



INSTRUCTION MANUAL

SIL 3 Digital Output Driver,
NE Loads, Loop Powered DIN-Rail and
Termination Board, Models D6040S, D6040D



General Description:

The single or dual channel Loop Powered Digital Output Isolators, D6040S and D6040D, are suitable for driving solenoid valves, visual or audible alarms to alert a plant operator, or other process control devices from driving signals. 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 D6040S and D6040D, which provide isolation. For each channel two basic output circuits are selectable, with different 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.

Functional Safety Management certification:

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



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 D6040D, typical in normal operation. 55 mA with 40 mA output (typical for D6040S).

Power dissipation: 0.75 W with 24 V supply, output energized at 35 mA nominal load for each channel of D6040D;

0.85 W with 24 V supply, output energized at 45 mA nominal load for D6040S.

Isolation (Test Voltage):

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 (D6040S);

≥ 35 mA (40 mA typical) for single output configurations (D6040D);

≥ 70 mA (80 mA typical) for parallel output configurations (D6040D).

Response time: ≤ 75 ms.

Frequency response: 50 Hz

Compatibility:



CE mark compliant, conforms to Directive: 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.

Approvals:



TÜV Certificate No. C-IS-722134640-01, 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.

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.

Protection class: IP 20.

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

Ordering Information

Model:	D6040	
1 channel		S
2 channels		D

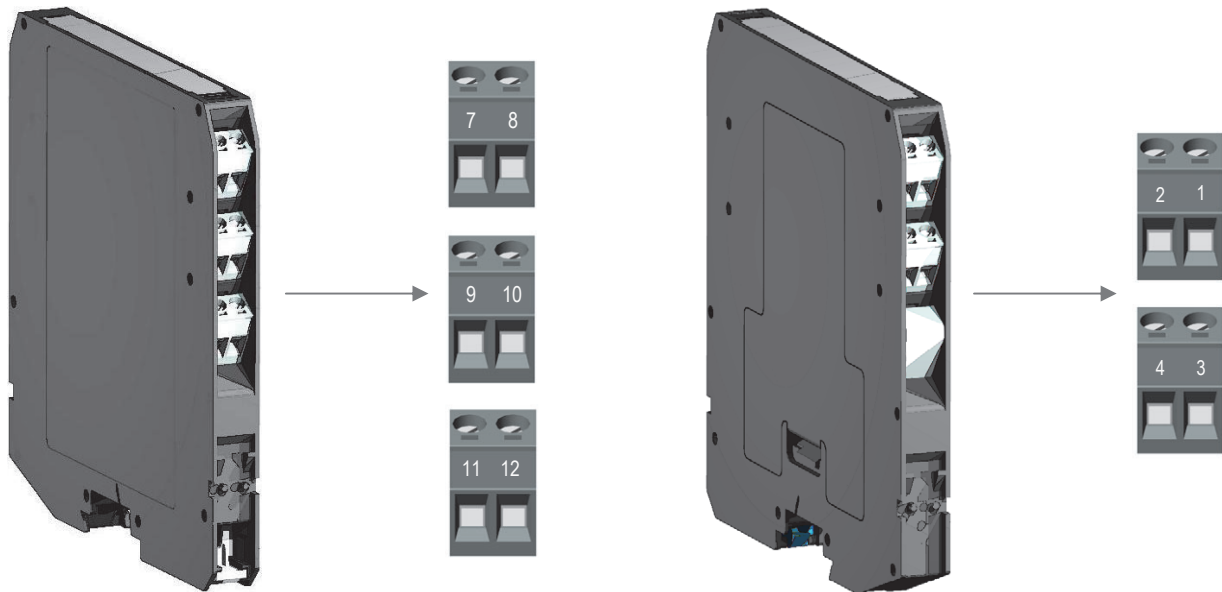
DIN-Rail accessories:
Cover and fix MCHP196

Front Panel and Features



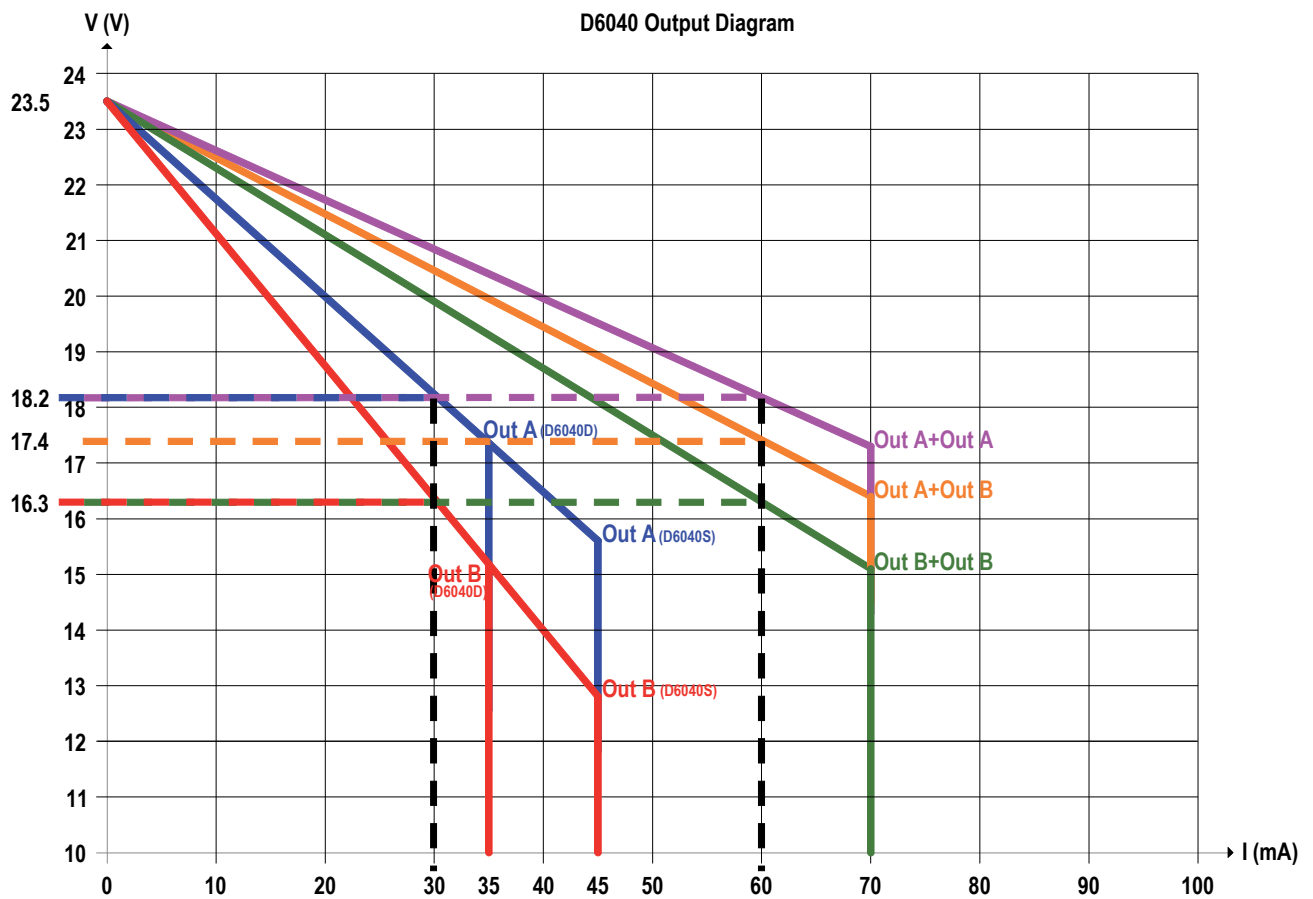
- SIL 3 according to IEC 61508:2010 Ed. 2 for lifetime = 20 yrs.
- PFDavg (1 year) 0.00 E+00, SFF 100 %.
- SIL 3 Systematic capability
- Loop powered for NE loads.
- Output short circuit proof and current limited.
- Two port isolation, Input/Output.
- EMC Compatibility to EN61000-6-2, EN61000-6-4, EN61326-1, EN61326-3-1 for safety systems.
- TÜV Certification.
- TÜV Functional Safety Certification.
- Simplified installation using standard DIN-Rail and plug-in terminal blocks, or customized Termination Boards.

Terminal block connections



- 7** + Output , Ch 1 for Solenoid Valve
- 8** - Output A, Ch 1 for Solenoid Valve
- 9** - Output B, Ch 1 for Solenoid Valve
- 10** + Output , Ch 2 for Solenoid Valve
- 11** - Output A, Ch 2 for Solenoid Valve
- 12** - Output B, Ch 2 for Solenoid Valve

- 1** + Input Ch 1
- 2** - Input Ch 1
- 3** + Input Ch 2
- 4** - Input Ch 2



$V_o \geq 23.5 \text{ V}$ (no load)

$I_{lim} \geq 35 \text{ mA}$ (single output of D6040D)

$I_{lim} \geq 45 \text{ mA}$ (only for D6040S)

$I_{lim} \geq 70 \text{ mA}$ (parallel output)

$R_{out} \leq 176.3 \ \Omega$ (Out A)

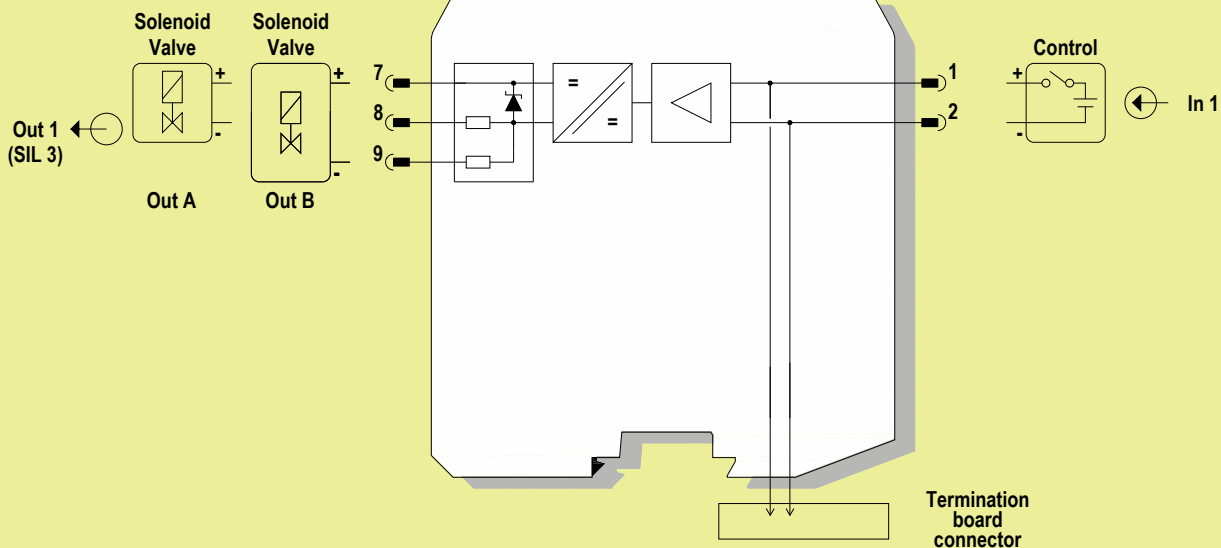
$R_{out} \leq 238.7 \ \Omega$ (Out B)

$R_{out} \leq 88.2 \ \Omega$ (Out A+Out A)

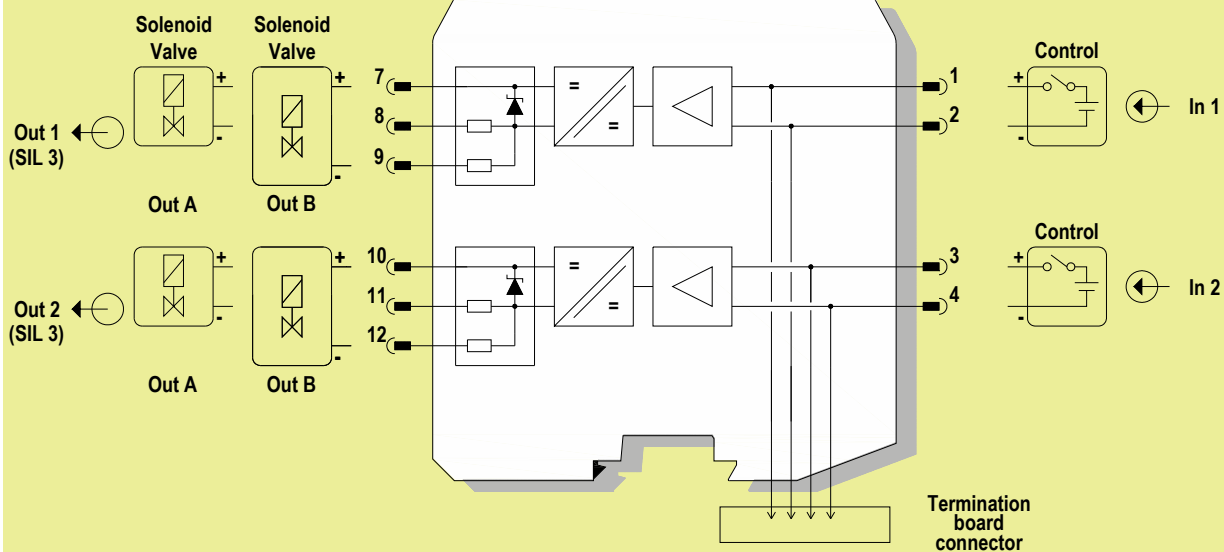
$R_{out} \leq 119.4 \ \Omega$ (Out B+Out B)

$R_{out} \leq 101.4 \ \Omega$ (Out A+Out B)

MODEL D6040S



MODEL D6040D



Warning

D6040S and D6040D must be installed, operated and maintained only by qualified personnel, in accordance with the relevant national/international installation standards. Failure to properly installation or use of the equipment may risk to damage the unit or severe personal injury. The unit cannot be repaired by the end user and must be returned to the manufacturer or his authorized representative. Any unauthorized modification must be avoided.

Operation

The single and double channel Loop Powered Digital Output Isolators, D6040S and D6040D, are suitable for driving solenoid valves, visual or audible alarms to alert a plant operator, or other process control devices from driving signal. The presence of the input signal is also indicated by a yellow LED (one for each channel). They can also be used as a controllable supply to power measuring or process control equipment.

Their use is allowed in applications requiring up to SIL 3 level (according to IEC 61508) in safety related systems for high risk industries. The Safety PLC or DCS driving signals control the field devices through D6040S and D6040D, which provide isolation.

Two basic output circuits for each channel are selectable, with different 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.

Installation

D6040S and D6040D are Digital Output Driver housed in a plastic enclosure suitable for installation on T35 DIN-Rail according to EN50022, or on customized Termination Board. D6040S and D6040D units can be mounted with any orientation over the entire ambient temperature range.

Electrical connection of conductors up to 2.5 mm² are accommodated by polarized plug-in removable screw terminal blocks which can be plugged in/out into a powered unit without suffering or causing any damage.

The wiring cables have to be proportionate in base to the current and the length of the cable.

In the section "Function Diagram" and enclosure side, a block diagram identifies all connections.

Identify the function and location of each on the connection terminal using the wiring diagram on the corresponding section, as an example:

Connect positive input at terminal "1" and negative input at "2" (or "3" and "4" for channel 2).

Connect positive output A for solenoid valve to terminal "7" and negative at "8" or output B to terminal "7" and negative to "9" (or "10" and "11" or "10" and "12" for channel 2).

Units must be protected against dirt, dust, extreme mechanical (e.g. vibration, impact and shock) and thermal stress, and casual contacts.

If enclosure needs to be cleaned use only a cloth lightly moistened by a mixture of detergent in water.

Any penetration of cleaning liquid must be avoided to prevent damage to the unit. Any unauthorized card modification must be avoided.

Start-up

Before powering the unit, check that all wires are properly connected and verify their polarity. Check conductors for exposed wires that could touch each other causing dangerous unwanted shorts. The status yellow LED must be in accordance with the condition of the corresponding input line.