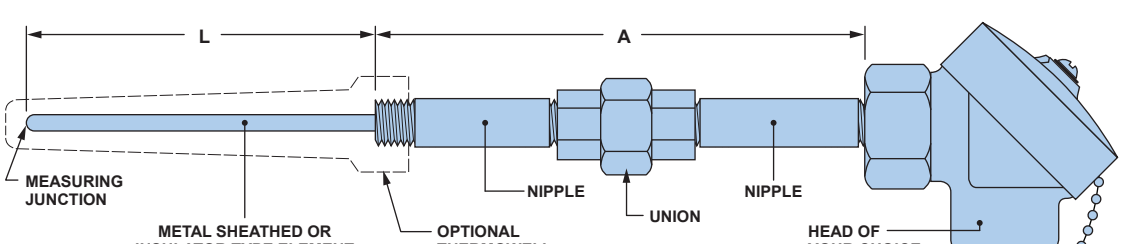
To order any style on this page see below:

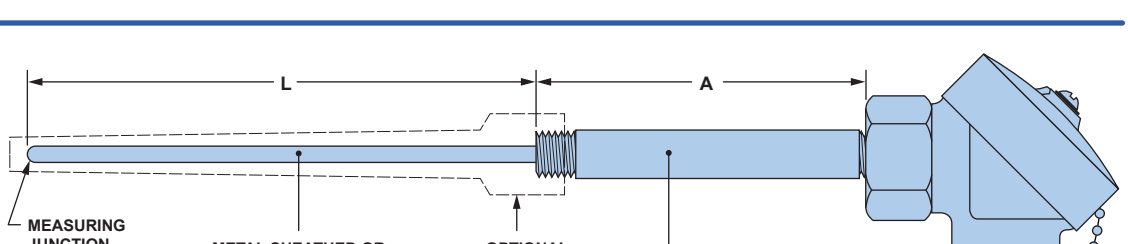
Sandelius Style 1H –

Head Mounted with a Nipple-Union-Nipple (For spring-loading , insert an “S” in front of the style number)



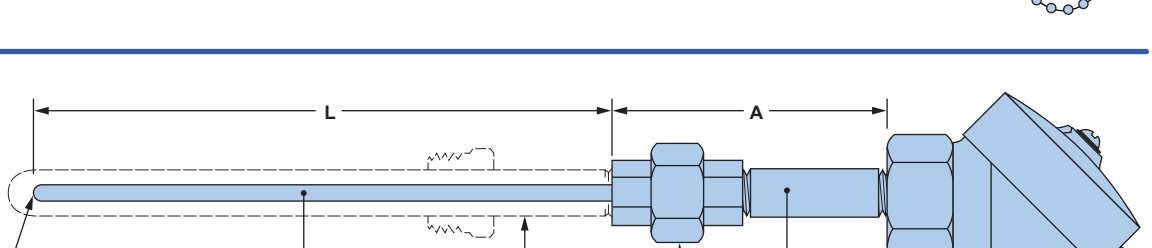
Sandelius Style 2H –

Head Mounted with a Nipple Only (For spring-loading , insert an “S” in front of the style number)



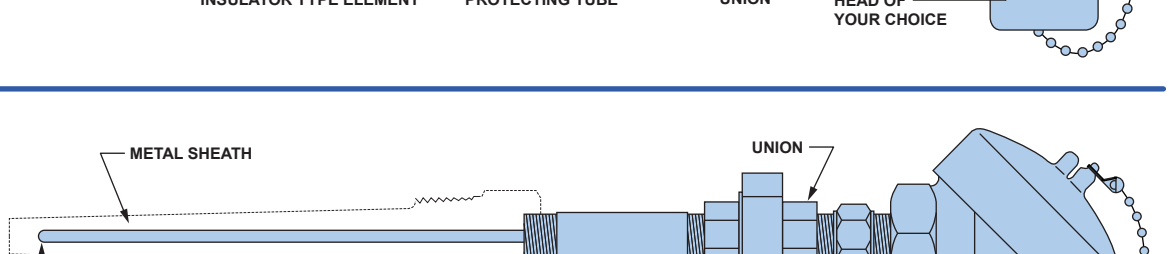
Sandelius Style 3H –

Head Mounted with a Nipple-Union Only (For spring-loading , insert an “S” in front of the style number)



Style 7H –

Nipple-Union-Brazed SS Fitting - Head (For spring-loading , insert an “S” in front of the style number)



To Order Any Style 1H, 2H, 3H or 7H Assembly Specify:

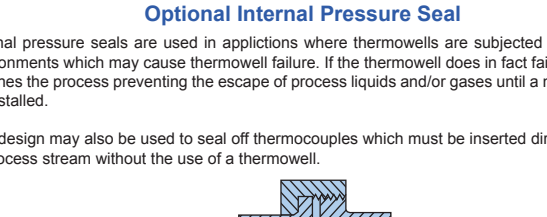
S1H–250K316–G–18–4G6–C46B–(Optional Thermowell)[2]

- See Catalog Section B[1]
- Head Pages A-18 & A-19
- Nominal A Dimension in inches
- Nipple & Union Material
  C–Carbon Steel, G–Galvanized Steel, S–Stainless Steel
- Nipple Sizes
  4– 1/2” NPT; 6– 3/4” NPT, 8– 1” NPT
- L – Length in inches[1]
- Junction Pg. A-10
- Element Pg. A-10 or A-8
- Assembly Style (If spring-loaded is desired, insert a “S” in front of the assembly style).

Optional Internal Pressure Seal

Internal pressure seals are used in applictions where thermowells are subjected to extremely harsh environments which may cause thermowell failure. If the thermowell does in fact fail, the pressure seal confines the process preventing the escape of process liquids and/or gases until a new thermowell can be installed.

This design may also be used to seal off thermocouples which must be inserted directly into a furnace or process stream without the use of a thermowell.



1. To order an assembly complete with a thermowell or protecting tube, simply insert the part number of the thermowell or protecting tube desired from Section B of this catalog. When ordering a complete assembly, the “L” (element) length should be shown as “00” (the element will be precisely matched to the thermowell or protecting tiube).
2. When ordered without a thermowell assembly, Assembly Styles 1H, 2H, 3H, 4H and S5H are shipped unassembled to avoid damage in transit.

To order specfiy Sandelius Assembly Style “P1H” and complete the part number as indicated. (Note Assembly Style “P1H” cannot be spring-loaded).

METAL SHEATH TYPE THERMOCOUPLE ELEMENTS

SANDELIUS NUMBERING SYSTEM

125 J 316

SHEATH O.D IN 1000ths OF AN INCH

ORDER SYMBOL	APPROXIMATE FRACTION
020	1/50
032	1/32
040	1/25
063	1/16
125	1/8
188	3/16
250	1/4
313	5/16
375	3/8
500	1/2

CALIBRATION SYMBOL

ORDER SYMBOL*	CONDUCTOR MATERIAL	TEMPERATURE RANGE
E	Chromel / Constantan	-328 - 1652ºF**
J	Iron / Constantan	32 - 1382ºF**
K	Chromel / Alumel	-328 - 2282ºF**
R	Platinum / Platinum 13% Rh	32 - 2642ºF
S	Platinum / Platinum 10% Rh	32 - 2642ºF
B	Platinum 6% Rh / Platinum 30% Rh	1598 - 3092ºF
N	Nicrosil / Nisil	32 - 2282ºF
T	Copper / Constantan	-328 - 662ºF**

* Single letter calibration symbol is used for single element. A double letter calibration symbol is used for dual element. EXAMPLE: 125JJ316 is dual element type J.

** Type E, K & T may be used for cryogenic temperature as low as -328ºF, but must be specifically ordered to insure accuracy in cryogenic range.

SHEATH MATERIAL

ORDER SYMBOL	MATERIAL
200	Nickel 200
304	304SS
304L	304L
310	310SS
310L	310L
316	316SS
316L	316L
321	321SS
347	347SS
400	Monel 400
446	446SS
600	Inconel 600
601	Inconel 601
625	Inconel 625
800	Incoloy 800
276	Hastelloy C-276
277	Hastelloy X
285	Tantalum
337	Titanium Grade 2
928	Pyrosil

MEASURING JUNCTION STYLES

G-GROUNDED JUNCTION

The conductors and sheath material are simultaneously cap welded. This process forms a measuring junction which is an integral part of the end cap and electrically grounded to the sheath. The most common junction style, grounded junctions protect the thermocouple conductors from contamination and offer fast response times.

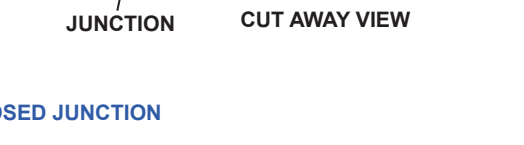
Order Symbol: **G-Single or Dual Element**

R-REMOTE OR UNGROUNDED JUNCTION

The conductors are first junction welded together. Prior to cap welding the sheath, the junction is covered with insulating material to insulate it from the sheath and end cap. Remote junctions protect the thermocouple conductors from both contamination and outside electrical interference. They are used whenever electrical isolation of the element is desirable.

Order Symbol:
R – Single Element
RC* – Dual Element Common
RS* – Dual Element Separate

E-EXPOSED JUNCTION

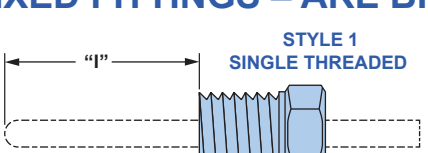


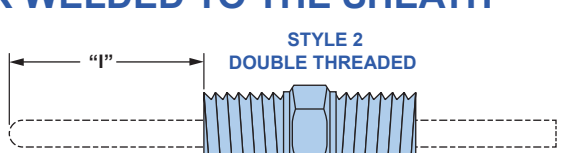
The sheath material is stripped back slightly and the conductors are welded together to form a measuring junction. The exposed insulation is sealed against moisture penetration. Exposed junctions provide the fastest possible response times but do not offer protection to the thermocouple conductors.

Order Symbol:
E – Single Element
EC* – Dual Element Common
ES* – Dual Element Separate

* When ordering dual element remote or exposed junctions, a “C” indicates common junction (all four conductors welded together forming a common junction); an “S” indicates separate junctions (each thermocouple element independently junctioned and isolated from each other).

FIXED FITTINGS – ARE BRAZED OR WELDED TO THE SHEATH





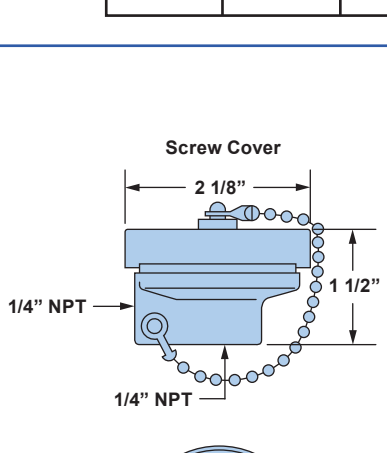
ORDER SYMBOL		THREAD SIZE	MATERIAL	AVAILABLE TO FIT THESE SHEATH O.D. SIZES
STYLE 1	STYLE 2			
F11	F21	1/8" NPT	304SS	0.063, 0.125, 0.188 & 0.250
F12	F22	1/4" NPT	304SS	0.063, 0.125, 0.188, 0.250, 0.313 & 0.375
F14	F24	1/2" NPT	304SS	0.063, 0.125, 0.188, 0.250, 0.313, 0.375 & 0.500
F16	F26	3/4" NPT	304SS	0.063, 0.125, 0.188, 0.250, 0.313, 0.375 & 0.500
F18	F28	1" NPT	304SS	0.063, 0.125, 0.188, 0.250, 0.313, 0.375 & 0.500

SPRING-LOADED FITTINGS

STYLE 1 – SINGLE THREADED

STYLE 2 – DOUBLE THREADED

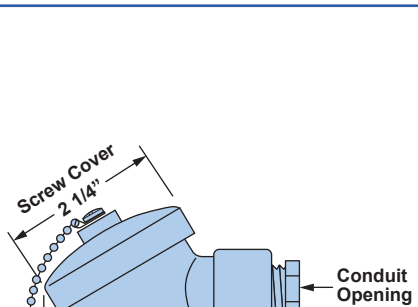
ORDER SYMBOL		THREAD NPT SIZE	MATERIAL	SPRING TYPE	AVAILABLE SHEATH SIZES
STYLE 1	STYLE 2				
SF14	SF24	1/2" NPT	304SS	Adjustable	0.125, 0.188, 0.250, 0.312 & 0.375
SB14	–	1/2" NPT	BRASS	Adjustable	0.125, 0.188, 0.250, 0.312 & 0.375
SPF14	SPF24	1/2" NPT	304SS	Adjustable with Liquid-tight O-Ring	0.125, 0.188 & 0.250



Miniature Weatherproof Thermoset Plastic Head

1/4" NPT x 1/4" NPT with 4 Integral Terminals

Part Number	Ambient Temperature Rating
N22	350° F
W22	800° F



Miniature Aluminum Head (Type M)

Part Number: M44* (1/2" x 1/2" NPT)

(Use "120" Series Terminal Blocks)

Max No. of Terminals: 4 + Ground

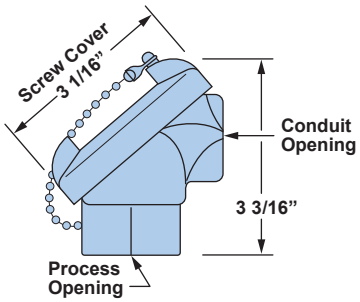
*See note on page A-18

Ceramic Terminal Blocks

Fit Miniature Head Type: M

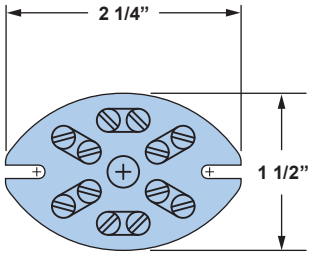
Part Number	Description
CP122	2 - Terminals
CP124	4 - Terminals

TERMINAL HEADS & CONNECTOR BLOCKS



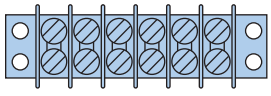
Standard Weatherproof Heads
(Use "115F Series" Ceramic Terminal Blocks)
Max. number of terminals: 6+Ground.

Part Number[1]	Type	Description
P46*	P	Polypropylene
PW46*	PW	White Polypropylene[2] (FDA Compliant)
Q46*	Q	Aluminum
R46*	R	Cast Iron
T46*	T	Cast Iron/Aluminum[5] Explosion Proof[4]



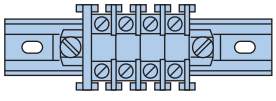
115 Series Ceramic Terminal Blocks

Part Number[1]	Description
CP115F	2 Terminals



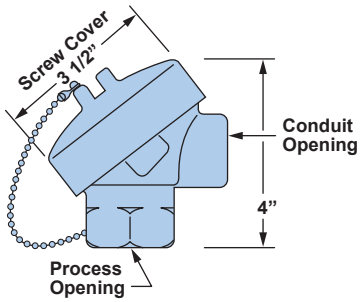
CP129 & CP130 Terminal Strips
CP129 (3/8" spacing) is standard in E & F type heads.
CP130 (7/16" spacing) available with compensated terminals is commonly used in junction boxes.

To Order Specify
CP130–12–K
- K — Type of Optional Compensated Terminals (Available on CP130 only)
- 12 — Number of Terminals (20 max.)
- CP130 — Part Number



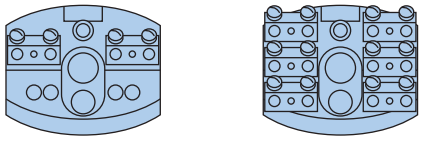
CP140 Tubular Clamp Type Terminal Strip
Commonly used in junction boxes. May be specified as an option for E & F type heads.

To Order Specify
CP140–10
- 10 — Number of Terminals
- CP140 — Part Number



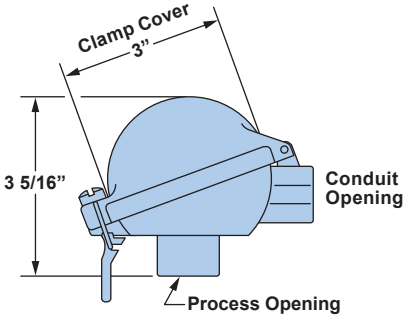
Large Weatherproof Heads
(Use "100 Series" Ceramic Terminal Blocks)
Max. number of terminals: 6+Ground.

Part Number[1]	Type	Description
A46*	A	Aluminum
C46*	C	Cast Iron



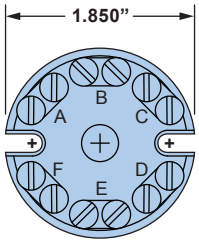
100 Series Ceramic Terminal Blocks
Fit Head Types: A, B, C, D

Part Number[1]	Description
CP102	2 Terminals
CP104	4 Terminals
CP106	6 Terminals



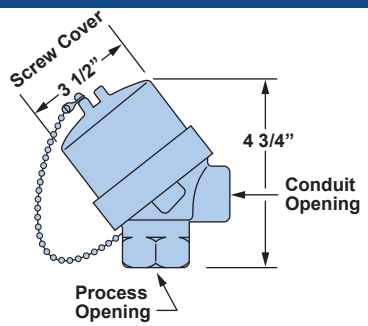
Weatherproof Aluminum Head
(Use "117 Series" Terminal Blocks)
Max No. of Terminals: 6 + Ground

Part Number[1]	Type	Description
H44*	H	1/2" x 1/2" NPT
H46*	H	1/2" x 3/4" NPT



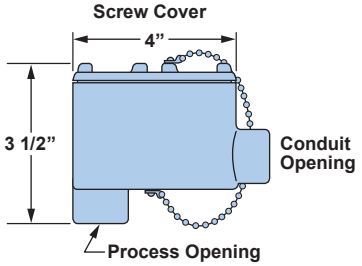
117 Series Ceramic Terminal Blocks
Fit Head Type: H44

Part Number	Description
CP117	6 Terminals



Large Dome Cover Weatherproof Heads
(Use "100 Series" Ceramic Terminal Blocks)
Max. number of terminals: 6+Ground.

Part Number[1]	Type	Description
B46*	B	Aluminum
D46*	D	Cast Iron



Large Explosion Proof[3] Heads
(Standard Terminal Block is CP129)
Max No. of Terminals: 6 + Ground

Part Number[1]	Type	Description
E46*	E	Aluminum
F46*	F	Cast Iron/Aluminum[5]

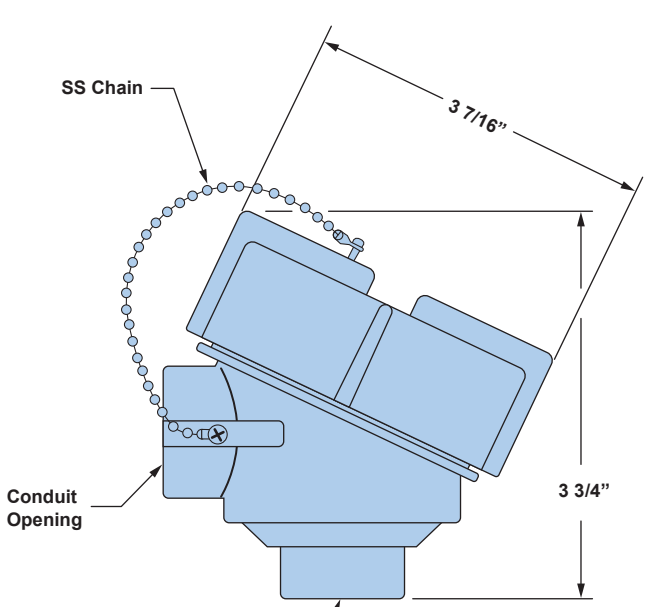
To Order Any Head On This Page
C 4 6 B
- B — Connector block if required. B – 2 Terminals C – 3 Terminals D – 4 Terminals F – 6 Terminals
- 6 — Conduit Opening (See table A below)
- 4 — Process Opening (See table A below)
- C — Head Type
- If a tapped internal ground screw is required insert a "G" in front of the part number.

Table A -Connection Sizes[7] (All heads on this page)

NPT SIZE	ORDER CODES	Available on Head Types	
		PROCESS	CONDUIT
1/2	4	All	All
3/4	6	All except H+P	All
1	8	A B C D E F & R	E & F

Notes:
* To order heads complete with terminal block add suffix to specify the number of terminals required B=2 terminals, C=3 terminals, etc.
1. Unless otherwise noted, all head part numbers shown are for heads with 0.5" NPT process openings and 0.75" NPT conduit openings. See Table A for other available sizes.
2. PW series heads may be specially ordered with molded-in terminals. To order insert an "M" before the number of terminals required. Example: PW46MF would have 6 molded-in terminals.
3. Type E & F explosion proof heads are approved for Class 1, Groups B, C, & D; Class 2, Groups E, F & G; Class 3, All Groups.
4. Type T explosion proof heads are approved for Class 1, Groups C & D; Class 2, Groups E, F & G; Class 3, All Groups.
5. Type F & T explosion proof heads have cast iron bodies with aluminum covers.
6. Aluminum & Cast Iron heads are available with epoxy coating add an "X" after the type designation. Example: QX46D.
7. Some NPT sizes are achieved through the use of reducing bushings.

TERMINAL HEADS & CONNECTOR BLOCKS



To Order Specify

AE–46–D

- Standard Terminal Block
  B – 2 Terminal Block (CP162B)
  C – 3 Terminal Block (CP162C)
  D – 4 Terminal Block (CP162D)
  F – 6 Terminal Block (CP162F)
  Leave blank if no Terminal Block
- Connection Code (See Table B)
- Basic Part Number (See Table A)

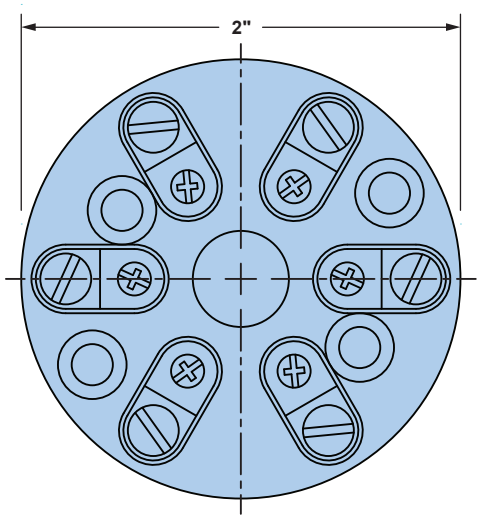
TABLE A - Basic Part Numbers	
Part Number	**Material**
AE	Aluminum, Explosion Proof
AEX	Epoxy Coated Aluminum, Explosion Proof
SE	316SS, Explosion Proof

Table B – Connection Code		
Code	**Process Opening**	**Conduit Opening**
44	1/2" NPT	1/2" NPT
45	1/2" NPT	M20 x 1.5
46	1/2" NPT	3/4" NPT
66	3/4" NPT	3/4" NPT

FM/CSA APPROVALS:
CLASS 1, DIV. 1, GROUPS B, C & D and
Dust Ignitionproof for Class II, Div. 1,
Group E, F and G, Class III
Type 4X and IP68

Ex II 2 G Ex d IIC Gb Ta, IP68
II 2 D Ex tb IIIC Db Ta, IP68

IECEx Approvals:
Ex d IIC Gb
Ex tb IIIC Db



Part Number	Number of Terminals
CP162B	2
CP162C	3
CP162D	4
CP162E	5
CP162F	6