ... 2.5		MS5002-02
			0 ... 4		MS5002-04
			0 ... 6		MS5002-06
			0 ... 10		MS5002-10
			0 ... 16		MS5002-16
			0 ... 25		MS5002-25
63	K	1.6	0 ... 25 mbar		MS6302-B2
			0 ... 60 mbar		MS6302-B6
			0 ... 100 mbar		MS6302-C1
			0 ... 160 mbar		MS6302-C2
			0 ... 250 mbar		MS6302-C3
			0 ... 400 mbar		MS6302-C4
63	R	1.6	0 ... 600 mbar		MS6302-C6
			0 ... 1		MS6302-01
			0 ... 2.5		MS6302-02
			0 ... 4		MS6302-04
			0 ... 6		MS6302-06
			0 ... 10		MS6302-10
			0 ... 16		MS6302-16
			0 ... 25		MS6302-25
			0 ... 60		MS6302-60



Special options, add the appropriate number

for oxygen specially cleaned MS15



PDF CAD
www.aircom.net

Order example:
MS4001-02

Gauges
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