



KF SERIES TEMPERATURE INDICATING CONTROLLER

MODEL:KFT

General

The KF Series instruments are field installed type of pneumatic indicating controllers which are used to measure and control the various types of process variables such as temperatures, pressures, flows and liquid levels.

Model KFT Temperature Indicating Controllers indicate and control a process variable by converting its temperature change into mechanical displacement of a bellows through change in expansion of liquid-fill by temperature or change in gas-fill pressure by temperature.

Indicating transmitters and indicating transmitting controllers also are available as well as indicating controllers. The controllers are available either in the local type to set the set-point value with the knob on the instrument or in the cascade type(remote type) to set the set-point value with a pneumatic set-point signal.

Features

- ◆ A wide variety of measuring elements and control mechanisms are available to meet various applications.
- ◆ A pneumatic circuit board and a heat-resistant weatherproof sturdy case are used, thereby greatly improving the durability and reliability.
- ◆ The pneumatic circuit board system allows to readily add or eliminate control mechanisms and units, thereby enhancing the system modification and expansion flexibility.
- ◆ Interchangeable parts are used to the maximum practicable extent, thereby reducing the number of parts to be kept in stock,
- ◆ A bellows type pressure receiving element, which provides a larger torque and a higher resistance against vibration, is employed.
- ◆ A Compensation mechanisms for ambient temperature change is incorporated.

Standard Specifications

Item		Specifications			
Detector Section	Measuring range	Standard range: (°C)		Special range: (°C)	
		Span	Range	Span	Range
		50	0~50, 50~100	50	-20~30, 20~70
		100	-50~+50, 0~100, 100~200	60	-10~50
		150	-50~+100, 0~150	80	-15~65, 0~80
		200	0~200, 100~300	120	50~150
		300	0~300, 100~400(★)	150	-20~100, 0~120
		400	0~400(★)	100	50~200
		500	0~500(★)	250	-50~150, 50~250
		Note) ★....Gas-fill type (nitrogen) Others....Liquid-fill type (kerosene)		Note) Indicating accuracy : ±1.5%FS Repeatability : 1%FS	
	Allowable overrange	Maximum temperature plus 20% of span			
	Material	Bulb : SUS304 Armored tube: SUS304 Capillary tube : SUS304 Pressure element: phosphor bronze bellows			
	Capillary tube length	5m standard			
Function	Indicating capacity	±1% FS			
	Repeatability	Within 0.3% FS			
	Dead band	Within 0.2% FS			

Standard Specifications

Indication	Angle	44 degrees
	Scale length	150 mm
	Pointer	Process variable: Red, Set point value: Green
	Output indicator(Φ40mm)	Scale range: 0-2kgf/cm ² Indicator accuracy: ±3%FS
Set-point Section	Local setting	Internal or external setting by setting knob.
	Remote setting	Pneumatic pressure setting of 0.2-1.0 kgf/cm ²
	Setting range	0-100%FS
Controller	Control action	P+ Manual reset, PI, PID, PD + Manual reset, PI + Batch, On - Off, Differential gap, P+ External reset, PD + External reset
	Proportional band (P)	5-500% (direct or reverse action)
	Integral (I)	0.05-30 min
	Derivative (D)	0.05-30 min
	Differential gap	1-100% FS, adjustable
	Batch setting pressure	0.6-1.1 kgf/cm ² , adjustable
	External reset pressure	0.2-1.0 kgf/cm ²
	Manual reset	0-100% FS, adjustable (by pneumatic pressure setting.)
General Specifications	Output	0.2-1.0 kgf/cm ² , 0 or 1.4 kgf/cm ² (on-off, differential gap)
	Minimum load	I. D. 4mm×3m+20 cm ³
	Supply air pressure	1.4±0.14 kgf/cm ²
	Air consumption	Indicating transmitter: 4 N ℓ /min Only indicating: 0 Indicating controller: 4 N ℓ /min Manual control: 3 N ℓ /min. Indicating controlling transmitter: 8 N ℓ /min.
	Saturated air supply capacity	Pneumatic transmission: 40 N ℓ /min. Output: 40 N ℓ /min. Manual pneumatic pressure: 30 N ℓ /min.
	Air connection	PT ¼ or ½ NPT internal thread
	Ambient temperature	-30 to +80°C (up to -30 to +60°C for 0-50°C range)
	Relative humidity	10-90%RH
	Case, Door	Enclosure: Rain-tight and dust, meets JIS F8001 Class 3 splash-proof, NEMA 3, IEC IP54 Vibration resistant.....Lloyd regulation or equivalent Materials: Case.....Aluminum die-cast Door.....Polyester with fiberglass Door-glass.....Reinforced glass (3.3mm thick) Case finish: Acryl baking finish (for corrosion-resistant and silver finish, refer to the optional specification.) Color of finish: Dark beige (MUNSELL 10YR4.7/ 0.5)
	Mounting	Panel, wall or 2-inch pipe mounting (mounting bolt, nut material: SUS304)
Net weight	Approx. 6.7kg (pipe mounting type, local mode PI controller using 0-100 °C element.)	

Optional Specifications

Item	Specifications
(1) External SP setting knob (for local setting)	A setting knob is mounted on the door, SP can be adjusted from outside.
(2) Built-in manual controller (with auto/manual transfer switch)	Consists of a manual control regulator, two position transfer switch and balance check button.
(3) With union	Threaded union nut provided for connection with thermal well provided.
(4) Air set (not applicable to panel mounting type)	Pressure regulator with filter plus Φ40mm pressure gauge. (supply pressure: 2-9.9 kgf/cm ² , output: 1.4 kgf/cm ² , pressure gauge: 0-2 kgf/cm ²)

Model Number Table

Ex: KFTA13-06100B4T-K.M.U.7

Basic model no.			Selections					Options	Description
Type	Function	Control action	Sensing element	Measuring range	Air connection	Signal pressure	Mounting method		
KFT								Temperature indicating controller	
	A0							Indicating transmitter	
	A1							Indicating controller (local type)	
	A2							Indicating transmitting controller (local type)	
	A3							Indicating controller (cascade type)	
	A4							Indicating transmitting controller (cascade type)	
		0						No selection	
		1						P + Manual reset	
		2						PI	
		3						PID	
		4						PD + Manual reset	
		5						PI + Batch	
		6						On-Off	
		7						Differential gap	
		8						P + External reset	
		9						PD + External reset	
			-06					Liquid-fill type	
			-07					Gas-fill type	
				105				Liquid-fill type -50 ~ 50°C	
				155				Liquid-fill type -50 ~ 100°C	
				50				Liquid-fill type 0 ~ 50°C	
				100				Liquid-fill type 0 ~ 100°C	
				150				Liquid-fill type 0 ~ 150°C	
				200				Liquid-fill type 0 ~ 200°C	
				300				Liquid-fill type 0 ~ 300°C	
				400				Gas-fill type 0 ~ 400°C	
				500				Gas-fill type 0 ~ 500°C	
				55				Liquid-fill type 50 ~ 100°C	
				101				Liquid-fill type 100 ~ 200°C	
				201				Liquid-fill type 100 ~ 300°C	
				301				Gas-fill type 100 ~ 400°C	
					A			PT ¼ internal thread (instruction plate: Japanese)	
					B			¼ NPT internal thread (instruction plate: English)	
						1		0.2~1.0 kgf/cm ²	
						2		3~15 psi	
						3		0.2~1.0 bar	
						4		20~100 KPa	
							P	Panel mounting	
							S	Wall mounting	
							T	2-inch pipe mounting	
							-X	No selection	
							-K	With external SP setting knob (applicable to type A1 or A2 controller.)	
							-M	Built-in manual controller (with auto/manual switch) (applicable to type A1, A2, A3 or A4 controller.)	
							-U*	With union (see Notes 1 and 2.)	
							-7	With air-set	

[Note]

1) When neither option -U {with well or -U (union) is specified, only nut is provided to ship. (nut: liquid-fill type: PF 3/4, gas-fill type: PF1)}

2) Air connecting screw and union screw

Type of air	Union screw (material: SUS304)
PT ¼	Liquid-fill: PT ¼ *
	Gas-fill: PT 1
¼ NPT	Liquid-fill: ¼ NPT *
	Gas-fill: 1 NPT

*: For liquid-fill type, either PT 1 or 1 NPT is available, please specify it.

Well (Liquid-fill type)

Ex: KFZ1-1112-15

Basic model no.		Selections			Options	Description		
		Type	Connection	Material				
KFZ	1					Well for temperature element		
		-1				For liquid-fill type (drilled)		
		-2				For liquid-fill type (welded)		
			11			Flange connection	20mm-JIS10K	
			12			Flange connection	25mm-JIS10K	
			13			Flange connection	40mm-JIS10K	
			14			Flange connection	50mm-JIS10K	
			21			Flange connection	20mm-JIS20K	
			22			Flange connection	25mm-JIS20K	
			23			Flange connection	40mm-JIS20K	
			24			Flange connection	50mm-JIS20K	
			31			Flange connection	3/4" -ANSI 150	
			32			Flange connection	1" -ANSI 150	
			33			Flange connection	1 1/2" -ANSI 150	
			34			Flange connection	2" -ANSI 150	
			41			Flange connection	3/4" -ANSI 300	
			42			Flange connection	1" -ANSI 300	
			43			Flange connection	1 1/2" -ANSI 300	
			44			Flange connection	2" -ANSI 300	
			71			Flange connection	3/4" JPI 150	
			72			Flange connection	1" JPI 150	
			73			Flange connection	1 1/2" JPI 150	
			74			Flange connection	2" JPI 150	
			81			Flange connection	3/4" JPI 300	
			82			Flange connection	1" JPI 300	
			83			Flange connection	1 1/2" JPI 300	
			84			Flange connection	2" JPI 300	
			91			Flange connection	3/4"-ANSI 600	
			92			Flange connection	1"-ANSI 600	
			93			Flange connection	1 1/2"-ANSI 600	
			94			Flange connection	2"-ANSI 600	
			01			Flange connection	3/4" JPI 600	
			02			Flange connection	1" JPI 600	
			03			Flange connection	1 1/2" JPI 600	
			04			Flange connection	2" JPI 600	
			51			Screw connection	PT3/4	
			52			Screw connection	PT1	
			61			Screw connection	3/4 NPT	
			62			Screw connection	1NPT	
				2		SUS316		
				7		SUS304		
				8		SUS316L		
						Insertion length	Drilled	Welded
					-15	150mm	○	
					-20	200mm	○	
					-25	250mm	○	○
					-30	300mm	○	○
					-35	350mm	○	○
					-40	400mm	○	○
					-45	450mm	○	○
					-50	500mm	○	○
					-60	600mm		○
					-70	700mm		○
					-80	800mm		○
					-90	900mm		○
					-00	1000mm		○

[Note] *Protecting tubes with insertion lengths (extension lengths) longer than 600mm are available as special order items (standard length 700mm).

Well (Gas-fill type)

Ex: KFZ1-3132-30

Basic model no.		Selections			Options	Description
		Type	Connection	Material		
KFZ	1					Well for temperature element
		-3				For liquid-fill type (drilled)
		-4				For liquid-fill type (welded)
			13			Flange connection 40mm-JIS10K
			14			Flange connection 50mm-JIS10K
			23			Flange connection 40mm-JIS20K
			24			Flange connection 50mm-JIS20K
			33			Flange connection 1 1/2" -ANSI 150
			34			Flange connection 2" -ANSI 150
			43			Flange connection 1 1/2" -ANSI 300
			44			Flange connection 2" -ANSI 300
			73			Flange connection 1 1/2" JPI 150
			74			Flange connection 2" JPI 150
			83			Flange connection 1 1/2" JPI 300
			84			Flange connection 2" JPI 300
			93			Flange connection 1 1/2" -ANSI 600
			94			Flange connection 2" -ANSI 600
			3			Flange connection 1 1/2" JPI 600
			4			Flange connection 2" JPI 600
			52			Screw connection PT3/4 (not applicable to welded type)
			62			Screw connection 1NPT (not applicable to welded type)
				2		SUS316
				7		SUS304
				8		SUS316L
					Insertion length	Drilled
						Welded
				-30	300mm	○
				-35	350mm	○
				-40	400mm	○
				-45	450mm	○
				-50	500mm	○
				-60	600mm	○
				-70	700mm	○
				-80	800mm	○
				-90	900mm	○
				-00	1000mm	○

[Note] * Well with insertion lengths (extension lengths) longer than 600mm are available as special order items (standard length 700mm).

Overall Dimensions

Dimensions of Temperature Elements

Union type (without well)

Screw type (with well)

Flange type (with well)

Bulb Dimensions

DIMENSION TEMP. SPAN	BULB LENGTH L (MM)	LENGTH OF UNDER SCREW OR FLANGE	
		MIN.	MAX.
LIQUID-FILL	50	267	300
	100	140	200
	150	100	150
	200	80	100
	300	60	100
GAS-FILL	300		
	400	250	300
	500		

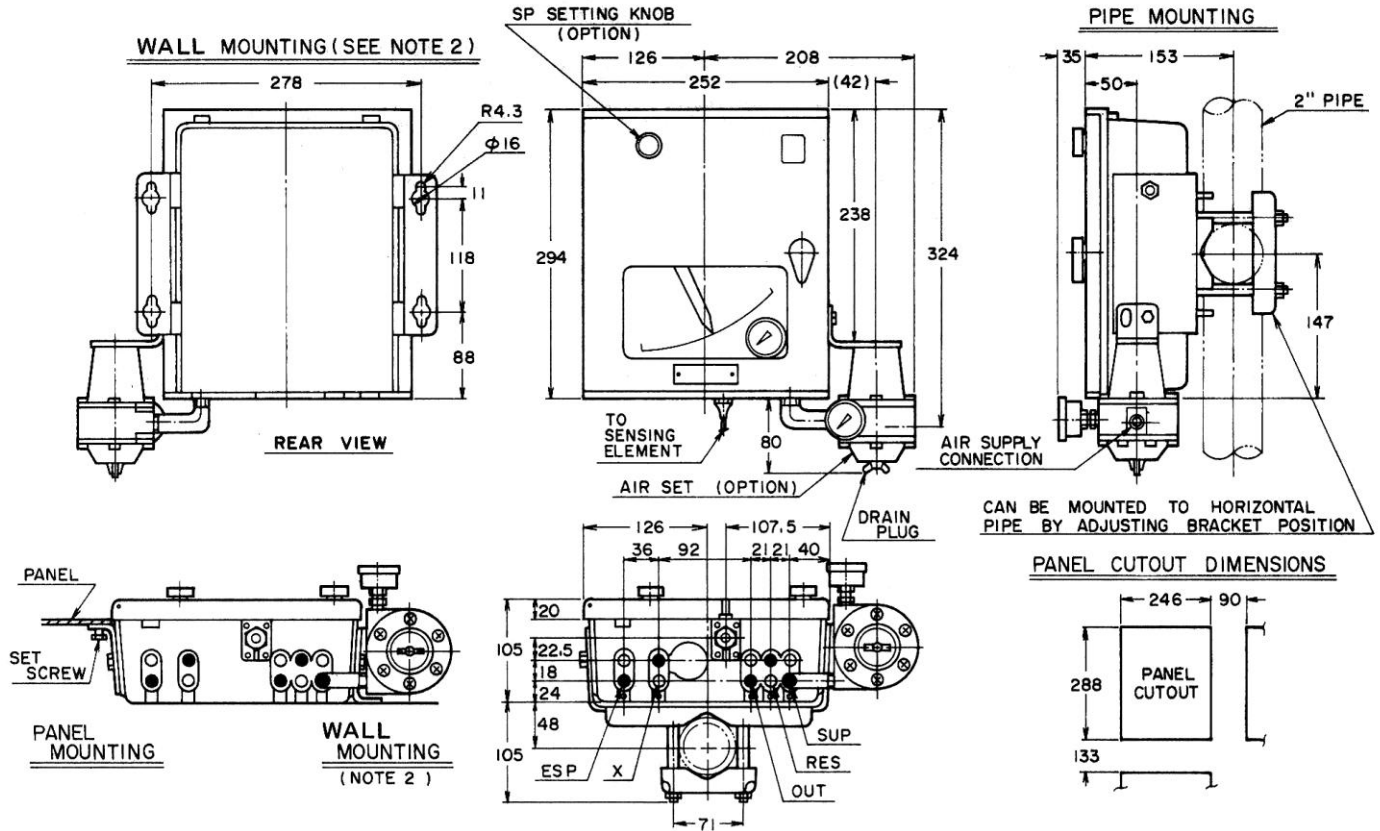
Well Dimensions

DIMENSION TYPE	IMMERSION LENGTH (L) (MM)	φd	
		WELDED	DRILLED
LIQUID-FILL	150	—	18
	200	—	19
	250	—	20
	300	17	21
	350	—	22
	400	—	22
GAS-FILL	500	—	22
	600-1000	—	—
	300	—	28
	350	—	28
GAS-FILL	400	27	SCREW TYPE 28 FLANGE TYPE29
	500	—	SCREW TYPE 28 FLANGE TYPE30
	600-1000	—	SCREW TYPE 28 FLANGE TYPE30

Notes:

- The dimensions enclosed in the parentheses in the above drawings are for gas-fill type of elements. Dimensions of those not enclosed in parentheses are identical with those of liquid seal type of elements.
- *Insertion lengths 800-1000mm are available in 100-mm increments and those 1200-2200mm in 200-mm increments.

(Unit: mm)



AIR CONNECTIONS (REFER TO NOTE 1, 3)

- : PT 1/4 FEMALE
- : 1/4 NPT FEMALE

REGEND

- ESP : EXTERNAL SP SIGNAL
(FOR CASCADE TYPE ONLY)
- X : TRANSMITTING SIGNAL
(FOR TRANSMITTER ONLY)
- OUT : CONTROLLED SIGNAL
- RES : EXTERNAL RESET SIGNAL
(FOR EXTERNAL RESET TYPE ONLY)
- SUP : SUPPLY AIR PRESSURE

Notes:

- 1) The holes not to be used for connection are plugged.
- 2) If two or more instruments are to be mounted on wall, keep them apart at least 80mm (163mm for instruments with air set) horizontally and at least 126mm vertically.
- 3) For manual reset provision, "SUP" and "RES" have been preconnected.