

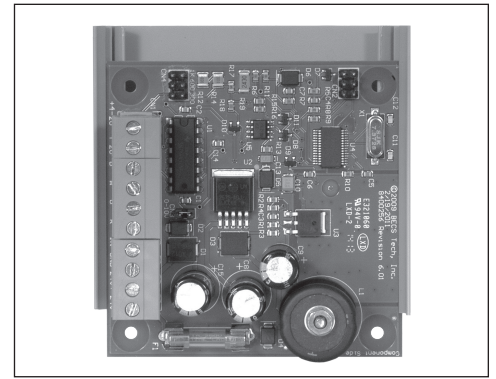


Sporlan IB Series Interface Boards

IB1, IB2, IB3, IB6, IB ESX

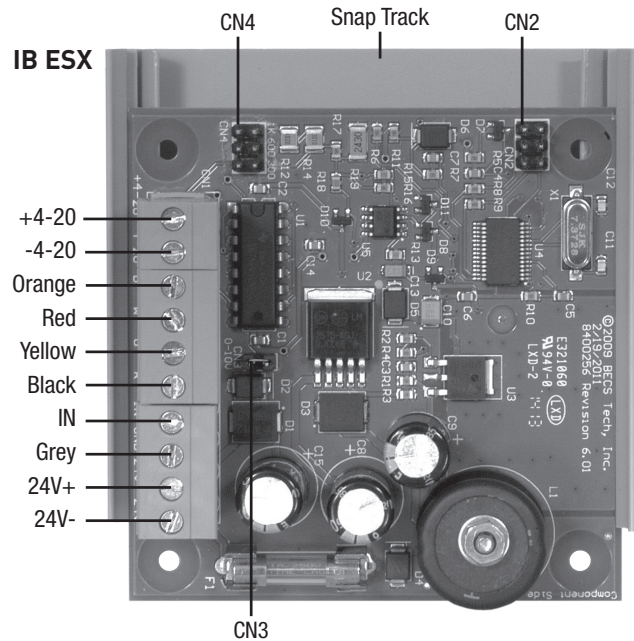
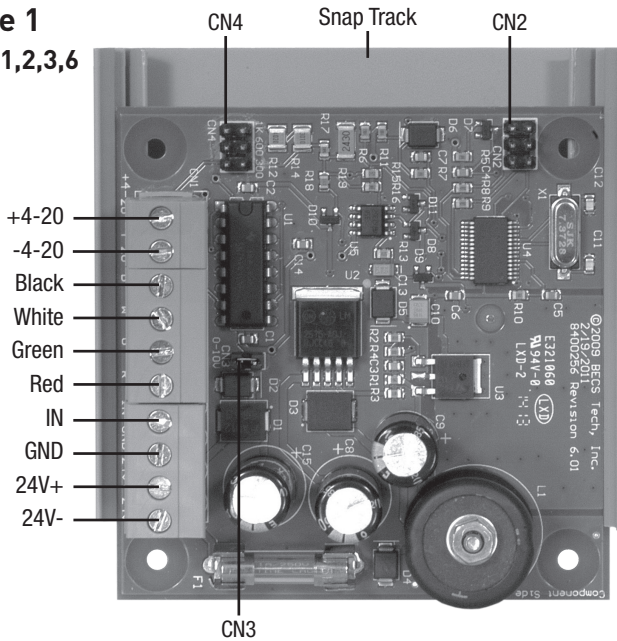
SD-278/072014

Interface Boards



The **IB Series** interface boards have been developed as economical compliments to the TCB temperature control boards. The **IB Series** is available in five basic models, IB1, IB2, IB3, IB6, and IB ESX and each can accept 4-20 milliamp or 0-10 volt DC analog input signals. All are designed to allow externally supplied control signals to control one or two Sporlan step motor valves including CDS evaporator control valves, SDR electric discharge bypass valves, and SEI/SER/SEH/ESX electric expansion valves.

Figure 1



The IB ESX is specifically programmed to control the ESX family of valves. The IB1 is programmed to control any Sporlan step motor valve having 1596 steps of resolution, the IB2 is used with valves having 2500 steps, the IB3 is used with valves having 3193 steps and the IB6 is used on valves with 6386 steps. “Q” denotes quick response for special applications. Please contact Sporlan Division. Refer to Ordering Information, page 3.

CONFIGURE THE BOARD

When used with a 0-10 volt input signal, a jumper should be placed on the pins labeled CN3 as shown in Figure 1. This is the default jumper position. The impedance for this input is 40k ohms.

When used with a 4-20 milliamp input, the board must be matched to the impedance of the external controller. Refer to the manufacturer’s literature and choose the jumper position on CN4 as shown in Figure 1. Possible impedance selections on CN4 are 1,000 ohms (1k), 600 ohms, and 300 ohms.

Choose “Open on Rise” or “Close on Rise” operation using the middle two pins on jumper CN2. The jumper is stored on one

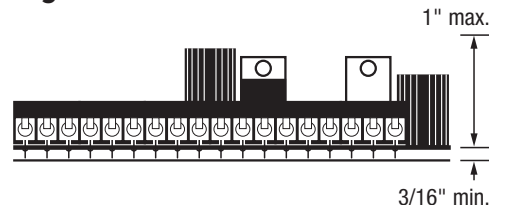
pin only and will cause the valve to open as input signal rises, i.e. valve is closed at 0 volts or 4 milliamps and fully open at 10 volts or 20 milliamp input. By placing the jumper on both pins, the operation is reversed so that the valve will be fully open at 0 volts or 4 milliamps. Other pins on CN2 have been clipped at the factory and are not used for operation of the valve.

MOUNT THE BOARD

The **IB Series** is based on a 3.0” x 3.0” circuit card with 0.125” mounting holes, 0.25” from each corner. If desired, these mounting holes may be used with customer supplied non-metallic standoffs. The **IB Series** does, however, come supplied with a length of snap-in plastic track. The track should be

mounted in the desired location and one side of the IB engaged in the upper groove in the track. The IB is then pushed down so that the opposite side of the board snaps into the uppermost groove in the opposite side of the track. The board must be mounted in the orientation shown in Figure 1. Location should be dry, protected and close to the 24 volt power supply and external controller.

Figure 2



WIRING INSTRUCTIONS & CAUTIONS

Use the chart as a guide for wire connections. Certain precautions must be taken in wiring and operation of the **IB Series**.

1. The 24 volts must be supplied by a 30 VA or 40 VA transformer (depending on the valve type and number of valves per IB) not used for any other purpose. In addition, the secondary winding of the transformer must not be connected

WIRING CONNECTIONS

From left to right when the board is oriented with the terminal strip across the bottom.

- +4-20** - connection for the positive leg of a 4-20 milliamp or 0-10 volt signal
- 4-20** - connection for negative leg of a 4-20 milliamp or 0-10 volt signal
- B** - black wire from valve, or both valves when two valves are used
- W** - white wire from valve, or both valves when two valves are used
- G** - green wire from valve, or both valves when two valves are used
- R** - red wire from valve, or both valves when two valves are used
- IN** - from external pumpdown switch or relay. See wiring instructions.
- GND** - to external pumpdown switch or relay. See wiring instructions.
- 24V-1** - from 24 volt, 30 VA or 40 VA transformer. See wiring instructions.
- 24V-2** - from 24 volt, 30 VA or 40 VA transformer. See wiring instructions.

NOTE: Power supplied may be 24 volts AC or DC.

to chassis ground. A single transformer may be used for multiple IB boards. If this feature is used, one leg of the 24 volt supply must be connected to all of the IB boards at the 24+ terminal. The other leg of the 24 volt supply must be connected to all of the IBs at the 24- terminal. **Please refer to Figure 3.** Incorrect wiring will cause the fuse to fail, a spare fuse is included and may be replaced with any 1 amp 250 volts delay fuse type GMC1 or equivalent. Wiring should be corrected before replacing the fuse.

2. The primary input of the transformer should be protected by Metal Oxide Varister (MOV) surge suppressors, supplied with the IB. For protection from electrical transients, connect one MOV between one leg of the input voltage (high side) of the 24 VAC transformer and earth ground. Connect a second MOV between the other leg of the input voltage of the 24 VAC transformer and earth ground. See Figure 3.
3. The pumpdown terminals must be supplied with a “dry” contact from a switch or relay. No external power should be applied to these terminals.

Note: The terminals are labeled IN and GND. The GND terminal is shared with the grey ESX wire. Do not connect GND to system ground.

OPERATION & TROUBLESHOOTING

When properly configured and installed the IB Series requires no maintenance. They incorporate a number of operational features to assure trouble free service. On power-up the board will initialize by giving the valve a large number of steps to assure that the valve is fully shut. The routine will require approximately 8 seconds for the IB1, 11 seconds for the IB ESX, 16 seconds for the IB2 and IB3, and 32 seconds for the IB6. The valve will not respond to input signals during this time. If the valve is required to shut during opera-

tion, the pumpdown terminals should be used. When given a pumpdown signal, the board will shut the valve immediately and overdrive by 250 steps to reset most valves' position and 50 steps for ESX valves. On removal of the pumpdown signal the valve will resume position as dictated by the external control signal.

If power is lost to the IB or wire to the valve severed, the valve will remain in its last position. Solenoid valves may be desired before the step motor valve on critical applications.

To force the valve shut during operation for test purposes, simply remove the jumper from CN4 or CN3, depending on configuration. To resume normal operation, replace the jumper.

To allow for component tolerances, the IB will shut the valve when the input signal reaches 4.05 milliamps or 0.05 volts depending on the configuration.

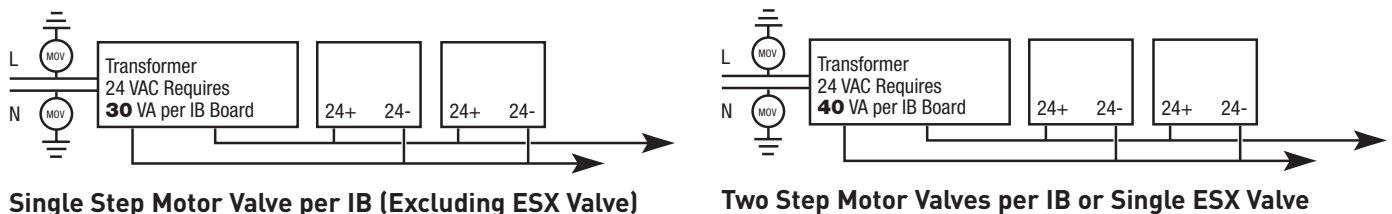
The IB can power one or two valves (IB-ESX can only power one ESX valve). The valves will operate simultaneously and will open and close by the same number of steps. Valve wires must be connected exactly the same for both valves.

TEST THE VALVE

The resistance of the motor winding may be tested without opening the system.

1. Remove power from the external controller and/or IB.
2. Remove the valve leads from IB.
3. Measure the resistance between the black and white leads of the valves. For the SEI, SDR, SEH, CDS-9, CDS-16, and CDS-17 valves, the resistance should be 75 ohms with the valve at room temperature or approximately 65 ohms if the valve is at -40°F. For the SERI-G, SERI-J, SERI-K, CDS-4, and CDS-7 valves, the resistance should be 100 ohms at room temperature and approximately 76 ohms if the valve is at -40°F.

Figure 2



4. Measure the resistance between the green and red leads. This value should be within $\pm 5\%$ of the resistance between the black and white leads.
5. Measure the resistance from any lead to valve body. Resistance should be infinite, that is to say, open.

TEST THE IB

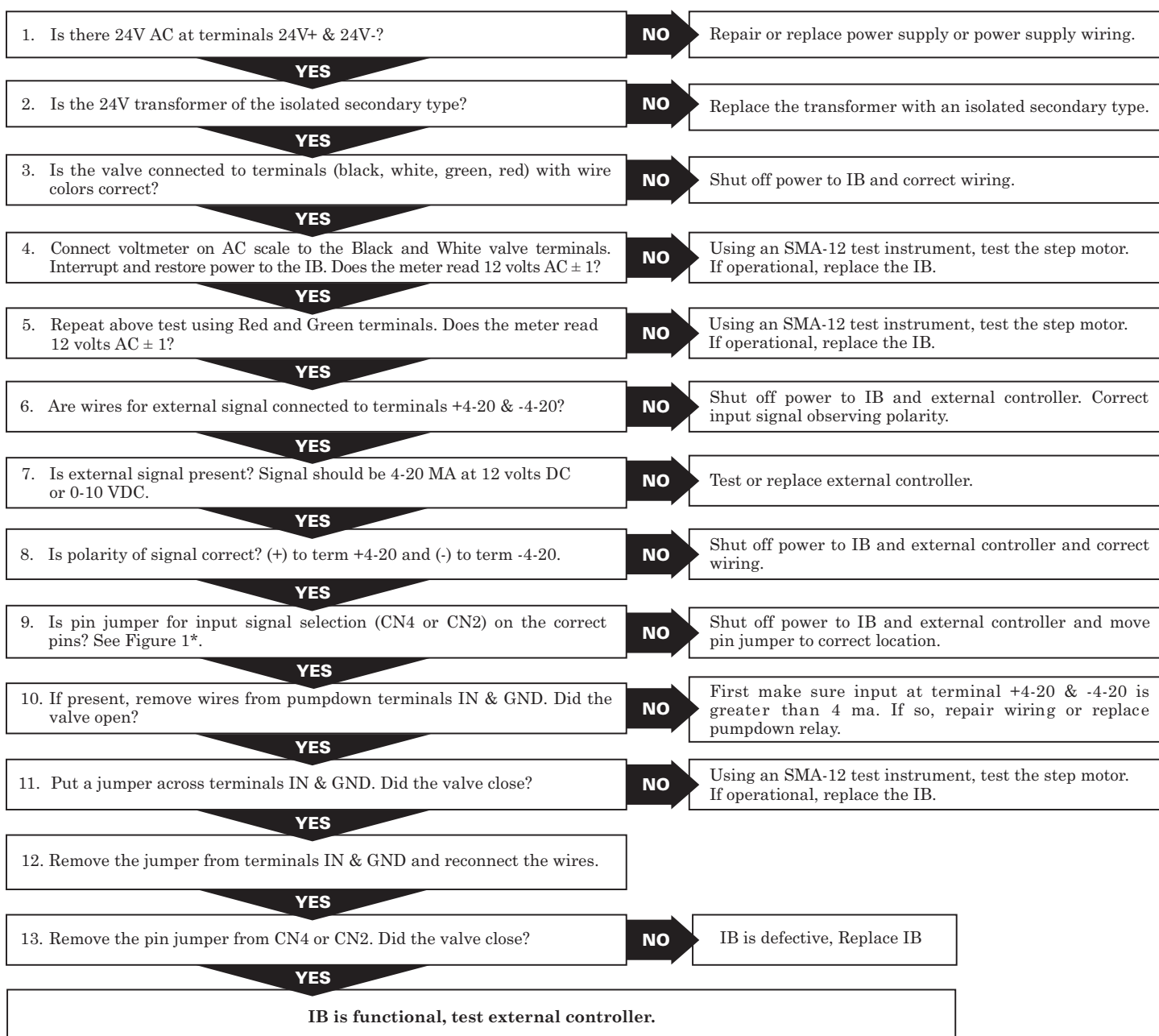
The flow charts on the following page are designed to assist in diagnosing a possible IB failure. All measurements should be made with a **Digital Multimeter**.

ORDERING INFORMATION

MODEL	PART #	STEPS	USED ON VALVES
IB1	952955	1596	SEI .5 -11, SER-1.5, SER-20 for discharge
IB2	983188	2500	CDS-4, CDS-7
IB3	952956	3193	SDR-3, SDR-3X
IB6	959957	6386	CDS-9, CDS-16, CDS-17, SDR-4
IB ESX	950002	500	ESX
IB1Q	952958	1596	SEI .5, SEI-11, SER
IB2Q	983189	2500	SERI-G, SERI-J, SERI-K
IB3Q	952959	3193	SEI-30
IB6Q	952960	6386	SEI-50, SEH

TROUBLESHOOTING GUIDE – IB Operating on External Signal (4-20 ma or 0-10 VDC)

Note: Before testing the IB, make certain the valve is operating. See "Test the Valve" instructions.



Note: CNA provides 3 levels of input impedance to match external controller outputs. Be sure controller output and IB inputs are matched. Refer to controller manufacturer literature for more information.

⚠ WARNING – USER RESPONSIBILITY

Failure or improper selection or improper use of the products described herein or related items can cause death, personal injury and property damage.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

For safety information see the Safety Guide at www.parker.com/safety or call 1-800-CParker.

OFFER OF SALE

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated in the detailed "Offer of Sale" elsewhere in this document or available at www.parker.com.

FOR USE ON REFRIGERATION and/or AIRCONDITIONING SYSTEMS ONLY

SD-278, July 2014 supersedes SD-278, November 2008 and all prior publications.

