

Characteristics:

General Description:

The single or dual channel Loop Powered Digital Output Isolators, D5040S and D5040D, are suitable for driving solenoid valves, visual or audible alarms to alert a plant operator, or other process control devices in Hazardous Area from driving signals in Safe Area. They can also be used as controllable supplies to power measuring or process control equipment.

Their use is allowed in applications requiring up to SIL 3 level (according to IEC 61508:2010 Ed. 2) in safety related systems for high risk industries.

The Safety PLC or DCS driving signals control the field devices through D5040S and D5040D, which provide isolation.

For each channel two basic output circuits are selectable, with different safety parameters, to interface the majority of devices on the market. The selection among the two output characteristics is obtained by connecting the field device to a different couple of terminal blocks.

Mounting on standard DIN-Rail or on customized Termination Boards, in Safe Area / Non Hazardous Location or in Zone 2 / Class I, Division 2 or Class I, Zone 2.

Functional Safety Management certification:

G.M. International is certified by TUV to conform to IEC61508:2010 part 1 clauses 5-6 for safety related systems up to and included SIL3.



Front Panel and Features:



- SIL 3 according to IEC 61508:2010 Ed. 2 for lifetime = 20 yrs.
- PFDavg (1 year) 0.00 E+00, SFF 100 %.
- SIL 3 Systematic capability.
- Output to Zone 0 (Zone 20), installation in Zone 2.
- Loop powered for NE loads.
- Output short circuit proof and current limited.
- Two port isolation, Input/Output.
- EMC Compatibility to EN61000-6-2, EN61000-6-4, EN61326-1, EN61326-3-1 for safety systems.
- ATEX, IECEx, UL & C-UL, UKR TR n. 898, KCs, TÜV Certifications.
- TÜV Functional Safety Certification.
- Type Approval Certificate DNV and KR for maritime applications.
- Simplified installation using standard DIN-Rail and plug-in terminal blocks, or customized Termination Boards.
- 250 Vrms (Um) max. voltage allowed to the instruments associated with the barrier.

Ordering Information:

Model:	D5040	
1 channel		S
2 channels		D

DIN-Rail accessories:
Cover and fix MCHP196

Technical Data:

Loop Input:

loop powered control signal.

Loop Supply: 24 Vdc nom (18 to 30 Vdc) reverse polarity protected, 2 A time lag fuse internally protected.

Current consumption @ 24 V: 45 mA with 30 mA output for each channel of D5040D, typical in normal operation. 55 mA with 40 mA output (typical for D5040S).

Power dissipation: 0.75 W with 24 V supply, output energized at 35 mA nominal load for each channel of D5040D; 0.85 W with 24 V supply, output energized at 45 mA nominal load for D5040S.

Isolation (Test Voltage):

I.S. Out/In 1.5 KV.

Out/Out 500 V.

In/In 500 V.

Output:

See next page for detailed output diagrams and characteristics.

Short circuit current:

≥ 45 mA (50 mA typical) for single output configuration (D5040S);

≥ 35 mA (40 mA typical) for single output configurations (D5040D);

≥ 70 mA (80 mA typical) for parallel output configurations (D5040D).

Response time: ≤ 75 ms.

Frequency response: 50 Hz

Compatibility:

CE mark compliant, conforms to Directive: 2014/34/EU ATEX, 2014/30/EU EMC, 2014/35/EU LVD, 2011/65/EU RoHS.

Environmental conditions:

Operating: temperature limits - 40 to + 70 °C, relative humidity 95 %, up to 55 °C.

Storage: temperature limits - 45 to + 80 °C.

Safety Description:



ATEX: II 3(1)G Ex nA [ia Ga] IIC T4 Gc, II (1)D [Ex ia Da] IIIC, I (M1) [Ex ia Ma] I

IECEx: Ex nA [ia Ga] IIC T4 Gc, [Ex ia Da] IIIC, [Ex ia Ma] I,

UL: NI / I / 2 / ABCD / T4, AIS / I, II, III / 1 / ABCDEFG, AEx nA [ia Ga] IIC T4 Gc

C-UL: NI / I / 2 / ABCD / T4, AIS / I, II, III / 1 / ABCDEFG, Ex nA [ia Ga] IIC T4 Gc

UKR TR n. 898: 2ExnAiaIICT4 X, Exial X

KCs: Ex nA [ia Ga] IIC T4 Gc

associated apparatus and non-sparking electrical equipment.

See next page for safety parameters.

Um = 250 Vrms, -40 °C ≤ Ta ≤ 70 °C.

Approvals:

BVS 14 ATEX E 159 X conforms to EN60079-0, EN60079-11, EN60079-15

IECEx BVS 14.0111X conforms to IEC60079-0, IEC60079-11, IEC60079-15.

UL & C-UL E222308 conforms to UL913, UL 60079-0, UL60079-11, UL60079-15,

ANSI/ISA 12.12.01 for UL and CSA-C22.2 No.157-92, CSA-E60079-0, CSA-E60079-11, CSA-C22.2 No. 213 and CSA-E60079-15 for C-UL.

CL 16.0036 X conforms to DCTY 7113, GOCT 22782.5-78, DCTY IEC 60079-15.

KTL 16-KA4BO-443X for KCs approval (for D5040S).

KTL 16-KA4BO-444X for KCs approval (for D5040D).

TÜV Certificate No. C-IS-236198-04, SIL 3 conforms to IEC61508:2010 Ed.2.

TÜV Certificate No. C-IS-236198-09, SIL 3 Functional Safety Certificate conforms to IEC61508:2010 Ed.2, for Management of Functional Safety.

DNV Type Approval Certificate No.A-13625 and KR No.MIL20769-EL002 Certificates for maritime applications.

Mounting:

T35 DIN-Rail according to EN50022, or on customized Termination Board.

Weight: about 110 g.

Connection: by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm².

Location: installation in Safe Area/Non Hazardous Locations or Zone 2, Group IIC T4 or Class I, Division 2, Group A,B,C,D, T4 or Class I, Zone 2, Group IIC, T4.

Protection class: IP 20.

Dimensions: Width 12.5 mm, Depth 123 mm, Height 120 mm.

Parameters Table:

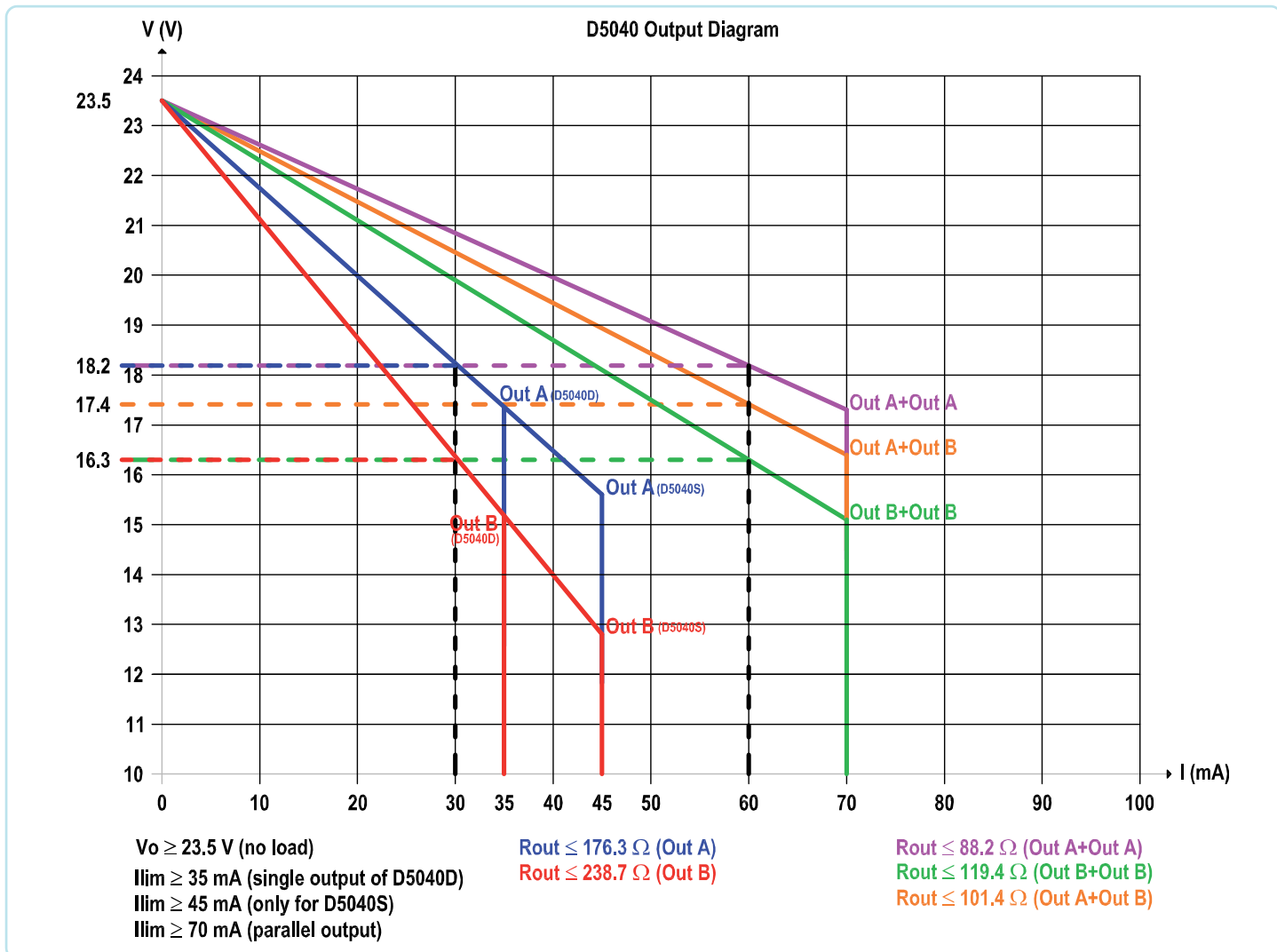
Safety Description	Maximum External Parameters			
	Group Cenelec	Co/Ca (μF)	Lo/La (mH)	Lo/Ro ($\mu\text{H}/\Omega$)
Out A	IIC	0.107	1.67	38.8
Terminals 7-8 or 10-11	IIB	0.82	6.71	155.3
$U_o/V_{oc} = 25.2\text{ V}$	IIA	2.9	13.4	310.7
$I_o/I_{sc} = 146\text{ mA}$	I	4.8	22	509.8
$P_o/P_o = 916\text{ mW}$	IIIC	0.82	6.7	155.3
Out B	IIC	0.107	3	52.6
Terminals 7-9 or 10-12	IIB	0.82	12.3	210.4
$U_o/V_{oc} = 25.2\text{ V}$	IIA	2.9	24.6	420
$I_o/I_{sc} = 108\text{ mA}$	I	4.8	40	690.3
$P_o/P_o = 676\text{ mW}$	IIIC	0.82	12.3	210.4
Out A + Out A				
Terminals 7//10 - 8//11	IIB	0.82	1.67	77.6
$U_o/V_{oc} = 25.2\text{ V}$	IIA	2.9	3.3	155.3
$I_o/I_{sc} = 292\text{ mA}$	I	4.8	5.5	254.9
$P_o/P_o = 1831\text{ mW}$	IIIC	0.82	1.67	77.6
Out B + Out B				
Terminals 7//10 - 9//12	IIB	0.82	3	105.2
$U_o/V_{oc} = 25.2\text{ V}$	IIA	2.9	6.1	210.4
$I_o/I_{sc} = 216\text{ mA}$	I	4.8	10.09	345.1
$P_o/P_o = 1352\text{ mW}$	IIIC	0.82	3	105.2
Out A + Out B				
Terminals 7//10-8//12 or 7//10-9//11	IIB	0.82	2.2	89.3
$U_o/V_{oc} = 25.2\text{ V}$	IIA	2.9	4.4	178.7
$I_o/I_{sc} = 254\text{ mA}$	I	4.8	7.28	293.2
$P_o/P_o = 1592\text{ mW}$	IIIC	0.82	2.2	89.3

Image:



NOTE: "//" sign means parallel connection.
E.g. 7//10 is obtained shortening pins 7 and 10

Output Diagram:



Function Diagram:

HAZARDOUS AREA ZONE 0 (ZONE 20) GROUP IIC,
HAZARDOUS LOCATIONS CLASS I, DIVISION 1, GROUPS A, B, C, D,
CLASS II, DIVISION 1, GROUPS E, F, G, CLASS III, DIVISION 1,
CLASS I, ZONE 0, GROUP IIC

SAFE AREA, ZONE 2 GROUP IIC T4,
NON HAZARDOUS LOCATIONS, CLASS I, DIVISION 2,
GROUPS A, B, C, D T-Code T4, CLASS I, ZONE 2, GROUP IIC T4

