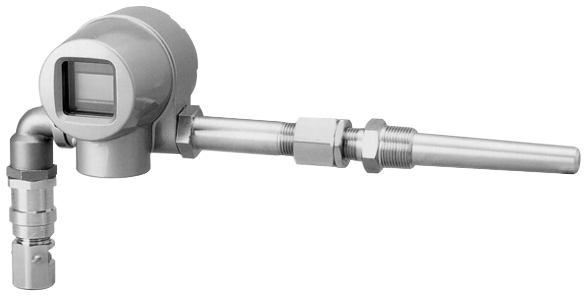
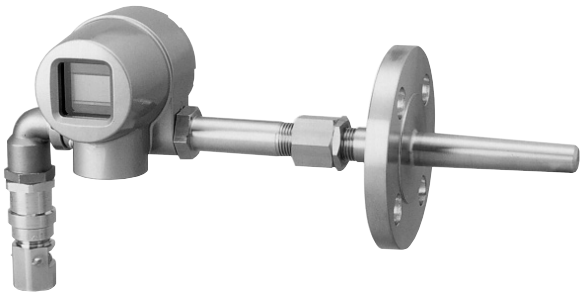
ThermoPLUS
Metallic Protecting Well for Temperature Sensor
Model ATT9□

OVERVIEW

The model ATT9□ Metallic Protecting Well for temperature sensors is a specialized protecting well for the model ATT61/71 Smart Temperature Transmitter. The well can be used with a variety of sensors, from model ATT91 through model ATT98, and used at various process locations in a wide range of conditions.
A temperature sensor's protecting well protects sensors such as the thermocouple or resistance temperature detector. It follows that the well must be selected to suit various process conditions, such as ambient atmosphere of the measuring location or the accuracy of the measurement required. It has to be able to withstand the temperature and pressure of the measured object, hold up against vibration and shock and should be able to be used over a prolonged period of time.
The model ATT9□ is comprised of pipe protecting well (pipe end is welded) or drilled protecting well (bar rod is drilled-out). In general, the pipe protecting well can be used in a low pressure location whereas the drilled type should be used at a location, that is exposed to high-pressure gas or high-velocity fluid with large stress. It is recommended to select a suitable shape, size, and material for the temperature sensor and use the respective combined conditions.



Combination of ATT71 temperature transmitter (sold separately), ATT90 temperature sensor (sold separately) with ATT91 protecting well *1



Combination of ATT71 temperature transmitter (sold separately), ATT90 temperature sensor (sold separately) With ATT95 sensor protecting well *1

Drilled and welded protecting wells product line

Table 1 Protecting wells product line

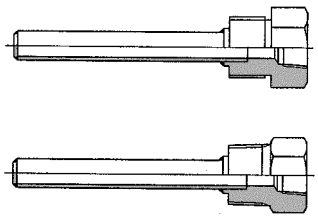
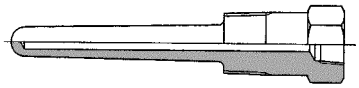
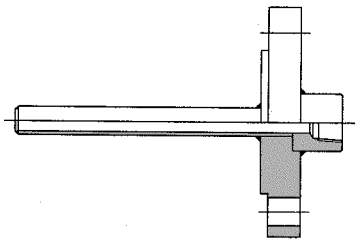
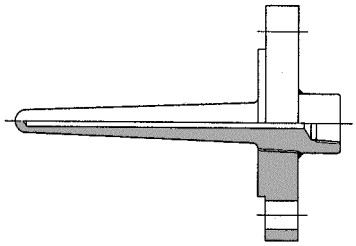
Construction	Drilled protecting well			Pipe protecting well	
Process connection	Screwed		Flanged	Screwed	Flanged
Head type	Hexagon Head	Hexagon lagging	Screwed		
Basic Model No.	ATT91	AT92	ATT95	ATT97	ATT98

Sensor	External shape	Taper/straight	Straight
	Drilled shape	Straight bore/step bore	Straight bore

Note)*1 External appearances may differ from those shown in the photographs in this specification sheet depending on types of sensors to be integrated.

Basic external appearances

Table 2 Basic external appearances

Basic model	External appearance	Basic model	External appearance
ATT91 Screwed drilled protecting well		ATT97 Screwed pipe protecting well	
ATT92 Screwed, lagging drilled protecting well		ATT98 Flanged pipe protecting well	
ATT95 Flanged, drilled protecting well (Screw-on flanged)			

Standard specifications of protecting well

Table 3 Temperature sensing parts

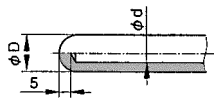
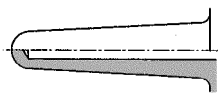
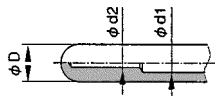
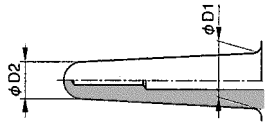
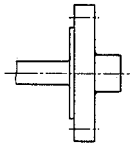
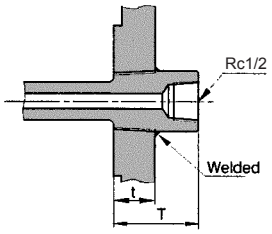
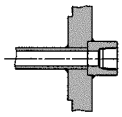
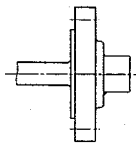
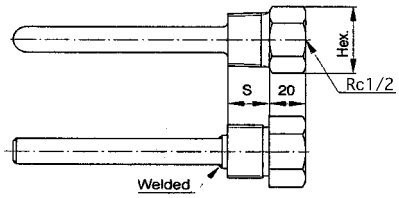
		External dia. (mm)	Internal dia. (mm)	Max. length (mm)	External shape / drilled shape	
					Straight	Tapered
Shape of temperature	Drilled protecting well	> Ø9	Ø4	100	Straight bore 	Straight bore 
		> Ø10	Ø5	350		
		> Ø12	Ø6~Ø7	600		
		> Ø15	Ø8~Ø10	1000	Step bore 	Step bore 
		> Ø22	Ø11~Ø16	1000		
	Pipe protecting well	Ø12, Ø15, Ø21.7	Ø9, Ø11, Ø16.1	1000		

Table 4 Connection types

<table>
<tr><th colspan="2" rowspan="2"></th><th colspan="3">Specifications</th><th rowspan="2" colspan="2">Facing surface</th><th rowspan="2">Top</th><th rowspan="2">Construction</th></tr>
<tr><th>Std.</th><th>Rate</th><th>Size</th></tr>
<tr><td rowspan="3">Process connection</td><td rowspan="2">Flanged</td><td>JIS</td><td>5K
10K
20K</td><td>20mm
25mm
40mm
50mm</td><td rowspan="2" colspan="2">RF
FF
RJ</td><td>Blind/BL
  </td><td rowspan="2">ATT95
 

ATT98
 
Dimension T
When t≤15, T=35.
When t>15, T=t+20
(Rounded up in 5mm increments.)
Note) For details, refer to “Table of dimensions of various standard flanges” on page 4</td></tr>
<tr><td>ANSI/
JPI</td><td>150LB
300LB
600LB</td><td>3/4 in.
1 in.
1½ in.
2 in.*2</td><td>Slip-on/SQ
  </td></tr>
<tr><td rowspan="6">Screwed</td><td>Size</td><td>Type</td><td>1/2</td><td>3/4</td><td>1</td><td colspan="2">Shape</td></tr>
<tr><td rowspan="2">S
Screw length</td><td>RNPT</td><td>16</td><td>20</td><td>23</td><td rowspan="5">ATT91,92
 

ATT97</td></tr>
<tr><td>GNPS</td><td>20</td><td>20</td><td>25</td></tr>
<tr><td rowspan="3">Hex</td><td>RNPT</td><td>26×30</td><td>30×34.6</td><td>36×41.6</td></tr>
<tr><td>GNPS</td><td>26×30</td><td>32×37</td><td>38.4×3.9</td></tr>
</table>

Note)*2 Only applicable for 150LB.

Table 5 Material specifications

Material	Drilled protecting well	SUS304, SUS316, SUS310S
	Pipe	SUS304, SUS316, SUS310S
Stamping	Flanged	TAG No., flange rating, and protecting well material are stamped on the flange face.
	Screwed	Thread standard and well material are stamped on the head of the hexagon port.

Table 6 Main materials of pipe protecting wells and drilled protecting wells

Type	Construction		Temperature limit (°C)		Features
	Pipe	Drilled	Normal	Maximum	
SUS304	✔	✔	850	950	Highly heat, acid and alkali- resistant. Vulnerable to sulfur and reducing gas.
SUS316	✔	✔	850	950	Heat, acid and alkali resistance characteristics are the same as SUS304. Anti-corrosion characteristics at high temperatures are superior to SUS304.
SUS310S	✔	✔	1050	1100	High Ni-Cr. content, anti-oxidizing characteristics ideal for high temperature applications.

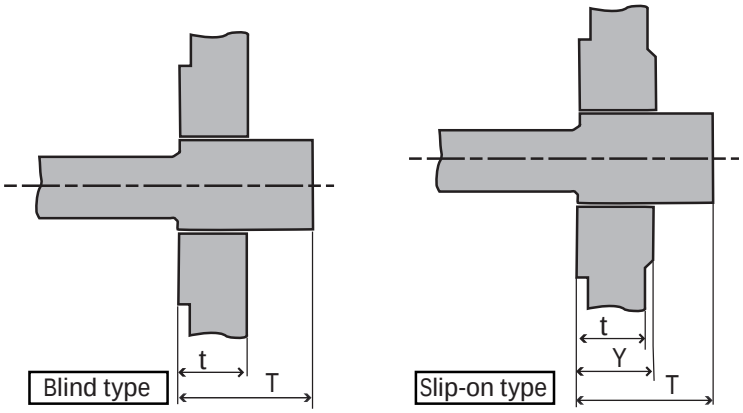
Table of dimensions of various standard flanges

JIS Standard flange

Blind/BL type

Table 7 JIS Standard flange-Blind/BL type

Rate	Size	t	T
5K	20mm	10	35
	25mm		
	40mm	12	
	50mm	14	
10K	20mm		
	25mm		
	40mm	16	40
	50mm		
20K	20mm		
	25mm		
	40mm	18	
	50mm		



ANSI/JPI standard flange

Blind/BL type

Table 8 ANSI/JPI standard flange - Blind/BL type

Rate	Size	(t)	T
150#	3/4in.	12.7	35
	1in.	14.3	
	1-1/2in.	17.6	40
	2in.	19.1	
300#	3/4in.	15.8	
	1in.	17.6	
	1-1/2in.	20.6	45
600#	3/4in.	22.2	
	1in.	24	
	1-1/2in.	28.8	50

Slip-on/SO type

Table 9 ANSI/JPI standard flange - Slip-on/SO type

Rate	Size	(Y)	Y
150#	3/4in.	16	40
	1in.	18	
	1-1/2in.	22	45
	2in.	25	
300#	3/4in.	25	
	1in.	27	50
	1-1/2in.	30	
600#	3/4in.	31.4	55
	1in.	33.4	
	1-1/2in.	38.4	60

Inspection standards

Visual inspections

The unit is visually inspected for cracks or bending.

Dimension inspections

Flange

Inspected per flange standard.

Length, external appearance, size

Dimension of the parts shown in the fabrication drawing is measured by the measuring instrument. Unless otherwise specified, inspected as JIS B0405.

Thread

Inspected per thread gauge.

Material

The mil sheet as submitted by the vendor is compared with the specific standard.

Air pressure inspections

The device is inspected for air tightness of the protecting well using a specified nitrogen gas pressure at a specific time.
Maximum inspection pressure is 6.86 MPa.

Pressure resistance inspections

The device is inspected for the pressure resistance of the protecting well using a specified water pressure at a specific time.
Maximum inspection pressure is 49.03 MPa.

X-ray inspections

The unit is inspected for the eccentricity and wall thickness of the tip of all drilled protecting wells that are longer than 750 mm. Others are tested as specified.

Allowances for X-ray inspections

Table 10 Allowance for X-ray inspections

Length (mm)	Eccentricity of tip wall thickness (mm)	Allowable eccentricity of tip (mm)
<500	+0.3	+0.5
500≤	+0.5	0

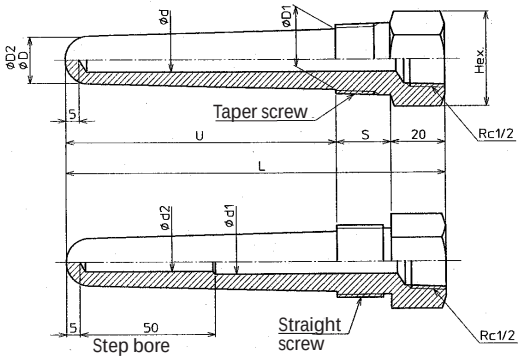
Liquid penetration inspections

Welded parts are inspected as specified.

‘MODEL SELECTION

Screwed
Drilled
Protecting well

ATT91



Note:
Formula to solve the adequate sheath length (l) for model ATT90
If sheath for ATT90-S
Spring loaded type: l=L-10 (mm)
If sheath for ATT90-W
Welded type: l=L-20(mm)

Smart Temperature Transmitter (with temperature sensor protecting well) model numbers

Basic Model No. Selection Option

ATT91 - [ ] - [ ][ ][ ][ ][ ]

External dia. (Root)	D1 (mm) Ø15~26 mm	[ ][ ]			
External dia. (Tip)	D2 (mm) Ø15~26 mm *1	[ ][ ]			
Internal dia. (Root)	d1 (mm) Ø8~16 mm refer to Table 11	[ ][ ]			
Internal dia. (Tip)	d2 (mm) Ø8~16 mm *2	[ ][ ]			
Material	SUS304		A		
	SUS316		C		
	SUS310S		D		
Full length	L (mm) 60~1000 mm	[ ][ ][ ][ ]			
Screw std.	JIS std. screw			J	P
	ANSI std. screw *3			N	P
Screw type	Taper				T
	Straight				F
Screw size (in)	1/2			1	5
	3/4			2	0
	1			2	5
Insertion length	U (mm)	[ ][ ][ ][ ]			

X	No selection
C	Color check
D	Oil free, water free treatment
L	Hydraulic pressure test, leak test
M	Mil sheet
N	Radio-graphic test
R	Strength calculation sheet

*Note) *1 For tapered well, D2≤D1 and for straight well, D1 and D2 are identical.*
**2 For straight bore d2≤d1 and if not step bore, d1 and d2 are identical.*
**3 The Straight “code F” in the Screw type can not be selected.*

Table 11 Protecting well dimensions

D1	d1	L max.
Ø15~17	Ø8~10	1000
Ø22~26	Ø11~16	1000

The Ø9 mm and Ø11mm internal diameters (d1) are standard product.

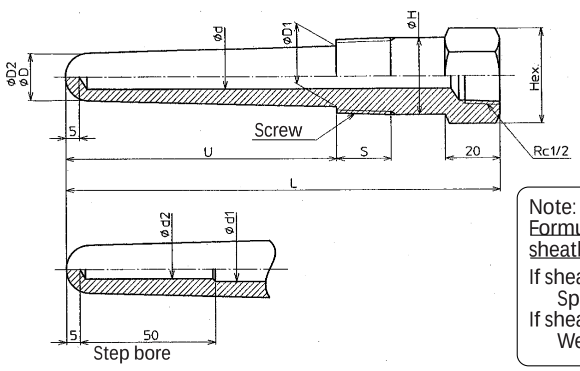
Table 12 Standard dimensions

Model no.			Thread standard	S	Hex
JP	T	15	R1/2	16	26×30
		20	R3/4	20	30×34.6
		25	R1	23	36×41.6
NP	T	15	1/2NPT	16	26×30
		20	3/4NPT	20	30×34.6
		25	1NPT	23	36×41.6
JP	F	15	G1/2	20	26×30
		20	G3/4	20	32×37
		25	G1	25	38×43.9

Prior to selecting a model numbers, please read “PROTECTING WELL SELECTION” on page 11.

Screwed
Lagging
Drilled
Protecting well

ATT92



Note:
Formula to solve the adequate sheath length (l) for model ATT90
If sheath for ATT90-S
Spring loaded type: l=L-10 (mm)
If sheath for ATT90-W
Welded type: l=L-20(mm)

Smart Temperature Transmitter (with temperature sensor protecting well) model numbers

Basic Model No. Selection Option

ATT92 - □□□□□□□□□□□□□□□□□□□□□□ - □□□□□□

Item	Specification	Code
External dia. (Root)	D1 (mm) Ø15~26 mm	□□
External dia. (Tip)	D2 (mm) Ø15~26 mm *1	□□
Internal dia. (Root)	d1 (mm) Ø8~16 mm refer to Table 13	□□
Internal dia. (Tip)	d2 (mm) Ø8~16 mm *2	□□
Material	SUS304	A
	SUS316	C
	SUS310S	D
Full length	L (mm) 60~1000 mm	□□□□
Screw std	JIS std screw	J P
	ANSI std screw	N P
Screw type	Taper	T
Screw size (in)	1/2	1 5
	3/4	2 0
	1	2 5
Insertion length	U (mm)	□□□□

Option	
X	No selection
C	Color check
D	Oil free, water free treatment
L	Hydraulic pressure test, leak test
M	Mil sheet
N	Radio-graphic test
R	Strength calculation sheet

*Note) *1 For tapered well, D2≤D1 and for straight well D1 and D2 are identical.*
**2 For straight bore, d2≤d1 and if not step bore, d1 and d2 are identical.*

Table 13 Protecting well dimensions

D1	d1	L max.
Ø15~17	Ø8~10	1000
Ø22~26	Ø11~16	1000

The Ø9 mm and Ø11mm internal diameters (d1) are standard product.

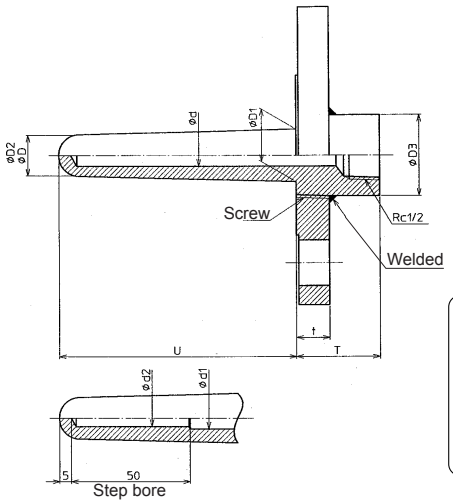
Table 14 Standard dimensions

Model no.			Thread standard	S	Hex	ØH
JP	T	15	R1/2	16	26×30	22
		20	R3/4	20	30×34.6	28
		25	R1	23	36×41.6	34
NP	T	15	1/2NPT	16	26×30	22
		20	3/4NPT	20	30×34.6	28
		25	1NPT	23	36×41.6	34

Prior to selecting a model number, please read “PROTECTING WELL SELECTION” on page 11.

Flanged
Drilled protecting well
(Threaded welded type)

ATT95



Note:
Formula to solve the adequate sheath length (l) for model ATT90
If sheath for ATT90-S
Spring loaded type: l=L-10 (mm)
If sheath for ATT90-W
Welded type: l=L-20(mm)

Smart Temperature Transmitter (with temperature sensor protecting well) model numbers

Basic Model No. ATT95 - Selection - Option

External dia. (Root)	D1 (mm) Ø15~26mm																					
External dia.(Tip)	D2 (mm) Ø15~26 mm *1																					
Internal dia. (Root)	d1 (mm) Ø8~16 mm refer to Table 15																					
Internal dia. (Tip)	d2 (mm) Ø8~16 mm *2																					
Material	SUS304						A															
	SUS316						C															
	SUS310S						D															
Insertion length	U (mm) (60 ~1000 mm)																					
Flange std	JIS5K *3									J	0	5										
	JIS10K *3									J	1	0										
	JIS20K *3									J	2	0										
	ANSI150LB									A	1	5										
	ANSI300LB *4									A	3	0										
	ANSI600LB *4									A	6	0										
	JPI150LB									P	1	5										
	JPI300LB *4									P	3	0										
	JPI600LB *4									P	6	0										
Flange face	Raised face												R	F								
	Flat face												F	F								
	Ring joint												R	J								
	Tongue and groove												M	F								
Flange size	20 mm or 3/4 in.														2	0						
	25 mm or 1 in.														2	5						
	40 mm or 1.5 in.														4	0						
	50 mm or 2 in.														5	0						
Connection	Blind																B	L				
	Slip-on																S	O				
Flange material	SS400 (Consult with us)																		S			
	SUS304																		A			
	NCF600 (Consult with us)																		B			
	SUS316																		C			

X	No selection
C	Color check
D	Oil free, water free treatment
L	Hydraulic pressure test, leak test
M	Mil sheet
N	Radio-graphic test
R	Strength calculation sheet

*Note) *1 For tapered well, D2≤D1 and for straight well, D1 and D2 are identical.*
**2 For straight bore, d2≤d1 and if not step bore, d1 and d2 are identical.*
**3 The Slip-on "code SO" in the connection can not be selected.*
**4 The 50mm or 2in. "code 50" in the Flange size can not be selected.*

Table 15 Protecting well dimensions

D1	d1	L max.
Ø15~17	Ø8~10	1000
Ø22~26	Ø11~16	1000

The Ø9 mm and Ø11mm internal diameters (d1) are standard product.

Table 16 Standard dimensions

D1	D3	Thread	T
≤ Ø26	Ø34	R1	When t<15, T=15. When t>15, T=t+202. Rounded up in 5 mm increments. See notes 1 and 2.
≤ Ø22	Ø28	R3/4	

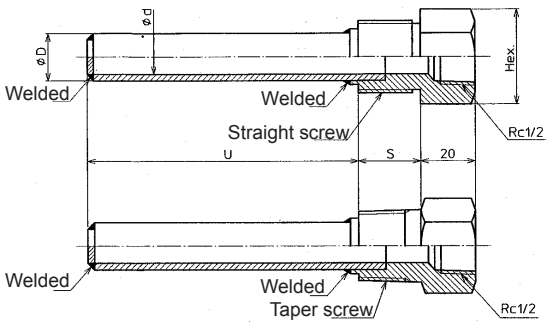
Note) 1. For dimension T, refer to "Table of dimensions of various standard flanges" on page 4.
2. For slip-on flange, apply dimension Y instead of dimension t.

Prior to selecting a model number, please read "PROTECTING WELL SELECTION" on page 11.

Screwed-in type

Pipe protecting well

ATT97



Note:
Formula to solve the adequate sheath length (l) for model ATT90
If sheath for ATT90-S
Spring loaded type: l=L-10 (mm)
If sheath for ATT90-W
Welded type: l=L-20(mm)

Smart Temperature Transmitter (with temperature sensor protecting well) model numbers

Basic Model No. Selection Option

ATT97	-															-					

External dia. (mm)	D1(mm) Ø12 mm	1	2																			
	Ø15 mm	1	5																			
	Ø21.7 mm	9	4																			
Material	SUS304			A																		
	SUS316			C																		
	SUS310S			D																		
Insertion length	U (mm) 60~1000 mm																					
Screw std	JIS std screw									J	P											
	ANSI std screw *1									N	P											
Screw type	Taper											T										
	Straight											F										
Screw size (in)	1/2												1	5								
	3/4												2	0								
	1												2	5								
Screw material	SUS304														A							
	SUS316														C							

X	No selection
C	Color check
D	Oil free, water free treatment
L	Hydraulic pressure test, leak test
M	Mil sheet
N	Radio-graphic test
R	Strength calculation sheet

*Note) *1 The Straight "code F" in the Screw type can not be selected.*

Table 17 Protecting well dimensions

Material	D1	d1
SUS304 SUS316A	Ø12	Ø9
	Ø15	Ø11
	Ø21.7 (15A)	Ø16.1
SUS310S	Ø21.7 (15A)	Ø16.1

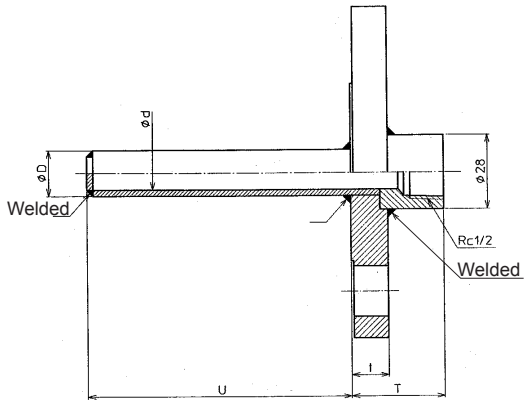
Table 18 Standard dimensions

Model no.			Thread standard	S	Hex
JP	T	15	R1/2	16	26×30
		20	R3/4	20	30×34.6
		25	R1	23	36×41.6
NP	T	15	1/2NPT	16	26×30
		20	3/4NPT	20	30×34.6
		25	1NPT	23	36×41.6
JP	F	15	G1/2	20	26×30
		20	G3/4	20	32×37
		25	G1	25	38×43.9

Prior to selecting a model number, please read "PROTECTING WELL SELECTION" on page 11.

Flanged pipe protecting well

ATT98



Note:
Formula to solve the adequate sheath length (l) for model ATT90
If sheath for ATT90-S
Spring loaded type: l=L-10 (mm)
If sheath for ATT90-W
Welded type: l=L-20(mm)

Smart Temperature Transmitter (with temperature sensor protecting well) model numbers

Basic Model No. Selection Option

ATT98 - [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ] - [ ][ ][ ][ ][ ]

External dia. (mm)	D1 (mm) Ø12mm	1	2															
	Ø15mm	1	5															
	Ø21.7mm	9	4															
Material	SUS304			A														
	SUS316			C														
	SUS310S			D														
Insertion length	U (mm) 60~1000mm																	
Flange std	JIS5k								J	0	5							
	JIS10k								J	1	0							
	JIS20k								J	2	0							
	ANSI150LB								A	1	5							
	ANSI300LB *1								A	3	0							
	ANSI600LB*1								A	6	0							
	JPI150LB								P	1	5							
	JPI300LB *1								P	3	0							
	JPI600LB *1								P	6	0							
Flange face	Raised face											R	F					
	Flat Face											F	F					
	Ring joint											R	J					
	Tongue and groove											M	F					
Flange size	20mm or 3/4 in.													2	0			
	25mm or in.													2	5			
	40mm or 1.5 in.													4	0			
	50mm or 2 in.													5	0			
Flange Material	SS400															S		
	SUS304															A		
	SUS316															C		

X	No selection
C	Color check
D	Oil free, water free treatment
L	Hydraulic pressure test, leak test
M	Mil sheet
N	Radio-graphic test
R	Strength calculation sheet

*Note) *1 The 50mm or 2in. "code 50" in the Flange size can not be selected.*

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Table 19 Protecting well dimensions

Material	D	d
SUS304 SUS316A	Ø12	Ø9
	Ø15	Ø11
	Ø21.7 (15A)	Ø16.1
SUS310S	Ø21.7 (15A)	Ø16.1

Table 20 Standard dimensions

T
When t≤15, T=15. When t>15, T=t+20. Rounded up at 5mm increments. See note 1

Note) 1. For T dimension, refer to "Table of dimensions of various standard flanges" on page 4

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Prior to selecting a model number, please read "PROTECTING WELL SELECTION" on page 11.

PROTECTING WELL SELECTION

External/internal diameter of the protecting well

When selecting a drilled protecting well for models ATT91, 92, or 95, follow the following suggestions. (These do not apply to pipe protecting wells for the ATT97 and 98)

1. Wall thickness of the protecting well should be at least 2.5 mm.
2. Drilled protecting well should be straight.
3. Internal diameter should be 9mm or 11 mm.

It follows that the external diameter of the standard protecting well (at its tip) should be $9 + 2.5 \times 2 < 15$(mm) or less. The external diameter at the root should be selected optionally depending on whether the type is straight or taper. However, no screw size exceeding the root diameter can be selected.

Table 21 Screw size and root diameter

Screw size	Root diameter (mm)	Maximum selectable external diameter (root) (mm)
1/2 (15)	18.23	16
3/4 (20)	24.12	22
1 (25)	30.29	26

If the external diameter of a 1/2 size (15) tapered protecting well needs to be larger, select either a larger screw size (3/4 (20)) or the internal diameter can be made smaller where upon wall thickness becomes a specially designed product.

Length of protecting well and internal/external diameter selection

There is a limitation imposed on the internal diameter of the protecting well when determining the length of the protecting well. This is due to a technical difficulty in deeply drilling holes of small diameters.

Table 22 Relationship between external and internal diameter and length

External diameter (tip) (mm)	Internal diameter (mm)	Length (mm)	Remarks
9	4	100	Special product
10	5	350	Special product
11	6	600	Special product
12	7	600	Special product
15~17	9(8~10)	1000	For 9 mm internal diameter, standard product. For 8 or 10 mm, special product
22~26	11(11~16)	1000	For 11 mm internal diameter, standard product. For 12-16 mm, special product

As shown in Table 22, Yamatake can supply any length of well up to 1000 mm if the internal diameter is 9 mm, which is our standard size. However, if greater strength is desired for a well over 1000 mm, the external diameter can be made thicker or the screw size can be enlarged one size and the internal diameter of the well can also be made larger. On the other hand, if the external diameter of the well is desired to be smaller, this can be accommodated by making the internal diameter smaller, although there will be a limitation on the length.

Selection of flanged protecting wells for model ATT95, 98 and screwed-in pipe protecting well for model ATT97

Please select the same material for the flange or screwed parts as that selected for the well for models ATT97 and 98.

Selection of pipe protecting well for models ATT97 and 98

The pipe material for models ATT97 and 98 should be SUS if strength of protecting well is not critical. Alternatively, select a special pipe material to improve anti-corrosiveness or high-temperature resistance.

Surface treatment of the protecting well

Various types of surface treatments for model ATT9□ sensors are available.

Combination with model ATT90 temperature sensor

Please follow the instructions contained in the ‘MODEL SELECTION section when determining length l. Note that the construction of the temperature sensor may slightly vary the length of the sensor.

Thermonex Inquiry Specifications

Company name		Name of person	
Date		Contact	
Service name		Tag No.	

Transmitter specifications

Output type	☐ Analog ☐ DE ☐ FOUNDATION fieldbus	
Construction	☐ Waterproof ☐ Pressure withstanding explosion-proof (O JIS O FM)	
Electric conduit	☐ G1/2 ☐ NPT1/2 ☐ G1/2+M20×1.5 adaptor ☐ w/G1/2+Pg13.5 adaptor	
Integral indicating meter	☐ No ☐ Yes (O °C scale O F scale) Note: F cannot be used in Japan due to standardization of IS units	
Painting	☐ Standard ☐ Corrosion-proof ☐ Heavy duty corrosion-proof	
Burn-out	☐ Up-scale ☐ Down-scale	
Additional specifications	Document	☐ Test report ☐ Traceability certificate
	Accessories	☐ 2 inch pipe bracket ☐ Electric conduit and elbow Note: Must be used with JIS pressure withstanding explosion-proof
	Treatment	☐ Tropicalization
	Settings at shipping	☐ Sensor & range settings at shipping (Please state the setting parameters in column below)
Remarks (setting at shipping)	Tag. No.	Eight digit alphanumeric Tag. No. will be engraved on name plate and PROM
	Sensor type	☐ RTD (O Pt100 O JPt100) ☐ T/C (O J O K O T O E O N)
	Range	☐ Range (~) Note: Enter the unit in indicating scale's unit

Sensor specifications

Sensor type	☐ RTD (O Pt100) ☐ T/C (O J O K O T O E)	
Seal construction	☐ Welded ☐ Spring loaded	
Seal length	( ) mm However, 50 ≤ L≤ 1000 mm	
Sheath external diameter	☐ 3.2mm ☐ 4.8mm ☐ 6.4mm ☐ 8.0mm	
Accuracy class	RTD ☐ JIS (OA OB) Thermocouple ☐ JIS (O 1 O 2) ☐ ASTM (O STD O SP)	
Connecting thread	☐ R1/2 ☐1/2NPT	
Additional specifications	Document	☐ Test report ☐ Traceability certificate
	Accessories	☐ Connecting union (O100mm O150mm)

Protecting well specifications

Basic construction	Select basic construction		Basic model No.	Items to determine specifications (Numbers refer to the item no. to be filled in.)
	☐ Threaded drilled well		ATT91	(1) (2) (3) (4) (5) (6) (7) (12) (15)
	☐ Threaded lagging drilled well		ATT92	(1) (2) (3) (4) (5) (6) (7) (12) (15)
	☐ Flanged drilled well (Screw-on welding)		ATT95	(1) (2) (4) (8) (9) (10) (11) (12) (13) (15)
	☐ Threaded pipe well		ATT97	(1) (4) (5) (6) (7) (12) (13) (14) (15)
	☐ Flanged pipe well		ATT98	(1) (4) (8) (9) (10) (11) (12) (13) (15)
External/internal diameter	(1) External diameter D	☐ Root D1 ( ) mm ☐ Tip D2 ( ) mm Note if tapered well is required		
	(2) Internal diameter d	☐ Root d1 ( ) mm ☐ Tip d2 ( ) mm Note if step bore is required		
Length	(3) Overall L	( ) mm		
	(4) Insertion length U	( ) mm		
Screw	(5) Standard	☐ JIS pipe thread ☐ ANSI pipe thread		
	(6) Shape	☐ Taper thread ☐ Plain thread		
	(7) Size	☐ 1/2 ☐ 3/4 ☐ 1		
Flange	(8) Standard	JIS	☐ 5K ☐ 10K ☐ 20K	
		ANSI	☐ 150 lb ☐ 300lb ☐ 600 lb	
		JPI	☐ 150lb ☐ 30lb ☐ 600lb	
	(9) Size	☐ 20mm or 3/4in. ☐ 25mm or 1in. ☐ 40mm or 1.5in. ☐ 50mm or 2in.		
	(10) Seating face	☐ Plain ☐ Full faced ☐ Ring joint ☐ Slip-on		
	(11) Top shape	☐ Blind ☐ Slip-on		
	(12) Protecting well	☐ SUS304 ☐ SUS316 ☐ SUS310S		
Material	(13) Flange	☐ SUS304 ☐ SUS316		
	(14) Thread *Note	☐SUS304 ☐ SUS316 Note: For ATT97, select pipe well's thread		
Additional specifications (15)	Documents	☐ Strength calculation ☐ Mil sheet		
	Inspections	☐ Color check ☐ Pressure and air tightness inspection ☐ X-ray test		
	Surface treatment	☐ Oil-free, water-free		

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