

1 DESCRIPTION

The Model CBL-C2 cryocable simplifies interfacing between STAR Cryoelectronics' standard SQUID sensor packages and single-channel Programmable Feedback Loops Models PFL-100 and PFL-102.

Standard cryocables are assembled using a stainless steel braided shield; cryocables with optional solid stainless steel shields offering 100% shielding against electromagnetic interference (EMI) are available by special order. Standard wiring includes four (CBL-C2-10) or five (CBL-C2-14) twisted pairs of 0.005 (125 μm) OD phosphor-bronze and one pair of 0.005 (125 μm) OD copper wire with heavy polyimide insulation. Optional builds with six pair of 0.004 OD phosphor-bronze and one pair of 0.004 (125 μm) OD copper wire are available by special order for TES detector applications using STAR Cryoelectronics' PFL-102T programmable feedback loop. The warm-end connector housing is vacuum sealed and may be installed through a ½-inch opening. Two 4-40 bolt holes are available to securely mount the warm-end connector housing to a cryostat flange.

The standard cable length is 1 meter; custom lengths and optional heat sinks for vacuum installations are available by special order.

FEATURES

- Stainless steel braided shield to minimize thermal loss.
- Vacuum sealed connector housing may be bolted directly to cryostat flange.
- Mates with all STAR Cryoelectronics SQUID sensors and single-channel Programmable Feedback Loop electronics.

2 ORDER INFORMATION

The standard model numbers for CBL-C2 cryocables are summarized in the table below. For custom cables including optional heat sinks, please contact STAR Cryoelectronics.

Model	Description
CBL-C2-10-L	Standard 10-pin, overall length L (in meters)
CBL-C2-10W-L	Standard 10-pin, warm connector only, overall length L (in meters); cold end terminates with 10 cm of wire pigtailed
CBL-C2-10C-L	Standard 10-pin, cold connector only, overall length L (in meters); warm end terminates with 10 cm of wire pigtailed
CBL-C2-14-L	Standard 14-pin, overall length L (in meters)
CBL-C2-14W-L	Standard 14-pin, warm connector only, overall length L (in meters); cold end terminates with 10 cm of wire pigtailed
CBL-C2-14C-L	Standard 14-pin, cold connector only, overall length L (in meters); warm end terminates with 10 cm of wire pigtailed

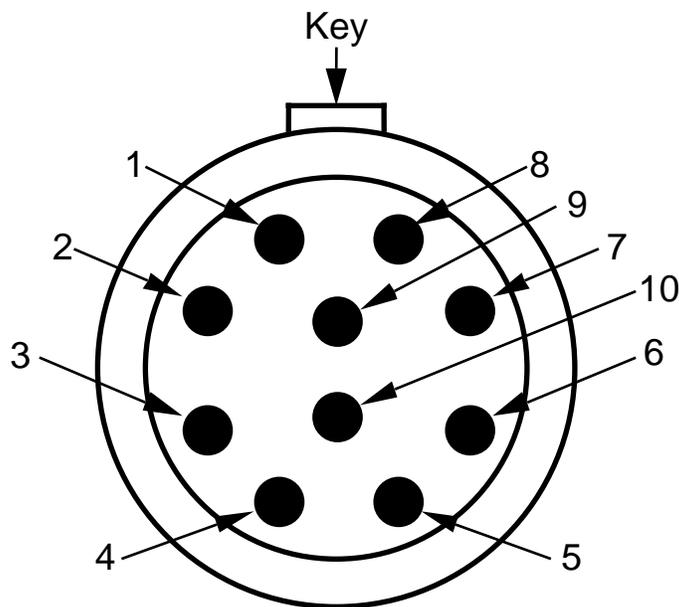
3 SPECIFICATIONS

Item	Description	CBL-C2-10	CBL-C2-14
PFL		PFL-100	PFL-102
Warm Connector		LEMO EHG.1B.310.CLL	LEMO EHG.1B.314.CLL
Cold Connector		LEMO EGG.1B.310.ZLL	LEMO EGG.1B.314.ZLL
Braided Shield	.002 OD stainless steel, six wires per bundle, wrapped on PTFE tube core, .038 ID, .062 OD; overall OD .094		
Solid Shield	Type 304 stainless steel, seamless, .062 OD, .006 wall		
Ph-Br Leads	Cu (94.8%), Sn (5%), Ph (.2%); .005 OD, twisted pair (7-10 TPI), polyimide insulation, red/green,	4 pair	5 pair
Resistance	9.07 Ohms/meter		
Thermal Conductivity	0.699 W/cm-°C		
Cu Leads	Cu, 99.99%; .005 OD, twisted pair (7-10 TPI), polyimide insulation, clear/green	1 pair	1 pair
Resistance	1.35 Ohms/meter		
Thermal Conductivity	3.84 W/cm-°C		

3.1 Pin Assignments, CBL-C2-10 (10-Pin Cryocables)

Sensor	Cold End	Wire Type	Warm End	PFL-100	Resistance ¹ [Ω]
+H	1	Ph-Bronze	1	+H	10
+V	2	Copper	2	+V	2
-V	3	Copper	3	-V	2
-H	4	Ph-Bronze	4	-H	10
-FB	5	Ph-Bronze	5	-FB	10
+FB	6	Ph-Bronze	6	+FB	10
+M	7	Ph-Bronze	7	+M	10
+I	8	Ph-Bronze	8	+I	10
-I	9	Ph-Bronze	9	-I	10
-M	10	Ph-Bronze	10	-M	10

¹Resistances are typical values for standard 1-meter cable length.

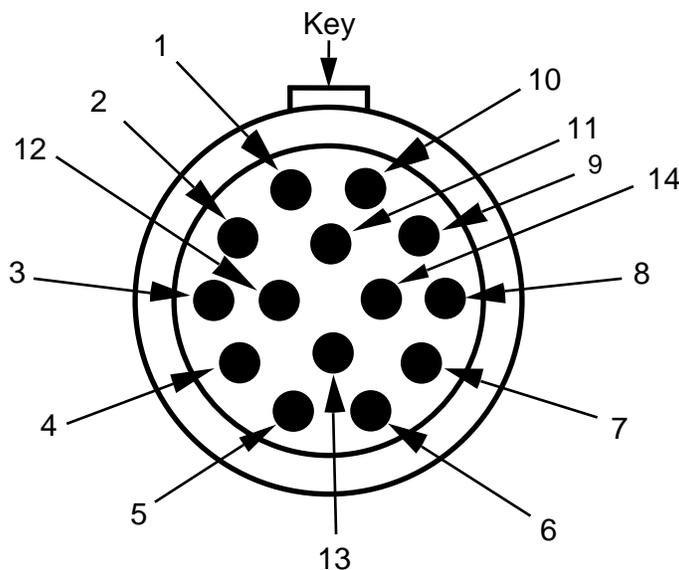


Pin numbering scheme for the cryocable connectors (LEMO receptacle), as seen when looking at the connector. The Key refers to the keyed slot on the warm end receptacle and the tab on the cold end connector.

3.2 Pin Assignments, 14-Pin Cryocables

Sensor	Cold End	Wire Type	Warm End	PFL-102	Resistance ¹ [Ω]
+V	1	Copper	1	+V	2
-V	2	Copper	2	-V	2
N/C	3		3	N/C	
-I1	4	Ph-Bronze	4	-I1	10
+I1	5	Ph-Bronze	5	+I1	10
+H	6	Ph-Bronze	6	+H	2
-H	7	Ph-Bronze	7	-H	2
N/C	8		8	N/C	
+FB1	9	Ph-Bronze	9	+FB1	10
-FB1	10	Ph-Bronze	10	-FB1	10
-I2	11	Ph-Bronze	11	-I2	10
-FB2	12	Ph-Bronze	12	-FB2	10
+FB2	13	Ph-Bronze	13	+FB2	10
+I2	14	Ph-Bronze	14	+I2	10

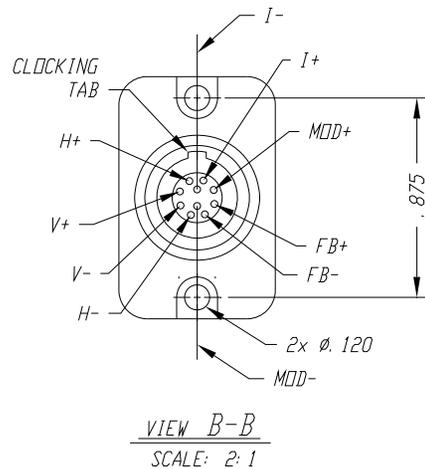
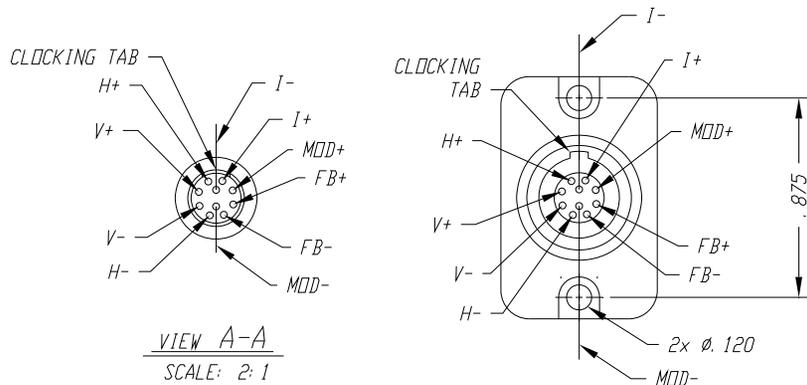
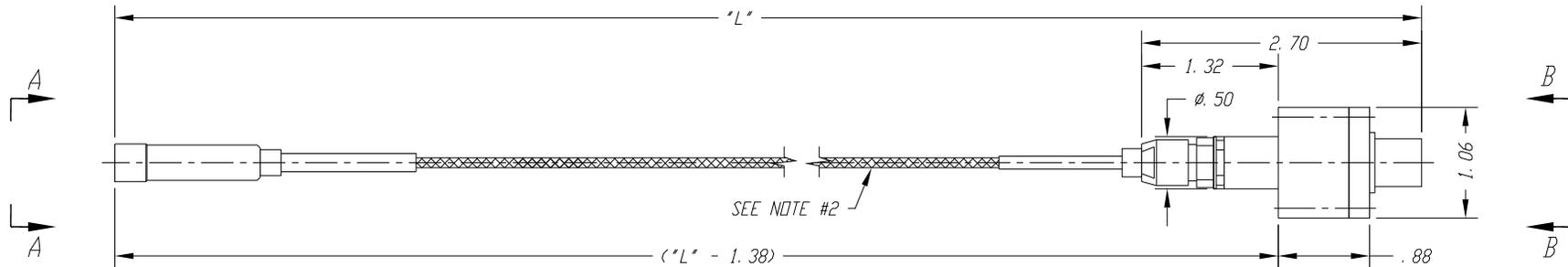
¹Resistances are typical values for standard 1-meter cable length.



Pin numbering scheme for the cryocable connectors (LEMO receptacle), as seen when looking at the connector. The Key refers to the keyed slot on the warm end receptacle and the tab on the cold end connector.

5 MECHANICAL SPECIFICATIONS

5.1 CBL-C2-10

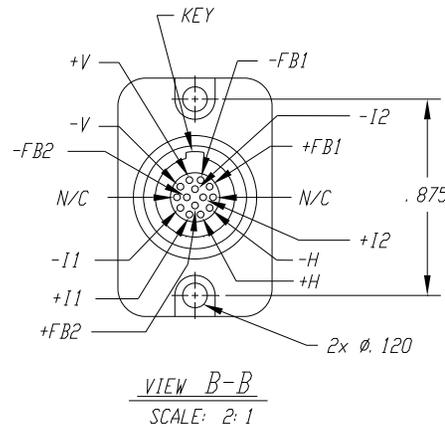
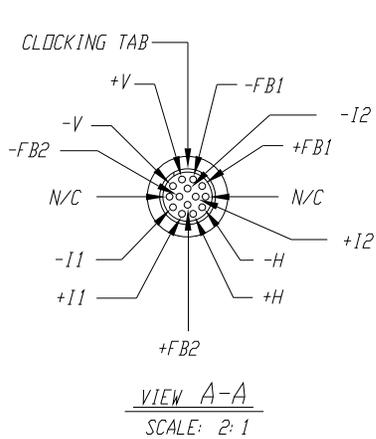
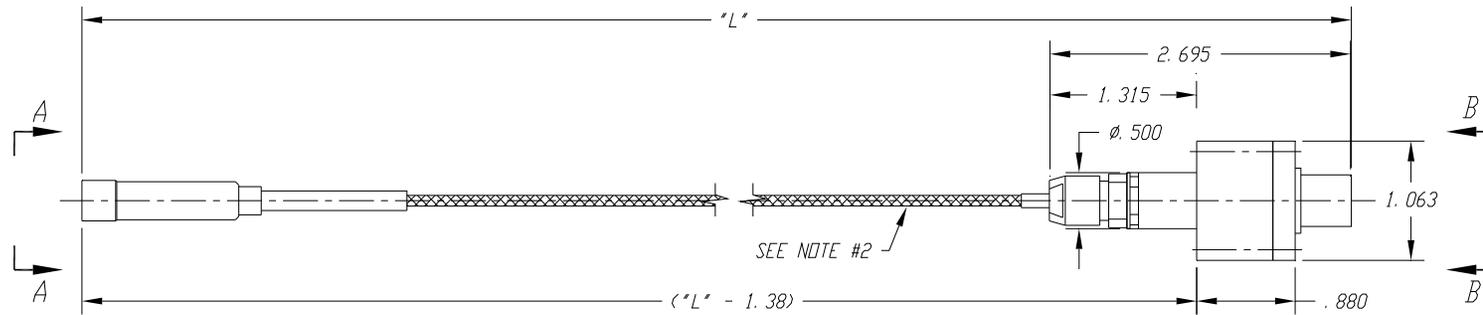


NOTES: UNLESS OTHERWISE SPECIFIED.

- 1 TEN CONDUCTOR CABLE WITH:
4 TWISTED PAIRS OF 0.005 DIAM. Ph-Br (+/-I, +/-M, +/-FB, +/-H),
1 TWISTED PAIR OF 0.005 DIAM. Cu (+/-V).
- 2 INNER TEFLON JACKET, STAINLESS STEEL BRAID,
NOM. Ø0.094 O. D.

Mechanical specifications, Model CBL-C2-10 cryocable with 10-pin LEMO connectors. The standard length L is 1 meter.

5.2 CBL-C2-14



NOTES: UNLESS OTHERWISE SPECIFIED.

1. TWELVE CONDUCTOR CABLE WITH:
5 TWISTED PAIRS OF 0.005 DIAM. Ph-Br (+/-I1, +/-I2, +/-FB1, +/-FB2, +/-H)
1 TWISTED PAIR OF 0.005 DIAM. Cu (+/-V).
2. INNER TEFLON JACKET, STAINLESS STEEL BRAID, NOM. Ø0.094 I. D.

Mechanical specifications, Model CBL-C2-14 cryocable with 14-pin LEMO connectors. The standard length L is 1 meter.