

# SIL 2 Powered Isolating Driver Smart-Hart Compatible DIN-Rail Models D1020S, D1020D

## Characteristics:

### General Description:

The single and dual Isolating Driver, D1020S and D1020D, isolates and transfers a 4-20, 0-20 mA signal from a Controller located in Safe Area to a load of up to 750 Ohm in Hazardous Area. It has a high output capacity of 15 V at 20 mA combined with a low (2.0 V) drop across its input terminals. The circuit allows bi-directional communication signals, for Smart I/P. In the 4-20 mA input range, a field open circuit reflects a high impedance to the control device output circuit.

### Function:

1 or 2 channels I.S. mA analog output for 2 wire I/P Smart converters or valve positioners, provides 3 port isolation (input/output/supply).

### Signalling LED:

Power supply indication (green).

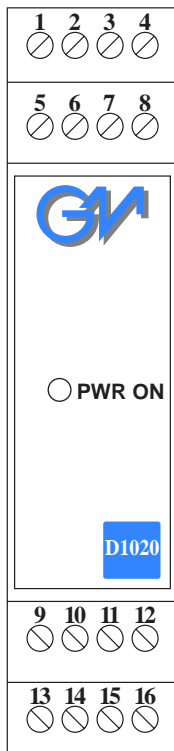
### Smart Communication Frequency Band:

0.5 to 40 KHz within 3 dB (Hart and higher frequency protocols).

### EMC:

Fully compliant with CE marking applicable requirements.

## Front Panel and Features:



- SIL 2 according to EN61508.
- 4-20 or 0-20 mA Input, Output Signal.
- Wide Band Smart Communication, Hart compatible.
- Field open circuit detection.
- High Accuracy.
- Three port isolation, Input/Output/Supply.
- EMC Compatibility to EN61000-6-2, EN61000-6-4.
- ATEX, UL & C-UL, Russia and Ukraine Certifications.
- High Reliability, SMD components.
- High Density, two channels per unit.
- Simplified installation using standard DIN Rail plug-in terminal blocks.
- 250 Vrms (Um) max. voltage applied to the instruments associated with barrier.

## Technical Data:

### Supply:

24 V nom (20 to 30 V) reverse polarity protected ripple within voltage limits  $\leq 5$  Vpp.

**Current consumption @ 24 V:** 85 mA for 2 channels D1020D, 45 mA for 1 channel D1020S with 20 mA output typical.

**Max. power consumption:** 2.70 W for 2 channels, 1.50 W for 1 channel with 30 V supply voltage and overload condition.

### Isolation (Test Voltage):

I.S. Out/In 1.5 KV; I.S. Out/Supply 1.5 KV; I.S. Out/I.S. Out 500 V; In/In 500 V; In/Supply 500 V.

### Input:

0/4 to 20 mA with  $\leq 2.0$  V voltage drop, reverse polarity protected.

### Output:

0/4 to 20 mA, on max. 750  $\Omega$  load, current limited at  $\approx 23$  mA.

**Response time:** 50 ms (10 to 90 % step change).

**Output ripple:**  $\leq 20$  mVrms on 250  $\Omega$  communication load on 0.5 to 40 KHz band.

**Frequency response:** 0.5 to 40 KHz bidirectional within 3 dB (Hart and higher frequency protocols).

### Performance:

Ref. Conditions 24 V supply, 250  $\Omega$  load,  $23 \pm 1$  °C ambient temp.

**Calibration accuracy:**  $\leq \pm 0.1$  % of full scale.

**Linearity error:**  $\leq \pm 0.05$  % of full scale.

**Supply voltage influence:**  $\leq \pm 0.05$  % of full scale for a min to max supply voltage change.

**Load influence:**  $\leq \pm 0.05$  % of full scale for a 0 to 100 % load resistance change.

**Temperature influence:**  $\leq \pm 0.01$  % on zero and span for a 1 °C change.

### Compatibility:

**CE** CE mark compliant, conforms to 94/9/EC Atex Directive and to 89/336/CEE EMC Directive.

### Environmental conditions:

**Operating:** Temperature limits -20 to + 60 °C, relative humidity max 90 % non condensing, up to 35 °C.

**Storage:** Temperature limits - 40 to + 80 °C.

### Safety Description:

**Ex** II (1) G D [Ex ia] IIC or I M2 [Ex ia] I associated electrical apparatus.  $U_0/V_{oc} = 25.9$  V,  $I_0/I_{sc} = 90$  mA,  $P_0/P_o = 576$  mW at terminals 14-15, 10-11.  $U_m = 250$  Vrms,  $-20$  °C  $\leq T_a \leq 60$  °C.

**Approvals:** DMT 01 ATEX E 042 X conforms to EN50014, EN50020, UL & C-UL E222308 conforms to UL913 (Div.1), UL 60079-0 (General, All Zones), UL60079-11 (Intrinsic Safety "i" Zones 0 & 1), UL60079-15 ("n" Zone 2), UL 1604 (Div.2) for UL and CSA-C22.2 No.157-92 (Div.1), CSA-E60079-0 (General, All Zones), CSA-E60079-11 (Intrinsic Safety "i" Zones 0 & 1), CSA-C22.2 No. 213-M1987 (Div. 2) and CSA-E60079-15 ("n" Zone 2) for C-UL, TCCEXEE (Russia) Nr.665 according to GOST R 51330.0-99, 51330.10-99 [Exia]IIC X, TCCEXEE (Ukraine) Nr.665 according to GOST 12.2.007.0, 22782.0, 22782.5 ExialIIC X, Gosortekhnadzor of Russia Permit Nr. PPC 04-11284. EXIDA Report No. GM03/07-24 R001, SIL 2 according to EN61508. Please refer to Functional Safety Manual for SIL applications.

### Mounting:

T35 DIN Rail according to EN50022.

**Weight:** about 175 g D1020D, 120 g D1020S.

**Connection:** By polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm<sup>2</sup>.

**Location:** Safe Area / Non Hazardous Locations or Class I, Division 2, Groups A, B, C, D and Class I, Zone 2, Group IIC installation.

**Protection class:** IP 20.

**Dimensions:** Width 22.5 mm, Depth 99 mm, Height 114.5 mm.

## Ordering Information:

<b>Model:</b>	<b>D1020</b>		
1 channel		S	
2 channels		D	
Power Bus enclosure			/B

## Parameters Table:

Safety Description	Maximum External Parameters			
	Group Cenelec	Co/Ca (μF)	Lo/La (mH)	L/R/La/Ra (μH/Ω)
<b>Terminals</b> <b>14-15, 10-11</b>				
Uo/Voc = 25.9 V	II C	0.099	4.4	61.7
Io/Isc = 90 mA	II B	0.769	17.8	246.9
Po/Po = 576 mW	II A	2.630	35.7	493.8

### NOTE for USA and Canada:

II C equal to Gas Groups A, B, C, D, E, F and G.

II B equal to Gas Groups C, D, E, F and G.

II A equal to Gas Groups D, E, F and G.



## Function Diagram:

**HAZARDOUS AREA / HAZARDOUS LOCATIONS**  
CLASS I, DIVISION 1 and CLASS II, DIVISION 1 or  
CLASS I, Zone 0

**SAFE AREA / NON HAZARDOUS LOCATIONS** or  
CLASS I, DIVISION 2, GROUPS A, B, C, D or  
CLASS I, ZONE 2, GROUP IIC

