EXPLOSION PROOF NIPPLE UNION ASSEMBLY

92 SERIES SPRING LOADED STAINLESS STEEL NIPPLE UNION

Description

The 92 series are the ATEX and IECEx approved spring loaded stainless steel nipple union assemblies that can be used with any approved equipment or transmitter that offers at least the same level of protection as detailed at the bottom of this page. This allows the entire assembly to be ATEX and IECEx approved. The assembly has a 1/2" NPT thread at the probe end and a 1/2" NPT or M20 thread at the lead end (thread for flame lock). The probe end of the nipple union is threaded to accommodate an optional protection of the probe such as a thermowell.

The 92 series comes with an option for a customized stainless steel nameplate that can be attached on the union. We can also provide these assemblies with a sensor from any manufacturer of your choice. See below for ordering information.

SECTION "A-A"

Model	Spring Loaded Stainless Steel Nipple Union					
91	General Purpose					
92	ATEX & IECEx Approved Assembly (See Certification System Below For Details)					
Code	**Sensor Description**					
TJ	Type J Thermocouple, Class 1, DIN/EC 584-2-1992					
TK	Type K Thermocouple, Class 1, DIN/EC 584-2-1992					
TT	Type T Thermocouple, Class 1, DIN/EC 584-2-1992					
TE	Type E Thermocouple, Class 1, DIN/EC 584-2-1992					
TR	Type R Thermocouple, Class 1, DIN/EC 584-2-1992					
TS	Type S Thermocouple, Class 1, DIN/EC 584-2-1992					
PA	100 Ohm Platinum Resistance Sensor, Class A, DIN/EC 751-1985, 3 Wire					
PB	100 Ohm Platinum Resistance Sensor, Class B, DIN/EC 751-1985, 3 Wire					
PF	100 Ohm Platinum Resistance Sensor, Class A, DIN/EC 751-1985, 4 Wire					
XX	To Be Specified					
	Code	**Number of Elements**				
	S	Single Element				
	D	Dual Element				
		Code	**"N" Length (OAL Length)**			
		02	2 Inch (General Purpose Only) (OAL:3 Inch)			
		03	3 Inch (General Purpose Only) (OAL:4 Inch)			
		04	4 Inch (OAL: 5 Inch)			
		05	5 Inch (OAL: 6 Inch)			
		06	6 Inch (OAL: 7 Inch)			
		07	7 Inch (OAL: 8 Inch)			
			Code	**Thread For Flame Lock**		
			001	1/2" NPT		
			002	M20 x 1.5		
				Code	**Plain Capsule Sensor Diameter**	
				EG	6.4mm	
				MT	6.0mm	
					Code	**Sensor "A" Length**
					L0000	SPECIFY "A" in mm
92	**PA**	**S**	**04**	**001**	**EG**	**L0120**

Certification System

	II 2G D Exd IIC T6 Gb Ex tb IIIC T85℃ Db, IP68 Ta = -40℃ to +70℃	CE	IECEx	Ex d IIC T6 Gb Ex tb IIIC T85℃ Db, IP68 Ta = -40℃ to +70℃

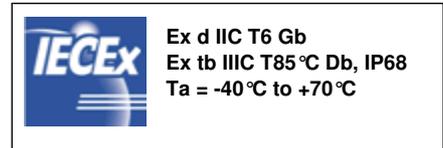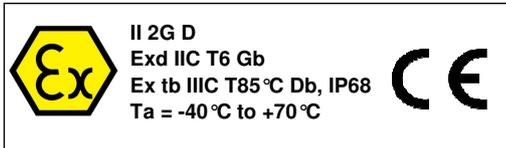## 93 SERIES SPRING LOADED STAINLESS STEEL NIPPLE

Description

The 93 series are a variation of the 92 series where these are the ATEX and IECEx approved spring loaded stainless steel nipple assemblies. This assembly can also be used with any approved equipment or transmitter that offers at least the same level of protection as detailed at the bottom of this page.This thus allows the entire assembly to be ATEX and IECEx approved The assembly has a 1/2" NPT thread at the probe end and a 1/2" NPT or M20 thread at the lead end. The probe end of the nipple union is threaded to accommodate an optional protection of the probe such as a thermowell. See below for ordering information.

A ←

"N" LENGTH

OAL LENGTH

"A" LENGTH

A ←

SECTION "A-A"

Thread For Flame Lock

1/2" NPT

Plain Capsule Sensor
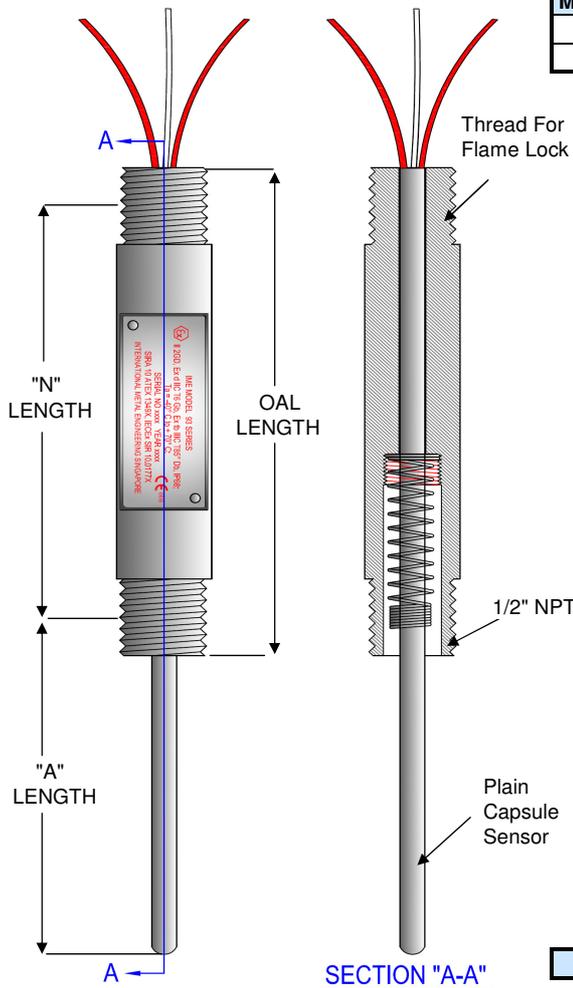
Model	Spring Loaded Stainless Steel Nipple				
90	General Purpose				
93	ATEX & IECEx Approved Assembly (See Certification System Below For Details)				
	Code	**Sensor Description**			
	TJ	Type J Thermocouple, Class 1, DIN/EC 584-2-1992			
	TK	Type K Thermocouple, Class 1, DIN/EC 584-2-1992			
	TT	Type T Thermocouple, Class 1, DIN/EC 584-2-1992			
	TE	Type E Thermocouple, Class 1, DIN/EC 584-2-1992			
	TR	Type R Thermocouple, Class 1, DIN/EC 584-2-1992			
	TS	Type S Thermocouple, Class 1, DIN/EC 584-2-1992			
	PA	100 Ohm Platinum Resistance Sensor, Class A, DIN/EC 751-1985, 3 Wire			
	PB	100 Ohm Platinum Resistance Sensor, Class B, DIN/EC 751-1985, 3 Wire			
	PF	100 Ohm Platinum Resistance Sensor, Class A, DIN/EC 751-1985, 4 Wire			
	XX	To Be Specified			
		Code	**Number of Elements**		
		S	Single Element		
		D	Dual Element		
			Code	**"N" Length (OAL Length)**	
			02	2 Inch (General Purpose Only) (OAL:3 Inch)	
			03	3 Inch (General Purpose Only) (OAL:4 Inch)	
			04	4 Inch (OAL: 5 Inch)	
			05	5 Inch (OAL: 6 Inch)	
			06	6 Inch (OAL: 7 Inch)	
			07	7 Inch (OAL: 8 Inch)	
				Code	**Thread For Flame Lock**
				001	1/2" NPT
				002	M20 x 1.5

				Code	**Plain Capsule Sensor Diameter**
				EG	6.4mm
				MT	6.0mm

				Code	**Sensor "A" Length**
				L0000	SPECIFY "A" in mm

93	PA	S	04	001	EG	L0120

Certification System

	II 2G D Exd IIC T6 Gb Ex tb IIIC T85℃ Db, IP68 Ta = -40℃ to +70℃	CE	
	Ex d IIC T6 Gb Ex tb IIIC T85℃ Db, IP68 Ta = -40℃ to +70℃		

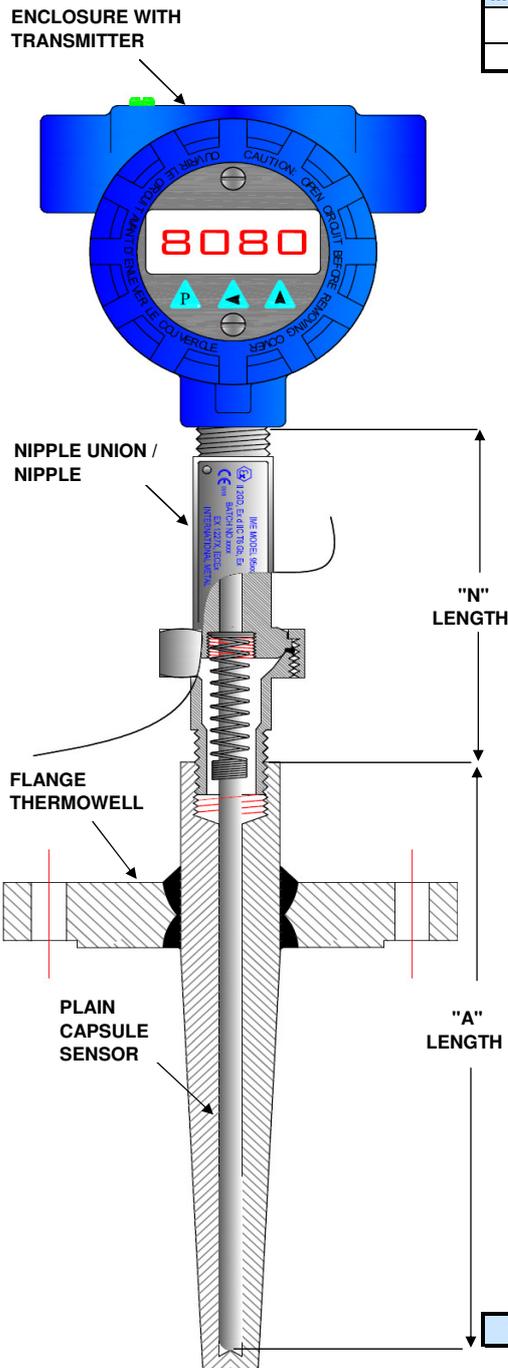## INTERNATIONAL METAL ENGINEERING

EXPLOSION PROOF TEMPERATURE ASSEMBLY

98 SERIES SPRING LOADED STAINLESS STEEL NIPPLE UNION

Description

The 98 series are ATEX and IECEx approved temperature assemblies. These temperature assemblies encompasses our 8080KN Battery Operated Digital Temperature Indicator, 8080PR Indicating Temperature Temperature switch with Dual Relays, 8080PN Indicating Transmitter Transmitter and our 8080HT Indicating Temperature Trasmitter with Hart®. See below for ordering information.

ENCLOSURE WITH TRANSMITTER

NIPPLE UNION / NIPPLE

FLANGE THERMOWELL

PLAIN CAPSULE SENSOR

"N" LENGTH

"A" LENGTH

Model	Temperature Assembly
94	General Purpose
98	ATEX & IECEx Approved Assembly (See Certification System Below For Details)

Code	Sensor Description
TJ	Type J Thermocouple, Class 1, DIN/EC 584-2-1992
TK	Type K Thermocouple, Class 1, DIN/EC 584-2-1992
TT	Type T Thermocouple, Class 1, DIN/EC 584-2-1992
TE	Type E Thermocouple, Class 1, DIN/EC 584-2-1992
TR	Type R Thermocouple, Class 1, DIN/EC 584-2-1992
TS	Type S Thermocouple, Class 1, DIN/EC 584-2-1992
PA	100 Ohm Platinum Resistance Sensor, Class A, DIN/EC 751-1985, 3 Wire
PB	100 Ohm Platinum Resistance Sensor, Class B, DIN/EC 751-1985, 3 Wire
PF	100 Ohm Platinum Resistance Sensor, Class A, DIN/EC 751-1985, 4 Wire
XX	To Be Specified

Code	Number of Elements
S	Single Element
D	Dual Element

Code	"N" Length
02	2 Inch (General Purpose Only)
03	3 Inch (General Purpose Only)
04	4 Inch
05	5 Inch
06	6 Inch
07	7 Inch

Code	Transmitter Option
8080KN	Battery Operated Digital Temperature Indicator
8080PR	Indicating Temperature Switch with Dual Relays
8080PN	Indicating Temperature Transmitter
8080HT	Indicating Temperature Transmitter with Hart®
xxxxxxx	Any Preferred Transmitter Model of Any Make

Code	Choice Of Enclosure
A	Die Cast Aluminum, Epoxy Painted
T	SS316, Electro Polished

Code	Conduit Entry
01	3/4" NPT
02	1/2" NPT
06	M20x1.5P
23	1/2" BSP

Code	Nipple Union
N	Nipple Only (See Model 93 Series)
U	Nipple Union Nipple Assembly (See Model 92 Series)

Code	Plain Capsule Sensor Diameter
EG	6.4mm
MT	6.0mm

Code	Sensor "A" Length
L0000	SPECIFY "A" in mm

98	PA	S	05	8080HT	A	01	N	EG	L0120	Typical Model Number

Certification System

II 2G D
Exd IIC T6 Gb
Ex tb IIIC T85℃ Db, IP68
Ta = -40℃ to +70℃

CE

Ex d IIC T6 Gb
Ex tb IIIC T85℃ Db, IP68
Ta = -40℃ to +70℃

INTERNATIONAL METAL ENGINEERING

DIGITAL TEMPERATURE INDICATORS

MODEL 8080KN BATTERY OPERATED DIGITAL TEMPERATURE INDICATOR

Description

Model 8080KN is a Battery Operated Digital Temperature Indicator which accepts an input from a standard Type J or K Thermocouple or RTD and provides local indication of temperature in degree F or C. The 8080KN becomes a universal instrument since only one instrument will indicate the entire useful range of the thermocouple or RTD (-100 to +1400℃).

Functional Specifications

Sensor
Thermocouple Type J / K or RTD Pt100

Indication Accuracy
0.5 Degree C

Display Height
12.5mm (½") high

Display Units
℃ or ℉, switch selectable

Battery Life
Approx. 24 Months

Calibration
Single point calibration for enhanced accuracy

MODEL 8080PR TEMPERATURE INDICATING SWITCH WITH DUAL RELAYS

Description

Model 8080PR allows 2 independent alarms to be assigned over the temperature range of the sensor. The unit will accept an input from a Pt100 RTD or Type J or K thermocouple and provide an indication on a bright 4 digit LED. The unit serves a dual purpose since in addition to local indication of temperature, which is switch selectable to read ℃ or ℉, it also serves as an accurate and repeatable temperature switch.

Functional Specifications

Indication Accuracy
0.1% of Calibrated range +/- 1 digit

Set Point Adjustment
10~100% of full scale, user selectable

Reset
Automatically when the input falls below the alarm set point by approximately ±0.5% of full scale.

Alarm Set Point Accuracy
±0.5% of full scale.

Alarm Status Indication
LED on front panel

Display Height
12.5mm (1/2") high

Alarm Output
2 sets SPDT, 1 from C, rated 10A @ 250V AC, 50/60Hz

Stability Over Time
0.1% of calibrated range ± 1 digit over 6 months

Over Range Indication
Flashing of display

Response Time
Typically 75ms

Supply Voltage
18~28V DC

MODEL 8080PN TEMPERATURE TRANSMITTER

Description

Model 8080PN is a two wire indicating transmitter which coverts input from a Type J/K Thermocouple or Pt100 sensor into a load independent 4-20mA process signal. A 4 digit bright red LED allows for local indication of Temperature, which is switch selectable to read ℃ or ℉.

LED Meter

Model 8080PN has 4 digit bright red LED and may be configured to read temperature in either degrees C or F. The zero and span setting for 4 to 20mA signal as well as the units of display can be set either using the membrane switches on the front panel, eliminating potentiometric adjustments.

Functional Specifications

Sensor
Type J/K Thermocouple or Pt100 RTD

Indication Accuracy
0.1% of Calibrated range ± 1 digit

Lead Compensation Error
<±0.05/10Ω lead resistance

Stability Over Time
0.1% of calibrated range ±1 digit over 6 months

Temperature Stability
±0.01% per Degree C

Adjustable Span
Over the entire range of sensor (Minimum Span=20℃) (about 30℉)

Burnout Protection
Upscale

Supply Voltage
18~28V DC

Supply and Load Effect
<0.03% of span for full change

MODEL 8080HT TEMPERATURE TRANSMITTER WITH HART®

Description

Model 8080HT is a digital, PC/Hand-Held programmable, isolated 2-wire transmitter with HART® protocol. The unit converts 8 types of thermocouples; 8 types of RTDs, configured as 2, 3 and 4 wires; potentiometer, resistor and millivolt inputs into process current loop.

Exceptional digital accuracy of typical ±0.1 ℃ is provided for all the sensors regardless of the calibrated span. Extremely accurate cold-junction temperature measurement provides precise compensation throughout the entire ambient range. The unit also accurately measures and compensates the RTD sensor leads in the 3-wire connection.

The transmitter is fully configurable by connecting to a PC or a Hand-Held programmer. The configuration parameters are stored in a non volatile memory. Detection of sensor breakage or disconnection of input leads, forces the output to a pre-defined up/down scale value. The unit continuously monitors the sensor and automatically returns to normal operation mode when the sensor is recovered.

Functional Specifications

Output
4~20mA with HART® protocol (2 wire)

Supply Voltage
10.5 to 45 VDC (with backlight LCD)

Input
RTD, TC, Ohm, mV

Accuracy (Pt100)
< 0.2K or 0.08%

Cold Junction Compensation
Internal

Galvanic Isolation
2 KVAC (In/Out)

Influence of Ambient Temperature
Negligible

Load Influence
Negligible

Resolution
0.3 µA

INTERNATIONAL METAL ENGINEERING

TEMPERATURE TRANSMITTER WITH HART®   8080HT

Input

	Type	Measurement Ranges	Min. meas. Ranges	Maximum Measured Error
Resistance Thermocouple (RTD)	Pt100	-200℃ to 850℃ (-328℉ to 1562℉)	10K	0.2K or 0.08%
	Pt500	-200℃ to 850℃ (-328℉ to 1562℉)	10K	0.5K or 0.20%
	Pt1000	-200℃ to 850℃ (-328℉ to 1562℉)	10K	0.3K or 0.12%
	Cu50	-50℃ to 150℃ (-58℉ to 302℉)	10K	0.2K or 0.08%
	Cu100	-50℃ to 150℃ (-58℉ to 302℉)	10K	0.3K or 0.12%
	Ni100	-60℃ to 180℃ (-76℉ to 356℉)	10K	0.2K or 0.08%
	Ni500	-60℃ to 180℃ (-76℉ to 356℉)	10K	0.5K or 0.20%
	Ni1000	-60℃ to 180℃ (-76℉ to 356℉)	10K	0.3K or 0.12%
ResistanceTransmitter	Resistance (Ω)	0 to 400 Ω	10 Ω	± 0.1Ω or 0.08%
		0 to 2000 Ω	20 Ω	± 1.5Ω or 0.12%
		0 to 10000 Ω	100 Ω	± 7.5Ω or 0.20%
Thermocouple (TC)	B (PtRh30-PtRh6)	0 to 1820℃ (32 to 3308℉)	500K	
	E (NiCr-CuNi)	-270 to 1000℃ (-454 to 1832℉)	50K	typ. 0.5K or 0.08%
	J (Fe-CuNi)	-210 to 1200℃ (-346 to 2192℉)	50K	typ. 0.5K or 0.08%
	K (NiCr-Ni)	-270 to 1372℃ (-454 to 2501℉)	50K	typ. 0.5K or 0.08%
	N (NiCrSi-NiSi)	-270 to 1300℃ (-454 to 2372℉)	50K	typ. 1.0K or 0.08%
	R (PtRh13-Pt)	-50 to 1768℃ (-58 to 3214.4℉)	500K	typ. 2.0K or 0.08%
	S (PtRh10-Pt)	-50 to 1768℃ (-58 to 3214.4℉)	500K	typ. 2.0K or 0.08%
	T(Cu-CuNi)	-270 to 400℃ (-454 to 752℉)	50K	typ. 0.5K or 0.08%
VoltageTransmitters (mV)	Millivolt transmitter(mV)	-10 to 75 mV	5 mV	± 20 µV or 0.08%
		-100 to 100 mV	5 mV	± 20 µV or 0.08%
		-100 to 500 mV	6 mV	± 30 µV or 0.08%
		-100 to 2000 mV	20 mV	± 50 µV or 0.08%

Output

Output Signal	4 to 20 mA + Hart®	
Signal On Alarm	Underranging	Linear drop to 3.8 mA
	Overranging	Linear rise to 20.8 mA
	Sensor break; sensor open-circuit	<3.8 mA
Load	Max. ($V_{power supply}$ - 7.5 V) / 0.0208A (without display)	
	Max. ($V_{power supply}$ - 10.5 V) / 0.0208A (with display)	
Linearization/Transmission Behavior	Temperature linear, resistance linear, voltage linear	
Galvanic Isolation	U = 2 KV AC (input/output)	

Power Supply

Supply Voltage (polarity protected)	U_b = 10.5 to 45 VDC

Performance Characteristic

Response Time	1s
Reference Operating Conditions	Calibration Temperature : 23℃ (73.4℉) ± 5K
Long Term Stability	≤ 0.05% / year
Switch On Delay	≤ 5s
Self Stability Configuration	0 to 2%
Filter Configuration	0 to 160 µA
Resolution	0.3 µA

Environment Condition

| Ambient Temperature Limits	-40 to 85℃ (-40℉ to 195℉) Without display
	-20 to 70℃ (-4℉ to 158℉) With display
Storage Temperature	-40 to 100℃ (-40℉ to 212℉)
Condensation	100%
Electromagnetic Compatibility (EMC)	Interference immunity and interference emission according
	to GB/T17626.2-1998), compliance with IEC 61000-4-3:1995

INTERNATIONAL METAL ENGINEERING

EXPLOSION PROOF TEMPERATURE ASSEMBLY

99 SERIES TEMPERATURE ASSEMBLY

Description

The 99 series ATEX and IECEx approved temperature assemblies incorporate a Thermocouple Head and a head mounted (hockey puck) temperature transmitter or a 6 post ceramic block.The sensor can be from any manufacturer and may include any thermowell (flanged or threaded). The nipple union assembly is then fitted to an IME Model 1080 Thermocouple Head (Aluminum or SS316).Any model head mounted (hockey puck) temperature transmitter that has less than 3 watts power dissipation or a 6 post terminal block is mounted in the Thermocouple Head to complete the approved temperature assembly. See below for ordering information.

ENCLOSURE WITH TRANSMITTER OR TERMINAL BLOCK

NIPPLE UNION / NIPPLE

"N" LENGTH

FLANGE THERMOWELL

PLAIN CAPSULE SENSOR

"A" LENGTH
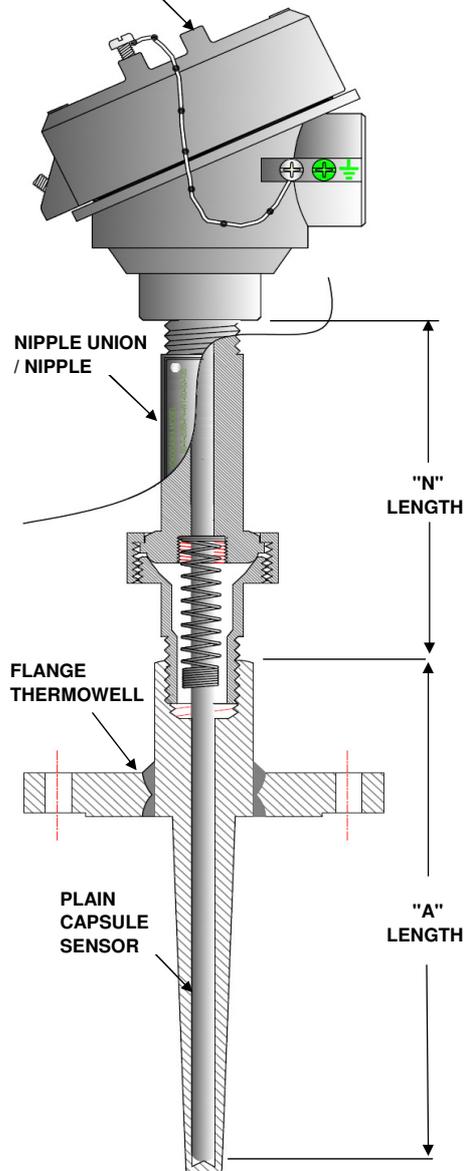
Model	Temperature Assembly
97	General Purpose
99	ATEX & IECEx Approved Assembly (See Certification System Below For Details)

Code	Sensor Description
TJ	Type J Thermocouple, Class 1, DIN/EC 584-2-1992
TK	Type K Thermocouple, Class 1, DIN/EC 584-2-1992
TT	Type T Thermocouple, Class 1, DIN/EC 584-2-1992
TE	Type E Thermocouple, Class 1, DIN/EC 584-2-1992
TR	Type R Thermocouple, Class 1, DIN/EC 584-2-1992
TS	Type S Thermocouple, Class 1, DIN/EC 584-2-1992
PA	100 Ohm Platinum Resistance Sensor, Class A, DIN/EC 751-1985, 3 Wire
PB	100 Ohm Platinum Resistance Sensor, Class B, DIN/EC 751-1985, 3 Wire
PF	100 Ohm Platinum Resistance Sensor, Class A, DIN/EC 751-1985, 4 Wire
XX	To Be Specified

Code	Number of Elements
S	Single Element
D	Dual Element

Code	"N" Length
02	2 Inch (General Purpose Only)
03	3 Inch (General Purpose Only)
04	4 Inch
05	5 Inch
06	6 Inch
07	7 Inch

Code	Temperature Transmitter Or Terminal Block
8070HN	Head Mounted Transmitter (See Page 2 For Details)
8070HH	Head Mounted Transmitter with Hart (See Page 2 For Details)
xxxxxxx	Any Preferred Transmitter Model of Any Make
8070-06	Ceramic Teminal Block with 6 Dual Posts

Code	Choice Of Enclosure
A	Die Cast Aluminum, Epoxy Painted
T	SS316, Electro Polished

Code	Conduit Entry
01	3/4" NPT
02	1/2" NPT
08	M20x1.5P
37	1/2" BSP
38	3/4"BSP

Code	Nipple Union
N	Nipple Only (See Model 93 Series)
U	Nipple Union Nipple Assembly (See Model 92 Series)

Code	Plain Capsule Sensor Diameter
EG	6.4mm
MT	6.0mm

Code	Sensor "A" Length
L0000	SPECIFY "A" in mm

99	PA	S	05	8070HN	A	01	N	EG	L0120	Typical Model Number

Certification System

II 2G D
Exd IIC T6 Gb
Ex tb IIIC T85℃ Db, IP68
Ta = -40℃ to +70℃

CE

IECEx
Ex d IIC T6 Gb
Ex tb IIIC T85℃ Db, IP68
Ta = -40℃ to +70℃

INTERNATIONAL METAL ENGINEERING

IME TEMPERATURE TRANSMITTER DETAILS

HEAD MOUNTED TRANSMITTER   8070HN

- 2 wire, 4 to 20mA analog output
- High accuracy in total ambient temperature range
- An internal temperature sensor for active temperature compensation (For T/C)
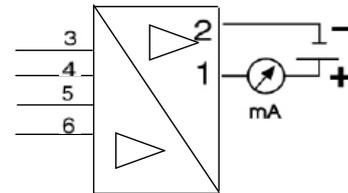- 3 year warranty
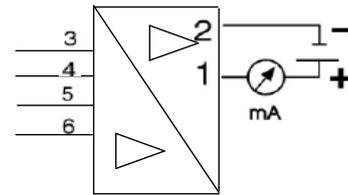
INPUT	TYPE
Platinum Resistance Sensors	Pt 100, Cu 50, Cu 100
Resistance Transmitter	0 to 400 Ω
Votage Transmitter (mV)	-10 to 75mV
Thermocouple Types	B,E,J,K,N,R,S and T
OUTPUT	
Output Signal	4 to 20 mA
Under Range	Linear Drop to 3.8mA
Over Range	Linear Rise to 20.8mA
Sensor Breakage	< 3.8mA
Load	Max. ($V_{power supply}$ - 7.5 V) / 0.0208A
POWER SUPPLY	
Supply Voltage	7.5 to 45 VDC, Polarity Protected
SPECIFICATION	
Response time	1s
Reference Operation Conditions	Calibration temperature: 23℃ (75℉)
Long Term Stability	≤0.05% / Year
Infuence of ambient Temperature	Negligible
Load Influence	Negligible
Power Supply Influence	Negligible
Ambient Temperature Limits	-40 to 85 ℃

HEAD MOUNTED TRANSMITTER WITH HART®   8070HH

- Universal settings with HART ® - protocol for various input signals
- 2 wire, 4 to 20mA analog output + Hart ®
- High accuracy over total ambient temperature range
- Galvanic isolation
- An internal temperature sensor for active temperature compensation (For T/C)
- Wide voltage supply range
- 3 year warranty

INPUT	TYPE
Platinum Resistance Sensors	Pt100, Pt500, Pt1000, Cu50, Cu100, Ni100, Ni500, Ni1000
Resistance Transmitter Range/ Min Range	0 to 400 Ω / 10 Ω 0 to 2000 Ω / 20 Ω 0 to 10000 Ω / 100 Ω
Thermocouple Types	B,E,J,K,N,R,S and T
Voltage Transmitters (mV) / Min Range	-10 to 75mV / 5mV -100 to 100mV / 5mV -100 to 500mV / 6mV -100 to 2000mV / 20mV
OUTPUT	
Output Signal	4 to 20 mA + Hart®
Under Range	Linear Drop to 3.8mA
Over Range	Linear Rise to 20.8mA
Load	Max. ($V_{power supply}$ - 7.5 V) / 0.0208A
Galvanic Isolation	U=2KV AC (input/ output)
POWER SUPPLY	
Supply Voltage	7.5 to 45 VDC/ Polarity Protected
SPECIFICATION	
Programmable	Easy programming with USB
Response Time	1s
Reference Operating Conditions	Calibration Temperature:23℃ ± 5K
Long Term Stability	≤ 0.05% / year
Switch On Delay	≤ 5s
Self Stability Configuration	0 to 2%
Filter Configuration	0 to 160 µA
Input Current Required	≤3.8mA
Current Limit	≤20.8mA
Ambient Temperature Limits	-40 to 85 ℃

INTERNATIONAL METAL ENGINEERING