General Specifications

Model MC43
Pneumatic Indicating Controller

MC40 SERIES

GS 02M04B01-00E

The Model 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, stand-alone 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 SPFCIFICATIONS

Measuring Range Limits:
Temperature: -25°C to 500°C (-13 to 932°F).
Gauge pressure: Full vacuum to 42 MPa {420 kgf/cm^2}.

Measuring Elements:
Refer to page 3 and 4.

Output Signal:
With proportion: 20 to 100 kPa, 0.2 to 1.0 kgf/cm^2 or bar, or 3 to 15 psi, whichever specified.
On - off and differentian gap: 0 kPa or air supply.

Output Gauge:
0 to 200 kPa, 0 to 2 kgf/cm^2 or bar, or 0 to 30 psi.

Air Supply:
140 kPa, 1.4 kgf/cm^2 or bar, or 20 psi, whichever specified.

Air Consumption:
0.5 m^3/h at 0°C, 101.3 kPa {1.033 kgf/cm^2} 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, T3B elements: ±0.5% span or ±0.3°C, whichever is greater.
Pressure P31, PR1, P42, 51, 52 elements: ±0.5% span.
Pressure P32 element: ±0.75% span.

Pointers:
Fluorescent red.

Set Point:
Local (manual) set, standard. Remote (pneumatic) set, optional. 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.

Connections:
In bottom of case.
Air: Tapped for JIS R1/4 or 1/4 NPT male.
Pressure and vacuum: JIS Rc1/4 or 1/4 NPT female up to 140 kgf/cm^2 or bar, 13.7 MPa, 2000 psi. JIS R1/2 or 1/2 NPT male up to 420 kgf/cm^2 or bar, 42 MPa, 6000 psi.

Approximate Weight:
7.6 kg (17 lb)
. . .MC43-A5C-N*A (excluding elements and bracket).

YOKOGAWA

Yokogawa Electric Corporation
2-9-32, Nakacho, Musashino-shi, Tokyo, 180-8750 Japan
Tel.: 81-422-52-5690 Fax : 81-422-52-2018

GS 02M04B01-00E

12th Edition Jun. 2013 (KP)

■ MODEL AND SUFFIX CODES

Model	Suffix Codes	Description
MC43	.....	Pneumatic Indicating Controller
Control Mode	**-A1** ..... **-A2** ..... **-A3** ..... **-A4** ..... **-A5** ..... **-A7** ..... **-B4**	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	**N** ..... **C**	None With 2-position switch, regulator
Remote Pneumatic Set Point	**-N** ..... **-P**	None With remote pneumatic set point *2
Style	***A**	Style A
Base Instrument Option	/ □	
Measuring Element and Option	// □ / □	

T01E.EPS

*1: Batch plus proportional plus derivative not additional for pneumatic set point and /TRS (refer to additional feature below).

*2: Remote pneumatic set point is not available together with option TRS or ECRB.

■ 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.”
Option code: ECRB

Pneumatic Transmission Unit:
Transmits pneumatic signal 20 to 100 kPa; 0.2 to 1.0 kgf/cm^2 or bar; 3 to 15 psi corresponding to measurement value indicated.
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/cm^2 or bar, or 30 to 150 psi.
Output pressure: 140 kPa, 1.4 kgf/cm^2 or bar, or 20 psi.
Maximum operating temperature: 80°C (180°F).
Option code: GAS-FP (Air connection: JIS Rc1/4 female)
NAS-FP (Air connection: 1/4 NPT female)
In case GAS(NAS)-FP air set is optionally mounted to the transmitter calibrated for CAL-E, B or M, the last letter P of GAS(NAS)-FP must be replaced with E(psi), B(bar) or M(kgf/cm^2) respectively for the purpose of using the same pressure unit for supply pressure gauge.

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-□P (specify color code in □.)
(Refer to GS 22D01F01-00E.)

ANSI Connection:
Air connections are also tapped for ANSI NPT threads in addition to the process connections.
Option code: NPT

Special Scale Plates:
Specify the following option codes when scale plates other than standard are desired.
(Refer to GS 22D01C07-00E.)
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/cm^2)
Option code: CAL-M

■ MEASURING ELEMENT SPECIFICATIONS

Temperature Elements:

Element Code	Element Code Suffix	Description
T1A	.....	Liquid expansion system, fully compensated.
T3B	.....	Gas pressure system, case compensated.
		Bulb extention neck
	-AB	Bendable neck with adjustable union.
	-FB	Bendable neck with fixed union.
	-NB	Plain bendable neck.
		Process connection
	0	Plain or jam nut only (without bushing).
	2	JIS R1/2 (for T1A element).
	3	JIS R3/4 (for T1A element).
	4	JIS R1 (for T3B element).
	5 *1	ANSI 1/2 NPT (for T1A element).
	6 *1	ANSI 3/4 NPT (for T1A element).
	7 *1	ANSI 1 NPT (for T3B element).
		Capillary tubing *2
	-DS □	Specity length in □ m Dual capillary (for T1A element).
	-SS □	Single capillary (for T3B element).
		Base Instrument
	-3	Model MC 43
		Option:
	-L □ ...	Lengh of J other than standard Specify length in □ mm 150≦J≦3000 mm J: Refer to GS 06P01F01-00E
	/SR	Range other than standard.
	/ORP	Overrange protection.
	/URP	Underrange protection *3.

T02E.EPS

*1: Air connections are also tapped for ANSI NPT threads in addition to the process connection.
*2: Capillary tubing length: 02 to 22 m (every 1 m) .
*3: Underrange protection is standard for all elements the bottom range of which is over 25°C.

Note: ⚠ 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
T3B	150	0 to 150 *1, 50 to 200 *2, 100 to 250 *2, 150 to 300 *2, 200 to 350 *2, 250 to 400 *2	-15 to 400
	200	0 to 200 *1, 50 to 250 *2, 100 to 300 *2, 150 to 350 *2, 200 to 400 *2, 250 to 450 *2, 300 to 500 *2	-15 to 500
	250	0 to 250 *1, 50 to 300 *2, 100 to 350 *2, 150 to 400 *2, 200 to 450 *2, 250 to 500 *2	-15 to 500
	300	0 to 300 *1, 50 to 350 *2, 100 to 400 *2, 150 to 450 *2, 200 to 500 *2	-15 to 500
	350	0 to 350 *1, 50 to 400 *3, 100 to 450 *2, 150 to 500 *3	-15 to 500
	400, 450, 500	0 to 400 *1, 50 to 450 *3, 100 to 500 *2, 0 to 450 *1, 50 to 500 *3, 0 to 500 *1	-15 to 500

T03E.EPS

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

Pressure Elements:

Element Code	Element Type	Element Material	Process Connection	Minimum and Maximum Spans *3		
				SI Units	Metric Unit	psi Unit
P 31	Bellows	Phosphor Bronze	JIS Rc 1/4 (or 1/4 NPT) female	34 to 101.3 kPa Vacuum.	255 to 760 mmHg Vacuum.	10 to 32 inHg Vacuum.
P 32	Bellows	JIS SUS 316		31 to 140 kPa	0.32 to 1.4 kgf/cm^2	4.5 to 20 psi
PR 1 *1	Receiver bellows	Phosphor Bronze		80 kPa	0.8 kgf/cm^2	12 psi
P 42	Spiral bourdon	JIS SUS 316L		0.1 to 1.37 MPa	1.0 to 14 kgf/cm^2	15 to 200 psi
P 51	Helical bourdon	JIS SUS 316L		1.37 to 7 MPa	14 to 70 kgf/cm^2	200 to 1000 psi
P 52	Helical bourdon	JIS SUS 316L	*2	7 to 42 MPa	71 to 420 kgf/cm^2	1000 to 6000 psi

T04E.EPS

*1: Pressure range for PR1 is 0.2 to 1 kgf/cm^2 or bar, 20 to 100 kPa, or 3 to 15 psi.
*2: Measuring pressure 140 kgf/cm^2 or bar (13.7 MPa or 2000 psi) or less: Process connection JIS Rc1/4 (or 1/4 NPT) female.
Measuring pressure 141 to 420 kgf/cm^2 or bar (13.8 to 42 MPa, or 2000 to 6000 psi): JIS R 1/2 (or 1/2 NPT) male.
*3: mbar or bar unit calibration is also available.

Applicable Items for Pressure Element:

Element Code	Suppressed-Zero Range	Elevated-Zero-Range	Vacuum Range	Over-range Protection	Under-range Protection
P 31	×	×	○	standard	×
P 32	×	×	×	standard	×
PR 1	always	×	×	standard	standard
P 42	○	○	○	○	○
P 51	○	○	○	○	○
P 52	○	○	○	○	○

T05E.EPS

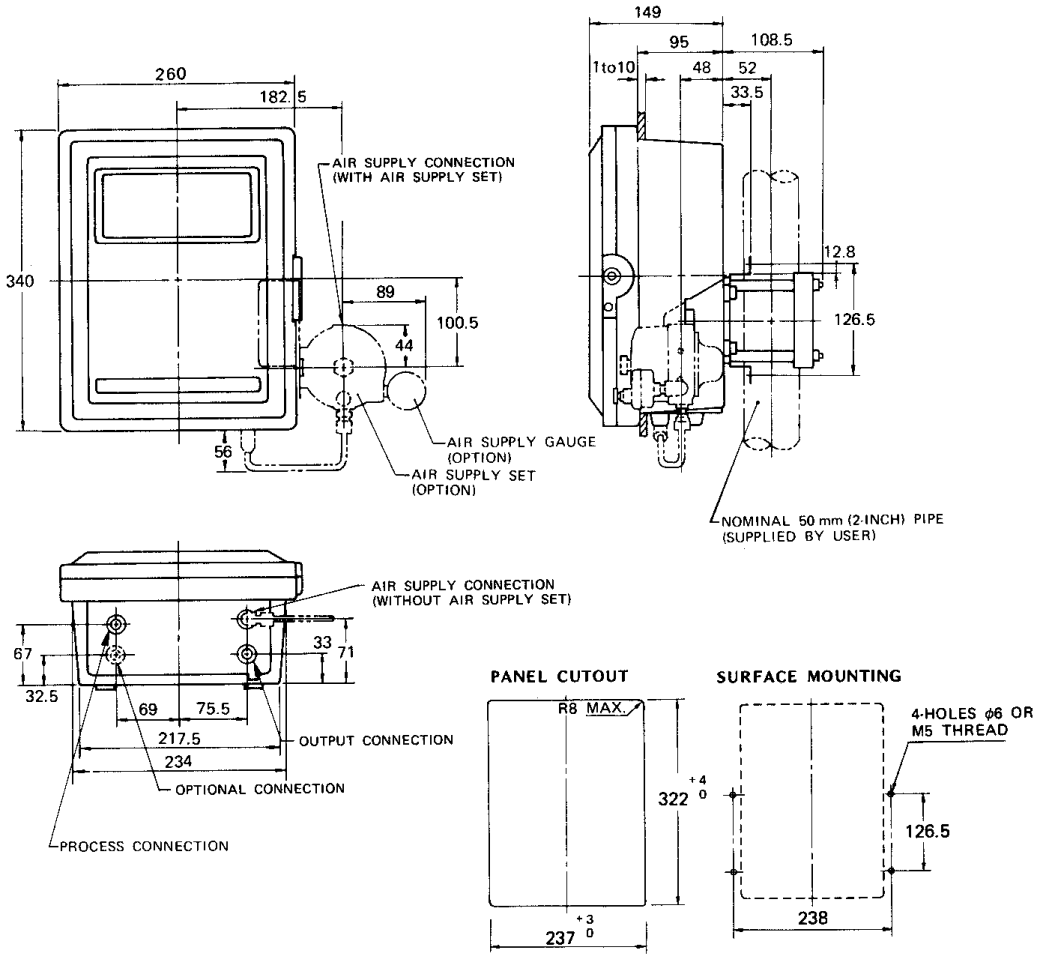
○ mark: Optionally available.
× mark: Not available.

Pressure Element Options:

Write option code immediately after element code.
Extended scale: Suppressed zero range.
Option code: EXS
For P42, P51 or P52, specity 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

Unit : mm



■ ORDERING INSTRUCTIONS

When ordering specify the following:

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