Product Data Sheet
00813-0400-2654, Rev AA
Catalog 2008 - 2009

Rosemount Series 1075 and 1099 High-Temperature Thermocouples

- *Accurate technical temperature measurements in heat treatment and combustion processes*
- *Reliable temperature measurements in hot gas environments of glass, ceramic, and metals industries*
- *Ceramic protective tube materials available for use up to 1800 °C (3272 °F)*
- *Metal protective tube materials, such as Super Kanthal, suitable for use up to 1700 °C (3092 °F)*
- *Wide range of thermocouples in precious-metal (Types B, S. and R), and base-metal (Type K)*
- *Maximum measurement reliability obtained in the DKD Calibration Laboratory*
- *Complete point solutions with integrated or remote temperature transmitter and mounting accessories*

Contents

Overview

This document contains information on Rosemount Series 1075 standard thermocouples, which conform to the requirements of the DIN EN 60584-1/2 (IEC 584) standards. The DIN EN 50446 (new) standard defines all protective tube designs. Emerson Process Management's high-temperature thermocouples are manufactured of premium materials. The state-of-the-art manufacturing process allows the thermocouples to be used in many different applications including the monitoring and control of process temperatures up to 1800 °C (3272 °F).

Our calibration laboratory is certified by the German Calibration Service (DKD) to perform calibrations on thermocouples and resistance thermometers for comparative and fixed point measurements. This enables us to calibrate and certify every customer sensor. As the equipment traceability requirements of DIN EN/ISO 9000 are becoming more stringent, Emerson Process Management strives to keep our customers internationally competitive by providing certificates and documents for quality assurance systems.

Technical References

THERMOELECTRIC EFFECT

A thermocouple consists of a connection between two different metals to produce a change of the thermoelectric emf in comparison with a temperature change. A thermocouple provides a thermoelectric voltage in millivolts D.C., which depends on the temperature difference between the hot and cold junctions. The hot junction is exposed to the measurement temperature, while the temperature for the cold junction is known. A thermocouple has two different connected leads called positive or negative leg. In practice, these leads are connected to extension or compensating cable, or directly to the transmitter in the local connection head. The simplest practicable thermocouple consists of two wires welded together at one end, forming the measuring tip.

THERMOCOUPLE MATERIALS

The IEC 584 (DIN EN 60584) standards define the basic values and tolerances of the thermocouple types at a temperature range between 0 °C (32 °F) and 1800 °C (3272 °F). High-temperature measurements up to 1800 °C (3272 °F) can only be carried out with precious-metal thermocouples. Generally, precious-metal (platinum) thermocouples are stable and can be used up to 1800 °C (3272 °F), see Table 1 for electrical output.The most commonly used base-metal thermocouple, Type K, covers most industrial applications.

Rosemount transmitters are programmable for most thermocouple inputs. The thermoelectric voltage is amplified and, for example, converted into a 4—20mA output signal in proportion to the temperature.

TABLE 1. Characteristics of Standard Thermocouples

Thermocouple Type	Alloy of Leads + / -	Temperature Range	Output [mV d.c.]
K	NiCr-Ni	0 to 1200 °C (32 to 2192 °F)	0 to 48.828
R	PtRh87/13%-Pt	0 to 1600 °C (32 to 2912 °F)	0 to 18.842
S	PtRh90/10%-Pt	0 to 1600 °C (32 to 2912 °F)	0 to 16.771
B	PtRh70/30%-Pt Rh94/6%	0 to 1800 °C (32 to 3272 °F)	0 to 13.585

LIMIT TOLERANCES

All thermocouples manufactured and supplied by Rosemount are in accordance with IEC 584-2 (DIN EN 60584-2) limit tolerances. Calibration of one or more customer-specific measuring points can be provided on request with a DKD-certificate up to 1200 °C (2192 °F) and a works certificate up to 1300 °C (2372 °F).

IMPORTANT INFORMATION ABOUT INSTALLATION OF HIGH-TEMPERATURE THERMOCOUPLES

To reduce risk of damage of gas-tight, ceramic protective tubes by thermal shock, it is necessary to pre-heat the thermocouple assembly before installation. Slow insertion into the ceramic protective tubes avoids damages caused by rapid changes in temperature. At high temperatures vertical assembly is recommended to prevent bending under the sensor’s own weight. A hair-line fracture can cause contamination and drift. Additionally, support is required in order to avoid bending or breakage in a horizontal assembly. The temperature at the connection head and the terminal block must not exceed 200 °C (392 °F).

Rosemount Series 1075 and 1099

Standard Application Thermocouples

INTRODUCTION

The Rosemount Series 1075 thermocouples conforms to DIN EN 50446 standard, and can be ordered as complete thermocouple assemblies.

ASSEMBLY DESIGN

TABLE 2. Thermocouple Design Type Descriptions

Option Code	Rosemount Description
1	BM - DIN B with Metal Protection Tube (Max Temp. 1200 °C [2192 °F])
2	AM - DIN A with Metal Protection Tube (Max Temp. 1200 °C [2192 °F])
3	AMK - DIN A with Metal Protection Tube and Ceramic Inner Tube (Max Temp. 1350 °C [2462 °F])
4	BK - DIN B with Ceramic Protection Tube (Max Temp. 1800 °C [3272 °F])
5	AK - DIN A with Ceramic Protection Tube (Max Temp. 1800 °C [3272 °F])
6	AKK - DIN A with Ceramic Protection Tube and Inner Tube (Max Temp. 1800 °C [3272 °F])

TABLE 3. Thermocouple Type Selection Guide

Option Code	Type	Temp. Type/ Max. Temp	Protective Tube Material/Max. Temp	Diameter	Max. Length	Inner Tube Material	Applications
1	BM	K /1200 °C (2192 °F)	1.4762/ 1200 °C (2192 °F) 1.4841/ 1200 °C (2192 °F)	15 x 2 mm (0.59 x 0.08 in.)	2000 mm (78.74 in.)	Without	Tempering furnaces for thermal treatment processes, pipelines, curtain, air ducts, flue-gas desulphurization plants, bearing metals-, lead- and tin melts
2	AM	K /1200 °C (2192 °F)	1.4762/ 1200 °C (2192 °F) 1.4841/ 1200 °C (2192 °F)	22 x 2 mm (0.87 x 0.08 in.)	6000 mm (236.22 in.)	Without	Cooling furnaces in glass tank furnaces in glass melts, pipelines, curtains, air ducts, flue-gas desulphurization plants, refuse incinerators
3	AMK	R and S /1600 °C (2912 °F)	1.4762 1200 °C (2192 °F) 1.4841/ 1200 °C (2192 °F) 1.4762 (Kanthal AF)/ 1350 °C (2462 °F)	22 x 2 mm (0.87 x 0.08 in.)	6000 mm (236.22 in.)	C610	Cooling furnaces in glass tank furnaces in glass melts, pipelines, curtains, air ducts, flue-gas desulphurization plants, refuse incinerators.
4	BK	K / 1200 °C (2192 °F) R and S / 1600 °C (2912 °F) B/ 1800 °C (3272 °F)	Ceramic Type C610/ 1400 °C (2552 °F) Ceramic Type C799/ 1800 °C (3272 °F)	10 x 1.5 mm (0.39 x 0.06 in.)	1000 mm (39.37 in.)	Without	Glass industry, verified clay furnaces, hardening bays, steel industry
5	AK	K / 1200 °C (2192 °F) R and S / 1600 °C (2912 °F) B/ 1800 °C (3272 °F)	Ceramic Type C610/ 1400 °C (2552 °F) Ceramic Type C799/ 1800 °C (3272 °F)	15 x 2 mm (0.59 x 0.08 in.) 15 x 2.5 mm (0.59 x 0.10 in.)	2000 mm (78.74 in.)	Without	Glass industry (regenerator checkerwork, tempering furnaces), verified clay furnaces, hardening bays, steel industry (annealing and tempering areas)
6	AKK	K / 1200 °C (2192 °F) R and S / 1600 °C (2912 °F) B/ 1800 °C (3272 °F)	Ceramic Type C530/ 1600 °C (2912 °F) Ceramic Type C799/ 1800 °C (3272 °F) Kanthal Super/ 1700 °C (3092 °F)	26 x 4 mm (1.02 x 0.16 in.) 24 x 3 mm (0.94 x 0.12 in.) 25 x 5 mm (0.98 x 0.20 in.)	2000 mm (78.74 in.)	C610/799 C799 C799	Tempering furnaces for thermal treatment processes, pipelines, curtain, air ducts, flue-gas desulphurization plants, bearing metals-, lead- and tin melts

THERMOCOUPLE DESIGN

TABLE 4. Limit Tolerances of Thermocouples According to DIN EN 60584-2

Type	Alloy	Temperature Range	Limit Tolerance DIN EN 60584-2	Tolerance Class
Base-Metal Thermocouples				
K	NiCr-Ni	-40 to 375 °C (-40 to 707 °F) 375 to 1000 °C (707 to 1832 °F)	1.5 °C 0.004 x (t)	1
		-40 to 333 °C (-40 to 631 °F) 333 to 1200 °C (631to 2192°F)	2.5 °C 0.0075 x (t)	2
Precious-Metal Thermocouples				
R	PtRh87/13%-Pt	0 to 1100 °C (32 TO 2012 °F) 1100 to 1600 (2012 t to 2912 °F)	1.0 °C 1+0.003 x (t-1100 °C)	1
		0 to 600 °C (32 TO 1112 °F) 600 to 1600 (1112 t to 2912 °F)	1.5 °C 0.0025 x (t)	2
S	PtRh90/10%-Pt	0 to 1100 °C (32 TO 2012 °F) 1100 to 1600 (2012 t to 2912 °F)	1.0 °C 1+0.003 x (t-1100 °C)	1
		0 to 600 °C (32 TO 1112 °F) 600 to 1600 (1112 t to 2912 °F)	1.5 °C 0.0025 x (t)	2
B	PtRh70/30%-PtRh94/6%	600 to 1700 °C (1112 to 3092 °F)	0.0025 x .004(t)	2

TABLE 5. Protective and Inner Tube Combinations

Outer Protective Tube Material	Inner Tube	Thermocouple Type	Applications	Max. Application Temperature
C530	C610	K	Ceramic furnaces in brickworks	1200 °C (2192 °F)
C530	C799	R / S	Glass tank furnaces; regenerator checkerwork (above)	1600 °C (2912 °F)
C799	C799	B	Glass tank furnaces; side walls, crown, bottom (in pre-drilled channels up to 50 mm below the bottom)	1800 °C (3272 °F)
C799	C799	B	Glass melting pot	1800 °C (3272 °F)

The thermocouple wire diameter varies with the design of the thermocouple. The standard diameter is 0.5 mm (0.02 in.) and is recommended for long-term stability, however a wire diameter of 0.35 mm (0.01 in.) is also available.

PROTECTION TUBE DESIGN

A protective tube is used to shield thermocouples from pressure, flow, corrosion, as well as mechanical and chemical influences. Selecting a suitable protective tube is crucial to the service life of the thermocouple assembly. Multiple designs using different materials and alloys were standardized for the use of our thermocouple assemblies. Emerson Process Management offers a range of application specific protective tubes dependent on the process conditions.

Metal, heat-resistant, protective tubes, such as Inconel or CrNi-steel, provide high-mechanical stress protection and can be used at temperatures to 1200 °C (2192 °F). Emerson Process Management offers, as standard design, protective tubes of the following materials: AISI 446 (1.4762) and AISI 314 (1.4841). Protective tubes of Kanthal AF and Kanthal Super are available for temperatures of 1350 °C (2463 °F) or 1700 °C (3092 °F), e.g. in corrosive furnace atmospheres. Kanthal protective tubes can be used for multiple applications in refuse incinerators.

Ceramic protective tubes are used for high-temperature ranges. The characteristics and fields of application for standard materials and Ceramic Types C630, C610, and C799 are shown in Table 6.

Gas-tight protective tubes made of silicon carbide are used in high dust loads and corrosive environments up to 1400 °C (2552 °F), and are available on request. High service lives under extreme operating conditions are guaranteed by special characteristics of reactions sintered, silicon infiltrated silicon-carbide protective tubes.

High-temperature thermocouples are used for technical temperature measurements in heat treatment and combustion processes. They are also used in the hot gas environments of glass, ceramic, and metal industry.

The most frequent fields of application are temperature monitoring and control of incinerators, industrial furnaces, and reactors.

Rosemount Series 1075 and 1099

The ceramic protective tube is usually cemented into a holding tube for easy installation of the connection head. Since the temperature above the fitting is generally low, unalloyed steel is used for holding tubes unless it reaches into the body of the furnace, then heat resistant steel is used.

TABLE 6. Protection Tube Material/Application Selection Guide

Material	Max. Temperature	Particularly Suitable	Less Suitable	Field of Application
Metal Protective Tubes				
1.0305 (St 35.8)	600 °C (1112 °F)	For air, averaging resistance to nitrogenous gases	Poor resistance to sulphurous gases	Temperature furnace for thermal treatment processes, galvanization and tinning plants, carbon-dual-air mixture pipelines in steam power stations
1.0305 enamelled (St 35.8 enamelled)	600 °C (1112 °F)	For corrosive applications within the dew-point range of flue gases	Sensitive to shock, inflexibility	Flue-gas desulphurization plants, bearing metal, lead and tin melts
1.4762	1200 °C (2192 °F)	High resistance to sulphurous gases	Poor resistance to nitrogenous gases	Combustion exhausts, cement and ceramic furnaces, thermal treatment processes, annealing furnaces
1.4749	1200 °C (2192 °F)	Very high resistance to sulphurous gases	Poor resistance to nitrogenous gases	Flue ducts, cooling furnaces
Kanthal AF™ 1.4767	1350 °C (2462 °F)	High heat resistance, high resistance to sulphurous gases, high abrasion resistance	Poor resistance to nitrogenous gases	Industrial furnaces, glass, ceramic, and cement industry, refuse incinerators
Kanthal Super™ (Molybdenum Disilicide)	1700 °C (3092 °F)	Very high heat resistance, high resistance to corrosion, high thermal conductivity, excellent hardness characteristics, high abrasion resistance	Poor resistance to nitrogenous gases	Glass and ceramic industry, carbon pressure-gasification, refuse incinerators
1.4841	1200 °C (2192 °F)	High Resistance to nitrogenous and low-oxygen gases	Poor resistance to sulphurous	Combustion chambers, industrial furnaces, petrochemical industry, nitrogenous blast heaters, cyanide baths
Ceramic Protective Tubes According to DIN VDE 0335 Standards (Except Silicon Carbide)				
Type C530 (Al_2O_3)	1600 °C (2912 °F)	Resistant to thermal shocks	Fine pores, not gas-tight, sensitive to shock	Electrically heated furnaces up to 1300 °C and other industrial furnaces, glass tank furnaces, regenerator chamber
Type 610 (Al_2O_3 Content: 60%)	1400 °C (2552 °F)	Gas-tight, high refractory quality, average resistance to thermal shocks	Low Al_2O_3-purity, sensitive to shock	Gas-tight furnaces, diffusion furnaces
Type 799 (Al_2O_3 Content: 99.7%))	1800 °C (3272 °F)	Very gas-tight, highest refractory quality, resistant to acids, alkalines and hot steam, high flexibility	Poor resistance to thermal shocks, sensitive to shock	Protective gas furnaces as well as electrically heated furnaces up to 1700 °C (glass tank furnaces), flue-gas desulphurization, chemical industry, cement production
Silicon infiltrated, Reaction Sintered, Silicon Carbide (e.g. Halsic™, Protec™, Silit SK™)	1400 °C (2552 °F)	Very high consistency, extremely high corrosion resistance to acids, and alkalines, excellent thermal conductivity, very resistant to thermal shocks, high abrasion resistance	Low mechanical stress	Flue-gas desulphurization plants, carbon mills, combustion chambers, flue-gas channels (in corrosive environments and at high temperatures)

Several connection head versions are available that differ in size and type of covers. All connection heads have a rubber o-ring-seal on the cable entry that limits the temperature to about 80 °C (176 °F). If a silicone o-ring-seal is used, the maximum temperature for the aluminum-alloy connection head is 200 °C (392 °F). Suitable connection heads are listed in Accessories.

In addition to our standard connection heads with inserted terminal block, thermocouples are also available with head-mounted transmitters (Rosemount Series 248 and 644). These transmitters can be inserted into the cover of the connection head TZ-A/BL or TZ-/AL, but reduces the maximum temperature the connection head can be exposed to 70 °C (158 °F).

A summary of some of the available transmitters is listed in Accessories.

The process connections are supplied with adjustable and removable mounting elements that are sealed with a stuffing brush. We offer adjustable stop flanges and threaded fittings in appropriate sizes.

TABLE 7. Summary of Material Standards

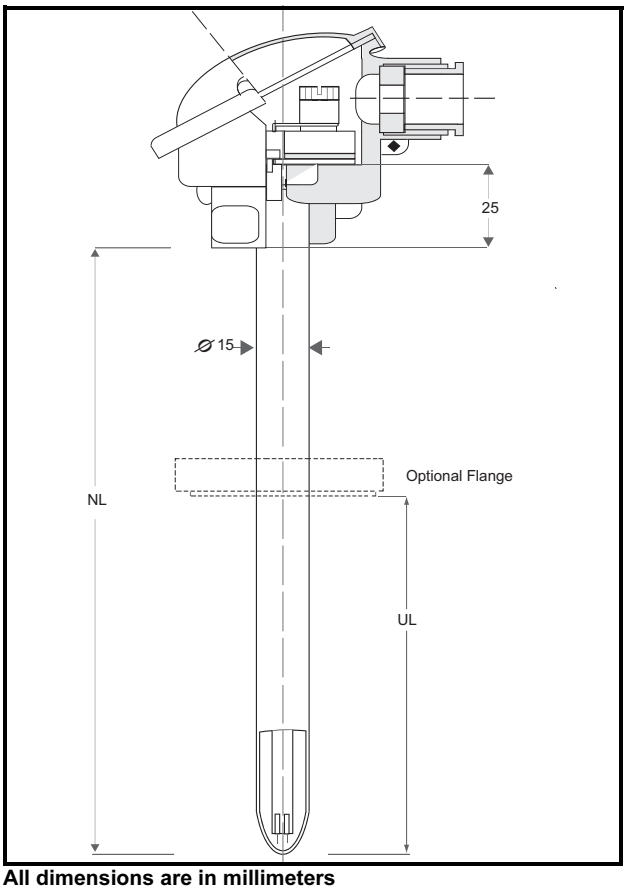
Material No. DIN	Material Code	AISI (USA)	B.S. (Great Britain)	AFNOR NF (France)	Product Group
1.0305	St 35.8				Carbon steels
1.4749	X 18 CrN 28	446			Heat-resistant steels
1.4762	X 18 CrAk 24	446		Z 10 XAS 24	Heat-resistant steels
1.4767	CrAl 20 5 (Kanthal AF™)				Heat-resistant steels
1.4841	X 15CrNiSi 25 20	314	314 S 25	Z 12 CNS 25-20	Heat-resistant steels
Super Kanthal™	Molybdenum disilicide				Sintered metals

SERIES 1075 FORM 1 IMMERSION THERMOCOUPLES, TYPE BM - WITH METAL PROTECTIVE TUBE

This design consists of a ceramic-insulated thermocouple with a protective tube housing, Type BM according to DIN EN 50446.

The Single or Dual thermocouple legs are insulated with ceramic elements. Oxygen-poor, neutral and reducing atmospheres, particularly in conjunction with humidity or carbon monoxide, can produce “selective chrome oxidation” at temperatures between 800 and 1000 °C (1472 and 1832 °F). This process changes the emf of the thermocouple (Type K). If the operating temperature is within this range, the use of a minimally insulated thermocouple is recommended.

For gas-tight installation of the protective tube, a gas-tight threaded fitting is necessary (pressure load up to maximum 1 bar). The standard heat resistance materials for protective tubes are 1.4762 and 1.4841. It is recommended that for temperatures up to 1200 °C (2192 °F), a protective tube made of material 1.4749, without a weld, be used. Protective tubes of material 1.4762 have a lengthwise weld that makes the tube brittle and may cause superficial cracking.



All dimensions are in millimeters

TABLE 8. Order Table: Rosemount Series 1075 Design Form 1 (BM)

Model	Product Description		
1075	Thermocouple, IEC 584 (DIN EN 60584-1), Tolerance Class 1 acc. to IEC 584 (DIN EN 60584-2)		
Model	**Product Form**		
1	BM - DIN B with Metal Protection Tube (Max Temp 1200 °C, Max length 2000 mm))		
Code	**Connection Head**	**IP Rating**	**Conduit Entry**
L(1)	TZ-A/BL (BUZH), Aluminum	54	M20 x 1.5
U	GN-BL, Aluminum, DIN 43729	43	M20 x 1.5
Y	HR-A/BL (BUS), Aluminum	54	M20 x 1.5
Code	**Sensor Connection**		
2	Terminal Block Form B		
Code	**Number of Elements**	**Thermocouple Type**	
01	Single	K	
02	Dual	K	
Code	**Thermocouple Type**		
K	K		
Code	**Wireless Diameter (mm)**	**Thermocouple Type**	**Maximum Temperature (°C)**
13	1.38 (Use with Dual Element)	K	1200
20	2 (Use with Single Element)	K	1200
Code	**Protective Tube Material**		**Maximum Temperature (°C)**
A	1.4762 (AISI 446,), 15 x 2		1200
B	1.4841 (AISI 314), 15 x 2		1200
Code	**Nominal Length (NL))**		
0250	250 mm		
0500	500 mm		
0710	710 mm		
1000	1000 mm		
XXXX	Other lengths (Maximum 2,000 mm)		
Code	**Process Connection**	**Material**	
A1	Adjustable stop flange	GTW-35 (cast iron)	
B1	Adjustable threaded fitting with G 3/4	1.0711 (steel)	
A2	Adjustable stop flange	GTW-35 (cast iron)	
B2	Adjustable threaded fitting with G 1	1.0711 (steel)	
A3	Adjustable stop flange	GTW-35 (cast iron)	
B3	Adjustable threaded fitting with G 1 1/4	1.0711 (steel)	
C4	Adjustable Flange 1 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
C5	Adjustable Flange 1 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
C6	Adjustable Flange 1 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
D4	Adjustable Flange 1 1/2 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
D5	Adjustable Flange 1 1/2 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
D6	Adjustable Flange 1 1/2 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
E4	Adjustable Flange 2 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
E5	Adjustable Flange 2 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
E6	Adjustable Flange 2 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
F4	Welded Flange 1 inch Class 150 Requires Flange immersion length (UXXXX)		
F5	Welded Flange 1 inch Class 300 Requires Flange immersion length (UXXXX)		
F6	Welded Flange 1 inch Class 600 Requires Flange immersion length (UXXXX)		
G4	Welded Flange 1 1/2 inch Class 150 Requires Flange immersion length (UXXXX)		
G5	Welded Flange 1 1/2 inch Class 300 Requires Flange immersion length (UXXXX)		
G6	Welded Flange 1 1/2 inch Class 600 Requires Flange immersion length (UXXXX)		
H4	Welded Flange 2 inch Class 150 Requires Flange immersion length (UXXXX)		
H5	Welded Flange 2 inch Class 300 Requires Flange immersion length (UXXXX)		
H6	Welded Flange 2 inch Class 600 Requires Flange immersion length (UXXXX)		
NN	No fitting		

Continued on Next Page

TABLE 8. Order Table: Rosemount Series 1075 Design Form 1 (BM)

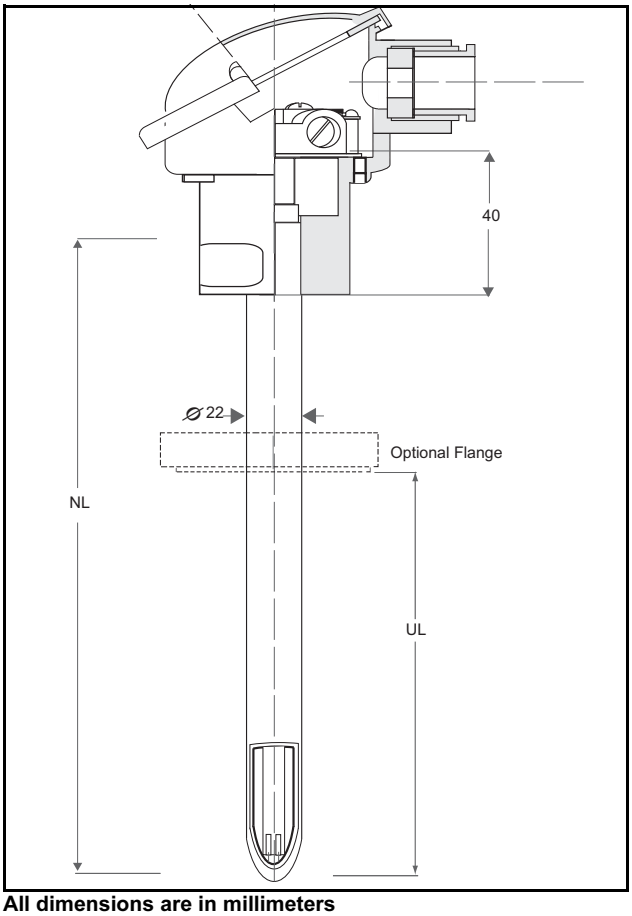
Model	Product Description
Code	**Holding Tube Material/Length**
N000	No Holding Tube
Code	**Options**
	Calibration Options
W02	Works Cert: Comparison measurement at thermocouple with 2 temperature points
W05	Works Cert: Comparison measurement at thermocouple with 5 temperature points
K02	DKD Calibration Cert: DKD Cert for 2 temperature points specified by customer
K05	DKD Calibration Cert: DKD Cert for 5 temperature points specified by customer
Q4	Calibration Cert (must be ordered with W01 through W12 or K01 through K12)
	Mounting Options
XA	Fit sensor to temperature transmitter
	Welded Flange Options
U1500	Length from Welded flange face to sensor tip (1500 mm) must be welded to Holding tube
UXXXX	Length from Welded flange face to sensor tip Non-standard length (xxxx mm) must be welded to Holding tube
	Other Options
R24	TAG plate, stainless steel
M99	Order specific drawing

(1) Connection head suitable for mounting a transmitter inside (Rosemount 248 and 644)

SERIES 1075 FORM 2 IMMERSION THERMOCOUPLES, TYPE AM - WITH METAL PROTECTIVE TUBE

This design consists of a base-metal thermocouple Type K, and a housing with a productive Design Type AM according to DIN EN 50446. The Single or Dual Type K thermocouple legs are insulated with ceramic elements.

For gas-tight installation of the protective tube, a gas-tight threaded fitting is necessary (pressure load up to a maximum of 1 bar). Our standard heat-resistant materials for protective tubes are 1.4762 and 1.4841.



All dimensions are in millimeters

Rosemount Series 1075 and 1099

TABLE 9. Order Table: Rosemount Series 1075 Design Form 2 (AM)

Model	Product Description		
1075	Thermocouple IEC 584 (DIN EN 60584-1), Tolerance Class 1 acc. to IEC 584 (DIN EN 60584-2)		
Model	**Product Form**		
2	AM - DIN A with Metal Protection Tube (Max Temp 1200 °C, Max length 6000 mm)		
Code	**Connection Head**	**IP Rating**	**Conduit Entry**
E	HR-AL (AUS), Aluminum	54	M20 x 1.5
G(1)	TZ-AL (AUZH), Aluminum	54	M20 x 1.5
P	GN-AL, Aluminum, DIN 43729	43	M20 x 1.5
Code	**Sensor Connection**		
3	Terminal Block, Form A		
Code	**Number of Elements**	**Thermocouple Type**	
01	Single	K	
02	Dual	K	
Code	**Thermocouple Type**		
K	K		
Code	**Wireless Diameter (mm)**	**Thermocouple Type**	**Maximum Temperature (°C)**
20	2 Dual	K	1200
30(2)	3 Single	K	1200
Code	**Protective Tube Material**		**Maximum Temperature (°C)**
C	1.4762 (AISI 446)		1200 / K
D	1.4841 (AISI 446)		1200 / K
Code	**Nominal Length (NL)**		
0500	500 mm		
0710	710 mm		
1000	1000 mm		
1400	1400 mm		
XXXX	Other lengths (Maximum 6000 mm)		
Code	**Process Connection**	**Material**	
A1	Adjustable stop flange	GTW-35 (cast iron)	
B1	Adjustable threaded fitting with G 3/4	1.0711 (steel)	
A2	Adjustable stop flange	GTW-35 (cast iron)	
B2	Adjustable threaded fitting with G 1	1.0711 (steel)	
A3	Adjustable stop flange	GTW-35 (cast iron)	
B3	Adjustable threaded fitting with G 1 1/4	1.0711 (steel)	
C4	Adjustable Flange 1 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
C5	Adjustable Flange 1 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
C6	Adjustable Flange 1 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
D4	Adjustable Flange 1 1/2 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
D5	Adjustable Flange 1 1/2 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
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E5	Adjustable Flange 2 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
E6	Adjustable Flange 2 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
F4	Welded Flange 1 inch Class 150 Requires Flange immersion length (UXXXX)		
F5	Welded Flange 1 inch Class 300 Requires Flange immersion length (UXXXX)		
F6	Welded Flange 1 inch Class 600 Requires Flange immersion length (UXXXX)		
G4	Welded Flange 1 1/2 inch Class 150 Requires Flange immersion length (UXXXX)		
G5	Welded Flange 1 1/2 inch Class 300 Requires Flange immersion length (UXXXX)		
G6	Welded Flange 1 1/2 inch Class 600 Requires Flange immersion length (UXXXX)		
H4	Welded Flange 2 inch Class 150 Requires Flange immersion length (UXXXX)		
H5	Welded Flange 2 inch Class 300 Requires Flange immersion length (UXXXX)		
H6	Welded Flange 2 inch Class 600 Requires Flange immersion length (UXXXX)		
NN	No fitting		

Continued on Next Page

TABLE 9. Order Table: Rosemount Series 1075 Design Form 2 (AM)

Model Code	Product Description Holding Tube Material/Length
N000	No Holding Tube
Code	**Options**
	Calibration Options
W02	Works Cert: Comparison measurement at thermocouple with 2 measurement points
W05	Works Cert: Comparison measurement at thermocouple with 5 measurement points
K02‘	DKD Calibration Cert: DKD Cert for 2 temperature points specified by customer
K05	DKD Calibration Cert: DKD Cert for 5 temperature points specified by customer
Q4	Calibration Cert (must be ordered with W01 through W12 or K01 through K12)
	Mounting Options
XA	Fit sensor to temperature transmitter
	Welded Flange Options
U1500	Length from Welded flange face to sensor tip (1500 mm) must be welded to Holding tube
UXXXX	Length from Welded flange face to sensor tip Non-standard length (xxxx mm) must be welded to Holding tube
	Other
R24	TAG plate, stainless steel
M99	Order specific drawing

(1) Connection head suitable for mounting a transmitter inside (Rosemount 248 and 644)
(2) 3 mm suitable for better long term stability

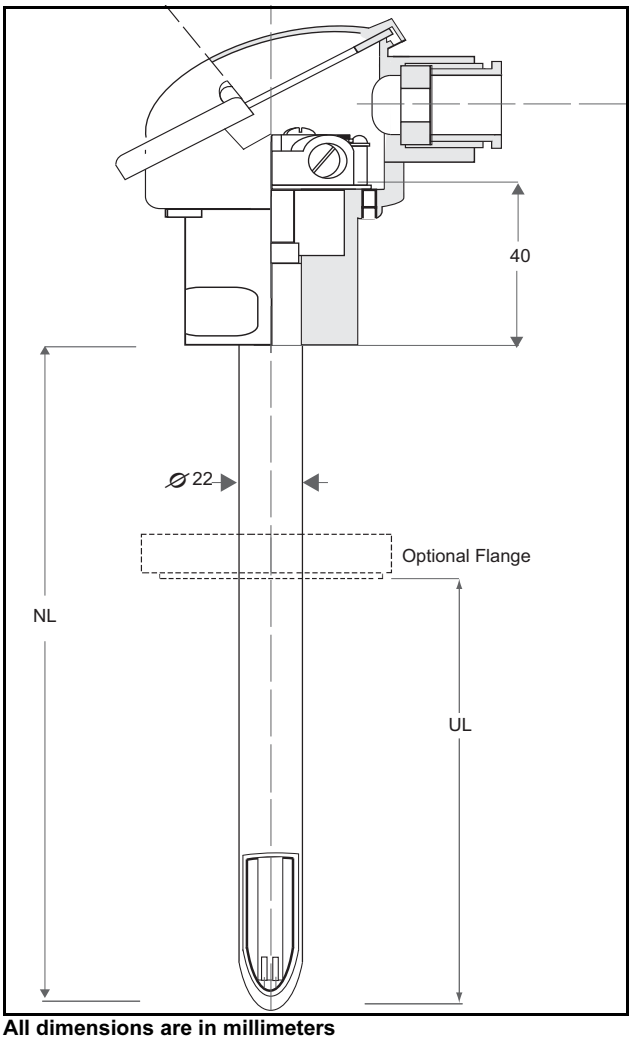
SERIES 1075 FORM 3 IMMERSION THERMOCOUPLES, TYPE AMK - WITH METAL PROTECTIVE TUBE AND WITH CERAMIC INNER TUBE

This design consists of precious-metal thermocouples Types R, S, or B, and a housing with a protective tube design Type AMK according to DIN EN 50446. Precious-metal thermocouples are insulated with a 4-hold Ceramic Type C610 insulating rod and have a gas-tight inner tube of 15 x 2 mm (0.59 x 0.08 in.).

For gas-tight installation of the protective tube, a gas-tight threaded fitting is necessary (pressure load up to a maximum of 1 bar). Our standard heat-resistant materials for protective tubes are 1.4762 and 1.4841. In addition, we have a protective tube type made of heat-resistant Kanthal with an outer diameter of 22 mm (0.67 in.).

Protective tubes of Kanthal AF offer the following advantages:

- Temperature resistance to 1350 °C (2462 °F)
- Longer service life with a wall thickness of 1.3 mm (0.05 in.)
- Greater heat transfer because low wall thickness leads to a better response time of the thermocouples
- Greater temperatures create a form fitting alumina film that keeps away impurities
- Resistance to oxidation superior to most iron and nickel-base alloys



All dimensions are in millimeters

TABLE 10. Order Table: Rosemount Series 1075 Design Form 3 (AMK)

Model	Product Description		
1075	Thermocouple IEC 584 (DIN EN 60584-1), Tolerance Class 1 acc. to IEC 584 (DIN EN 60584-2)		
Model	**Product Form**		
3	AMK - DIN A with Metal Protection Tube and Ceramic Inner Tube (Max Temp 1350 °C, Max length 6000 mm)		
Code	**Connection Head**	**IP Rating**	**Conduit Entry**
E	HR-AL (AUS), Aluminum	54	M20 x 1.5
G(1)	TZ-AL (AUZH), aluminum	54	M20 x 1.5
P	GN-AL, Aluminum, DIN 43729	43	M20 x 1.5
Code	**Sensor Connection**		
3	Terminal Block, Form A		
Code	**Number of Elements**		
XX	B, R, S; Thermocouple wire specified in separate line XB option required (See Model 1099 on Table 11)		
Code	**Thermocouple Type**		
X	B, R, S; Thermocouple wire specified in separate line XB option required (See Model 1099 on Table 11)		
Code	**Wireless Diameter (mm)**	**Thermocouple Type**	**Maximum Temperature (°C)**
XX	Any diameter		1600 / B, R, S
Code	**Protective Tube Material**	**Inner Tube Material**	**Maximum Temperature (°C)**
E	1.4762 (AISI 446)	Type C610	1200 / B, R,S
F	1.4841 (AISI 446)	Type C610	1200 / B, R, S
G	1.4767 (Kanthal AF)	Type C610	1350 / B, R, S
Code	**Nominal Length (NL)**		
0500	500 mm		
0710	710 mm		
1000	1000 mm		
1400	1400 mm		
XXXX	Other lengths (Maximum 6000 mm)		
Code	**Process Connection**	**Material**	
A1	Adjustable stop flange	GTW-35 (cast iron)	
B1	Adjustable threaded fitting with G 3/4	1.0711 (steel)	
A2	Adjustable stop flange	GTW-35 (cast iron)	
B2	Adjustable threaded fitting with G 1	1.0711 (steel)	
A3	Adjustable stop flange	GTW-35 (cast iron)	
B3	Adjustable threaded fitting with G 1 1/4	1.0711 (steel)	
C4	Adjustable Flange 1 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
C5	Adjustable Flange 1 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
C6	Adjustable Flange 1 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
D4	Adjustable Flange 1 1/2 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
D5	Adjustable Flange 1 1/2 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
D6	Adjustable Flange 1 1/2 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
E4	Adjustable Flange 2 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
E5	Adjustable Flange 2 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
E6	Adjustable Flange 2 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
F4	Welded Flange 1 inch Class 150 Requires Flange immersion length (UXXXX)		
F5	Welded Flange 1 inch Class 300 Requires Flange immersion length (UXXXX)		
F6	Welded Flange 1 inch Class 600 Requires Flange immersion length (UXXXX)		
G4	Welded Flange 1 1/2 inch Class 150 Requires Flange immersion length (UXXXX)		
G5	Welded Flange 1 1/2 inch Class 300 Requires Flange immersion length (UXXXX)		
G6	Welded Flange 1 1/2 inch Class 600 Requires Flange immersion length (UXXXX)		
H4	Welded Flange 2 inch Class 150 Requires Flange immersion length (UXXXX)		
H5	Welded Flange 2 inch Class 300 Requires Flange immersion length (UXXXX)		
H6	Welded Flange 2 inch Class 600 Requires Flange immersion length (UXXXX)		
NN	No fitting		

Continued on Next Page

Rosemount Series 1075 and 1099

TABLE 10. Order Table: Rosemount Series 1075 Design Form 3 (AMK)

Model	Product Description		
Code	**Holding Tube Material/Length**		
N000	No Holding Tube)		
Code	**Options**		
	Calibration Options		
W02	Works Cert: Comparison measurement at thermocouple with 2 measurement points		
W05	Works Cert: Comparison measurement at thermocouple with 5 measurement points		
K02	DKD Calibration Cert: DKD Cert for 2 temperature points specified by customer		
K05	DKD Calibration Cert: DKD Cert for 5 temperature points specified by customer		
Q4	Calibration Cert (must be ordered with W01 through W12 or K01 through K12)		
	Mounting Options		
XA	Fit sensor to temperature transmitter		
XB	Assemble to precious-metal thermocouple Model 1099 (Table 11)		
	Welded Flange Options		
U1500	Length from Welded flange face to sensor tip (1500 mm) must be welded to Holding tube		
UXXXX	Length from Welded flange face to sensor tip Non-standard length (xxxx mm) must be welded to Holding tube		
	Other		
R24	TAG plate, stainless steel	R24	TAG plate, stainless steel
M99	Order specific drawing	M99	Order specific drawing

(1) Connection head suitable for mounting a transmitter inside (Rosemount 248 and 644)

TABLE 11. Order Table: Rosemount Series 1099

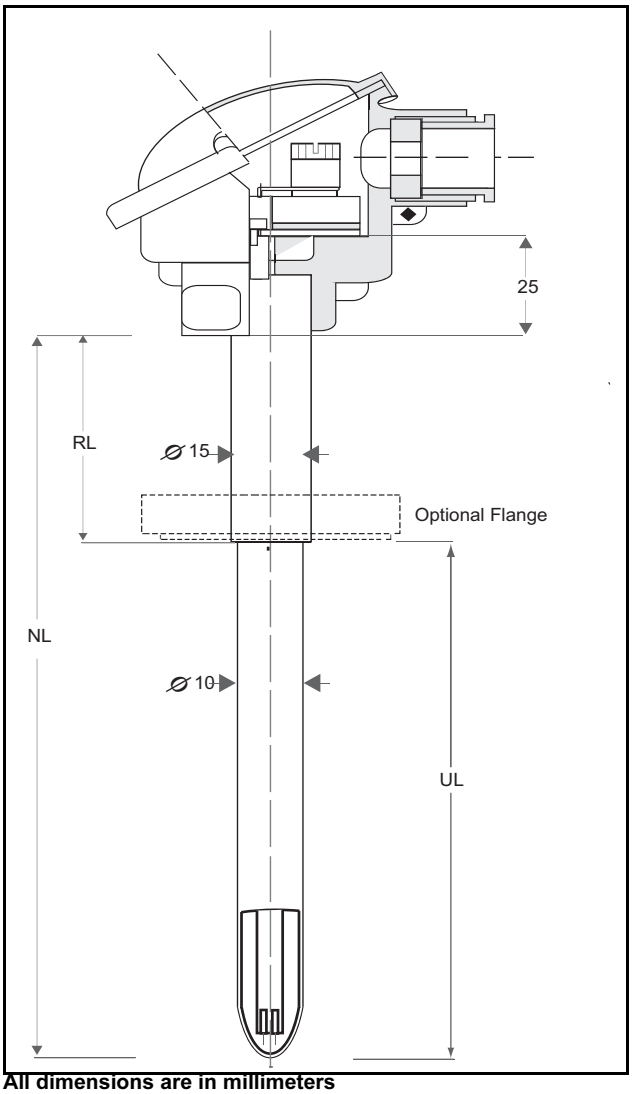
Model	Product Description		
1099	Precious-metal thermocouple wire assembled to model		
Model	**Product Form**		
A3	Assembled to 1075 Form 3		
Code	**Number of Elements**		
01	Single		
02	Dual		
Code	**Thermocouple Type**		
R	R		
S	S		
B	B		
Code	**Wireless Diameter**	**Thermocouple Type**	**Maximum Temperature (°C)**
05	0.5 mm	B, R, S	1600/R, S; 1800/B
03	0.35 mm	B, R, S	1600/R, S; 1800/B
Code	**Nominal Length (NL)**		
0500	500 mm		
0710	710 mm		
1000	1000 mm		
1400	1400 mm		
XXXX	Other lengths		
Code	**Additional Options**		
XB	Assemble to Model 1075 thermocouple		

SERIES 1075 FORM 4 IMMERSION THERMOCOUPLES, TYPE BK - WITH CERAMIC PROTECTIVE TUBE

This design consists of a base-metal thermocouple Type K or precious-metal thermocouples Type R, S, or B and a housing with a protective tube Type BK according to DIN EN 50446.

The Single or Dual Type K thermocouple legs are insulated with ceramic elements. Precious-metal thermocouples are insulated with a 4-hole insulating rod.

Installation requires stop flanges and threaded fittings. Standard materials for the protective tubes are Ceramic Types C610 and C799. The hold tube is made of materials AISI (1.4841), AISI 446 (1.4762) or mild steel (1.0305).



All dimensions are in millimeters

TABLE 12. Ordering Table: Rosemount Series 1075 Design Form 4 (BK)

Model	Product Description		
1075	Thermocouple IEC 584 (DIN EN 60584-1), Tolerance Class 1 acc. to IEC 584 (DIN EN 60584-2)		
Model	**Product Form**		
4	BK - DIN B with Ceramic Protection Tube (Max Temp 1800 °C, Max length 1000 mm)		
Code	**Connection Head**	**IP Rating**	**Conduit Entry**
L(1)	TZ-A/BL (BUZH), Aluminum	54	M20 x 1.5
U	GN-BL, Aluminum, DIN 43729	43	M20 x 1.5
Y	HR-A/BL (BUS), Aluminum	54	M20 x 1.5
Code	**Sensor Connection**		
2	Terminal Block, Form B		
Code	**Number of Elements**	**Thermocouple Type**	
01	Single Type K thermocouple wire only	K	
02	Dual Type K thermocouple wire only	K	
XX	B, R, S; Thermocouple wire specified in separate line XB option required (See Model 1099 on Table 13)		
Code	**Thermocouple Type**		
K	K		
X	B, R, S; Thermocouple wire specified in separate line XB option required (See Model 1099 on Table 13)		
Code	**Wireless Diameter (mm)**	**Thermocouple Type**	**Maximum Temperature (°C)**
13	1.38	K	1200 K
XX	B, R, S, Thermocouple wire specified in separate line XB option required (See Model 1099 on Table 13)		1600 / R, S; 1800 / B
Code	**Protective Tube Material**	**Inner Tube Material**	**Maximum Temperature (°C)**
J	Type C610 / 10 x 1.5	without	1000 / K; 1400 / R, S
L	Type C799 / 10 x 1.5	without	1600 / R, S; 1800 / B
Code	**Nominal Length (NL)**		
0250	250 mm		
0500	500 mm		
0710	710 mm		
XXXX	Other lengths (Maximum 1000 mm)		
Code	**Process Connection**	**Material**	
A1	Adjustable stop flange	GTW-35 (cast iron)	
B1	Adjustable threaded fitting with G 3/4	1.0711 (steel)	
A2	Adjustable stop flange	GTW-35 (cast iron)	
B2	Adjustable threaded fitting with G 1	1.0711 (steel)	
A3	Adjustable stop flange	GTW-35 (cast iron)	
B3	Adjustable threaded fitting with G 1 1/4	1.0711 (steel)	
C4	Adjustable Flange 1 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
C5	Adjustable Flange 1 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
C6	Adjustable Flange 1 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
D4	Adjustable Flange 1 1/2 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
D5	Adjustable Flange 1 1/2 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
D6	Adjustable Flange 1 1/2 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
E4	Adjustable Flange 2 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
E5	Adjustable Flange 2 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
E6	Adjustable Flange 2 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
F4	Welded Flange 1 inch Class 150 Requires Flange immersion length (UXXXX)		
F5	Welded Flange 1 inch Class 300 Requires Flange immersion length (UXXXX)		
F6	Welded Flange 1 inch Class 600 Requires Flange immersion length (UXXXX)		
G4	Welded Flange 1 1/2 inch Class 150 Requires Flange immersion length (UXXXX)		
G5	Welded Flange 1 1/2 inch Class 300 Requires Flange immersion length (UXXXX)		
G6	Welded Flange 1 1/2 inch Class 600 Requires Flange immersion length (UXXXX)		

Continued on Next Page

TABLE 12. Ordering Table: Rosemount Series 1075 Design Form 4 (BK)

Model	Product Description
	Process Connection (Continued)
H4	Welded Flange 2 inch Class 150 Requires Flange immersion length (UXXXX)
H5	Welded Flange 2 inch Class 300 Requires Flange immersion length (UXXXX)
H6	Welded Flange 2 inch Class 600 Requires Flange immersion length (UXXXX)
NN	No fitting
Code	**Holding Tube Material**
A	1.4762 (AISI 446)
B	1.4841 (AISI 316)
C	1.0305 (mild steel)
Code	**Holding Tube Length**
080	80 mm
XXX	Other length (mm)
Code	**Options**
	Calibration Options
W02	Works Cert: Comparison measurement at thermocouple with 2 measurement points
W05	Works Cert: Comparison measurement at thermocouple with 5 measurement points
K02	DKD Calibration Cert: DKD Cert for 2 temperature points specified by customer
K05	DKD Calibration Cert: DKD Cert for 5 temperature points specified by customer
Q4	Calibration Cert (must be ordered with W01 through W12 or K01 through K12)
	Mounting Options
XA	Fit sensor to temperature transmitter
XB	Assemble to precious-metal thermocouple wire (Table 13)
	Welded Flange Options
U1500	Length from Welded flange face to sensor tip (1500 mm) must be welded to Holding tube
UXXXX	Length from Welded flange face to sensor tip Non-Standard length (xxxx mm) must be welded to Holding tube
	Other
R24	TAG plate, stainless steel
M99	Order specific drawing

(1) Connection head suitable for mounting a transmitter inside (Rosemount 248 and 644)

TABLE 13. Order Table: Rosemount Series 1099

Model	Product Description		
1099	Precious-metal thermocouple wire assemble to model		
Model	**Product Form**		
A4	Assembled to 1075 Form 4		
Code	**Number of Elements**		
01	Single		
02	Dual		
Code	**Thermocouple Type**		
B	B		
R	R		
S	S		
Code	**Wireless Diameter (mm)**	**Thermocouple Type**	**Maximum Temperature (°C)**
03	0.35	B, R, S	1600/R, S; 1800/B
05	0.5	B, R, S	1600/R, S; 1800/B
Code	**Nominal Length (NL) (mm)**		
0250	250 mm		
0500	500 mm		
0710	710 mm		
XXXX	Other Lengths (Maximum 1000 mm)		
Code	**Additional Options**		
XB	Assemble to Model 1075 thermocouple		

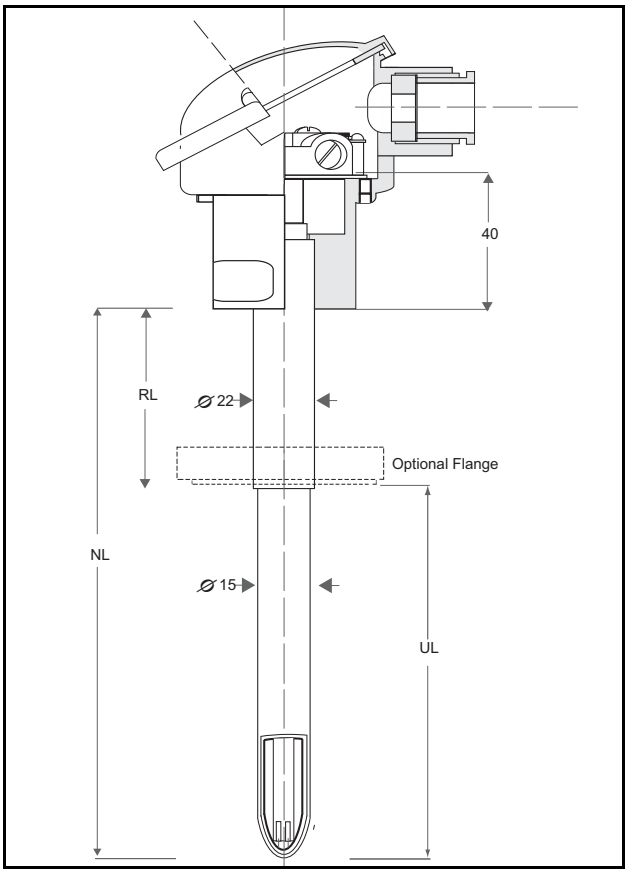
Rosemount Series 1075 and 1099

SERIES 1075 FORM 5 IMMERSION THERMOCOUPLE, TYPE AK - WITH CERAMIC PROTECTIVE TUBE.

This design consists of a base-metal thermocouple Type K or precious-metal thermocouples Type R, S, or B and a housing with a protective tube Type AK according to DIN EN 50446.

The Single or Dual Type K thermocouple legs are insulated with ceramic elements. Precious-metal thermocouples are insulated with a 4-hole insulating rod.

Installation requires stop flanges and threaded fittings, Standard materials for the protective tubes are Ceramic Types C610 and C799. The holding tube is made of materials AISA 314 (1.4841), AISI 446 (1.4762), or mild steel (1.0305).



All dimensions are in millimeters

TABLE 14. Order Table: Rosemount Series 1075 Design Form 5 (AK)

Model	Product Description		
1075	Thermocouple IEC 584 (DIN EN 60584-1), Tolerance Class 1 acc. to IEC 584 (DIN EN 60584-2)		
Model	**Product Form**		
5	AK - DIN A with Ceramic Protection Tube (Max Temp 1800 °C, Max length 2000 mm)		
Code	**Connection Head**	**IP Rating**	**Conduit Entry**
E	HR-AL (AUS), Aluminum	54	M20 x 1.5
G(1)	TZ-AL (AUZH), Aluminum	54	M20 x 1.5
P	GN-AL, Aluminum, DIN 43729	43	M20 x 1.5
Code	**Sensor Connection**		
3	Terminal Block, Form A		
Code	**Number of Elements**	**Thermocouple Type**	
01	Single	K	
02	Dual	K	
XX	B, R, S; Thermocouple wire specified in separate line XB option required (See Model 1099 on Table 15)		
Code	**Thermocouple Type**		
K	K		
X	B, R, S; Thermocouple wire specified in separate line XB option required (See Model 1099 on Table 15)		
Code	**Wireless Diameter (mm)**	**Thermocouple Type**	**Maximum Temperature (°C)**
13	1.38 mm	K	1200
30	3.0 mm	K	1200
XX	B, R, S, Thermocouple wire specified in separate line XB option required (See Model 1099 on Table 15)		
Code	**Protective Tube Material**	**Inner Tube Material**	**Maximum Temperature (°C)**
P	Type C610	without	1200 / K; 1400 / R, S
R	Type C799	without	1600 / R, S; 1800 / B
Code	**Nominal Length (NL)**		
0500	500 mm		
0710	710 mm		
1000	1000 mm		
1400	1400 mm		
XXXX	Other lengths (Maximum 2,000 mm)		
Code	**Process Connection**	**Material**	
A1	Adjustable stop flange	GTW-35 (cast iron)	
B1	Adjustable threaded fitting with G 3/4	1.0711 (steel)	
A2	Adjustable stop flange	GTW-35 (cast iron)	
B2	Adjustable threaded fitting with G 1	1.0711 (steel)	
A3	Adjustable stop flange	GTW-35 (cast iron)	
B3	Adjustable threaded fitting with G 1 1/4	1.0711 (steel)	
C4	Adjustable Flange 1 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
C5	Adjustable Flange 1 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
C6	Adjustable Flange 1 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
D4	Adjustable Flange 1 1/2 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
D5	Adjustable Flange 1 1/2 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
D6	Adjustable Flange 1 1/2 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
E4	Adjustable Flange 2 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
E5	Adjustable Flange 2 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
E6	Adjustable Flange 2 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
F4	Welded Flange 1 inch Class 150 Requires Flange immersion length (UXXXX)		
F5	Welded Flange 1 inch Class 300 Requires Flange immersion length (UXXXX)		
F6	Welded Flange 1 inch Class 600 Requires Flange immersion length (UXXXX)		
G4	Welded Flange 1 1/2 inch Class 150 Requires Flange immersion length (UXXXX)		
G5	Welded Flange 1 1/2 inch Class 300 Requires Flange immersion length (UXXXX)		
G6	Welded Flange 1 1/2 inch Class 600 Requires Flange immersion length (UXXXX)		

Continued on Next Page

Rosemount Series 1075 and 1099

TABLE 14. Order Table: Rosemount Series 1075 Design Form 5 (AK)

Model	Product Description	
	Process Connection (Continued)	
H4	Welded Flange 2 inch Class 150 Requires Flange immersion length (UXXXX)	
H5	Welded Flange 2 inch Class 300 Requires Flange immersion length (UXXXX)	
H6	Welded Flange 2 inch Class 600 Requires Flange immersion length (UXXXX)	
NN	No fitting	
Code	**Holding Tube Material**	**Dimensions in Millimeters**
D	1.4762 (AISI 446)	
E	1.4841 (AIIS 314)	
F	1.0305	
Code	**Holding Tube Length**	
150	150	
XXX	Other length	
Code	**Options**	
	Calibration Options	
W02	Works Cert: Comparison measurement at thermocouple with 2 measurement points	
W05	Works Cert: Comparison measurement at thermocouple with 5 measurement points	
K02	DKD Calibration Cert: DKD Cert for 2 temperature points specified by customer	
K05	DKD Calibration Cert: DKD Cert for 5 temperature points specified by customer	
Q4	Calibration Cert (must be ordered with W01 through W12 or K01 through K12)	
	Mounting Options	
XA	Fit sensor to temperature transmitter	
XB	B, R, S, Thermocouple wire specified in separate line XB option required (See Model 1099 on Table 15)	
	Welded Flange Options	
U1500	Length from Welded flange face to sensor tip (1500 mm) must be welded to Holding tube	
UXXXX	Length from Welded flange face to sensor tip Non-Standard length (xxxx mm) must be welded to Holding tube	
	Other	
R24	TAG plate, stainless steel	
M99	Order specific drawing	

(1) Connection head suitable for mounting a transmitter inside (Rosemount 248 and 644)

TABLE 15. Order Table: Rosemount Series 1099

Model	Product Description		
1099	Precious-metal thermocouple wire assemble to model		
Model	**Product Form**		
A5	Assembled to 1075 Form 5		
Code	**Number of Elements**		
01	Single		
02	Dual		
Code	**Thermocouple Type**		
B	B		
R	R		
S	S		
Code	**Wireless Diameter)**	**Thermocouple Type**	**Maximum Temperature (°C)**
05	0.5 mm	B, R, S	1600/R, S; 1800/B
03	0.35 mm	B, R, S	
Code	**Nominal Length (NL)**		
0500	500 mm		
0710	710 mm		
1000	1000 mm		
1400	1400 mm		
XXXX	Other Lengths (Maximum 2000 mm)		
Code	**Additional Options**		
XB	Assemble to Model 1075 thermocouple		

Rosemount Series 1075 and 1099

SERIES 1075 FORM 6 IMMERSION THERMOCOUPLES, TYPE AKK, WITH CERAMIC PROTECTIVE TUBE AND CERAMIC INNER TUBE

This design consists of a base-metal thermocouple Type K or precious-metal thermocouples Type R, S or B and a housing with a protective tube Type AKK according to DIN EN 50446.

The Single or Dual Type K thermocouple legs are insulated with ceramic elements. Precious-metal thermocouples are insulated with a 4-hole insulating rod and provided a gas tight inner tube made of Ceramic Type C610 or C799.

Installation requires stop flanges or threaded fittings. Standard materials for the protective tubes are Ceramic Types C530, C610 and C799. Gas-tight ceramic materials are sensitive to thermal shock and stress impact with a tolerance level that can be optimized by selecting the proper materials for protective and inner tubes

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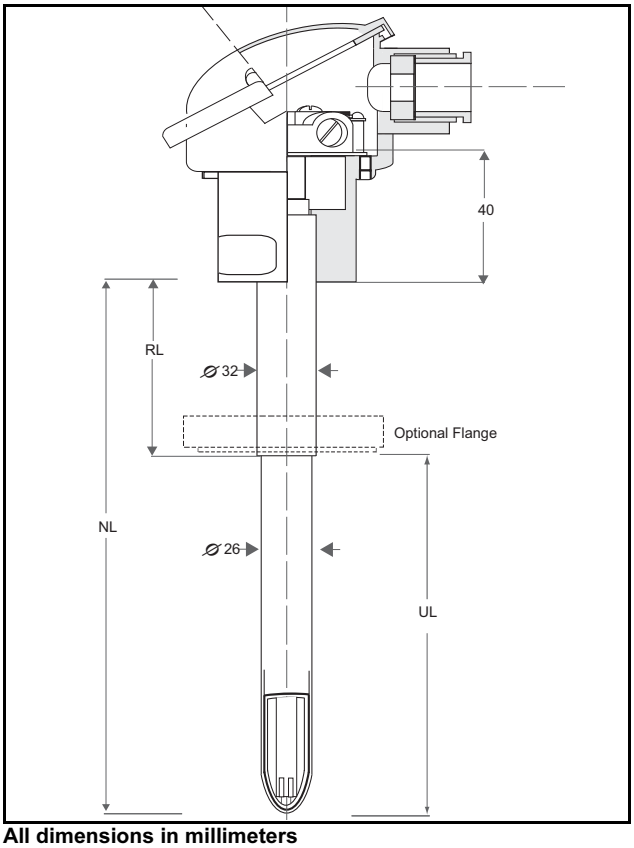


All dimensions in millimeters

For recommended combinations of ceramic protective and inner tube combinations, please see Table 18, on page page Temperature-28.

The standard holding tube is made of material 1.0305 and is recommended for temperatures to 200 °C (392 °F). For temperatures exceeding 200 °C (392 °F), Emerson Process Management offers holding tubes made of heat resistant materials AISI 446 (1.4762) or AISI 314 (1.4841).

Kanthal Super protective tubes consist of sintered material and have the following properties:

- Temperature resistant to 1700 °C (3092 °F)
- Not as porous or brittle, so they can be used in higher temperatures and in corrosive furnace atmospheres
- Suppress electromagnetic oscillations that could disturb the thermocouple function

TABLE 16. Ordering Table: Rosemount Series 1075 Design Form 6 (AKK)

Model	Product Description		
1075	Thermocouple, IEC 584 (DIN EN 60584-1). Tolerance Class 1 acc. to IEC 584 (DIN EN 60584-2)		
Model	**Product Form**		
6	AKK - DIN A with Ceramic Protection Tube and Inner Tube (Max Temp 1800 °C, Max length 2000 mm)		
Code	**Connection Head**	**IP Rating**	**Conduit Entry**
E	HR-AL (AUS), Aluminum	54	M20 x 1.5
G(1)	TZ-AL (AUZH), aluminum	54	M20 x 1.5
P	GN-AL, Aluminum, DIN 43729	43	M20 x 1.5
Code	**Sensor Connection**		
3	Terminal Block, Form A		
Code	**Number of Elements**	**Thermocouple Type**	
01	Single	K	
02	Dual	K	
XX	B, R, S; Thermocouple wire specified in separate line XB option required (See Model 1099 on Table 17)		
Code	**Thermocouple Type**		
K	K		
X	B, R, S; Thermocouple wire specified in separate line XB option required (See Model 1099 on Table 17)		
Code	**Wireless Diameter (mm)**		**Maximum Temperature (°C)**
20	2.0 Type K Dual Element		1200
30	3.0 Type K Single Element		1200
XX	B, R, S; Thermocouple wire specified in separate line XB option required (See Model 1099 on Table 17)		
Code	**Protective Tube Material**	**Inner Tube Material**	**Maximum Temperature (°C)**
H	Kanthal Super (Maximum length 1500 mm)	Type C799	1700 / B
T	Type C530	Type C610	1200 / K 1400 / R, S
V	Type C530	Type 799	1600 / R, S
W	Type C799	Type 799	1200 / B
Code	**Nominal Length (NL)**		
0500	500 mm		
0710	710 mm		
1000	1000 mm		
1400	1400 mm		
2000	2000 mm		
XXXX	Other lengths (Maximum 2,000 mm,1500 mm for protective material H)		
Code	**Process Connection**	**Material**	
A1	Adjustable stop flange	GTW-35 (cast iron)	
B1	Adjustable threaded fitting with G 3/4	1.0711 (steel)	
A2	Adjustable stop flange	GTW-35 (cast iron)	
B2	Adjustable threaded fitting with G 1	1.0711 (steel)	
A3	Adjustable stop flange	GTW-35 (cast iron)	
B3	Adjustable threaded fitting with G 1 1/4	1.0711 (steel)	
C4	Adjustable Flange 1 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
C5	Adjustable Flange 1 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
C6	Adjustable Flange 1 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
D4	Adjustable Flange 1 1/2 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
D5	Adjustable Flange 1 1/2 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
D6	Adjustable Flange 1 1/2 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
E4	Adjustable Flange 2 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
E5	Adjustable Flange 2 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
E6	Adjustable Flange 2 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting	
F4	Welded Flange 1 inch Class 150 Requires Flange immersion length (UXXXX)		
F5	Welded Flange 1 inch Class 300 Requires Flange immersion length (UXXXX)		
F6	Welded Flange 1 inch Class 600 Requires Flange immersion length (UXXXX)		

Continued on Next Page

Rosemount Series 1075 and 1099

TABLE 16. Ordering Table: Rosemount Series 1075 Design Form 6 (AKK)

Model	Product Description		
	Process Connection (Continued)		
G4	Welded Flange 1 1/2 inch Class 150 Requires Flange immersion length (UXXXX)		
G5	Welded Flange 1 1/2 inch Class 300 Requires Flange immersion length (UXXXX)		
G6	Welded Flange 1 1/2 inch Class 600 Requires Flange immersion length (UXXXX)		
H4	Welded Flange 2 inch Class 150 Requires Flange immersion length (UXXXX)		
H5	Welded Flange 2 inch Class 300 Requires Flange immersion length (UXXXX)		
Code	**Holding Tube Material**		
G	1.4762 (AISI 446)		
H	1.4841 (AISI 314)		
J	1.0305		
Code	**Holding Tube Length**		
200	200 mm	200	200 mm
XXX	Other length	XXX	Other length
Code	**Options**		
	Calibration Options		
W02	Works Cert: Comparison measurement at thermocouple with 2 measurement points		
W05	Works Cert: Comparison measurement at thermocouple with 5 measurement points		
K02	DKD Calibration Cert: DKD Cert for 2 temperature points specified by customer		
K05	DKD Calibration Cert: DKD Cert for 5 temperature points specified by customer		
Q4	Calibration Cert (must be ordered with W01 through W12 or K01 through K12)		
	Mounting Options		
XA	Fit sensor to temperature transmitter		
XB	Assemble to precious-metal thermocouple wire (B, R, S) Model 1099 on Table 17		
	Welded Flange Options		
U1500	Length from Welded flange face to sensor tip (1500 mm) must be welded to Holding tube		
UXXXX	Length from Welded flange face to sensor tip Non-Standard length (xxxx mm) must be welded to Holding tube		
	Other		
R24	TAG plate, stainless steel	R24	TAG plate, stainless steel
M99	Order specific drawing	M99	Order specific drawing

(1) Connection head suitable for mounting a transmitter inside (Rosemount 248 and 644)

TABLE 17. Order Table: Rosemount Series 1099

Model	Product Description		
1099	Precious-metal thermocouple wire assemble to model		
Model	**Product Form**		
A6	Assembled to 1075 Form 6		
Code	**Number of Elements**		
01	Single		
02	Dual		
Code	**Thermocouple Type**		
B	B		
R	R		
S	S		
Code	**Wireless Diameter**	**Thermocouple Type**	**Maximum Temperature (°C)**
05	0.5 mm	B, R, S	1600/R, S; 1800/B
03	0.35 mm	B, R, S	1600/R, S; 1800/
Code	**Nominal Length (NL)**		
0500	500 mm		
0710	710 mm		
1000	1000 mm		
1400	1400 mm		
2000	2000 mm		
XXXX	Other Lengths Non-Standard Nominal Length		
Code	**Additional Options**		
XB	Assemble to Model 1075 thermocouple		

TABLE 18. Ordering Table Series 1075 (All Forms)

Form						Model	Product Description		
BM	AM	AMK	BK	AK	AKK	1075	High Temperature Thermocouple		
						Code	**Product Form**		
1						1	BM - DIN B with Metal Protection Tube (Max Temp 1200 °C, Max length 2000 mm)		
	2					2	AM - DIN A with Metal Protection Tube (Max Temp 1200° C°, Max length 6000 mm)		
		3				3	AMK - DIN A with Metal Protection Tube/Ceramic Inner Tube (Max Temp 1350 °C, Max length 6000 mm)		
			4			4	BK - DIN B with Ceramic Protection Tube (Max Temp 1800 °C, Max length 1000 mm)		
				5		5	AK - DIN A with Ceramic Protection Tube (Max Temp 1800 °C, Max length 2000 mm)		
					6	6	AKK - DIN A with Ceramic Protection Tube and Inner Tube (Max Temp 1800 °C, Max length 2000 mm)		
						Code	**Connection Head**	**IP Rating**	**Conduit Entry**
	2	3		5	6	E	HR-AL (AUS), Aluminum, DIN A	54	M20 x 1.5
	2	3		5	6	G	TZ-AL (AUZH), Aluminum, DIN A	54	M20 x 1.5
	2	3		5	6	P	GN-AL, Aluminum, DIN 43729, DIN A	43	M20 x 1.5
1			4			L	TZ-A/BL (BUZH), Aluminum, DIN B	54	M20 x 1.5
1			4			U	GN-BL, Aluminum, DIN 43729, DIN B	43	M20 x 1.5
1			4			Y	HR-A/BL (BUS), Aluminum, DIN B	54	M20 x 1.5
						Code	**Sensor Connection**		
1			4			2	Terminal Block, DIN Form B		
	2	3		5	6	3	Terminal Block, DIN Form A		
						Code	**Number of Elements**		
1	2	3	4	5	6	01	Single Type K		
1	2	3	4	5	6	02	Dual Type K		
1	2	2	4	5	6	XX	B, R, S; Thermocouple wire specified in Model 1099 XB option required. See Table 19		
						Code	**Thermocouple Type**		
1	2		4	5	6	K	K		
		3	4	5	6	X	B, R, S; Thermocouple wire specified in separate line XB option requires (See Model 1099 on Table 19)		
						Code	**Wireless Diameter (mm)**	**Thermocouple Type**	**Max. Temperature (°C)**
1			4	5		13	1.38 Single for Type 4 - Dual for Form 1, 4, 5	K	1200
1	2				6	20	2.0 Single for Type 1 - Dual for Form 2, 6	K	1200
	2			5	6	30	3.0 Single for Form 2, 5, 6	K	1200
		3	4	5	6	XX	B, R, S; Thermocouple wire specified in Model 1099 XB option required. See Table 19		
						Code	**Protective Tube Material / Dimensions**	**Inner Tube Material / Dimensions**	**Max. Temperature (°C)**
1						A	1.4762 (AISI 446)	without	1200
1						B	1.4841 (AISI 314)	without	1200
	2					C	1.4762 (AISI 446)	without	1200 / K
	2					D	1.4841 (AISI 446)	without	1200 / K
		3				E	1.4762 (AISI 446)	Type C610	1200 / R, S
		3				F	1.4841 (AISI 446)	Type C610	1200 /R, S
		3				G	1.4767 (Kanthal AF)	Type C610	1350 /R, S; 1200 / K
					6	H	Kanthal Super (Note Max length 1500 mm)	Type C 799	1700 / B
			4			J	Type C 610	without	1000 / K 1400 / R, S
			4			L	Type C 799	without	1600 / R, S 1800 / B
				5		P	Type C 610	without	1200 / K 1400 / R, S
				5		R	Type C 799	without	1600 / R, S 1800 / B
					6	T	Type C 530	Type C 610	1200 / K 1400 / R, S
					6	V	Type C 530	Type 799	1600 / R, S
					6	W	Type C 799	Type 799	1600 / R, S 1800 / B

Continued on Next Page

TABLE 18. Ordering Table Series 1075 (All Forms)

Form						Model	Product Description	
						Code	Nominal Length (NL) (mm) (Standard Lengths)	
1			4			0250	250	
1	2	3	4	5	6	0500	500	
1	2	3	4	5	6	0710	710	
1	2	3		x	6	1000	1000	
	2	3		5	6	1400	1400	
					6	2000	2000	
1	2	3	4	5	6	XXXX	Non-Standard Length	
						Code	Process Connection	Material
1			4			A1	Adjustable stop flange	GTW-35 (cast iron)
1			4			B1	Adjustable threaded fitting with G 3/4	1.0711 (steel)
	2	3		5		A2	Adjustable stop flange	GTW-35 (cast iron)
	2	3		5		B2	Adjustable threaded fitting with G 1	1.0711 (steel)
					6	A3	Adjustable stop flange	GTW-35 (cast iron)
					6	B3	Adjustable threaded fitting with G 1 1/4	1.0711 (steel)
1	2	3	4	5	6	C4	Adjustable Flange 1 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting
1	2	3	4	5	6	C5	Adjustable Flange 1 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting
1	2	3	4	5	6	C6	Adjustable Flange 1 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting
1	2	3	4	5	6	D4	Adjustable Flange 1 1/2 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting
1	2	3	4	5	6	D5	Adjustable Flange 1 1/2 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting
1	2	3	4	5	6	D6	Adjustable Flange 1 1/2 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting
1	2	3	4	5	6	E4	Adjustable Flange 2 inch Class 150	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting
1	2	3	4	5	6	E5	Adjustable Flange 2 inch Class 300	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting
1	2	3	4	5	6	E6	Adjustable Flange 2 inch Class 600	1.4571 (SS316Ti) Flange/1.0711 Steel Compression fitting
1	2	3	4	5	6	F4	Welded Flange 1 inch Class 150 Requires Flange immersion length (UXXXX)	
1	2	3	4	5	6	F5	Welded Flange 1 inch Class 300 Requires Flange immersion length (UXXXX)	
1	2	3	4	5	6	F6	Welded Flange 1 inch Class 600 Requires Flange immersion length (UXXXX)	
1	2	3	4	5	6	G4	Welded Flange 1 1/2 inch Class 150 Requires Flange immersion length (UXXXX)	
1	2	3	4	5	6	G5	Welded Flange 1 1/2 inch Class 300 Requires Flange immersion length (UXXXX)	
1	2	3	4	5	6	G6	Welded Flange 1 1/2 inch Class 600 Requires Flange immersion length (UXXXX)	
1	2	3	4	5	6	H4	Welded Flange 2 inch Class 150 Requires Flange immersion length (UXXXX)	
1	2	3	4	5	6	H5	Welded Flange 2 inch Class 300 Requires Flange immersion length (UXXXX)	
1	2	3	4	5	6	H6	Welded Flange 2 inch Class 600 Requires Flange immersion length (UXXXX)	
1	2	3	4	5	6	NN	No fitting	
						Code	Holding Tube Material	
			4			A	1.4762 (AISI 446)	
			4			B	1.4841 (AISI 316)	
			4			C	1.0305	
				5		D	1.4762 (AISI 446)	
				5		E	1.4841 (AISI 314)	
				5		F	1.0305	
					6	G	1.4762 (AISI 446)	
					6	H	1.4841 (AISI 314)	
					6	J	1.0305	
1	2	3				N	No Holding Tube	
						Code	Holding Tube Length (RL) in MIllimeters	
1	2	3				000	No Holding Tube	
			4			080	080	
				5		150	150	
					6	200	200	
			4	5	6	XXX	Other Length	

Continued on Next Page

Rosemount Series 1075 and 1099

TABLE 18. Ordering Table Series 1075 (All Forms)

Form						Model Code	Product Description Options
						Calibration Options	
1	2	3	4	5	6	W01	1 temperature point
1	2	3	4	5	6	W02	2 temperature points
1	2	3	4	5	6	W03	3 temperature points
1	2	3	4	5	6	W04	4 temperature points
1	2	3	4	5	6	W05	5 temperature points
1	2	3	4	5	6	W12	Measuring system with 1 thermocouple
1	2	3	4	5	6	K01	1 temperature point specified by the customer
1	2	3	4	5	6	K02	2 temperature points specified by the customer
1	2	3	4	5	6	K03	3 temperature points specified by the customer
1	2	3	4	5	6	K04	4 temperature points specified by the customer
1	2	3	4	5	6	K05	5 temperature points specified by the customer
1	2	3	4	5	6	K12	Measuring system with 1 thermocouple
						Q4	Calibration Cert (must be ordered with W01 through W12 or K01 through K12)
						Mounting Options	
1	2	3	4	5	6	XA	Assemble to temperature transmitter
1	2	3	4	5	6	XB	Assemble to thermocouple wire specified with Model 1099 (Table 19
						Welded Flange Options	
1	2	3	4	5	6	U1500	Length from Welded flange face to sensor tip (1500 mm) must be welded to Holding tube
						UXXXX	Length from Welded flange face to sensor tip Non-standard length (xxxx mm) must be welded to Holding tube
						Other	
1	2	3	4	5	6	R24	TAG plate, stainless steel
1	2	3	4	5	6	M99	Order specific drawing

TABLE 19. Order Table: Rosemount Series 1099

Form				Model	Product Description		
				1099	Precious-metal thermocouple wire assemble to model		
				Model	**Product Form**		
3				A3	Assembled to 1075 Form 3		
	4			A4	Assembled to 1075 Form 4		
		5		A5	Assembled to 1075 Form 5		
			6	A6	Assembled to 1075 Form 6		
				Code	**Number of Elements**		
3	4	5	6	01	Single		
3	4	5	6	02	Double		
				Code	**Thermocouple Type**		
3	4	5	6	B	B		
3	4	5	6	R	R		
				S	S		
				Code	**Wireless Diameter**	**Thermocouple Type**	**Maximum Temperature (°C)**
3	4	5	6	05	0.5 mm	B, R, S	1600/R, S; 1800/B
3	4	5	6	03	0.35 mm	B, R, S	1600/R, S; 1800/B
				Code	**Nominal Length (NL)**		
3	4	5	6	0250	250 mm		
3	4	5	6	0500	500 mm		
3	4	5	6	0710	710 mm		
3	4	5	6	1000	1000 mm		
3	4	5	6	1400	1400 mm		
3	4	5	6	2000	2000 mm		
3	4	5	6	XXXX	Non-Standard Nominal Length		
				Code	**Additional Options**		
				XB	Assemble to Model 1075 thermocouple		

Calibration and Certificates

CALIBRATION WITH DKD-CERTIFICATE

The calibration of temperature sensors is done in our calibration laboratory pursuant to DKD-K-05601.

For many applications, especially ISO 9000, documentation of measurements is essential, so our calibration laboratory issues certificates pursuant to DKD standards and international standards (SI).

While compiling a DKD or works certificate, the thermocouple or measuring system is checked using comparison standards regarding measurement accuracy. Thermocouples with a works certificate can show documentation of measurements in the service and quality assurance department.

Our laboratory is authorized to issue DKD calibration certificates for temperature in the measurement ranges shown in Table 10. The measurement uncertainties are defined in the various calibration points and based on the Dual standard deviation (k = 2), (probable coincidence approximately 95%).

The calibrations carried out by our laboratory are services provided to the customer. Our intention is to meet the quality requirements of the customer in relation to thermocouple calibration. This includes traceability to national standards and accomplishing the contract commitments with the accreditation authority - PTB (German Physical Technical Authority). The thermocouple, which provides the measurement result on its own or as a measuring chain, is compared with the national standards. This comparison measurement produces quantitative verification of traceability. A report is issued in the form of a calibration certificate according to DKD specifications (Figure 1 on page -33).

TABLE 20. DKD Laboratory Accreditation Ranges

Subject of Calibration	Temperature Range	Measurement Conditions	Measurement Uncertainty	Remarks
Thermocouples	0 to 1200 °C (32 to 2192 °F)	Comparison with standard thermocouples in tube furnaces	1.5K	
Thermocouples Type S and R	0 to 1000 °C (32 to 1832 °F)		1K	Comparison without protective tube in a Pt tube
Transmitter with connected thermocouples	as for thermocouples	as for thermocouples	U(TE) + 500mK	U(TE) is the measurement uncertainty of calibrating the thermocouple by itself.

WORKS CERTIFICATES

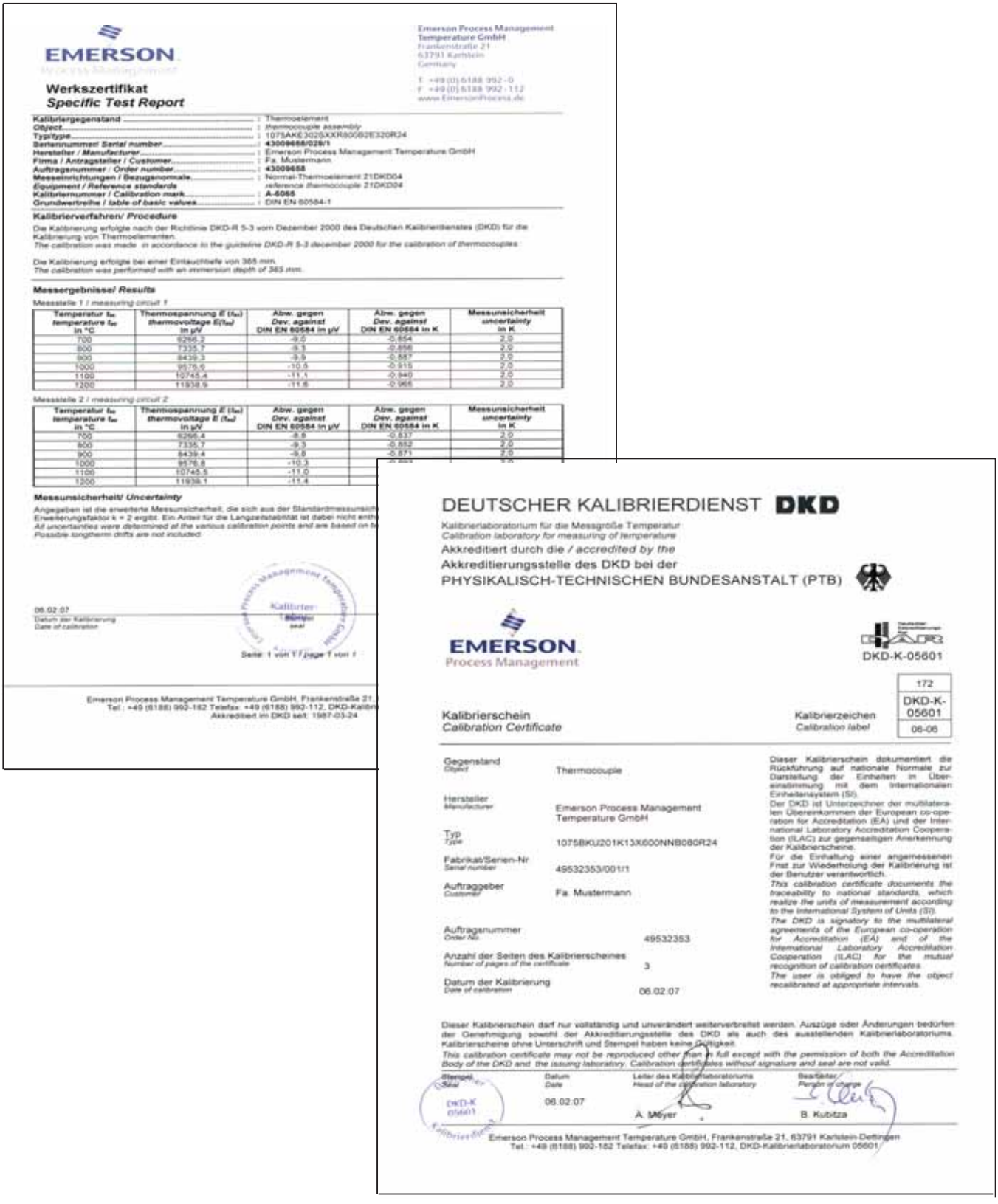
Using the comparison method, the calibrated values can be certified on a works certificate. The maximum test temperature is 1300 °C (2372 °F).

A calibration pre-condition is a suitable design of the thermocouple, e.g. it needs to have a minimum insertion length.

The customer, when ordering a thermocouple, must mention the number and values of the calibrated test variables.

NOTE
Before specifying a temperature value, consider the temperature limits of the thermocouple. For individual order options see Ordering Tables.

FIGURE 1. Works and DKD Certificate



EMERSON
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Werkszertifikat
Specific Test Report

Kalibriergegenstand	:	Thermoelement
Object	:	*thermocouple assembly*
Typ/type	:	1075AKE3020/AXXR60B2E320R24
Seriennummer/ Serial number	:	**43009658/028/1**
Hersteller / Manufacturer	:	Emerson Process Management Temperature GmbH
Firma / Antragsteller / Customer	:	Fa. Mustermann
Auftragsnummer / Order number	:	**43009658**
Messeinrichtungen / Bezugsnormale	:	Normal-Thermoelement 21DKD04
Equipment / Reference standards		*reference thermocouple 21DKD04*
Kalibriernummer / Calibration mark	:	**A-6065**
Grundwertreihe / table of basic values	:	DIN EN 60584-1

Kalibrierverfahren/ *Procedure*

Die Kalibrierung erfolgte nach der Richtlinie DKD-R 5-3 vom Dezember 2000 des Deutschen Kalibrierdienstes (DKD) für die Kalibrierung von Thermoelementen.
The calibration was made in accordance to the guideline DKD-R 5-3 december 2000 for the calibration of thermocouples

Die Kalibrierung erfolgte bei einer Eintauchtiefe von 365 mm.
The calibration was performed with an immersion depth of 365 mm.

Messergebnisse/ *Results*

Messstelle 1 / *measuring circuit 1*

Temperatur t_{90} / *temperature* t_{90} in °C	Thermospannung E (t_{90}) / *thermovoltage* $E(t_{90})$ in µV	Abw. gegen / *Dev. against* DIN EN 60584 in µV	Abw. gegen / *Dev. against* DIN EN 60584 in K	Messunsicherheit / *uncertainty* in K
700	6266,2	-9,0	-0,654	2,0
800	7335,7	-9,3	-0,656	2,0
900	8439,3	-9,9	-0,687	2,0
1000	9576,6	-10,5	-0,915	2,0
1100	10745,4	-11,1	-0,940	2,0
1200	11938,9	-11,6	-0,966	2,0

Messstelle 2 / *measuring circuit 2*

Temperatur t_{90} / *temperature* t_{90} in °C	Thermospannung E (t_{90}) / *thermovoltage* E (t_{90}) in µV	Abw. gegen / *Dev. against* DIN EN 60584 in µV	Abw. gegen / *Dev. against* DIN EN 60584 in K	Messunsicherheit / *uncertainty* in K
700	6266,4	-8,8	-0,637	2,0
800	7335,7	-9,3	-0,652	2,0
900	8439,4	-9,8	-0,671	2,0
1000	9576,8	-10,3		
1100	10745,5	-11,0		
1200	11938,1	-11,4		

Messunsicherheit/ *Uncertainty*

Angegeben ist die erweiterte Messunsicherheit, die sich aus der Standardmessunsich
Erweiterungsfaktor k = 2 ergibt. Ein Anteil für die Langzeitstabilität ist dabei nicht enth
All uncertainties were determined at the various calibration points and are based on t
Possible longterm drifts are not included

06.02.07
Datum der Kalibrierung
Date of calibration

Kalibrierer
Temperatur
Stempel

Seite 1 von 1 / *page 1 von 1*

Emerson Process Management Temperature GmbH, Frankenstraße 21,
Tel.: +49 (6188) 992-182 Telefax: +49 (6188) 992-112, DKD-Kalibr
Akkreditiert im DKD seit: 1987-03-24

DEUTSCHER KALIBRIERDIENST **DKD**

Kalibrierlaboratorium für die Messgröße Temperatur
Calibration laboratory for measuring of temperature
Akkreditiert durch die / *accredited by the*
Akkreditierungsstelle des DKD bei der
PHYSIKALISCH-TECHNISCHEN BUNDESANSTALT (PTB)

EMERSON
Process Management

DKD-K-05601

Kalibrierschein
Calibration Certificate

Kalibrierzeichen / *Calibration label*: 172 | DKD-K-05601 | 06-06

Gegenstand / *Object*	Thermocouple
Hersteller / *Manufacturer*	Emerson Process Management Temperature GmbH
Typ / *Type*	1075BKU201K13X600NNB080R24
Fabrikat/Serien-Nr / *Serial number*	49532353/001/1
Auftraggeber / *Customer*	Fa. Mustermann
Auftragsnummer / *Order No.*	49532353
Anzahl der Seiten des Kalibrierscheines / *Number of pages of the certificate*	3
Datum der Kalibrierung / *Date of calibration*	06.02.07

Dieser Kalibrierschein dokumentiert die Rückführung auf nationale Normale zur Darstellung der Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI).
Der DKD ist Unterzeichner der multilateralen Übereinkommen der European co-operation for Accreditation (EA) und der International Laboratory Accreditation Cooperation (ILAC) zur gegenseitigen Anerkennung der Kalibrierscheine.
Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.
This calibration certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI).
The DKD is signatory to the multilateral agreements of the European co-operation for Accreditation (EA) and of the International Laboratory Accreditation Cooperation (ILAC) for the mutual recognition of calibration certificates.
The user is obliged to have the object recalibrated at appropriate intervals.

Dieser Kalibrierschein darf nur vollständig und unverändert weiterverbreitet werden. Auszüge oder Änderungen bedürfen der Genehmigung sowohl der Akkreditierungsstelle des DKD als auch des ausstellenden Kalibrierlaboratoriums. Kalibrierscheine ohne Unterschrift und Stempel haben keine Gültigkeit.
This calibration certificate may not be reproduced other than in full except with the permission of both the Accreditation Body of the DKD and the issuing laboratory. Calibration certificates without signature and seal are not valid.

Stempel / *Seal*	Datum / *Date*	Leiter des Kalibrierlaboratoriums / *Head of the calibration laboratory*	Bearbeiter / *Person in charge*
DKD-K 05601	06.02.07	A. Meyer	B. Kubitza

Emerson Process Management Temperature GmbH, Frankenstraße 21, 63791 Karlstein-Dettingen
Tel.: +49 (6188) 992-182 Telefax: +49 (6188) 992-112, DKD-Kalibrierlaboratorium 05601

Accessories

TRANSMITTERS

Rosemount transmitters 248H and 644H can be assembled to the extended cover of the connection head Types TZ-A/BL (BUZH) or TZ-AL (AUZH). These transmitters have the following common properties:

- Complete installation ready assembly
- Improved accuracy with cold junction, and ambient temperature compensation
- Micro Processor controlled, with user selectable inputs and 4–20mA/HART® or Foundation™ fieldbus communication protocols
- Meets NAMUR NE21, and is resistant to Radio Frequency and Electro Magnetic Interference
- Epoxy sealed electronics ensure reliable performance

The Rosemount 248H/R is a HART (Highway Addressable Remote Transducer) transmitter. The Rosemount 644H communicates using Hart-protocol and is compatible with Rosemount HART-communicator, HART-based control systems, and Micro Processor-based Asset Management Solutions software.

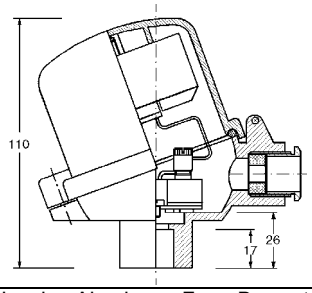
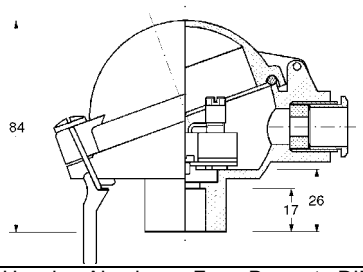
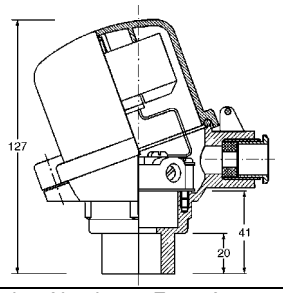
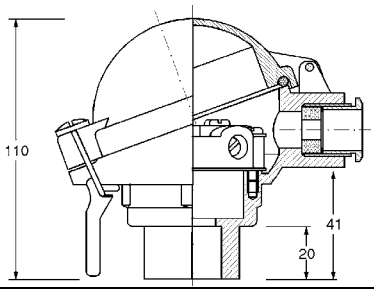
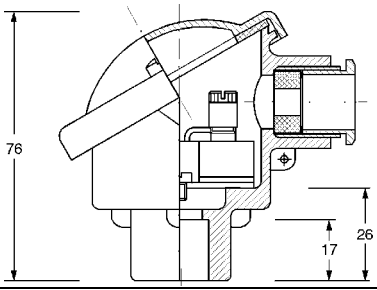
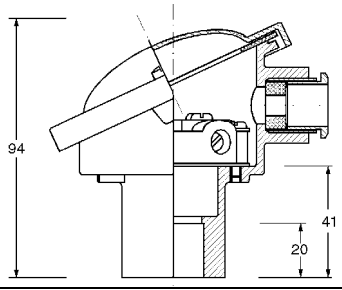
In addition, Emerson Process Management offers a wide range of rail-mounted or field-mounted transmitters. See the corresponding product data sheets:

- Rosemount 248R HART Temperature Transmitter (Publication No. 00813-0100-4825)
- Rosemount 644R - Hart or Foundation™ fieldbus Head- and Rail-Mount Temperature Transmitters (Publication No. 00813-0100-4728)
- Rosemount 3144P - Hart or Foundation™ fieldbus Temperature Transmitters (Publication No. 00813-0100-4021)
- Rosemount 848T Eight Input Temperature Transmitter with Foundation™ Fieldbus (Publication No. 00813-0100-4697)

CONNECTION HEAD

This section includes the technical data of all connection heads mentioned. The screwed cable gland is available with thread M 20 x 1.5. A silicone gasket is used at temperatures up to 200 °C (392 °F), and is necessary for protection class IP 65.

FIGURE 2. Connection Head Dimensional Drawings and Information (All Temperature Limits -40 to 80 °C [-40 to 176 °C])

TZ-A/BL (BUZH) (Option L)	HR-A/BL (BUS) (Option Y)
	
Materials: Housing Aluminum; Form B acc. to DIN 43729; Finish Aluminum lacquer; O-Ring-Seal Rubber **Weight:** 0.20 kg **Protection Class:** IP 54 **Cover:** Hinged lid, screwed **Transmitter Inst.:** Within cover	**Materials:** Housing Aluminum; Form B acc. to DIN 43729; Finish Aluminum lacquer; O-Ring-Seal Rubber **Weight:** 0.24 kg **Protection Class:** IP 54 **Cover:** Hinged lid, with lever lock **Transmitter Inst.:** Possible
TZ-AL (AUZH) (Option G)	**HR-AL (AUS) (Option E)**
	
Materials: Housing Aluminum; Form A acc. to DIN 43729; Finish Aluminum lacquer; O-Ring-Seal Rubber O-Ring-Seal Rubber **Weight:** 0.22 kg **Protection Class:** IP 54 **Cover:** Hinged lid, screwed **Transmitter Inst.:** Within cover	**Materials:** Housing Aluminum; Form A acc. to DIN 43729; Finish Aluminum lacquer; O-Ring-Seal Rubber **Weight:** 0.24 kg **Protection Class:** IP 54 **Cover:** Hinged lid, with lever lock **Transmitter Inst.:** Possible
GN-BL (B) (Option V)	**GN-AL (A) (Option P)**
	
Materials: Housing Aluminum; Form B acc. to DIN 43729; Finish Aluminum lacquer; O-Ring-Seal Rubber **Weight:** 0.18 kg **Protection Class:** IP 43 **Cover:** Lose lid, with 2 screws **Transmitter Inst.:** Not Available	**Materials:** Housing Aluminum; Form A acc. to DIN 43729; Finish Aluminum lacquer; O-Ring-Seal Rubber **Weight:** 0.20 kg **Protection Class:** IP 43 **Cover:** Lose lid, with 2 screws **Transmitter Inst.:** Not Available
Dimensions are in millimeters	

Rosemount Series 1075 and 1099

Product Data Sheet
00813-0400-2654, Rev AA
Catalog 2008 - 2009

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