PRELIMINARY TECHNICAL INFORMATION

Signal conditioner for MTM-series sensors + voltage transducer



non-contractual photo

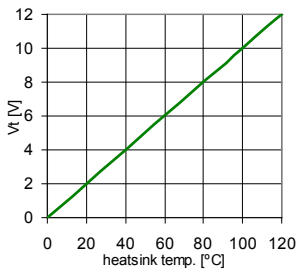
HIGHLIGHTS

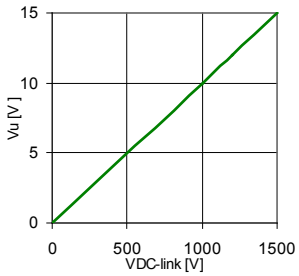
- Heatsink temperature signal conditioning
- Up to 3 output phase current signal conditioning
- DC-link voltage measuring (up to 1500 V_{DC})
- Mechanical adaption for connect up to 3 internal modules NTC's and a thermostat

SCiSensor153 is a signal conditioner board designed for conditioning the electrical output signals of the sensors included in the MTM-series**.** It also includes the voltage transducer. **SCiSensor153** concentrates all the necessary feedback signals (for monitoring and control) in a single connector.

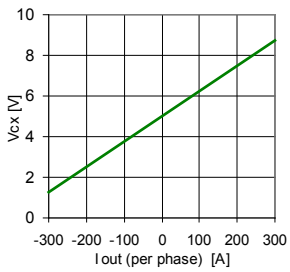
ELECTRICAL CHARACTERISTICS

Description	*symbol*	*notes/test conditions*	*Min*	*Typ*	*Max*	*Units*
Supply voltage	V_{CC}			±15		V
Feedback signal of heatsink temp.	V_T	relative error <2.5%	0		12	V
Heatsink temp. measurable range			0		120	ºC
Feedback signal of output current	V_{CX}	relative error <3%	0		10	V
Current measurable range		using HASS 100-S	-300		300	A
Current measurable range		using HASS 200-S	-600		600	A
Current measurable range		using HASS 300-S	-900		900	A
Feedback signal of DC-link voltage	V_U	relative error <2.8%	0		15	V
DC-link measurable voltage range			0		1500	V_{DC}

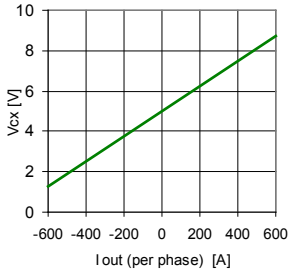




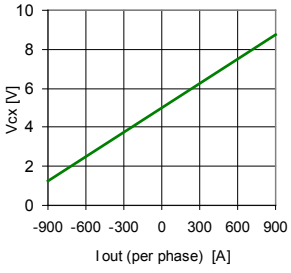
using HASS 100-S



using HASS 200-S



using HASS 300-S



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CON1	designation	function
1	+15Vcc	+15V_{DC} for supply voltage
2	NTCU1	NTC terminal 1 of IGBT module U
3	NTCV2	NTC terminal 2 of IGBT module V
4	NTCV1	NTC terminal 1 of IGBT module V
5	NTCW1	NTC terminal 1 of IGBT module W
6	NTCU2	NTC terminal 2 of IGBT module U
7	NTCW2	NTC terminal 2 of IGBT module W
8	TH_2	Thermostat terminal 2
9	V_T	Output signal of heatsink temp.
10	TH_1	Thermostat terminal 1
11	V_{C_V}	Output signal of phase V output current
12	V_U	Output signal of VDC-link voltage
13	V_{C_W}	Output signal of phase W output current
14	V_{C_U}	Output signal of phase U output current
15	-15Vcc	-15V_{DC} for supply voltage
16	GND	Ground terminal for supply and signal

connector CON1: type TYCO 1-1634688-6
connector JTH, JN1, JN2, JN3: type MOLEX 22-27-2021
connector JT: type MOLEX 22-27-2031
connector JVDC,JC1, JC2, JC3: type MOLEX 22-27-2041

JVDC:1	to R+ V_{DC}link voltage sensing
JVDC:2	N.C.
JVDC:3	N.C.
JVDC:4	to R- V_{DC}link voltage sensing
JT:1	to V- HTS system
JT:2	to ADJ HTS system
JT:3	to V+ HTS system
JC1:1	5V to supply HASS X00-S (1)
JC1:2	GND for HASS X00-S (1)
JC1:3	output signal from HASS X00-S (1)
JC1:4	reference for HASS X00-S (1)
JC2:1	5V to supply HASS X00-S (2)
JC2:2	GND for HASS X00-S (2)
JC2:3	output signal from HASS X00-S (2)
JC2:4	reference for HASS X00-S (2)
JC3:1	5V to supply HASS X00-S (3)
JC3:2	GND for HASS X00-S (3)
JC3:3	output signal from HASS X00-S (3)
JC3:4	reference for HASS X00-S (3)
JN1:1	to internal module NTC 1 (A)
JN1:2	to internal module NTC 1 (B)
JN2:1	to internal module NTC 2 (A)
JN2:2	to internal module NTC 2 (B)
JN3:1	to internal module NTC 3 (A)
JN3:2	to internal module NTC 3 (B)
JTH:1	to thermostat (A)
JTH:2	to thermostat (B)

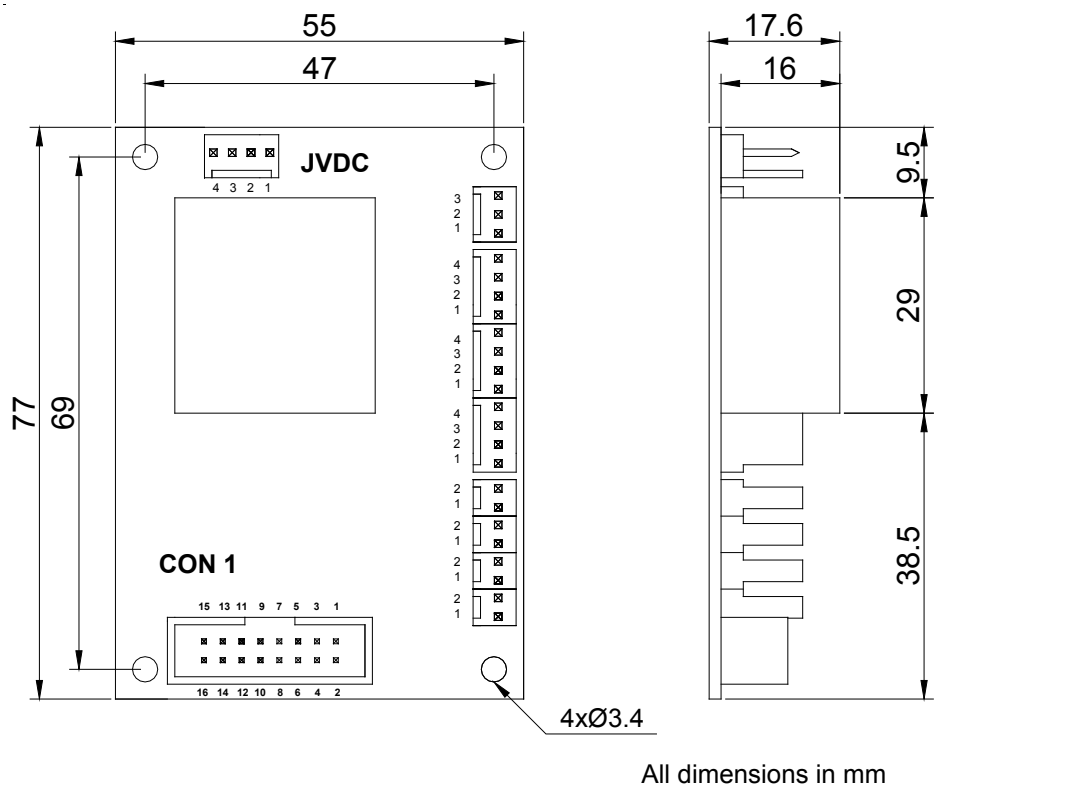


Figure 1: *General PCA dimensions.*

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On-board calibration and adjustments

In this section is detailed the calibration procedure to adjust the outputs of DC-Link voltage sensor (V_U) and heatsink temperature (V_T) of **SCiSensor153** board.

ADJUSTING VOLTAGE SENSOR GAIN STAGE

In order to adjust the SCiSensor153 voltage sensor gain the JVDC connector must be connected, as is shown in Figure 2, along with an external resistive load great enough as to procure a current between pins 1 and 4 of approximately 10 mA when connected to nominal voltage on DC-Link.

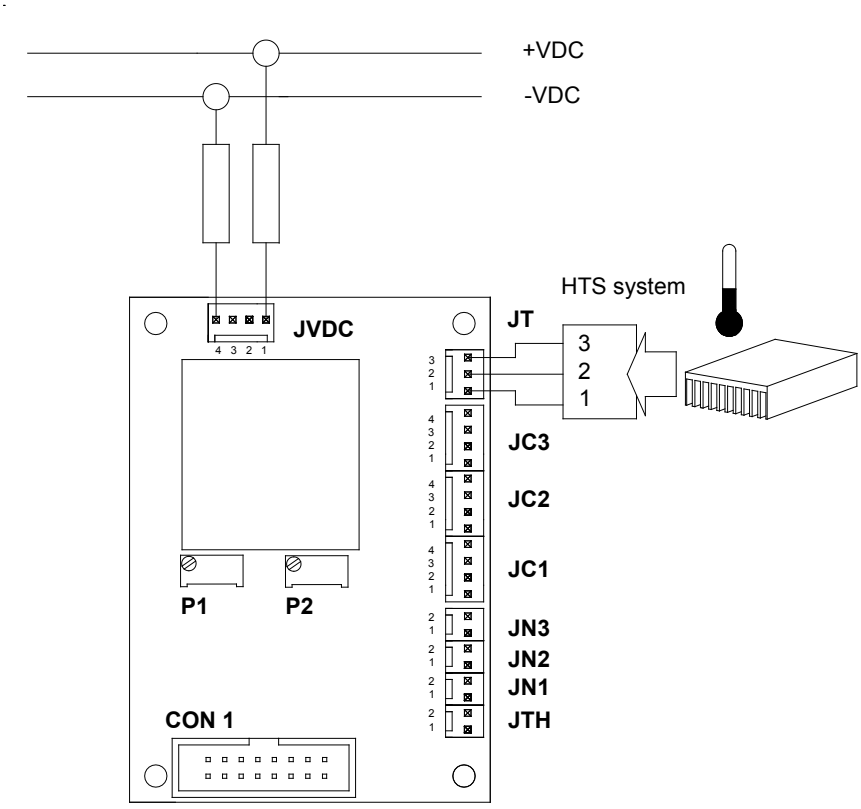


Figure 2: *SCiSensor153 connection scheme.*

In those cases where the board is part of a MTM-series power stack the external resistive load is already included on the equipment and it is only necessary to connect JVDC connector of the board with its corresponding cable.

The adjust of voltage sensor gain stage it must be performed at power stack nominal DC-Link voltage in order to minimize the global relative error and linearity error inherent to the on-board voltage sensor (<0.2%) in the surroundings of its working voltage point.

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- Adjust Procedure:

- Connect the PCA to the power supply, ±15 V_{DC} (±5%) through CON1. Please see CON1 connector pinout table on page 2.
- Connect, with an external resistive load if needed, the adjusting voltage (nominal working voltage). When the board is part of a MTM-series power stack, supply to the DC-Link terminals the working nominal voltage while JVDC is connected to the board.
- Adjust by means of P1 multi-turn potentiometer (see Figure 2) the voltage signal output amplitude (CON1[p12]-VU) of SCiSensor153.

Notes:
The regulation and final adjust of voltage sensor gain must be performed once the board has been installed in its MTM power stack or in its final application.

Board's correct adjustment depends directly on the external resistive load, because of that each board must be adjusted matching the load resistor associated to the power stack.

For this reason, if a matched SCiSensor153 is changed or replaced then will be necessary to proceed with a new adjustment and calibration of its voltage sensor.

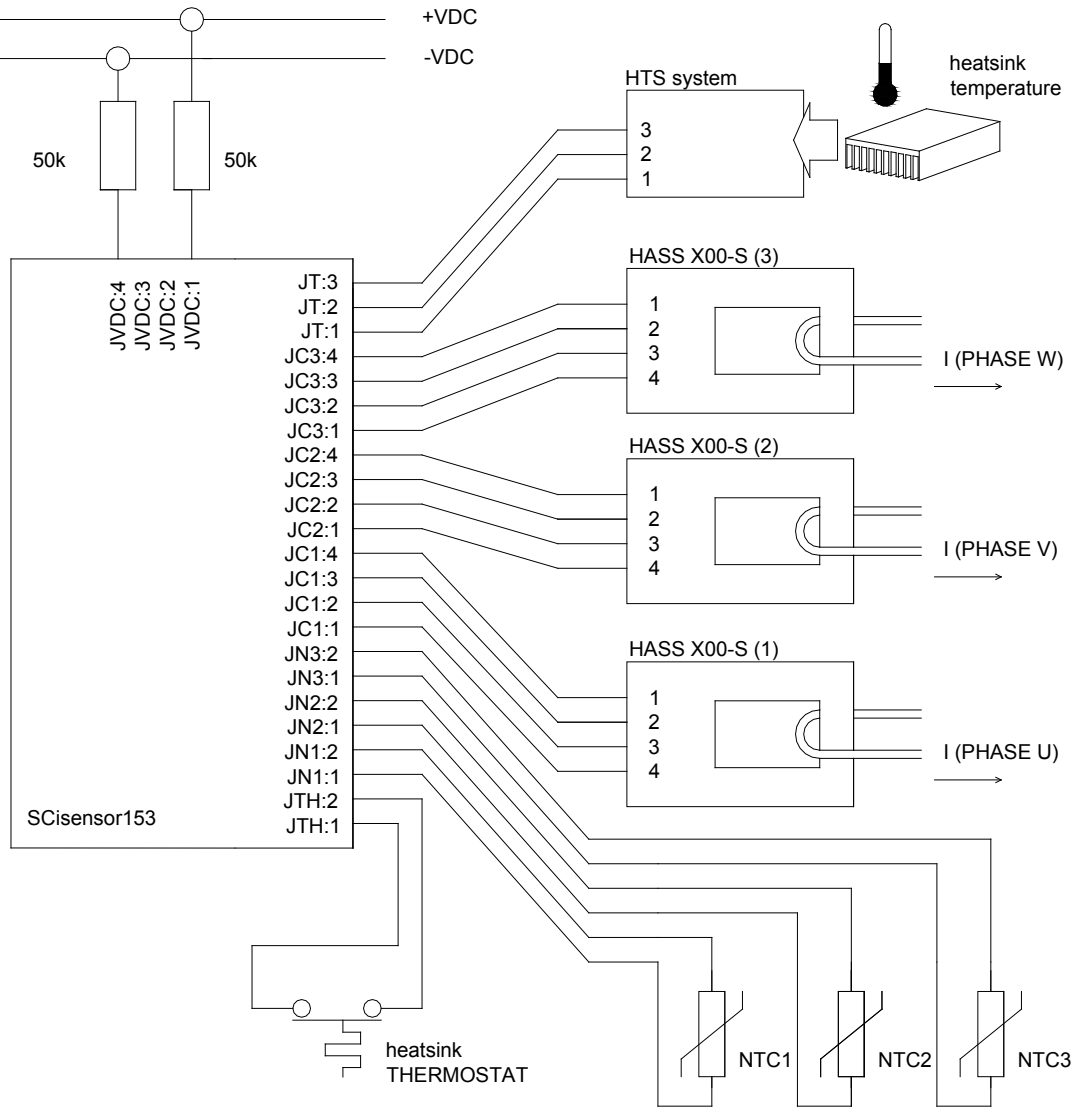
HTS HEATSINK TEMPERATURE SENSOR ADJUSTMENT

HTS heatsink temperature sensor it is factory adjusted and it would not be necessary to make any later adjustment.
However, the output amplitude of this sensor can be adjusted using on-board P2 multi-turn potentiometer (see Figure 2) by checking on the corresponding output signal of HTS sensor (CON1[p9]-V_T).

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APPLICATION EXAMPLE



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