General Specifications

MC43 Pneumatic Indicating Controller

MC40 SERIES

GS 02M04B01-00EN

MC43 Pneumatic Indicating Controller, designed for field mounting, satisfies industry's need for an economical, dependable means of automatically controlling on-line variables where no permanent record is required. Highly reliable, it measures and controls important process variables such as temperature, pressure and liquid level. A variety of measuring elements for specific process variables can be built into its housing along with the control mechanism, making the Model MC43 a low cost. compact, standalone instrument which can both indicate process variables and control them at desired setpoints. The controller's case is weatherproof and dustproof offering excellent durability, and the indicating pointer and the setting index are visible even from a distance.

Thus the MC43 is highly suitable for mounting outdoors or in the field.

STANDARD SPECIFICATIONS

Measuring Range Limits:

Temperature: -25°C to 250°C (-13 to 482°F) Gauge pressure: -0.1 to 20.6 MPa, (210 kgf/cm²)

Measuring Elements: Refer to page 3 and 4.

Output Signal:

With proportion: 20 to 100 kPa, 0.2 to 1.0 kgf/cm² or bar, or 3 to 15 psi, whichever specified.

On - off and differential gap: 0 kPa or air supply.

Output Gauge:

0 to 200 kPa, 0 to 2 kgf/cm² or bar, or 0 to 30 psi.

Air Supply:

140 kPa, 1.4 kgf/cm² or bar, or 20 psi.

Air Consumption:

0.5 m³/h at 0°C, 101.3 kPa {1.033 kgf/cm²} absolute (0.3 scfm).

Control Modes:

On-off, proportional (P), proportional plus derivative (P+D), proportional plus integral (P+I), proportional plus integral plus derivative (P+I+D), differential gap,

batch plus proportional plus integral (BATCH+P+I). Proportional band: 4 to 400%, direct or reverse. Integral time: 0.01 to 50 minutes. Derivative time: 0.05 to 50 minutes. Differential gap: 2 to 100%.

Indicating and Setting Scale:

Effective nominal length 156 mm (6 inches). Black divisions and letters on white background.



Indicator Accuracy:

Temperature T1A element: $\pm 0.5\%$ span or ± 0.3 °C, whichever is greater.

Pressure PR1, P42, P51, P52 elements: ±0.5% span.

Pointers:

Fluorescent red.

Set Point:

Local (manual) set or remote (pneumatic) set In local set version internal set point knob is accessible by opening hinged door.

Door and Case:

Aluminum alloy, finished with polyurethane paint. Light grayish green (Munsell 2.5GY5.0/1.0).

Degrees of Protection:

IP53, NEMA 3.

Operating Temperature Range:

-30 to +80°C (-20 to +180°F).

Mounting:

Surface, flush panel and 2-inch pipe.

Air Supply Connection:

With air set: JIS Rc1/4 female or 1/4 NPT female Without air set: JIS Rp1/4 female or 1/4 NPSF female (Tapped for JIS R1/4 or 1/4 NPT male)

Output connection:

JIS Rp1/4 female or 1/4 NPSF female (Tapped for JIS R1/4 or 1/4 NPT male)

Measuring Range and Process Connection: See measuring element specifications.

Approximate Weight:

7.6 kg (17 lb)

MC43-A5C-N*A (excluding elements and bracket).



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MODEL AND SUFFIX CODES

Model Suffix Codes		des	Description				
MC43			Pneumatic Indicating Controller				
Control Mode	-A -A -A -A -A -A -A	 2 3 5 5	· · · · · ·	· · · · · · · · ·	On-off Proportional Proportional plus derivative Proportional plus integral Proportional plus integral plus derivative Defferential gap Batch plus proportional plus integral *1		
Auto/Manual Transfer Switching				••	None With 2-position switch, regulator		
Remote -N . Pneumatic Set -P . Point		N	 	None With remote pneumatic set point *2			
Style *A			*A.		Style A		
Base Instrument /□ Option							
Measuring Element // \Box / and Option ^{*3}				//□/			

- *1: Not available for pneumatic set point and /TRS (refer to additional feature below).
- *2: Not available together with option TRS and ECRB
- *3: Be sure to specify //PDD or //T1A.

OPTIONS

External Connection to Integral (Reset) Bellows:

Applicable for proportional plus integral controllers for use in multiple auto-selector system or other arrangements where an external feedback signal, must be applied to prevent "reset wind-up." Connection: Rc1/4 female or 1/4 NPT female Option code: ECRB

Pneumatic Transmission Unit:

Transmits pneumatic signal 20 to 100 kPa; 0.2 to 1.0 kgf/cm² or bar; 3 to 15 psi corresponding to measurement value indicated. Connection: Rc1/4 female or 1/4 NPT female Option code: TRS

TRS is not available together with ECRB.

Air Set:

Fixed combination pressure regulator and filter with 35 mm diameter pressure gauge mounted and piped to transmitter. Also available without gauge.

Supply pressure: 0.2 to 1 MPa, 2 to 10 kgf/cm² or bar, or 30 to 150 psi.

Output pressure: 140 kPa, 1.4 kgf/cm² or bar, or 20 psi.

Maximum operating temperature: 80°C (180°F).

Air Connection	Gauge Scale	Option Code	
	0 to 200 kPa 0 to 2 kg/cm ²	GAS-FP GAS-FM	
JIS Rc 1/4 female	0 to 30 psi 0 to 2 bar	GAS-FE GAS-FB	
1/4 NPT female	0 to 200 kPa 0 to 2 kgf/cm ² 0 to 30 psi 0 to 2 bar	NAS-FP NAS-FM NAS-FE NAS-FB	

Not applicable for panel mounting.

Stainless Steel Tubing between Body and Air Set: Option code: SST

Shatterproof Glass Window:

For use in areas where abrasive dust would cause scratching of the glass window under conditions of frequent wiping. Option code: GID

Stainless Steel Tag Number Plate:

JIS SUS304 stainless steel tag number plate on side of case.

Option code: SCT **Special Coating:**

Epoxy resin coating Option code: EPF

Special Color Finish on Door:

Option code: SCF- \Box P (specify color code in \Box .) (Refer to GS 22D01F01-00EN.)

ANSI Connection:

Air connections, process connection and optional connection (for /ECRB and /TRS) are ANSI NPT threads. Option code: NPT

Special Scale Plates:

Specify the following option codes when scale plates other than standard are desired. (Refer to GS 22D01C07-00EN.) Special range scale (uniform single-scale with single label) Option code: SPQ Special graduation scale (uniform single-scale with single label) Option code: SPR Special range scale (uniform double-scale with double label) Option code: SPW Pressure equivalent unit scale (uniform double-scale with double label) Option code: SPX

Calibration:

P-calibration (output signal: 3 to 15 psi)

- Option code: CAL-E bar-calibration (output signal: 0.2 to 1.0 bar)
- Option code: CAL-B
- M-calibration (output signal: 0.2 to 1.0 kgf/cm²) Option code: CAL-M

MEASURING ELEMENT SPECIFICATIONS

Temperature Elements:

Element Code	Element Code Suffix		Description		
T1A			Liquid expansion system, fully compensated		
Bulb extention neck	-AB -FB -NB		Bendable neck with adjustable union (Use with TW1 bulb wells) Bendable neck with fixed union (Specify the U length) Plain bendable neck without union		
Process connection 0 2 3 5 6			Plain or jam nut only (without bushing) JIS R1/2 JIS R3/4 ANSI 1/2 NPT ANSI 3/4 NPT		
Capillary tubing ^{*1} -DS		S□	Double core (Specify length in 🗀 m)		
Base Instrument -3		-3	Model MC 43		
Option		/SR /ORP /URP	Lengh of J other than standard Specify length in \square mm $150 \le J \le 3000$ mm J: Refer to GS 06P01F01-00EN Range other than standard (Span is standard) Overrange protection Underrange protection ^{*2}		

*1: *2: Capillary tubing length: 02 to 22 m (every 1 m).

Underrange protection is standard for all elements the bottom range of which is over 25°C.

Note: A Users must consider the characteristics of selected wetted parts material and the influence of process fluids. The use of inappropriate materials can result in the leakage of corrosive process fluids and cause injury to personnel and/or damage to plant facilities.

It is also possible that the instrument itself can be damaged and that fragments from the instrument can contaminate the user's process fluids.

Be very careful with highly corrosive process fluids such as hydrochloric acid, sulfuric acid, hydrogen sulfide, sodium hypochlorite, and high-temperature steam (150°C [302°F] or above). Contact Yokogawa for detailed information of the wetted parts material.

Standard Ranges for Temperature Elements:

	Span	Standard Range (°C)	Measuring Range
T1A	25	0 to 25 ^{*1} , 25 to 50 ^{*2} , 50 to 75 ^{*2} , 75 to 100 ^{*2}	0 to 120
	50	0 to 50^{*1} , 25 to 75^{*3} , 50 to 100^{*2} , 75 to 125^{*3} , 100 to 150^{*2} , 125 to 175^{*3} , 150 to 200^{*2}	-15 to 200
	100	0 to 100 ^{*1} , 25 to 125 ^{*3} , 50 to 150 ^{*3} , 75 to 175 ^{*3} , 100 to 200 ^{*2} , 150 to 250 ^{*3} , -25 to 75 ^{*3}	-25 to 200
	150	0 to 150 ^{*1} , 50 to 200 ^{*2} , 100 to 250 ^{*2} , -25 to 125 ^{*3}	-25 to 250
	200	0 to 200 ^{*1} , 50 to 250 ^{*2}	-25 to 250
	250	0 to 250*1	-25 to 250

*1: *2: Applicable for Uniform standard scale on the instrument (Single-scale with single label requires no option code).

Applicable for Special range scale on the instrument (Single-scale with single label requires Option code SPQ).

*3: Applicable for Special graduation scale on the instrument (Single-scale with single label requires Option code SPR).

Note: Select the measurement range so that the normal temperature is 75% or less of the measurement span.

Pressure Elements:

Element Code	Element Type	Element Material	Process Connection	Minimum and Maximum Spans *3			
				SI Units	Metric Unit	psi Unit	
PR1 ^{*1}	Receiver bellows	Phosphor Bronze	JIS Rc 1/4	80 kPa	0.8 kgf/cm ²	12 psi	
P42	Spiral bourdon	JIS SUS 316L	(or 1/4 NPT)	0.1 to 1.37 MPa	1.0 to 14 kgf/cm ²	15 to 200 psi	
P51	Helical bourdon	JIS SUS 316L	female	1.37 to 7 MPa	14 to 70 kgf/cm ²	200 to 1000 psi	
P52	Helical bourdon	JIS SUS 316L	*2	7 to 20.6 MPa	71 to 210 kgf/cm ²	1000 to 3000 psi	

*1:

Pressure range for PR1 is 0.2 to 1 kgf/cm² or bar, 20 to 100 kPa, or 3 to 15 psi. Measuring pressure 140 kgf/cm² or bar (13.7 MPa or 2000 psi) or less: Process connection JIS Rc1/4 (or 1/4 NPT) female. Measuring pressure 141 to 210 kgf/cm² or bar (13.8 to 20.6 MPa, or 2000 to 3000 psi): JIS R1/2 (or 1/2 NPT) male. *2:

*3: mbar or bar unit calibration is also available.

Applicable Items for Pressure Element:

Element Code	Suppressed-Zero Range	Elevated-Zero Range	Vacuum Range	Overrange Protection	Underrange Protection
PR1	always	✓	✓	standard	standard
P42	0	0	0	0	0
P51	0	0	0	0	0
P52	0	0	0	0	0

O mark: Optionally available.

✓ mark: Not available.

Note: A Users must consider the characteristics of selected wetted parts material and the influence of process fluids. The use of inappropriate materials can result in the leakage of corrosive process fluids and cause injury to personnel and/or damage to plant facilities.

It is also possible that the instrument itself can be damaged and that fragments from the instrument can contaminate the user's process fluids.

Be very careful with highly corrosive process fluids such as hydrochloric acid, sulfuric acid, hydrogen sulfide, sodium hypochlorite, and high-temperature steam (150°C [302°F] or above). Contact Yokogawa for detailed information of the wetted parts material.

Pressure Element Options:

Write option code immediately after element code.

Extended scale: Suppressed zero range.

Option code: EXS

For P42, P51 or P52, specify option code /EXS

when the lower range is greater than 0 (zero).

Overrange protection:

Option code: ORP

Underrange protection:

Option code: URP

Element degreasing for oxygen service:

Available for P42, P51 and P52.

Option code: OSW

DIMENSIONS





ORDERING INSTRUCTIONS

When ordering specify the following:

- 1. Model and Suffix codes.
- 2. Range and scale range. Refer to GS 22D01C07-00EN.