FM Control Drawing ISM0164 for D5090, D5091, D5290, D5290-078, D5291

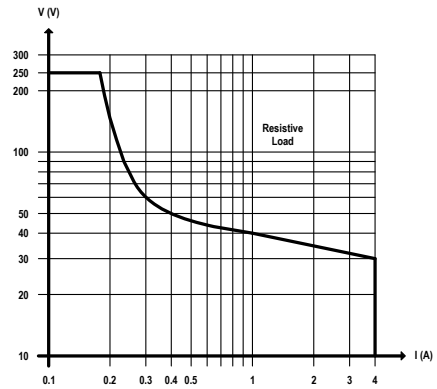
Warning

D5090, D5091, D5290, D5290-078, D5291 series are isolated Apparatus located in Non Hazardous Locations or Class I, Division 2, Groups A, B, C, D, Temperature Code T4 and Class I, Zone 2, Group IIC, IIB, IIA Temperature Code T4 Hazardous Locations (according to FM3600, FM3611, ANSI/ISA 60079-0, ANSI/ISA 60079-15, CSA-C22.2 NO. 213, CSA-C22.2 NO. 60079-0, CSA-C22.2 NO. 60079-15) within the specified operating temperature limits Tamb –40 to +70 °C (D5090, D5091) or Tamb –40 to +60 °C (D5290, D5291).
When installed in Class I, Division 2 or Class I, Zone 2 Hazardous Locations, the module must be mounted in supplemental enclosure meeting at least IP54 degree protection.
D5090, D5091, D5290, D5290-078, D5291 series must be installed, operated and maintained only by qualified personnel, in accordance to the relevant national/international installation standards (e.g. National Electrical Code NEC ANSI/NFPA 70 Section 501 and 505, Canadian Electrical Code CEC) following the established installation rules.
De-energize power source (turn off power supply voltage) before plug or unplug the terminal blocks when installed in Hazardous Locations or unless area is known to be nonhazardous.
Warning: substitution of components may impair suitability for Division 2, Zone 2.
Warning: de-energize main power source (turn off power supply voltage) and disconnect plug-in terminal blocks before opening the enclosure to avoid electrical shock when connected to live hazardous potential.
Explosion Hazard: to prevent ignition of flammable or combustible atmospheres, disconnect power before servicing or unless area is known to be nonhazardous.
The enclosure provides, according to EN60529, an IP20 minimum degree of mechanical protection (or similar to NEMA Standard 250 type 1) for indoor installation, outdoor installation requires an additional enclosure with higher degree of protection (i.e. IP54 to IP65 or NEMA type 12-13) consistent with the effective operating environment of the specific installation.
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.
Electrostatic Hazard: to avoid electrostatic hazard, the enclosure of D5090, D5091, D5290, D5290-078, D5291 must be cleaned only with a damp or antistatic cloth.
Any penetration of cleaning liquid must be avoided to prevent damage to the unit.
Failure to properly install 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.
If calibration requires the use of an adjustable power supply, current meter, or voltmeter, it should be only be performed when the area is known to be nonhazardous or with equipment suitable for the area classification.

D5090 Technical Data

Input: 24 Vdc nom (21.6 to 27.6 Vdc) reverse polarity protected, ripple within voltage limits ≤ 5 Vpp.
The following monitoring circuits are mutually exclusive:
1) ***Line input monitoring (DIP-Switch selectable):*** to allow DCS/PLC line monitoring function (pulse test).
2) ***Voltage monitoring (DIP-Switch selectable):*** ≥ 21.6 Vdc for normal operation, ≤ 17 Vdc reflects a high impedance (≤ 10 mA consumption) to the control device.
3) **Short circuit fault detection *(DIP-Switch selectable):*** to allow DCS/PLC to detect short circuit fault of module.

Current consumption @ 24 V: 35 mA with relay energized and line input monitoring disabled, 45 mA with relay energized and line input monitoring enabled, typical.
Power dissipation: 0.85 W with 24 V input voltage, relay energized and line input monitoring disabled, 1.1 W with 24 V input voltage, relay energized and line input monitoring enabled, typical.
Isolation (Test Voltage): Input / All Outputs 2.5 KV ; Out 1 / Out 2: 500V.
Output: 1 voltage free SPDT relay contact identified with outputs: Out 1 (NO contact) terminals 7-11 and Service Load Out (NC contact) terminals 9-10;
1 voltage free SPST relay contact identified with output Out 2 (NO contact) terminals 8-12.
Terminals 7-11 (Out 1) and 8-12 (Out 2) are open when relay is de-energized, closed in energized relay condition.
Service load output (not SIL) at terminals 9-10 is normally close when relay is de-energized, open in energized relay condition.
Contact material: Ag Alloy (Cd free).
Contact rating: 4 A 250 Vac 1000 VA, 4 A 250 Vdc 120 W (resistive load).
DC Load breaking capacity:



Mechanical / Electrical life: 5 * 10^6 / 3 * 10^4 operation, typical.
Bounce time NO / NC contact: 3 / 8 ms, typical.
Frequency response: 10 Hz maximum.
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:
for use in Class I, Division 2, Groups A, B, C, D, Temperature Code T4; Class I, Zone 2, AEx nA nC IIC T4 Gc and CL I, ZN 2, Ex nA nC IIC T4 Gc Hazardous Locations.
Approvals:
FM, FM-C according to FM3600, FM3611, ANSI/ISA 60079-0, ANSI/ISA 60079-15, CSA-C22.2 NO. 157, CSA-C22.2 NO. 213, CSA-C22.2 NO. 60079-0, CSA-C22.2 NO. 60079-15
Mounting: T35 DIN-Rail according to EN50022, with or without Power Bus or on customized Termination Board.
Weight: about 120g
Connection: by polarized plug-in disconnect screw terminal blocks to accomodate terminations up to 2.5 mm^2
Location: Non Hazardous Locations or Class I, Division 2, Groups A, B, C, D Temperature Code T4 and Class I, Zone 2, Group IIC, IIB, IIA T4 installation.
Protection class: IP 20.
Dimensions: Width 12.5 mm, Depth 123 mm, Height 120 mm.

D5091 Technical Data

Input: 24 Vdc nom (21.6 to 27.6 Vdc) reverse polarity protected, ripple within voltage limits ≤ 5 Vpp.

The following monitoring circuits are mutually exclusive:

1) ***Line input monitoring (DIP-Switch selectable):*** to allow DCS/PLC line monitoring function (pulse test).

2) ***Voltage monitoring (DIP-Switch selectable):*** ≥ 21.6 Vdc for normal operation, ≤ 17 Vdc reflects a high impedance (≤ 10 mA consumption) to the control device.

Current consumption @ 24 V: 35 mA with relay energized and line input monitoring disabled, 45 mA with relay energized and line input monitoring enabled, typical.

Power dissipation: 0.85 W with 24 V input voltage, relay energized and line input monitoring disabled, 1.1 W with 24 V input voltage, relay energized and line input monitoring enabled, typical.

Isolation (Test Voltage): Input/Output 2.5 KV.

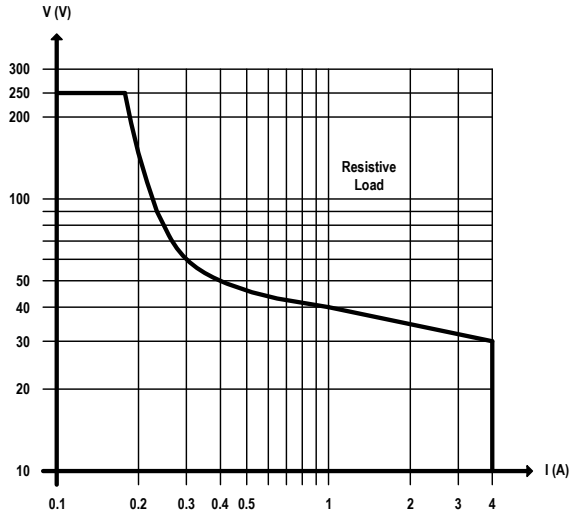
Output: voltage free SPDT relay contact.

Terminals 7-8, open when relay de-energized, close in energized condition. Terminals 9-10, close when relay de-energized, open in energized condition.

Contact material: Ag Alloy (Cd free).

Contact rating: 4 A 250 Vac 1000 VA, 4 A 250 Vdc 120 W (resistive load).

DC Load breaking capacity:



Mechanical / Electrical life: 5 * 10^6 / 3 * 10^4 operation, typical.

Bounce time NO / NC contact: 3 / 8 ms, typical.

Frequency response: 10 Hz maximum.

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:

for use in Class I, Division 2, Groups A, B, C, D, Temperature Code T4; Class I, Zone 2, AEx nA nC IIC T4 Gc and CL I, ZN 2, Ex nA nC IIC T4 Gc Hazardous Locations.

Approvals:

FM, FM-C according to FM3600, FM3611, ANSI/ISA 60079-0, ANSI/ISA 60079-15, CSA-C22.2 NO. 157, CSA-C22.2 NO. 213, CSA-C22.2 NO. 60079-0, CSA-C22.2 NO. 60079-15

Mounting: T35 DIN-Rail according to EN50022, with or without Power Bus or on customized Termination Board.

Weight: about 120g

Connection: by polarized plug-in disconnect screw terminal blocks to accomodate terminations up to 2.5 mm^2

Location: Non Hazardous Locations or Class I, Division 2, Groups A, B, C, D Temperature Code T4 and Class I, Zone 2, Group IIC, IIB, IIA T4 installation.

Protection class: IP 20.

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

D5290 Technical Data

Input: 24 Vdc nom (21.6 to 27.6 Vdc) reverse polarity protected, ripple within voltage limits ≤ 5 Vpp.

The following monitoring circuits are mutually exclusive:

1) ***Line input monitoring (DIP-Switch selectable):*** to allow DCS/PLC line monitoring function (pulse test).

2) ***Voltage monitoring (DIP-Switch selectable):*** ≥ 21.6 Vdc for normal operation, ≤ 17 Vdc reflects a high impedance (≤ 10 mA consumption) to the control device.

3) Short circuit fault detection ***(DIP-Switch selectable):*** to allow DCS/PLC to detect short circuit fault of module.

Current consumption @ 24 V: 60 mA with relay energized, typical.

Power dissipation: 1.5 W with 24 V input voltage, relay energized, typical.

Isolation (Test Voltage): Input / All Outputs 2.5 KV ; Out 1 / Out 2: 500V.

Output: 1 voltage free SPDT relay contact identified with outputs: Out 1 (NO contact) terminals 13-21 and Service Load Out (NC contact) terminals 13-15;
1 voltage free SPST relay contact identified with output Out 2 (NO contact) terminals 14-22.

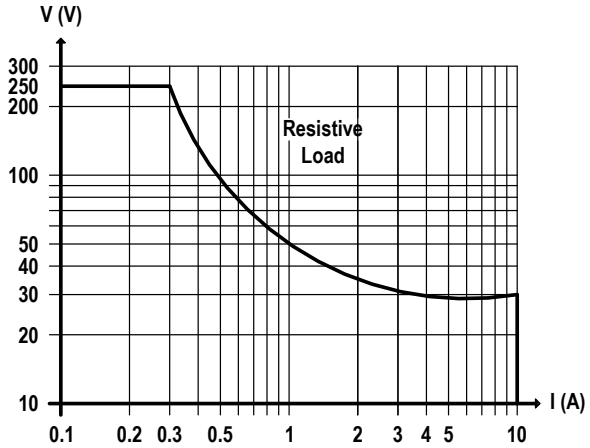
Terminals 13-21 (Out 1) and 14-22 (Out 2) are open when relay is de-energized, closed in energized relay condition.

Service load output (not SIL) at terminals 13-15 is normally close when relay is de-energized, open in energized relay condition.

Contact material: Ag Alloy (Cd free) or $AgSnO_2$.

Contact rating: 10 A 250 Vac 2500 VA, 10 A 250 Vdc 300 W (resistive load).

DC Load breaking capacity:



Mechanical / Electrical life: $10 * 10^6 / 5 * 10^4$ operation, typical.

Bounce time NO / NC contact: 4 / 6 ms, typical.

Frequency response: 10 Hz maximum.

Environmental conditions:

Operating: temperature limits – 40 to + 60 °C, relative humidity 95 %, up to 55 °C.

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

Safety Description:

for use in Class I, Division 2, Groups A, B, C, D, Temperature Code T4; Class I, Zone 2, AEx nA nC IIC T4 Gc and CL I, ZN 2, Ex nA nC IIC T4 Gc Hazardous Locations.

Approvals:

FM, FM-C according to FM3600, FM3611, ANSI/ISA 60079-0, ANSI/ISA 60079-15, CSA-C22.2 NO. 157, CSA-C22.2 NO. 213, CSA-C22.2 NO. 60079-0, CSA-C22.2 NO. 60079-15

Mounting: T35 DIN-Rail according to EN50022, with or without Power Bus or on customized Termination Board.

Weight: about 120g

Connection: by polarized plug-in disconnect screw terminal blocks to accomodate terminations up to 2.5 mm^2

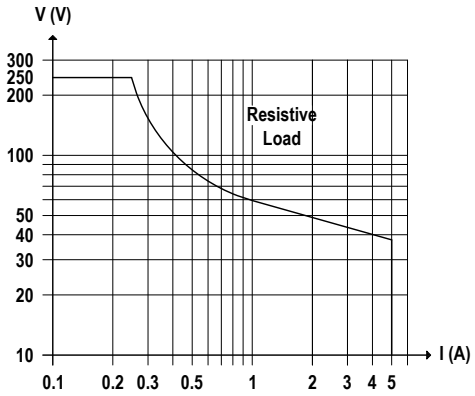
Location: Non Hazardous Locations or Class I, Division 2, Groups A, B, C, D Temperature Code T4 and Class I, Zone 2, Group IIC, IIB, IIA T4 installation.

Protection class: IP 20.

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

D5290-078 Technical Data

Input: 24 Vdc nom (21.6 to 27.6 Vdc) reverse polarity protected,
ripple within voltage limits ≤ 5 Vpp.
The following monitoring circuits are mutually exclusive:
1) ***Line input monitoring (DIP-Switch selectable):*** to allow DCS/PLC line monitoring function (pulse test).
2) ***Voltage monitoring (DIP-Switch selectable):*** ≥ 21.6 Vdc for normal operation, ≤ 17 Vdc reflects a high impedance (≤ 10 mA consumption) to the control device.
3)Short circuit fault detection ***(DIP-Switch selectable and only for Functional Safety applications with NE Relay condition):*** to allow DCS/PLC to detect short circuit fault of module.
Current consumption @ 24 V: 60 mA with relay energized, typical.
Power dissipation: 1.5 W with 24 V input voltage, relay energized, typical.
Isolation (Test Voltage): Input / All Outputs: 2.5 KV;
Out S_1 & Out P_1 / Out S_3 & Out P_2, Out S_2, Out S_4: 500 V;
Out S_3 & Out P_2 / Out S_2, Out S_4: 500 V;
Out S_2 / Out S_4: 500 V.
Output: 2 voltage free SPDT (= NO contact + parallel of 2 NC contacts) relay contacts identified with outputs: Out S_1 & Out P_1 and Out S_3 & Out P_2;
2 voltage free SPST (NO) relay contacts identified with: Out S_2 and Out S_4.
Terminals 13-14 (Out S_1), 15-16 (Out S_2), 21-22 (Out S_4) and 23-24 (Out S_3) are:
open when relay is de-energized, closed in energized relay condition.
Terminals 17-18 (Out P_1) and 19-20 (Out P_2) are: closed when relay is de-energized, open in energized relay condition.
Contact material: Ag Alloy (Cd free) or $AgSnO_2$.
Contact rating: 5 A 250 Vac 1250 VA, 5 A 250 Vdc 175 W (resistive load).
DC Load breaking capacity:



Mechanical / Electrical life: $10 * 10^6$ / $5 * 10^4$ operation, typical.
Operate / Release time: 8 / 4 ms typical.
Bounce time NO / NC contact: 4 / 10 ms, typical.
Frequency response: 10 Hz maximum.
Environmental conditions:
Operating: temperature limits - 40 to + 60 °C, relative humidity 95 %, up to 55 °C.
Storage: temperature limits - 45 to + 80 °C.
Safety Description:
for use in Class I, Division 2, Groups A, B, C, D, Temperature Code T4; Class I, Zone 2, AEx nA nC IIC T4 Gc and CL I, ZN 2, Ex nA nC IIC T4 Gc Hazardous Locations.
Approvals:
FM, FM-C according to FM3600, FM3611, ANSI/ISA 60079-0, ANSI/ISA 60079-15, CSA-C22.2 NO. 157, CSA-C22.2 NO. 213, CSA-C22.2 NO. 60079-0, CSA-C22.2 NO. 60079-15
Mounting:
T35 DIN-Rail according to EN50022 or on customized Termination Board.
Weight: about 145 g.
Connection: by polarized plug-in disconnect screw terminal blocks to accomodate terminations up to 2.5 mm^2.
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 22.5 mm, Depth 123 mm, Height 120 mm.

D5291 Technical Data

Input: 24 Vdc nom (21.6 to 27.6 Vdc) reverse polarity protected, ripple within voltage limits ≤ 5 Vpp.

The following monitoring circuits are mutually exclusive:

1) ***Line input monitoring (DIP-Switch selectable):*** to allow DCS/PLC line monitoring function (pulse test).
2) ***Voltage monitoring (DIP-Switch selectable):*** ≥ 21.6 Vdc for normal operation, ≤ 17 Vdc reflects a high impedance (≤ 10 mA consumption) to the control device.

Current consumption @ 24 V: 60 mA with relay energized, typical.

Power dissipation: 1.5 W with 24 V input voltage and relay energized, typical.

Isolation (Test Voltage): Input/Output 2.5 KV.

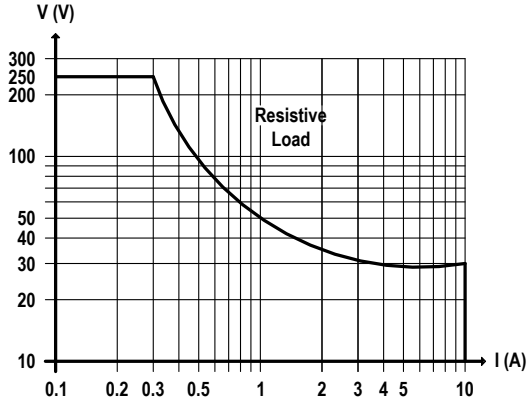
Output: voltage free SPDT relay contact.

Terminals 13-14, open when relay de-energized, close in energized condition. Terminals 13-15, close when relay de-energized, open in energized condition.

Contact material: Ag Alloy (Cd free) or $AgSnO_2$.

Contact rating: 10 A 250 Vac 2500 VA, 10 A 250 Vdc 300 W (resistive load).

DC Load breaking capacity:



Mechanical / Electrical life: $10 * 10^6$ / $5 * 10^4$ operation, typical.

Bounce time NO / NC contact: 4 / 6 ms, typical.

Frequency response: 10 Hz maximum.

Environmental conditions:

Operating: temperature limits - 40 to + 60 °C, relative humidity 95 %, up to 55 °C.

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

Safety Description:

for use in Class I, Division 2, Groups A, B, C, D, Temperature Code T4; Class I, Zone 2, AEx nA nC IIC T4 Gc and CL I, ZN 2, Ex nA nC IIC T4 Gc Hazardous Locations.

Approvals:

FM, FM-C according to FM3600, FM3611, ANSI/ISA 60079-0, ANSI/ISA 60079-15, CSA-C22.2 NO. 157, CSA-C22.2 NO. 213, CSA-C22.2 NO. 60079-0, CSA-C22.2 NO. 60079-15

Mounting: T35 DIN-Rail according to EN50022, with or without Power Bus or on customized Termination Board.

Weight: about 120g

Connection: by polarized plug-in disconnect screw terminal blocks to accomodate terminations up to 2.5 mm^2

Location: Non Hazardous Locations or Class I, Division 2, Groups A, B, C, D Temperature Code T4 and Class I, Zone 2, Group IIC, IIB, IIA T4 installation.

Protection class: IP 20.

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