



## DRG-SC-PT

### Potentiometer Input, Field Configurable Signal Conditioner

Instruction Sheet M2393/0796

#### DESCRIPTION

The DRG-SC-PT is a DIN rail mount, potentiometer input signal conditioner with 1800VDC isolation between DC power and the input/output circuitry. The input provides a constant voltage and is designed to accept any three-wire potentiometer from 100Ω to 100KΩ. The field configurable output is switch selectable providing either 0-5V, 0-10V, 0-1mA, 0-20mA or 4-20mA DC signal.

Wide ranging, precision zero and span pots, used in conjunction with DIP switches, allow 80% adjustability of offset and gain to transmit a full scale output from any 20% portion of the potentiometer input.

#### APPLICATION

The DRG-SC-PT field configurable, potentiometer input signal conditioner is useful in transmitting process control setpoints to remote PID controllers or interfacing position sensors to data acquisition and control systems.

The DRG-SC-PT's high density DIN rail mounting offers an extremely compact solution for saving valuable panel space.

#### CONFIGURATION

A major advantage of the DRG-SC-PT is its wide ranging capabilities and ease of configuration.

For example, in a valve positioning application a potentiometer is sometimes used as a feedback signal. Quite often a wide open valve is only a 25% turn of the feedback potentiometer. In this case the DRG-SC-PT can easily be adjusted with the zero and span to provide a full scale output signal (e.g. 4-20mA) representing 0-25% or even 50-75% of the potentiometer input.

Unless otherwise specified, the factory presets the Model DRG-SC-PT as follows:

Input Range: 0 to 100%  
Output: 4 to 20mA

The DC power input accepts any DC source between 9 and 30V; typically a 12V or 24VDC source is used.

For other output ranges, refer to Tables 1 and 2 to reconfigure switches SW1 and SW2 for the desired input and output ranges.

**WARNING:** Do not attempt to change any switch settings with power applied. Severe damage will result!

#### CALIBRATION

1. With power disconnected, set the output and input switch selectors (SW1 and SW2) to the desired ranges (Tables 1 and 2).

2. Connect the input and output as shown in Figure 1. Connect the output to the actual device load (or a load approximately equivalent to the actual device load value) and apply power.

*NOTE: To maximize thermal stability, final calibration should be performed in the operating installation, allowing approximately 1 to 2 hours for warm up and thermal equilibrium of the system.*

3. Set the input potentiometer to the desired minimum and adjust the zero potentiometer for the desired minimum output.

4. Set the input potentiometer to the desired maximum and adjust the span potentiometer for the desired maximum output.

Table 1: Input Range Switch Selector (SW2)

Span	SW2*					
	1	2	3	4	5	6
20 - 100%						
45 - 100%		■				
85 - 100%			■			
Offset	1	2	3	4	5	6
0 - 20%						
20 - 45%					■	
45 - 65%				■		
65 - 80%				■	■	

\* SW2-5,6 Not used.

Table 2: Output Range Switch Selector (SW1)

	SW1							
	1	2	3	4	5	6	7	8
0 to +5V	■	■	■	■				
0 to +10V	■		■	■	■			
0 to 1mA		■	■	■				
4 to 20mA						■	■	■
0 to 20mA							■	■

KEY ■ = ON

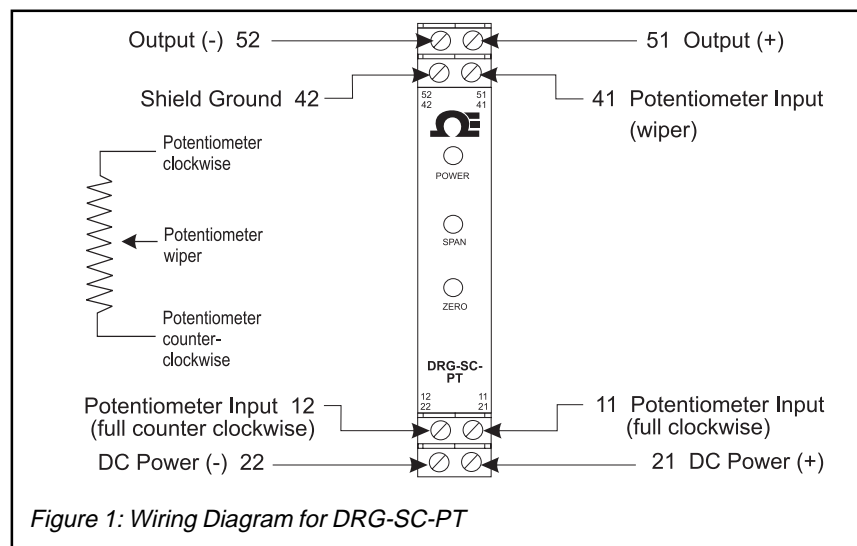
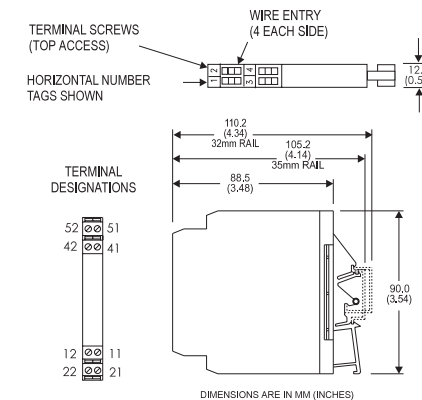


Figure 1: Wiring Diagram for DRG-SC-PT

#### DIMENSIONS



#### SPECIFICATIONS

**Potentiometer Input**  
Resistance (End to End): 100W up to 100KΩ  
Input Impedance: >1MΩ  
Input Excitation: 500mV, 5mA maximum drive.  
Zero Turn-Up: 80% of full scale input  
Span Turn-Down: 80% of full scale input (Table 1)  
Common Mode Rejection: 1800VDC (input to ground)

**Output**  
Voltage Output  
Output: 0-5V, 0-10V  
Source Impedance: <10Ω  
Drive: 10mA, max. (1KΩ min. @ 10V)  
Current Output  
Output: 0-1mA, 0-20mA, 4-20mA  
Source Impedance: >100KΩ

Compliance:  
0-1mA; 7.5V, max. (7.5KΩ, max.)  
0-20mA; 12V, max. (600Ω, max.)  
4-20mA; 12V, max. (600Ω, max.)

**Accuracy** (Including Linearity, Hysteresis)  
±0.1% maximum at 25°C.

**Stability**  
Temperature: <±0.05%/°C maximum of full scale range.  
Line Voltage: <±0.01%/° maximum of full scale range.

**Response Time (10 to 90%)**  
<200mSec., typical.

**Common Mode Rejection**  
DC to 60Hz: 120dB

**Isolation**  
1800VDC between line power and input, output

**EMC Compliance (CE Mark)**  
Emmissions: EN50081-1  
Immunity: EN50082-2  
Safety: EN50178

#### LED Indication (green)

Active DC power  
**Humidity (Non-Condensing)**  
Operating: 15 to 95% (@ 45°C)  
Soak: 90% for 24 hours (@ 65°C)  
**Temperature Range**  
Operating: 0 to 55°C (32 to 131°F)  
Storage: -25 to 70°C (-13 to 158°F)  
**Mounting**  
Horizontal DIN rail mounting is recommended. Vertical DIN rail mounting requires heat sink (model HS01, included) and circulating air is recommended.

**Power**  
Consumption: 1.5W typical, 2.5W max  
Range: 9 to 30VDC  
**Agency Approvals**  
CSA certified per standard C22.2, No. 0-M91 and 142-M1987 (File No. LR42272). UL recognized per standard UL508 (File No. E99775). CE Conformance per EMC directive 89/336/EEC and Low Voltage 73/23/EEC.

**Mounting**  
32mm and 35mm DIN Rail

#### PIN CONNECTIONS

- 11 Pot. Input (full clockwise)
- 12 Pot. Input (full counterclockwise)
- 21 DC Power (+)
- 22 DC Power (-)
- 41 Pot. Input (wiper)
- 42 Shield Ground
- 51 Output (+)
- 52 Output (-)



OMEGAmet™ On-Line Service http://www.omega.com	Internet e-mail info@omega.com
---	-----------------------------------

#### Servicing North America:

**USA:** One Omega Drive, Box 4047  
Stamford, CT 06907-0047  
Telephone: (203) 359-1660  
e-mail: info@omega.com  
Fax: (203) 359-7700

**Canada:** 976 Bergar  
Laval (Quebec) H7L 5A1  
Telephone: (514) 856-6928  
e-mail: canada@omega.com  
Fax: (514) 856-6886

#### For immediate technical service or application assistance:

**USA and Canada:** Sales Service: 1-800-826-6342 / 1-800-TC-OMEGA™  
Customer Service: 1-800-622-2378 / 1-800-622-BEST™  
Engineering Service: 1-800-872-9436 / 1-800-USA-WHEN™  
TELEX: 996404 EASYSYLNK; 62968934 CABLE: OMEGA

**Mexico and Latin America:** Tel: (95) 800-TC-OMEGA™ Fax: (95) 203-359-7807  
En Espanol: (203) 359-1660 ext. 2203 e-mail: espanol@omega.com

#### Servicing Europe:

**Benelux:** Postbus 8034, 1180 LA Amstelveen, The Netherlands  
Tel: (31) 20 6418405 Fax: (31) 20 6434643  
Toll Free in Benelux: 06 0993344  
e-mail: nl@omega.com

**Czech Republic:** Ostravska 767, 733 01 Karvina  
Tel: 42 (69) 6311899 Fax: 42 (69) 6311114  
e-mail: czech@omega.com

**France:** 9, rue Denis Papin, 78190 Trappes  
Tel: 33 0130-621-400 Fax: 33 0130-699-120  
Toll Free in France: 05-4-06342  
e-mail: france@omega.com

**Germany/Austria:** Daimlerstrasse 26, D-75392 Deckenpfronn, Germany  
Tel: 49 (07056) 3017 Fax: 49 (07056) 8540  
Toll Free in Germany: 0130 11 21 66  
e-mail: germany@omega.com

**United Kingdom:** 25 Swannington Road, Broughton Astley, Leicestershire, LE9 6TU, England  
Tel: 44 (1455) 285520 Fax: 44 (1455) 283912  
Toll Free in England: 0800-488-488  
e-mail: uk@omega.com



#### WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of manufacturing defects for the life of the product. If the unit should malfunction, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

#### RETURN REQUEST/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence. The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR WARRANTY RETURNS, please have the following information available BEFORE contacting OMEGA:  
1. P.O. number under which the product was PURCHASED,  
2. Model and serial number of the product under warranty, and  
3. Repair instructions and/or specific problems relative to the product

FOR NON-WARRANTY REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:  
1. P.O. number to cover the COST of the repair,  
2. Model and serial number of product, and  
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering. OMEGA is a registered trademark of OMEGA ENGINEERING, INC. © Copyright 1996 OMEGA ENGINEERING, INC. All rights reserved. This documentation may not be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form, in whole or in part, without prior written consent of OMEGA ENGINEERING, INC.

It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Agency Directives. OMEGA will add the CE mark to every appropriate device upon certification. The information contained in this document is believed to be correct but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice. WARNING: These products are not designed for use in, and should not be used for, patient connected applications.